GOVERNMENT OF THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF WATER SUPPLY

JAPAN INTERNATIONAL COOPERATION AGENCY

NATIONAL WATER SUPPLY & DRAINAGE BOARD

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

JICA LOAN No: SL – P115

BIDDING DOCUMENT

FOR

LOT C 1: SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

VOLUME 1 OF 4

JULY 2021

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Check List for Submission of Bid

This checklist is for the assistance of the Bidder to prepare and submit a complete Bid. This is NOT part of the Bidding Document. The submission requirements as indicated below need to be complied by the Bidder in accordance with guidance and instructions provided in ITB in Section 1.

The provisions in the Bidding Document shall prevail in the event of a conflict between this Checklist and the Bidding Document.

THE BID SUBMITTED BY BIDDER SHALL INCLUDE THE FOLLOWING DOCUMENTS		Check
One Original and One Copy of Bid Document in two separate Envelopes marked on left hand corner 'ORIGINAL' & 'COPY' respectively. The 'Original' and 'Copy' shall comprise the following Documents. (Refer to Clause 10 and 11 of ITB)		
(A)	Letter of Bid, in accordance with ITB 11.1 and 12.1	
(B)	Completed Schedules in accordance with ITB 12.1, 14 & 15 including Priced Bill of Quantities	
(C)	Bid Security, in accordance with ITB 11.1(c) and 19	
(D)	Authorizing the Signatory of the Bids to commit the Bidder, in accordance with ITB 11.1(f), 20.2 and 20.3	
(E)	In the case of a Bid submitted by a JV, copy of the JV Agreement, or Letter of Intent to enter into a JV including a draft agreement in accordance with ITB 11.2 and 4.1.	
(F)	Documentary evidence in accordance with ITB 17 establishing the Bidder's Eligibility and Qualifications to perform the Contract if it's Bid is accepted by submitting the completed following Forms in Section IV	
i.	Form ELI -1: Bidder's Information Form.	
ii.	Form ELI -2: Bidder's Party Information Form.	
iii.	Form CON: Historical Contract Non-Performance and Litigation.	
iv.	Form FIN -1: Financial Situation.	
v.	Form FIN -2: Average Annual Construction Turnover.	
vi.	Form FIR -1: Financial Resources.	
vii.	Form FIR -2: Current Contract Commitments.	
viii.	Form EXP -1: General Construction Experience	
ix.	Form EXP -2(a): Specific Construction Experience	
(G)	Technical Proposal in accordance with ITB 11.1 (h) and 16.1 by submitting the completed following Information/Details in Section IV	
i.	Site Organization.	
ii.	Method Statement	
iii.	Mobilization Schedule.	
iv.	Construction Schedule.	
v.	Health and Safety Plan	

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THE BID SUBMITTED BY BIDDER SHALL INCLUDE THE FOLLOWING DOCUMENTS		Check
vi.	Form PER -1: Proposed Personnel	
vii.	Form PER -2: Resume of Proposed Personnel.	
viii.	Form EQU: Equipment	
(H)	Acknowledgement of Compliance with the Guidelines for Procurement under Japanese ODA Loans (Form ACK) which shall be signed and dated by the Bidder's authorized representative.	
(I)	Any Additional Document required in BDS 11.1(i).	

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THE GOVERNMENT OF THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF WATER SUPPLY

NATIONAL WATER SUPPLY AND DRAINAGE BOARD

Anuradhapura North Water Supply Project – Phase II

Supply & Laying of HDPE, DI Distribution Mains and Providing Service Connections for Padaviya and Kebithigollewa DS Divisions

CONTRACT No.: AN/PH II/JICA/DM/LOT C1

INVITATION FOR BIDS (IFB) – NCB - 01

1. The Democratic Socialist Republic of Sri Lanka has received an Official Development Assistance (ODA) Loan from Japan International Cooperation Agency, hereinafter referred to as JICA, towards the cost of Water Sector Development Project (SL-P115) in the amount of JPY 23,137 Million according to the Loan Agreement signed on 17 November, 2016 and intends to apply a portion of the proceeds of the loan allocated to payments under the Contract No: AN/PH II/JICA/DM/LOT C1 for which this Invitation for Bid is issued. Disbursement of the ODA Loan by JICA will be subject, in all respects, to the terms and conditions of the Loan Agreement, including the disbursement procedures. No party other than the Government of the Democratic Socialist Republic of Sri Lanka shall derive any rights from the Loan Agreement or have any claim to Loan proceeds. The above Loan Agreement will cover only a part of the Project Cost. As for the remaining portion, the Government of the Democratic Socialist Republic of Sri Lanka will take appropriate measures for finance.

2. The Chairman, Standing Cabinet Appointed Procurement Committee, Ministry of Water Supply, No. 35, "Lakdiya Madura", New Parliament Road, Pelawatta, Battaramulla on behalf of the National Water Supply and Drainage Board (NWSDB) now invites sealed Bids from Eligible Bidders for Supply and Laying of HDPE & DI Distribution System for Kanugahawewa, Kambiliwewa, Padaviya, Wahalkada, Kahatagollawa, Galawewa, Kebithigollawa and Weerasole Areas under the Phase II of the Anuradhapura North Water Supply Project.

3. Bidding will be conducted through National Competitive Bidding Procedures in accordance with the applicable Guidelines for Procurement of all Goods and Services *(Including Consulting Services)* to be finance out of the proceeds of the JICA Loans, and is open to all Bidders from the Eligible Source Countries are, all the Countries and Areas.

4. Alternative Bids shall not be accepted.

5. To be Eligible for Contract Award,

   - The successful Bidder shall not have been Listed in the World Bank's website: www.worldbank.org/debarr and the Local Bidders shall have Registration with CIDA in the Field of Water Supply & Sewerage in Grade CS 1 or above at the time of submission of the Bid.
   - In case of Joint Ventures (JV):

     (a) One Partner with Registration at CIDA under Grade CS 1 or higher-Grade
     OR
     (b) Two (2) Grade C 1 Contractors

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(c) Joint Venture of Foreign Bidder with Local Partners: At least one Local Partner shall have Registration at CIDA under Grade C 1 or higher-Grade

(All in either (a), (b) or (c) related to the Local Bidders shall be in the Field of Water Supply and Sewerage)

Please refer Bidding Document for detailed Qualification Criteria.

6. The Construction Period is **819 days (2¼ years).**

7. Interested Eligible Bidders may obtain further information from Assistant General Manager, (Tenders and Contracts), NWSDB, Galle Road, Ratmalana, over the telephone, number 011-2635885 or 011-2638999 Ext. 1750 or facsimile number 011-2635885 and Bidding Documents may be inspected free of charge at the same address.

   A Copy of the Bidding Document in digital (PDF) Format is available for inspection by any interested Bidder in the following link. However, such Document would be applicable ONLY for inspection, and shall NOT be valid for Submission of Bids.

   http://www.waterboard.lk/web/index.php?option=com_content&view=article&id=177:tenders-contracts-2&catid=58:tenders-contracts&Itemid=199&lang=en

8. A complete set of Bidding Documents in English language may be purchased by interested Bidders on the submission of a written application on a business letter head to the Assistant General Manager (Tenders and Contracts), NWSDB, P. O. Box 14, Galle Road, Ratmalana, Sri Lanka from **21. 07. 2021** until **31. 08. 2021** from **09:00 hours to 15:00 hours** on normal working days upon payment of a non-refundable document fee of **LKR. 500,000.00** plus applicable VAT in cash or a bank draft in favour of National Water Supply and Drainage Board. Cancelled Copy of the Bidding Document can also purchase from the same procedure upon payment of half of the non-refundable Bid Fee.

9. The provisions in the Instructions to Bidders and in the General Conditions of Contract are the provisions of the Standard Bidding Documents under Japanese ODA Loans for the Procurement of Works.

10. A Pre–Bid Meeting will be held at **10:00** hrs., on **18. 08. 2021 at Auditorium, South Wing Building, National Water Supply & Drainage Board, Galle Road, Ratmalana** at which the prospective Bidders or their authorized representatives may request Clarification of the Project/Contract requirements and the Criteria for Qualification. A Site Visit will also be arranged.

11. Bids shall be delivered to the **Chairman, Standing Cabinet Appointed Procurement Committee, Procurement Division, Ministry of Water Supply, No. 35, "Lakdiya Medura", New Parliament Road, Pelawatta, Battaramulla** on **or before 10:00 hrs on 01. 09. 2021**. Late Bids will be rejected. Bids will be opened soon after closing in the presence of the Bidders' representatives who choose to attend.

12. All Bids shall be accompanied by a Bid Security of **LKR. 64 Million** and **valid up to 28 days beyond the Bid Validity Period *(28th December 2021)*** or any extended validity period.

13. Bidders shall bear all costs or expenses incurred by him in connection with attending Pre-Bid Meeting & Site Visit with regards to the Bids.

CHAIRMAN
STANDING CABINET APPOINTED PROCUREMENT COMMITTEE

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(Not for Bidding)

DOCUMENT ISSUANCE CERTIFICATE

"For References ONLY"
(Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

DOCUMENT ISSUANCE CERTIFICATE

(To be filled at the time of issue by the authorized issuing officer)

1. STANDARD DOCUMENT REFERENCE NUMBER : JICASBD/WORKS/VERSION 1.1 (October 2012)
2. CONTRACT NUMBER : AN/PH II/JICA/DM/LOT C1
3. a) ISSUED TO : .....
   b) ADDRESS : .....
   c) TELEPHONE NUMBER : .....
   d) FACSIMILE NUMBER : .....
4. a) DOCUMENT FEE : LKR 500,000/= RECEIVED (IN CASH/BANK DRAFT)
   b) RECEIPT/BANK DRAFT NUMBER : .....
5. NUMBER OF COPIES ISSUED : .....
6. NUMBER OF CANCELLED COPIES ISSUED: .....
7. a) CANCELLED COPY FEE : LKR 250,000/= RECEIVED (IN CASH/BANK DRAFT)
8. BUSINESS REGISTRATION NUMBER : .....
9. ISSUING AUTHORITY : AGM (Tenders and Contracts)
   National Water Supply & Drainage Board,
   P. O. Box 14, Galle Road, Ratmalana.
   Tel. Number: +94-011-2605328
   +94-011-2638999 Ext. 1750,
   Fax: + 94-011-2635885
   E-mail: agmtenders@waterboard.lk
10. a) ISSUING OFFICER : .....
    b) DESIGNATION : .....
    c) SIGNATURE : .....
11. PLACE OF ISSUE : .....
12. SEAL : .....
13. DATE : ..... TIME : .....

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Summary Description

Procurement of Works

Invitation for Bids (IFB)

A Form of Invitation for Bidding Without Prequalification is provided.

PART 1 – BIDDING PROCEDURES

A brief description of this Bidding Document is given below;

One-Envelope Bidding

Section I: **Instructions to Bidders (ITB)**
This Section provides relevant information to help Bidders prepare their Bids. Information is also provided on the submission, opening, and evaluation of Bids and on the award of Contracts.

Section II. **Bid Data Sheet (BDS)**
This Section includes provisions that are specific to each procurement and that supplement the information or requirements included in Section 1, Instructions to Bidders.

Section III. **Evaluation and Qualification Criteria**
This Section specifies the criteria to determine the lowest evaluated Bid and the qualifications of the Bidder to perform the contract.

Section IV: **Bidding Forms**
This Section includes the Forms which are to be completed by the Bidder and submitted as part of his Bid.

Section V. **Eligible Source Countries of Japanese ODA Loans**
This Section contains information regarding eligible source countries under Japanese ODA Loans.

PART 2 – WORKS REQUIREMENTS

Section VI. **Works Requirements**

This Section contains the Specification, the Drawings, and supplementary information that describe the Works to be procured.

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VII. **General Conditions (GC)**
This Section contains the general clauses to be applied in all contracts.

Section VIII. **Particular Conditions (PC)**

This Section consists of Part A, Contract Data, which contains data, and Part B, Specific Provisions, which contains clauses specific to each Contract.

Section IX: **Annex to the Particular Conditions - Contract Forms**
This Section contains Forms which, once completed, will form part of the Contract. The Forms for **Performance Security** and **Advance Payment Security**, when required, shall only be completed by the successful Bidder after Contract Award.

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B I D D I N G D O C U M E N T S

for

Procurement of

LOT C 1: SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO. AN/PH II/JICA/DM/LOT C1

Employer : *National Water Supply & Drainage Board*

Country : *Sri Lanka*

Project : *Anuradhapura North Water Supply Project – Phase II*

Loan No. : *SL-P115*

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ABBREVIATIONS

AGM	Assistant General Manager
ANWSP-PII	Anuradhapura North Water Supply Project – Phase II
APP	Appendix
BF	Bidding Forms
BOQ	Bills of Quantities
CA	Current Assets
CBO	Community Based Organization
CEA	Central Environmental Authority
CEB	Ceylon Electricity Board
CL	Current Liabilities
DB	Dispute Board
DED	Detailed Engineering Design
DI	Ductile Iron
DN	Nominal Diameter
DNP	Defects Notification Period
DSD	Divisional Secretariat Divisions
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPDM	Ethylene Propylene Diene Monomer Rubber
FIDIC	International Federation of Consulting Engineers
GCC	General Conditions of Contract
GIS	Geographical Information System
GOSL	Government of Sri Lanka
GPRS	General Pocket Radio Service
GSM	Global System for Mobile Communication
HDPE	High Density Poly Ethylene

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HO	Head Office, NWSDB
IESL	Institute of Engineers, Sri Lanka
ITB	Instructions to Bidders
JICA	Japan International Cooperation Agency
JPY	Japanese Yen
JV	Joint Venture
LA	Local Authority
LKR	Sri Lankan Rupee
LS	Longitudinal Section
MDB	Multilateral Development Bank
MOU	Memorandum of Understanding
NA	Not Applicable
NC	North Central
NW	Net Worth
NWSDB	National Water Supply & Drainage Board
O&M	Operation & Maintenance
O.D.	Outside Diameter
ODA	Official Development Assistance
OHS	Occupational Health and Safety
PAT	Profits After Taxes
PBT	Profits Before Taxes
PCC	Particular Conditions of Contract
PD	Project Director
PH II	Phase II
PMU	Project Management Unit
PN	Nominal Pressure
PPE	Personal Protective Equipment
PQ	Pre-Qualification

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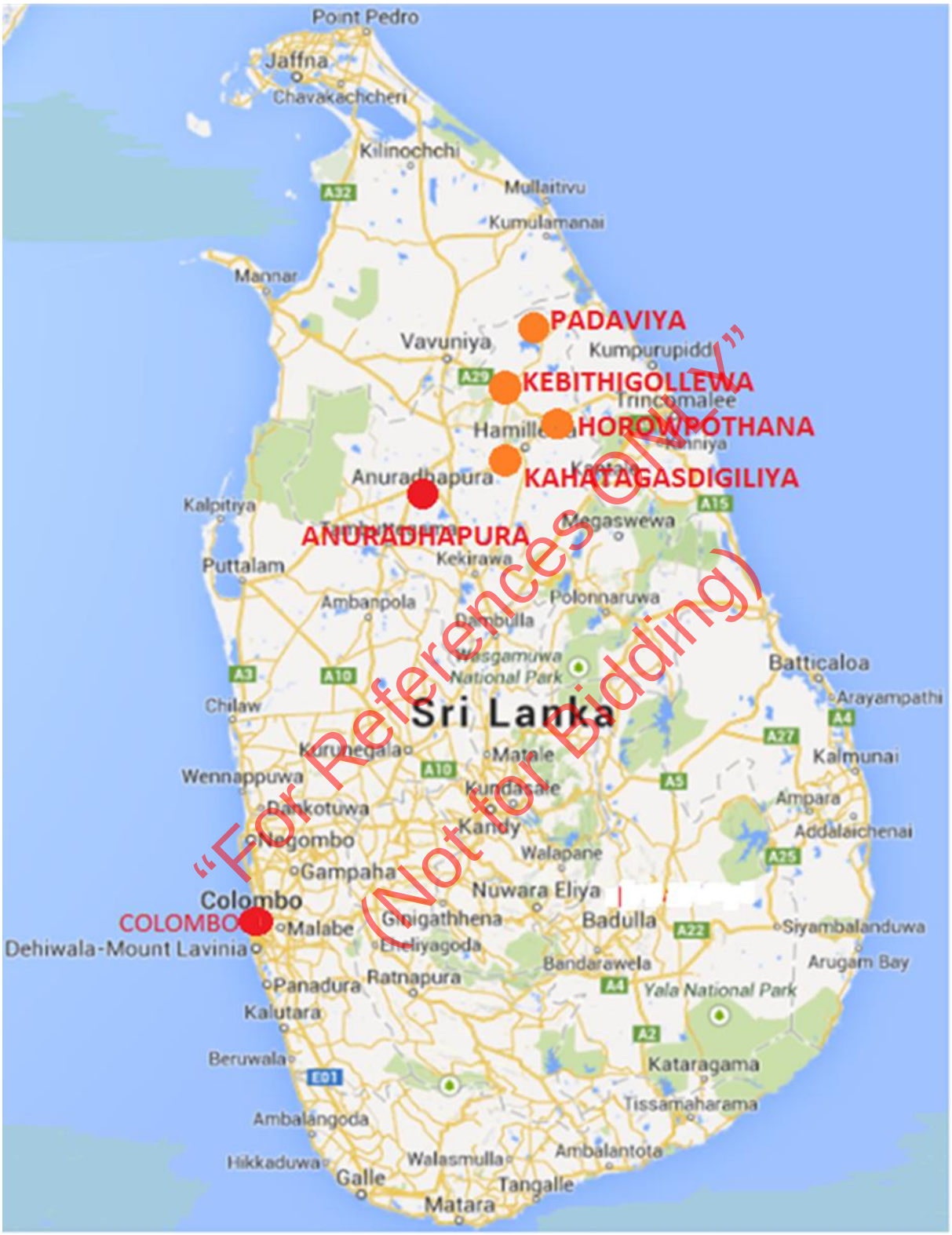
PRDA	Provincial Road Development Authority
PS	Pradeshiya Sabha
QA/QC	Quality Assurance/Quality Control
QCR	Qualification Criteria
QM	Quality Management
RDA	Road Development Authority
RSC	Regional Support Centre
SBD	Standard Bidding Document
SLS	Sri Lankan Standards
SOW	Scope of Work
SPD	Standard Pre-Qualification Documents
TA	Total Assets
TL	Total Liabilities
TOR	Terms of Reference
TR	Total Revenue
UDA	Urban Development Authority
USD	United States Dollar
WTP	Water Treatment Plant

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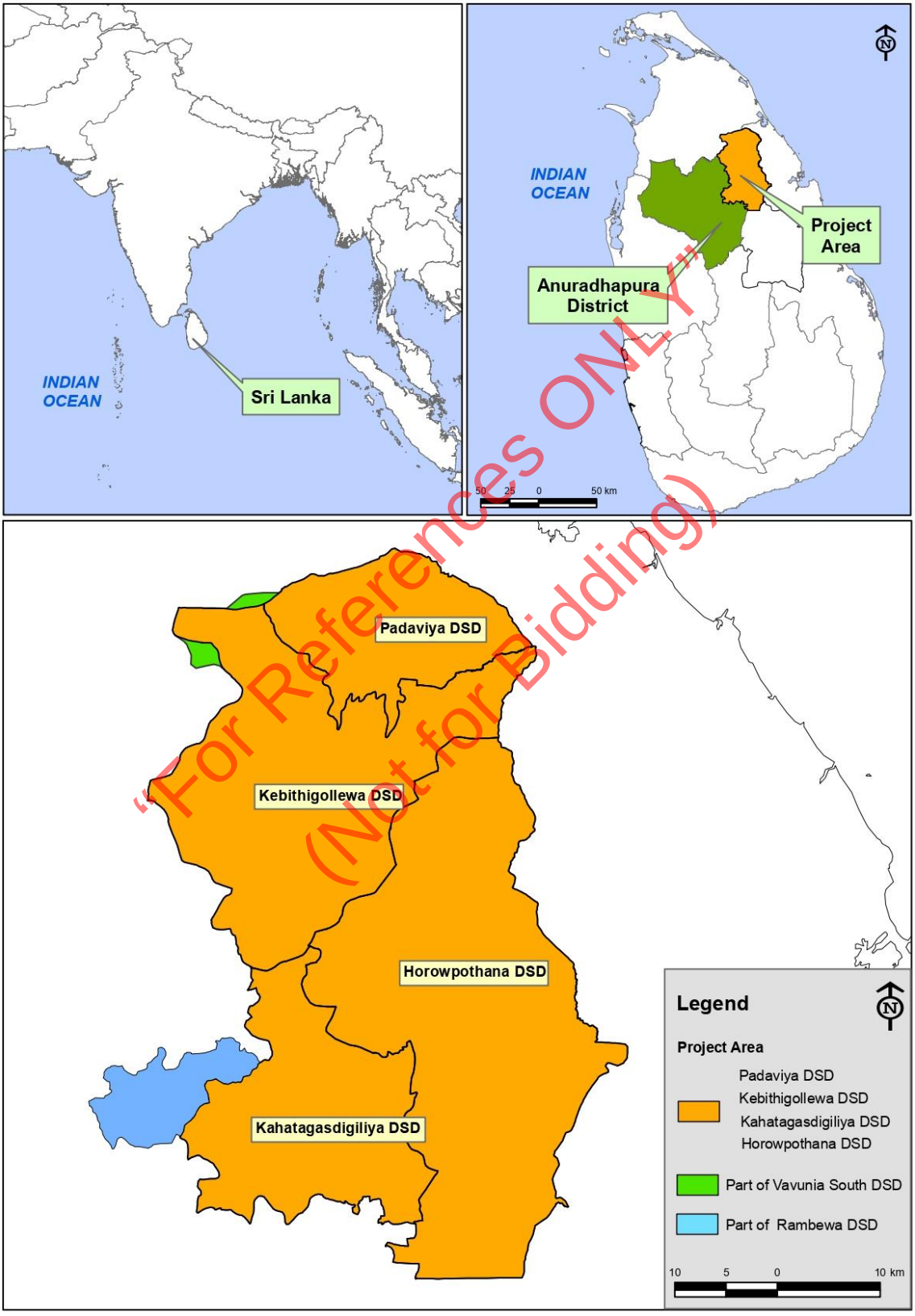
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LOCATION MAP

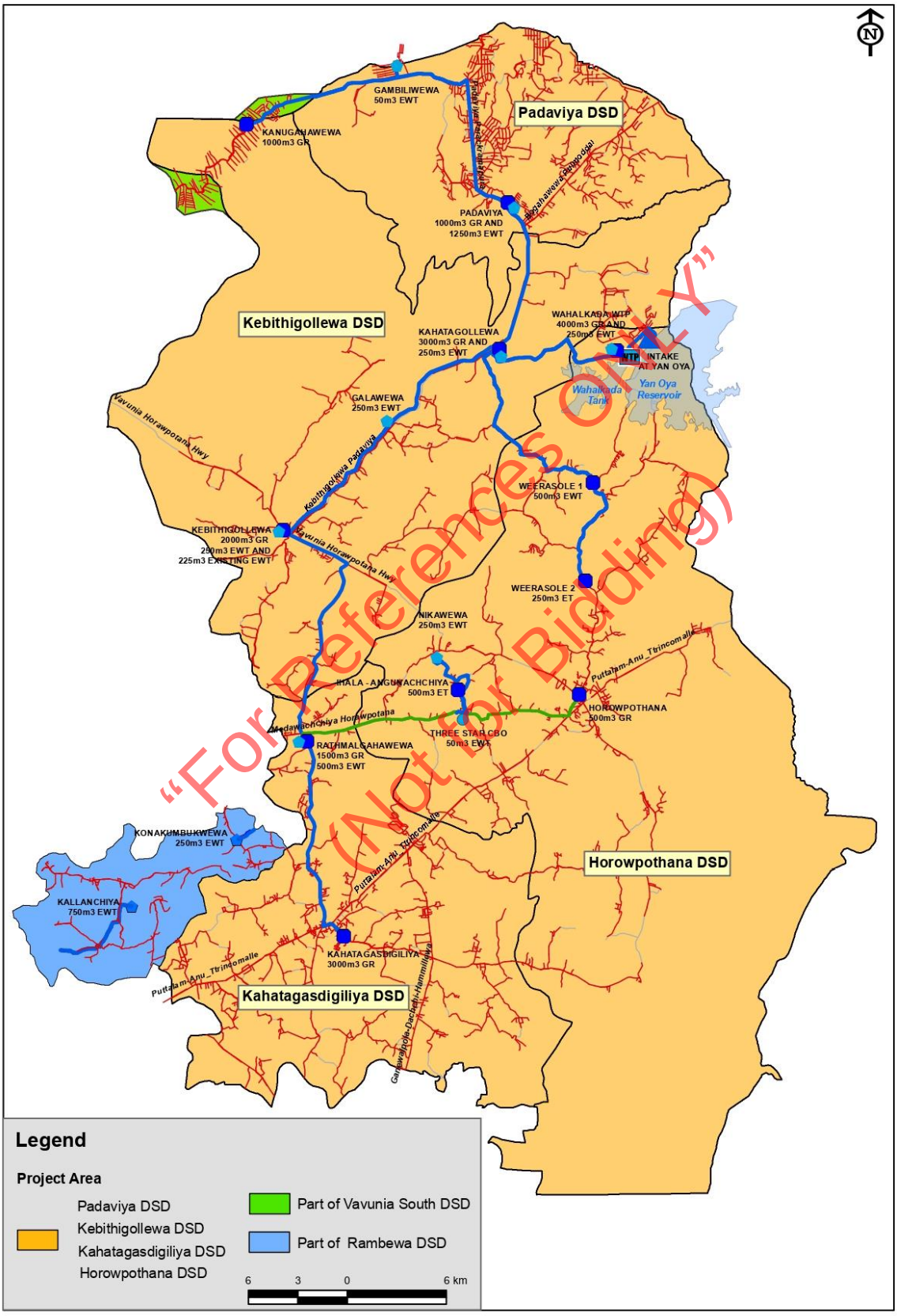


ANWSP PHASE II PROJECT AREA



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TRANSMISSION AND DISTRIBUTION MAP



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PART 1

BIDDING PROCEDURES

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One-Envelope Bidding

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SECTION I

INSTRUCTIONS TO BIDDERS

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A. General

1. Scope of Bid

1.1 In connection with the Invitation for Bids **specified in Section II, Bid Data Sheet (BDS)**, the Employer, as **specified in the BDS**, issues these Bidding Documents (hereinafter referred to as "Bidding Documents") for the procurement of Works as specified in Section VI, Works Requirements. The name, identification, and number of the lot(s) (contract(s)) comprising this International Competitive Bidding (ICB) process are **specified in the BDS.**

1.2 Throughout these Bidding Documents:

(a) the term "in writing" means communicated in written form and delivered against receipt;

(b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and

(c) "day" means calendar day.

2. Source of Funds

2.1 The Borrower **specified in the BDS** has received or has applied for a Japanese ODA Loan from Japan International Cooperation Agency (hereinafter referred to as "JICA"), with the number, in the amount and on the signed date of the Loan Agreement **specified in the BDS**, towards the cost of the project **specified in the BDS**. The Borrower intends to apply a portion of the proceeds of the loan to payments under the contract(s) for which these Bidding Documents are issued.

2.2 Disbursement of a Japanese ODA Loan by JICA will be subject, in all respects, to the terms and conditions of the Loan Agreement, including the disbursement procedures and the applicable Guidelines for Procurement under Japanese ODA Loans **specified in the BDS**. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the loan proceeds.

2.3 The above Loan Agreement will cover only a part of the project cost. As for the remaining portion, the Borrower will take appropriate measures for finance.

3. Corrupt and Fraudulent Practices

3.1 It is JICA's policy to require that Bidders and Contractors, as well as Borrowers, under contracts funded with Japanese ODA Loans and other Japanese ODA, observe the highest standard of ethics during the procurement and execution of

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such contracts. In pursuance of this policy, JICA:

(a) will reject a proposal for award if it determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question;

(b) will recognize a Bidder or Contractor as ineligible, for a period determined by JICA, to be awarded a contract funded with Japanese ODA Loans if it at any time determines that the Bidder or the Contractor has engaged in corrupt or fraudulent practices in competing for, or in executing, another contract funded with Japanese ODA Loans or other Japanese ODA; and

(c) will recognize a Contractor as ineligible to be awarded a contract funded with Japanese ODA Loans if the Contractor or subcontractor, who has a direct contract with the Contractor, is debarred under the cross debarment decisions by the Multilateral Development Banks. Such period of ineligibility shall not exceed three (3) years from (and including) the date on which the cross debarment is imposed.

"Cross debarment decisions by the Multilateral Development Banks" is a corporate sanction in accordance with the agreement among the African Development Bank Group, Asian Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank Group and the World Bank Group signed on 9 April, 2010 (as amended from time to time). JICA will recognize the World Bank Group's debarment of which period exceeds one year, imposed after 19 July, 2010, the date on which the World Bank Group started cross debarment, as "cross debarment decisions by the Multilateral Development Banks." The list of debarred firms and individuals is available at the electronic address **specified in the BDS**.

JICA will recognize a Bidder or Contractor as ineligible to be awarded a contract funded with Japanese ODA Loans if the Bidder or Contractor is debarred by the World Bank Group for the period starting from the date of the Invitation for Bid, if prequalification has not been conducted, or the date of the Advertisement for Prequalification, if prequalification has been conducted, up to the signing of the contract, unless (i) such debarment period does not exceed one year, or (ii) three

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(3) years have passed since such debarment decision.

If it is revealed that the Contractor was ineligible to be awarded a contract according to above, JICA will, in principle, impose sanctions against the Contractor.

If it is revealed that the subcontractor, who has a direct contract with the Contractor, was debarred by the World Bank Group on the subcontract date, JICA will, in principle, require the Borrower to have the Contractor cancel the subcontract immediately, unless (i) such debarment period does not exceed one year, or (ii) three (3) years have passed since such debarment decision. If the Contractor refuses, JICA will require the Borrower to declare invalidity or cancellation of the contract and demand the refund of the relevant proceeds of the loan or any other remedies on the grounds of contractual violation.

3.2 Furthermore, Bidders shall be aware of the provision stated in Sub-Clause 15.6 of the General Conditions.

4. Eligible Bidders

4.1 A Bidder may be a firm that is a single entity or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent. In the case of a JV, all members shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution.

4.2 A Bidder shall not have a conflict of interest. A Bidder shall not be employed under any of the circumstances set forth below, where it is determined to have a conflict of interest throughout the bidding/selection process and/or the execution of the contract unless the conflict has been resolved in a manner acceptable to JICA.

(a) A firm shall be disqualified from providing goods or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of a project that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm. This provision does not apply to the

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various firms (consultants, contractors, or suppliers) only due to the reason that those firms together are performing the Contractor's obligations under a turnkey or design and build contract.

(b) A firm that has a close business relationship with the Borrower's professional personnel, who are directly or indirectly involved in any part of: (i) the preparation of the Bidding Documents for the contract, (ii) the Bid evaluation, or (iii) the supervision of such contract, shall be disqualified.

(c) Based on the "One Bid Per Bidder" principle, which is to ensure fair competition, a firm and any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm shall not be allowed to submit more than one Bid, either individually as a Bidder or as a member of a JV. A firm (including its affiliate), if acting in the capacity of a subcontractor in one Bid, may participate in other Bids, only in that capacity.

(d) A firm having any other form of conflict of interest other than (a) through (c) above shall be disqualified.

4.3 A Bidder, and all members constituting the Bidder, shall be from any of the eligible source countries as indicated in Section V, Eligible Source Countries of Japanese ODA Loans.

4.4 A Bidder that has been determined to be ineligible by JICA in accordance with ITB 3.1 shall not be eligible to be awarded a contract.

4.5 This bidding is open only to prequalified Bidders unless **specified in the BDS**.

4.6 A Bidder shall provide such evidence of eligibility satisfactory to the Employer, as the Employer shall reasonably request.

5. Eligible Materials, Equipment, and Services

5.1 The materials, equipment and services to be supplied under the Contract and financed by JICA shall have their origin in any of the eligible source countries indicated in Section V, Eligible Source Countries of Japanese ODA Loans. At the Employer's request, Bidders may be required to provide evidence of the origin of materials, equipment and services.

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5.2 For purposes of ITB 5.1 above, "origin" means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.

B. Contents of Bidding Documents

6. Sections of Bidding Documents

6.1 The Bidding Documents consist of Parts 1, 2, and 3, which include all the Sections specified below, and which should be read in conjunction with any addenda issued in accordance with ITB 8.

PART 1 Bidding Procedures

- Section I. Instructions to Bidders (ITB)
- Section II. Bid Data Sheet (BDS)
- Section III. Evaluation and Qualification Criteria
- Section IV. Bidding Forms
- Section V. Eligible Source Countries of Japanese ODA Loans

PART 2 Works Requirements

- Section VI. Works Requirements

PART 3 Conditions of Contract and Contract Forms

- Section VII. General Conditions (GC)
- Section VIII. Particular Conditions (PC)
- Section IX. Annex to the Particular Conditions - Contract Forms

6.2 The Invitation for Bids issued by the Employer is not part of the Bidding Documents.

6.3 Unless obtained directly from the Employer, the Employer is not responsible for the completeness of the Bidding Documents, responses to requests for clarification, the minutes of the pre-bid meeting (if any), or addenda to the Bidding Documents in accordance with ITB 8. In case of any contradiction, documents obtained directly from the Employer shall prevail.

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6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Documents and to furnish with its Bid all information and documentation as is required by the Bidding Documents.

7. Clarification of Bidding Documents, Site Visit, Pre-Bid Meeting

7.1 A Bidder requiring any clarification of the Bidding Documents shall contact the Employer in writing at the Employer's address **specified in the BDS** or raise its enquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification, provided that such request is received no later than fourteen (14) days prior to the deadline for submission of Bids. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding Documents in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. If so **specified in the BDS**, the Employer shall also promptly publish its response at the web page **identified in the BDS**. Should the clarification result in changes to the essential elements of the Bidding Documents, the Employer shall amend the Bidding Documents following the procedure under ITB 8 and ITB 22.2.

7.2 The Bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself on its own responsibility all information that may be necessary for preparing the Bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.

7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.

7.4 If so **specified in the BDS**, the Bidder's designated representative is invited to attend a pre-bid meeting. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

7.5 The Bidder is requested to submit any questions in writing, to reach the Employer not later than one (1) week before the

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meeting.

7.6 Minutes of the pre-bid meeting, if applicable, including the text of the questions asked by Bidders, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Documents in accordance with ITB 6.3. Any modification to the Bidding Documents that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting. Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.

8. Amendment of Bidding Documents

8.1 At any time prior to the deadline for submission of Bids, the Employer may amend the Bidding Documents by issuing addenda.

8.2 Any addendum issued shall be part of the Bidding Documents and shall be communicated in writing to all who have obtained the Bidding Documents from the Employer in accordance with ITB 6.3. If so **specified in the BDS**, the Employer shall also promptly publish the addendum on the Employer's web page in accordance with ITB 7.1.

8.3 To give Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Employer may extend the deadline for the submission of Bids, pursuant to ITB 22.2.

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C. Preparation of Bids

9. Cost of Bidding

9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

10. Language of Bid

10.1 The Bid, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Employer, shall be written in the language **specified in the BDS**. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language of Bid, in which case, for purposes of interpretation of the Bid, such translation shall govern.

11. Documents

11.1 The Bid shall comprise the following:

Comprising the Bid

(a) Letter of Bid

(b) completed schedules as required, including priced Bill of Quantities, in accordance with ITB 12 and 14;

(c) Bid Security, in accordance with ITB 19;

(d) Acknowledgement of Compliance with Guidelines for Procurement under Japanese ODA Loans (Form ACK), which shall be signed and dated by the Bidder's authorized representative;

(e) alternative Bids, if permissible, in accordance with ITB 13;

(f) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 20.2;

(g) documentary evidence in accordance with ITB 17 establishing the Bidder's qualifications to perform the contract if its Bid is accepted;

(h) Technical Proposal in accordance with ITB 16; and

(i) any other document **required in the BDS**.

11.2 In addition to the requirements under ITB 11.1, Bids submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful Bid shall be signed by all members and submitted with the Bid, together with a copy of the proposed Agreement.

12. Letter of Bid and Schedules

12.1 The Letter of Bid and Schedules, including the Bill of Quantities, shall be prepared using the relevant forms furnished in Section IV, Bidding Forms. The forms must be completed without any alterations to the text, and no substitutes shall be accepted except as provided under ITB 20.2. All blank spaces shall be filled in with the information requested.

13. Alternative Bids

13.1 **Unless otherwise specified in the BDS**, alternative Bids shall not be considered.

13.2 When alternative times for completion are explicitly invited, a statement to that effect **will be included in the BDS**, as will the method of evaluating different times for completion.

13.3 Except as provided under ITB 13.4 below, Bidders wishing to offer technical alternatives to the requirements of the Bidding Documents must first price the Employer's design

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as described in the Bidding Documents and shall further provide all information necessary for a complete evaluation of the alternative by the Employer, including drawings, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the Employer.

13.4 **When specified in the BDS**, Bidders are permitted to submit alternative technical solutions for specified parts of the Works, and such parts **will be identified in the BDS**, as will the method for their evaluating," and described in Section VI, Works Requirements.

14. Bid Prices and Discounts

14.1 The prices and discounts (including any price reduction) quoted by the Bidder in the Letter of Bid and in the Bill of Quantities shall conform to the requirements specified below.

14.2 The Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Bidder shall be deemed covered by the rates for other items in the Bill of Quantities and will not be paid for separately by the Employer. An item not listed in the priced Bill of Quantities shall be assumed to be not included in the Bid, and provided that the Bid is determined substantially responsive notwithstanding this omission, the average price of the item quoted by substantially responsive Bidders will be added to the Bid Price and the equivalent total cost of the Bid so determined will be used for price comparison.

14.3 The price to be quoted in the Letter of Bid, in accordance with ITB 12.1, shall be the total price of the Bid, excluding any discounts offered.

14.4 The Bidder shall quote any discounts and the methodology for their application in the Letter of Bid, in accordance with ITB 12.1.

14.5 **Unless otherwise specified in the BDS** and the Contract, the rates and prices quoted by the Bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract. In such a case, the Bidder shall furnish the indices and weightings for the price adjustment formulae in the

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Schedule of Adjustment Data and the Employer may require the Bidder to justify its proposed indices and weightings.

14.6 If so specified in BDS 1.1, Bids are being invited for individual lots (contracts) or for any combination of lots (packages). Bidders wishing to offer discounts for the award of more than one Contract shall specify in their Bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITB 14.4, provided the Bids for all lots (contracts) are opened at the same time.

14.7 **Unless otherwise provided in the BDS**, all duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date twenty-eight (28) days prior to the deadline for submission of Bids, shall be included in the rates and prices and the total Bid Price submitted by the Bidder.

15. Currencies of Bid and Payment

15.1 The currency(ies) of the Bid shall be **as specified in the BDS**. Payment of the contract price shall be made in the currency or currencies in which the Bid Price is expressed in the Bid of the successful Bidder.

15.2 Bidders may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements, and to substantiate that the amounts included in the unit rates and prices and shown in the Schedule of Adjustment Data are reasonable, in which case a detailed breakdown of the foreign currency requirements shall be provided by Bidders.

15.3 The foreign currency requirements generally include the following:

(a) expatriate staff and labour employed directly on the Works;

(b) social, insurance, medical and other charges relating to such expatriate staff and labour, and foreign travel - expenses;

(c) imported materials, both temporary and permanent, including fuels, oil and lubricants required for the Works;

(d) depreciation and usage of imported Plant and Contractor's Equipment, including spare parts, required

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for the Works;

(e) foreign insurance and freight charges for imported materials, Plant and Contractor's Equipment, including spare parts; and

(f) overhead expenses, fees, profit, and financial charges arising outside the Employer's country in connection with the Works.

16. Documents Comprising the Technical Proposal

16.1 The Bidder shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule, safety plan and any other information as stipulated in Section IV, Bidding Forms, in sufficient detail to demonstrate the adequacy of the Bidder's proposal to meet the work requirements and the completion time.

17. Documents Establishing the Qualifications of the Bidder

17.1 In accordance with Section III, Evaluation and Qualification Criteria, if the prequalification process was conducted prior to the bidding process, the Bidder shall provide in the corresponding information sheets included in Section IV, Bidding Forms, (i) updated information on any assessed aspect that changed from that time to establish that the Bidder continues to meet the criteria used at the time of prequalification and (ii) the requested information on the additional qualification criteria stated in Section III, Evaluation and Qualification Criteria, or if the assessment of qualification criteria was not conducted prior to the bidding process, the Bidder shall provide the information requested in the corresponding information sheets included in Section IV, Bidding Forms.

17.2 Any change in the structure or formation of a Bidder after being prequalified and invited to bid (including, in the case of a JV, any change in the structure or formation of any member thereto) shall be subject to the written approval of the Employer prior to the deadline for submission of Bids. Such approval shall be denied if (i) such change has not taken place by the free choice of the firms involved; (ii) as a consequence of the change, the Bidder no longer substantially meets the qualification criteria set forth in the Prequalification Documents; or (iii) in the opinion of the Employer, the change may result in a substantial reduction in competition. Any such change should be submitted to the Employer not later than fourteen (14) days after the date of the Invitation for Bids.

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18. Period of Validity of Bids

18.1 Bids shall remain valid for the period **specified in the BDS** after the Bid submission deadline date prescribed by the Employer in accordance with ITB 22.1. A Bid valid for a shorter period shall be rejected by the Employer as non-responsive.

18.2 In exceptional circumstances, prior to the expiration of the Bid validity period, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. The Bid Security shall also be extended for twenty-eight (28) days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request shall not be required or permitted to modify its Bid, except as provided in ITB 18.3.

18.3 If the award is delayed by a period exceeding fifty-six (56) days beyond the expiry of the initial Bid validity, the Contract price shall be determined as follows:

(a) In the case of fixed price contracts, the Contract price shall be the Bid Price adjusted by the factor **specified in the BDS**.

(b) In the case of adjustable price contracts, to determine the Contract price, the fixed portion of the Bid Price shall be adjusted by the factor **specified in the BDS.**

(c) In any case, Bid evaluation shall be based on the Bid Price without taking into consideration the applicable correction from those indicated above.

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19. Bid Security

19.1 The Bidder shall furnish as part of its Bid, a Bid Security in the amount and currency **specified in the BDS**.

19.2 The Bid Security shall be a demand guarantee in any of the following forms at the Bidder's option:

(a) an unconditional guarantee issued by a bank or financial institution (such as an insurance, bonding or surety company);

(b) an irrevocable letter of credit;

(c) a cashier's or certified check; or

(d) another security **specified in the BDS**,

from a reputable source from an eligible source country. If the unconditional guarantee is issued by a financial

institution located outside the Employer's Country, the issuing financial institution shall have a correspondent financial institution located in the Employer's Country to make it enforceable. In the case of a bank guarantee, the Bid Security shall be submitted either using the Bid Security Form included in Section IV, Bidding Forms, or in another substantially similar format approved by the Employer prior to Bid submission. In either case, the form must include the complete name of the Bidder. The Bid Security shall be valid for twenty-eight (28) days beyond the original validity period of the Bid, or beyond any period of extension if requested under ITB 18.2.

19.3 Any Bid not accompanied by a substantially responsive Bid security shall be rejected by the Employer as non-responsive.

19.4 The Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's signing the Contract and furnishing the Performance Security pursuant to ITB 42.

19.5 The Bid Security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required Performance Security.

19.6 The Bid Security may be forfeited:

(a) if a Bidder withdraws its Bid during the period of Bid validity specified by the Bidder on the Letter of Bid, or any extension thereto provided by the Bidder; or

(b) if the successful Bidder fails to:

(i) sign the Contract in accordance with ITB 41; or

(ii) furnish a Performance Security in accordance with ITB 42.

19.7 The Bid Security of a JV shall be in the name of the JV that submits the Bid. If the JV has not been legally constituted into a legally enforceable JV at the time of bidding, the Bid Security shall be in the names of all future members as named in the letter of intent referred to in ITB 4.1 and ITB 11.2.

20. Format and Signing of Bid

20.1 The Bidder shall prepare one original of the documents comprising the Bid as described in ITB 11 and clearly mark it "ORIGINAL." Alternative Bids, if permitted in accordance

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with ITB 13, shall be clearly marked "ALTERNATIVE." In addition, the Bidder shall submit copies of the Bid, in the number **specified in the BDS** and clearly mark them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.

20.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation **as specified in the BDS** and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid where entries or amendments have been made shall be signed or initialed by the person signing the Bid.

20.3 In case the Bidder is a JV, the Bid shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by their legally authorized representatives.

20.4 Any inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.

D. Submission and Opening of Bids

21. Sealing and Marking of Bids

21.1 The Bidder shall enclose the original and all copies of the Bid, including alternative Bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL", "ALTERNATIVE" and "COPY." These envelopes containing the original and the copies shall then be enclosed in one single envelope.

21.2 The inner and outer envelopes shall:

(a) bear the name and address of the Bidder;

(b) be addressed to the Employer in accordance with ITB 22.1;

(c) bear the specific identification of this bidding process specified in BDS 1.1; and

(d) bear a warning not to open before the time and date for Bid opening.

21.3 If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the

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misplacement or premature opening of the Bid.

22. Deadline for Submission of Bids

22.1 Bids must be received by the Employer at the address and no later than the date and time **specified in the BDS**.

22.2 The Employer may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Documents in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

23. Late Bids

23.1 The Employer shall not consider any Bid that arrives after the deadline for submission of Bids, in accordance with ITB 22. Any Bid received by the Employer after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.

24. Withdrawal, Substitution, and Modification of Bids

24.1 A Bidder may withdraw, substitute, or modify its Bid after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 20.2, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Bid must accompany the respective written notice. All notices must be:

(a) prepared and submitted in accordance with ITB 20 and ITB 21 (except that withdrawals notices do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and

(b) received by the Employer prior to the deadline prescribed for submission of Bids, in accordance with ITB 22.

24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened to the Bidders.

24.3 No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of Bids and the expiration of the period of Bid validity specified by the Bidder on the Letter of Bid or any extension thereof.

25. Bid Opening

25.1 Except in the cases specified in ITB 23 and ITB 24, the Employer shall publicly open and read out in accordance with ITB 25.3 all Bids received by the deadline, at the date, time and place **specified in the BDS**, in the presence of

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Bidders' designated representatives and anyone who choose to attend.

25.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding Bid shall not be opened, but returned to the Bidder. No Bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at Bid opening. Next, envelopes marked "SUBSTITUTION" shall be opened and read out and exchanged with the corresponding Bid being substituted, and the substituted Bid shall not be opened, but returned to the Bidder. No Bid substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at Bid opening. Envelopes marked "MODIFICATION" shall be opened and read out with the corresponding Bid. No Bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at Bid opening. Only Bids that are opened and read out at Bid opening shall be considered further.

25.3 All other envelopes shall be opened one at a time, reading out:

(a) the name of the Bidder;

(b) whether there is a modification;

(c) the total Bid Price, per lot (contract) if applicable, including any discounts and alternative Bids;

(d) the presence or absence of a Bid Security; and

(e) any other details as the Employer may consider appropriate.

Only discounts and alternative Bids read out at Bid opening shall be considered for evaluation. The Employer shall neither discuss the merits of any Bid nor reject any Bid (except for late Bids, in accordance with ITB 23.1).

25.4 The Employer shall prepare a record of the Bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; the Bid Price, per lot (contract) if applicable, including any discounts and alternative Bids; and the presence or absence of a Bid Security. The Bidders' representatives who are

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present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

E. Evaluation and Comparison of Bids

26. Confidentiality

26.1 Information relating to the evaluation of Bids and recommendation of contract award shall not be disclosed to Bidders or any other persons not officially concerned with the bidding process until information on Contract award is communicated to all Bidders in accordance with ITB 40.

26.2 Any attempt by a Bidder to influence the Employer in the evaluation of the Bids or Contract award decisions may result in the rejection of its Bid.

26.3 Notwithstanding ITB 26.2, from the time of Bid opening to the time of Contract award, if a Bidder wishes to contact the Employer on any matter related to the bidding process, it shall do so in writing.

27. Clarification of Bids

27.1 To assist in the examination, evaluation, and comparison of the Bids, and qualification of the Bidders, the Employer may, at its discretion, ask any Bidder for a clarification of its Bid, giving a reasonable time for a response. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the Bids, in accordance with ITB 33.

27.2 If a Bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification, its Bid may be rejected.

28. Deviations, Reservations, and Omissions

28.1 During the evaluation of Bids, the following definitions apply:

(a) "Deviation" is a departure from the requirements specified in the Bidding Documents;

(b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Documents; and

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(c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Documents.

29. Preliminary Examination of Bids

29.1 The Employer shall examine the Bid to confirm that all documents and information requested in ITB 11.1 have been provided, and to determine the completeness of each document submitted.

29.2 The Employer shall confirm that the following documents and information have been provided in the Bid. If any of these documents or information is missing, the Bid shall be rejected.

(a) Letter of Bid;

(b) written confirmation of authorization to commit the Bidder;

(c) Bid Security;

(d) Technical Proposal in accordance with ITB 16; and

(e) Priced Bill of Quantities.

30. Qualification of the Bidder

30.1 The Employer shall determine to its satisfaction whether Bidders meet the qualifying criteria specified in Section III, Evaluation and Qualification Criteria, during the evaluation of Bids. However, if prequalification was carried out prior to the bidding process, the Employer may carry out the assessment of the qualification criteria specified in Section III, Evaluation and Qualification Criteria, for the Bidder who submitted the lowest evaluated and substantially responsive Bid only.

30.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant ITB 17.

30.3 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the Bid, in which event if the assessment of the Bidder's qualification was conducted for the lowest evaluated Bidder only, in accordance with ITB 30.1, the Employer shall proceed to the next lowest evaluated Bid to make a similar determination.

31. Determination of Responsiveness

31.1 The Employer's determination of a Bid's responsiveness is to be based on the contents of the Bid itself, as defined in

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ITB 11.

31.2 A substantially responsive Bid is one that meets the requirements of the Bidding Documents without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,

(a) if accepted, would

(i) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or

(ii) limit in any substantial way, inconsistent with the Bidding Documents, the Employer's rights or the Bidder's obligations under the proposed Contract; or

(b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.

31.3 The Employer shall examine the technical aspects of the Bid submitted in accordance with ITB 16, Technical Proposal, in particular, to confirm that all requirements of Section VI, Works Requirements have been met without any material deviation, reservation or omission.

31.4 If a Bid is not substantially responsive to the requirements of the Bidding Documents, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

32. Nonmaterial Nonconformities

32.1 Provided that a Bid is substantially responsive, the Employer may waive any nonconformities in the Bid that do not constitute a material deviation, reservation, or omission.

32.2 Provided that a Bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

32.3 Provided that a Bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be

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adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component. The adjustment shall be made using the method specified in Section III, Evaluation and Qualification Criteria.

33. Correction of Arithmetical Errors

33.1 Provided that the bid is substantially responsive, the Employer shall correct arithmetical errors on the following basis:

(a) if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;

(b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

(c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

33.2 Bidders shall be requested to accept correction of arithmetical errors. Failure to accept the correction in accordance with ITB 33.1, shall result in the rejection of the Bid.

34. Conversion to Single Currency

34.1 For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency **as specified in the BDS**.

35. Subcontractors

35.1 **Unless otherwise stated in the BDS,** the Employer does not intend to execute any specific elements of the Works by subcontractors selected in advance by the Employer (nominated subcontractors).

35.2 In case Prequalification was not conducted prior to the bidding process, Bidders planning to subcontract any of the key activities indicated in Section III, Evaluation and Qualification Criteria, shall clearly identify the proposed specialist subcontractor(s) in Forms ELI-2 and EXP-2(b) in Section IV, Bidding Forms. Such proposed specialist subcontractors(s) shall meet the corresponding qualification

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requirements specified in Section III, Evaluation and Qualification Criteria.

35.3 In case Prequalification was conducted prior to the bidding process, the Bidder's Bid shall name the same specialist subcontractor(s) whose experience in the key activities was evaluated in the Prequalification, unless such change is explicitly approved by the Employer in accordance with ITB 17.2.

36. Evaluation of Bids

36.1 The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted.

36.2 To evaluate a Bid, the Employer shall consider the following:

(a) the Bid Price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities, but including Daywork items, where priced competitively;

(b) price adjustment for correction of arithmetic errors in accordance with ITB 33.1;

(c) price adjustment due to discounts offered in accordance with ITB 14.4;

(d) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 34;

(e) price adjustment due to quantifiable nonmaterial nonconformities in accordance with ITB 32.3;

(f) the additional evaluation factors specified in Section III, Evaluation and Qualification Criteria;

36.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in Bid evaluation.

36.4 If these Bidding Documents allow Bidders to quote separate prices for different lots (contracts), the methodology to determine the lowest evaluated price of the lot (contract) combinations, including any discounts offered in the Letter of Bid, is specified in Section III, Evaluation and

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Qualification Criteria.

36.5 If the Bid, which results in the lowest Evaluated Bid Price, is seriously unbalanced or front loaded in the opinion of the Employer, the Employer may require the Bidder to produce detailed price analyses for any or all items of the Bill of Quantities, to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated Contract payments, the Employer may require that the amount of the Performance Security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.

37. Comparison of Bids

37.1 The Employer shall compare the evaluated prices of all substantially responsive Bids established in accordance with ITB 36.2 to determine the lowest evaluated Bid.

38. Employer's Right to Accept Any Bid, and to Reject Any or All Bids

38.1 The Employer reserves the right to accept or reject any Bid, and to annul the bidding process and reject all Bids at any time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all Bids submitted and specifically, Bid securities, shall be promptly returned to the Bidders.

F. Award of Contract

39. Award Criteria

39.1 Subject to ITB 38.1, the Employer shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated Bid and is substantially responsive to the Bidding Documents, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

40. Notification of Award

40.1 Prior to the expiration of the period of Bid validity, the Employer shall notify the successful Bidder, in writing, that its Bid has been accepted. The notification letter (hereinafter and in the Conditions of Contract and Contract Forms called the "Letter of Acceptance") shall specify the sum that the Employer will pay the Contractor in consideration of the execution and completion of the Works (hereinafter and in the Conditions of Contract and Contract Forms called "the Accepted Contract Amount"). At the same time, the Employer shall also notify all other Bidders

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of the results of the bidding.

40.2 After a contract has been determined to be eligible for financing under Japanese ODA Loans, the following information may be made public by JICA:

(a) name of each Bidder who submitted a Bid;

(b) Bid Prices as read out at Bid Opening;

(c) name and address of the successful Bidder;

(d) name and address of supplier; and

(e) award date and amount of the contract.

40.3 Until a formal contract is prepared and executed, the Letter of Acceptance shall constitute a binding Contract.

40.4 After notification of award, unsuccessful Bidders may request in writing to the Employer a debriefing seeking explanations on the grounds on which their Bids were not selected. The Employer shall promptly respond in writing to any unsuccessful Bidder who, after notification of award in accordance with ITB 40.1, requests a debriefing.

41. Signing of Contract

41.1 Promptly upon notification, the Employer shall send the successful Bidder the Contract Agreement.

41.2 Within twenty-eight (28) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Employer.

42. Performance Security

42.1 Within twenty-eight (28) days of the receipt of the Letter of Acceptance from the Employer, the successful Bidder shall furnish the Performance Security in accordance with the General Conditions of Contract, subject to ITB 36.5, using for that purpose the Performance Security Form included in Section IX, Annex to the Particular Conditions - Contract Forms, or another form acceptable to the Employer. If the Performance Security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Employer. A foreign institution providing a bond shall have a correspondent financial institution located in the Employer's Country.

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42.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security. In that event the Employer may award the Contract to the next lowest evaluated Bidder whose Bid is substantially responsive and is determined by the Employer to be qualified to perform the Contract satisfactorily.

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SECTION II

BID DATA SHEET

"For References ONLY"
(Not for Bidding)

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Bid Data Sheet

A. General	
ITB 1.1	The Number of the Invitation for Bids is: **NCB 01**
ITB 1.1	The Employer is: **National Water Supply & Drainage Board, Sri Lanka**
ITB 1.1	The Name, Identification and Number of the Lot(s), Contract(s) comprising this National Competitive Bidding: **Supply & Laying of HDPE, DI Distribution Mains and Providing Service Connections for Padaviya and Kebithigollewa DS Divisions** Contract No: **AN/PH II/JICA/DM/LOT C1** The Name, Identification, and Number of other contracts of the National Competitive Bidding is: None
ITB 2.1	The Borrower is: **The Democratic Socialist Republic of Sri Lanka**
ITB 2.1	The Number of the Loan Agreement is: **SL-P115** The Amount of the Japanese ODA Loan is: **JPY 23,137 Million** The Signed Date of the Loan Agreement is: **17 November, 2016**
ITB 2.1	The Name of the Project is: **Anuradhapura North Water Supply Project - Phase II**
ITB 2.2	The Applicable Guidelines for Procurement under Japanese ODA Loans are those published in: April **2012.**
ITB 3.1(c)	A list of debarred firms and individuals is available at the World Bank's website: **www.worldbank.org/debarr**
ITB 4.5	This Bidding is not subject to Prequalification.
B. Bidding Documents	
ITB 7.1	For **Clarification Purposes** only, the Employer's address is: Attention: **Assistant General Manager (Tenders & Contracts)** **National Water Supply & Drainage Board** Street Address: **P. O. Box.14, Galle Road** Floor/Room Number: - **2nd Floor** City: **Ratmalana** ZIP Code: **N/A** Country: **Sri Lanka** Telephone: **+9411 2638999 - Ext. 1750, +9411 2605328** Facsimile Number: **+9411 2635885** Electronic mail address: **agmtenders@waterboard.lk**
ITB 7.1	Responses to any request for clarification, if any, **will not** be published on the Employer's Web page.

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ITB 7.4	A Site Visit will take place at the following date, time and commencing from place: Date: **11th August 2021** Time: **09:30 hrs** Place: **Project Director's Office, ANWSP Phase II, WBQ 87, Kubichchankulam Lake Road, Anuradhapura** A Pre-Bid Meeting will take place at the following date, time and place: Date: **18th August 2021** Time: **10:00 hrs** Place: **Auditorium, South Wing Building, National Water Supply & Drainage Board, Galle Road, Ratmalana**
ITB 8.2	Addenda, if any, **will not** be published on the Employer's Web Page.
C. Preparation of Bids	
ITB 10.1	The Language of the Bid is: **English**
ITB 11.1 (i)	The Bidder shall submit with its Bid, the following additional Documents: 1. In respect of domestic Bidders, a copy of Registration in CIDA. 2. Any person who acts as an agent or sub-agent, representative or nominee on behalf of such Bidder, a Certificate or Registration issued by the Registrar of Contracts in Sri Lanka, in accordance with Contract Act No. 3 of 1987 of the Government of Sri Lanka and subsequent Gazette Notification. 3. If the Bidder is a Joint Venture, a certified/attested copy of JV Agreement. Letter of Intent to execute a Joint Venture Agreement or the Memorandum of Understanding and if the Bidder is Limited Liability Company, a certified/attested copy of the Certificate of Incorporation and if the Bidder is partnership, a certified/attested copy of the Partnership Agreement and if a Single Proprietor an attested copy of Registration. 4. If the Bidder intends to Subcontract any part or parts of the Work, more than 10% of the Bid Price, the details of all such proposals shall be submitted, along with copies of CIDA Registration of any such national sub-contractor(s). 5. Narrative on Bidder's compliance with the Environmental Management Plan (Refer Section 6B.18. in Volume 2 of 4) 6. Completed Schedule of Particulars as given in the Section IV. 7. Cost Breakdown for: a. Lump Sum Items in the General Requirements in, Bill No. 1 for BOQ Items - 1.1, 1.2, 1.3, 1.4, 1.10, 1.16, 1.17, 1.18, 1.19, 1.21, 1.22, 1.23, 1.24 b. Laying of HDPE Pipes & Fittings in, Bill No. 04 for BOQ Items – 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14, 4.15, 4.16 c. Construction of Valve Chambers in, - Bill No.04 for BOQ Items - 4.59, 4.60, 4.61, 4.62, 4.63, 4.64, 4.65, 4.66, 4.67, 4.68 - Bill No. 06 for BOQ Items - 6.83, 6.84 d. Culvert Crossings in, - Bill No. 04 for BOQ Items - 4.69, 4.73, 4.75, 4.78, 4.80, 4.81

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	- Bill No. 06 for BOQ Items – 6.115, 6.116 e. Bridge Crossings in, - Bill No. 06 for BOQ Items – 6.127, 6.129, 6.132, 6.136, 6.139, 6.140, 6.141 - Bill No. 10 for BOQ Items - 10.94, 10.97 f. Causeway Crossings in, - Bill No. 06 for BOQ Items - 6.171, 10.124, 10.125 - Bill No. 11 for BOQ Items - 11.101 g. Pipe Installations "On Supports" in, - Bill No. 06 for BOQ Items - 6.118, 6.119, 6.120, 6.121 - Bill No. 06 for BOQ Items - 8.15, 8.16 - Bill No.11 for BOQ Items - 11.71, 11.72 These Breakdowns shall show the details of Basic Cost of Items, and show separately the Contractor's Site Overhead, Head Office Overhead, and Profit. The Bids submitted without any one of the above documents/details shall be subject to the Request for Clarifications pursuant to ITB 27.1 and may be rejected pursuant to ITB 27.2. However, no changes shall be permitted with regards to the Rates & Prices Quoted in the Bid as per the Clause 27.1.
ITB 11.1 (b)	In completing the Price Schedules (Bill of Quantities), Prices entered for Columns (a) and (e) shall be comply to those as listed in Summary Table of the Schedule of Particulars as Annexed in Section IV – Bidding Forms as pursuant to BDS 11.1(i) - 6 to be supplied from Outside the Employer's Country. Similarly, Prices entered in Columns (c) and (g) shall be comply to those listed in Summary Table as Annexed in Section IV – Bidding Forms of the Schedule of Particulars pursuant to BDS 11.1(i) - 6 to be supplied from within the Employer's Country. The Bids submitted contrary to the above, with conflicts between Summary Table of the Schedule of Particulars and Price Schedules (Bill of Quantities) shall be subject to the Request for Clarifications pursuant to ITB 27.1 and may be rejected pursuant to ITB 27.2. However, no changes shall be permitted with regards to the Rates & Prices Quoted in the Bid as per the Clause 27.1.
ITB 13.2	Alternative times for Completion **will not be** permitted.
ITB 13.4	Alternative Technical solutions shall be permitted for the following parts of the Works: **None.**
ITB 14.5	The Prices quoted by the Bidder shall be: Subject to Price Adjustments for the Local Component ONLY in respect of Pipe Laying and associated Civil Works in Column No. (h) of the BOQ as per Clause 13.8 of Particular Conditions of Contract – Part B. The Materials supplied from "Outside the Employer's Country" in JPY in Column No. (e) and LKR in Column No (f) and the Materials supplied from "Within the Employer's Country" in LKR in Column No. (g) of the BOQ shall NOT be Subjected to Price Adjustments.
ITB 14.7	Duties, Taxes and other Levies indicated below will be arranged to be exempted by the Employer on behalf of the Contractor: The Customs Duties and VAT Charged, levied by Sri Lanka Customs Department in respect of Materials Imported to be used specifically for Permanent Works where, CIF Rates & Prices quoted in Japanese Yen in column (a) and of the BOQ on production of Certified Customs Documents by the Contractor. However, the Contractor shall be responsible for the charges Levied by the Ports Authority including any demurrage (if any) payable.

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	The documents issued by Customs Department shall be submitted to NWSDB in time to prepare the necessary Letter of Clearance to Sri Lanka Customs without delay. Any additional costs incurred due to delays shall be borne by the Contractor. However, for the Local Component or any other Tax other than VAT imposed by the Government shall be borne by the Contractor. The VAT chargeable for such Local Component shall be exempted for the Contractor.
ITB 15.1	The Currency(ies) of the Bid shall be as described below: The Unit Rates and Prices shall be quoted by the Bidder in the Bill of Quantities separately in the following Currencies: (i) for those Inputs to the Works that the Bidder expects to supply from within the Employer's Country, in Sri Lankan Rupees (LKR) and further referred to as "the Local Currency"; and (ii) for those Inputs to the Works that the Bidder expects to supply from outside the Employer's Country (referred to as "the Foreign Currency requirements"), in Japanese Yen (JPY), with no decimal places.
ITB 18.1	The Bid Validity Period shall be **119 days** from the deadline for submission of Bids**.**
ITB 18.3 (b)	The Fixed Portion of the Bid Price *(Non-Adjustable Elements in Part B, Specific Provision in Particular Conditions of Contract – Clause 13.8)* quoted in JPY shall be adjusted by a factor reflecting Inflation in the country of Japan during the period of extension and the Factor for Japanese Yen shall be derived from below source, **Consumer Price Index – Ku-Area of Tokyo (to use: All Items - Category (Code 0010) published by Statistics Bureau, Ministry of Internal Affairs and Communications, Japan** **http://www.stat.go.jp/english/data/cpi/index.htm** The Fixed Portion of the Bid Price *(Non-Adjustable Elements Part B, Specific Provision in Particular Conditions of Contract – Clause 13.8)* except fixed Provisional Sums quoted in LKR shall be adjusted by a factor reflecting Inflation in the country of Sri Lanka during the period of extension and the Factor for Sri Lankan Rupees shall be derived from below source, **Colombo Consumers' Price Index (CCPI) in "Weekly Economic Indicators" published by the Statics Department of Sri Lanka (Year on year change %)**
ITB 19.1	The amount and currency of the Bid Security shall be: **LKR 64.0 Million**
ITB 19.2	**ITB Sub-Clause – 19.2 should be deleted entirely and replaced by the following:** The Bid Security shall be issued by an agency stipulated below using the Form for Bid Security (unconditional guarantee) included in Section IV - Bidding Form. (a) Bank operating in Sri Lanka, approved by the Central Bank of Sri Lanka. (b) Sri Lankan Rupee Cash Deposit to NWSDB (the original receipt of such deposit shall be attached to the original Bid Document submitted.) (c) Certified Cheque issued by a Bank operating in Sri Lanka in favour of National Water Supply & Drainage Board. (NWSDB). (d) Construction Guarantee Fund. (e) A bank Guarantee issued by a bank based in another eligible source country *(Outside of Sri Lanka)*, but the Security or Guarantee should endorsed/confirmed by a corresponding bank operating in Sri Lanka, approved by the Central Bank of Sri Lanka.

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	However, the requirement of endorsement/confirmation of Guarantees issued by a bank based in another eligible source country *(Outside of Sri Lanka),* by a bank operating in Sri Lanka is not necessary, if the entity that issues the guarantee is an Export Credit Agency *(Exim Bank)* of any foreign government or a reputed International Financier acceptable to the Central Bank of Sri Lanka. The Bid Security shall be valid for twenty-eight (28) days beyond the original validity period of the Bid, or beyond any period of extension if requested under ITB18.2.
ITB 20.1	In addition to the Original of the Bid, the Number of Copies is: **One Copy** Further, a copy of Bills of Quantities in digital version (CD-R) coded in MS Excel format provided along with the Bidding Document to the Bidders to facilitate pricing of the Bills of Quantities, shall be returned complete with quoted Rates and Prices. The Bidder must assure that, the original descriptions or any other texts remain unchanged. For Evaluation purposes, the Rates and Prices submitted in the printed version of the Bid shall be taken into account and not the digital versions. If there is a discrepancy between the digital version and the printed version, the latter shall prevail. The Bidder's Name etc., to be marked on the CD with Contract Number and include 01 CD each in Submission of "Original" & "Copy".
ITB 20.2	The written confirmation of Authorization to Sign on behalf of the Bidder shall consist of: (a) Bids submitted by a Limited Liability Company or a Corporation: A Power of Attorney *(Notarized in the Bidder's home Country),* or a Board Resolution *(Certified by the Company Secretary).* (b) Bid submitted by a Single Proprietor or a Partnership: Power of Attorney *(Notarized in the Bidder's home Country).* In the case of a Partnership, a Notarized Copy of the Partnership Agreement shall be submitted with the Power of Attorney. (c) Bid submitted by a Joint Venture: Power of Attorney *(Notarized in the Bidder's home Country).* It shall include an undertaking signed by all parties (i) stating that all parties shall be jointly and severally liable, and (ii) nominating a Representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the JV during the Bidding process and, in the event the JV is awarded the Contract, during contract execution.
D. Submission and Opening of Bids	
ITB 22.1	For Bid Submission Purposes only, the Employer's Address is: **Chairman, Standing Cabinet Appointed Procurement Committee** Attention: **Director (Procurement), Ministry of Water Supply** Street Address: **''Lakdiya Medura", No. 35, New Parliament Road, Pelawatta** Floor/Room Number: **2nd Floor** City: **Battaramulla** ZIP Code: **N/A** Country: **Sri Lanka** Telephone: **+94-11-2177226** Facsimile number: **+94-11-2786472** Electronic mail address: dprocurement@watermin.gov.lk **The deadline for Bid submission is:** Date: **01. 09. 2021** Time: **10:00 hrs**

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ITB 25.1	The Bid Opening shall take place immediately after the above Bid Submission deadline and at the address given in 22.1 above.
E. Evaluation, and Comparison of Bids	
ITB 34.1	The Currency that shall be used for Bid Evaluation and Comparison purpose to convert all Bid Prices in various currencies into a single currency is: **Sri Lankan Rupees (LKR).** The Source of Selling Exchange Rate shall be: **Central Bank of Sri Lanka** The date for the Selling Exchange Rate shall be: – 28 days prior to Bid Opening deadline (or extended deadline) given in ITB 25.1. The Employer will convert the amounts in various currencies in which the Bid Price, corrected pursuant to ITB 33, is payable *(excluding Provisional Sums and provisions for Contingencies, but including Dayworks, where priced competitively)* to the single currency identified above at the Selling Rates established for similar transactions by the authority specified and, on the date, stipulated above.
F. Award of Contract	
ITB 39.2	Insert new Sub clause 39.2 as follows: After Evaluation of Bids in accordance with the procedures described under Clauses 36, 37 & 38 the Employer will inform to all the Bidders in writing of the selection of the successful Bidder and the intention of Contract Award to such Bidder. The unsuccessful Bidders if they so wish, within one week of such notice may make representation to the following address, along with a cash deposit of LKR 100,000. Such representation shall be self-contained to enable the Secretary of Appeal Board to arrive at a conclusion. The Appeal Board may request the Bidder who had made representation to submit further evidence during the investigation of such representation. The cash deposit will be forfeited unless the Employer has changed the original Contract Award decision in favour of the Bidder who has made such representation. Address: The Secretary, Appeal Board, Presidential Secretariat. Colombo – 01.

"For Reference ONLY" (Not for Bidding)

SECTION III
EVALUATION AND QUALIFICATION CRITERIA
(WITHOUT PREQUALIFICATION)

"For References ONLY"
(Not for Bidding)

"For References ONLY"
(Not for Bidding)

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Evaluation and Qualification Criteria (Without Prequalification)

1. Evaluation

1.1 Technical Evaluation

1.1.1 Assessment of adequacy of Technical Proposal with Requirements

Evaluation of the Bidder's Technical Proposal will include an assessment of the Bidder's technical capacity to mobilize key equipment and personnel for the contract consistent with its proposal regarding Work Methods, Scheduling, and Material Sourcing in sufficient detail and fully in accordance with the requirements stipulated in Section VI, Works Requirements.

1.1.2 Personnel

The Bidder must demonstrate that it has the personnel for the key positions that meet the following requirements:

No.	Position	Minimum Number of Years	
		Similar Positions	Total Work Experience
1.	**Project Manager – (01 No.)** B.Sc. in Civil/Mechanical Engineering or equivalent from a recognized Institution. Should have served as the Project Manager (PM) on at least 3 Nos. contracts of similar nature, size and magnitude all of which should have been successfully completed.	10	15
2.	**Quality Assurance/Quality Control (QA/QC) Engineer – (01 No.)** Engineer qualified from a recognized Institution and experience in QA/QC works in at least 02 similar nature contracts.	05	08
3.	**GIS Expert – (01 No.)** Post Graduate Diploma in GIS and Remote sensing or equivalent. Should have at least work experience of GIS related works for more than 3 years.	03	05
4.	**Civil Engineers - (03 Nos.)** B.Sc. in Civil Engineering or equivalent. Should have experience in Civil Construction Works on at least 1 No. contract of similar nature, size and magnitude, which should have been successfully completed.	03	05
5.	**Health & Safety (Accident Prevention) Officer – (01 No.)** Occupational Safety & Health Certificate from a recognized Institution. Should have experience in Civil Construction Work Sites and related environmental management /monitoring activities etc.	03	05

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6.	**Quantity Surveyor – (01 No.)** B. Sc. Degree in Quantity Surveying or Equivalent**.** Should have experience in pipe supply and laying works.	03	05

The Bidder shall provide details of the proposed personnel for the Contract together with their experience records in Form PER-1 and Form PER-2 in Section IV, Bidding Forms.

1.1.3 Construction Equipment

The Bidder must demonstrate that it has the key construction equipment listed hereafter:

No.	Equipment Type and Required Performance Characteristics	Minimum Requirement (Number of Units)
1	Buttfusion HDPE Welding Machines *(up to 500mm diameter)*	08
2	Electrofusion (EF) HDPE Welding Machines	10

The Bidder shall provide further details of proposed items of Equipment using Form EQU in Section IV, Bidding Forms.

1.1.4 Material for Permanent Works

It is mandatory for the Bidders to submit with the Bid duly completed Schedule of Particulars given in Section IV of the Bidding Document together with the Certificates and other requirements stated in (i), (ii), (iii), (iv) and (v) below.

Only the essential Materials listed below in (a), (b), (c) and (d) will be evaluated. Non-Compliance of the Bidder's offered Products with Specifications, Standards, Work Requirements and non-submittal of required Certificates etc., with the Bid as stated in (i) to (v) as applicable shall be subject to the Request for Clarifications pursuant to ITB 27.1 and may rejected pursuant to ITB 27.2. However, no changes shall be permitted with regards to the Rates & Prices Quoted in the Bid as per the Clause 27.1

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(i). Certified True copies of Valid Product Conformity Certificate/Internationally accepted Product Regulatory Certificate meeting the specifications given in the Bidding document issued by an Accredited Testing Laboratory.

(ii). Certified True copies of Compliance to ISO 9001:2015 Quality Management System or equivalent international Quality Management System (acceptable to the Employer) Covering Design, Manufacturing and Marketing etc. issued by an Accredited Testing Laboratory.

(iii). The Manufacturers/Brands/Makes of Pipeline Materials offered for this Contract shall be from those listed in the Annexure – 06 of Section IX (*the List of NWSDB's Pre-Qualified Manufacturers and in such situation, the End user Certifications will be not required).*

Any Pipeline Materials offered not conforming to the requirement stipulated above (iii), shall comply with the followings:

- Documentary evidence from the Manufacturers which substantiate, Supply, Installation and Successful Commissioning of Pipelines Material of two (02) comparable size to outside the "Country of Origin" to "Developed Countries" during

the last 10 years and provide Certified True Copy of End User Certificate including Name of End user, contact details, value of contract and dates etc.

* *The "Developed Countries" shall means those countries that possess the Human Development Index (HDI) exceeding 0.802).*

* *The "Country of Origin" shall means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.*

(iv). Any type of deviation to specifications given in Bid shall be duly indicated in the space for deviations in Schedule of Materials. Failing to indicate does not absolve the Bidder from his responsibility even if it is not detected by the Employer and the Contract is awarded with deviations. If, so Contractor shall have to abide by the Bid Requirements, and it is deemed that the rates and prices offered are as per the Bid requirements.

(v). For PE Pipes and fittings Certified true copies of Water Application Compatibility Certificate issued by either 1) NSF International USA or 2) WRAS UK or 3) IAPMO USA.

List of essential Materials ,

a) HDPE Pipes, Fittings & Accessories
b) DI Pipes, Fittings & Accessories
c) DI Valves, Fire Hydrants & Accessories
d) Consumer Water Meters

"For References ONLY" (Not for Bidding)

1.2 Price Evaluation

In addition to the criteria listed in ITB 36.2 (a) – (d), the following criteria shall apply:

1.2.1 Quantifiable Nonmaterial Nonconformities and Omissions

The evaluated costs of quantifiable nonconformities are determined as follows:

Pursuant to ITB 32.3, the cost of all quantifiable nonmaterial nonconformities or omissions shall be evaluated. The Employer will make its own assessment of the cost of any nonmaterial nonconformities and omissions for the purpose of ensuring fair comparison of Bids, except for the omissions stated in ITB 14.2 which shall be treated in accordance with said clause.

1.2.2 Award Criteria for Multiple Contract (ITB 36.4): (Not Applicable)

1.3 Alternative Times for Completion (ITB 13.1)

Time for Completion of the Works shall be: 819 days (2¼ years). No Credit will be given for earlier Completion.

1.4 Alternative Technical Solutions for Specified Parts: (ITB 13.4) (Not Applicable)

2. Qualification

(I) Qualification of the Bidder but not of that of Bidder's Affiliate

It is the legal entity or entities comprising the Bidder (which is/are party to the Bidder under a JV or as subcontractors to be employed for the Key Activities listed in this Section), and not the Bidder's parent company(ies), group companies, subsidiaries, or other affiliates, that must satisfy the qualification criteria.

(II) Exchange Rate for Qualification Criteria

Wherever a Form in Section IV, Bidding Forms, requires the Bidder to state a monetary amount, the Bidder should indicate the LKR Equivalent using the rate of exchange determined as follows:

(a). For Turnover or Financial Data required for each year - Exchange Rate prevailing on the last day of the respective calendar or fiscal year, as applicable.

(b). Value of Single Contract - Exchange Rate prevailing on the date of the contract.

Exchange rates shall be taken from the publicly available source **identified in BDS 34.1** or, in case such rates are not available in the source identified above, any other publicly available source acceptable to the Employer. Any error in determining the Exchange Rates may be corrected by the Employer.

(III) Qualification Criteria for Multiple Contracts: (Not Applicable)

Note: All Qualifications including General Experience, Specific Experience, Litigation History, and Financial Status etc., of the selected Bidder shall be checked again with necessary authorities before Awarding the Contract.

"For References ONLY"
(Not for Bidding)

2.1 Eligibility (A)

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
2.1.1	Nationality	Nationality in accordance with ITB 4.3	Must meet requirement	N/A	Must meet requirement	N/A	Forms ELI –1 and 2(i) with attachments
2.1.2	Conflict of Interest	No conflicts of interest in ITB 4.2	Must meet requirement	N/A	Must meet requirement(ii)	N/A	Letter of Bid
2.1.3	JICA Ineligibility	Not having been declared ineligible by JICA, as described in ITB 4.4	Must meet requirement	N/A	Must meet requirement(ii)	N/A	Letter of Bid Form ACK

Notes for the Bidders

(i) ELI - 2 is required only if the Bidder is a JV.

2.1 Eligibility (B)

Local Bidders and/or JV Partners shall have the following additional requirements,

- **Single Firm:** Registration at CIDA under Grade CS1 or higher-Grade in the Field of Water Supply and Sewerage
- **Joint Ventures:** (a) One Partner with Registration at CIDA under Grade CS1 or higher-Grade OR
  (b) Two (2) Grade C1 Contractors
  (*All in either (a) or (b) shall be in the Field of Water Supply and Sewerage)*
- **Joint Venture of Foreign Bidder with Local Partners:** At least one Local Partner shall have Registration at CIDA under Grade C 1 or higher-Grade in the Field of Water Supply and Sewerage.

"For References ONLY" (Not for Bidding)

2.2 Historical Contract Non-Performance and Litigation

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
2.2.1	History of Non-Performing Contracts	Non-performance of a contract did not occur as a result of contractor's default since 1st January 2019	Must meet requirement (ii)	N/A	Must meet requirement (ii)	N/A	Form CON
2.2.2	Pending Litigation	All pending litigation shall in total not represent more than 60% of Bidder's net worth and shall be treated as resolved against the Bidder.	Must meet requirement (ii)	N/A	Must meet requirement (ii)	N/A	Form CON
2.2.3	Litigation History	No consistent history of court/arbitral award decisions (iii) against the Bidder since 1st January 2016.	Must meet requirement (ii)	N/A	Must meet requirement (ii)	N/A	Form CON

Notes for the Bidders

(i). Non-performance, as decided by the Employer, shall include all contracts:

(a) where non-performance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and

(b) that were so challenged but fully settled against the contractor.

Non-performance shall not include contracts where Employer's decision was overruled by the dispute resolution mechanism. Moreover, non-performance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.

(ii). This requirement also applies to contracts executed by the Bidder as a JV member.

(iii). The Bidder shall provide accurate information on the related Bidding Form about any litigation resulting from contracts completed or ongoing under its execution over the last five (5) years. A consistent history of court orders against the Bidder or any member of a joint venture may result in failure of the Bid.

"For References ONLY" (Not for Bidding)

2.3 Financial Situation

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Firm	Joint Venture (existing or intended)			Submission Requirements
				All Members Combined	Each Member	One Member	
2.3.1	Financial Performance	The Audited Financial Statements or, if not required by the laws of the Bidder's country, other financial statements acceptable to the Employer, for the last 3 years shall be submitted and must demonstrate the current soundness of the Bidder's financial position and indicate its prospective long-term profitability. As the minimum requirement, the Bidder's net worth calculated as the difference between total assets and total liabilities should be positive.	Must meet requirement	N/A	Must meet requirement	N/A	Form FIN –1 with attachments
2.3.2	Average Annual Turnover	Minimum Average Annual Turnover of **LKR. 2,500 Million**, calculated as total certified payments received for construction contracts in progress and/or completed, within the last 3 years.	Must meet requirement	Must meet requirement	Must meet 25% of the requirement	Must meet 50% of the requirement	Form FIN –2

"For References ONLY" (Not for Bidding)

2.4 Experience

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Each Member	One Member	
2.4. Experience							
2.4.1	**General Construction Experience**	Experience under construction contracts in the role of prime contractor (single entity or JV member), subcontractor, or management contractor[(i)] for at least the last five years starting 1st January 2016.	Must meet Requirement	N/A	Must meet Requirement	N/A	Form EXP – 1
2.4.2 (a)	**Specific Construction Experience**	A minimum number of one similar [(ii)] contract that have been satisfactorily and substantially [(iii)] completed as a prime contractor (single entity or JV member) [(iv)] between 1st January 2011 and Bid submission deadline.	Must meet Requirement	Must meet Requirement[(V)] N/A	Must meet at least 40% of similar [(ii)] contract in respect of Value and Length	Must meet at least 75% of similar [(ii)] contract in respect of Value and Length	Form EXP – 2 (a)

"For References ONLY" (Not for Bidding)

Notes for the Bidder

(i) A management contractor is a firm which takes on the role of contract management as a "general" contractor of sort could do. It does not normally perform directly the construction work(s) associated with the contract. Rather, it manages the work of other (sub) contractors while bearing full responsibility and risk for price, quality, and timely performance of the work contract.

(ii) Similarity shall mean the Supply & Laying of HDPE, DI & uPVC Pipes, Fittings & Accessories minimum of 90mm to 160 mm diameter Pipes and Fittings of length not less than of 100km, which include the Supply & Laying of HDPE Pipes & Fittings length not less than 20km and Supply & Laying of DI Pipes & Fittings length not less than 5km in a Water Supply Project.

(a) In case of a JV - At least one Member of the JV shall meet the 75% of Lengths in Item (ii) by satisfactorily and substantially completing a minimum of one contract, and

(b) Each Members of the JV - Shall meet at least 40% of Lengths in Item (ii) by satisfactorily and substantially completing a minimum of one contract with characteristics as described below.

(iii) Substantial completion shall be based on 80% or more of the works completed under the contract.

(iv) For contracts under which the Bidder participated as a JV member, only the Bidder's share, by value, shall be considered to meet this requirement.

(v) In case of a JV, the value of contracts completed by its members shall not be aggregated to determine whether the requirement of the minimum value of a single contract has been met. Instead, each contract performed by each member shall satisfy the minimum value of a single contract as required for single entity. In determining whether the JV meets the requirement of total number of contracts, only the number of contracts completed by all members, each of value equal or more than the minimum value required shall be aggregated. **(Not Applicable)**

(vi) For contracts under which the Bidder participated as a JV member or subcontractor, only the Bidder's share, by value, shall be considered to meet this requirement.

(vii) Volume, number or rate of production of any key activity can be demonstrated in one or more contracts combined if executed during same time period. The rate of production shall be the annual production rate for the key construction activity (or activities). For the rate of production, either the average during the entire period or in any one or more years during the period should be specified. **(Not Applicable)**

(viii) The minimum experience requirement for multiple contracts will be the sum of the minimum requirements for respective individual contracts. **(Not Applicable)**

"For References ONLY"
(Not for Bidding)

Eligibility and Qualification Criteria			Compliance Requirements				Documentation
No.	Factor	Requirement	Single Entity	Joint Venture (existing or intended)			Submission Requirements
				All Parties Combined	Each Member	One Member	
2.5. Financial Resources							
2.5.1	**Financial Resources**	(i) The Bidder shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow requirements estimated as **LKR. 600 Million** for the subject contract net of the Bidders other commitments.	Must meet requirement	Must meet requirement	Must meet 30% of the requirement	Must meet 50 % of the requirement	Form FIR – 1
		(ii)The Bidders shall also demonstrate, to the satisfaction of the Employer, that it has adequate sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments.	Must meet requirement	Must meet requirement	N/A	N/A	Form FIR – 1 and FIR – 2

"For References ONLY" (Not for Bidding)

SECTION IV
BIDDING FORMS

"For References ONLY"
(Not for Bidding)

"For References ONLY"
(Not for Bidding)

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"For References ONLY"
(Not for Bidding)

Letter of Bid

Date: *[insert date of Bid submission]*
Loan Agreement No.: SL- P115
IFB No.: NCB 01
Alternative No.: Not Applicable

To: **Chairman, National Water Supply & Drainage Board**

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents, including addenda issued in accordance with Instructions to Bidders (ITB 8). *[Insert the number and issuing date of each addendum]*;

(b) We, including subcontractors meet the eligibility requirements in accordance with ITB 4 and ITB 5.

(c) We, including subcontractors have no conflict of interest in accordance with ITB 4;

(d) We offer to execute in conformity with the Bidding Documents and our Technical Proposal, the following Works: Supply & Laying of HDPE, DI Distribution Mains and Providing Service Connections for Padaviya and Kebithigollewa DS Divisions - Contract No.: AN/PH II/JICA/DM/LOT C1.

(e) The Total Price of our Bid, excluding any discounts offered in item (f) below is:
Total Price of the Bid in Japanese Yen ……*(in words)* (JPY……) *(in figures without decimals)* and in Sri Lankan Rupees…… *(in words)* (LKR……) *(in figures)* *[insert the total price of the Bid in words and figures, indicating the various amounts and the respective currencies]*

(f) The discounts offered and the methodology of application are:

The discounts offered are*: [specify in detail each discount offered.]*

The exact method of calculations to determine the net price after application of the discounts is shown below: *[specify in detail the method that shall be used to apply the discounts.];*

(g) Our Bid shall be valid for a period of *[specify the number of calendar days]* days from the date fixed for the Bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(h) If our Bid is accepted, we commit to obtain a Performance Security in accordance with the Bidding Documents;

"For References ONLY" (Not for Bidding)

(i) We are not participating, as a Bidder or as a subcontractor, in more than one Bid in this bidding process in accordance with ITB 4.2 (c), other than alternative Bids submitted in accordance with ITB 13;

(j) We understand that this Bid, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed;

(k) We understand that you are not bound to accept the lowest evaluated Bid or any other bid that you may receive; and

(l) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of fraud or corruption.

Name of the Bidder***** *[insert complete name of person signing the Bid]*
Name of the person duly authorized to sign the Bid on behalf of the Bidder****** *[insert complete name of person duly authorized to sign the Bid]*

Title of the person signing the Bid *[insert complete title of the person signing the Bid]*

Signature of the person named above *[insert signature of person whose name and capacity are shown above]*

Date signed *[insert date of signing]* day of *[insert month]*, *[insert year]*

"For References ONLY"
(Not for Bidding)

*****: In the case of the Bid submitted by joint venture specify the name of the Joint Venture as Bidder
******: Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid.

Schedule of Adjustment Data

Table A. Local Currency (LC)

NOTE:

Price Adjustments only for the Local Currency (LKR) Component in the Column No.(h) of the BOQ will be calculated based on the Construction Industry Development Authority (CIDA) formula given in Clause 13.8 of the Particular Conditions of Contract (PC), Provision B.

Table B. Foreign Currency (FC)

Not Applicable

"For References ONLY"
(Not for Bidding)

Bill of Quantities
(Bound Separately in Volume 3 of 4)

"For References ONLY"
(Not for Bidding)

Technical Proposal

Site Organization

Method Statement

Mobilization Schedule

Construction Schedule

Health & Safety Plan

Form PER -1: Proposed Personnel

Form PER -2: Resume of Proposed Personnel

Form EQU: Equipment

"For References ONLY"
(Not for Bidding)

Site Organization

The Bidder shall give details of the organization to be established at Site with a proposed Organization Chart with designations, and a narrative description of the authority and responsibilities of each such designation. In the case of a JV the role and responsibility of each Member of the JV shall be provided. The Bidder is required to prepare a description of the relationship between the head office and the Site Management which clearly Indicate responsibility and what authority will be delegated to Site Management.

The Bidder shall include an Assignment Schedule for the Site Works for each of the Personnel in Form PER -1.

"For References ONLY"
(Not for Bidding)

Method Statement

The Bidder shall give detailed description of the approach and methodology for executing the overall Works and specific work methods for each location, which shall include, but not be limited to:

(a) Supply & Delivery of imported HDPE Pipes, Fittings and Accessories

(b) Supply & Delivery of DI Pipes & Valves, Fittings & Accessories, Man Hole Covers, Fire Hydrants etc.

(c) Handling & Storing of Construction Materials.

(d) Concrete Works including arrangements for ensuring supply of Concrete to meet the Construction Schedule.

(e) Inspection and Tests of HDPE & DI Pipes.

(f) Laying/Installation of HDPE & DI Pipe Lines

(g) Flushing, Disinfection, Testing and Commissioning of Pipelines

The Method Statements with special reference to above shall show the Bidder's understanding of the Work Site Conditions and relevant Construction Methodology, Mobilization, Construction Labour, Material & Machinery Management System, Handling & Storing, Quality Assurance & Quality Controlling arrangements, Health, Safety and Environment Management arrangements etc., and is required to prepare a Method Statement not exceeding 20 pages including charts and tables etc., which describes the approaches to be adopted in the Construction, Commissioning and Hand Over of the Works.

Despite the Method Statement submitted, the Works Requirements specified in Section VI shall prevail, unless otherwise approved by the Engineer under the provisions in the Contract.

"For References ONLY"
(Not for Bidding)

Mobilization Schedule

The Bidder shall provide details of the Mobilization Schedule for the Works, separately for Pipe Laying.

The Mobilization Schedule shall be in the form of a Bar Chart, which indicates the proposed dates of submitting and approvals of Guarantees, Insurances, Access Road Construction, Mobilization of Staff, Machinery, Workers and all relevant Temporary Works at each Work Site.

Also, the Mobilization Schedule should include the Mobilization of Sub Contractors with proposed dates, staff, machinery and workers etc., if any.

"For References ONLY"
(Not for Bidding)

Construction Schedule

The Bidder shall provide a Construction Schedule which shall be produced in the form of Gantt chart using MS Project indicating all the Major Construction Activities covering the entire Contract Implementation Period including the Defects Notification Period and which shall be submitted in both Hard and Soft copies. The Schedule shall show Start Dates, Finish Dates, Milestones, the Sequence and Duration of each Activity at each location with clear links between activities, showing critical path and allow for review of submittals by the Engineer. Interface Activities requiring the support of the Employer shall be shown.

This Construction Schedule should include cash flow and resource scheduling as well. Resource schedule shall be prepared taking into consideration periods of inclement weather conditions and holidays.

The Schedule shall include the following;

(a) Approvals of Bonds, Guarantees and Insurance Policies

(b) Mobilization at Site.

(c) Temporary Works such as Site Office(s), Camp(s) for workmen, mobile units, etc.

(d) Development of Material Stockyard.

(e) Procurement, Importation, transport and delivery schedules for DI, HDPE Pipes & Fittings and DI Valves & Fittings including all accessories, Flow Meters etc. to be completed within six months of the Letter of Acceptance and subsequent importation and delivery.

(f) Pipe laying works showing work in several locations in parallel.

(g) Civil Construction Schedule for each major component and for each location.

(h) GIS Database Creation and Mapping

(i) Preparation of As - Built Drawings,

(j) Creation Asset Registers.

(k) Pressure Testing and checking for Leakages

(l) Disinfection and Flushing of Pipes and Commissioning

"For References ONLY" (Not for Bidding)

Health & Safety Plan

The Bidder shall provide details of the Safety Plan for the Works to comply with the Safety Requirements. It shall show the health, including of measures to prevent communicating of Pandemic situations such as Covid-19, safety and environmental management and monitoring procedures as per the contract but not limited to the stipulations.

Safety requirement of all construction activities shall be in compliance with Occupational Safety & Health Administration (OSHA) assessment including the role of the Health & Safety Officer (Accident Prevention Officer) and other personnel to be deployed, taking into due consideration the particular Site conditions and environments, as well as the relevant rules and regulations, with reference to the particular equipment.

The Safety Plan and monitoring method shall be provided for each of the locations of the Work Site. All proposed Personal Protective Equipment (PPE), Safety Sign Boards, environmental pollution control due to Dust, Noise, Vibration, grease and oil spills from machinery, etc., shall also be included in the Safety Plan.

Further, the Contractor shall strictly adhere and comply to the Guidelines stipulated in the Health and Safety Guidelines for Sri Lankan Construction Sites issued by CIDA to be adopted during COVID 19 Outbreak as attached in Volume 2 of 4, Section 6B.20.

"For References ONLY"
(Not for Bidding)

Form PER -1: Proposed Personnel

[insert day, month, year]
Bidder's Legal Name: *[insert full name]*
IFB No. NCB 01
Page *[insert page number]* of *[insert total number]* page

[The Bidder shall provide the names of suitably qualified personnel to meet the specified requirements stated in Section III Evaluation and Qualification Criteria, Clause 1.1.2.]

1.	**Title of Position***
	Name
2.	**Title of Position***
	Name
3.	**Title of Position***
	Name
4.	**Title of Position***
	Name
5.	**Title of Position***
	Name
6.	**Title of Position***
	Name
7.	**Title of Position***
	Name

"For References ONLY" (Not for Bidding)

•As listed in Section III

Form PER -2: Resume of Proposed Personnel

[insert day, month, year]
Bidder's Legal Name: *[insert full name]*
Joint Venture Party Legal Name: *[insert full name]*
IFB No. NCB 01
Page *[insert page number]* of *[insert total number]* page

[The Bidder shall provide the data on the experience of the personnel indicated in Form PER-1, in the Form below:]

Name of Bidder *

Position		
Personnel information	**Name**	**Date of Birth**
	Professional Qualifications	
Present employment	**Name of Employer**	
	Address of Employer	
	Telephone	**Contact (manager/personnel officer)**
	Fax	**E-mail**
	Job Title	**Years with present employer**

"For References ONLY" (Not for Bidding)

* Note : The Bidder shall submit documentary evidence to prove qualification & experience.

[Summarize professional experience over the last 20 years as relevant, in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.]

From	To	Company / Project / Position / Relevant Technical and Management Experience

"For References ONLY"
(Not for Bidding)

Form EQU: Equipment

[insert day, month, year]
Bidder's Legal Name: *[insert full name]*
Joint Venture Party Legal Name: *[insert full name]*
IFB No. NCB 01
Page *[insert page number]* of *[insert total number]* page

[The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the Key Equipment listed in Section III, Evaluation and Qualification Criteria, Clause 1.1.3. A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder.]

"For References ONLY" (Not for Bidding)

Item of equipment		
Equipment information	**Name of manufacturer**	**Model and power rating**
	Capacity	**Year of manufacture**
Current status	**Current location**	
	Details of current commitments	
Source	**Indicate source of the equipment** ☐ **Owned** ☐ **Rented** ☐ **Leased** ☐ **Specially Manufactured**	

Omit the following information for equipment owned by the Bidder.

Owner	**Name of Owner**	
	Address of Owner	
	Telephone	**Contact Name and Title**
	Fax	**E-mail**
Agreements	**Details of Rental /Lease / Manufacture Agreements Specific to the Project**	

Bidders Qualification

(Without Prequalification)

To establish its qualifications to perform the contract in accordance with Section III, Evaluation and Qualification Criteria, the Bidder shall provide the information requested in the corresponding Forms included hereunder.

Form ELI – 1	:	Bidder's Information Form
Form ELI – 2	:	Bidder's Party Information Form
Form CON	:	Historical Contract Non-Performance
Form FIN – 1	:	Financial Situation
Form FIN – 2	:	Average Annual Construction Turnover
Form EXP – 1	:	General Construction Experience
Form EXP - 2(a)	:	Specific Construction Experience
Form FIR – 1	:	Financial Resources
Form FIR – 2	:	Current Contract Commitments

"For References ONLY"
(Not for Bidding)

"For References ONLY"
(Not for Bidding)

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Form ELI -1: Bidder's Information Form

Date: *[insert day, month, year]*
IFB No.: NCB 01
Page *[insert page number]* of *[insert total number]* pages

[Bidders shall provide the following information:]

Bidder's legal name *[insert full name]*
In case of a JV, legal name of the representative member and of each member: *[Insert full name of each member in the JV and specify the representative member.]*
Bidder's actual or intended country of registration: *[insert country of registration]*
Bidder's actual or intended year of incorporation: *[insert year of incorporation]*
Bidder's legal address in country of registration: *[insert street/ number/ town or city/ country]*
Bidder's authorized representative information Name: *[insert full name]* Address: *[inset street/ number/ town or city/ country]* Telephone/Fax numbers: *[insert telephone/fax numbers, including country and city codes]* E-mail address: *[insert E-mail address]*
1. Attached are copies of original documents of, ☐ Articles of incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above, in accordance with ITB 4.3. ☐ In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB 4.1. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

"For References ONLY" (Not for Bidding)

Form ELI -2: Bidder's Party Information Form

Date: *[insert day, month, year]*
IFB No.: NCB 01
Page *[insert page number]* of *[insert total number]* pages

[The following form is additional to Form ELI-1, and shall be completed to provide information relating to each JV Member (in case the Bidder is a JV) as well as any Specialist Sub Contractor proposed to be used by the Bidder for any part of the Contract resulting from this process.]

Bidder's legal name: *[insert full name]*
Bidder's Party legal name: *[insert full name of Bidder's party]*
Bidder's Party country of registration: *[insert country of registration]*
Bidder's Party year of incorporation: *[insert year of incorporation]*
Bidder's Party legal address in country of registration: *[insert street/ number/ town or city/ country]*
Bidder's Party authorized representative information Name: *[insert full name]* Address: *[insert street/ number/ town or city/ country]* Telephone/Fax numbers: *[insert telephone/fax numbers, including country and city codes]* E-mail address: *[insert E-mail address]*
1. Attached are copies of original documents of ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITB 4.3. 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

"For References ONLY" (Not for Bidding)

Form CON: Historical Contract Non-Performance

Date: *[insert day, month, year]*
Bidder's Legal Name: *[insert full name]*
Bidder's Party Legal Name: *[insert full name]*
IFB No. NCB 01
Page *[insert page number]* of *[insert total number]* pages

[The following table shall be filled in for the Bidder and for each Member of a JV]

1. History of Non-Performing Contracts

Non-Performing Contracts			
☐ Contract non-performance did not occur since 1st January 2019, in accordance with the Prequalification criteria or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.1, as appropriate. ☐ Contract(s) not performed since 1st January 2019, in accordance with the Prequalification criteria or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.1, as appropriate, is (are) indicated below:			
Year	**Non- performed portion of contract**	**Contract Identification**	**Total Contract Amount (current value, currency, exchange rate and LKR Equivalent)**
[insert year]	*[insert amount and percentage]*	Contract Identification: *[insert complete contract name, number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Reason(s) for Non-Performance: *[indicate main reason(s)]*	*[insert amount]*

"For References ONLY" (Not for Bidding)

2. Pending Litigation

Pending Litigation				
☐ No Pending litigation in accordance with the Prequalification Criteria or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.2, as appropriate. ☐ Pending litigation in accordance with the Prequalification criteria or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.2, as appropriate, is indicated below:				
Year of Dispute	**Amount in dispute (currency)**	**Outcome as Percentage of Net Worth**	**Contract Identification**	**Total Contract Amount (current value, currency, exchange rate and LKR Equivalent)**
[insert year]	*[insert amount]*	*[insert percentage]*	Contract Identification: *[indicate complete contract name, number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/ city/ country]* Matter in dispute: *[indicate main issues in dispute]* Status of dispute: *[Indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary]*	*[insert amount]*

"For References ONLY" (Not for Bidding)

3. Litigation History

Litigation History		
☐ No court/arbitral award decisions against the Bidder since 1st January 2016, in accordance with the Prequalification criteria or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.3, as appropriate. ☐ Court/ arbitral award decisions against the Bidder since 1st January 2016, in accordance with the Prequalification criteria or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.3, as appropriate, are indicated below:		
Year of award	**Contract Identification**	**Total Contract Amount (current value, currency, exchange rate and LKR Equivalent)**
[insert year]	Contract Identification: *[indicate complete contract name, number, and any other identification]* Name of Employer: *[insert full name]* Address of Employer: *[insert street/city/country]* Matter in dispute: *[indicate main issues in dispute]* Party who initiated the dispute: *[indicate "Employer" or "Contractor"]* Status of dispute: *[Indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary]*	*[insert amount]*

"For References ONLY" (Not for Bidding)

Form FIN -1: Financial Situation

[The following table shall be filled in for the Bidder and for each member of a JV.]

Date: *[insert day, month, year]*
Bidder's Legal Name: *[insert full name]*
Bidder's Party Legal Name: *[insert full name]*
IFB No. NCB 01
Page *[insert page number]* of *[insert total number]* page

1. Financial Data

Type of Financial information in (currency)	**Historic information for previous 3 years (Amount in currency, currency, exchange rate, LKR Equivalent)**		
	Year 1	Year 2	Year 3
Statement of Financial Position (Information from Balance Sheet)			
Total Assets (TA)			
Total Liabilities (TL)			
Net Worth (NW)			
Current Assets (CA)			
Current Liabilities (CL)			
Information from Income Statement			
Total Revenue (TR)			
Profits Before Taxes (PBT)			
Profits After Taxes (PAT)			

"For References Only" (Not for Bidding)

2. Financial Documents

The Bidder and its parties shall provide copies of the financial statements for three (03) years pursuant the Prequalification criteria or Section III, Evaluation and Qualification Criteria Sub-Factor 2.3.1, as appropriate. The financial statements shall:

(a) reflect the financial situation of the Bidder or in case of JV, of each Member, and not of an affiliated entity (such as parent company or group member).

(b) be independently audited or certified in accordance with local legislation.

(c) be complete, including all notes to the financial statements.

(d) correspond to accounting periods already completed and audited.

☐ Attached are copies of Financial Statements* for the *[number of years]* years required above; and complying with the requirements.

* If the most recent set of financial statements is for a period earlier than 12 months from the date of Bid, the reason for this should be justified.

"For References ONLY"
(Not for Bidding)

Form FIN -2: Average Annual Construction Turnover

[The following table shall be filled in for the Bidder and for each Member of a JV]

Date: *[insert day, month, year]*
Bidder's Legal Name: *[insert full name]*
Bidder's Party Legal Name: *[insert full name]*
IFB No. NCB 01
Page *[insert page number]* of *[insert total number]* page

Annual Turnover Data (Construction only)			
Year	**Amount and Currency**	**Exchange Rate**	**LKR Equivalent**
[indicate year]	*[insert amount and indicate currency]*	*[insert applicable exchange rate]*	*[insert amount in LKR equivalent]*
1			
2			
3			
Average Annual Construction Turnover *			

* Total LKR Equivalent for all years divided by the total number of years, in accordance with the Prequalification Criteria or Section III, Evaluation and Qualification Criteria, Sub-Factor 2.3.2, as appropriate.

"For References ONLY"
(Not for Bidding)

Notes:

1. *The contract price of completed or substantially completed works quoted by Bidder shall be the actual contract price as per the Completion Certificate issued by the Client. (Certified true copy of Completion Certificate shall be submitted with the Bid).*

2. *Evaluation of the contract price thus quoted shall be compounded annually at the Inflation Rate of the country of the contract executed to determine whether calculated value is >or = to the stipulated criteria for Average annual turnover.*

3. *The formula to be used is* $(1.0m)^n x A$

   Where A = the quoted contract value, m = the Inflation Rate of the country of the contract executed and n = the number of years before the current year, when the subject contact was awarded.

Form FIR -1: Financial Resources

[The following table shall be filled in for the Bidder and for each member of a JV]

Date: *[insert day, month, year]*
Bidder's Legal Name: *[insert full name]*
Bidder's Party Legal Name: *[insert full name]*
IFB No. NCB 01
Page *[insert page number]* of *[insert total number]* page

[Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as specified in Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2 (Following Prequalification), or Sub-Factor 2.5.1 (Without Prequalification), as appropriate.]

Financial Resources		
No.	**Source of Financing***	**Amount (LKR Equivalent)**
1.		
2.		
3.		
4.		

"For References ONLY" (Not for Bidding)

* *Lines of Credit available from Financial Institutions shall be supported by original letters from such institutions addressed to the Employer, certifying the Lines of Credit available to the Bidder, and that such credit is available exclusively for this Contract without any further conditions.*

Form FIR -2: Current Contract Commitments

[The following table shall be filled in for the Bidder and for each Member of a JV]

Date: *[insert day, month, year]*
Bidder's Legal Name: *[insert full name]*
Bidder's Party Legal Name: *[insert full name]*
IFB No. NCB 01
Page *[insert page number]* of *[insert total number]* page

[Bidders and each member to a JV should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued, in accordance with Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2 (Following Prequalification), or Sub-Factor 2.5.1 (Without Prequalification), as appropriate.]

"For References ONLY" (Not for Bidding)

Current Contract Commitments					
No.	**Name of Contract**	**Employer's Contact Address, Tel, Fax**	**Value of Outstanding Work [Current LKR Equivalent]**	**Estimated Completion Date**	**Average Monthly Invoicing Over Last Six Months [LKR Per Month)]**
1.					
2.					
3.					
4.					
5.					

Form EXP -1: General Construction Experience

[The following table shall be filled in for the Bidder and for each member of a JV]

Date: *[insert day, month, year]*
Bidder's Legal Name: *[insert full name]*
Bidder's Party Legal Name: *[insert full name]*
IFB No. NCB 01
Page *[insert page number]* of *[insert total number]* page

[Identify contracts that demonstrate continuous construction work over the past 05 years pursuant to Section III, Evaluation and Qualification Criteria (Without Prequalification), Sub-Factor 2.4.1. List contracts chronologically, according to their commencement (starting) dates.]

General Construction Experience			
Starting Year	Ending Year	Contract Identification	Role of Bidder
[indicate year]	*[indicate year]*	Contract name: *[insert full name]* Brief description of the Works performed by the Bidder: *[describe Works performed briefly]* Amount of contract: *[insert amount in currency, mention currency used, exchange rate and LKR Equivalent]* Name of Employer: *[indicate full name]* Address: *[indicate street/number/town or city/ country]*	*[insert "Prime Contractor (single entity or JV member)" or "Subcontractor" or "Management Contractor"]*

"For References ONLY" (Not for Bidding)

* Note: The Bidder shall submit documentary evidence to prove qualification & experience.

Form EXP -2(a): Specific Construction Experience

[The following table shall be filled in for the Bidder and for each member of a JV]

Date: *[insert day, month, year]*

Bidder's Legal Name: *[insert full name]*

Bidder's Party Legal Name: *[insert full name]*

IFB No. NCB 01

Page *[insert page number]* of *[insert total number]* page

[Fill out one (1) form per contract, in accordance with Section III, Evaluation and Qualification Criteria (Without Prequalification), Sub-Factor 2.4.2(a).]

"For References ONLY" (Not for Bidding)

Contract of Similar Size and Nature			
Similar Contract No. *[insert number]* of *[insert number of similar contracts required]*	**Information**		
Contract Identification	*[insert contract name and reference identification number, if applicable]*		
Award Date	*[insert day, month, year, e.g., 15 June, 2015]*		
Completion Date	*[insert day, month, year, e.g., 03 October, 2017]*		
Role in Contract *[check the appropriate box]*	**Prime Contractor**		
	Single entity ☐		JV member ☐
Total Contract Amount	*[insert total contract amount and currency(ies)]*		LKR *[insert exchange rate and total contract amount in LKR equivalent]*
If member in a JV, specify participation in total Contract amount	*[insert a percentage amount]*	*[insert total contract amount and currency(ies)]*	LKR *[insert exchange rate and total contract amount in LKR equivalent]*
Employer's Name:	*[insert full name]*		
Address: Telephone/fax number E-mail:	*[indicate street / number / town or city / country]* *[insert telephone/fax numbers, including country and city area codes]* *[insert E-mail address, if available]*		

* Note: The Bidder shall submit documentary evidence to prove qualification & experience.

Form ACK

Acknowledgement of Compliance with Guidelines for Procurement under Japanese ODA Loans

A) I, [*insert name and position of authorized signatory*], being duly authorized by [*insert name of Bidder/members of joint venture ("JV")*] (hereinafter referred to as the "Bidder") to execute this Acknowledgement of Compliance with the Guidelines for Procurement under Japanese ODA Loans, hereby certify on behalf of the Bidder and myself that:

(i). all information provided in the Bid submitted by the Bidder and its subcontractors for [*insert name of the Project, and name, number and identification of lot(s) (contracts(s)) as stated in BDS 1.1*] is true, correct and accurate to the best of the Bidder's and my knowledge and belief; and

(ii). the Bidder or any of its subcontractors has not, directly or indirectly, taken any action which is or constitutes a corrupt or fraudulent practice and is not subject to any conflict of interest as stipulated in the relevant section of the Guidelines and the Bidding Document.

<If debarment for more than one year by the World Bank Group is NOT imposed, use the following sentence B).>

B) I certify that the Bidder has NOT been debarred by the World Bank Group for more than one year since the date of issuance of Invitation for Bids.

<If debarment for more than one year by the World Bank Group has been imposed BUT three (3) years have passed since the date of such debarment decision, use the following sentence B').>

B') I certify that the Bidder has been debarred by the World Bank Group for a period more than one year BUT that on the date of issuance of Invitation for Bids at least three (3) years had passed since the date of such debarment decision. Details of the debarment are as follows:

name of the debarred firm	starting date of debarment	ending date of debarment	reason for debarment

(C) I certify that the Bidder will not enter into a subcontract with a firm which has been debarred by the World Bank Group for a period more than one year, unless on the date of the subcontract at least three (3) years have passed since the date of such debarment decision.

D) I certify, on behalf of the Bidder and its subcontractors, that if selected to undertake works and services in connection with the Contract, the Bidder and its subcontractors shall carry out such works and services in continuing compliance with the terms and conditions of the Contract.

"For References ONLY" (Not for Bidding)

E) I further certify, on behalf of the Bidder and its subcontractors, that if the Bidder and any of its subcontractors is requested, directly or indirectly, to engage in any corrupt or fraudulent practice under any applicable law, such as the payment of a rebate, at any time or any stage of a process of procurement such as negotiations, execution or implementation of contract (including amendment thereof), the Bidder shall report all relevant facts regarding such request to the relevant section in JICA (details of which are specified below) in a timely manner.

JICA's information desk on fraud and corruption (A report can be made to either of the offices identified below.)

(1) JICA Headquarters: Legal Affairs Division, General Affairs Department

URL: https://www2.jica.go.jp/en/odainfo/index.php

Tel: +81 (0)3 5226 8850

(2) JICA Sri Lanka office - Chief Representative, Representative Office in Colombo, Japan International Cooperation Agency, 10th & 13th Floors, DHPL Building, No. 42, Navan Mawatha Colombo 02. Sri Lanka

Tel - 011 2300470, 011 2303700
Fax - 011 2300473, 011 2303692

The Bidder acknowledges and agrees that the reporting obligation stated above shall NOT in any way affect the Bidder's responsibilities, obligations or rights, under relevant laws, regulations, contracts, guidelines or otherwise, to disclose or report such request or other information to any other person(s) including the Employer or to take any other action, required to or allowed to, be taken by the Bidder. The Bidder further acknowledges and agrees that JICA is not involved in or responsible for the procurement process in any way.

(F) If any of the statements made herein is subsequently proven to be untrue or incorrect based on facts subsequently determined, or if any of the warranties or covenants made herein is not complied with, the Bidder will accept, comply with, and not object to any remedies taken by the Employer and any sanctions imposed by or actions taken by JICA.

"For References ONLY" (Not for Binding)

_____

Authorized Signatory
[*Insert name of signatory; title*]

For and on behalf of
[*Insert name of the Bidder***]**

Date: **[***Insert date***]**

Form of Bid Security

(Bank Guarantee)

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: Chairman, National Water Supply & Drainage Board, P.O. Box 14, Galle Road, Ratmalana.

IFB No.: NCB 01

Date: [*Insert date of issue]*

BID GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*
We have been informed that *[insert name of the Bidder, which in the case of a joint venture shall be the name of the joint venture (whether legally constituted or prospective) or the names of all members thereof]* (hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its Bid (hereinafter called "the Bid") for the execution of Contract for Supply & Laying of HDPE, DI Distribution Mains and Providing Service Connections for Padaviya and Kebithigollewa DS Divisions - Contract No.:AN/PH II/JICA/DM/LOT C1 under Loan Agreement No. SL-P115.

Furthermore, we understand that, according to the Beneficiary's conditions, Bids must be supported by a bid guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in words]* (*[insert amount in figures]*) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

(a) has withdrawn its Bid during the period of bid validity set forth in the Applicant's Letter of Bid ("the Bid Validity Period"), or any extension thereto provided by the Applicant; or

(b) having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the Performance Security, in accordance with the Instructions to Bidders of the Beneficiary's bidding documents.

This guarantee will expire and shall be returned: (a) if the Applicant is the successful Bidder, upon our receipt of copies of the contract agreement signed by the Applicant and the Performance Security issued to the Beneficiary in relation to such contract agreement; or (b) if the Applicant is not the successful Bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the bidding process; or (ii) twenty-eight days after the end of the Bid Validity Period.

"For References ONLY" (Not for Bidding)

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758.

_____

[signature(s)]
[Note: All italicized text is for use in preparing this form and shall be deleted from the final product.]

"For References ONLY"
(Not for Bidding)

SCHEDULE OF PARTICULARS

"For References ONLY"
(Not for Bidding)

"For References ONLY"
(Not for Bidding)

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SCHEDULE OF PARTICULARS

(Information to be provided by the Bidder for the Supply Items only after reference to the Specifications, Bills of Quantities and Appendices)

Notes:

1. The Bidder shall complete all the Schedules appearing in this Section. Bids submitted without such completed Schedules shall be subject to the Request for clarification pursuant to ITB 27.1 and ITB 27.2.

2. The Bidder shall limit the number of makes of products proposed only to **three (03) Manufacturers** with regard to any product submitted. If Bidder submits more than three, the Employer will select of his choice. The Bidder can use copies of the questionnaire as necessary.

3. For the Supply of HDPE & Ductile Iron Pipes & Fittings, Valves Couplings & Adaptors and Manhole Covers & Surface Boxes Manufacturers shall be of NWSDB Pre-Qualified Manufacturer as listed in the Annexure 6 of Section IX of this Document.

4. The Bidder shall complete the Questionnaires & submit Certificates pertaining to the Materials, that he offers and return with this Bid and give all the details relevant to the Materials offered.

5. Unless otherwise specified, all Materials shall conform to relevant BS/BSEN/ISO Standards and to relevant ISO Quality Assurance Standards.

6. All printed Catalogues, Technical Literature, Manuals, Spares Lists etc., shall be submitted with the Bid.

7. Certified true copies of Product Conformity Certificates, ISO Certificates for the items shall be submitted with the Bid.

8. Where pamphlets, catalogues and drawings are accompanied with the Bid, their reference should be quoted in the Schedule of Particulars.

9. Copies of the Technical Literature with regard to Pipes, Specials and Fittings shall be submitted to establish conformity with BS, BS EN or ISO Standards along with ISO 9001:2015 Quality Management System certificate, together with the offer.

10. "Country of Origin" shall mean as defined in ITB 5.1 and 5.2.

Important: The Bidder shall fill in completely the Questionnaires attached herewith as relevant. General references to catalogues are not acceptable.

"For References ONLY" (Not for Bidding)

SCHEDULE OF PARTICULARS

Summary Form for Supply of Pipeline Materials

Item Number	Pipes, Fittings, Valves & Accessories etc.	Country of Origin	*Country of Supply *(Outside of the Employer's Country/Within the Employer's Country)*
1.	**HDPE PIPES, FITTINGS & ACCESSORIES**		
1.2.	HDPE PIPES		
1.3.	HDPE FITTINGS		
1.4.	BACKING RINGS		
1.5.	GASKETS		
1.6.	NUTS & BOLTS, WASHERS		
2.	**DUCTILE IRON PIPES, FITTINGS & ACCESSORIES**		
2.1.	DUCTILE IRON STANDARD SOCKETTED PIPES		
2.2.	DUCTILE IRON FLANGED PIPES		
2.3.	DUCTILE IRON SOKETTED FITTINGS		
2.4.	DUCTILE IRON FLANGED FITTINGS		
2.5.	GASKETS/RUBBER RINGS		
2.6.	NUTS & BOLTS, WASHERS		
2.7.	BOLT JOINT PROTECTION (MASTIC) MATERIALS (ALL INCLUSIVE)		
2.8.	POLYTHENE SLEEVINGS FOR DI PIPES		
2.9.	MARKER TAPES (DETECTABLE TYPE)		
2.10.	MARKER TAPES (DETECTABLE TYPE FOR NON-METALLIC PIPELINES)		
2.11.	MARKER TAPES (FOR METALLIC PIPELINES)		
3.	**COUPLINGS, FLANGED ADAPTORS, MANHOLE COVERS & SURFACE BOXES**		
3.1	MECHANICAL COUPLINGS & ACCESSSORIES (NUTS & BOLTS, WASHERS)		
3.2	FLANGE ADAPTERS & ACCESSSORIES (NUTS & BOLTS, WASHERS)		
3.3	SURFACE BOXES & ACCESSSORIES		

"For References ONLY" (Not for Bidding)

Item Number	Pipes, Fittings, Valves & Accessories etc.	Country of Origin	*Country of Supply *(Outside of the Employer's Country/Within the Employer's Country)*
3.4	MANHOLE COVERS & ACCESSSORIES		
4.	**DUCTILE IRON VALVES**		
4.1	GATE/SLUICE VALVES		
4.2	BUTTERFLY VALVES		
4.3	AIR VALVES		
4.4	FLAP VALVES		
4.5	PRESSURE REDUCING (PRV) VALVES		
4.6	FIRE HYDRANTS		
4.7	FIRE HYDRANTS – DRY BARREL TYPE		
4.8	NUTS & BOLTS, WASHERS		

**The Bidder shall clearly indicate his intention on the Supplies of Pipeline Materials as listed above and shall be marked as "Within the Employer's Country" or "Outside the Employer's Country" on which, he shall quote the Rates & Prices in the BOQ accordingly in the provided Columns.*

"For References ONLY" (Not for Bidding)

SCHEDULE OF PARTICULARS

1. HDPE PIPES AND FITTINGS

1.1. Country of Origin:

Pipes: …….

Fittings: ……...……

1.2. Manufacturer's Address and the Intended Date of Manufacture:

	Address	**Intended Date of Manufacture**
Pipes:	……	……
Fittings:	……..….	……

1.3. Colour of the Product:

Pipes: …….

Fittings: ……..……

1.4. Port of Shipment: ……

1.5. 1.5.1 Standards to which Pipes and Fittings Conform:

Pipes: …….

Fittings: ……..……

1.6. Is Certificate of Product Conformity from a Relevant Standards Institution Provided:

Pipes ……. *(Attach a Copy)*

Fittings ……. *(Attach a Copy)*

1.7. Nominal Sizes and Pressure Ratings of Pipes & Fittings:

	Nominal Dia	**Pressure Rating**	**SDR**
Pipes:	……..…	…….	……..……
Fittings:	……..……	…...……..	……..……

1.8. Manufacturer/Type/Pressure Rating for HDPE EF Tapping Tee: ……

1.9. Manufacturer/Type/Pressure Rating for HDPE/Brass EF Adaptor: …….

"For References ONLY" (Not for Bidding)

1.10. Characteristics of PE Compound as Granules

i. Compound Density: ……

ii. Carbon Black Content
(Black Compound % by Mass) ……

iii. Carbon Black Dispersion
(Black Compound Specify the Grade Range) ……

1.11. Mechanical Characteristics

i. Hydrostatic Strength at 20^0C

(a) For Pipes ……

(b) For Fittings ……..

ii. Hydrostatic Strength at 80^0C

(a) For Pipes ……

(b) For Fittings ……..

1.12. Packing and Protection in Transit:

Pipes …… *(Specify in Detail)*

Fittings …… *(Specify in Detail)*

1.13. Catalogues, Technical Literature, Drawing Provided with the Bid:

Pipes: ……

Fittings: ……..…

1.14. Name and Address of the Supplier's Agent in Sri Lanka: ……

……

1.15. Whether ISO 9001: 2015 Quality Assurance Certificate is Available for Manufacturing Factor:

(i) (a) For Pipes ……(i) (b) *If yes, attach a copy*

(ii) (a) For Fittings ……(ii) (b) *If yes, attach a copy*

"For References ONLY"
(Not for Bidding)

2. DUCTILE IRON (DI)

2.1 PIPES AND FITTINGS

2.1.1 Country of Origin: 1. Pipes ……

2. Fittings…….……..…....

2.1.2 Manufacturers' Name and Address: 1. Pipes ……..…

2. Fittings …….……..……

2. 2.1.3.1 Standards to which Pipes and Fittings Conform:

1. Pipes ……

2. Fittings ……...

2.1.4 Is Certificate for Conformity to Standards from Relevant Standards Institution Provided to the Factory/Factories:

1. Pipes ……..……

2. Fittings ……..…..…

2.1.5 Is ISO 9001:2015 Quality Management System Certificate Provided to the Factory/Factories:

1. Pipes ……..……

2. Fittings ……..…..……

2.1.6 Class of Pipes and Fittings:

	Class
Socket & Spigot Pipes	…….
Pipes with Integral Casted Flanges	…….
Pipes with Factory Welded Flanges	…….
Pipes with Screwed Flanges	…….
Tees	……..…
Bends & Other Fittings	…….

2.1.7 Whether Factory Welded Flange Pipes Tested for Each Flanged Joint? .....

2.1.8 Whether Pipes & Fittings are from same Manufacturer? ……..……..…

"For References ONLY" (Not for Bidding)

2.1.9 Standard to which Flanges Conform: ……

2.1.10 Whether Flanges Are Integrally Casted or Factory Welded? ……

2.1.11 Type of External Coating and Grade: ……..……..……

2.1.12 Standard to Which External Coating Conform: ……

2.1.13 Type of Internal Coating/Lining and Standard: ……..……..……

2.1.14 Port of Shipment: ……...

2.1.15 Packing and Protection in Transit: …….

2.1.16 Catalogues, Technical Literature, Drawing Provided with the Bid: ….....

2.1.17 Name and Address of the Supplier's Accredited Agent in Sri Lanka: ……..……

.

"For References ONLY"
(Not for Bidding)

2.2 MECHANICAL COUPLINGS AND FLANGE ADAPTERS

2.2.1 Country of Origin: ……

2.2.2 Manufacturers' Name and Address: ……..…

2.2.2.1 Make, Material, Hardness Range and Standard:

	Make	Material	Hardness Range	Standard	Date of Manufacture
Sleeve:	…….	……..	N/A	……	……
Flange:	…….	……..	N/A	……	……
Gaskets:	…….	…….	…….	……	……
Joint Rings:	…….	……..	……..…	……..…	……

2.2.3 Type of External Coating and Thickness: ……

2.2.4 Type of Internal Coating and Lining: ……..

2.2.5 Port of Shipment: ……

2.2.6 Catalogues, Technical Literature, Drawings Provided with the Bid: ……

2.2.7 Name and Address of Supplier's Agent (If any) in Sri Lanka: ……..…….

……..…….

2.2.8 Is ISO 9001: 2015 Quality Management System Certificate Provided to the Factory: ……

"For References ONLY" (Not for Bidding)

2.3 SURFACE BOXES AND MANHOLE COVERS

2.3.1 Country of Origin: ……

2.3.2 Manufacturer's Name and Address: ……

2.3.3 Is ISO 9001: 2015 Quality Management System Certificate Provided to the Factory: ……

2.3.4 Material: ……

2.3.5 Class, Make, Standard and Date of Manufacture

	Class	Make	Standard	Date of Manufacture
Manhole Covers:	……	……..	……	……
Surface Boxes:	……	…….	……	…….……

2.3.6 Coating: ……

2.3.7 Lifting Arrangements:

Manhole Covers: ……

Surface Boxes: ……

2.3.8 Name and Address of Supplier's Agent (if any) in Sri Lanka: ……

2.3.9 Port of Shipment: ……

"For References ONLY" (Not for Bidding)

3. DI VALVES AND ACCESSORIES

3.1 GATE/SLUICE VALVES

3.1.1 Country of Origin: ……...

3.1.2 Manufacturer's Name and Address: ……

3.1.3 Date of Manufacture: ……...

3.1.4 Standards to Which Valves Conform: ……

3.1.5 Is Certificate for Conformity to Standards from Relevant Standards Institution Provided to the Factory: ……

3.1.6 Is ISO 9001: 2015 Quality Management System Certificate Provided to the Factory: ……

3.1.7 Material

Body: ……

Spindle: ……

Metal Faces and Seal: ……

3.1.8 Length Between Flanges (mm): ……

3.1.9 End Flanges - Pressure Rating: ……

3.1.10 Internal Protection: ……

3.1.11 External Protective Finish: ……

3.1.12 Weight of the Valve: ……... kg

3.1.13 Packing and Protection of Valves in Transit: ……

3.1.14 Catalogues, Technical Literature and Drawing Provided with the Bid: ……

3.1.15 Port of Shipment: ……

3.1.16 Name and Address of Supplier's Accredited Agent in Sri Lanka: ……

"For References ONLY" (Not for Bidding)

3.2 AIR VALVES

3.2.1 Country of Origin: ……

3.2.2 Manufacturer's Name and Address: ……

……

3.2.3 Date of Manufacture: ……

3.2.4 Is ISO 9001: 2015 Quality Management System Certificate Provided to the Factory: ……

3.2.5 Type of Valve (Single Orifice/Double Orifice/Single or Double Action): ……

3.2.6 For Large Orifice and Double Orifice Air Valves; whether Isolating Valve has miter Gearing for Making it Tee key Operated: ……

3.2.7 Make of Material of Ball (Stainless Steel or Plastic): ……

3.2.8 Flanges (If applicable) - Pressure Rating: ……

3.2.9 Internal Protective Finish: ……

3.2.10 External Protective Finish: ……

3.2.11 Weight of the Valve: …… kg

3.2.12 Packing and Protection of Valves in Transit: ……

3.2.13 Catalogues, Technical Literature and Drawings Provided with the Bid: ……

3.2.14 Port of Shipment: ……

3.2.15 Name and Address of Supplier's Agent (If any) in Sri Lanka: ……

……

"For References ONLY" (Not for Bidding)

3.3 FLAP VALVES

3.3.1 Country of Origin: …….

3.3.2 Manufacturer's Name and Address: ……..……..…

……

3.3.3 Date of Manufacture: ……..…

3.3.4 Is ISO 9001: 2015 Quality Management System Provided to the Factory……..…

3.3.5 Is Product Conformity Certificate from Relevant Standard Institution Provided to the Factory: ……

3.3.6 Material

Frame and door: ……

Sealing: ……

Hinge pin: ……..……

Links: …….

3.3.7 Flanges - Pressure Rating: ……..……

3.3.8 Weight of the Valve: …… kg

3.3.9 Packing and Protection of Valves in Transit: ……...……

3.3.10 Catalogues, Technical Literature and Drawings Provided with the Bid: ……

3.3.11 Time of Delivery of Valves at Port of Shipment: …….

3.3.12 Name and Address of Supplier's Agent (If any) in Sri Lanka: ……

……

"For References ONLY" (Not for Bidding)

3.4 FIRE HYDRANTS

3.4.1 Is this Pillar Type or Underground Type: ……

3.4.2 Screw Down Type: ……

3.4.3 Country of Origin: ……

3.4.4 Manufacturer's Name and Address: ……

3.4.5 Is ISO 9001: 2015 Quality Management System Provided to the Factory: ……

3.4.6 Is Product Conformity Certificate from Relevant Standard Institution Provided to the Factory / Factories: ……

3.4.7 Date of Manufacture: ……..…

3.4.8 Standard to which it conforms: ……..……

3.4.9 Inlet Flanges - Pressure Rating: ……...

3.4.10 The Direction of Closing of the Hydrant Valve: ……..

3.4.11 Body Test Pressure: …… Bars

3.4.12 Valve and Seat Test Pressure: …… Bars

3.4.13 Internal Protective Finish: ……

3.4.14 External Protective Finish: ……

3.4.15 Weight of the Hydrant: …… kg

3.4.16 Packing and Protection of Hydrants in Transit: ……..……

3.4.17 Catalogues, Technical Literature and Drawings Provided with the Bid: .....

3.4.18 Name and Address of Supplier's Agent (If any) in Sri Lanka: ……..

……..……

"For References ONLY" (Not for Bidding)

3.5 FIRE HYDRANTS - DRY BARREL TYPE

3.5.1 Country of Origin: ……

3.5.2 Manufacturer's Name and Address: ……..

3.5.3 Is ISO 9001: 2015 Quality Management System Provided to the Factory……

3.5.4 Is Product Conformity Certificate from Relevant Standard Institution Provided to the Factory / Factories: ……

3.5.5 Standard to which it Conforms: ……

3.5.6 Number of Outlet Nozzles Nominal Diameter and Standard:

No. of outlet nozzles: ……

Nominal diameter (mm): ……

Standard: ……

3.5.7 Inlet Flange

Pressure Rating: ……

3.5.8 The Direction of Closing of the Hydrant Valve: ……

3.5.9 Color of the Finish Paint Above Ground Line: ……

3.5.10 Weight of the Hydrant: …… kg

3.5.11 Packing and Protection of Hydrants in Transit: ……

3.5.12 Catalogues, Technical Literature and Drawings Provided with the Bid: …….

3.5.13 Port of Shipment: ……...

3.5.14 Name and Address of Supplier's Agent (If any) in Sri Lanka: ……

……

"For References ONLY" (Not for Bidding)

4. CONSUMER WATERMETERS

4.1 Country of Origin: ……..

4.2 Make: ……..

4.3 Manufacturer's Name and Address: ……..

4.4 Type: ……..

4.5 Model Number : ……..

4.6 Standard to which it conforms: ……..

4.7 Threaded End Connection Diameter (mm): ……..

4.8 Metrological/Accuracy Class: ……..

4.9 Material of Meter Body: ……..

4.10 Material of Parts in contact with Water: ……..

4.11 Pressure Rating: ……..

4.12 Maximum Permissible Pressure ……..

4.13 Whether Anti-Tampering Facilities Available: ……..

4.14 Is ISO 9001: 2015 Quality Management System Provided to the Factory: ……

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APPENDICES

"For References ONLY"
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(Supplier's Company Letterhead)

APPENDIX 1 - GUARANTEE FOR …….... *(Product Name)*

General Manager,
National Water Supply & Drainage Board,
P. O. Box 14, Galle Road,
Ratmalana.

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE **CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS**.
CONTRACT No. AN/PH II/JICA/DM/LOT C1

We, ……
……
…… *(Name & Address of the Manufacturer)* Manufacturer of …….. *(Product Name)* hereby guarantee that,

1 …….. *(Product Name)* under the Contract shall fit properly and adequately to ensure leak proof pipeline installations under all working conditions.

2. We will unconditionally undertake to replace any material rejected by the Engineer within the time period as agreed with the Engineer during implementation stage at no additional cost to NWSDB ensuring the timely implementation of the Project.

3. We will unconditionally undertake that the Nominated Inspection Agency issues a certificate ensuring that …….. *(Product Name)* inspected shall fit properly and adequately to ensure leak proof pipeline installations under all working conditions upon shipment.

…….
Signature of the Authorized
Officer on behalf of the
…… *(Product Name)* Manufacturer
Name : ……
Capacity: ……

Witness :

1	Signature	:	……
	Name	:	……
	Capacity	:	……
	Address	:	……
2	Signature	:	……
	Name	:	……
	Capacity	:	……
	Address	:	……

Note: Bidder shall use separate sheet for each different Products/Source.

"For References ONLY"
(Not for Bidding)

(Supplier's Company Letterhead)

APPENDIX 2 - CONFIRMATION OF CAPABILITY OF PRODUCTION AND SUPPLY ACCORDING TO CONSTRUCTION SCHEDULE

Chairman,
Standing Cabinet Appointed Procurement Committee,

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS.
CONTRACT No. AN/PH II/JICA/DM/LOT C1

We, ……[*name of Manufacturer*] of ……..…… ……..*[address of Manufacturer]*confirm that we have sufficient production capacity to produce the quantity of ……..*(Product Name)* submitted in our Bid and shall deliver them according to the delivery schedule indicated in Contract Data in the Bid.

…….. ……..
Authorized Officer of the Manufacturer. Seal of the Company.

Name: ……

Note: Bidder shall use separate sheet for each different Products/Source.

"For References ONLY" (Not for Bidding)

(Supplier's Company Letterhead)

APPENDIX 3 - MANUFACTURER'S AUTHORIZATION TO SIGN THE CONTRACT

[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letter head of the Manufacturer and should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer. The bidder shall include it in his bid].

To: **Chairman,**
Standing Cabinet Appointed Procurement Committee

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS.
CONTRACT No. AN/PH II/JICA/DM/LOT C1

We, …… *[insert complete name of Manufacturer]*, who are official Manufacturers of ……. *(Product Name)* having factories at ……*[insert full address of Manufacturer's factories],* do hereby authorize ……. *[insert complete name of Bidder]* to submit a Bid the purpose of which is to provide ……. ***(****Product Name)* manufactured by us and to subsequently negotiate and sign the Contract.

We hereby extend our full Guarantee and Warranty in accordance with Clause 3.6 of the Particular Requirement, with respect to the Goods offered by the above firm.

Signed: …… *[insert signature(s) of authorized representative(s) of the Manufacturer]*

Name: …… *[insert complete name(s) of authorized representative(s) of the Manufacturer]*

Title: ……. *[insert title]*

Duly authorized to sign this Contract on behalf of: …… *[insert complete name of Manufacturer]*

Dated on …… day of ……. *[insert date of signing]*.

This is to certify that the seal and signatures of legal representative and authorized person affixed to Power of Attorney attached hereto are found to be authentic.

……
Signature of Attorney at Law
……..
Seal of Attorney at Law

Note: Bidder shall use separate sheet for each different Products/Source.

"For References ONLY" (Not for Bidding)

(Company Letterhead)

APPENDIX 4 - MANUFACTURER'S AWARENESS OF THE TOR FOR INDEPENDENT INSPECTION AGENCY AND PRE-SHIPMENT INSPECTION BY NWSDB ENGINEERS

[Address of the Manufacturer]

……..

To: **Chairman,**
Standing Cabinet Appointed Procurement Committee

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS.
CONTRACT No. AN/PH II/JICA/DM/LOT C1

We, …… [*name of manufacturer*] of …….. *[address of manufacturer]* confirm that we have noticed that

a) TOR for Independent Inspection Agency in Annexure to Contract Forms in Section IX.
b) Section 6.B 6 – Specification for Inspections and Testing of Goods - Volume 2 of 4.

"For References ONLY (Not for Bidding)

…….. ……

Authorised Officer of the Manufacturer. Seal of the Company.

Name: ……

Note: Bidder shall use separate sheet for each different Products/Source.

(Company Letterhead)

APPENDIX 5 - MANUFACTURER'S WARRANTY FOR THE GOODS SUPPLIED UNDER THE CONTRACT

[Address of the Manufacturer]

……..

Chairman,
National Water Supply & Drainage Board.

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS.
CONTRACT No. AN/PH II/JICA/DM/LOT C1

We, ……..…. [*name of manufacturer*] of ……*[address of manufacturer]*warrant that the goods supplied under this contract are new, unused, of the most recent or current models and have incorporated all recent improvements, and no defects arising out of the design, material or workmanship from any act that may be develop under normal use of the supplied goods.

If there are any defects during the warranty period specified in the Clause 3.6 of the Particular Requirements, we shall attend to repair or replace the defective goods with all reasonable speed without any cost to the Purchaser.

……. ……

Authorised Officer of the Manufacturer. Seal of the Company.

Name: …… Date …….

In the capacity of ……

This is to certify that the seal and signatures of authorized officer of the manufacturer affixed to Manufacturer's Warranty, are found to be authentic.

……
Signature of Attorney at Law

……..
Seal of Attorney at Law

In the place of (……address)
Date ……

Note: Bidder shall use separate sheet for each different Products/Source.

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SECTION V
ELIGIBLE SOURCE COUNTRIES OF JAPANESE ODA LOANS

The Eligible Source of Country(ies) for Procurement of All Goods and services *(Including Consulting Services)* to be finance out of the proceeds of the Loan are all the Countries and Areas.

"For References ONLY"
(Not for Bidding)

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PART 2

SECTION VI -WORKS REQUIREMENTS

SCOPE OF WORK

SPECIFICATIONS

DRAWINGS

SUPPLEMENTARY INFORMATION

"For References ONLY"
(Not for Bidding)

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SCOPE OF WORK

(Bound Separately as Volume 2 of 4)

SPECIFICATIONS

(Bound Separately as Volume 2 of 4)

DRAWINGS

(Bound Separately as Volume 4 of 4)

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SUPPLEMENTARY INFORMATION

The following documents are available for inspection/references as Supplementary Information, at the office of **Project Director, Anuradhapura North Water Supply Project – Phase II, National Water Supply & Drainage Board, No. 2/3, School Lane, Niwanthidiya, Bokundara, Piliyandala.**

As with all Supplementary Information, such information is issued or made available for inspection/references purely for the guidance of the Bidder/Contractor who is free to make his own interpretation of such documents.

- Geotechnical Investigation Reports for,
    - Geotechnical Investigations at sites proposed for Construction of Structures of Anuradhapura North Water Supply Project- Phase II (Padaviya & Bogaswewa Distribution Zones (Dated February 2019)
    - Geotechnical Investigations at sites proposed for Construction of Structures of Anuradhapura North Water Supply Project- Phase II (Kebithigollewa Kahatagollewa & Weerasole Distribution Zones (Dated February 2019)

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PART 3

CONDITIONS OF CONTRACT AND CONTRACT FORMS

"For References ONLY"
(Not for Bidding)

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Section VII
General Conditions (GC)

"For References ONLY"
(Not for Bidding)

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Section VII - General Conditions (GC)

The General Conditions governing this Contract shall be Conditions of Contract for Construction MDB Harmonized Edition, prepared and copyrighted by the International Federation of Consulting Engineers **(***Fédération Internationale des Ingenious-Conseils, or FIDIC***),** FIDIC 2010, all rights reserved, (hereinafter referred to as "Standard GC"). This publication is exclusive for the use of JICA's Borrowers and their project implementing agencies as provided under the License Agreement dated August 1st, 2008, between JICA and FIDIC, and, consequently, no part of this publication may be reproduced, translated, adapted, stored in a retrieval system or communicated, in any form or by any means, whether mechanical, electronic, magnetic, photocopying, recording or otherwise, without prior permission in writing from FIDIC, except by the parties above and only for the exclusive purpose of preparing this Contract.

The General Conditions of Contract are available on the JICA's website shown below:

http://www.jica.go.jp/english/our_work/types_of_assistance/oda_loans/oda_op_info/guide/tender/index.html

A copy of these General Conditions is not attached to these Bidding Documents.

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SECTION VIII
PARTICULAR CONDITIONS (PC)

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Particular Conditions (PC)

The following Particular Conditions shall supplement the GC. Whenever there is a conflict, the provisions herein shall prevail over those in the GC.

Part A - Contract Data

Conditions	Sub-Clause	Data
Employer's Name and Address	1.1.2.2 & 1.3	National Water Supply & Drainage Board, P.O. Box 14, Galle Road, Ratmalana, Sri Lanka.
Engineer's Name and Address	1.1.2.4 & 1.3	General Manager, National Water Supply & Drainage Board, P.O. Box 14, Ratmalana, Sri Lanka.
Bank's Name	1.1.2.11	Japan International Cooperation Agency (JICA)
Borrower's Name	1.1.2.12	The Democratic Socialist Republic of Sri Lanka.
Time for Completion	1.1.3.3	819 days (2¼ Years).
Defects Notification Period	1.1.3.7	365 days.
Sections	1.1.5.6	Not Applicable
Electronic Transmission Systems	1.3	i. Facsimiles of Letters shall be recorded with signature. ii. Un-Editable record of Communication *(such as a signed scanned letter in PDF format)* attached to an e-mail. All other parts of the transmitted Communication such as the body text of the e-mail, shall not be construed as Communication under the Contract. *[insert Contractor's name, address and the e-mail address]*
Governing Law	1.4	The Law that applies to the Contract is the Law of The Democratic Socialist Republic of Sri Lanka.
Ruling Language	1.4	English.
Language for Communications	1.4	English.
Time for Access to and Possession of all Parts of the Site *(subject to Sub-Clause 2.1 of Part B- Specific Provisions)*	2.1	Within (7) days from the date of submission of both Performance Guarantee *{at Contractor's cost (GC 4.2)}* and evidence of Insurance in Clauses GC 18.1, 18.2, 18.3 & 18.4 have been effected and/or relevant Policies submitted. However, non-invasive Work at Site may be done at Site after issue of the Letter of Acceptance with prior approval of the Engineer.

"For References ONLY" (Not for Bidding)

Conditions	Sub-Clause	Data
Engineer's Duties and Authority	3.1 (B) (ii)	Variations resulting in an increase of the final Contract Price from the Accepted Contract Amount shall require approval of the Employer.
Determinations	3.5	Add to the end of the Sub Clause, The Engineer will be guided by the Society of Construction Law - Delay and Disruption Protocol *(2nd Edition, February 2017)* in making determinations on matters, when no specific provisions are available in the Contract. The document can be downloaded from the below web link: https://www.scl.org.uk/sites/default/files/documents/SCL_Delay_Protocol_2nd_Edition_Final.pdf
Performance Security	4.2	The Performance Security will be in the form of an unconditional bank guarantee in the amount(s) of 5% of the Accepted Contract Amount or as stated in the Letter of Acceptance. The Performance Security shall be issued by an agency stipulated below using the format for Performance Security (unconditional guarantee) included in Section IX – Annex to the Particular Conditions. a) Bank operating in Sri Lanka, approved by the Central Bank of Sri Lanka. b) Construction Guarantee Fund c) A bank Guarantee issued by a bank based in another eligible source country *(Outside of Sri Lanka)*, but the Security or Guarantee should endorsed/confirmed by a corresponding bank operating in Sri Lanka, approved by the Central Bank of Sri Lanka. However, the requirement of endorsement/ confirmation of Guarantees issued by a bank based in another eligible source country *(Outside of Sri Lanka)*, by a bank operating in Sri Lanka is not necessary, if the entity that issues the guarantee is an Export Credit Agency *(Exim Bank)* of any foreign government or a reputed International Financier acceptable to the Central Bank of Sri Lanka
Progress Reports	4.21	**Add the following to the Sub-Clause** (i) monitoring of the obligations in Sub-Clauses 4.18, 6.4, 6.7, 6.20, 6.21 & 6.24

"For References ONLY" (Not for Bidding)

Conditions	Sub-Clause	Data
Normal Working Hours	6.5	8.00 A.M. to 5.00 P.M. and six (06) days per Week. However, normal working times to be as agreed with the Engineer, considering the limitations applicable and the methodology to be adopted for each part of the Works subject to compliance to regulations of relevant Authorities including Health Authorities and Local Labour Laws.
Commencement of Work	8.1	**Sub-Clause 8.1 deleted and substituted as:** The Engineer shall give the Contractor not less than 7 days' notice of the Commencement Date. The Commencement Date shall be within 42 days after the Contractor receives the Letter of Acceptance. The Contractor shall commence the execution of the Works as soon as is reasonably practicable after the Commencement Date and shall then proceed with the Works with due expedition and without delay.
Delay Damages for the Works	8.7	0.1% of the Accepted Contract Amount Less Provisional Sums and provision for Contingencies per day.
Maximum Amount of Delay Damages	8.7	Up to a Maximum of 10% of the Contract Price.
Provisional Sums	13.5.(b) (ii)	The Percentage for Adjustments for Provisional Sums are as given under the respective Item(s) of Bill No. 2 of Price Schedule (BOQ) .

"For References ONLY"
(Not for Bidding)

Conditions	Sub-Clause	Data
Total Advance Payment	14.2	20 Percentage of the Accepted Contract Amount without VAT (less Provisional Sums, Day Works and Contingencies) payable in the currencies and proportions in which the Accepted Contract Price is payable, in the following 2 instalments. 1st Instalment – 10% on submission of stipulated Guarantees and signing of the Contract Agreement. 2nd Instalment –10% on submission of Insurance Policies and sufficiently mobilized at Site, Submission of Program, Methodology and Cash Flow Estimates as per Clauses 8.3 and 14.4; and provided proposed ways of utilizing the total Advance Payment (20%), all on certification by the Engineer. The unconditional Bank Guarantee shall be in Amounts and Currencies equal to the Advance Payment excluding VAT (Since the VAT is exempted) The Advance Payment Security shall be issued by an agency stipulated below using the Form for Advance Payment Security (unconditional guarantee) included in Section IX – Annex to the Particular Conditions. • Bank operating in Sri Lanka, approved by the Central Bank of Sri Lanka. • Construction Guarantee Fund. • A bank Guarantee issued by a bank based in another eligible source country *(Outside of Sri Lanka)*, but the Security or Guarantee should endorsed/confirmed by a corresponding bank operating in Sri Lanka, approved by the Central Bank of Sri Lanka. However, the requirement of endorsement /confirmation of Guarantees issued by a bank based in another eligible source country *(Outside of Sri Lanka)*, by a bank operating in Sri Lanka is not necessary, if the entity that issues the guarantee is an Export Credit Agency *(Exim Bank)* of any foreign government or a reputed International Financier acceptable to the Central Bank of Sri Lanka

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Conditions	Sub-Clause	Data
Repayment Amortization Rate of Advance Payment	14.2 (b)	The Advance Payment shall be repaid through percentage deductions from the Interim Payments certified by the Engineer in accordance with this Clause. Deductions shall commence in the next Interim Payment Certificate following that in which the total of all Interim Payments certified to the Contractor has reached 30 (thirty) per cent of the Accepted Contract Amount and shall be made at an amortization rate calculated in accordance with the following formula: $Y = \frac{(X-0.3)}{(0.9-0.3)} \times Z$ Y = Cumulative Repayment Z = Total Amount of Advance X = Percentage Value of Cumulative Work Done In the type's proportionate amounts of currencies of the Advance Payment until such time as the Advance Payment has been repaid: always provided that the Advance Payment shall be completely repaid prior to the time when 90% of the Accepted Contract Amount has been certified for Payment.
Percentage of Retention	14.3 (c)	10 %
Limit of Retention Money	14.3 (c)	5% of the Accepted Contract Amount Less Provisional Sums and Contingencies.
Plant and Materials	14.5 (c)(i)	Materials for payment when delivered to Site: HDPE, DI Pipes & Fittings, DI Valves & Accessories, Imported Items for Permanent Works subject to submission of following and other relevant certificates. (a) Third Party Inspection Certificate (b) Pre-Shipment Inspection Certificate by NWSDB Engineers *(If applicable in Specs)* (c) Bill of Lading (d) Country of Origin (e) Warranty Certificates. (f) Packing List (g) Printed Catalogues (h) Purchase Orders, Receipts, Delivery Notes Up to 80% of Rates and Prices quoted for Imported Permanent Works Items in JPY in the Column Number (e) and Sri Lanka Rupees in the Column Number (f) of Priced BOQ will be paid, when delivered to Site and subject to the submission of the above and other relevant certificates required by the Employer.

"For References ONLY" (Not for Bidding)

Conditions	Sub-Clause	Data
		Similarly, up to 80% of Rates and Prices quoted for the Pipeline Materials *(HDPE/DI Pipes & Fittings, Valves & Accessories etc.)* for Permanent Works Items in LKR in the Column Number (g) of Priced BOQ will be paid, when delivered to Site and subject to the submission of the above or other relevant certificates/documents required by the Employer.
Minimum Amount of Interim Payment Certificates	14.6	0.6% of the Accepted Contract Amount, less Provisional Sums and Contingencies.
The Disbursement Procedure	14.7	(A) Local Currency: Transfer Procedure (B) Foreign Currency: Transfer Procedure The brochures describing JICA's Disbursement Procedures are available at: *[https://www.jica.go.jp/english/our_work/types_of_assistance/oda_loans/oda_op_inf o/procedure]* The relevant *Brochure on Transfer Procedure for Japanese ODA Loans* shall be the latest available in the above link. The JICA or the Employer (NWSDB) shall not be liable for any risks incurred by the Contractor for any difference between the Contractor's Claim and the Payment due to the Exchange Rates and or for any bank charges.
Maximum Total Liability of the Contractor to the Employer	17.6	The product of 1.1 times the Accepted Contract Amount.
Periods for Submission of Insurance: a. Evidence of Insurance. b. Relevant Policies	18.1	35 days *(reckoned from the date of Letter of Acceptance)* 14 days *(reckoned from the date of Commencement)*
Maximum Amounts of Deductibles for Insurance of the Employer's Risks	18.2 (d)	LKR. 500,000.00 or 10% whichever is less.
Insurance against injury to Persons and Property	18.3	Total cover LKR. 30,000,000.00 *(number of events unlimited)* Additionally, Personal Accident Cover for a total of 15 members of the Employer's Staff and Consultant's Staff engaged for supervision of Works for a sum of not less than LKR. 10.0 million for each such member. All other members of Employer's Staff and any Property of the Employer to be considered as of Third Party for the purpose of Third-Party Insurance Cover.
Insurance for Contractor's Personnel	18.4	The Minimum Cover for each Contractor's Personnel including Workmen shall be LKR. 2,000,000.00

"For References ONLY" (Not for Bidding)

Conditions	Sub-Clause	Data
Date by which the DB shall be Appointed	20.2	DB shall be appointed, if and when one Party requests for such appointment.
The DB shall be Comprised of	20.2	3 Members
Appointment (if not agreed) to be Made by	20.3	Institution of Engineers, Sri Lanka (IESL)
Arbitration	20.6 (b)	03 Arbitrators

"For References ONLY"
(Not for Bidding)

Part B - Specific Provisions

Conditions & Sub-Clause	Specific Provision
Sub-Clause 1.1.6.7 "Site"	The Site shall also include the area of facilities provided by the Contractor to the Engineer and Engineer' Representatives within the terms of the contract, areas of storage of materials for the Contract, and roads connecting each of the above areas.
Sub-Clause 1.13 Compliance with Laws	**At the end of Sub-Clause 1.13, add:** However, the Contractor shall submit, in good time to the Employer, the details of Goods, Contractor's Equipment and Plant etc., where the recommendations of the Employer is necessary, who shall then on the request of the Contractor, assist as far as practicable, to obtain all import permits or licences required for these Goods, Contractor's Equipment and Plant etc., in the way of recommendations and confirmations. The Employer shall also assist as far as practicable to obtain or grant all consents including Permits-to-Work, Rights-of-Way and Approvals required for the Works.
Sub-Clause 1.15 Inspections and Audit by the Bank	**This Sub-Clause is deleted entirely.**
Sub-Clause 2.1 Right of Access to Site	Amend the second sentence of first Para of the Sub-Clause *(i.e. The right and possession may not be exclusive to the Contractor)* to read as follows: The Right and Possession of Roads forming the Site shall not be exclusive to the Contractor, but shall be subject to joint occupation with the Right to use of Site by the Public as given in Work Requirements, and with Utility Service Organizations, and other Authorized Entities, to carry out their Legitimate Duties within the Site, if so required by them.
Sub-Clause 2.2 Permits, Licences and Approvals	**Add to Sub-Clause:** However, the Contractor shall submit, in good time, the details for all required imported plant and materials to the Employer.
Sub-Clause 3.6 Management Meetings	**Insert this new Sub-Clause 3.6 at the end of Clause 3**: The Engineer shall invite the Contractor and other relevant Parties to the Inception Management Meeting where it would be explained and decided on the modalities of administering the Contract and decide upon the intervals between future Management Meetings. It is the duty of the Contractor's Representative and his relevant key staff to participate in the Management Meetings which henceforth shall be normally held monthly at the Site. The purpose of these Management Meetings is to coordinate the Works with the Contractor, (and other parties if deemed necessary) to record progress in relation to agreed program, and to reach and verify agreements. The Contractor shall provide the status of the Contract in such detail and format as acceptable to the Engineer.

"For References ONLY" (Not for Bidding)

Conditions & Sub-Clause	Specific Provision
	Minutes of each Management Meeting will be prepared by the Engineer and circulated to all parties attending the Management Meeting, prior to the next meeting. Agreements reached at a particular Management Meeting if duly recorded and confirmed at the next meeting will be considered accepted by all parties. Where such agreements require to be confirmed by Instructions from the Engineer in compliance with the Contract, the Engineer shall forthwith issue such Instructions. Agreements reached at meetings shall not be a means to override the requirements in GCC to follow stipulated procedure in submittals, notices, claims etc., and to submit the required quality assurance documents, method statements, shop drawings etc., in the Contract. .
Sub-Clause 4.1 Contractor's General Obligations	**Replace the third paragraph:** "as defined by the Bank" with "as defined by the Loan Agreement between the Bank and the Borrower." **Add the following to the Sub-Clause;** Upon completion of construction in each section, the Contractor shall fully reinstate roads, pathways, other local infrastructure, and agricultural land to at least their pre-contract condition as recorded by the Contractor in consonance with its obligation in Sub-Clause 4.16.
Sub-Clause 4.4 Subcontractors	**Amend first paragraph of Sub-Clause 4.4 as follows:** The Contractor shall not subcontract more than forty percent (40%) of the Contract in terms of value.
Sub-Clause 4.7 Setting Out	**At the end of first paragraph in Sub-Clause 4.7, add** : When setting out any part of the Works, the Contractor shall give the Engineer sufficient notice (not less than 24 hours) to enable the Engineer also to satisfy the correctness of the setting out, before the Contractor commences construction of the part concerned. However, this will not relieve the responsibility of the Contractor for the correct positioning of all Parts of the Works.
Sub-Clause 4.8 Safety Procedure	**Amend paragraph (d) as follows**: Provide Fencing, Lighting, Guarding and Watching of the Works until Completion and Taking over under Clause 10 [Employer's Taking Over], provided that such actions do not in any way obstruct the legitimate activities of any Authority or of the Public, and At the end of subparagraph (e), add: (f) Comply with all reasonable safety requirements as communicated by the Engineer. However, this will not absolve the Contractor from the responsibility of adopting and maintaining adequate safety measures. Add a new paragraph at the end of Clause. The Contractor shall use explosives only when the nature of the work to be done so requires them. In such case, in addition to complying with the legal requirements attending to the purchase, transport, storage and handling of explosives, the Contractor shall, when engaged on blasting operations:

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Conditions & Sub-Clause	Specific Provision
	(a) adopt an appropriate warning system to the satisfaction of the Engineer; and (b) maintain full liaison with and inform well in advance and obtain such permission as is required from all Government Authorities, Public Bodies and Private Parties whatsoever concerned or affected by the blasting operations, and (c) take all reasonable steps to prevent damage to adjacent Properties. (d) The Contractor shall take necessary measures and make sure to stack/store the Pipes, Fittings & Accessories in suitably safer & proper locations within reasonable distance from Work Sites. Only the quantities that can be laid in excavated trenches shall be brought in to the Roadsides/Site to minimize the left-overs in order to avoid the Public inconvenience and pilferage of unattended Pipes & Fittings. The Contractor shall pay all licence fees and charges of whatsoever kind relating to the use of explosives. The Contractor shall comply with the Guidelines issued by CIDA in all activities connected with the execution of this Contract, and all costs for such compliance are deemed to be included in all rates and prices.
Sub-Clause 4.10 Site Data	**Add to Sub-Clause:** The Contractor shall obtain all the necessary information to satisfy that he has knowledge needed for groundwater conditions, corrosivity, alkalinity, conductivity and the like as applicable towards ensuring proper selection of all materials and mechanical parts and selection of grades of all materials which come into contact with the water and flows.
Sub-Clause 4.14 Avoidance of Interference	**At the end of Sub-Clause 4.14, add**: The Contractor shall acquaint himself with the locations of all existing services including drains, telephone and electricity lines and poles, water mains, irrigation ditches and the like, in the vicinity, before any excavation or other work (which are likely to affect the existing services) is commenced. Any permanent or temporary shifting of utilities required to execute the permanent Works, shall be done through such utility agency, by paying the required charges levied by such agency. These amounts would be reimbursed through P Sums provided for such purposes. In the case of any accidental damages being caused to existing utilities due to his operations, he shall promptly bring it to the notice of the Engineer, the relevant Utility Authority and insurer as applicable. The Contractor will be held liable for all damage (including consequential damages) to the road, irrigation structures, ditches, water mains, and electric or telecommunication cables, lines or ducts of any kind caused by him or his Subcontractors in the execution of the Works. The Contractor shall make good any damage without delay and, if necessary, carry out any further work ordered by the Engineer.

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	He shall also ensure that his Third-Party Insurance Cover shall include provisions to fully settle any Claims which may be made by the Utility Authorities consequent to such damages. When operations on the public roads or irrigation canals necessitate diversion, obstruction or closure of any road, or any other right of way, the written approval of the Engineer and relevant authorities shall be obtained in advance by the Contractor. The method of working on public roads shall be in compliance with the Specifications and in accordance with procedures approved by the Engineer, and complying with stipulations of the relevant road authority, Irrigation Department and / or Local Authority, Police and security forces. The Contractor shall not deposit any equipment or material in any waterway adjacent to the Works. Where temporary works obstruct any waterway, the Contractor shall be responsible for obtaining any approvals from the relevant authorities for such purpose and for rectifying any damages caused by consequential flooding and shall remove all temporary works to the satisfaction of the Engineer on completion of his operations.
Sub-Clause 4.16 Transport of Goods	**Add to Sub-Clause:** The Contractor shall adequately record the condition of roads, agricultural land and other adjacent infrastructure, prior to start of transporting plant, materials, goods and equipment and prior to commencing construction.
Sub-Clause 4.18 Protection of Environment	**Add to Sub-Clause:** The Contractor shall (a) establish an operational system for managing environmental impacts, (b) carry out all of the monitoring and mitigation measures set forth in the Environmental Management Plan (EMP) and in the relevant environmental approval document (c) allocate the budget required to ensure that such measures are carried out. The Contractor shall submit monthly reports on the carrying out of such measures to the Employer. The Contractor shall comply with all applicable National, Provincial and Local Environmental Laws and Regulations including Rules and Regulations of the Central Environmental Authority of Sri Lanka. The Contractor shall submit the relevant monthly reports approved by Engineer with each interim bill. Failing to comply with mitigation measures or submitting reports will carry a deduction of maximum 1% of the billed value of the pipe laying/civil works done within the billing period. If the submitted report shows that only part of the activities is carried out, the deductions will be done proportionately to the activities carried

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	out as determined by the Engineer. Contractor is forewarned that no other party other than the Contractor can attend to Environmental Protection (EP) measures, as it goes hand in hand with the construction work. Mitigation measures such as, regular maintenance of machinery & vehicles used for construction work, and maintaining any gravel roads, paths or premises for the plying of vehicles and machinery; prevent clogging of ditches & drains, prevent formation of mud puddles in thresholds and all other places in the Site; pollution such as dust, noise, waste accumulation, waste water logging etc. and/or as set out in EMP. Hence, if the Contractor continues to violate the said measures, the Engineer will have no other option other than to suspend Works, until all measures are in place prior to re-start of construction work. Contractor shall be held responsible for any delay due to such stoppage of Works, and any claim for time extension or costs will not be granted.
Sub-Clause 4.19 Electricity and Water	**Delete the Sub-Clause 4.19 in its entirety and substitute**: The Contractor shall be responsible for the provision all Power, Water and other Services as he may require, and shall not be entitled to such services available at Site belonging to the Employer.
Sub-Clause 4.21 Progress Reports	**At the end of the Sub-Clause 4.21, add**: **(i) each of the obligations in Sub-Clause 4.18, 6.2 and 6.7.** These Reports shall be taken up for discussion at the Management Meetings specified under Sub-Clause 3.6. The format of the report shall be as acceptable to the Engineer.
Sub-Clause 4.23 Contractor's Operations on Site	**At the end of Sub-Clause 4.23, add**: The Contractor shall not sell or otherwise dispose of or remove, except for the purpose of the Works, any sand, stone, clay, ballast, rock or other substances or materials which he obtains from any excavation made for the purpose of the Works or any buildings or produce upon the Site during the time he is in the possession of the Site, and all such substance, materials, buildings and produce shall be the property of the Employer or the relevant Government Authority, provided that the Contractor may with the permission in writing of the Engineer use any of the same for the purposes of the Works or dispose of them off the Site at approved locations
Sub-Clause 6.1 Engagement of Staff and Labour	**At the end of Sub-Clause 6.1, add**: Contractor's Equipment operators, skilled and semi-skilled labour shall possess or be in training to acquire National Certificates of Trade Tests issued by the National Apprenticeship Board in Sri Lanka or equivalent agencies in the respective countries of their permanent residence. The Engagement of Contractor's Personnel and their stay in and around the Site shall be subject to clearance and regulations of the Armed forces, Sri Lanka Police and/or any other legal authority. No Contractor's Personnel will be allowed in and around the Site without such clearance.

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Sub-Clause 6.2 Rates of Wages and Conditions of Labour	**At the end of Sub-Clause 6.2, add**: All employees of the Contractor and the Subcontractors, whether Local or Foreign, are liable for Personal Taxation on their emoluments and any other benefits to be derived, in accordance with the Laws and Regulations being in force in Sri Lanka. In this regard the Contractor is further required to comply with the directives of the Department of Inland Revenue, where applicable.
Sub-Clause 6.6 Facilities for Staff and Labour	**Insert the following at the end of the first paragraph**: The Contractor shall obtain Land Rights or any other Rights required for these purposes. On completion of the Contract, unless otherwise agreed with the Employer or provided for in the Contract, the temporary camps/housing provided by the Contractor shall be removed and the sites reinstated to their original condition, to the approval of the Engineer.
Sub-Clause 6.7 Health and Safety	**At the end of Sub-Clause 6.7, add:** In the event of an outbreak of illness of an epidemic/pandemic nature, the Contractor shall comply with and carry out such regulations, orders and requirements as may be required by the Government/Ministry of Health or the Local Medical or Sanitary Authorities, for the purpose of dealing and overcoming the same. Further, the Contractor shall strictly adhere and comply to the Guidelines stipulated by the CIDA Publication on Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID 19 Outbreak *(Version 29th April 2020)* as well as the Health and Immunity Enhancement Guidelines for COVID -19 and Dengue - CIDA Health Guidelines for Construction Industry Version 3 *(Revised – August 2020)* as well as the Health and Immunity Enhancement Guidelines for COVID -19 and Dengue - CIDA Health Guidelines for Construction Industry Version 3 *(Revised – August 2020)* or any other subsequent Government Instructions released from time to time, which will also appear in the CIDA web site to mitigate the spread of COVID19 in all Construction Projects operated under their purview, during the entire period declared as critical by the Authorities.
Sub-Clause 6.8 Contractor's Superintendence	**Add to Sub-Clause**; To ensure quality and timely execution of the Works, the Contractor shall be responsible for the employment of the approved supervisory and other personnel nominated by the Contractor at site and at designated places on full time basis as agreed until the completion of the contract Works. The Project Manager or Contractor's Representative must be deployed at Site prior to starting of Permanent Works. The Contractor shall not replace any of the nominated and approved personnel with persons having less qualifications or experience. The Engineer shall suspend the contract Works forthwith for breach of any of the above stipulations, and no extensions of Time for Completion or costs will be granted due to the delay of the Works as a consequence. The Contractor shall also make good the Works that suffers in quality without any additional cost to the Employer. **At the end of Sub-Clause 6.8, add**: A reasonable proportion of the Contractor's superintending staff shall

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	have a working knowledge of the English language, or the Contractor shall have sufficient competent interpreters available on Site during all working hours. The Engineer may require any key staff member of the Contractor's Personnel to be replaced under Sub –Clause 6.9, if his knowledge of the English language is found to be insufficient by the Engineer.
Sub-Clause 6.9 Contractor's Personnel	**Insert additional paragraph at the beginning of the Sub-Clause 6.9**: The Contractor shall submit curricula vitae of all proposed key personnel of Contractor's Personnel to the Engineer for approval prior to engagement. Approval would not be granted for substitution of personnel engaged for key staff positions, except under very exceptional circumstances. In such an event the Contractor would be required to propose a replacement with equal or better qualification and experience for approval by the Employer.
Sub-Clause 7.1 Manner of Execution	**Insert additional paragraphs at the end of Sub-Clause 7.1**: Unless otherwise stated elsewhere in the contract, at least 14 days in advance of his programmed commencement of each principal item of work, the Contractor shall furnish for the Engineer's concurrence, the method of working he intends to adopt for execution of such item giving full details of the method of working, equipment to be deployed and measures to be adopted for ensuring the quality of construction and the safety of his workers as well as third parties. He shall also inform the Engineer as a good practice, at least 24 hours in advance of its intended commencement of any work / operation requiring Engineer's inspection and/or approval by forwarding the relevant details, including the resources intended to be deployed - preferably in an agreed format.
Sub-Clause 7.3.1 Testing and Inspection by Independent Inspection Agencies	**Insert this new Sub-Clause 7.3.1 at the end of Clause 7.3**: Notwithstanding the above, the Employer requires that, all the imported Material to be supplied under the Contract (unless otherwise stated) shall conform to the Contracted Specifications and the Contractor, through his relevant Manufacturer shall inspect, test and obtain the Certificates of Inspection for the conformity, carried out as Specified in the Technical (General) specification section 6B-6 Inspection & Testing of Goods in Volume 2 of 4.
Sub-Clause 7.3.2 Pre-Shipment by NWSDB Officials	**Insert this new Sub-Clause 7.3.2 at the end of new Sub-Clause 7.3.1**: Notwithstanding the above, the Contractor shall also arrange for 02 NWSDB Engineers for each of the items stipulated to be inspected to attend a Pre-Shipment Inspection Visit to the Country/Countries of Manufacture of the Imported Material before dispatching, as Specified in the Technical (General) Specification Section 6B-6 Inspection & Testing of Goods in Volume 2 of 4.
Sub-Clause 8.3 Programme	**At the end of the penultimate paragraph, add:** Notwithstanding the above, the Contractor should also recommend to the Engineer, practical ways and means of reducing or avoiding the

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Conditions & Sub-Clause	Specific Provision
	adverse effects on the work, due to such specific probable future events or circumstances which may result in an increase of cost or extension of time for completion of the Contract.
Sub-Clause 8.4 Extension of time for Completion	Replace "entitled to an extension of time" with "entitled to have his claim for an extension of time considered", in the first sentence of Sub-Clause 8.4. **Add at the end of Sub-Clause 8.4** (A) For the purposes of Sub-Clause 8.4 (c), it is agreed that "exceptionally adverse climatic conditions" in respect of rain shall be exclusively where: (i) In any single day, the rainfall measured at the meteorological station closest to the location of the Site, exceeds the maximum rainfall in any day for that calendar month for that station, as recorded during the last 10 years of that station's rainfall records or, in the case where the station's rainfall records do not extend back as far as 10 years, then that station's available records, and (ii) work affected by rain is in progress that day. (B) If the Contractor is of the opinion that exceptionally adverse climatic conditions have occurred on any day then he shall notify the Engineer subject to requirements under Sub-Clause 20.1, and shall supply relevant confirmatory rainfall data (as detailed in above (A)). If the Contractor does not so inform the Engineer then no extension of the Time for Completion in relation to that event will be considered or allowed. (C) Within 28 days of receiving the Contractor's notification of exceptionally adverse climatic conditions the Engineer shall determine the amount, if any, of the extension of the Time for Completion, taking due account of the nature and extent of the work affected, and shall notify the Contractor accordingly. Any delay caused by exceptionally adverse climatic conditions will be "no fault delay" and cost will be deemed to lie where they fall. That is, in the case of such delay the Employer agrees to forego the right to claim Delay Damages for the period of delay and the Contractor agrees to forego any right to claim additional costs arising from such delay.

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Sub-Clause 12.3 Evaluation	**Add to Sub-Clause** If Contract rates or prices are not relevant for derivation of new rates or prices, it shall be derived from the relevant rates analysis given in the most current edition published by the National Water Supply & Drainage Board (NWSDB), or other relevant schedule of rates as agreed by the Employer for specific work published by the appropriate government authority in Sri Lanka. Such rates analysis shall be priced with reasonable rates for Labour, Material, Construction Equipment & Machinery (Plant) and Sub- Contracting, together with Contractor's Service Charges (Inclusive of Contractors Site overhead, principal & branch office overheads and profit) indicated in the BOQ against the Provisional Sum to which the new rate relates; to arrive at new rates or prices. In absence of relevant rate analysis in NWSDB or other schedule of rates as specified above, new rates or prices shall be derived from the reasonable basic cost of the new work, together with Contractor's Service Charges (Inclusive of Contractors site overhead, principal & branch office overheads and profit), indicated in the BOQ against the Provisional Sum to which the new rate relates; to arrive at new rates or prices. For any new rates or prices, the Contractor shall provide acceptable supporting documentation, in timely manner, of such rates or prices to the Engineer's satisfaction. Until such time as an appropriate new rate or price is agreed or determined, the Engineer shall determine a provisional rate or price for the purpose of Interim Payment Certificates."
Sub-Clause 13.5 Provisional Sums	**The following text should be added at the end of Sub-Clause 13.5**: "As an exception to the above, the Provisional Sum for the cost of the DB shall be used for payments to the Contractor of the Employer's share (one-half) of the invoices of the DB for its fees and expenses, in accordance with GC 20.2. No prior instruction of the Engineer shall be required with respect to the work of the DB. The Contractor shall produce the DB invoices and satisfactory evidence of having paid 100% of such invoices as part of the substantiation of those Statements submitted under Sub-Clause 14.3, which contain requests for payment under the Provisional Sum toward the cost of the DB. The Engineer's certification of such Statements shall be based upon such invoices and such evidence of payment by the Contractor. Contractor's overhead, profit, etc., shall not be included in the provisional sums for the cost of the DB."
Sub-Clause 13.8 Adjustments for Changes in Cost	**Delete entire Sub-Clause 13.8 and substitute the following**: The amounts computed from the formula given under this sub-clause in respect of the rise or fall in the cost of labour, Material, Plant and other inputs to the Works, shall be added to or deducted from the payment to the Contractor. The formula applied for the calculation of Adjustments due to changes in costs shall be as per the CIDA formula: $F = \frac{0.966\,(V - V_{na})}{100} \sum_{\text{All Inputs}} P_x \frac{(I_{xc} - I_{xb})}{I_{xb}}$

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Where:

F = Price Adjustment for the Period concerned

V = Current Valuation of Work Done for the Period

V_{na} =Value of Non- Adjustable Element or Value of Work not considered for Price Variation

P_x = Input Percentage of Input Named X

I_{xc} = Current Indices of Input Named X

I_{xb} = Base Indices of Input Named X, prevailing one month prior to the latest date for submission of Bids

No other adjustment of the Contract Price on account of fluctuations of inputs shall be made, notwithstanding the fact that, the Contractor has to pay additional amount under special circumstances.

The Indices refers to in the Formula shall be the Monthly Indices published by the CIDA.

Applicable as per the Percentages shown here under.

Index No.	Input Name	Input Percentage
L1	Skilled Labour	10.0
L3	Unskilled Labour	16.0
M3	Cement	3.0
M8	Sand	9.0
M52	Quarry dust	6.0
M13	Reinforcement	6.0
M21	Formwork	15.0
M45	Earth	11.0
P1	Small Equipment	6.0
P2	Heavy Equipment	5.0
P3	Fuel	3.0
	Total	90.0
		===

"Non-Adjustable Elements" shall be the following:

- Bill No 01- General Requirements
- Bill No 02 – Provisional Sums
- Foreign Currency Components of Column No.(e) in JPY of the Bills of Quantities
- Local Currency Component in the Delivery to Sites such as Transport, Transit Insurance, Port Charges and Handling Charges etc., in Column No.(f) in LKR of the Bills of Quantities
- Local Currency Component of Supply of Materials within the Employer's Country in Column (g) in LKR of the Bills of Quantities.

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	• Variations carried out by the Contractor on the instructions of the Engineer valued on prices and costs prevailing at the time of execution and any other item which does not belong to the above Indices of Inputs as listed above. The "Current Valuation" means the gross values of work executed during the current valuation period and will include the cost of materials the Contractor has purchased or delivered to Site but were not consume for the physical work done. The "Base Indices" means the indices for the input, prevailing one month prior to the latest date for submission of bids. In the case of first interim bill, the current indices for the purpose of calculation of price adjustment shall be taken as the indices prevailing on first months the commencement of the Contract. For any other interim claim or for the final claim the current indices shall be taken as the indices prevailing for the calendar month, one month after the previous valuation was done. If the Contractor fails to complete the Works within the Time for Completion or any extension granted thereto, shall be made using the current indices prevailed at the due date of completion.
Sub-Clause 14.1 **The Contract Price**	**The following sentence under Clause 14.1 shall not apply**: "Notwithstanding the provisions of sub-paragraph (b), Contractor's Equipment, including essential spare parts therefore, imported by the Contractor for the sole purpose of executing the Contract shall be exempt from the payment of import duties and taxes upon importation." **Replace Sub-Clause 14.1(b) with the following:** The Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract, **except** the Customs Duties & VAT charges payable in respect of BOQ Bill Numbers for Imported Supply Items in **Column Number (a) and (e)** of the Priced Bills of Quantities for which items only the CIF cost as priced in the BOQ is payable. The Contract Price shall not be adjusted for any of these Costs except as stated in Sub-Clause 13.7 [Adjustments for Changes in Legislation]; Only Customs Duties & VAT charges levied by the Sri Lanka Customs in respect of Imported Items in the above-mentioned Bills would be exempted by the Employer on behalf of the Contractor at the time of Clearance from Sri Lanka Customs, on timely production of original certified Customs Assessment Documents by the Contractor. Any delay in clearance is the responsibility of the Contractor and demurrages, if any shall be borne by the Contractor. However, the Contractor shall be responsible for the charges levied by the Sri Lanka Ports Authority including any demurrage (if any) payable. However, for the Local Component, any other Tax other than VAT imposed by the Government of Sri Lanka shall be borne by the Contractor. The VAT chargeable for such Local Component shall be exempted for the Contractor.

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	At the end of Sub-Clause14.1, add The Contract Price shall include all taxes, duties and other charges imposed outside the Employer's Country on the production, manufacture, sale and transport of the Contractor's equipment, Plant, materials and supplies to be used on or furnished under the Contract, and on the services performance under the Contract. Nothing in the Contract shall relieve the Contractor from its responsibility to pay any tax that may be levied in the Employer's country on profits made by it in respect of the Contract. All employees of the Contractor and the Subcontractors, whether local or foreign, are liable for personal taxation on their emoluments and any other benefits to be derived, in accordance with the laws and regulations being in force in Sri Lanka. In this regard the Contractor is further required to comply with the directives of the Department of Inland Revenue, where applicable.
Sub-Clause 14.3 Application for Interim Payment Certificate	**Add the following Wording at the end of 14.3 (a):** The Estimated Contract Value of the Works shall be supported by measurements of the Work done taken jointly with the Engineer's Supervisory Staff.
Sub-Clause 14.6 Issue of Interim Payment Certificate	**Add the following sentence at the end of subparagraph (b)** The amount to be withheld for such non-compliance shall be as determined by the Engineer.
Sub-Clause 14.7 Payment	**Add the following at the end of Sub-Clause 14.7** However, if the Employer finds sufficient evidence that the Progress of the Works suffers due to non-payment or delayed payment to Subcontractors/Suppliers by the Contractor, the Employer shall be entitled to request the Contractor to establish an ESCROW Account with a reputed local bank (ESCROW Agent) acceptable to the Central Bank of Sri Lanka with an ESCROW Agreement, in accordance to the format given with the Contract Forms**.**

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Conditions & Sub-Clause	Specific Provision
Sub-Clause 14.15 Currencies of Payment	**Replace the entire Sub-Clause 14.15 with the following**: The Contract Price shall be paid in the currency or currencies in which the Bid Price was expressed in the Letter of Bid. If more than one currency is so named, payments shall be made as follows: (a) payment of the damages specified in GC 8.7, shall be made in the currencies and proportions specified in the Letter of Bid; (b) other payments to the Employer by the Contractor shall be made in the currency in which the sum was expended by the Employer, or in such currency as may be agreed by both Parties; (c) if any amount payable by the Contractor to the Employer in a particular currency exceeds the sum payable by the Employer to the Contractor in that currency, the Employer may recover the balance of this amount from the sums otherwise payable to the Contractor in other currencies; and (d) the applicable rates of exchange shall be those prevailing on the Base Date and determined by the central bank of the Sri Lanka.
Sub-Clause 15.6 Corrupt or Fraudulent Practices	**Replace the entire Sub-Clause 15.6 with the following**: If the Employer determines, based on reasonable evidence, that the Contractor has engaged in corrupt, fraudulent, collusive or coercive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days' notice to the Contractor, terminate the Contract and expel him from the Site, and the provisions of Clause 15 shall apply as if such termination had been made under Sub-Clause 15.2 [Termination by Employer]. Should any employee of the Contractor be determined, based on reasonable evidence, to have engaged in corrupt, fraudulent or coercive practice during the execution of the work then that employee shall be removed in accordance with Sub-Clause 6.9 [Contractor's Personnel].
Sub-Clause 18.1 General Requirements for Insurances	**Add the following at the end of Sub-Clause 18.1**: All Insurances as required by the Contract is preferred to be executed from a reputed Insurance Company of Sri Lanka acceptable to the Employer. In case of Insurance cover from a Foreign Insurance Company from an Eligible Source Country, the concerned Insurance Policy shall be at the Contractor's risk and cost be endorsed by a reputed local Insurance Company acceptable to the Employer.
Sub-Clause 18.3 Insurance against Injury to Persons and Damage to Property	**Add the following at the end of Sub-Clause 18.3** Prior to commencing any excavation or using any heavy Equipments in close proximity to third party property, the Contractor shall at his own expense arrange to inspect such properties. He shall also prepare pre-operation condition reports of such property including any photographs, as deemed appropriate, for future reference.

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Conditions & Sub-Clause	Specific Provision
Sub-Clause 20.5 Amicable Settlement	**Delete the 2nd sentence and replace with the following:** If amicable settlement has not been reached, and unless both parties agree otherwise, the Party giving a Notice of Dissatisfaction in accordance with Sub-Clause 20.4 above, may move to commence arbitration after the fifty-sixth (56th) day but not later than one hundred and forty-seventh (147th) day from the day on which a Notice of Dissatisfaction was given, even if no attempt at an amicable settlement has been made. If arbitration proceedings are not commenced within such period, then the decision of the Dispute Board shall become final and binding.
Sub-Clause 20.6 Arbitration	**Replace the entire Sub-Clause 20.6 with the following**: Any dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with Sub-Clause 20.5 above and in respect of which the DB's decision (if any) has not become final and binding shall be finally settled by Arbitration. Arbitration shall be conducted as follows: (a) if the contract is with foreign contractors (or if the lead partner is a foreign contractor, in case of JV), international arbitration with proceedings administered by UNCITRAL and conducted under the rules of Arbitration of UNCITRAL; by one or more arbitrators appointed in accordance with said arbitration rules. (b) if the Contract is with domestic contractors, arbitration with proceedings conducted in accordance with the laws of the Employer's country. The place of Arbitration shall be in Colombo at the "Institute for the Development of Commercial Law and Practice" The Arbitrators shall have full power to open up, review and revise any certificate, determination, instruction, opinion or valuation of the Engineer, and any decision of the DB, relevant to the dispute. Nothing shall disqualify representatives of the Parties and the Engineer from being called as a witness and giving evidence before the arbitrators on any matter whatsoever relevant to the dispute. Neither Party shall be limited in the proceedings before the arbitrators to the evidence or to arguments previously put before the DB to obtain its decision, or to the reasons for dissatisfaction given in its Notice of Dissatisfaction. Any decision of the DB shall be admissible in evidence in the arbitration. Arbitration may be commenced prior to or after completion of the Works subject to provisions of PCC 20.5 above. The obligations of the Parties, the Engineer and the DB shall not be altered by reason of any arbitration being conducted during the progress of the Works.

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SECTION IX
ANNEX TO THE PARTICULAR CONDITIONS - CONTRACT FORMS

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Letter of Acceptance

[Insert letterhead paper of the Employer]

[Insert date]

To: *[Insert name and address of the Contractor]*

This is to notify you that your Bid dated *[insert date]* for execution of the Supply & Laying of HDPE, DI Distribution Mains and Providing Service Connections for Padaviya and Kebithigollewa DS Divisions, Contract No: AN/PH II/JICA/ DM/LOT C1 for the Accepted Contract Amount of the equivalent of *[insert amount in words and figures] [insert name of currency]*, as corrected and modified in accordance with the Instructions to Bidders, is hereby accepted by our Agency.

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract, using for that purpose one of the Performance Security Forms included in Section IX, Annex to the Particular Conditions - Contract Forms, of the Bidding Documents.

Authorized Signature: _____

Name and Title of Signatory: _____

Name of Agency: _____

Attachment: Contract Agreement

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(Not for Bidding)

Contract Agreement

THIS AGREEMENT made the *[insert day]* day of *[insert month]*, *[insert year]*, between National Water Supply & Drainage Board, P O Box 14, Galle Road, Ratmalana. (hereinafter "the Employer"), of the one part, and *[insert name of the Contractor]* (hereinafter "the Contractor"), of the other part:

WHEREAS the Employer desires that the Works known as Supply & Laying of HDPE, DI Distribution Mains and Providing Service Connections for Padaviya and Kebithigollewa DS Divisions, Contract No: AN/PH II/JICA/DM/LOT C1 should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects therein,

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.

   (i) the Letter of Acceptance;
   (ii) the Letter of Bid;
   (iii) the addenda Nos *[insert addenda numbers, if any]* (if any);
   (iv) the Particular Conditions;
   (v) the General Conditions;
   (vi) the Specification;
   (vii) the Drawings;
   (viii) the completed Schedules; and any other documents, letters attached with the agreement; and
   (ix) the Acknowledgement of Compliance with Guidelines for Procurement under Japanese ODA Loans.
   (x) Any other relevant document

3. In consideration of the payments to be made by the Employer to the Contractor as specified in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of *[insert the laws of the borrowing country]* on the day, month and year specified above.

Signed by _____

for and on behalf of the Employer
in the presence of
Witness, Name, Signature, Address, Date

Signed by _____

for and on behalf the Contractor
in the presence of
Witness, Name, Signature, Address, Date

"For References ONLY"
(Not for Bidding)

Performance Security

[Insert Guarantor letterhead or SWIFT identifier code]

Beneficiary: Chairman, National Water Supply & Drainage Board, P.O. Box 14, Galle Road, Ratmalana.

Date: *[Insert date of issue]*

PERFORMANCE GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that *[insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. AN/PH II/JICA/DM/LOT C1 dated *[insert date]* with the Beneficiary, for the execution of Supply & Laying of HDPE, DI Distribution Mains and Providing Service Connections for Padaviya and Kebithigollewa DS Divisions. (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (*[insert amount in words]*),[1] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for its demand or the sum specified therein.

This guarantee shall expire, no later than the *[insert the day]* day of *[insert month], [insert year]*[2], and any demand for payment under it must be received by us at this office indicated above on or before that date.

The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed one year, in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

_____

[signature(s)]

[Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.]

"For References ONLY" (Not for Bidding)

1 *The Guarantor shall insert an amount representing the percentage of the Accepted Contract Amount specified in the Letter of Acceptance, less provisional sums, if any, and denominated either in the currency(cies) of the Contract or a freely convertible currency acceptable to the Beneficiary.*

2 *Insert the date twenty-eight days after the expected completion date as described in GC Clause 11.9.*

Advance Payment Security

Demand Guarantee

[Insert Guarantor letterhead or SWIFT identifier code]

Beneficiary: Chairman, National Water Supply & Drainage Board, P.O. Box 14, Galle Road,

Ratmalana.

Date: *[Insert date of issue]*

ADVANCE PAYMENT GUARANTEE No.: [*Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that [*insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. AN/PH II/JICA/DM/LOT C1 dated *[insert date of the contract]* with the Beneficiary, for the execution of Supply & Laying of HDPE, DI Distribution Mains and Providing Service Connections for Padaviya and Kebithigollewa DS Divisions. (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum *[insert amount in figures]* (*[insert amount in words]*) is to be made against an advance payment guarantee.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (*[insert amount in words]*)[1] upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:

(a) has used the advance payment for purposes other than the costs of mobilization in respect of the Works; or

(b) has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Applicant as specified in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that ninety (90) per cent of the Accepted Contract Amount, less provisional sums, has been certified for payment, or on the *[insert day]* day of *[insert month]*, *[insert year]*[2], whichever is earlier.

Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed one year, in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

"For References ONLY" (Not for Bidding)

[1] *The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Employer.*

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

_____
[signature(s)]

[Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.]

_____

[2] *Insert the expected expiration date of the Time for Completion.*

"For References ONLY"
(Not for Bidding)

Retention Money Security

Demand Guarantee

[Insert Guarantor letterhead or SWIFT identifier code]

Beneficiary: Chairman, National Water Supply & Drainage Board, P.O. Box 14, Galle Road, Ratmalana.

Date: *[Insert date of issue]*

RETENTION MONEY GUARANTEE No.: *[Insert guarantee reference number]*

Guarantor: *[Insert name and address of place of issue, unless indicated in the letterhead]*

We have been informed that *[insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]* (hereinafter called "the Applicant") has entered into Contract No. AN/PH II/JICA/DM/LOT C1 dated *[insert date]* with the Beneficiary, for the execution of Supply & Laying of HDPE, DI Distribution Mains and Providing Service Connections for Padaviya and Kebithigollewa DS Divisions. (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, the Beneficiary retains moneys up to the limit set forth in the Contract ("the Retention Money"), and that when the Taking-Over Certificate has been issued under the Contract and the first half of the Retention Money has been certified for payment, payment of *[insert* the second half of the Retention Money *or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money,* the difference between half of the Retention Money and the amount guaranteed under the Performance Security*]* is to be made against a Retention Money guarantee.

At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of *[insert amount in figures]* (*[insert amount in words]*)[1] upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or show grounds for its demand or the sum specified therein.

This guarantee shall expire no later than the *[insert day]* day of *[insert month]*, *[insert year]*[2], and any demand for payment under it must be received by us at the office indicated above on or before that date.

The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed one year, in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

"For References ONLY"
(Not for Bidding)

[1] *The Guarantor shall insert an amount representing the amount of the second half of the Retention Money or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security and denominated either in the currency(ies) of the second half of the Retention Money as specified in the Contract, or in a freely convertible currency acceptable to the Beneficiary.*

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.

_____
[signature(s)]

[Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.]

_____

2 *Insert the same expiry date as set forth in the Performance Security, representing the date twenty-eight days after the completion date described in GC Clause 11.9.*

"For References ONLY"
(Not for Bidding)

ESCROW Agreement

THIS AGREEMENT is made and entered into at Colombo on this …. day of …….. …… *[insert month and year]* in the Democratic Socialist Republic of Sri Lanka

BY AND BETWEEN

National Water Supply & Drainage Board, a corporate body duly established under the provisions of the National Water Supply and Drainage Board Act No.2 of 1974 (hereinafter referred to as **NWSDB**) of having its Head Office at Ratmalana in Sri Lanka (hereinafter referred to as the **'Employer'** or **'the Board'** and its successors and assigns)

AND

…….. a firm duly registered in the said Republic of Sri Lanka under Partnership Agreement Bearing No. …… and having its Registered Office at ……

OR/AND …… (Company name) a company duly incorporated in …… (Country in incorporation) under the provision of the Companies Act/Country legislation No. …… and having its Registered Office at …… (address of the Registered Office) in …… (Country) (hereinafter referred to as the **'Contractor'** and its successors and assigns)

AND

…… *[insert the name of the Bank]* a Banking Company incorporated under the laws of Sri Lanka and having its registered office at …… and a branch office at …… (hereinafter called and referred to as the "**ESCROW Agent**" which term or expression as herein used shall where the context so requires or admits mean and include the said……*[insert the name of the Bank]* and its successors and assigns)

(The Employer, the Contractor and the ESCROW Agent are hereinafter and sometimes collectively referred to as 'the Parties')

WHERE AS THE EMPLOYER AND THE CONTRACTOR ARE PARTIES TO STANDARD OPERATING PROCEDURE FOR OPERATION OF JOINT ESCROW ACCOUNT FOR COMPLETION OF WORKS OF.....…… FOR:

1. CONTRACT NO:

   ……...……...……

NOW THIS AGREEMENT WITNESSETH THAT THE PARTIES HEREBY AGREE AS FOLLOWS:

1. **Appointment**

   The Employer and the Contractor hereby appoint …… [*insert the name of the Bank*] ……... BRANCH the ESCROW Agent and the joint ESCROW Account shall be opened for the Contract in the name of the Contractor. Withdrawals from this account shall only be made by way of joint written request/ fund transfer order duly signed by a signatory for the Contractor and a signatory for the Employer. The Contractor ……..…… [insert the name of the Contractor] shall authorize two signatories for each Account and NWSDB shall authorize two signatories to operate this account.

"For References ONLY" (Not for Bidding)

2. The Accounts

The Account shall solely constitute for the money due to the Contractor, ……[*insert the name of the Contractor*] in the form of loan disbursement, additional advance, Interim Payment Certificates (IPCs), escalation claims or any other money due on account of Contract payments.

3. Auditing

The internal audit of the ESCROW Account shall be the co-responsibility of the NWSDB and the …… [*insert the name of the Contractor*].

4. Operation in Accounts

No cheque books are issued for the ESCROW Accounts. The Cash/Funds out of the ESCROW Account shall only be made under the authorized signature of the Employer and the Contractor.

5. Payments

Payments from the ESCROW Account shall be processed as follows:

a. Once the ESCROW account is established, payments of all future certified IPCs shall be deposited in the ESCROW Account.

b. Limitation on transactions:
Transactions out of the ESCROW Account shall be limited to payments under the project including Salaries/Wages, Utility Bills, Subcontractors, Suppliers, Service Renders, maintenance work, material supplies, administration requirements, individual dues etc.

c. The Contractor shall request disbursements from the Committee specified under 5(d) in this Agreement by listing items in appropriate grouping of Salaries/Wages, Utility Bills, Subcontractors, Suppliers, Service Renders, maintenance work, material supplies, administration requirements, individual dues, showing the total amount required for each item listed. Appropriate summary and detailed assessments shall accompany the request. Notwithstanding above, the disbursement against Head Office Overheads shall constitute a mutually agreed amount and the same shall be paid directly to an account as requested by ……..…… [*insert the name of the Contractor*].

d. The committee comprising of the Project Director (NWSDB), Consultant Team Leader, and Project Manager of the Contractor, Accountant of the Contractor ……..…… [*insert the name of the Contractor*], shall review the requested list, and determine if the requirements are appropriate to the needs of the Contractor's activities on the Project. Once approved/agreed, the disbursement payment shall be issued directly to agreed creditors/suppliers. The committee must ensure that;

1) The materials are in accordance with the specifications for the Works.

2) The materials have been delivered to the site and the properly stored and protected against loss, damage, or deterioration.

"For References ONLY" (Not for Bidding)

3) The Contractor's records of the requirements, orders, receipts and use of materials are kept in a form approved by the Engineer, and such records are available for inspection by the Engineer.

4) The Contractor has submitted a statement certified by the Employer of his cost of acquiring and delivering the materials to the Site, together with such documents as may be required for the purpose of evidencing such cost.

5) No cash payments will be made through this account

6) All written requests duly signed by the Employer and the Contractor shall be submitted to the bank before 15th of each month.

7) No Facsimile transactions requests shall be accepted

e. Any unreasonable imbalance between the amount paid out from the ESCROW account and the agreed list of payments shall result in further disbursements from the ESCROW account being stopped until the required information/explanation is provided.

6. Bank Interest

Any bank interest gained on balance amount in ESCROW account shall be that of ……..…… [*insert the name of the Contractor*]

7. Disputes

The ESCROW Account shall operate within the provisions of terms, conditions and clauses of the Contract. In case of any Conflict between …… [*insert the name of the Contractor*] and NWSDB, the provisions of this ESCROW agreement shall hold preference. In the case of such dispute the ESCROW Agent shall have sole authority to cease the operation of such ESCROW account immediately.

8. Maintaining Cash Books

The cash book shall be maintained by the Project Manager, of …… [*insert the name of the Contractor*] and it will be countersigned by the Employer's Representative. The cash book shall be closed on monthly basis.

9. Period

By operation on this ESCROW Account, the Contractor is not relieved of any of its obligations under the Contract Agreement with respect to completion of the Works on time as stated in the Contract.

10. The Role of ESCROW Account

The role of the ESCROW Account is limited to ensure smooth flow of finance to the contract by channelling contract payments for speedy execution of the contract.

11. Termination of the ESCROW Agreement:

The ESCROW Account may be terminated when the full amount of all mobilization advance and additional advance are repaid and the whole of the Works are "Taken Over' by the Employer, or when the original Contract of the Project between the NWSDB and the ……[*insert the name of the Contractor*] comes to an end. On termination of the account all remaining funds shall be paid to the Contractor subject to any dues to be recovered by the ESCROW Agent.

"For References ONLY" (Not for Bidding)

12. Amendments

Employer has the right to add any amendments with the written consent of the Contractor and the ESCROW Agent when it is necessary in the interest of public money.

13. Governing Law

This Agreement shall be construed in accordance with the Laws of the Democratic Socialist Republic Sri Lanka and be subjected to the Jurisdiction of the Courts of Sri Lanka.

14. Miscellaneous

i. Good Faith

The Parties hereto agree and recognize that not all matters forming the intent of the Parties hereto may be incorporated in this Agreement and not all possibilities which may arise in connection with the subject matter hereof can be foreseen at the time being and fully provided for at the execution of this Agreement. Where any omission or lacuna becomes known, the Parties hereto agree to amend in writing this Agreement to cover such omission or lacuna in conformity with spirit of this Agreement.

ii. Severability

If any provision of this Agreement or the application to any party or circumstances are determined to be invalid, illegal or unenforceable to any extent, the remainder of this Agreement or such provision or the application of such provision to such party or circumstances, other than those to which it is so determined to be invalid, illegal or unenforceable, will remain in full force and effect to the fullest extent permitted by law and will not be affected thereby unless such a construction would be unreasonable.

iii. Assignment

This Agreement shall ensure to the benefit of and shall be legally.

iv. Non – waiver

The failure of either party to enforce a provision of this Agreement shall not be construed as a waiver of any of their rights and obligations in terms of this Agreement. The rights or remedies hereof are cumulative to any other rights or remedies, which may be granted by law.

v. Accrued Rights/Obligations

All of the rights and obligations referred to in this Agreement shall apply during the period of this Agreement provided that where any right(s) and/or obligation(s) has been accrued, such right / obligation shall nevertheless be complied with even after the termination of this Agreement.

vi. Entire Agreement

This agreement sets forth the entire understanding between the parties concerning the subject matter of this Agreement and incorporates and supersedes all prior negotiations and understandings of the same.

vii. Joint Preparation

This Agreement is to be deemed to have been prepared jointly by the Parties hereto and any uncertainty or ambiguity existing herein shall be interpreted according to the application of the rules of interpretation.

"For References ONLY"
(Not for Bidding)

15. Notices

Any notice of or other communications to be given or sent by the Employer/ Contractor/ ESCROW Agent shall be in writing and any be as provided hereunder served personally or sent by email or facsimile or registered mail to the addresses and to the persons as set out herein and shall be deemed to have been given as follows.

If personally served when served / or any email or by facsimile, on the second business day after transmission thereof on a facsimile machine to the proper fax number or if emailed to the proper email address /or if mailed (by registered post) on the third business day after deposit in the mail with postage pre – paid and properly addressed.

IN WITNESS whereof the parties thereto have caused this Agreement to be executed the day and year aforementioned in accordance with the laws of Sri Lanka.

Signed by the said ……. Chairman, National Water Supply and Drainage Board and …… Board Member of **the National Water Supply and Drainage Board** at …… on the …… day of ……... Two Thousand and …… in the presence of the following Witnesses.

Chairman ……

Board Member ……

NATIONAL WATER SUPPLY AND DRAINAGE BOARD

Witnesses

1.	Signature ……	2.	Signature: ……
	Name: ……		Name: ……
	Address: ……		Address: ……
	……		……
	……		……

For and on behalf of **the Contractor**: signed by the said ……in the capacity of …… and/or duly authorized to sign this contract agreement for and on behalf of ……. (Block Letters).

Witnesses

1.	Signature ……	2.	Signature: ……
	Name: ……		Name: ……
	Address: ……		Address: ……
	……		……
	……		……

"For References ONLY" (Not for Bidding)

For and on behalf of the "the ESCROW Agent": signed by the said ……in the capacity of ……. and/or duly authorized to sign this contract agreement for and on behalf of …… (Block Letters)

Witnesses

1. Signature: ……
   Name: ……
   Address: ……
   ……
   ……

2. Signature: ……
   Name: ……
   Address: ……
   ……
   ……

---

2 *Insert the same expiry date as set forth in the Performance Security, representing the date twenty-eight days after the completion date described in GC Clause 11.9.*

"For References ONLY"
(Not for Bidding)

"For References ONLY"
(Not for Bidding)

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ANNEXURE To CONTRACT FORMS

"For References ONLY"
(Not for Bidding)

"For References ONLY"
(Not for Bidding)

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TOR

For

INDEPENDENT INSPECTION AGENCY & NWSDB PRE SHIPMENT INSPECTION

(The below attached Forms are only for references at the Bidding Stage and required to use at the Construction Stage. However, the detailed Inspection Requirements etc., as listed in the TORs shall be studied and taken in to consideration for the preparation of the Bid)

"For References ONLY"
(Not for Bidding)

"For References ONLY"
(Not for Bidding)

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ANNEXURE 1 - TOR FOR INDEPENDENT INSPECTION AGENCY

PE Pipes & Fittings

	Activity	Test Performed	Results	Acceptability as per Specification
1.	**Physical Proportion/Properties**			
1.1	**Pipes**			
	Pipe Wall Thickness External Diameter Length of Pipe SDR Category PE Designation Elongation at Break for e ≤ 5 m 5m ≤ e ≤ 12 mm e > 12 m Melt Mass Flow Rate (MFR) Oxidation Induction Time Ovality Density Effect on Water Quality			
1.2	**Stainless Steel Backing Rings**			
	Flange Thickness Flange Diameters No. of Bolt Holes Cleanliness of Flange Smoothness of Face			
1.3	**Bends**			
	Diameter Length of Bend SDR PE designation Wall thickness of bend Melt mass flow rate (MFR)			

"For References ONLY" (Not for Bidding)

	Activity	Test Performed	Results	Acceptability as per Specification
	Oxidation induction time Cohesive resistance Tensile strength Ovality Density Effect on water quality			
1.4	**Tees**			
	Length of tees Length of Branch Diameter of tee (all faces) Wall thickness of Tees Wall thickness of Branch SDR PE Designation Melt mass flow rate (MFR) Oxidation induction time Density Ovalty Tensile strength Effect on water quality Cohesive resistance			
2.	**Strength & Mechanical Properties**			
2.1	**PE Pipes & Fittings**			
	Hydrostatic strength at 20 0C Hydrostatic strength at 80 0C Manufacturing Standards of Pipes & Fittings.			
3.	**Accessories**			
3.1	**Stub Flange Connecter**			
	Dimension Physical appearance Ovality			

"For References ONLY" (Not for Bidding)

	Activity	Test Performed	Results	Acceptability as per Specification
4..	**Quality Assurance**			
4.1	**Raw Materials (R/M)** R/M received and kept separately in quarantine area on R/M test report received (Report Ref. No.) on			
4.2	**Manufacture** Date and Time of commencement of batch Date and Time of completion of batch Date batch sent to quarantine area			
4.3	**Physical/Mechanical Checkings (by In-House Q/A Department and Laboratory)** a. Dimension and appearance checking b. Heat reversion test c. General test d. Batch test Tensile test			
4.4	Pipe sample sent for chemical test			
4.5	Pipes passed by inspector for release to general storage area			
4.6	General storage area for packing Wrapping/packing completed and labelled and separately stored, awaiting chemical test results for pipe.			
4.7	**Verification of Quality** Chemical tests results of pipe received			
4.8	Separation of coils pipes not complying with BS			
4.9	Test certificate submitted for inspection agent/NWSDB's approval			
4.10	Purchaser's approval received for shipment			
4.11	**Containerisation & Final Approval** Pipe stocks loading in to container & passed by Q/A Department & Inspection Agent			
4.12	Final approval for transport & shipment			

"For References ONLY" (Not for Bidding)

Inspected by : …….

Signature of Inspector
Inspection Agency

Name of the Inspector : …….

Designation : ……...

Date : ……...

Inspection Agency:

Name of the Inspection Agency

: …….

ANNEXURE 2 - TOR FOR INDEPENDENT INSPECTION AGENCY

DI Pipes & Fittings

	Activity	Test Performed	Results	Acceptability as per Specification
1.	**Physical Proportion**			
1.1	**Socket & Spigot Pipes**			
	Pipe wall thickness External Diameter Internal Diameter Length of Pipe Socket Length Chamfering of Spigot end K - Class Grooves in the Socket. Thickness of Internal Cement lining Smoothness of Internal Cement lining. External Zinc Coating. Thickness & Weight of external Zinc Coating. Compressive Strength of the Cement Lining. Curing period of Pipes after Cement Lining. Smoothness of external Bitumen Coating.			
1.2	**Flanged Pipes**			
	Flange thickness Flange diameters No. of bolt holes Length of pipe Wall Thickness of Pipe			

"For References ONLY" (Not for Bidding)

	Activity	Test Performed	Results	Acceptability as per Specification
	K – Class of Pipe Cleanliness of Flange Raised Face or Flat Face Smoothness of Raised Face/Flat Face Integrally casted or Factory Welded Condition of weld if welded. Thickness of Internal Cement lining Smoothness of Internal Cement Lining. External Zinc Coating. Thickness & Weight of external Zinc Coating Method of Application of Bitumen Coating. Compressor Strength of the Cement Lining Curing period of Pipes after Cement Lining. Smoothness of external Bitumen Coating			
1.3	**Socketed Bends**			
	Socket Diameter Length of Bend K-Class of Bend Wall Thickness of bend Grooves in the Socket. Thickness of Internal Cement lining Smoothness of Internal Cement linin External Zinc Coating			

"For References ONLY" (Not for Bidding)

	Activity	Test Performed	Results	Acceptability as per Specification
	Thickness & Weight of external cement coating Method of Application of Bitumen Coating Compression Strength of the Cement Lining Curing period of Bends after Cement Lining Smoothness of external Bitumen Coating.			
1.4	**Flanged Bends**			
	Flange Diameter Length of Bend Thickness of Flange No. of Bolt holes Wall Thickness of Pipe Raised Face or Flat Face Smoothness of Raise Face/ Flat Face Integrally Casted / Factory welded condition of Weld if welded K – class Thickness of Internal Cement lining Smoothness of Internal Cement lining External Zinc Coating Thickness & Weight of External Coating Compressive Strength of the Cement Lining.			

"For References ONLY" (Not for Bidding)

	Activity	Test Performed	Results	Acceptability as per Specification
	Method of Application of Bitumen Coating Compressive Strength of the Cement Lining Curing period of Bends after Cement Smoothness of external Bitumen Coating			
1.5	**<u>Tees</u>**			
	<u>Socketed Tees</u> Length of Tees Length of Branch Diameter of Tee (all faces) Wall Thickness of Tees Wall Thickness of Branch Condition of grooves in socket K – Class Thickness of Internal Cement lining Smoothness of Internal Cement lining. External Zinc Coating Thickness & Weight of External Zinc Coating Method of Application of Bitumen Coating Compressive Strength of the Cement Lining Curing period of Tees after Cement Lining Smoothness of external Bitumen coating.			

"For References ONLY" (Not for Bidding)

	Activity	Test Performed	Results	Acceptability as per Specification
1.6	**Flanged Tees**			
	Length of Tee Length of Branch Diameter of Tee (all Branches) Wall Thickness of Tee Diameter of Flanges (All faces) No of Bolt holes Flange thickness Integrally Casted or Factory Welded Condition of weld if welded Flanges of Raised Face or Flat Face Smoothness of Raised Face/ Flat Face K – Class Thickness of Internal Cement lining Smoothness of Internal Cement lining. External Zinc Coating Thickness & Weight of external Zinc Coating Method of Application of Bitumen Coating Compressive Strength of the Cement Lining Smoothness of external Bitumen coating.			
2.	**Strength & Metalogical Properties**			
2.1	**DI Pipes & Fittings**			
	1. Method of Casting Metalogical Properties Tensile Strength Hardness minimum Elongation Positive			

"For References ONLY" (Not for Bidding)

	Activity	Test Performed	Results	Acceptability as per Specification
	Internal Hydrostatic Pressure Negative Internal Pressure 2. Manufacturing Standards of Pipes & Fittings. 3. Lubricant make & seal type of designation of lubricant. 4. Manufacturing of lubricant 5. Manufacturing Standard of lubricant **Joint Rings/ Gaskets** 6. Materials of Joint Ring/ Gasket 7. Manufacturing Standards of Joint Ring/Gasket 8. Hardness of materials of Joint Ring/ Gasket. 9. Seal Type designation of Joint Ring/ Gasket Nuts & Bolts. 10. Materials of Nuts & Bolts Washers 11. Manufacturing Standard of Nuts & Bolts 12. Number of Washers/ Bolt.			

"For References ONLY" (Not for Bidding)

Inspected by : ……...

Signature of Inspector
Inspection Agency

Name of the Inspector : ……...

Designation : ……...

Date : ……...

Name of the Inspection Agency : …….

Inspection Agency:

ANNEXURE 3 - TOR FOR INDEPENDENT INSPECTION AGENCY

DI Valves & Accessories

	Activity	Test performed	Results	Acceptability as per specification
1.	**GATE/SLUICE VALVES**			
1.1	Performance test			
	a) Operate Fully Closed to Fully Open – times b) Operate Fully open to Fully close – times			
1.2	Leakage test for internal pressure			
1.3	Material			
	Body Spindle Metal faces and seal			
1.4	Length between flanges			
1.5	End flanges			
	Pressure Rating Dimensions Bolt Circle dia			
1.6	Gear Ratio			
	Unbalanced head Seat test pressure Body test pressure			
1.7	Internal protection coating			
1.8	External protective finish coating			
2.	**AIR VALVES**			
2.1	Performance test			
	a) Operate Fully Closed to Fully Open – times b) Operate Fully Closed to Fully Done – times			
2.2	Body strength test			
2.3	Leakage test			
2.4	Material of Ball (Stainless Steel or Plastic)			
2.5	Flanges (if applicable)			

"For References ONLY" (Not for Bidding)

	Activity	Test performed	Results	Acceptability as per specification
	Pressure rating Standard Dimensions Bolt circle dia			
2.6	Seat test pressure			
2.7	Body test pressure			
2.8	Internal protective finish			
2.9	External protective finish			
3.	**FLAP VALVES**			
3.1	Material			
	Frame and door Sealing Hinge pin Links			
3.2	Flanges			
	Pressure rating Dimensions Bolt circle dia			
4.	**FIRE HYDRANTS**			
4.1	**Screw Down Type**			
4.1.1	Inlet Flanges			
	Pressure rating Dimensions Bolt circle dia			
4.1.2	Body test pressure			
4.1.3	Valve and seat test pressure			
4.1.4	Internal protective finish			
4.1.5	External protective finish			
4.2	**Dry Barrel Type**			
4.2.1	No. of outlet nozzles			
4.2.2	Nominal diameter			

"For References ONLY" (Not for Bidding)

	Activity	Test performed	Results	Acceptability as per specification
	Inlet Flange Pressure rating Dimensions Bolt circle dia			
4.2.3	Material, Hardness range of Gaskets			
4.2.4	Material of Nuts and Bolts			
5.	**SURFACE BOXES AND MANHOLE COVERS**			
5.1	Material			
5.2	Class			
	Manhole Covers Surface Boxes			
5.3	Coating			

Inspected by : ……..

Signature of Inspector
Inspection Agency

Name of the Inspector: ……..

Designation : ……..

Date : ……..

Name of the Inspection Agency

: ……..

Inspection Agency:

"For References ONLY"
(Not for Bidding)

(1 of 7)

ANNEXURE 4 - PRE-SHIPMENT INSPECTION OF HDPE PIPES AND FITTINGS BY THE EMPLOYER

CHECK LIST

Name & Location of the Factory

Pipe : -

……

……

Fittings : -

……

……

(Requirement - Pipes and fittings should be manufactured by same manufacturer or manufacturing group.)

Applicable Standards

Manufacturing Standards of pipes & Fittings : (ISO 4427-1 to 3 and 5:2019, EN12201-1 to 3 and 5:2011, and EN12201-4:2012)

Manufacturing Standards of Joint Rings : (EN681-1) …….

Quality Management System : (ISO 9001: 2015) ……

Parameters to be checked

Markings
Mechanical Properties
Hydrostatic Pressure Tests
Wall Thickness
Length of straight pipes
Testing of Flanges
Joint Rings
Chemical Composition of Pipes & Fittings
HDPE condition of Pipes & Fittings
Tolerances

Handling of pipes, Fittings after production : Satisfactory/Unsatisfactory

Inspection Procedure

Witness testing a sample with Factory QC Team : Yes/No
Witness testing with Independent Inspection Agency : Yes/No

"For References ONLY" (Not for Bidding)

(2 of 7)

ANNEXURE 4 , Contd;

CHECK LIST

Mark 'Yes' or 'No' in the Remarks Column as Appropriate

Date of Inspection ……

Technical Specifications Clause No.	Description	Values as per Specifications	Satisfactory/ Unsatisfactory	Remarks
GENERAL				
Quality Assurance	Availability of Valid Quality Standard Certificates	ISO 9001:2000/2015		
Independent Inspection	Availability of Inspection Agency. Certificate before Shipment	-		
Markings		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
		-		
Material Characteristics				
	Mechanical Properties			

"For References ONLY" (Not for Bidding)

(3 of 7)

ANNEXURE 4, Contd;
PRE –SHIPMENT INSPECTION OF PE PIPES & FITTINGS - CHECK LIST

Test	Hydrostatic Test							
Bill No:		Item No. & Qty.			Sample size:			
Description of Item :)		Class:			HDPEa x Length:			
Tech Spec Clause No:		Reference Standard:						
Sample No	Item of Testing	Test results			Deviation	Tolerance Allowed	Comply?	Remarks
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
Inspection & Testing Witnessed by								
Name								
Signature:				Date:				

"For References ONLY" (Not for Bidding)

(4 of 7)

ANNEXURE 4, Cont.;
PRE –SHIPMENT INSPECTION OF PE PIPES & FITTINGS - CHECK LIST

Test	Length of Straight Pipes and Fittings					
Bill No:		Item No. & Qty.			Sample size:	
Description of Item: PE Pipes (SS/DF), Fittings		Class:			PE x Length:	
Tech Spec Clause No:		Reference Standard:				
Sample No	Item of testing	Physical/Measured Value	Deviation	Tolerance Allowed	Comply?	Remarks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Inspection & Testing Witnessed by						
Name						
Signature		Date				

"For References ONLY" (Not for Bidding)

(5 of 7)

ANNEXURE 4, Contd;
PRE –SHIPMENT INSPECTION OF PE PIPES & FITTINGS - CHECK LIST

Test	Wall Thickness of Pipes & Fittings					
Bill No:		Item No. & Qty.			Sample size:	
Description of Item: PE Pipes, Fittings		SDR:			PE x Length:	
Tech Spec Clause No:		Reference Standard				
Sample No	Item of testing	Physical/Measured Value	Deviation	Tolerance Allowed	Comply?	Remarks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Inspection & Testing Witnessed by						
Name						
Signature		Date				

"For References ONLY" (Not for Bidding)

(6 of 7)

ANNEXURE 4, Contd;
PRE –SHIPMENT INSPECTION OF PE PIPES & FITTINGS - CHECK LIST

Test	Chemical Composition					
Bill No:		Item No. & Qty.			Sample size:	
Description of Item: PE Pipes		SDR:			PE x Length:	
Tech Spec Clause No:		Reference Standard				
Sample No	Item of testing	Physical/Measured Value	Deviation	Tolerance Allowed	Comply?	Remarks
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Inspection & Testing Witnessed by						
Name						
Signature		Date				

"For References ONLY" (Not for Bidding)

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ANNEXURE 4, Contd;
INSPECTION OF HDPE PIPES & FITTINGS

CHECK LIST

Technical Specifications Clause No.	Description	Requirements as per Specifications	Satisfactory/ Unsatisfactory	Remarks
HANDLING OF PIPES AND FITTINGS AFTER PRODUCTION				
	Handling			
	Stacking			
	Inspection by Factory/Inspection Authority			
	Transport Arrangements within manufacturers Country			
	Shipping Arrangements			
	Freight Insurance Arrangements			
CONCLUSION AT THE END OF THE INSPECTION TOUR				
Total Process of Production, Testing Handling, Insurance and Freight Arrangements Satisfactory				

Observations :

"For References ONLY"
(Not for Bidding)

Signature 1 **Signature 2**

Name & Designation 1: **Name & Designation 2:**

ANNEXURE 5 - PRE –SHIPMENT INSPECTION OF DI PIPES & FITTINGS BY NWSDB ENGINEERS - CHECK LIST

Name & Location of the Factory

Pipe : - ……
……

Fittings : -……
……

Valves : - ……
……

Couplings :- ……
……

Adaptors :-……
……

Flanged Pipes : -……
……

(Requirement - Pipes and fittings should be manufactured by same manufacturer or manufacturing group.)

Applicable Standards

Manufacturing Standards of pipes & Fittings	:	(ISO 2531: 2009/BSEN 545: 2010)	…….
Manufacturing Standards of Joint Rings	:	(BSEN 681-1/ISO	…….
Quality Assurance Standards	:	(ISO 9001:2015)	……

Parameters to be checked

Markings to casted on, painted or cold stamped
Mechanical Properties, Hardness, Elongation,
Hydrostatic Pressure Tests
Wall Thickness
Length of straight pipes
Straightness
External Coating
Internal Coating
Testing of Welded Flanges
Chemical Composition of Pipes & Fittings (Composition of metals).
Condition of Pipes & Fittings

Warping or shrinkage		
Surface or other defects detrimental to functionality	:	Satisfactory/Unsatisfactory
Handling of pipes, Fittings after production	:	Satisfactory/Unsatisfactory

Inspection Procedure

Witness testing a sample with Factory QC Team	:	Yes/No
Witness testing with Independent Inspection Agency	:	Yes/No

"For References ONLY" (Not for Bidding)

(2 of 13)

PRE-SHIPMENT INSPECTION OF DI PIPES & FITTINGS

CHECK LIST

Mark Yes or No in the Remarks Column as Appropriate **Date of Inspection ……**

Technical Specifications Clause No.	Description	Values as per Specifications	Satisfactory/ Unsatisfactory	Remarks
GENERAL				
Quality Assurance	Availability of Valid Quality Standard Certificates	ISO 9001:2015		
Independent Inspection	Availability of Inspection Agency. Certificate before Shipment	-		
Markings	Pipe Material (Ductile Iron)	-		
	Year of Manufacture (Last Two Digits)	-		
	Manufacturers Identification Mark/Name	-		
	Nominal Diameter in mm	-		
	Class Designation	-		
	Quality Standard & Product Conformity certificate	-		
	Client Identification	-		
	Socket Penetration Lines (2 Lines)	-		
	In case of Fittings, these marks shall appear on the body of each fitting together with its main characteristics such as angle of bend, pressure rating of flange etc.	-		
Material Characteristics				
	Mechanical Properties			
	Minimum Tensile Strength	420 N/mm^2		
	Minimum Bending Strength	Table B1 BSEN-545: 2010		
	Modulus of Elasticity	14- 18 N/mm^2		
	Brinell hardness for pipes	230HB		
	Brinell hardness for fittings	250 HB		

"For References ONLY" (Not for Bidding)

(3 of 13)

PRE –SHIPMENT INSPECTION OF DI PIPES & FITTINGS - CHECK LIST

Test	**Hydrostatic Test**											
Bill No:		Item No. & Qty.						Sample size:				
Description of Item: DI Pipes (SS/DF)		Class:						Dia x Length:				
Tech Spec Clause No:		Reference Standard: BSEN545:2010 - Clause 6.5 & Table 15 ISO 2531:2009 - Clause 6.5 & Table 13										
Sample No	Item of Testing	Pressure Class ("C" class)/ Test Pressure	Test Condition						Deviation	Tolerance Allowed	Comply?	Remarks
			Flexible joints		Push-fit joints		Flanges & flanged joints					
			+ve int. pressure	**-ve int. pressure**	**+ve ext. Pressure**	**Dynamic int. pressure**	**Flanged joints**	**Screwed & welded flanges**				
1												
2												
3												
4												
5												
6												
7												
8												
Inspection & Testing Witnessed by												
Name: 1.								Name: 2.				
Signature: 1.								Signature: 2.				
Date:												

"For References ONLY" (Not for Bidding)

(4 of 13)

PRE –SHIPMENT INSPECTION OF DI PIPES & FITTINGS - CHECK LIST

Test	**Length of Straight Pipes and Fittings**						
Bill No:			Item No. & Qty.			Sample size:	
Description of Item: DI Pipes (SS/DF), Fittings			Class:			Dia x Length:	
Tech Spec Clause No:			Reference Standard: BSEN545:2010 – Clause 4.3.3 & Table 4,5,6,7 ISO 2531:2009 – Clause 4.2.4 & Tables 4,5,6,7				
Sample No	Item of testing	Physical/Measured Value		Deviation	Tolerance Allowed	Comply? (Yes or No?)	Remarks
		Required	Measured				
1							
2							
3							
4							
5							
6							
7							
8							
Inspection & Testing Witnessed by							
Name: 1.					Name: 2.		
Signature: 1.					Signature: 2.		
Date:							

"For References ONLY" (Not for Bidding)

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PRE –SHIPMENT INSPECTION OF DI PIPES & FITTINGS - CHECK LIST

Test	**Straightness**						
Bill No:		Item No. & Qty.				Sample size:	
Description of Item: DI Pipes (SS/DF),		Class:				Dia x Length :	
Tech Spec Clause No:		Reference Standard: BSEN545:2010 – Clause 4.3.4 ISO 2531 :2009 - Clause 4.2.5					
Sample No	Item of testing	Physical/Measured Value		Deviation	Tolerance Allowed	Comply? (Yes or No?)	Remarks
		Required	Measured				
1							
2							
3							
4							
5							
6							
7							
8							
9							
Inspection & Testing Witnessed by							
Name: 1.				Name: 2.			
Signature: 1.				Signature: 2.			
Date:							

"For References ONLY" (Not for Bidding)

(6 of 13)

PRE –SHIPMENT INSPECTION OF DI PIPES & FITTINGS - CHECK LIST

Test	**Internal & External Diameter of Pipes & Fittings**		
Bill No:	Item No. & Qty.	Sample size:	
Description of Item: DI Pipes (SS/DF), Fittings	Class:	Dia x Length:	
Tech Spec Clause No:	Reference Standard: BSEN545:2010 – Clause 4.3.2 ISO 2531:2009 - Clause 4.2.2		

Sample No	Item of testing	Physical/Measured Value		Deviation	Tolerance Allowed	Comply? (yes or No?)	Remarks
		Required	Measured				
1							
2							
3							
4							
5							
6							
7							
8							
9							

Inspection & Testing Witnessed by

Name: 1. Name: 2.

Signature:1. Signature: 2.

Date:

"For References ONLY" (Not for Bidding)

PRE –SHIPMENT INSPECTION OF DI PIPES & FITTINGS- CHECK LIST

Test	**Wall Thickness of Pipes & Fittings**						
Bill No:			Item No. & Qty.			Sample size:	
Description of Item: DI Pipes (SS/DF), Fittings			Class:			Dia x Length:	
Tech Spec Clause No:			Reference Standard: BSEN545:2010 – Clause 4.3.1 ISO 2531:2009 - Clause 4.2.3				
Sample No	Item of testing	Physical/Measured Value		Deviation	Tolerance Allowed	Comply? (Yes/No?)	Remarks
		Required	Measured				
1							
2							
3							
4							
5							
6							
7							
8							
9							
Inspection & Testing Witnessed by							
Name: 1.					Name: 2.		
Signature: 1.					Signature: 2.		
Date:							

"For References ONLY"
(Not for Bidding)

PRE –SHIPMENT INSPECTION OF DI PIPES & FITTINGS - CHECK LIST

Test	**Internal Coating (Strength & Thickness)**						
Bill No:			Item No. & Qty.			Sample size:	
Description of Item: DI Pipes (SS/DF), Fittings			Class:			Dia x Length:	
Tech Spec Clause No:			Reference Standard: BSEN545:2010 – Clause 4.5.3 & 4.6 ISO 2531:2009 – Clause 4.4.2 & 4.5.2				
Sample No	Item of testing	Physical/Measured Value		Deviation	Tolerance Allowed	Comply? (Yes or No?)	Remarks
		Required	Measured				
1							
2							
3							
4							
5							
6							
7							
8							
9							
Inspection & Testing Witnessed by							
Name: 1.					Name: 2.		
Signature: 1.					Signature: 2.		
Date:							

"For References ONLY" (Not for Bidding)

PRE –SHIPMENT INSPECTION OF DI PIPES & FITTINGS - CHECK LIST

Test	**External Coating (Thickness of Zinc Mass & Paint coating)**						
Bill No:		Item No. & Qty.				Sample size:	
Description of Item: DI Pipes (SS/DF), Class: & Coating for fittings and Accessories		Dia x Length:					
Tech Spec Clause No:		Reference Standard: BSEN545:2010- Clause 4.5.2 & 4.6 ISO 2531:2009 - Clause 4.4.1 & 4.5.1					
Sample No	Item of testing	Physical/Measured Value		Deviation	Tolerance Allowed	Comply? (Yes or no?)	Remarks
		Required	Measured				
1							
2							
3							
4							
5							
6							
7							
8							
9							
Inspection & Testing Witnessed by							
Name: 1.				Name: 2.			
Signature: 1.				Signature: 2.			
Date:							

"For References ONLY" (Not for Bidding)

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PRE –SHIPMENT INSPECTION OF DI PIPES & FITTINGS -CHECK LIST

Test		**Chemical Composition**		
Bill No:		Item No. & Qty.:		Sample size:
Description of Item:		Class:		Dia x Length:
Tech Spec Clause No:		Reference Standard: BSEN545:2010& ISO 2531 :2009		
Sample No	Item of testing	Name of the Metal	Available %	Remarks
1		Fe		
		C		
		Zn		
		Cr		
		….		
		…..		
		…..		
Microscopic Inspection of DI sample: % of DI				
Inspection & Testing Witnessed by				
Name: 1.			Name: 2.	
Signature: 1.			Signature: 2.	
Date:				

"For References ONLY" (Not for Bidding)

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INSPECTION OF DI PIPES & FITTINGS

CHECK LIST

Technical Specifications Clause No.	Description	Requirements as per Specifications	Satisfactory/ Unsatisfactory	Remarks
HANDLING OF PIPES AND FITTINGS AFTER PRODUCTION				
	Packing			
	Handling			
	Stacking			
	Inspection by Factory/Inspection Authority			
	Transport Arrangements within manufacturers Country			
	Shipping Arrangements			
	Freight Insurance Arrangements			
CONCLUSION AT THE END OF THE INSPECTION TOUR				
Total Process of Production, Testing, Packing, Handling, Insurance and Freight Arrangements Satisfactory				

"For References ONLY" (Not for Bidding)

Observations :

Signature 1:

Name & Designation 1:

Signature 2:

Name & Designation 2:

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Rubber rings / Gaskets

Physical Parameter

1. Dimensions : ……..……...
2. Diameter : ……...
3. Hardness : ……..……
4. Appearance : ……...
5. Lot Numbers : ……...

Quality

1. Product Conformity certificate
2. ISO 9001:2008 /2015 certificate

Packing Arrangements

1. Inspection by Independent Inspection Agency : ……
2. Shipping Arrangements : ……

"For References ONLY"
(Not for Bidding)

Sample No	Diameter	Thickness (mm)	Hardness	Appearance	Deviation	Tolerance allowable	Whether Comply	Remarks

Product conformity certificate available acceptable : ……
(witness the original certificate)

ISO 9001:2008 /2015 Quality Management System certificate available and acceptable: ……...

(witness the original certificate)

……

"For References ONLY"
(Not for Bidding)

ANNEXURE 6 – PRE-QUALIFICATION OF MANUFACTURERS FOR SUPPLY & DELIVERY OF HDPE & DI PIPES, FITTINGS, COUPLINGS, FLANGED ADAPTORS, DI /CI VALVES, DI MANHOLE COVERS

Pre-Qualified manufacturers List for Supply of DI Pipes and Fittings as at 11.02.2021

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Brand name
			Water	Sewerage			
1	**M/s. Xinxing Ductile Iron Pipes Co., Ltd.,** Wu'an City, Hebei Province, P R China.	**Pipes** M/s. Xinxing Ductile Iron Pipes Co., Ltd., North of Shang Luoyang Village, Wu'an City, Hebei Province, P R China. **Fittings** M/s. Taojiang Xinxing Fittings Co., Ltd., No. 108, Taohua West Road, Taojiang County, Hunan Province, P R China.	Pipe 80mm-2600 mm Fittings 80mm-2600 mm Restrained pipes 80mm-1200 mm	Pipe 80mm-2000 mm Fittings 80mm-2000 mm	M/s. Xinxing Ductile Iron Pipes Co., Ltd., North of Shangluoyang Village, Wu'an City, Hebei Province, P R China	**M/s Jihua 3517 Rubber Product Co., Ltd,** No. 71, Dongting North Road, Yueyang, Hunan Province,414000 P.R. China	XinXing

Bank Details
Bank : Bank of China Handan Branch
Address : No. 79 East Renmin Road, Handan City, Hebei Province, China
Telephone : +883106265620
Fax No.: .....

Beneficiary
Payable to : XINXING DUCTILE IRON PIPES CO., LTD.
Address : North of Shang Luoyang Village, Wu'an City, Hebei Province, China
Account No : 108147912499
Swift Code : BKCHCNBJ220
Bank Code : BKCHCNBJ
Tel No : +8601065168733
E-mail of beneficiary : zhouyu@xinxingpipes.com.cn

Local Agent – M/s. Access International (Pvt) Ltd., 278, "Access Towers", Union Place, Colombo 2. Tele: 011-2302302 Fax : 011-2302333

"For References ONLY" (Not for Bidding)

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Remarks
			Water	Sewerage			
2	**M/s Saint Gobian PAM (France),** 21 Avenue Camille Cavallier, B.P. 129, 54704, PONT A MOUSSON CEDEX, France	**Pipes and Fittings** **1. M/s Saint Gobian PAM** 21 Avenue Camille Cavallier, B.P. 129, 54704, PONT A MOUSSON CEDEX, France. **2.M/s. Saint-Gobain Pipelines Co., Ltd.,** Hua Gong Road, Ci Hu, Maanshan, Anhui, P R China. **3. M/s. Saint-Gobain (Xuzhou) Pipe lines Co., Ltd.,** Yang Zhuang, Xuzhou, Jiangsu, P.R. China. **4. M/s. Saint-Gobain PAM Deutschland GmbH,** Saarbrucker StraBe 51, D-66130 Saarbrucken, Germany.	**Pipes** 60-2000 mm **Fittings** 60-2000 mm **Restrained Pipes** 700-2000 mm	**Pipes-** 80-2000 mm **Fittings** 80-2000 mm	**M/s Saint Gobian PAM (France),** 21 Avenue Camille Cavallier, B.P. 129, 54704, PONT A MOUSSON CEDEX, France	**1.** M/s Saint Gobian PAM (France), 21 Avenue Camille Cavallier, B.P. 129, 54704, Pont A Mousson Cedex, France **2.** M/s VIP Polymers Ltd.15 Winover Road, Huntingdon,PE 29 7EB United Kindom **3.** M/s Xintai Rubber Product Factory No 256 Jianshe Road Ren County,Xingtai city,Hebei Province, China	**PAM**

Bank Details
Bank : FORTIS BANQUE
Address : MONTAGNE DU PARC 3-B1000 BRUXELLES

Beneficiary
Payable to : SAINT GOBAIN PAM
Address : NO. 21, AVENUE CAMILLE CAVALLIER-BP 129, 54705, PONT-A-MOUSSON CEDEX, FRANCE
Account No : 210-0742940-69 (CSG PARIS)-(CURRENCY-USD)
Swift Code : GEBABEBB36A
IBAN : BE 71 210074294069
Tel No : +33 383806789
Fax No : .....
E-mail of beneficiary : .....

Local Agent - M/s. Romasha Engineers (Pvt) Ltd., 52/1A, Old KesbewaRoad,Gangodawila, Nugegoda , Tele :011-2820420, Fax :011-2769993

"For References ONLY" (Not for Bidding)

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Remarks
			Water	Sewerage			
3	**M/s. Electrosteel Castings Limited,** 30 and 48 BT Road, PO Sukchar Dist 24 Parganas (North), West Bengal, 700 115, India.	**Pipes and Fittings** **M/s. Electrosteel Castings Limited,** 30 and 48 BT Road, PO Sukchar Dist 24 Parganas (North), West Bengal, 700 115, India. **Fittings** **M/s. Electrosteel Castings Limited,** Village:Kashberia,PO-Shibramnagar,Haldia, Dist-Purba Midinipore-721635 West Bengal, India	Pipes- 80-1000mm Fittings – 80-1000mm **Restrained Pipes** 80mm-1000 mm	Pipes- 80-1000mm Fittings – 80-1000 mm	**M/s. Electrosteel Castings Limited,** M/s. Electrosteel Castings Limited., 30 B.T. Road, P.O.Sukchar Kamlah,Kolkata 700 115, India	**M/s. Andhra Polymers Private Ltd.** Plot No 2, Phase V, IDA Jeedimetla, Hyderabad- 500 055, India	ELECTROSTEEL
	Bank Details Bank : HDFC BANK LIMITED (TRADE FINANCE) Address : 88, CHOWRINGHEE ROAD, KOLKATA - 700020 Telephone : +91 7304479596 Fax No : +91 03344103411				**Beneficiary** Payable to : ELECTROSTEEL CASTINGS LIMITED Address : 19, CAMAC STREET, KOLKATA - 700017 Account No : 00140311000855 Swift Code : HDFCINBB IFSC Code : HDFC0000014 Bank Code: ..... Tel No : +91 33 22839990 Fax No : +91 33 22894338 e-mail : rajat.saraf@electrosteel.com/ sankar.sur@electrosteel.com		
	Local Agent – M/s. M&E Turnkey Engineers (Pvt) Ltd., 215D, Galle Road, Ratmalana, Tele : 011-2731265, 011-2718388, 011-2727692 Fax : 011-2731264						

"For References ONLY" (Not for Bidding)

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Remarks
			Water	Sewerage			
4	**M/s. Shin Nan Casting Factory Co., Ltd.,** 72, Jou Wei Street, Yen Jou Li, Yung Kang District, Tainan City, 710, Taiwan, R.O.C.	**Pipes:** **M/s. Shin Nan Casting Factory Co., Ltd.,** (Shan Shine Plant) 90, Pei Shu Jou, Ming Ho Li, Shan Shang District, Tainan 743, Taiwan, R.O.C. **Fittings:** **M/s. Shin Nan Casting Factory Co., Ltd.,** (Yuan Kang Plant) 72, Jou Wei Street, Yen Jou Li, Yung Kang District, Tainan City, 710, Taiwan, R.O.C.	**Pipe** 80mm-1400mm **Fittings** 80mm-1400mm **Restrained pipes** 80mm-1000 mm	**Pipe** 80mm-1400mm **Fittings** 80mm-1400mm	**M/s. Shin Nan Casting Factory Co., Ltd.,** 90, Pei Shu Jou, Ming Ho Li, Shan Shang District, Tainan 743, Taiwan, R.O.C.	**M/s Andhra Polymers Private Ltd,** Plot No. 2, Phase V, IDA Jeedimetla, Hyderabad 500 055, India	**Shin Nan**
	Bank Details Bank : CHANG HWA COMMERCIAL BANK LTD. TAINAN BRANCH Address : 88, CHUNG CHENG ROAD, TAINAN,TAIWAN Telephone :+886-6-222-1281 Fax No.: +886-6-222-3317		**Beneficiary** Beneficiary Name : **Shin Nan Casting Factory Co., Ltd.** Address : No. 435, Kung Yuan Road, Tainan, ROC Account No : 6402-22-64819-7-00			Swift Code:CCBCTWTP640 Bank Code: CCBC Tel No : +886-6-253-4185 Fax No : +886-6-251-4898 E-mail : irene@snpipe.com.tw	
	Local Agent - M/s. Lanka Development Network (Pvt) Ltd., No. 60/5 Sir S. Jayasinghe, Mawatha, Kotuwela, Tele: 011-2824775/6,011- 2822034 Fax : 011-2825256						
5	**M/s Kubota Corporation** Tokyo office-Pipe Export Department 1-3, Kyobashi 2-Chome, Chuo-ku, Tokyo 103-8307, Japan	**Pipes & Fitting** •Hanshin Plant: (Mukogava Site), 2 – 26 Ohamacho, Amagasaki-shi, Hyogo, 660-0095, Japan. •Hanshin plant(Amagasaki site):64, Nishimukoujima-cho, Amagasaki-shi, Hyogo, 661-0857, Japan • Keiyo Plant (Funabashi Site) : 2-16-1, Sakae – Cho, Funabashi-shi, Chiba 273-0018,Japan	**Pipes & Fittings** 100 – 1000 mm **Restrained pipes** 50mm-1600 mm	Not Qualified	**M/s Kubota Corporation** Hanshin Plant: (Mukogava Site), 2 – 26 Ohamacho, Amagasaki- shi, Hyogo, 660-0095, Japan.	**VIP Polymers limited,** 15 Winover Road, Huntingdon PE 29 7EB United Kindom **M/s Andhra Polymers Private Ltd,** Plot No. 2, Phase V, IDA Jeedimetla, Hyderabad 500 055, India.	**KUBOTA Corporation**

"For References ONLY" (Not for Bidding)

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Brand name
			Water	Sewer			
	Bank Details Bank : Sumitomo Mitsui Banking Corporation Address : 10-1, Ginza 6-chome, Chuo-ku, Tokyo 104-0061, Japan Telephone : +81-3-3574-6511				**Beneficiary** : KUBOTA Corporation Address : 1-3, Kyobashi 2-chome, Chuo-ku, Tokyo 104-8307, Japan Account No : 0222721 BIC (Swift Code) : SMBCJPJT Tel No : +81-3-3245-3228 Fax No : +81-3-3245-3830		
	Local Agent- M/s Lanka Development Network (Pvt) Ltd., No. 60, S de S Jayasinghe, Mawatha, Kohuwela Tele: 011-2824775/6/2822034 Fax:011-2825256						
6	**M/s. Benxi Beitai Ductile Cast Iron Pipes Co., Ltd.** Betai Town, Pingshan District, Benxi City, Liaoning Province, P.R.China	**Pipes:** **Benxi Beitai Ductile Cast Iron Pipes Co., Ltd.** Betai Town, Pingshan District, Benxi City, Liaoning Province, P.R.China **Fittings:** **Yingkou Economic & Technology Development Zone Xinfeng Pipe Fitting Co., Ltd.** Jintun Village, Hongqi Town, Bayuquan District, Liaoning Province, P R China	**Pipes** 80mm-2600mm **Fittings** 80mm-2600mm **Restrained Pipes** 80mm-2600mm	Not Qualified	**Benxi Beitai Ductile Cast Iron Pipes Co. Ltd.** Betai Town, , Benxi City, Liaoning Province, P.R.China	**M/s. Yingkou Jiahua Plastic New Technology Co., Ltd.** BA YU Quan, Yingkou City, Bayujuan Area Plastic Industrial Park(01-The red Se Xinxin Rubber Factory) P R China	**BXBT**
	Bank Details Bank : BANK OF CHINA, BENXI BRANCH Address : No. 72, JIEFANG NORTH ROAD BENXI LIAONING CHINA Telephone : +86 24 43872035 Fax No : +86 24 43872078				**Beneficiary** Beneficiary Name : Benxi Beitai Ductile Cast Iron Pipes Co., Ltd. Address : Beitai Town, Benxi City, Liaoning Province, P.R. China Account No : 07214108114014 Swift Code : BKCHCNBJ810 Tel No : 0086-244-2224359 Fax No : 0086-244-2224394 E-mail : Julie@beitaipipes.com		
	Local Agent-M/sSavinda Enterprises (Pvt) Ltd., 176 F, Saranatissa Mawatha, Kahathuduwa, Polgasowita Tele No:011-2705733/2704231 Fax : 011-2705734						

"For References Only" (Not for Bidding)

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Brand name
			Water	Sewer			
7	**M/s. Suns Pipelines Company Limited,** No. 8, Pangcun Village Cast Industry District, Gaoping City, Shanxi, P R China	**Pipes and Fittings:** **M/s. Suns Pipelines Company Limited,** No. 8, Pangcun Village Cast Industry District, Gaoping City, Shanxi, P R China	**Pipes** 80mm-1000mm **Fittings** 80mm-1000mm	**Pipes** 80mm-1000mm **Fittings** 80mm-1000mm	Not Qualified	**M/s. Xingtai Rubber Factory,** No.256, Jianshe Road, Ren County, Xingtai City, Hebei Province, P R China	SUNS

Bank Details

Bank : BANK OF CHINA SHANXI JINCHENG BRANCH
Address : NO.255, FENGTAI EAST STREET,
JINCHENG CITY, SHANXI PROVINCE,CHINA
Telephone : +86 356 2022329
Fax No.: +86 356 2022680

Beneficiary

Beneficiary Name : SUNS PIPELINES COMPANY LIMITED.
Address : No.8, Pangcun Village cast Industry District, Gaoping City, Shanxi Province, P R China
Account No : 140456662027
Swift Code : BKCHCNBJ680
Bank Code :104168007319
Tel No : +86 356-5266741/5266346
Fax No : +86 356-5266518
E-mail : suns_pipe@163.com

Local Agent - M/s. Jedara International (Pvt) Ltd., 58/1, PeirisMawatha, Kalubowila, Dehiwala, Tele: 011-2764957,011-2765958 Fax : 011-4411957

"For References ONLY" (Not for Bidding)

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Brand name
			Water	Sewer			
8	**M/s. Jindal Saw Gulf LLC** Plot No. 11 NR 28 ICAD-III, Mussafah,P.O.132595, Abu Dhabi, United Arab Emirates	**Pipes** **M/s. Jindal Saw Gulf LLC** P.O. 92135-Plot No. 11 NR 28, ICAD-III, Massafah- Abu Dhabi, United Arab Emirates **Fitting** **M/s. Jindal Fittings Ltd,** Plot No. B – 13, MIDC, Tembhurni, Tal– Madha, Dist. Solapur – 413211, Maharashtra, India.	**Pipes** 100mm-1000mm AJ 100mm-2000mmTJ **Fittings** 100mm-2000mm	**Pipes** 100mm-1000mm AJ 100mm-2000mmTJ **Fittings** 100mm-2000mm	Not Qualified	M/s Andhra Polymers Private Ltd, Plot No. 2, Phase V, IDA Jeedimetla, Hyderabad 500 055, India.	JINDAL

Bank Details
Bank :EMIRATES NBD BANK PJSC
Address : P O BOX -777, DUBAI, UAE
Telephone : .....
Fax No : .....

Beneficiary
Beneficiary Name : JINDAL SAW GULF LLC
Payable to: JINDAL SAW GULF LLC
Address : Musaffah ICAD-III, UAE
Account No : [illegible]4764-02
Swift Code : EBILAEAD
Bank Code : AE540260001024847476402
Tel No : +919560740333
Fax No : +911126100138
E-mail : ranjan.bhat @jindalsaw.com

Local Agent - M/s. Hydro Alliance, 279, Sri Rathnajothi Saravanamuttu Mawatha, Colombo 13, Tele / Fax: 011-2447600 Fax :011- 2385213

"For References ONLY" (Not for Bidding)

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Brand name
			Water	Sewerage			
9	**M/s. Shanxi Yuansheng Industrial Co., Ltd.** No 08, Dizangan, Yingze District, Taiyuan City, Shanxi Province 030002, PR China.	**Pipe** **M/s. Shanxi Yuansheng Industrial Co., Ltd.** No 08, Dizangan, Yingze District, Taiyuan City, Shanxi Province 030002, PR China. **Fittings** M/s Yingkou Economic & Technology Development Zone Xinfeng Pipe Fitting Co., Ltd.Jintun Village, Hongqi Town, Liaonan Street, Bayuquan District, Liaoning Province, P R China	**Pipe** 80mm-1000mm **Fittings** 80mm-1000mm	Not Qualified	Not Qualified	**M/s. Xingtai Rubber Factory,** No.256, Jianshe Road, Ren County, Xingtai City, Hebei Province, P R China.	**SYI**

Bank Details
Bank : China Everbright Bank
Address : No. 295, Yi Ze street, Taiyuan, Shanxi, China
Telephone : 0086 3513839083

Beneficiary
Payable to : Shanxi Yuansheng Industrial Co., Ltd.
Address : No. 8, Di Zang'an, Taiyuan, Shanxi, China
Account No : 75310188000286092
Swift Code : EVERCNBJTY1
Bank Code : 400208604
Tel No : 0086 3512027764
Fax No : 0086 3514040962
E-mail : info@syigroup.com

Local Agent: M/s. Allied Trading International (Pvt.) Ltd., 301, Old Moor Street, Colombo12.Tel 011-7397777 Fax :011-7397770

"For References ONLY" (Not for Bidding)

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Brand name
			Water	Sewerage			
10	**M/s Rizhao Zhufu Industry Co., Ltd.** Zhufu Industrial Park, Ianshan District, Rizhao City, Shandong Province, Beikuo Town Highway 342 to the North, China	**Pipes** **M/s Rizhao Zhufu Industry Co., Ltd.** Zhufu Industrial Park, Ianshan District, Rizhao City, Shandong Province, Beikuo Town Highway 342 to the North, China **Fittings** **M/s Rizhao Zhufu Industry Co., Ltd.** Zhufu Industrial Park, Beikuo Township Lanshan Rizhao City, Shandong Province, 276809, China	Pipe 80mm-1200mm Fittings 80mm-1200mm	Pipe 80mm-1200mm Fittings 80mm-1200mm	**M/s Rizhao Zhufu Industry Co., Ltd.** Zhufu Industrial Park, Beikuo Township Lanshan Rizhao City, Shandong Province, 276809, China	**Andhra Polymers Private Ltd.,** Plot No. 2, Phase V, IDA Jeedimetla, Hyderabad, 500055, India.	**Zhufu**

Bank Details
Bank : BANK OF CHINA RIZHAO BRANCH LANSHAN SUB - BRANCH
Address : 1ST FLOOR, LANSHAN XINTIANDI BUILDING LANSHAN MIDDLE ROAD, LANSHAN RIZHAO SHANDONG CHINA

Beneficiary
Payable to : Rizhao Zhufu Industry Co., Ltd.
Address : Zhufu Industrial Park, Beikuo Township Lanshan Rizhao Shandong, China
Account No : 223401095762
Swift Code : BKCHCNBXXXX
Bank Code:.....
Tel No : 8663-6186699
Fax No : 8663-6186699
e-mail of beneficiary : 18606330815@163.com

Local Agent - M/s. Megatech (Pvt) Ltd, 66/4, Havelock Road, Colombo 05.Tel : 011-2581117, 011-2598197 Fax : 011-2594488

"For References ONLY" (Not for Bidding)

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Brand name
			Water	Sewerage			
11	**Shanxi Solid Industrial Co., Ltd.,** No. 1501, Building B, Dingyuan Times Center, Taiyuan, Shanxi, China.	**Pipes and Fittings** Shanxi Solid Industrials Co. Ltd., Xiajiaying Industrial Zone, Jiaocheng Shanxi Province, China.	**Pipes** 80mm-2000mm **Fittings** 80mm-2000mm	**Pipes** 80mm-2000mm **Fittings** 80mm-2000mm	Not Qualified	**Xingtai Rubber Factory,** No.256, Jianshe Road, Ren County Xingtai City, Hebei province, P.R.China	**SOLID**

Bank Details

Bank : Bank of China (Shanxi Branch)

Address : No.186, Pingyang Road, Taiyuan, Shanxi Province, P.R. China

Telephone : 00863518266782

Fax No : 00863514040364

Beneficiary

Payable to : Shanxi Solid Industrial Co., Ltd. 1501, Building B, Dingyuan Times Center, Yingzemanjie, Taiyuan, Shanxi, China.

Account No : 142951077899

Swift Code : BKCHCNBJ680

Bank Code: .....

Tel No : 0086-351-8390336/ 8390369

Fax No : 0086-351-8390339

E-mail : sales@cnsolid.com/ solid@cnsolid.com

Local Agent: Thahirs (Pvt) Ltd. No.5, Quarry Road, Colombo 12. Tel: 011-2424999 Fax : 011-2449788

"For References ONLY" (Not for Bidding)

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Brand name
			Water	Sewerage			
12	**M/s Suns Casting Company Limited** Huangnilong Nonferrous Metal Industrial Park, Dingqiao Town, Qingyang County, Chizhou City, Anhui, PR China	**Pipes** **M/s Suns Casting Company Limited** Huangnilong Nonferrous Metal Industrial Park, Dingqiao Town, Qingyang County, Chizhou City, Anhui, PR China. **Fittings** **M/s. Suns Pipelines Company Limited** No. 8, Pangcun Village Cast Industry District, Gaoping City, Shanxi, P R China	**Pipes** 80mm-800mm **Fittings** 80mm-800mm	**Pipes** 80mm-800mm **Fittings** 80mm-800mm	Not Qualified	**Xingtai Rubber Factory,** No.256, Jianshe Road, Ren County Xingtai City, Hebei province, P.R.China	SUNS

Bank Details
Bank : BANK OF CHINA (ANHUI CHIZHOU BRANCH)
Address : NO. 308 CHANGJIANG MIDDLE ROAD CHIZHOU CITY, ANHUI PROVINCE, CHINA
Telephone : (86) 0551-62926995
Fax No. : (86) 0551-62926993

Beneficiary
Payable to : SUNS CASTING COMPANY LIMITED Address: Dingqiao Industrial Park Qingyang Town, Anhui Province China
Account No : 182 737 259 640
Swift Code : BKCHCNBJ780
Bank Code : .....
Telephone : +86 0566 3301188
Fax No : +86 0566 3301188
E-mail : gifengwei@sunspipe.com

Local Agent: M/s Sierra System Engineering (Private) Limited, No. 22, Byrde Place, Colombo 06. Tel: 011-2552310,011-2555542 Fax:011-2552356

"For References ONLY" (Not for Bidding)

	Manufacturers Name	Factory Address of Manufacture	Scope for pipes & fittings		Factory address for restraint joints	Factory address for joint rings	Brand name
			Water	Sewerage			
13	**M/s. Jincheng Chunchen Xinghui Industrial Co. Ltd.,** Langjing Village, Nancun Town, Zezhou County, Jincheng City, Shanxi, P.R.China	**Pipes** **M/s. Jincheng Chunchen Xinghui Industrial Co. Ltd.,** Langjing Village, Nancun Town, Zezhou County, Jincheng City, Shanxi, P.R.China **Fittings** **M/s Liaoning Ever Metal Forming Tech Co., Ltd.,** No.7, Shifu Avenue Gaizhou City, Liaoning Province, PR China.	**Pipes** 80mm-1600mm **Fittings** 80mm-1600mm	Not Qualified	Not Qualified	**M/s. Yingkou Jiahua Plastic New Technology Co., Ltd.** BA YU Quan, Yingkou City, Bayujuan Area Plastic Industrial Park (01-The red Se Xinxin Rubber Factory) P R China	CCXH

Bank Details
Bank : BANK OF CHINA Jincheng city Branch
Address : NO. 19 Fengtai East Street, Jincheng City, Shanxi province, China
Telephone : +86 -356-2038898
Fax No. : +86 0356-2022680

Beneficiary
Payable to : Jincheng Chunchenxinghui Industrial Co. Ltd.,
Address : Zezhou County, Jincheng 048012, Shanxi, China
Account No : 145456662112
Swift Code : BKCHCNBJ680 Bank Code : .....
Telephone : +86-356-3915806 Fax No : +86-356-3915809
E-mail : dcipipe@163.com

Local Agent: M/s Seno Impex Pvt Ltd., No.306, Hospital Road, Kalubowila, Dehiwala. Tel: 0114-231035 Fax:0114-231035

"For References ONLY" (Not for Bidding)

Pre-Qualified Manufacturers for
Supply and Delivery of PE Pipes & Fittings for Water Supply and Sewerage- as at 11.03.2021

No	Name of Manufacturer	Address of the Manufacturer	Address of Pipe Manufacturing factory	Name & Address of Fitting Manufacturer	Scope (Dia. in mm)		Brand Name & Validity of certificates
					Water	Sewerage	
1	**Wuhan Kingbull Economic Development Co., Ltd.**	Production Base, 8, Jinfu Rd; Huangjinkou Industrial Park, Hanyang, Wuhan, Hubei, China.	Hubei King Bull Pipe Industry Co.Ltd., No: 18, Chuangye Avenue, E Zhou Economic Development zone, E Zhou City, Hubei Province, China	Wuhan Kingbull Economic Development Co.Ltd / Hubei King Bull Pipe Industry Co.Ltd. No: 18, Chuangye Avenue, E Zhou Economic Development zone, E Zhou City, Hubei Province, China.	**Blue colour Pipes** PN 10-PN 25 DN 16 -1200 **Blue colour Fittings** PN 10-PN 25 DN 16 -1200	**Black colour Pipes** PN 10-PN 25 DN 16 -1200 **Black colour Fittings** PN 10-PN 25 DN 16 -1200	• **Brand name: KINGBULL** • **Certificates** **QMS– ISO 9001:2015 issued by QAC** **Pipes**- 28th May 2022 **Fittings**- 27th December 2021 **Product Conformity** **Water Supply:** **Pipes**- 14th July 2022 issued by BV conform ISO4427-2 **Fittings**- 14th July 2022 issued by BV conform ISO4427-3 **Sewerage:** **Pipes**- 14th July 2022 issued by BV conform EN12201-2 **Fittings**- 14th July 2022 issued by BV conform EN12201-3 **Water Suitability Certificate issued by WRAS for** **Pipes**-up to September 2020 **Fittings** - up to May 2022
	Local Agent: M/s M & E Turnkey Engineers (Pvt) Ltd., No.215 D, Galle Road, Ratmalana, Sri Lanka. Tel 011-2731265 Fax 011-2731264						

"For References ONLY" (Not for Bidding)

No	Name of Manufacturer	Address of the Manufacturer	Address of Pipe Manufacturing factory	Name & Address of Fitting Manufacturer	Scope (Dia. in mm)		Brand Name & Validity of certificates
					Water	Sewerage	
2	**Jain irrigation systems Ltd**	Jain plastic park, P.O.Box,72,N.H.No.6, Jalgaon,425001,India	Jain Plastic Park, P.O.Box,72,N.H.No.6,Jal gaon, 425001,India	Jain Plastic Park, P.O.Box,72,N.H.No.6,Jal gaon, 425001, India	**Blue colour Pipes** PN 25: DN 16- 450 PN20: DN 16- 800 PN16: DN 20- 1000 PN12.5: DN 25- 1600 PN10: DN 32- 2000 PN8: DN 40- 2500 PN6 : DN 50- 2500 **Blue colour Fittings** PN 25: DN 16- 450 PN20: DN 16- 800 PN16: DN 20- 1000 PN12.5: DN 25- 1600 PN10: DN 32- 2000 PN8: DN 40- 2500 PN6 : DN 50- 2500 PN5: DN315- 2500	Not Supply	**Brand name: Jains** **QMS – ISO 9001:2015 issued by TUV NORD** **Pipes & Fittings**- 18th October 2023 **Product Conformity** **Water Supply:** **Pipes**- 31st December 2020 issued by SGS conform ISO 4427-2 & EN12201-2 **Fittings**- 31st December 2020 issued by SGS conform ISO4427-3 & EN12201-3 **Water Suitability Certificate issued by WRAS** **Pipes**-up to April 2022 **Fittings** - up to November 2022
		Bank Details Bank : STATE BANK OF INDIA COMMERCIAL BANK Address : N.G.N VAIDYA MARG FORT, MUMBAI 400023 Telephone No. : +91-22-22617963 Fax No.: +91-22-22621915 **Beneficiary** Payable to : JAIN IRRIGATION SYSTEMS LTD. Address : 7, KUMTHA STREET, BALLARD ESTATE, MUMBAI 400 001 Account No. : 0000001079528030 Swift Code : SBININBB101 Bank Code : SBIN0006070 Tel No. : 022-22620011/22 Fax No. : 022-22621177 E-mail of Beneficiary : srbala@jains.com					
	Local Agent: M/s Sierra Engineering & Construction (Pvt) Ltd., No.23, Havelock Road, Colombo 05, Tel 011-2552310 Fax 011-2552356						

"For References ONLY" (Not for Bidding)

No	Name of Manufacturer	Address of the Manufacturer	Address of Pipe Manufacturing factory	Name & Address of Fitting Manufacturer	Scope (Dia. in mm)		Brand Name & Validity of certificates
					Water	Sewerage	
3	**S-lon Lanka (Pvt) Ltd.**	No.515/7, T.B.Jaya Mw, Colombo 10. Tel 011-4760100 Fax 011-4760150	S-lon Lanka (Pvt) Ltd. No. 135, Ratamedapara Singakkuliya Sandalankawa, Sri Lanka	S-lon Lanka (Pvt) Ltd. No. 135, Ratamedapara Singakkuliya Sandalankawa, Sri Lanka	**Blue colour Pipes** PN16 DN 20-450 PN 12.5 DN25-450 PN10: DN 32-450 PN 8: DN 40-450 **Blue colour Fittings** PN10, PN16 (SDR17, SDR11) DN 63-450	Not supply	**Brand name: S-lon** **QMS – ISO 9001:2015 issued by SLS** **Pipes & Fittings- 30th** November 2020 **Product Conformity** **Water Supply:** **Pipes**- 01st June 2021 issued by SLS conform SLS 1498:2015 **Fittings**- 26th June 2021 issued by SLS conform SLS 1499:2015 **Water Suitability Certificate issued by WRAS for** **Pipes**-up to June 2025 **Fittings** - up to June 2025 (fabricated fittings only)

"For References ONLY" (Not for Bidding)

No	Name of Manufacturer	Address of the Manufacturer	Address of Pipe Manufacturing factory	Name & Address of Fitting Manufacturer	Scope (Dia. in mm)		Brand Name & Validity of certificates
					Water	Sewerage	
4	**Dura-Line India Pvt Ltd**	A/10,Sanskrit Bhawan, Qutab Institutional area, New Delhi 110067	**unit 1:** Plot No.L-24.25, Phase IIA, Verna Industrial Estate,Verna, Veerna, Salcete, Goa-403722, India **unit 2:**Survey No.114& 115 Railway Station Road, Timmapur Village, Kottur Mandal, Dist, Mahaboobnagar-509325,Telgana,India **unit 3**:Plot No.SP-14D Riico Industrial Area, Neemrana Alwar-301705, Rajasthan , India	unit 1: Plot No.L-24.25, Phase IIA, Verna Industrial Estate,Verna, Veerna, Salcete, Goa-403722, India	**Blue colour Pipes** PN 2.5-PN20: DN90-900 **Blue colour Fittings** PN 2.5-PN20: DN90-900	Not Supply	**Brand name:** **Dura-line** **QMS – ISO 9001:2015** **issued by Bureau Veritas** **Pipes & Fittings**- 14th April 2021 **Product Conformity** **Water Supply:** **Pipes**- 07th October 2021 issued by SGS conform ISO 4427-2 **Fittings**- 21st February 2020 issued by SGS conform ISO4427-3 **Water Suitability Certificate** **issued by WRAS** **Pipes**-up to October 2021 **Fittings** - up to July 2025
		Bank Details Bank : Address : Telephone No. : Fax No.: Beneficiary Address : Account No. : Swift Code : Bank Code : Tel No. : Fax No. : E-mail of Beneficiary :					
	Local Agent: M/s Savinda Enterprises Pvt Ltd., 176 F, Saranatissa Mawatha, Kahathuduwa, Polgasowita. Tel 011-2704231 Fax 011-2705734						

"For References ONLY" (Not for Bidding)

No	Name of Manufacturer	Address of the Manufacturer	Address of Pipe Manufacturing factory	Name & Address of Fitting Manufacturer	Scope (Dia. in mm)		Brand Name & Validity of certificates
					Water	Sewerage	
5	**M/s Guan Dong Liansu Technology Industrial Co. Ltd,**	Liansu Industrial State, longjiang Town, Shunde Zone, Foshan City, Guan Dong, China.	M/s Guan Dong Liansu Technology Industrial Co. Ltd, Liansu Industrial State,Longjiang Town, Shunde Zone, Foshan City, Guan Dong, China	M/s Guan Dong Liansu Technology Industrial Co. Ltd, Liansu Industrial State,Longjiang Town, Shunde Zone, Foshan City, Guan Dong, China	**Blue colour Pipes** PN4-PN25: DN 20-900 **Blue colour Fittings** PN4-PN25: DN 20-900	**Black colour Pipes** PN4-PN25: DN 20-900 **Black colour Fittings** PN4-PN25: DN 20-900	• **Brand name: LESSO** • **Certificates** **QMS– ISO 9001:2015 issued by Zhongjian certification Co., Ltd.** **Pipes & Fittings**- 06th August 2021 **Product Conformity** **Water Supply:** **Pipes**- 19th September 2022 issued by BV conform ISO4427-2 **Fittings**- 19th September 2022 issued by BV conform ISO4427-3 **Sewerage:** **Pipes**- 19th September 2022 issued by BV conform EN12201-2 **Fittings**- 19th September 2022 issued by BV conform EN12201-3 **Water Suitability Certificate issued by WRAS for** **Pipes**-up to September 2021 **Fittings** - up to September 2021
		Bank Details Bank : Address : Telephone : Fax No : **Beneficiary** Payable to : Address : Account No : Swift Code : Bank Code : Tel No : Fax No :					
	Local Agent: M/s San Trading Enterprises (Pvt) Ltd., 295, Madampitiya Road, Colombo 14, Sri Lanka, Tel 011-2673058 Fax 011-2673141						

"For References ONLY" (Not for Bidding)

No	Name of Manufacturer	Address of the Manufacturer	Address of Pipe Manufacturing factory	Name & Address of Fitting Manufacturer	Scope (Dia. in mm)		Brand Name & Validity of certificates
					Water	Sewerage	
6	**M/s Shandong Donghong Pipe Industry Co. Ltd.**	No.1, Donghong Rd; Qufu, Shandong, China	M/s Shandong Donghong Pipe Industry Co. Ltd. No.1, Donghong Rd; Qufu, Shandong, China.	M/s Shandong Donghong Pipe Industry Co. Ltd. No.1, Donghong Rd; Qufu, Shandong, China.	**Blue colour Pipes** PN4-PN25: DN 20-900 **Blue colour Fittings** PN4-PN25: DN 20-900	Not supply	**Brand name:** DH **Donghong** **QMS – ISO 9001:2015 issued by CQM** **Pipes & Fittings**- 15th August 2022 **Product Conformity** **Water Supply:** **Pipes**- 22nd May 2021 issued by BV conform ISO 4427-2 & EN12201-2 **Fittings**- 22nd May 2021 issued by BV conform ISO4427-3 & EN12201-3 **Water Suitability Certificate issued by WRAS** **Pipes**-up to June 2022 **Fittings** - up to June 2022
		Bank Details Bank : BANK OF CHINA LIMITED QUFU SUB-BRANCH SHANDONG CHINA Address : 6 CHUNQIU ROAD, QUFU, SHANDONG, P.R.CHINA Telephone No. : 0537-4491131 Fax No.: 0537-4491131 **Beneficiary** Payable to : Shandong Donghong Pipe Industry Co. Ltd. Address : No. 1, Donghong Road, Qufu, Shandong, China. Account No. : 2234 1471 4065 Swift Code : BKCHCNBJ500 Bank Code : …….. Tel No. : 0537-4491131 Fax No. : 0537-4491131 E-mail of Beneficiary : christinadhong@outlook.com					
	Local Agent: PCAS Consortium (Pvt) Ltd,N0.83C, Egodawatta,Ambalangoda, Polgasowita						

"For References ONLY" (Not for Bidding)

No	Name of Manufacturer	Address of the Manufacturer	Address of Pipe Manufacturing factory	Name & Address of Fitting Manufacturer	Scope (Dia. in mm)		Brand Name & Validity of certificates
					Water	Sewerage	
7	**M/s Zhejiang Weixing New Building Materials Co. Ltd.,**	Zhejiang Weixing New Building Materials Co. Ltd., Economic Development Zone of Linhai, Zhejiang Province, China.	Zhejiang Weixing New Building Materials Co. Ltd., Economic Development Zone of Linhai, Zhejiang Province, China.	Zhejiang Weixing New Building Materials Co. Ltd., Economic Development Zone of Linhai, Zhejiang Province, China.	**Blue colour Pipes** SDR11:DN20-630 SDR13:DN63-800 SDR17: DN75-1000 SDR21: DN40-1200 SDR26: DN50-1200 **Blue colour Fittings** DN20 -1200	**Not Supply**	**Brand name: Weixing** **QMS – ISO 9001:2015** **issued by Gainshine Assessment** **Pipes & Fittings**- 21st September 2021 **Product Conformity** **Water Supply:** **Pipes**- 03rd March 2022 issued by **TUV Astria** conform ISO 4427-2 & EN12201-2 **Fittings**- 03rd March 2022 issued by **TUV Astria** conform ISO4427-3 & EN12201-3 **Water Suitability Certificate** **issued by WRAS** **Pipes**-up to November 2022 **Fittings** - up to July 2022
		Bank Details Bank : Industrial And Commercial Bank of China Zhejiang Branch Address : Floor 6, No. 98 Fengqi Road, Hangzhou, Zhejiang, China Telex : 351015 ICBZI CN, 351041 ICBZI CN Fax No : **Beneficiary** Payable to : ZHEJIANG WEIXING NEW BUILDING MATERIALS CO., LTD Address : ECONOMIC DEVELOPMENT ZONE OF LINHAI ZHEJIANG PROVINCE CHINA. Account No : 1207021109814017028 Swift Code : ICBKCNBJZJP Bank Code : ICBKCNBJZJP Tel No : +86 57685185006 Fax No : +86 5765176826 E- mail : kyleking@foxmail.com / jimmy@china- pipes.com / ekko@china-pipes.com					
	Local Agent: M/s Access International (Pvt) Ltd., No.278, Access Towers, Union Place, Colombo 02, Sri Lanka. Tel 011-2302302 Fax 011-2302333						

"For References ONLY" (Not For Bidding)

No	Name of Manufacturer	Address of the Manufacturer	Address of Pipe Manufacturing factory	Name & Address of Fitting Manufacturer	Scope (Dia. in mm)		Brand Name & Validity of certificates
					Water	Sewerage	
8	**M/s Jilin Song Jiang Smart Joint Co., Ltd.**	**M/s Jilin Song Jiang Smart Joint Co., Ltd.** No.1-Building-01, 1-1 qiu, Tiangang Economic Developing Zone, Jiaohe City, Jilin Province, P.R.China	**M/s Jilin Song Jiang Smart Joint Co., Ltd.** No.1-Building-01, 1-1 qiu, Tiangang Economic Developing Zone, Jiaohe City, Jilin Province, P.R.China	**M/s Jilin Song Jiang Smart Joint Co., Ltd.** No.1-Building-01, 1-1 qiu, Tiangang Economic Developing Zone, Jiaohe City, Jilin Province, P.R.China	**Blue colour Pipes** PN4-PN25: DN 20-DN630 **Blue colour Fittings** PN4-PN25: DN20-DN630	**Black colour Pipes** PN4-PN25: DN 20-630 **Black colour Fittings** PN4-PN25: DN20-630	• **Brand name: Smart Joint** • **Certificates** **QMS–ISO 9001:2015 issued by IQNet** **Pipes & Fittings factory-** 29th January 2021 **Product Conformity** **Water Supply:** **Pipes**- 15th January 2023 issued by BV conform ISO4427-2 **Fittings**- 15th January 2023 issued by BV conform ISO4427-3 **Sewerage:** **Pipes**- 15th January 2023 issued by BV conform EN12201-2 **Fittings**- 15th January 2023 issued by BV conform EN12201-3 **Water Suitability Certificate issued by WRAS for** **Pipes**-up to May 2023 **Fittings** - up to May 2023
		Bank Details Bank : BANK OF CHINA JILIN CITY BRANCH LONG TAN Sub- BR Address : No.5, HAN YANG STREET LONG TAN DISTRICT JILIN CITY JILIN PROVINCE Telephone No. : 0086-432-64606415 Fax No : 0086-432-64670329 **Beneficiary** Payable to : JILIN SONG JIANG SMART JOINT CO., LTD Address : Tiangang Economic Developing Region Jiaohe City Jilin Province China Account No : 158806948905(USD) Swift Code : BKCHCNBJ85B Bank Code : BKCHCNBJ85B Tel No : 0086-432-66606688 Fax No : 0086-432-66976664					
	Local Agent: M/s Earth Core International (Pvt) Ltd, No.389/5 A, Ekamuthu Mw, Thalangama North, Battaramulla. Tel 011-2790640 Fax 011-2790640						

"For References ONLY" (Not for Bidding)

No	Name of Manufacturer	Address of the Manufacturer	Address of Pipe Manufacturing factory	Name & Address of Fitting Manufacturer	Scope (Dia. in mm)		Brand Name & Validity of certificates
					Water	Sewerage	
9	**M/s Central Industries PLC**	**M/s. Central Industries PLC,** No.312, Nawala Road, Rajagiriya, Sri Lanka. Tel 011-5303000 011-5303001 011-2806624 Fax 011-5303031-4	**M/s Central Industries PLC,** No.07, Elhena, Warapalana, Uduthuththiripitiya, Sri Lanka.	**M/s Central Industries PLC,** No.195/4, Kerawalapitiya Road, Hendala, Wattala, Sri Lanka	**Blue colour Pipes** PN 16 DN 20 -DN450 PN 10 DN 32- DN450 **Blue colour Fittings** PN 10 & PN16 DN 90 –DN 315	**Not Supply**	**Brand name: National** **QMS – ISO 9001:2015 issued by SLSI** **Pipes & Fittings factory**- 12th July 2021 **Product Conformity** **Water Supply:** **Pipes**- 20th November 2021 issued by SLS conform SLS 1498:2015 **Fittings**- 03rd April 2021 issued by SLS conform SLS 1499:2015 **Water Suitability Certificate issued by WRAS for** **Pipes**-up to November 2022 **Fittings** - up to June 2023 (injection moulded fittings)
				M/s Shandong Donghong Pipe Industry Co. Ltd. No.1, Donghong Rd; Qufu, Shandong, China.	**Blue colour Fittings** PN10 & PN16 DN 20-75 DN 355-450	**Not Supply**	**Brand name:** DH **Donghong** **QMS – ISO 9001:2015 issued by CQM** **Pipes & Fittings**- 15th August 2022 **Product Conformity** **Water Supply:** **Pipes**- 22nd May 2021 issued by BV conform ISO 4427-2 & EN12201-2 **Fittings**- 22nd May 2021 issued by BV conform ISO4427-3 & EN12201-3 **Water Suitability Certificate issued by WRAS** **Pipes**-up to June 2022 **Fittings** - up to June 2022

"For References ONLY" (Not for Bidding)

Pre-qualified Manufacturers List for Supply & Delivery of Couplings, Flange Adaptors, Stepped Couplings and Dismantling Joints for DI, Asbestos, GRP, PE & PVC connections to NWS&DB as at 11.03.2021

No	Name of Manufacturer	Address of the Manufacturer	Address of Manufacturing factory	Name & Address of Rubber Ring Manufacturer	Scope			Brand Name
					Item Description	Product(model) Name	Dia. (mm)	
1	**M/s Crane BS& U Trading/As Helden**	Crane House Epsilon Terrace, West Road, Ipswich, Suffolk,IP3 9FJ,United Kingdom	Crane House Epsilon Terrace, West Road, Ipswich, Suffolk,IP3 9FJ,United Kingdom	VIP-Polymers Ltd, 15 Windover Road, Huntingdon, PE29 7EB,United Kingdom	Stepped Coupling		50 - 300 DI 350- 4000 Steel	**HELDEN**
					Coupling		50 - 300 DI 350- 4000 Steel	
					Non-restrained Flange Adaptors	MaxiFit(Including MaxiFit*Plus)*	50-300	
					Non-restrained Couplers	MaxiFit(Including MaxiFit*Plus)*	40-300	
					Flange Adaptors		50 - 300 DI 350- 4000 Steel	
					Dismantling Joints		50 - 2000 DI	

Bank Details

Bank : NATIONAL WESTMINISTER BANK PLC
Address : 2, Tavern Street Ipswich Suffolk, Ip1 3BD United Kingdom
Telephone : 00 44 3457 888444
Fax No : .....

Beneficiary

Payable to : **Crane Limited Trading/As Helden**
Address : Crane House Epsilon Terrace, West Road, Ipswich, Suffolk,IP3 9FJ,United Kingdom Account No : 66755433
Swift Code : NWBKGB2L
Bank Code : GB28NWBK53612466755433
Tel No : 00 44 1473 277300
Fax No : 00 44 1473 277301

E-mail of beneficiary: accountsreceivable@cranebsu.com

Local Agent: **M/s M&E Turnkey Engineering (Pvt) Ltd., 215D, Galle Road, Ratmalana**

"For References ONLY" (Not for Bidding)

2	**M/s Crane BS& U Trading/As Viking Johnson**	Crane House Epsilon Terrace, West Road, Ipswich, Suffolk,IP3 9FJ,United Kingdom	Crane House Epsilon Terrace, West Road, Ipswich, Suffolk,IP3 9FJ,United Kingdom	VIP-Polymers Ltd. 15 Windover Road, Huntingdon, PE29 7EB,United Kingdom	Stepped Coupling		50 - 300 DI 350- 4000 Steel	**Viking Johnson**
					Coupling		50 - 300 DI 350- 4000 Steel	
					Non-restrained Flange Adaptors	MaxiFit (Including MaxiFit*Plus)*	50-300	
					Non-restrained Couplers	MaxiFit (Including MaxiFit*Plus)*	40-300	
					Flange Adaptors		50 - 300 DI 350- 4000 Steel	
					Dismantling Joints		50 - 2000 DI	
	Local Agent: **M/s Lanka Development Network (Pvt) Ltd., 60,S de S Jayasingha Mawatha, Kohuwala**							
3	**M/s Saint Gobain PAM**	M/s Saint Gobain PAM 21avenue Camille Cavallic - BP 129- 54705 Pont –A- Mousson Cedex-France	M/s Saint Gobain PAM 21avenue Camille Cavallier - BP 129- 54705 Pont –A- Mousson Cedex-France	**VIP-Polymers Ltd.** 15 Windover Road,Huntingdon, PE29 7EB,United Kingdom	Large Tolerance Flange Adaptors	UQUICK	DN50-325	**PAM**
					Collars	ULINK.	DN50-325	
	Local Agent: **M/s Romasha Engineers(Pvt) Ltd., No. 52/1A, Old Kesbewa Road, Gangodawila, Nugegoda**							

"For References ONLY" (Not for Bidding)

Pre-Qualified manufacturers List for Supply & delivery of DI /CI Valves
Revised on 15/09/2020

	Name and Address of the Manufacturers	Factory Address	Scope of Valves	Brand Name
1	M/s. AVK Valves Manufacturing Malaysia SDN BHD, Lot No.1, Jalan SG, Chadong 8,Batu 5 ½, Jalan Kapar, 42100 Klang, Selangor Darul Ehsan,	M/s. AVK Valves Manufacturing Malaysia SDN BHD, Lot No.1, Jalan SG, Chadong 8,Batu 5 ½, Jalan Kapar, 42100 Klang, Selangor Darul Ehsan, Malaysia	**Gate Valves** PN 16 :50 mm-600 mm **Air Valves** PN 16 : 25 mm-200mm PN 25: 50 mm-150 mm **Check Valves** PN10 : 50 mm-125 mm PN16 : 50 mm- 600mm	**AVK**
		Wouter Witzel EuroValve B.V, Industrieterrein De Pol 12, 7581 CZ Losser, The Netherland.	**Butterfly Valve** PN 10 : 50 – 2000 mm PN 16 : 50 – 2000 mm	**WW**

Bank Details
Bank : HSBC Bank Malayasia BERHAD
Address : 2 Leboh Ampang ,50100 kuala Lumpur, Malaysia
Telephone : 03-83123696
Fax No : ---

Beneficiary
Payable to : AVK Valves Manufacturing Malaysia SDN BHD
Address : Lot No.1, Jalan SG, Chadong 8,Batu 5 ½, Jalan Kapar, 42100 Klang,Selangor Darul Ehsan,
Account No :105-694988-725
Swift Code :HBMB MYKL
Bank Code :---
Tel No : 03-32918270 Fax No : 03-32914275
E-mail of beneficiary: AVK.Finance@avkvalves.com.my

Local Agent -M/s. Hovael Holding (Pvt) Ltd., No.245/47, Old Avissawela Road, Orugodawatte.
Tele Phone: 0112531636/39, 0112533044 Fax :011 2531640

	Name and Address of the Manufacturers	Factory Address	Scope of Valves	Brand Name
2	M/s. Anhui Fangxing Industrial (Group) Co.Ltd . No. 01,Economic Development Zone, Qingyang, Anhui Province, 242800, P R China	M/s.Anuhi Fangxing Industrial (Group) Co.Ltd, No.01, Economic Development Zone,Qingyang County, Anhui Province, 242800, P R China	**Gate Valves** PN 10: 40mm- 1000mm PN 16: 40mm- 1000mm **Air Valves** PN 16 :25mm-150mm	**GVP**

Bank Details
Bank : China Construction Bank, Anhui Branch
Address : No. 373, Meiling Road, Hefei, Anhui, China
Telephone : 05512874100
Fax No : 05512872014

Beneficiary
Payable to : Anhui Fangxing Industrial Co. Ltd.
Address : No.1, Economic Development Zone, Qingyang, Anhui, P.R. China
Account No : 34014760300229888888
Swift Code : PCBCCNBJAHX
Bank Code : PCBCCN
Tel No : 00865665115556
Fax No : 00865665115558
E-mail of beneficiary : fxfzs@fxgvp.com ; fxlnc@fxgvp.com

Local Agent -M/s. Thahirs (Pvt) Ltd., 5, Quarry Road, Colombo 12 Tel : 0112424999 Fax : 0112449788

3	M/s Qingdao Huaguan Valves Co.Ltd, Wanjia Town, Pingdu,Qingdao City,Shangdong Province, P R China.	M/s Qingdao Huaguan Valves Co.Ltd, Wanjia Town, Pingdu, Qingdao City,Shangdong Province, P R China.	**Gate Valve** PN10 : 50mm-1000 mm PN16 : 50mm-800 mm PN25 : 50mm-400 mm **Check Valves** PN 10 & PN 16 50mm-500 mm	**HGV**

"For Reference ONLY" (Not for Bidding)

	Bank Details Bank : Qingdao Rural Commercial Bank Corporation Address : No.109, Hongkong East Road, Laoshan District, Qingdao, Shandong Province, China Telephone : +86-532-85933800 Fax No : +86-532-85933800 **Beneficiary** Payable to : Qingdao Huaguan Valves Co.Ltd, Address : No. 173, Wanli Road, Wanjia Town, Pingdu city, Qingdao, Shandong Province, China Account No : 902140594006222810011 5 Swift Code : QDRCCNBQ Bank Code : QDRCCNBQ Tel No : +86-532-82361098 Fax No : +86-532-82361098 E-mail of beneficiary : INFO@HUAGUANVALVE.COM			
	Local Agent - M&E Turnkey Engineers (Pvt) Ltd, 215 D, Galle Road, Ratmalana Tele No: 0112731265 Fax :011 2731264			
4	**Name and Address of the Manufacturers**	**Factory Address**	**Scope of Valves**	**Brand Name**
	M/s. Zhengzhou City Zhengdie Valve Co.Ltd., No.130 ,Zhongxin Road, Shangj, Zhengzhou City, Henan Province , P.R.China 450041	M/s. Zhengzhou City Zhengdie Valve Co.Ltd., No.100 ,Jinhua Road, Shangjie, Zhengzhou City, Henan Province , P.R.China 450041	**Butterfly Valve** PN 10:80-3600 mm PN 16:80-3600 mm PN 25:80-3600 mm	**ZD**
	Bank Details Bank : Agricultural Bank of China, Henan, Zhengzhou Branch Address : Zhengzhou City, Henan Province, China Telephone : +86-371-68934570 Fax No : +86-371-68934570 **Beneficiary** Payable to : Zhengzhou City Zhengdie Valve Co.Ltd. Address : 130, Zhongxin Road, Shangjie District, Zhengzhou, Henan, P.R. China Account No : 16057114040000078 Swift Code :ABOCCNBJ160 Bank Code : ABOCCNBJ160 Tel No : +86-371-68115566 Fax No : +86-311-68115155 E-mail of beneficiary : CINDY@ZDVALVE.COM			
	Local Agent - M&E Turnkey Engineers (Pvt) Ltd, 215 D, Galle Road, Ratmalana Tele No: 0112731265 Fax : 0112731264			
05	M/s.Shanghai Karon Valves Machinery Co.Ltd., No 88, Lianxing Rd, Anting Town, Jiading District, Shanghai, P.R.China	M/s. Shanghai Karon Valve Machinery Co. Ltd., No 88, Lianxing Rd, Anting Town, Jiading District, Shanghai, P.R.China	**Gate Valves** Up to PN25: 50 -600 mm **Air Valves** Up to PN2 : 50 -400 mm **Check Valves** Up to PN25: 50-1200 mm **Butterfly Valve** Up to PN25: 50-3600 mm	KARON

"For References ONLY" (Not for Bidding)

	Bank Details Bank : Agricultural Bank of China Shanghai Branch Address : No. 355, Tacheng Road, Jiading District, Shanghai 201804 Telephone : 0086-021-20730392/0086-021-20730389 Fax No : 0086-021-69919700	**Beneficiary** Payable to : Shanghai Karon Valves Machinery Co. Ltd. Address : No.815, De Yuan Road, Nanxiang Town, Jiading District, ShangHai, China[#201802] Account No : 09045014040000075 Swift Code : ABOCCNBJ090 Bank Code : ABOCCNBJ090 Tel No : 0086-021-31652173 Fax No : 0086-021-31296808 E-mail of beneficiary : derrick.lee@karon-valve.com overseadept@karon-valve.com		
	Local Agent -M/s. MegaTech ((PVT) Ltd,No:66 /4, Havelock Road,Colombo 5. Tele No: 0112581117/0112598137 Fax :011 2594488			
	Name and Address of the Manufacturers	**Factory Address**	**Scope of Valves**	**Brand Name**
6	M/s Duvalco Valves & Fittings (Wuxi) Co. Ltd. Lidong Village, Xin'an Sub-district, Xinwu District,Wuxi City, Jiangsu Province, China.	M/s Duvalco Valves & Fittings (Wuxi) Co. Ltd., Lidong Village, Xin'an Sub-district, Xinwu District, Wuxi City, Jiangsu Province, China	**Gate Valves** PN16 : 50 -600 mm **Butterfly Valve** PN16 : 400 -2000 mm	**DUVALCO**
	Bank Details Bank : Bank of China, WUXI Branch Address : No. 258, Zhongshan Road, Wuxi 214001, P.R. China Telephone : 0086 510-81168106 Fax No : 0086 510-82790663	**Beneficiary** Payable to : Duvalco Valves & Fittings (Wuxi) Co. Ltd. Address : Lidong Village Xinan Street, New District, Wuxi, Jiangsu Province, 214135, China USD Account No : 496270680780 Swift Code : BKCHCNBJ95C Bank Code : 104302046024 TLX No : 362021 WXBOC CN Tel No : 0086 510-85381427 Fax No : 0086 510-85381304 E-mail of beneficiary : EDDIE.KOH@DUVALCO.NET		
	Local Agent -M/s. Lanka Development Network (Pvt.) Ltd., No. 60, S de S Jayasinghe Mawatha, Kohuwela. Tele No: 0112824775-6 Fax : 0112825256			
	Name and Address of the Manufacturers	**Factory Address**	**Scope of Valves**	**Brand Name**
7	M/s VAG Valves (India) Private Ltd., Plot No s 57 & 56, Phase III, TSIIC, Pashamylaram, Patancheru Mandal, Medak District, Telangana-502307, India	M/s VAG Valves (India) Private Ltd., Plot No s 57 & 56, Phase III, TSIIC, Pashamylaram, Patancheru Mandal, Medak District, Telangana-502307, India	**Gate Valves** PN 10:50 mm-700 mm PN16:50 mm-700 mm **Air Valves** PN 10:50 mm-200 mm PN 16:50 mm-200 mm **Non-Return Valves** PN 10:32 mm-400 mm PN16:32 mm-400 mm **Butterfly Valve** PN 10:80 mm-800 mm PN 16:100 mm-1400 mm	**VAG**

"For Reference ONLY" (Not for Bidding)

Bank Details
Bank : Axis Bank Ltd.
Address : Patancheru Branch, D.No. 9-131 to 133, Old No. 1-26/1, NH 9
Branch city & PIN Code : PATANCHERU - 502319
Telephone : 08455 240123
Fax No : 08455 240125

Beneficiary
Name of the Firm : VAG-Valves (India) Private Limited
Address : Plot No's : 57 & 56, Phase III, TSIIC, Pashamylaram, Patancheru Mandal, Sanga Reddy District 502307, Telangana, India
MICR Code No : 500211017
Account Type : Current
Account No : 068010200020712
RTGS/I.F.S. Code of the : UTIB0000687
Bank / Branch : Axis Bank Patancheru Branch
Swift Code : AXISINBB193
Bank Code : 687
Tel No : 08455 240123 Fax No : 08455 240125
E-mail of beneficiary : B.Chakradhar@vag-group.com

Local Agent : M/s. M&E Turnkey Engineers (Pvt.) Ltd., No. 215D, Galle Road, Ratmalana
Tel:0112731265/0112727692 Fax:0112731264.

	Name and Address of the Manufacturers	Factory Address	Scope of Valves	Brand Name
8	**M/s. Weflo Valve Co., Ltd.** Intersection of Huadong Road and Chunyang Road, Qingdao National High-tech Industrial Development Zone, Qingdao, China,266111	**Butterfly Valve** **M/s. Weflo Valve Co., Ltd.** Intersection of Huadong Road and Chunyang Road, Qingdao National High-tech Industrial Development Zone,Qingdao China, 266111 (Unicode 91370200614257783M)	**Butterfly Valve** PN10 : 125-1600 mm PN16 : 65-1600 mm PN25 : 50-300 mm	WEFLO
		Gate Valves **M/s. Weflo Valve Co., Ltd.** 45, Xinghe Road, Lancun Town, Jimo, Qingdao, China, 266232	**Gate Valves** PN10 : 125-900 mm PN16 : 65-600 mm PN25 : 50-300 mm	

Bank Details
Bank : CITIC INDUSTRIAL BANK, QINGDAO
Address : 22, Hongkong Road, Central, Qingdao, People's Republic of China.
Telephone : +86-532-85022911
Fax No : +86-532-85022902

Beneficiary
Name of the Firm : Weflo Valve Co., Ltd.
Address : Intersection of Huadong Road and Chunyang Road, Qingdao National High-Tech Industrial Development Zone,Qingdao, People's Republic of China.
,
Account No : 7371060182600208016
Swift Code : CIBKCNBJ266
Bank Code :
Tel No : +86 532 87905016, 87905017,
Fax No : +86 532 87905015
E-mail of beneficiary : **info@weflovalve.com**

Local Agent: M/s. Savinda Enterprises (Pvt) Ltd., 176 F, Saranatissa Mawatha, Kahathuduwa, Polgasowita.
Tel:0112704231/0112705733 Fax:0112705734

"For References ONLY" (Not for Bidding)

	Name and Address of the Manufacturers	Factory Address	Scope of Valves	Brand Name
9	**Saint-Gobain PAM ,** 21, avenue Camille Cavallier, 54705,pont-A-Mousson, Cedex,France.	**Saint-Gobain PAM ,** 21, Avenue Camille Cavallier, 54705, pont-A-Mousson, Cedex, France.	**Butterfly Valve** **PN 10/16/25** Euro Stop 150 mm-2000 mm	**Euro Stop**
			Euro Stop NGL 150mm-800mm	**Euro Stop NGL**
		Lavis Plant Saint-Gobain PAM (Italia) Via L. Galvani 6,38015 Lavis (TN), Italy	**Air Valve** **PN 10/16/25** **Ventex** 50 mm-200 mm **4000D & 4000S**	**Ventex** **4000D & 4000S**
			50mm,60mm,65mm **6000D & 6000S**	**Ventex** **6000D & 6000S**
			80mm **9000D & 9000S** 100mm,150 mm	**Ventex** **9000D & 9000S**
	Bank Details Bank : FORTIS BANQUE Address : MONTAGNE DU PARC 3-B1000 BRUXELLES		**Beneficiary** Payable to : SAINT GOBAIN PAM Address : NO. 21, AVENUE CAMILLE CAVALLIER-BP 129. 54705, PONT-A-MOUSSON CEDEX, FRANCE Account No : 210-0742940-69 (CSG PARIS)-(CURRENCY-USD) Swift Code : GEBABEBB36A IBAN : BE 71 210 0742940 69 Tel No : +33 383806789 Fax No : ..... E-mail of beneficiary :	
	Local Agent : M/s. Romasha Engineers (Pvt) Ltd., 52/1A, Old Kesbewa Road, Gangodawila, Nugegoda , Tele :011-2820420, 011-5670440, 011-2890014 Fax :011-2769993			

"For Reference ONLY"
(Not for Bidding)

Pre-Qualification of Manufacturers for

Supply & Delivery of DI Manhole Covers and Surface Boxes

(Updated List as at 29/10/2019)

	Manufacturer	Factory Address	Scope
1	**M/s. Shanxi Yuansheng Industrial Co. Ltd.** Cuijiazhuang Village, Dingxiang County, Taiyuan City, Shanxi Province 035400, P R China	Shanxi Yuansheng Casting and Forging Industrial Co., Ltd of Cuijia Village, Shenshan Township, Dingxiang County, Xinzhou City, Shanxi, China	DI Manhole Covers
	Local Accredited Agent M/s. Megatech (Pvt) Ltd., No: 66/4, Havelock Road, Colombo – 05.		
2	**M/s. R B A Ferro Industries (Pvt) Ltd** 2/6, Sarat Bose Road, Central Plaza -808, Kolkata 700020, West Bengal, India	NH-6, Vill& P O : Prasastha, PS – Domjur, Howrah-711302, West Bengal, India	DI Manhole Covers
	Local Accredited Agent M/s. M&E Turnkey Engineers (Pvt) Ltd., 215D, Galle Road, Ratmalana Tele : 2731265, 2718388, 2727692 Fax : 2731264		
3	**M/s. PerniagaanLogam Xing FaSdnBhd** PT 3340 & 3341, JalanPermata ½ , Arab Malaysian Industrial Park, 71800 Nilai,Negeri Sembilan, Malaysia	PT 3340 & 3341, JalanPermata ½ , Arab Malaysian Industrial Park, 71800 Nilai, Negeri Sembilan, Malaysia	DI Manhole Covers
	Local Accredited Agent M/s. Jedara International (Pvt) Ltd., 58/1, PeirisMawatha, Kalubowila, Dehiwala Tele: 2764957, 2765958 Fax : 4411957		
4	**M/s. Crescent Foundry Company (Pvt)Ltd.** 7/1,Lord Sinha Road, Lords Building, 4th Floor (Room No.#406), Kolkata, West Bengal, India, PIN - 700071	NH-6, Nibra, Salap, Domjur, Howrah, West Bengal, India, PIN – 711403 NH-6, Srirampur, Kulgachia, Howrah, , West Bengal, India, PIN – 711303	DI Manhole Covers
	Local Accredited Agent M/s. Savinda Enterprises (Pvt) Ltd., 176 F, SaranatissaMawatha, Kahathuduwa, Polgasowita Tele No: 2705733, 2705028, 2704231 Fax : 2705734		

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5	**M/s. Kiswok Industries (Pvt) Ltd** No 11, Brabourne Road, Kolkata-700001, West Bengal, India	Bipranna Para, Via. Begri, Domjur, Howrah 711 411, West Bengal, India	DI Manhole Covers
	Local Accredited Agent M/s. Lanka Development Network (Pvt) Ltd, 60, S. De S. Jayasinghe Mawatha, Kohuwala Tele No : 2824775-6, 2825553-4 Fax : 2825256, 2822034		
6	**M/s. Changyi City Changzhan Casting Co. Ltd,** Beimi Village, Weizi Town, Changyi City, Shandong Province P.R.China	Industrial Park, Beimi Village, Weizi Town, Changyi City, Shandong Province, P.R.China	DI Manhole Covers
	Local Accredited Agent M/s. Jedara International (Pvt) Ltd, No. 58/1, Peiris Mawatha, Kalubowila, Dehiwala Tele No : 2764957, 2765958, 2766363 Fax : 4411957		
7	**M/s. Carnation Industries Ltd,** 222, A.J.C. Bose Road, Kolkata 700 017, West Bengal, India	1st Floor, Circular Centre, 222, A.J.C. Bose Road, Kolkata 700 017, West Bengal, India	DI Manhole Covers
	Local Accredited Agent M/s. Skavita (Pvt) Ltd, 25, Shady Grove Avenue, Colombo 08 Tele No : 011-3137658 Fax : 0112675386, 0112675482		

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ANNEXURE 7- ENTITLED ALLOWANCES ON FOREIGN TRAVELS & RELATED EXPENSES

Category of Countries

Category No.	Countries					Combined & Incidental Allowance
1st category	Afganistan Albania Algeria Azerbaijan Bahamas Balarus Barbados Belize Bhutan Bolivia Bosnia Botswana	Burundi Cambodia Canary Island Capevrde Cooks Island Domenica El Salvador Etihiyopiya Equatorial Gabon Gambia Gibraltar	Guam Kiribati Lao Peoples Dem.Rep. Lesothe Liechtenstein Nacedonia Rep. Malawi Malta Mauritania Mongolia Montenegro Myanmar	Nambia Nauru Netherlands Anti Nicaragua Palau Paraguay Samoa Sao Tome & Prince Serbia Sierra Leon Soloman Island Somalia	Tanzania Swaziland Tajikistan Tunisia Uganda Uzbekistan	US$ 200 + US$ 75
2nd category	Antigue Barbuda Armenia Argentina Bulgaria Bangaldesh Brunei Cameroon Coted Ivoria Costa Rica	Ecuador Fiji French Guiana Guyana Grenada Gerogia Guatemala Greenland	Guinea Bissaw Hawai Haiti Honduras Ireland Iraq Jamaica Korea Dem.Rep.	Liberia Mexico Micronesia Fed. Monaco Mozambique Papua new Guinea Suriname Yeman Rep.	Yogoslavia Tahiti Tonga Vanuatu	US$ 260 + US$ 75
3rd category	Baharain Chile Cyprus Egypt Arab Rep. Estonia Guinea Hungary Indinesia Iran Islamic Rep. Kenya	Kuwait Lithuania Madagascar Mauritius Malayasia Maldives Morocco Macedonia Rep Nepal Oman	Pakistan Panama Peru Pholippines Poland Quarter Romania Ruwada Saudi Arabia Solvenia	Sriyan Arab Rep. South Africa St Lucia Sudan Thailand Togo Trinidad & Tobago Uruguay Ukrain Venezuela	Vietnam Zaire Zambia Zimbabwe	US$ 330 + US$ 75
4th category	Belgium Benin Burkina Faso Comoros Central African Rep. Colombia Congo	Croatia Cuba Czech Republic Dem.Rep.of Congo Djibouti Greece Iceland	India Ivory Coast Jordan Kazakhastan Latvia Lebanon Luxemburg	Mali New Caledonia Nigeria Portugal Slovak Rep. Spain Taiwan	Turkey United Arab Emirates	US$ 400 + US$ 75
5th category	Angola Australia Austria Brazil Canada Chad	China (Beijin) Denmark France Germany Finland Hongkong	Israel Italy Japan Libiya Netherland New Zealand	Niger Norway Russia Senagal Swedan Seychelles	Singapore South Korea Switzerland United Kingdom USA	US$ 530 + US$ 75

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GOVERNMENT OF THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF WATER SUPPLY

JAPAN INTERNATIONAL COOPERATION AGENCY

NATIONAL WATER SUPPLY & DRAINAGE BOARD

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

JICA LOAN No: SL – P115

BIDDING DOCUMENT

FOR

LOT C 1: SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

VOLUME 2 OF 4
(SPECIFICATIONS)

JULY 2021

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Summary Description

Procurement of Works

Invitation for Bids (IFB)

A Form of Invitation for Bidding Without Prequalification is provided.

PART 1 – BIDDING PROCEDURES

A brief description of this Bidding Document is given below;

One-Envelope Bidding

Section I: **Instructions to Bidders (ITB)**
This Section provides relevant information to help Bidders prepare their Bids. Information is also provided on the submission, opening, and evaluation of Bids and on the award of Contracts.

Section II. **Bid Data Sheet (BDS)**
This Section includes provisions that are specific to each procurement and that supplement the information or requirements included in Section 1, Instructions to Bidders.

Section III. **Evaluation and Qualification Criteria**
This Section specifies the criteria to determine the lowest evaluated Bid and the qualifications of the Bidder to perform the contract.

Section IV: **Bidding Forms**
This Section includes the Forms which are to be completed by the Bidder and submitted as part of his Bid.

Section V. **Eligible Source Countries of Japanese ODA Loans**
This Section contains information regarding eligible source countries under Japanese ODA Loans.

PART 2 – WORKS REQUIREMENTS

Section VI. Works Requirements

This Section contains the Specification, the Drawings, and supplementary information that describe the Works to be procured.

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VII. **General Conditions (GC)**
This Section contains the general clauses to be applied in all contracts.

Section VIII. **Particular Conditions (PC)**

This Section consists of Part A, Contract Data, which contains data, and Part B, Specific Provisions, which contains clauses specific to each Contract.

Section IX: **Annex to the Particular Conditions - Contract Forms**
This Section contains Forms which, once completed, will form part of the Contract. The Forms for **Performance Security** and **Advance Payment Security**, when required, shall only be completed by the successful Bidder after Contract Award.

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B I D D I N G D O C U M E N T S

for

Procurement of

LOT C1: SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO. AN/PH II/JICA/DM/LOT C1

Employer : *National Water Supply & Drainage Board*

Country : *Sri Lanka*

Project : *Anuradhapura North Water Supply Project – Phase II*

Loan No. : *SL-P115*

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ABBREVIATIONS

AGM	Assistant General Manager
ANWSP-PII	Anuradhapura North Water Supply Project – Phase II
APP	Appendix
BF	Bidding Forms
BOQ	Bills of Quantities
CA	Current Assets
CBO	Community Based Organization
CEA	Central Environmental Authority
CEB	Ceylon Electricity Board
CL	Current Liabilities
DB	Dispute Board
DED	Detailed Engineering Design
DI	Ductile Iron
DN	Nominal Diameter
DNP	Defects Notification Period
DSD	Divisional Secretariat Divisions
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPDM	Ethylene Propylene Diene Monomer Rubber
FIDIC	International Federation of Consulting Engineers
GCC	General Conditions of Contract
GIS	Geographical Information System
GOSL	Government of Sri Lanka
GPRS	General Pocket Radio Service

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GSM	Global System for Mobile Communication
HDPE	High Density Poly Ethylene
HO	Head Office, NWSDB
IESL	Institute of Engineers, Sri Lanka
ITB	Instructions to Bidders
JICA	Japan International Cooperation Agency
JPY	Japanese Yen
JV	Joint Venture
LA	Local Authority
LKR	Sri Lankan Rupee
LS	Longitudinal Section
MDB	Multilateral Development Bank
MOU	Memorandum of Understanding
NA	Not Applicable
NC	North Central
NW	Net Worth
NWSDB	National Water Supply & Drainage Board
O&M	Operation & Maintenance
O.D.	Outside Diameter
ODA	Official Development Assistance
OHS	Occupational Health and Safety
PAT	Profits After Taxes
PBT	Profits Before Taxes
PCC	Particular Conditions of Contract
PD	Project Director

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PH II	Phase II
PMU	Project Management Unit
PN	Nominal Pressure
PPE	Personal Protective Equipment
PQ	Pre-Qualification
PRDA	Provincial Road Development Authority
PS	Pradeshiya Sabha
QA/QC	Quality Assurance/Quality Control
QCR	Qualification Criteria
QM	Quality Management
RDA	Road Development Authority
RSC	Regional Support Centre
SBD	Standard Bidding Document
SLS	Sri Lankan Standards
SOW	Scope of Work
SPD	Standard Pre-Qualification Documents
TA	Total Assets
TL	Total Liabilities
TOR	Terms of Reference
TR	Total Revenue
UDA	Urban Development Authority
USD	United States Dollar
WTP	Water Treatment Plant

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PART 2

SECTION VI
WORKS REQUIREMENTS

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Particular Requirements

(These Particular Requirements (PR) shall be read in conjunction with the Chapter 1 – General Requirements (GR) of CIDA Specifications for Water Supply, Sewerage and Storm Water Drainage Works SCA/3/2 – Second Edition (Revised) – April 2002. The following PR shall complement and supplement the above. Whenever there is a conflict, the provisions herein for the PR shall prevail over those in the GR. However, for any information or requirement which are not covered by these PR, then the GR shall prevail)

PR.1 LOCATION AND SCOPE OF WORK

PR.1.1 Location of Work

The location of the Works for the Lot C1 Contract Package for the supply and construction of distribution pipelines are mainly covered within two Divisional Secretariate Divisions of Anuradhapura District, namely Padaviya and Kebithigollawa, and part of Horowpathana DSD. These Divisions are located to the north-east of Anuradhapura City. Anuradhapura City is located at about 200 km North-East direction from Colombo.

The Contract works are being implemented as part of the overall Anuradhapura North Phase II water supply project, which covers four Divisional Secretary Divisions in Padaviya, Horowpathana, Kebithigollewa, and Kahatagasdigiliya, and part of Rambewa.

The service area of Anuradhapura North Water Supply Project Phase II is divided into 16 Distribution Zones out of which, the HDPE Pipelines to be laid under the Lot C1 Contract Package cover eight (8) of these Zones. The Lot C1 covers the construction for most of the distribution network pipelines in these Zones. However, the distribution mains, which are parallel to the transmission and pumping mains, are to be constructed under the separate Lot B Contract Package. The distribution pipelines under Lot C1 are gravity pipelines, except for one demand driven distribution direct pumping network for Kanugahawewa Zone. The distribution pipelines are to be constructed along RDA, PRDA and interior Pradeshiya Sabha roads. The details of the distribution pipelines for construction in each Zone are as shown in the Table 1.2 below.

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PR.1.2 Scope of Work

This Section describes of the Scope of Works for the Contract and shall be read in conjunction with the Bill of Quantities and all Employer's Requirements. The Contract Works are specified in detail in the Employer's Requirements and Contract Conditions; however, a brief description of the scope is provided as follows.

The Works shall include for the mobilisation, supply of all labour, equipment and materials, sign boards, temporary services, temporary protection requirements and diversions, and all other general items and tasks required to supply, transport, and deliver all required plant and materials to site, and construct the entire works, including but not limited to the clearing, excavation and temporary or permanent supports, temporary cofferdams, all other temporary works, temporary drainage diversions and dewatering,

complete foundations, laying and jointing to required levels of all pipes and valves, construction of all pipeworks, manholes, chambers and outlet structures, installation of all valves, and all fittings and appurtenances required to complete the works, backfilling, compaction and testing, connections, relocation of other service crossings, testing, reinstate surfaces, disposal of surplus spoil and cleaning of Site, inspection reports and as-built drawings, training of Employer's personnel, O&M manuals, commissioning tests on completion, demobilisation, all undertakings for the maintenance of the works in the DNP, and all other related and incidental work as required to complete the whole of the works as shown on the Drawings or as specified or instructed by the Engineer. The scope includes for all materials and items necessary for a successful completion of the works, whether or not such materials and items are specifically indicated in the specifications or shown on the drawings.

The Conditions of Contract and Drawings are to be read in conjunction with all parts of the Specifications and matters referred to, shown or described in any of the former are not necessarily repeated in the latter.

Notwithstanding the subdivision of the Specification under different headings, every part of it shall be deemed supplementary to and complementary of every other part.

The works shown on the Drawings and quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract. The works shown on the Drawings and quantities of work and materials in the Bill of Quantities are not to be considered as limiting or extending the amount of work to be done by the Contractor.

The scope of work for Lot C1 covers the Distribution Zones in the Kanugahawewa, Kambiliwewa, Padaviya, Wahalkada, Kahatagollawa, Galawewa, Kebithigollawa and Weerasole Areas.

The overall Scope of Works for the Lot C1 Contract is for the supply of all required pipes, fittings, valves, materials, and accessories and the construction of water supply distribution pipeline networks for town, semi-rural and rural areas, incorporating:

- approximately 399.7 km of welded HDPE PE100 pipes of 280mm, 250mm, 225mm, 160mm, 110mm, 90mm, and 63mm diameter;
- supply and installation of approximately 6,000 consumer connections for existing and new connections, with 6,000 electrofusion (EF) service tapping tees of 20mm diameter, incorporating approximately 60 km of 20mm diameter HDPE PN10 connection pipes and 6,000 each for 20mm diameter HDPE PN10 EF elbows, EF couplings and 20mm diameter HDPE temporary end caps;
- Supply and installation of flanged and rubber ring jointed ductile iron pipes and fittings, including all required reinforced concrete supports, thrust blocks, columns. piles, brackets, bolts, gaskets, and accessories as applicable to complete, for construction of: overhead pipe-bridge crossings, overland DI pipelines with all

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necessary concrete supports; and steel bridge structures including all required reinforced concrete column/pile supports; and,

- including, but not limited to, all other associated supplies, works and services for the installation of the pipelines for gate valves, butterfly valves, air valves with isolation valves, valve chambers, valve surface boxes, air valve chambers, washout arrangements, outlet structures, manholes, thrust restraints, concrete supports, all road and other surfaces' reinstatement, testing as specified, flushing, disinfection, clean-up, maintenance services, and all pipe-fittings, stop valves, couplings, jointing, adaptors, gaskets, short pipes, drainage pipes, fittings, tappings, accessories, materials and services required and as specified or as shown to complete the Works.
- Supply and delivery of operations and maintenance tools and instruments, O&M manuals as specified, and the provision of spare parts.

Following the completion of the consumer connection Works described above, the remaining leftover amounts for all consumer connection pipes, tappings, fittings, adaptors, and materials shall be delivered by the Contractor, and handed over to the Regional Stores of the NWSDB – RSC-NC.

The scope of works for the contract further includes for the supply and handover of service connection pipes, water meters, tappings, valves, fittings, adaptors and materials to the Employer, as follows:

small diameter HDPE PE100 PN10 Pipes, to the amount of:

- 5.0 km of 63mm diameter HDPE PN10 pipes;
- 20 km of 20mm diameter HDPE PN10 pipes; and,

Watermeters and valves for consumer connections, to the amount of:

- 20,000 nos. vertical-type ½ inch (15mm) consumer watermeters;
- 20,000 lockable ½ inch threaded end ball valves; and,

Further service connection fittings, tappings and mounting posts, to the amounts of;

- 8,000 PN10 20mm diameter HDPE/brass threaded adaptor fittings;
- 2,000 HDPE EF 20mm diameter service tapping tees;
- 10,000 HDPE EF 20mm diameter couplings;
- 2,000 HDPE EF 20mm diameter elbows; and,
- 8,000 nos. 150mm square pre-cast reinforced concrete meter-mounting posts,

to cover a further approximately 2,000 consumer connections. These connections are to be installed later by others.

The implementation of the house connection meters and connection to houses and other water supply consumer properties will be undertaken by the Employer.

The Table 1.2 below indicates the Zones and the approximate quantities of pipe covered under the Works.

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Table 1.2 Approximate Works Quantities for Distribution Mains

No.	Zone	Lot C1: Length and diameter for HDPE Pipes (m)							Total (m)
		63	90	110	160	225	250	280	
1	Kanugahawewa	30	16,315	3,010	400	3,710	2,870	555	**26,890**
2	Kambiliwewa	1,560	7,880	340					**9,780**
3	Padaviya	27,415	58,490	17,960	26,840	9,250		3,900	**143,855**
4	Wahalkada	1,100	8,945	5,900	3,835	820			**20,600**
5	Kahatagollawa	10	2,720						**2,730**
6	Galawewa	30	14,145	2,430	1,670				**18,275**
7	Kebithigollawa	16,500	52,590	18,840	22,660	10,910			**121,500**
8	Weerasole	275	26,565	13,190	14,550	1,440			**56,020**
TOTAL		**46,920**	**187,650**	**61,670**	**69,955**	**26,130**	**2,870**	**4,455**	**399,650**

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PR.1.3 Climate and Local Conditions

Sri Lanka is an island in the Indian Ocean having an area of 65,610 square kilometres with a central mountain region rising to some 2,100 metres surrounded by coastal plains on all sides. It is located 880km north of the equator, off the southern tip of India.

The climate is tropical with mean monthly temperatures in the range of 26-28 degrees Celsius. Rainfall varies island wide with a wet zone in the South-West receiving about 2,400 mm rainfall annually and the remainder of the country being in the dry zone with some 1,400 mm of precipitation. See the attach Precipitation Data Sheet for details of Rain Fall in the Project Area.

The Project area falls within the Anuradhapura District, which is in the dry zone of the country.

Rivers flow radially from the central mountains to the coastal plains. Irrigation has been widely practiced in the dry zone for many years with extensive canal and storage systems particularly in the North Central plains. Groundwater resources are not well documented or controlled. Although some high yielding aquifers have been identified in the North-West area, the predominant crystalline rocks produce only limited quantities of groundwater for the rural supplies.

The population (based on 2012 Census & Statistics Data) is estimated at 20.35 Million with 77% in rural areas, 4.4% estate areas and 18.2% urban inhabitants. Population growth is estimated around 1.3%.

Languages are Sinhala, Tamil and English. English is widely spoken throughout Sri Lanka, except in remote villages.

International Airports: Bandaranayake International Airport at Katunayake, (30 km North of Colombo), Jaffna International Airport at Palaly (395 km from Colombo by road), and Mattala Rajapaksa International Airport at Hambantotta (255 km by road).

Sea Ports are located in Colombo, Trincomalee harbor, Hambantota, and regional port in Galle.

Train routes are located between Colombo and Anuradhapura through Kurunegala, and from Anuradhapura to Jaffna and Anuradhapura to Mannar.

Maximum temperature varies from 29 deg. C to 35 deg. C while minimum temperature varies from 21 deg C to 26 deg C. It can be seen that Maximum Temperature occurs in March, April, and the second highest occurs in August, September, which are the period of sun's overhead position over Sri Lanka. Minimum Temperature occurs in December, January Months.

Particular attention shall be made towards some of the pipelaying areas, which may become inundated or affected by high ground water table during the Monsoon Period. The Contractor shall consider the specific climatic situation, where the Project Area is located.

The Annual Rainfall Data of (Nearest available Measuring Centers of Meteorological Department) Anuradhapura Area are provided in this Document for reference. The Contractor shall verify the data for accuracy.

The Contractor shall become fully familiarized with the Climatic and Environmental conditions of the Project Area, and the effects on the Works, and shall fully consider these factors in the Construction Planning and preparation of their Works Programme.

"For References ONLY" (Not for Bidding)

PRECIPITATION DATA
SOURCE: METEOROLOGICAL DEPARTMENT
MONTHLY TOTAL RAINFALL IN MILLIMETERS

STATION NAME: PADAVIYA

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	-	-	-	-	-	--	-	-	-	-	321.9	696.1	**1018.1**
2010	-	-	16.5	53.7	131.7	-	37.5	-	205.9	-	-	-	**445.3**
2011	-	-	-	-	-	-	17.0	130.0	22.3	155.5	312.3	253.6	**890.7**
2012	-	39.2	14.7	97.9	-	-	59.7	-	98.7	731.6	228.7	769.8	**2040.3**
2013	212.0	306.4	185.0	35.0	139.0	-	-	-	21.0	9.0	175.1	190.6	**1273.1**
2014	288.2	72.7	6.0	17.0	68.0	-	27.0	127.0	122.8	167.9	582.9	499.8	**1979.3**
2015	-	353.6	-	-	184.8	30.0	-	16.0	208.4	228.7	542.3	245.4	**1809.2**
2016	224.9	46.4	2.0	-	374.4	-	13.2	69.0	-	118.4	344.4	86.0	**1278.7**
2017	200.0	22.5	90.8	-	70.0	-	173.0	214.0	182.0	265.0	389.5	177.0	**1783.8**
2018	7.0	11.0	26.0	-	279.5	13.0	32.0	67.0	64.2	270.5	392.0	314.0	**1476.2**
2019	-	168.4	-	7.0	8.0	-	13.2	5.0	192.0	299.0	207.4	469.5	**1369.5**

"For References ONLY" (Not for Bidding)

Note: The rainfall of the day is considered as the amount of rainfall measured during the 24-hour period ending at 08.30 a.m. of the following day.

RECIPITATION DATA
SOURCE: METEOROLOGICAL DEPARTMENT
MONTHLY TOTAL RAINFALL IN MILLIMETERS

STATION NAME: KEBITHIGOLLEWA

"For References ONLY" (Not for Bidding)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	97.5	-	123.7	149.4	44.4	-	-	102.7	18.4	97.7	364.0	511.6	**1509.4**
2010	51.7	5.8	51.6	74.5	121.7	-	45.4	30.9	245.3	56.1	361.3	608.6	**1652.9**
2011	716.7	411.4	29.5	91.5	3.8	-	12.8	29.4	-	170.5	461.8	191.1	**2118.5**
2012	29.3	107.3	8.5	219.7	2.0	-	85.4	-	15.3	490.5	61.1	723.3	**1742.4**
2013	73.8	207.8	138.9	46.8	36.3	-	-	42.1	14.3	24.3	204.9	78.8	**868.0**
2014	267.1	15.1	-	8.8	236.8	-	-	81.8	67.2	186.1	472.6	534.0	**1869.5**
2015													
2016													
2017													
2018													
2019	104.8	37.5	-	14.0	-	-	-	78.3	117.3	254.7	-	443.2	**1049.8**

DATA NOT AVAILABLE

Note: The rainfall of the day is considered as the amount of rainfall measured during the 24-hour period ending at 08.30 a.m. of the following day.

PRECIPITATION DATA
SOURCE: METEOROLOGICAL DEPARTMENT
MONTHLY TOTAL RAINFALL IN MILLIMETERS

STATION NAME: WAHALKADA

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	76.5	-	151.6	102.0	70.0	-	69.2	-	10.0	-	318.7	457.7	1255.7
2010	28.0	-	8.0	NA	71.5	-	85.0	50.0	156.5	118.0	475.0	643.0	1635.0
2011	587.0	368.0	-	138.0	-	-	-	63.0	-	328.7	487.0	333.0	2304.7
2012	-	82.0	14.0	64.0	16.0	-	22.0	-	70.0	443.0	131.0	478.0	1320.0
2013	171.0	234.0	98.0	56.0	84.0	4.0	19.0	26.0	24.0	66.0	74.0	55.2	911.2
2014	141.0	39.0	11.0	4.0	33.0	-	18.0	92.0	61.0	232.0	496.0	625.0	1752.0
2015	-	275.0	18.0	4.0	102.0	12.0	-	63.0	182.0	130.0	373.0	196.0	1355.0
2016	264.0	30.0	-	-	265.0	-	20.0	4.0	-	75.0	300.0	46.0	1004.0
2017	189.0	20.0	145.0	-	76.0	-	242.0	97.0	117.0	262.0	384.0	109.0	1641.0
2018	10.0	6.0	-	-	135.0	12.0	8.0	-	-	348.0	343.0	322.0	1184.0
2019	-	-	-	-	-	-	-	-	-	-	-	-	-

"For References ONLY" (Not for Bidding)

Note: The rainfall of the day is considered as the amount of rainfall measured during the 24-hour period ending at 08.30 a.m. of the following day.

PR.1.4 Working Hours and Holidays

The Contractor in general, shall abide by the laws pertaining to Working Hours and Holidays of the country. However, considering the nature of Work, the Contractor in consultation with the Engineer/Engineer's Representative (ER) may determine the Working Hours and Holidays applicable to the Contract as stipulated in the PCC. Working outside the agreed upon times shall only be carried out by prior agreement with the Engineer/ER. However, there shall not be any adjustments to the rates or prices for Work items or Extra Payments.

Engineer/ER may ask the Contractor to carry out Work outside the agreed Working Hours and on statutory Holidays from time to time, if so required. In such circumstances, the Contractor shall comply with the request of the Engineer/ER without any additional charges to the Employer. Such circumstances include, but not limited to,

(a) to prevent inconvenience to public such as to maintain the regular daily life of the general Public

(b) if the non-completion of the Work will be a threat or hazard to general Public safety and property

(c) due to security reasons upon receipt of such request by Sri Lanka Police or any other Government Authority

Normal working hours of the Engineer shall be 8 hours per day between 0700 hrs. to 1800 hrs. Maximum number of working hours per week shall be 48 as stated in the Wages Board Ordinance of Sri Lanka.

Whenever working outside the normal hours is proposed, the Contractor shall request approval from the Engineer giving not less than two working days' notice in order to arrange his Staff, in advance.

"For References ONLY" (Not for Bidding)

PR.1.5 Co-operation with works Performed by other Contractors

The Contractor shall plan, schedule and co-ordinate his operations in a manner that will facilitate simultaneous progress of the works with the other Contractors working under the Anuradhapura North Water Supply Project – Phase II, as well as the Contractors of UDA, Roads' authorities, Electricity companies, Telecom companies, water board, etc., as implemented by other Agencies.

The Works under the Contract Package for Lot C1 are part of the ANWSP-PII Project, which includes other Works Contract Packages for Lot A, Lot B and Lot C2.

The Lot A works include the Yan Oya Intake, raw water main from intake to Wahalkada WTP, Water Treatment Plant at Wahalkada, 2 office sites at Kahatagasdigiliya and Horowpathana, and pump stations, ground reservoirs and elevated towers at Kahatagollewa, Galawewa, Kebithigollewa, Padaviya, Kambiliwewa, Kanugahawewa, Kahatagasdigiliya, Kallanchiya, Konakumbukwewa, Horowpathana, Rathmalgahawewa, Ihala Angunachchiya, Nikawewa, and 2 sites at Weerasole.

The Lot B works include the transmission and parallel distribution mains, valves and house connection tappings within all of the 8 zones incorporated in Lot C1 (Wahalkada, Kahatagollewa, Galawewa, Kebithigollewa, Padaviya, Kambiliwewa, Kanugahawewa, and Weerasole), with most of these pipelines located along the main RDA and PRDA roads between the reservoir sites. Lot B includes further transmission mains in Rathmalgahawewa, Ihala Angunachchiya, Nikawewa, Horowpathana, Kahatagasdigiliya, Halmillewa, Konakumbukwewa and Kallanchiya.

The Lot C2 works cover the supply and construction for the distribution networks in the separate Zones to the south, generally away from Lot C1, in Horowpathana, Ihala Angunachchiya, Nikawewa, Rathmalgahawewa, Kahatagasdigiliya, Halmillewa, Kallanchiya and Konakumbukwewa.
The overall layout of the works for Lot A, Intake, raw water main, WTP, pump stations, ground reservoirs and elevated towers are shown in relevant Lot A Works layout Drawing in Section 10. The overall layout of the works for Lot B transmission and distribution mains is shown in the relevant Lot B Works Layout Drawing in Section 10.

The Lot C1 Contractor shall maintain records of all pipe end points and interconnection points to other works to be done by others (as detailed in the plan and section design drawings), including invert levels and locations, and shall fix 'temporary' indicator posts as a physical identification of the pipe locations. The Lot C1 Contractor shall provide end caps to pipe ends as necessary and be responsible for pressure testing and flushing the pipelines to the limits of the contract, to the satisfaction of the Engineer.

The Lot B Contractor shall be responsible for procurement of the necessary pipes, fittings and materials required and for carrying out the Works to complete the connections between the Lot B distribution mains and the Lot C1 distribution mains, which have been completed by the Lot C1 Contractor.

Similarly, in the areas with interconnections between Lot A and Lot C1 distribution mains, the Lot A Contractor shall be responsible for procurement of the necessary pipes, fittings and materials and carry out the Works to complete the connections between the Lot A distribution mains and the Lot C1 distribution mains, that have been completed by the Lot C1 Contractor.

The Contractor shall coordinate his works accordingly and allow access for Contractors engaged on Lot B and Lot A to carry out works within the boundaries of the Sites for Lot C1, if so required. The Contractor shall keep roads clear for traffic, or otherwise provide traffic diversion measures. The Employer shall pay no extra claim for potential inconvenience incurred by the Contractor in relation to the other contractors at the site.

"For References ONLY"
(Not for Bidding)

PR.1.6 Intent of Contract Documents

It is the intent of the Contract Documents to quantify and qualify the execution and completion of all facets of the Works, and it is to be understood that the Contractor shall be fully responsible for provision of all labour, material, constructional plant and equipment, tools, transportation, necessary supplies and consumables, services, and all other items required to execute the Works in a satisfactory manner, fit for the purpose, and in accordance with the provisions in the Contract Documents.

PR.1.7 Programme of Works

The Bidder shall submit his Programme in the form of a bar chart, in English, and according to the requirements set out in the Contract. Bidders shall include and show against a monthly chart the planned dates for commencement and completion of all major items of works, including mobilization and demobilization, and include any times for customs clearances if necessary. The programme of works shall be deemed to have taken into account all factors, and including the effects of the prevailing pandemic situation, normal weather conditions, groundwater, geotechnical conditions, and other programmed works in the area. Some of the pipelaying areas may become inundated or affected by high ground water table during the monsoon period. The Contractor shall consider the specific climatic situation in the Northeastern part of Sri Lanka where the Project is located, while preparing the Programme of Works. However, the overall Programme of Works shall be within the Contract duration as specified in the Contract. The maximum time for completion is as stated in the Particular Conditions. The Programme shall be within the specified time limits, commencing from the date of acceptance of Bid. The proposed overall Programme will be binding upon the successful Bidder, of which the Bidder shall base his Price.

The successful Bidder shall submit the detailed Programme of Works with critical path analysis within the time stated in the Particular Conditions. The Contractor's detailed Programme may be subject to revisions with regards to certain items and sequences, as ordered and approved by the Engineer, however compliance to the overall Programme from the Bid shall remain. With reference to Clause PR.3.1 of Section 6A for submission of the Construction Programme, the detailed Programme shall be comprehensive and shall cover all portions of the Work, for each major item of Works, and the Contractor shall be expected to use adequate working teams along the pipelines. Further teams may be required to carry out other disciplines of work such as testing and cleaning, in order to remain on target towards the completion date. The Contractor shall supply to the Engineer detailed supporting information such as method statements, activity descriptions, sequences of work and time estimates for each activity. Bidders shall provide method statements and equipment schedules as required.

"For References ONLY" (Not for Bidding)

Notwithstanding the above, the Contractor shall proceed with the Works in such a manner as directed by the Engineer. The Engineer shall be entitled to, at any time, direct the Contractor to proceed with a particular section of the work, regardless of the Construction Programme.

The Construction Programme of the Contractor shall accommodate the following specific requirements depicted hereinafter.

(a). Access to any of the roads and highways by the Contractor for the purpose of executing the contract shall be subject to prior approval of the relevant roads' authorities. Submission of a suitably prepared Programme of Works by the Contractor incorporating the entire work in each section of road, from trench excavation through to hydraulic pressure testing of pipelines, completion of backfilling to the satisfaction of the relevant road authority, temporary reinstatement of road surface and hand over to the roads authorities on completion of permanent reinstatement, etc., is a prerequisite for approval by the

road authority. The Contractor shall limit the trench excavation in any one location to lengths as specified or as previously approved, at any one time.

(b). Equipment to be provided by the Contractor to facilitate effective supervision of the Works by the Engineer, as specified, shall be in place prior to commencing any Permanent Works.

PR.1.8 Interchangeability of Standards

The applicable technical standard specifications for the Works that appear in these specifications are intended to be of the latest available version published by the relevant agencies. The Engineer may accept certain materials meeting other internationally accepted standards for use in the Project, provided they are of an equal or higher quality than the reference standards. The Contractor shall provide sufficient documentary evidence to substantiate that the standard of substituted material is better than or equal to that stipulated in the specifications. The Engineer shall have the right to accept or reject any proposal offered by the Contractor. The Contractor shall provide copies of all relevant standards in English to the Engineer for reference and approval at no additional cost to the Employer.

PR.1.9 Minimum Standard

The Specifications, Drawings and other Contract Documents define a minimum standard required for Materials, Manufacture and Workmanship. The Bidder shall include in his Bid the cost of any additional work or improvements in the quality of the Work that he may consider necessary to unconditionally guarantee the performance of the completed Works in conformity with the Contract. All such proposals shall be given in the form of an Annexe but there is no obligation on the part of the Employer to accept any of the proposals offered by the Bidder.

"For References ONLY" (Not for Bidding)

PR.1.10 Workmanship

The quality of the workmanship and materials shall be compatible with the latest version of BS / BS EN ISO 9000 Series Quality Assurance Standards.

PR.1.11 Specifications to be kept on Site

The Contractor shall have a complete copy set of Contract Documents including Specifications, approved Construction Drawings, Standard Specifications or parts of Specifications applicable to the Works on Site at all times. Any document relevant to this Contract shall be made available from the Contractor upon demand by the Engineer. Failure to have copies of these documents on Site shall be considered an infraction to the Contract and any delays caused to the Works as a result of this lapse shall be the responsibility of the Contractor.

PR.1.12 Pre-Construction Start-Up Meeting

Prior to the start of Permanent Works at site, a pre-construction meeting shall be held at a mutually agreed time and place, attended by representatives of the following:

- The Contractor, the Engineer, the Employer and/or his Representative, NWSDB.
- Others as requested by the Contractor, the Employer or the Engineer.

The Contractor shall submit to the Engineer a proposal for each of the following at least seven days prior to this meeting for discussion:

- Site organization chart, key posts and curriculum vitae of the key staff to be employed for this project on full time basis by the Contractor.
- Construction Programme (refer to Clause PR 3.1, under Section 6A).
- Cash flow forecast.
- Detailed Method Statements for the Works.
- List of Construction equipment proposed for the works including category, quantity, type and capacity.
- Proposal for location and size of the camps, offices, workshops and stores, etc.
- Proposal for temporary storage of pipes and fittings during the works.
- Computer system and software to be used in producing programme of works as well for monitoring and updating the progress and resources throughout the project.
- Details of normal working days and daily working hours to be 6 days per week, 8 hours per day, or as agreed with the Engineer.
- Form of Design Drawings for approval.
- Details of procurement of imported materials, if any.
- Materials and other submittals for approval.
- Details of procurement of local materials such as Ready Mix Concrete, structural steel, galvanising, mild steel sleeves, pipe materials, valves, rock protection, cast iron covers, geotextile fabric, bedding sand, granular bedding materials, bitumen coatings, cement, concrete additives, aggregate, reinforcing steel, sand, water source, marker posts and all as required in the specifications and drawings.
- Draft format of Monthly Interim Statement.

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- Other details as required within the Specifications.

The purpose of this meeting is to designate responsible personnel and establish a cordial working relationship among the concerned parties. Matters requiring co-ordination for smooth implementation of the works shall be discussed and procedures for handling such matters will be established. The agenda for the meeting shall include:

- Programme of Works of the Contractor.
- Proposed methods of work and site organisation of the Contractor.
- Transmittal, review and distribution of submittals by the Contractor.
- Processing applications for payment & payment procedures.
- Maintaining record documents.
- Critical works sequencing.
- Field instructions and variations.
- Quality Assurance and Quality Control of the Works.
- Use of office and storage areas, security, and the Employer's needs.
- Major procured items, deliveries and priorities.
- Collection procedure of pipe materials and fittings from designated depots.
- Contractor's assignments for safety and first aid.
- Co-ordination with other agencies.
- Any other relevant matters.

"For References ONLY" (Not for Bidding)

PR.1.13 Progress Meetings

The Engineer/ER shall schedule and hold regular Progress Meetings at least every 2 weeks. In addition, there will be any other Special Meetings shall schedule by the Employer, Engineer, Engineer's Representative and or as requested by the Contractor and agreed by all Parties to review the progress of the Work, to maintain co-ordination of efforts, discuss programme changes and resolve other associated problems which may develop. The Progress/Special Meetings will also be summoned by any of above Party to discuss the issues related to technical matters, issues arising due to unforeseen circumstance, payment related matters and Inter-Agency cooperation meetings etc. The Contractor shall inform of any foreseeable risks towards the future progress of the works. Further regular site meetings shall be conducted for any sub-projects at dates and intervals agreed with the Engineer/ER.

The Contractor, Engineer and the Engineer's Representative shall be represented at each Progress meeting. The Contractor may at his discretion request the attendance of representatives of his suppliers and manufacturers. The Engineer shall preside at the Meetings and shall be responsible for providing, maintaining and distributing the minutes.

The Draft Minutes of Meetings shall be circulated among the Participants within a 05 Day period and the Contractor must submit his written objection(s) if any, 05 Days before the next Meeting Date.

PR.1.14 Site Administration

The Contractor shall be fully responsible for all areas of the Site used by him in the performance of the Works, and shall exert full control over the actions of all his employees and other persons with respect to the use and preservation of property and existing facilities, except such controls as may be specifically reserved to the Engineer or others. The Contractor has the right to expel from the site all persons who have no purpose related to the Works or its inspection, or to operations related to dominant rights to the site with the approval of the Engineer.

The Contractor shall also provide the construction management services for the proper performance of the contract within the given time frame maintaining quality of works and the safety of the property and personnel at all times.

PR.1.15 Project Signs

A. Fixed Project Sign Boards shall be erected at the Engineer's Office/Field Office and at Work Sites as directed by the Engineer. The Size of the board, logos, letter sizes, script and the colours (letter/background) shall require Engineer's approval.

B. Safety Signboards shall be erected adjacent each Site Office, along the Work Sites, and at other locations, as specified and as requested by the Engineer.

C. The Contractor shall provide, erect and maintain such traffic signs, lights, barriers and other measures as are necessary on Site for the execution of the Works. The measures shall be to the approval of the Engineer and to satisfaction of the relevant authorities, and as specified.

"For References ONLY" (Not for Bidding)

PR.1.16 Requirements of Authorities and Agencies

The Contractor shall be responsible for full compliance with the requirements of all duly constituted Authorities and Agencies concerned with any or all of the Work under this Contract. The Contractor shall give to the Engineer copies of all written notices required by the authority and the responses given.

Specific requirements for dealing with authorities concerned with road, stream, river and railway crossings are included in this specification, but this shall not relieve the Contractor of his general obligations under this Clause. The Contractor shall have early discussions with these authorities as regards their requirements and procedures and may seek the assistance of the Employer where necessary to arrange such discussions.

PR.2 CONTROL OF WORK

PR 2.1 Land for Construction Purposes

(1) Public Property

It is the responsibility of the Contractor to give all notices and obtain all necessary information and all necessary permissions from the authorities, prior to commencing construction. In addition, it is the Contractor's responsibility to liaison with the Police Traffic Department, if required, to arrange any road closures or traffic diversions required to complete the works.

Permits or approval for Work to proceed shall be obtained by the Contractor from relevant agencies with the assistance of the NWSDB through the Engineer. All works performed and all operations of the Contractor, his employees or Sub-Contractors within the limit of the public property shall be in conformity with the requirements and be under the control (through the NWSDB and Engineer) of such agencies owning or having jurisdiction over and control of the right-of-way in each case. Those relevant agencies shall include but not be limited to the following:

- Road Development Authority (RDA)
- Provincial Road Development Authority (PRDA)
- Department of Irrigation
- Relevant Pradeshiya Sabhas and Urban Councils (Local Authorities)
- Survey Department
- Ceylon Electricity Board (CEB) and/or Lanka Electricity Company (LECO)
- Sri Lanka Telecom
- Sri Lanka Railway
- Board of Investment (BOI)
- Relevant Divisional and District Secretariats
- Mahaweli Authority of Sri Lanka
- National Water Supply & Drainage Board and its Regional Support Centres
- Agrarian Services Department
- Archaeology Department
- Urban Development Authority
- Forest Department
- Wild-Life Department

Materials or Equipment shall not be placed on the property until the relevant agency has agreed to the location to be used for storage. The locations and extents of the areas so used shall be within the property line directed by relevant agencies. The Contractor shall immediately move stored materials or equipment at his own cost, if any occasion arises or when requested by the relevant agency as instructed by the Engineer.

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The Contractor shall contact the utilities and other concerned agencies and obtain permissions prior to cutting or closing roads, streets or other traffic areas or excavating near underground utilities or above ground utilities.

(2) Private Property

The Contractor shall not enter for any deliveries or occupy for any other purpose with personnel, tools, equipment, construction materials, or with materials excavated from any trench or pit, any private property outside the designated way-leaves without written permission from the owner and/or tenant of the property.

Whenever the way-leave is occupied by crops which will be damaged by construction operations, the Contractor shall notify the Engineer and owner or tenant sufficiently in advance so that where possible the crops may be harvested before excavation or trenching is started.

Within private properties, the Contractor shall be responsible for all damages caused due to his construction and investigation works, and shall make satisfactory reinstatement at his own cost for such damages, directly with the property owner and/or tenant involved. Before starting any works within private property, the Contractor shall prepare a Condition Report of the area likely to be affected by the works to be agreed with the owner/tenant and the Engineer.

(3) Access to Private Property

The Contractor shall arrange and maintain temporary access to residential and commercial properties for all affected local residents and businesses at all times.

When it is necessary to temporarily deny the normal access-ways to owners or tenants to their property or when any utility service connection has to be interrupted, the Contractor shall give written notice as prescribed herein or by the relevant Authority sufficiently in advance to enable the affected persons to provide for their needs. Notices shall include appropriate information concerning the interruption and instructions on how to limit their inconvenience.

All tasks above shall be deemed covered by the Contractor generally within his rates and prices in the Bill of Quantities.

(4) Access for Pipe-Works

For pipe-works, the Contractor shall be allowed access to the sites along the public roads, depending on his demonstration of adequate mobilisation of working gangs, plant and materials to be deployed for the said works, and as depicted in the construction programme, to ensure continuous work at the rate of progress in the programme. The Contractor has the option to plan his works programme and sites, but the open sites shall constitute a single area or several adjacent areas, and shall be approved by the Engineer. Access to further sites in other areas for pipe-works through public property shall be considered by the Engineer for approval, only progressively and in proportion to the lengths as fully completed (pressure testing, road reinstatement works, and sites handed

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over to Road Authorities). A lag length of 2 km only, between completed works and the starting of works in new sites, will be allowed.

Restrictions shall not apply for major construction works under the contract, such as bridge crossings, culvert crossings, piling, etc., and not necessarily limited to these. However, the approval of the local authorities, road authorities and the Engineer shall be required.

The Contractor shall consider this aspect of pipelaying in preparing the construction programme, and organizing his works, and any costs involved shall be deemed included in his rates and prices.

PR 2.2 Surveying and Setting Out

All Work shall be done to the lines, grades and elevations shown on the Drawings. Basic horizontal and vertical control points shall be established by the Contractor. Temporary points shall be established by the Contractor and shall be used as datum for the works. All additional survey, layout and measurement work shall be performed by the Contractor as a part of the work without any additional cost to the Employer.

The Contractor shall provide qualified and experienced surveyors and instrument men, competent assistants and such instruments, tools, stakes and other materials required to complete the survey, set-out and measurement work. In addition, the Contractor shall furnish without charge, competent men from his force and such tools, survey equipment, stakes and other materials as the Engineer and Engineer's Representative site staff may require in establishing or designating control points, in establishing construction easement boundaries, or in checking survey, layout, as-placed pipe levels, and measurement work performed by the Contractor.

The Contractor shall record as detailed in Clause PR 2.8 of the Particular Requirements, all other obstructions including that of religious nature, encountered along the works sites during surveying and liaise with the Engineer any issues that impact on the setting-out.

The Contractor shall keep the Engineer informed, with prior notice of at least 7 days, of the times and locations at which he wishes to commence works and excavation, so that horizontal and vertical control points may be checked by the Engineer with minimum inconvenience and no delay to the works. The Contractor shall remove and reconstruct work to the satisfaction of the Engineer, which may otherwise become improperly located due to control points not being checked by the Engineer, with all costs borne by the Contractor.

"For References ONLY" (Not for Bidding)

PR 2.3 Field Datum

The following data have been used to produce the information shown on the Drawings from the Survey Department; National Datum based on the National Grid Values:

Kanugahawewa			
Survey Bench Mark	**North**	**East**	**Elevation**
TBM-PB 12	706182.032	486114.544	77.703
TBM-PB 12A	706239.976	486130.25	77.214
Kambiliwewa			
Survey Bench Mark	**North**	**East**	**Elevation**
BM X5	710142.25	495328.147	57.739
Padaviya			
Survey Bench Mark	**North**	**East**	**Elevation**
BS -1	701396.59	501936.486	65.478
BM-BS1	701313.671	501890.472	65.365
Wahalkada			
Survey Bench Mark	**North**	**East**	**Elevation**
GPS - 77	692265.936	508632.141	53.731
WK-1	692328.129	508574.127	56.77
HW-122	692525.558	509011.988	39.337
BM-HW13	692453.753	508993.069	38.336
BM-HW14	692314.266	508528.124	54.927
Kahatagollawa			
Survey Bench Mark	**North**	**East**	**Elevation**
TBM - KP28	692954.2437	501288.139	62.84
Galewewa			
Survey Bench Mark	**North**	**East**	**Elevation**
BM X4	688190.918	494669.488	92.997
Kebithigollawa			
Survey Bench Mark	**North**	**East**	**Elevation**
BM - KS1	681636.387	488176.96	120.318
Weerasole - 1			
Survey Bench Mark	**North**	**East**	**Elevation**
BM-7	684576.461	507005.443	56.352
HW-70	684523.926	507019.106	55.774
Weerasole - 2			
HW-37	678517.369	506363.389	85.713
HW-38	678591.189	506257.208	85.345
BM-HW4	678543.936	506326.496	85.997

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The Contractor shall establish temporary benchmarks as specified at each location of the Work Sites and maintain them throughout the Contract Period. At the end of the Contract, the Bench Mark(s) shall be prepared as "Permanent Bench Mark(s)" for NWSDB's future reference, as directed by the Engineer.

PR 2.4 Construction Plant and Equipment

The Contractor shall mobilise adequate and appropriate construction plant and equipment with suitable type and capacity to secure a satisfactory quality of work and rate of progress, to ensure completion of the project within the time limit stipulated in the Contract. The Contractor shall also furnish to the Engineer a list containing all construction plant and equipment that he intends to deploy at site(s) before commencement of work. All plant and equipment shall be equivalent or higher in capacities and numbers as specified in the contract document or provided at the bid stage by the successful Bidder. Please note that the machinery & equipment numbers specified is the minimum, and Contractor shall duly provide the required numbers based on his program.

While selecting the construction plants and equipment, the Contractor shall strictly comply with the pollution mitigation measures as mentioned in the EMP Requirements under Section 6B.18.

PR 2.5 Locations of Work

The pipelines and chambers are located at the offsets to the road centre-lines and at the detailed positions as shown in the Drawings. The Engineer reserves the right to modify locations, within the Conditions of the Contract, in order to avoid obstructions and to avoid interfering with existing structures or service utilities, as encountered, or for any other reason.

PR 2.6 Open Trench Safety

At end of works each day, trenches in roads shall not be left open overnight. If any excavation is left open due to unavoidable circumstances, then the Contractor shall take all necessary steps to arrange safety precautions required by the Police/Authority and provide adequate steel plate covers, bridges, reflective Tapes/Warning Boards/Warning lamps, guards, etc., and all as required to ensure the safety of the Public/Traffic throughout the whole of the night.

The construction of open trenches shall, at any one time, be limited to lengths as previously approved by the Engineer, in writing, depending on the particular surrounding conditions, and in accordance with the approved method statement. The maximum length of trench, suggested for agreement for the works along narrow roads shall be 100 meters at any one site at any one time in the morning. Unless otherwise approved by the Engineer in writing, work on each approved length(s) shall be practically completed to the satisfaction of the Engineer before work on any new length is commenced. If the authorities permit the Contractor to temporarily close off to the public an entire street, then the length of open trench may be increased, as approved. However, the Contractor shall note his overall final responsibility towards safety protection around open trenches, and shall accept full responsibility for any related accident if such occurs.

The Contractor shall be responsible for safety on Site and shall take all necessary precautions for the safety of workers, visitors and the Public alike. The Contractor shall

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provide for all costs and charges incurred by complying with all safety, health and welfare regulations pertaining to all employees, visitors and the general public, including those employed by, or on the Site at the request of, sub-contractors. The Contractor shall attend to the protection and temporary covering and/or barricading of open excavations, trenches, pits and other hazards to safety.

The Contractor shall be responsible for providing, for the safety of the public, all necessary safety and protection provisions, at this own expense, during the construction of the Works and up until taking over of the site. Such provisions include barricades, tapes, lights, warning signals and sign-boards, guard rails, pedestrian crossings over trenches, supervision and watchmen services to the satisfaction of the Engineer and all other safety measures in accordance with local regulations, the General and Particular Specifications, the Appendices, and other applicable sections of the Specifications. Costs for all safety measures shall be deemed covered by the Contractor in his bid under the relevant General Bill Item for provision of safety measures in the Bill of Quantities.

The Contractor shall not allow any unauthorized visitors on the Site. Authorized visitors shall sign a Contractor's visitor's book. The Contractor shall provide safety equipment and appropriate protective clothing and PPE for such visitors. All visitors shall educate and abide by the rules & regulations of the Work Site.

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PR 2.7 Uncovering Work for Inspection & Correction of Defective Works

The Contractor shall perform all cutting, removal, patching and repairs required for the works as may be necessary in connection with uncovering of works for inspection purposes, or for the correction of defective works, or for the installation of improperly timed work, or for removing samples of installed materials for testing, at no extra cost to the Employer.

The Contractor shall not undertake any cutting or removal, which may affect the structural stability of the Work or existing facilities, without concurrence of the Engineer.

PR 2.8 Protection of Existing Structures and Utilities

The Contractor shall provide all shoring, bracing, supports and protective devices as necessary to safeguard all works and existing facilities during excavation, construction, cutting, removal, patching or repair operations. Excavated materials shall be removed off the site, to the extents as indicated on the Drawings, or as required on-site with the approval of the Engineer to complete the works. Materials shall be removed in a careful manner with no damage to adjacent facilities or materials. Materials, which are not salvageable, shall be disposed off- site by the Contractor at an approved disposal site.

All existing works and existing facilities affected by cutting, patching and construction operations shall be restored with new materials, or with salvaged materials acceptable to the Engineer, to obtain a finished installation with the strength, appearance, and functional capacity which pre-existed the construction. If necessary, entire surfaces shall be redone and refinished. The Contractor shall assume full responsibility at no additional

cost to the Employer for the protection of all buildings, structures, natural embankments and utilities either public or private including poles, signs, services to buildings, service utilities, water pipes, hydrants, drains, electric and telephone ducts and conduits whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from damage of any kind.

Prior to commencement of construction, the Contractor shall make further investigations, and contact the relevant authorities, if necessary, to determine and satisfy himself towards the exact location and level of all services that may be in conflict with the design of the proposed main or are in the vicinity of the main and other works. The Contractor shall also search for any service not shown on the plans but which he or the Engineer may believe to exist. The Contractor shall contact the local officials of each of the statutory authorities responsible for buried services and shall maintain close liaison with them throughout the construction period.

These works shall comprise the excavation of trial holes at suitable intervals, in a manner so as not to damage the utilities, while also referring to surface indications of chambers to be located, all without any additional cost to the Employer. Such excavations shall either be covered until the general excavation meets this pit excavation or be re-filled after recording the nature and position of the service according to the Engineer's instructions.

Thereafter, the Contractor shall assume full responsibility for all underground structures and service utilities, whether shown on the Drawings or not, and all such services shall be maintained uninterrupted during construction. The Employer accepts no responsibility whatsoever for any omissions or for the correct representation on the drawings of these existing services.

Prior to commencement of work in the vicinity of structures likely to be affected by the works, the Contractor shall prepare a Condition Report of adjacent structures to be agreed with the owner and the Engineer.

Apart from verifying positions of the underground existing services to avoid damage, scrutiny is needed to clarify those main services that might conflict with the new pipe as detailed on the drawings. In the event of conflicts, the Engineer may consider possible amendment to the design as an alternative to permanent relocation of the existing utility.

Whenever services are encountered which interfere with the execution of the works and which require to be moved and relocated, the Contractor, within 7 days prior to the construction of the pipe section, shall advise the Engineer, who will determine the extent of the work, if any, to be undertaken by the Contractor in removing, relocating and reinstating, on account of approval from the relevant authority, or protecting such services. With the written approval of the Engineer the Contractor shall arrange for the removal or deviation of such existing works.

Any work required to be undertaken by the Contractor in permanent relocation of services for which no provision is made, or for which no applicable bid rates exist, will be paid for in accordance with the Conditions of Contract.

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Early scrutiny of these services is essential to enable for such diversions to be prepared in advance of the construction. In addition to the scrutiny referred to above, the Contractor shall take all reasonable precautions to prevent damage to existing buried main house service pipes and connections to buildings.

Where existing house service connections conflict with the Permanent Works, permanent works for relocating the service may be agreed in detail with the Engineer at the time such connections being encountered. Drain and sewer permanent relocation works shall be made by the Contractor and other relocation works by the statutory authorities unless prior agreement is obtained from them for the work to be done by the Contractor, and shall issue detailed instructions for each works. Crossings of the new pipeline across all existing house service connections to individual premises or properties shall be deemed to be included in the unit rates for pipe-works.

The Contractor shall in any case provide adequate temporary support to all existing services and connections that are exposed or partially exposed or otherwise weakened by the excavation. The Contractor shall immediately notify the Engineer and relevant statutory authority and afford every facility for their quick repair when any damage occurs to the services. No separate payment shall be made to the Contractor for such repairs.

In addition to the precautions to be taken with buried services, the Contractor shall ensure that his plant and equipment do not damage pipeline or pipe supports above ground level or any electricity or telephone overhead cables. Adequate precautions shall be taken to prevent his plant from operating too close to overhead high-tension cables and shall in conjunction with the Engineer and electricity authority establish all necessary precautions for crossing under such cables. No mechanical excavation shall be permitted within 2 metres of the established positions of high voltage cables. If electric power lines need to be diverted, the Contractor will have to initiate such action prior to commencement of work through the agency concerned in liaison with the Engineer.

The costs of searching and locating existing underground utilities, potholing, protection of existing utilities and aboveground services, facilities and structures, and temporary removal and reinstatement of existing utilities shall be deemed covered generally by the Contractor within his rates and prices for the pipe-works.

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PR 2.9 Obstruction of Utility Services

The Contractor shall ensure that all existing fire hydrants, control valves and other utility controls shall remain unobstructed and readily accessible during the Construction of the Work.

PR 2.10 Operation of Existing Utility Services

The Contractor shall obtain written approval from the authorities concerned before operating any valve, switch, or other control on any existing utility services. All consumers affected by such operation shall be notified by the Contractor in advance, the full detail of operation date, time and probable length of time of service interruption. In

case of drinking water supplies, the Contractor shall provide alternative arrangements to supply water (such as supply with water tanker) to the affected consumers without any extra charge to the Employer.

PR 2.11 Maintenance of Flow

The Contractor shall provide alternative arrangement for the flow of drains and water courses interrupted during the progress of the work and shall immediately remove all debris and detritus matter on completion. Costs of all such works shall be deemed to be covered generally overall within the Contractors rates and prices for the works, or provided for in prices for items for large culvert crossings. The full procedure of maintaining existing drainage flows shall be discussed with the Engineer at least 7 days in advance of works.

PR 2.12 Provisions for Traffic and Detours

All construction activities and excavation shall be carried out in such a manner as to create a minimum of inconvenience and interference with pedestrian and vehicular traffic, and with access to buildings or other properties. The Contractor shall construct temporary bridging across his trenches where necessary, for traffic including access to private property and to pedestrians. All excavated material shall be stockpiled in a manner that will not endanger the work or the personnel engaged therein or third parties, be covered to prevent spreading, and will avoid obstructing sidewalks and driveways or lay on permanent structures. Hydrants, valve chamber covers, valve boxes, kerb stop boxes, fire and police call boxes or their utility controls shall be left unobstructed and accessible until the work is complete. All above shall be further in accordance with the details in the relevant Clauses of other parts of the Specifications.

Generally, the Employer suggests that excavated material for a relatively short length of initial trench is stockpiled, then, suitable excavated material from each subsequent short trench length in turn may be used as backfill for the previous short trench length, in order to limit temporary storage of backfill materials and disruption.

Roads shall not be closed unless permitted by the relevant road authority. Where detours are permitted, the Contractor shall provide all luminous barricades, red warning lights, and traffic signs required to divert the flow of traffic and shall expedite construction operations to minimise disruption. Costs for all such work for maintaining traffic flows shall deemed to be included in the BoQ Items as provided in the General Bill of the BoQ.

PR 2.13 Clean-up Work to be done

The Contractor shall bear full responsibility for the protection of all finished exterior and interior surfaces, fixtures and equipment from stains, marks, dirt or damage of any kind, from the time of their construction, finishing or installation until the time of final handing over the fully completed works to the Employer.

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Before requesting an inspection of the completed works with the intent of final acceptance, the Contractor shall do all necessary cleaning, making good and touching up that may be required to leave all finished surfaces, fixtures and equipment in acceptable condition in accordance with the full intent and meaning of these specifications.

PR 2.14 Flotation

The Contractor shall take all-necessary precautions against flotation of any structures or pipelines, particularly plastic pipes. The Contractor shall be fully responsible for any damage caused by flotation and for making good of such damage at no extra cost to the Employer.

PR 2.15 Inconvenience and Right of Access

The construction of the works shall be carried out avoiding inconvenience as far as feasible to the owners and occupants of properties adjacent to the works. Costs for any measures provided in this regard shall be borne by the Contractor.

PR 2.16 Preventive Measures against Water Supply Interruption

The Contractor shall also ensure that he has stocks of repair fittings and pipe materials at each site location for the pipe-works to enable effect immediate repairs and minimise interruption of supplies in the event of accidental pipe damage including service connections. Costs for such repairs shall be borne by the Contractor.

PR 2.17 Surplus Fill Material

The Contractor shall be responsible for making all arrangements for the disposal of all surplus material from any excavation, which is material extra over the selected excavated material needed for use in backfilling, grading or other purpose, as shown in the Drawings, and for handling of this surplus material over the whole distance from the point of excavation to the point of disposal. Costs for such works shall be deemed covered by the Contractor within his rates for pipe-works.

The Contractor shall not dispose the said material in unauthorized places, and the Contractor shall be held responsible for such acts. Any cost resulting in such unauthorized dumping, shall be borne by the Contractor at no additional cost to the Employer.

PR 2.18 Pumping and Drainage

The Contractor shall dispose of all groundwater and surface runoff to existing water courses with all measures needed to prevent excessive solid materials being discharged, all in a manner approved by the Engineer. Costs for such works shall be deemed covered by the Contractor within his rates and prices for the works.

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PR 2.19 Overhead Construction

No machinery shall be employed which, in the opinion of the Engineer shall unduly interfere with wires and other overhead construction.

PR 2.20 Unfavourable Construction Conditions

At times during adverse weather conditions, special means or precautions shall be taken by the Contractor to the approval of the Engineer so as to perform any work in a proper and satisfactory manner. No portion of the work shall be constructed under conditions, which would, in the opinion of the Engineer, adversely affect the quality of works.

PR 2.21 Public Notice of Starting Work

The Contractor shall provide and distribute to all residents in the area which, may be affected by the Work, a full-page size printed notice in Sinhala, Tamil and English languages with wording similar to that shown in the next page as directed by the Engineer.

PR 2.22 Notification of Noncompliance

The Engineer will notify the Contractor of any non-compliance with the details of actions required from the Contractor, either in written form or by a written record in the Daily Report / Site Diary at the Site. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor, shall be deemed sufficient for the notification. If the Contractor fails or refuses to comply promptly, the Engineer may issue an order stopping all or part of the Work until satisfactory corrective action has been taken. No part of the time lost to any such stop orders shall be made the subject of any claim for extension of time or for excess costs or damages by the Contractor.

"For References ONLY" (Not for Bidding)

NOTICE

TO THE PEOPLE IN THIS AREA

WITHIN THE NEXT FEW DAYS, WORK WILL BE STARTED ON THE CONSTRUCTION OF NEW WATER SUPPLY FACILITIES.

This work may cause some inconvenience but will be of permanent benefit.

We shall appreciate your co-operation on the following matters:

1. Please be alert when driving or walking in or near the Construction area.

2. Tools, materials, and equipment are attractive to children. For the safety of the children, please keep children away from the work sites.

3. Please report all inconvenience to the Site Engineer's Representative or call the office at the numbers given below.

   Telephone Nos: .....
   .....

The work is being performed to support the National Water Supply and Drainage Board under JICA Funding by:

(Insert Firm Name, Address, and Telephone Number of the Contractor in this space)

In case of any complaints, you may contact us on the above telephone.

We will endeavour to complete this work as rapidly as possible and with a minimum of inconvenience to you.

Date of Notice : .....

Signed : .....

Title : .....

"For References ONLY"
(Not for Bidding)

PR.3 SUBMITTALS

PR.3.1 Construction Programme

The Contractor shall submit three (03) copies of his detailed construction programme within the time stated in the Contract, after the date of the Letter of Acceptance. The Contractor shall comply with the following aspects in the preparation and presentation of his programme:

(a). Use appropriate computer-based project management software approved by the Engineer. The system used shall clearly show the Contractor's construction programme, resources, sites, procurement schedule, and cash-flow requirements; and during the course of the contract be capable of clearly showing progress compared to the original programme.

(b). The construction programme submitted in a bar chart form shall show the start and finish dates of the principal preparatory and construction operations including mobilisation, approvals of materials and equipment, procurement and delivery of materials and equipment, construction and installation, testing, commissioning and hand-over.

(c). The Contractor shall include some milestones in his construction programme with the approval of the Engineer. The milestones thus given shall be monitored and if the Contractor fails to reach the milestones liquidated damages will be deducted proportionately.

(d). A graph showing the build-up of staff and labour resources related to the tasks and work identified in the Construction Programme.

(e). A schedule of major plant and their time on site related to the Construction Programme.

(f). A Critical Path Network (CPN) showing the optimum order of work, available time for each activity and effects of delays. The CPN shall be updated during the course of the contract to show construction sequence changes that may arise together with the changes in resources needed to maintain the overall schedule for completion of the contract on time.

(g). Programming shall take into account:

- The Notice to Commence Work
- Periods for approval of the programme or subsequent revisions thereto
- Permissions for access to road sites
- Designs and approval of shop drawings

Approval of the programme and shop drawings shall not relieve the Contractor of any of his responsibilities under the Contract.

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(h). Three copies of programme revisions that become necessary during the course of the works shall be submitted to the Engineer for approval of the details at least seven days before the proposed revision is to be implemented. Three copies of the revised programme as approved shall be supplied to the Engineer within three (03) days of approval being given.

(i). The programme shall be based on sub-programmes for each section of transmission/road or region of distribution mains. The sub-programmes shall include all the principal tasks envisaged to be required for the proper execution of each sub-works.

Some of the pipe-laying areas either get inundated or affected by high ground water table during the monsoon period. Contractor shall consider the specific climatic situation in the North-Eastern part of Sri Lanka where the project is located while preparing the programme of work. However, overall programme of work shall be within the contract duration specified in the Particular Conditions.

In the case of pipe-works in roads, the periods required obtaining permission from the relevant authorities for entry into the roads and for the execution of the work until completion of testing and hand-over to the authorities for final reinstatement work shall be included. The Contractor shall be required to discuss the sub-programmes for each section of road with the Engineer and the relevant roads authorities prior to starting work and shall be expected to make such changes to the order of work as the authorities may impose.

The Contractor shall programme and execute the Works in such a manner to maintain access to existing residences and businesses at all times as far as are practicably possible.

"For References ONLY"
(Not for Bidding)

PR.3.2 Daily Programmes

A. The Contractor shall furnish a Daily Programme for the following working day before the close of each location of Site where the Contractor is working on each working day. The programme shall include the following:

1. work to be executed during normal working hours only;
2. location of the area of the site where work will be carried out;
3. proposed labour and Contractor's equipment and supervision to be provided.

PR.3.3 Progress of Works

(i) Contractor's Progress Reports

The Contractor shall submit Monthly Progress Reports to the Engineer/Engineer's Representative in quadruplicate at least 7 days prior to the date of monthly and quarterly progress meetings. The actual work done shall be superimposed upon the copies of the programme. The Contractor shall furnish an explanation of any deviation from the programme and shall state proposals for improving progress in the event of this be lacking in any respect. The reports shall show clearly and accurately the position of all activities associated with the works including mobilisation, manufacturing, delivery, site erection, installation, construction, testing and commissioning, etc. Reports shall inform of all problems and foreseen risks towards the progress of the works, together with suggested actions to resolve the issues. Costs for Progress Reports, Programme of Works and their updates shall be covered by the Contractor within the relevant General Bill Item provided in the Bill of Quantities.

(ii) Pre-Construction Survey and Daily Photographic Records

Prior to the start of pipelaying in each section of the Works, the Contractor shall take initial photographs for the existing conditions of the site, at appropriate spacing along the works, as well as at every bend, junction, culvert, bridge, and building. The pre-existing condition of road surfaces shall be recorded photographically, locations of existing structures where pre-existing damages shall be noted/determined, and locations where existing items are likely to be affected by the operations associated with the execution of the Works. The Contractor shall provide the Engineer/ER, the Survey Data with the Chainage Points suitably marked for identification purposes together with the Photographs along the routes of the Works. The Contractor shall coordinate with the Engineer/ER, the relevant road authority and any other party who are affected by construction activities. The Contractor shall prepare a report as a written and photographic record of the condition of building structures, main highways and other installations in the vicinity of the Works. The report shall be signed by the Contractor and the Engineer as an agreed record, with two copies provided to the Engineer.

The Contractor shall maintain daily electronic photographic records for all works and activities, and submit to the Engineer a dated compilation each month, electronically filed into daily date folders, with the Monthly Progress Report in the form of a CD. Selected prints from the electronic files of photographs (which would be considerably more extensive in electronic form) shall be printed on A4 pages (several per page) and submitted in quadruplicate with the monthly report. The Contractor shall submit a report in quadruplicate to the Engineer.

(iii) Progress Meetings (as per Clause PR 1.13 of Section 6A herein).

"For References ONLY" (Not for Binding)

PR.3.4 Drawings

A. The Drawings forming a part of the Contract Documents are listed in Volume 4.

B. Compliance with Drawings

1. All work, during its progress and upon completion shall conform to the lines, elevations and grades as shown on the Drawings.

2. The Contractor shall complete the proposed work in every detail as shown or as specified.

3. Where the Contractor has different dimensions or layouts to those shown on the Drawings, or should any detail or details be omitted from the Drawings and Specifications which are essential to its intended completeness, then the Contractor shall prepare and submit drawings and amended designs for the approval of the Engineer and then furnish and install Works so that upon completion, the Work will be acceptable, operational, and ready for use without additional cost to the client or time extension.

C. Further drawings may be issued to the Contractor by the Engineer as Work progresses.

D. Interpretive Drawings

1. Any additional drawings which the Contractor requires to interpret the drawings for the use of his employees shall be prepared by the Contractor.

2. Four copies of each shall be supplied to the Engineer, if required by him.

E. The Employer accepts no responsibility for any omissions or the correctness of the representation of existing features on the Drawings.

F. Co-ordination Drawings

Contractor shall be responsible to prepare and submit to the Engineer for approval the following documents at least two weeks before the commencement of the respective Activity/Works:

(a). Co-ordination Drawings

(b). Shop Drawings (for formwork, masonry work including the Culvert/Bridge and other Pipeline Crossings, Pipe Supports Arrangements etc.)

(c). Bar Bending Schedules

(d). Construction Drawings for all Temporary Works (including shoring cut-off wall construction, dewatering system etc.)

(e). Drawings for pouring patterns, casting sequence for expansion joints and construction joints, if any.

"For References ONLY" (Not for Bidding)

PR.3.5 Shop Drawings and Engineering Data

All shop drawings regardless of origin shall be stamped bearing the approval of the Contractor and identified with the name and number of this Contract, Contractor's name, and references to applicable specification paragraphs and Contract Drawings. Each submittal shall indicate the intended use of the item in the work. When catalogue pages are submitted, applicable items shall be clearly identified and printed brand name, manufacturer's name & address clearly visible. The current revision, issue number and/or date shall be indicated on all shop drawings and other descriptive data.

The Contractor's stamp of approval shall be representation to the Employer and the Engineer that the Contractor has assumed full responsibility for determining and verifying all quantities, dimensions, field construction criteria, materials, catalogue numbers, and similar data, and that he has reviewed or co-ordinated each submittal with the requirements of the work and the Contract Documents. The Engineer shall accept no shop drawing or other submittal from anyone but the Contractor. The Contractor shall be responsible for any submittals from his suppliers and manufacturers.

Engineering data covering all equipment, pipes, fittings & accessories and fabricated materials to be furnished under this contract shall be submitted to the Engineer for review. These data shall include drawings and descriptive information in sufficient detail to show the kind, size, arrangement, and operation of component materials and devices; the external connections, anchorage, and supports required; performance characteristics; and dimensions needed for installation and correlation with other materials and equipment and the standard for which the equipment or material is manufactured.

The Contractor shall in writing direct specific attention to revisions other than those called for by the Engineer on previous submissions when corrected copies are resubmitted. Neither the work shall be performed in connection with the fabrication or manufacture of materials and equipment nor shall any accessory or appurtenance be purchased until the shop drawings and data therein have been reviewed by the Engineer. The Contractor's commencement of works is his own risk and responsibility.

"For References ONLY" (Not for Bidding)

The Engineer shall be provided with four (4) copies of each shop drawing and necessary data initially. When the shop drawings and data [two (2) copies] are returned to the Contractor marked EXCEPTIONS NOTED, the corrections shall be made as noted thereon and as instructed by the Engineer and not less than two (2) additional copies of all such shop drawings and data shall be furnished after final review. When the drawings and data are returned marked NO EXCEPTIONS NOTED, not less than two (2) additional copies of single-side printing and both-sides printing shall be furnished.

The Engineer's review of shop drawings and data submitted by the Contractor shall cover general conformity to the Drawings and specifications, mistakes, contradiction, external connections, and dimensions which affect the layout. The Engineer's review of shop drawings returned marked NO EXCEPTIONS NOTED or EXCEPTIONS NOTED does not indicate a thorough review of all dimensions, capacities, design strengths, design calculations, quantities, and details of the material, equipment, device, or items shown.

All shop drawings and data after final processing by the Engineer shall become a part of the Contract Documents, and work shall conform to the shop drawings and data unless otherwise authorised by the Engineer. Any need for re-submission, or any other delay in obtaining the Engineer's review of submittals shall not entitle the Contractor to extension of the Contract Period. Shop Drawings shall be prepared and submitted well in advance, for the Engineer to check and approve. The Contractor shall ensure that the Engineer's approval is obtained before any construction/erection is commenced.
The furnishing of Engineering Data by the Contractor for Civil Engineering Works shall be in accordance with the Contract Document. The review of these data by the Employer will cover only general conformance of the data to the Specifications and not a thorough review of all dimensions, quantities and details of the materials, or items indicated or the accuracy of the information submitted. The review by the Engineer shall not be considered by the Contractor, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements, specified under these specifications.

All field books, notes and other data developed by the Contractor in performing surveys required as part of the work shall be made available to the Engineer for examination throughout the construction period. All such data shall be submitted to the Engineer with the other documentation required for final acceptance of the works. The survey shall be done in the presence of the Engineer where measurement for preparation of payment requests is required.

All Engineering Data submitted by the Contractor after review by the Engineer shall form part of the Contract Documents and the entire works performed under these Specifications shall be in strict conformity, unless otherwise expressly requested by the Engineer in writing.

"For References ONLY" (Not for Bidding)

PR.3.6 Warranties

All Contractor supplied HDPE and ductile iron pipes and fittings, adaptors, valves, manhole covers, surface boxes, and any other plant and materials for permanent installation into the Works shall be new and unused, of most recent models, and shall be supplied with warranties valid for 3 years after acceptance into the works. The warranties shall provide coverage against any defect arising from any act or omission by the Contractor or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination. The Contractor shall ensure that all warranty entitlements arising from the work include the Employer and Contractor as named beneficiaries. Such warranties shall be in a form approved by the Engineer and shall be submitted to the Engineer as a pre-requisite for acceptance of goods when delivered to site and as a requirement for making any payments.

PR.3.7 "As-Built" Drawings & ArcGIS Data Base

*As – Built Drawings

The Contractor shall submit one copy of the draft "As Built" drawings for Engineer's approval as soon as each portion of work is completed. During construction, the Contractor shall maintain As-Built Drawings and records on Site, which are available for inspection by the Engineer at any time. The "As-Built" Drawings are required as a record of all Work carried out. The Original "As-Built" drawings to be furnished in an A1 sized 80gsm Paper and three (03) sets of A3 sized photocopy prints. In these drawings, it is necessary to indicate "As-Built" conditions including field modifications and furnish additional paper copies for insertion in equipment instruction books or operation and maintenance manuals as required. All such copies shall be clearly marked "AS-BUILT" and signed by the Contractor. Production of "As-Built" Drawings shall proceed in parallel with the construction work and shall be considered as part of the completed Works. The Contractor shall be required to complete and provide all As-Built Drawings, to be approved by the Engineer, 7 days after testing of the works and prior to taking over by the Employer.

The Engineer, on Contractor's request, shall provide CAD (PDF) and prints of the drawings. The drawings shall be stamped "AS-BUILT" and be signed by the Contractor. Survey work shall be carried out by an experienced Engineering surveyor.

For Pipeworks and pipe networks, the "As-Built" Drawings shall indicate at least three (3) tie measurements for each and every tee junction, valve, washout valve, air valve, non-return valve, chamber, service connection, fire hydrants, bends, reducers, end cap, and DI crossings, facilitating subsequent identification of buried installations. If such locations occur more than 200m apart along the pipeline, tie measurements for additional locations on pipeline shall be provided so that the locations with tie measurements are not more than 200m apart. Where pipelines are laid to curvature with deflection at joints, tie measurements shall be indicated at closer intervals to the approval of the Engineer. At the above defined locations, the information to be provided shall include, but not be limited to the location, lines, surface level, invert level, diameter, material and class of all pipes, showing connections, valves, flowmeters and all other instruments.

The "As-Built" Drawings, at the junctions showing the schematic arrangements (Junction Details) shall be presented on A1 size (841mm x 594mm) sheets, arranged in sequential order along each pipeline. Lettering shall be sized and arranged to enable A3 size reductions to be legible.

In addition to all the hard copies, the Contractor shall provide 4 sets of electronic files in CAD (Editable) and PDF in CDs.

Costs for the provision of As-Built Drawings as specified shall be deemed covered under the respective General Bill Item as provided in the Bill of Quantities.

*ArcGIS Data Base Data Files/Maps

In parallel with preparation of "As-built" drawings, the Contractor shall produce GIS data of the constructed works including all the water utilities with specified attributes

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over the base map (flat plan of road survey) prepared by the road survey. The Contractor shall conduct all necessary survey work and shall ensure that vertical and horizontal measurements are captured at an accuracy of ± 5cm using most suitable and cost-effective data collection technology and methodology.

The Contractor shall survey the three-dimensional position (x, y, z) of all points and line assets constructed under this project. These include Pipelines, Bridge Crossings, Culvert Crossings, Manholes, Chambers, Valves, Fire Hydrants, Consumer watermeters, Flowmeters, Hydraulic Plugs, Reducers, Tees, end caps, etc. Nodes can be created to clearly delineate different pipe sections in terms of material, diameter, depth and to allow for future development of a hydraulic model in the GIS Platform. Point and line data shall be consistent with the attributes of the existing GIS System. In addition, the Service Connection details shall also be updated in the GIS System until the time of taking-over. The Contractor shall obtain the prior approval for the Format(s) of the Attribute Tables that he proposes to furnish the GIS Data.

Available Topographic Survey Drawings (Plan and LS drawings) and AutoCAD Drawings of the Transmission and Distribution Network will be made available to the Contractor. The balance field survey necessary to establish GIS Platform shall be carried out by the Contractor.

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Other Records/Detailed Requirements

Draft record documents shall be submitted to the Engineer and then finalized in accordance with any amendments required by him. Apart from the As–Built Drawings above, the records mainly shall include the following,

- Hydraulic Model of the Water Supply Pipe Network and Commissioning Data
- Asset Register in line with any NWSDB Standard requirements, and as specified herein
- Training Manuals for Class Room & On- the- Job training (OJT) as per the directives of the Engineer
- Preparation of Operation and Maintenance Manuals with agreed contents
- Reconciliation Statement, if applicable

The Contractor, with the approval of the Engineer, shall adopt the latest version of ArcGIS Software purchased in the name of NWSDB through the Provisional Sum Item as provided in the BoQ to process/prepare the Data Files. The same Software shall also be used by the PMU Staff for reviewing the draft Data Files as submitted by the Contractor time to time written in compact disks. The Contractor shall renew and maintain the Software License throughout the Contract Period and shall submit the 02 sets of ArcGIS data files compatible to the NWSDB's ArcGIS Platform at the end of the Contract. Further, the licensed ArcGIS Software as purchased above under P Sum shall also needed to be handed over to the NWSDB.

Please ensure all required items listed below are included in the As-Built submittal.

i. Main (Pipe Related Information)

ID, Road name, Date of pipe laid, Status of the life cycle, Material, Inner diameter, Nominal diameter, Pipe type (*transmission main, distribution main, service line*), Status (*Already laid, to be laid, Existing pipe, Abandoned pipe*)

ii. Joint

Chainage, ground level, Depth, Installed date.
Date will be entered for every 3 pipe joints, i.e. 18 m. All the special joints such as Bends, Tees, etc… will be taken

iii. Valve

ID, Road name, Installed date, Status of life cycle (*Active, Inactive or Abandoned*), Size, Type (Butterfly or Gate), Status (*Open or Closed*), Number of turns, closed direction (Clockwise or Anticlockwise), Installation status (*Existing, New, To be installed or Abandoned*), Category (*Boundary valve, Branch valve, Line valve, Step valve, Decommissioning valve, Washout valve or Air valve*), DPR number

iv. Reducer

ID, Road name, installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

v. Tees and Inverted Tee

ID, Road name, installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

vi. Flange Adaptor

ID, Road name, installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

vii. Flange / Socket Connector

ID, Road name, installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

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viii. Coupling

ID, Road name, Installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

ix. Bend

ID, Road name, installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

x. Stub Flange Connector

ID, Road name, installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

xi. End Cap

ID, Road name, installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

xii. Ferrule (Not Used)

ID, Road name, installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

xiii. Reducer

ID, Road name, installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

xiv. Nodes

ID, Road name, installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

xv. Tees for extension

ID, Road name, installed date, Status of life cycle (Active, Inactive or Abandoned), Nominal diameter, Depth, Material, Chainage, Ground level, Size remarks, DPR number.

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xvi. House Connection EF Tee

House connection tapping related information (Size of connection, Installed Date. DPR number)

xvii. Chamber

Washout, Air valve, Gate valve, Butterfly Valve and Flowmeter chamber

Costs for provision of the ArcGIS Data Base shall be covered under the respective General Bill Item as provided in the Bill of Quantities.

PR.3.8 Layout Data

The Contractor shall keep neat and legible notes of measurements and calculations made by him in connection with the setting out of the works. Copies of all such data shall be furnished to the Engineer for use in checking the Contractor's setting out, as provided under the Sub-Clause for "Surveying and Setting-Out".

PR.3.9 Standards and Specifications

The Contractors shall provide the Engineer with two sets of each standard and specification referred to in this specification concerning equipment, materials and workmanship in English.

PR.3.10 Taking-Over Documents

The final Taking-Over Documents to be submitted and handed over by the Contractor on Completion of the construction Works shall comprise the following:

a) Operation and Maintenance Manuals (3 Copies)
b) Commissioning Sheets (3 Copies)
c) Test Reports (3 Copies)
d) As Built Drawings (in AutoCAD Format) (3 Hard copies and one Soft copy in CD)
e) Geodatabase in Digital Format (ArcGIS System) (3 Soft Copy in CD)
f) Warranties

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PR.4 CONTROL OF MATERIALS

PR 4.1 Approval of Materials and Equipment

Only as-new materials and equipment shall be incorporated into the works. All materials and equipment furnished by the Contractor, such as cement, aggregate, reinforcement, steelwork, bolts, gravel, sand, backfill material, geotextile, pressure pipes, non-pressure pipe, etc. shall be in accordance with the Specifications and subject to the inspection and approval of the Engineer. No material shall be incorporated into the works without prior approval of the Engineer. The Contractor shall submit to the Engineer, all data relating to materials and equipment proposed to be furnished for the works, at least 21 days prior to purchasing or commencing such works. Such data shall be of sufficient detail to enable the Engineer to identify the particular product and to form an opinion as to its conformity to the specifications.

All required facilities including labour for the handling and inspection of all materials and equipment shall be furnished by the Contractor at his own cost. Prior to commencement of the relevant works, the Contractor shall submit samples of materials and carry out special tests to demonstrate that they conform to the specifications. Such samples shall be furnished, stored and tested as directed, at no extra cost to the Employer.

The Contractor shall submit data and samples sufficiently early but not less than twenty-one (21) days prior to the approval required date to permit consideration and approval before materials are ordered. Any delay of approval resulting from the Contractor's failure to submit samples or data timely shall not be used as a basis for any claim financial or otherwise against the Employer. In order to demonstrate the proficiency of workmen or to facilitate the choice among several textures, types, finishes and surfaces the Contractor shall provide such samples of workmanship of finish as may be required by the Engineer.

In case of all Imported Materials or Equipment (as relevant) under this Contract that are utilized for Permanent Works as per the BOQ, or ordered by the Engineer, the Contractor shall submit list of Materials or Equipment to be Imported to the Engineer for approval prior to placing purchase orders or order for manufacture. The Employer shall arrange exemption of Customs Duties only for the Materials or Equipment Imported as per the approved list, on submission by the Contractor of the documents *(Customs Declaration Forms)* issued by the by the Sri Lanka Customs. If it differs or is in excess of the approved list, the Employer shall not consider the stated exemption until the matter is sorted out. Demurrages for delay in clearing of shipment, or any other costs arising out of such works (considered as fraud), shall be borne by the Contractor at his own cost without any additional charges to the Employer.

For other items outside the BOQ imported by the Contractor on his own intent that shall be used for the works, must require the approval of the Engineer prior to ordering or importation. However, the Contractor shall bear all the costs of such works including all the duties, taxes, levies etc., at no extra cost to the Employer.

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PR 4.2 Inspection & Testing

Prior to the Works, individual tests on all proposed construction materials shall be in accordance with the Employer's Requirements, and in accordance with the requirements of the applicable Standards.

The Contractor shall submit to the Engineer for approval a Programme for Works testing, from commencement and up until Taking-Over, at least 28 days in advance of the proposed start date of the first testing and shall agree on the timing not less than one week before the start of testing. The Contractor is required to prepare test record sheets for all test results, for the approval of the Engineer, at least one month before tests are programmed to commence. As soon as the Engineer is satisfied that sufficient sections of the Works have been substantially completed, the Contractor can notify to commence testing.

The Contractor is responsible for all costs involved in the testing for the Works, all arrangements, equipment, temporary arrangements, fuel, electricity, water, provision of qualified testing staff, sampling and analysis, and all other costs as required.

It is the Contractor's responsibility to provide suitable quality for water for the flushing of pipelines and for hydrostatic pressure testing. The Engineer's approval is needed for the source of the water for testing, as well as the quality of the water. The Contractor shall provide Water Quality Test Reports of the water from the source that he proposes for Testing, or otherwise the water for testing shall be purchased from NWSDB as stipulated in the Particular Conditions.

During the stages of testing, no water shall be discharged into the water supply network except with the prior authorization of both the Engineer and Employer.

All instruments used for testing purposes shall have been calibrated by an independent accredited testing authority, and shall have a valid calibration certificate dated not exceeding 3-months prior. The Contractor shall satisfy the Engineer as to the manufacturer's certified accuracy of all the instruments used for the tests, or otherwise have them calibrated at his own expense by an independent authority.

For each and every test which the Contractor is required to carry out pursuant to the Contract, the Contractor shall produce a written report, in a format approved by the Engineer, certifying that the test has been carried out and the result. The Contractor's representative who carries out such tests shall sign the test record. The tests which are witnessed by the Engineer shall be countersigned upon the same record provided by the Contractor. The Contractor shall be responsible for collecting and collating all data into a bound report in an approved format.

Individual Tests - Individual tests shall be carried out in the presence of the Engineer and shall include at least the following tests which shall conform to the Contract Requirements:

- Concrete Tests, as specified;
- Compaction Tests for bedding and backfilling;

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- Compaction Tests for roadworks sub-base and surfaces.
- Asphalt Core Tests for roadworks;
- Operational test for all valves;
- Hydrostatic Pressure tests for water supply pipelines;
- Leak-tightness tests for chambers, as specified;
- Flushing and disinfection, as specified;
- All Other Tests as specified throughout the Employer's Requirements, Specifications, Drawings, and General Conditions of Contract;

All individual Tests shall be completed, as per the relevant Technical Specifications, technical Standard or as specified elsewhere, before starting the Commissioning/System Tests.

Commissioning/System Tests - Commissioning Tests on the overall works for the Water Supply Network shall be carried out by the Contractor to demonstrate to the Engineer that the completed Pipeline Network is ready to operate and satisfy the functional requirements. The Contractor shall provide his Programme of Commissioning including proposed sequence of opening and closing of Valves etc., which is to be carried out with the NWSDB O&M Staff, if so needed. The relevant O&M Officials of the NWSDB RSC-NC shall be present for the Commissioning.

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PR 4.3 Equivalent Materials and Equipment

Whenever a material is specified by using the name of the standard and/or class internationally accepted, the specified item mentioned shall be understood as the minimum acceptable standard. Other material may be accepted provided that sufficient information is submitted as specified elsewhere in this Specification to allow the Engineer to determine that the materials proposed are equivalent or better than those named. Such items shall be submitted 21 days prior to purchase for review and approval by the Engineer as per the procedure set forth in Clause PR 3 under Section 6A under "Submittals".

PR 4.4 Handling and Storage of Materials

Cement and lime shall be stored off the ground, covered and kept completely dry at all times. All structural steel, miscellaneous steel and reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease and in a position to prevent accumulations of standing water to minimise rusting. Beams shall be stored with the webs vertical. Pre-cast concrete elements shall be handled and stored in a manner to prevent accumulations of dirt and stagnation of water, staining, chipping or cracking. Masonry products shall be handled and stored in a manner to reduce breakage, chipping, cracking, and spilling to a minimum.

Any materials considered to be damaged or unfit for their intended use or not as specified for the work, in the opinion of the Engineer shall be promptly removed from the site of the work and the Contractor shall not be liable for any compensation for the

replacement of the damaged material or its removal. After placement of the backfill, all surplus material shall be removed immediately from the site by the Contractor.

Construction materials shall not be stored in streets or elsewhere for more than 5 days after unloading. All materials and equipment not installed or used within the construction within 5 days after unloading shall be stored elsewhere by the Contractor at his expense unless additional storage time has been prior approved by the Engineer.

PR 4.5 Materials Stock Control

The Contractor shall store all goods in a methodical and systematic manner, particularly the materials to be used in the Permanent Works in order to control his work efficiently and also to permit the Engineer to physically monitor the quantities in stock. The Contractor shall submit his up-to-date stock list of materials required for the Permanent Works at each month or at such other times as may be requested by the Engineer. In any case, such material list shall form part of the submission with his monthly valuation certificate.

PR 4.6 Salvage of Materials and Equipment

Any existing materials or equipment that were removed and not reused as a part of the works shall remain the property of the relevant agency. The Contractor shall carefully remove in a manner to prevent damage to materials and equipment specified or indicated to be salvaged and reused or to remain the property of the relevant agency. The Contractor shall store and protect salvaged items specified or indicated to be reused in the work. Salvaged items not to be reused in the works but remain the property of the relevant agency shall be transported and delivered by the Contractor in good condition to the owner as may be decided by the Engineer.

Items damaged during removal, storage, handling or transportation through carelessness or improper procedures shall be replaced by the Contractor in kind with new items at his own cost. The Contractor may at his own discretion and expense furnish and install new items acceptable to the Engineer without additional cost in lieu of those specified or indicated to be salvaged and reused. In such event, the removed items shall become the property of the Contractor. Existing materials and equipment removed by the Contractor shall not be reused in the works except where so specified or indicated.

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PR.5 TEMPORARY FACILITIES

PR.5.1 Field Offices for the Contractor

Field offices for the Contractor shall be established in proximity to job sites at the locations approved by the Engineer and shall be maintained in a clean orderly condition by the Contractor for the duration of construction unless earlier removal is authorised by the ER. Boundaries of the Contractor's offices, work-yards, workshops, depots and stores shall be agreed with the Engineer. Proper fencing, including lockable gate, shall be provided by the Contractor along the agreed boundaries and be completed within a period of thirty (30) calendar days after signing of the Contract Agreement, and maintained by the Contractor until the issuance of Certificate of Completion for the Works. The Contractor or his authorised representative shall be present in the office at all times while work is in progress. Instructions received there from the Engineer shall be considered as delivered to the Contractor. The Contractor shall also provide mobile offices for his staff at construction and pipeline work sites as required.

PR.5.2 Temporary Workshop and Dwellings for Contractor's Employees

Prior to constructing workshop or dwellings at the job site, permission shall be obtained from the Engineer. Workshops shall be constructed in such a manner that they will not be an obstacle to the movements of the general public, shall not cause noise pollution and shall be aesthetically acceptable. The area shall be kept clean at all times. If the Contractor provides living accommodation for those employed by him, the dwellings shall have adequate living space be maintained in a clean and sanitary condition. Each dwelling unit shall be provided with lights, water supply and sanitary facilities and properly furnished. The dwellings shall be hygienically clean and the Contractor shall take all steps to prevent contagious diseases or such diseases spread by mosquitoes etc. The Contractor shall take special care to ensure that all premises under his control are free from pools of stagnant water to prevent breeding of mosquitoes.
Employer shall not be responsible for any fatality that may occur due to the negligence of the Contractor. All first aid facilities shall be maintained at all dwellings at all times. The Contractor shall ensure that standby transport arrangements are available and maintained at all times to the nearest hospital in case of accident or illness.

The Cost of providing and maintaining Contractor's Temporary Facilities stipulated in Clauses PR 5.1 and PR 5.2 of Section 6A shall be deemed to be included generally in the Rates & Prices of the BoQ Items of the Contractor's Bid.

PR.5.3 Facilities for Engineer's Staff - Project Manager Office/Mobile/Field Office and Residential Facilities

*[**Note to the Bidder/Contractor**: The following Facilities are listed for the purpose of this Lot C1 Contract. The Bidder is to incorporate all the requirements as stipulated below and quote his total price as Monthly Rate under the respective BoQ item as provided for each Facility. Prior to placing orders or making any arrangements on such Facility, the Contractor shall liaise with the Engineer to understand the specific requirements, which the Engineer may time to time decide as and when the Facility requirements are needed/terminated].*

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PR.5.3.1 Facility Requirements

The following Facilities and Services *(water supply including drinking water, air conditioning, office stationery, sanitary facilities, electricity, and telephone with ADSL as specified)* for the Engineer's Staff shall be provided by the Contractor for the exclusive use of the Engineer's Staff. Locations of each Facility shall be agreed by the Engineer. Note that, the Facilities provided under this Contract (Lot C1) may be used by the Engineer's Staff for other Contracts Packages under the Anuradhapura North Water Supply Project – Phase II.

- Project Manager Office for Engineer's Staff at Kebithigollawa with Office Equipment and Furniture including Air Conditioning, Telecommunications & Office Supply Facilities etc., as specified.

- 01 No. Mobile/Field Office for Engineer's Supervisory Staff at Padaviya to be used at relevant Pipe-Works Sites with Office Equipment and Furniture including Air Conditioning, Telecommunications & Office Supply Facilities etc., as specified.

- Fully furnished 02 Nos. Residential Accommodations for Engineer's Staff at Kebithigollawa including Kitchen Appliances, Kitchen Utensils, Cutlery & Crockery, Telecommunications (Internet Facilities) & Gas supplies, etc., as specified. <u>These equipment and materials for Residential Facilities shall remain the property of the Contractor.</u>

- As required, a laboratory with suitable Office Equipment, Apparatus, Furniture, and Testing Consumables & Office Supply shall be erected at convenient location.

- Surveying & Personal Protective Equipment, as specified;

- Vehicles *(including Drivers)*;

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PR.5.3.2 Specific Requirements

Particular requirements in respect of the above facilities and services are detailed in the following clauses and the following shall apply:

A. All matters in respect of Facilities or Services shall be subject to the Engineer's formal approval. The Contractor shall submit details of all proposals prior to placing orders or making any arrangements. These PMO/Field Project Offices & Residential Facilities etc., shall be located within or in proximity of the respective Sites and as directed by the Engineer.

B. The Facilities shall be provided with a 220/240-volt electricity supply. Back up provisions shall be provided to all Facilities in the form of a standby electricity generator in the event of systematic failure of the main supply. The standby electricity generators shall be of sufficient power to supply the entire peak electricity demand (including air conditioning) of the offices. Power

points shall be supplied in numbers and at locations to the satisfaction of the Engineer. The power supply shall be fully earthed and shall be subject to power peak protection and voltage regulation.

C. The Facilities shall have a continuous water supply. There shall be a continuous supply of potable water, which may be provided separately through rechargeable dispensers or bottled supply. The Facilities shall be supplied with bottled gas or other fuel as appropriate for the cooking equipment provided. The Contractor shall be responsible for providing suitable hygienic methods for the treatment and disposal of waterborne sewage, waste water and refuse from all buildings

D. The Contractor shall provide fixed line telephones with intercom facilities and broadband internet connection to the PM Office throughout the period of occupancy of the Office. The internet connections shall be independent of any internet connections installed by the Contractor for its own use. The Monthly Bill to be paid by the Contractor for such communication facilities at PM Office except the mobile phones shall not exceed **LKR. 15,000.00.**
The Monthly Bill for each Mobile phone communication facility provided for PM Office to be paid by the Contractor and shall not exceed **LKR. 2,500.00.**
The Monthly Bill for the Internet and Mobile phone communication facilities for each phone provided for Field Office to be paid by the Contractor and shall not exceed **LKR. 3,000.00.**

E. All Facilities shall be newly constructed for the purpose of the Project except where expressly provided otherwise. The rented Facilities may also acceptable, subject to it conforming to the requirements specified.

F. Notwithstanding any particular requirement detailed below the buildings shall be to contemporary standards, shall comply with national building regulations and legislation and be fit for intended use.

G. All facilities and services shall be for the exclusive use of the Engineer and his staff during the period of the Contract and as further required to finalize measurement, payment etc.

H. The Contractor shall provide the Facilities and Services as soon as is practical and not later than 28 days after signing of the Contract Agreement. During the period prior to provision of the regular Facilities, the Contractor shall provide fully functional office accommodation & other facilities at a suitable location mutually agreed with the Engineer.

I. The Contractor shall provide the Laboratory Buildings, Facilities, Equipment, Apparatus and Services as soon as is practical and not later than 28 days after signing of the Contract Agreement. All the Equipment shall be mobilized on Site and made operational within this period so that it can be checked and approved by the Engineer well in advance of the commencement of

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Construction Work so that the Testing of Material Sources can be commenced as soon as possible.

J. The Contractor shall supply all the Vehicles as soon as is practical and not later than 28 days after signing of the Contract Agreement. Prior to the provision of the Vehicles the Contractor shall make available to the Engineer Similar Vehicles to the approval of the Engineer.

K. The Contractor will be responsible for ensuring that, the Facilities provided for the Engineer are secure at all times and shall erect fencing and employ day and night watchmen/security guards.

L. The Contractor shall provide replacement Services or Facilities whenever any item becomes unavailable or unusable from any cause.

M. The Facilities will include the provision of land, site grading, all weather access roads, hard standing parking facilities for vehicles with water supply, hose and vehicle wash down facilities, construction of all necessary appurtenances such as drainage systems, fencing, utilities, landscaping and area development etc.

N. The Contractor shall provide janitorial services to maintain a good working dwelling environment and security service at each Facility. Water and Electricity supply including receptacles on all walls, toilet facilities, potable water shall be provided. The Facilities shall be well lit, equipped with ceiling fans and air-conditioners with temperature control capable of maintaining a constant temperature of about 20° C. The Contractor shall provide all wiring, receptacles and fixtures in accordance with relevant codes and regulations. The offices in general, shall comply with local /building ordinances and be provided with all necessary fire extinguishers and approved first-aid kits.

O. Requirements for Kitchens, Wash Rooms and Partitioning of all Offices are as follows:

(a) The kitchen shall contain a sink, 0.5m^3 refrigerator, two burner gas cooker, 12kg gas cylinder, lockable cupboard (approx. 1.9m x 0.7m x 0.9m) with Formica top.

(b) The wash room shall be fixed with low level suite complete with fittings, wash basin 550 x 375 mm (pedestal type), shower, mirror (500 mm x 400mm), towel rack etc. All plumbing fittings shall be porcelain and all plumbing including pipes shall comply with local laws and regulations.

(c) Full partitioning up to the ceiling or roof of the office shall be done according to the above requirements with Aluminum frame. The middle third portion (approximately) of the partition shall be glass and the top and the bottom portion shall be plywood. Plywood shall be suitably painted. The specification for aluminum sections and glass are as follows. All partitioned rooms shall be provided with suitable lockable doors.

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P. Specifications for Partitioning shall be as follows:

i) All sections shall be extruded from AA 6063 aluminium alloy.

ii) All aluminium extrusions shall be powder coated to a thickness of minimum 70-75 microns.

iii) Joint sealants used for peripheral caulking and shall be one-part silicone sealant and shall conform to BS 4245.

iv) All surfaces shall have an anodized protective surface layer of minimum 25-micron thickness.

v) Frames shall be designed and manufactured with a maximum 2.5mm tolerance around the opening in the structure.

vi) Frame and/or sash sections shall be of extruded 6063-T5 aluminium having a nominal thickness of 1.575mm (accepted commercial tolerance of ± 0.15mm shall apply)

vii) Glass thickness is 5mm up to 0.54m^2 of glass area & 6mm above the glass areas when greater than 0.54m^2.

Q. The Contractor shall maintain all Facilities except where expressly provided otherwise, for the duration of the Contract, such maintenance shall include but not be limited to:

(a) keeping buildings in good repair and decorative order, and free from pests, insects etc.;

(b) cleaning offices/facilities and laboratory daily;

(c) maintaining the grounds around buildings;

(d) supplying kitchen-ware and crockery and cleaning materials;

(e) supplying toilet and cleaning equipment and materials;

(f) providing power and water, telephone services, fax and e-mail facilities;

(g) servicing and repairing all fittings and equipment installed, Eg: air-conditioners, fans, kitchen appliances etc.,

(h) provide adequate security for Offices and Laboratory.

R. The Facilities shall comply with the following requirements:

(a) facilities shall be insulated and painted internally and externally.

(b) floor to ceiling height shall be at least 2.7 m.

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(c) each external wall of each room shall have at least one insect proof screened window and shall have blinds.

(d) individual office rooms shall be provided with a floor/ceiling fan;

(e) kitchens and the bathrooms shall be provided with an extractor fan;

(f) all rooms shall be lockable and shall be fitted with auto-door closers;

(g) external doors shall have double mortice locks;

(h) floor coverings for the offices shall be vinyl, ceramic tiled or as approved by the Engineer.

(i) the laboratory floors shall be concrete painted with a sealant;

(j) emergency fire exits shall be provided and shall be clearly marked;

(k) Fire Protection/Fighting Facilities shall be provided;

S. At completion, all the equipment and furnishings of the Facilities ***(except the equipment/furniture provided for Residential Facilities)*** shall be handed over to NWSDB and will become Property of NWSDB thereafter. Immediately prior to the handing over to NWSDB defects in equipment and furnishings shall be made good and shall be in serviceable condition to the satisfaction of the Engineer.

T. Following Personnel shall have to be provided and maintained throughout the Contract. They shall work directly under Engineer's Staff.

- Each PM's Office

  - Office Aid 01 No.
  - Security Officer 02 officers per day, one for a 12-hour shift, two shifts per day to cover 24 hours service

- Field Office

  The Contractor shall be responsible for cleaning, securing and maintaining of each Field Office throughout the Project Period to the satisfaction of the Engineer.

- Residential Facility

  - Caretaker cum Cook 01 No.

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PR.5.3.3 Project Manager's Office at Kebithigollawa

The Project Manager's Office (PMO) at Kebithigollawa shall be made up as follows by partitioning or otherwise;

Partitioning	Min. Area (sqm)	Remarks
Project Manager	20	Common Washroom & Toilet (minimum 5sqm)
Resident Engineer	20	
Engineer 2 (04 Engineers)	40	Common Washroom & Toilet (minimum 5sqm)
EA 5 & EA 6 (02 Nos)	20	
Management Assistant 1, Office Aid 1	15	
Conference Room	35	
Pantry & Lunch Room	20	
Total Plan Area with 02 Washrooms	170	

*In addition to the above, covered parking space for 05 (five) vehicles shall be provided.

PR.5.3.4 Engineer's Field Office at Padaviya Site

Mobile Field Office at Pipe-Work Sites shall be fully Air-Conditioned and made up as follows, by partitioning or otherwise;

Partitioning	Min. Area (sqm)	Remarks
Engineering Assistants Room	20	01/02 Persons
Kitchen/Lunch Room	10	-
Wash Room with Toilet	05	
Total Plan Area	**35**	

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PR.5.3.5 Engineer's Residential Facilities - 02 Units (01 unit for PM, RE etc., & 01 unit for other Engineer's Staff) at Kebithigollewa

- The Residential Facility No. 1 for Engineer's Staff shall be made up as follows, by partitioning or otherwise;

Partitioning	Min. Area (sqm)	Remarks
Living Room/Dining Area	40	03/04 Persons
03 Bed Rooms with attached Bathrooms	60	Toilet with Bath each minimum 5 sqm
Caretaker's Room with Toilet	15	-
Kitchen/Pantry & Lunch Room	15	-
Total Plan Area including Washrooms	**145**	

- The Residential Facility No. 2 for Engineer's Staff shall be made up as follows, by partitioning or otherwise;

Partitioning	Min. Area (sqm)	Remarks
Living Room/Dining Area	40	05/06 Persons
05 Bed Rooms	100	Toilet with Bath minimum 5 sqm – 03 Nos.
Caretaker's Room with Toilet	15	-
Kitchen/Pantry & Lunch Room	15	-
Total Plan Area including Washrooms	**185**	

*In addition to the above, covered parking space for 04 (four) vehicles shall be provided for each resident.

"For References ONLY" (Not for Bidding)

PR.5.3.6 Equipment and Furnishing

- **Equipment for Project Manager's Office**

Telephone Line Connections	1
Broadband fiber internet connection of 1000mbps Download speed with 15 port1000mbps Switch connecting all the computers and printers with two extra network outlets.	1
01 Nr. Facsimile Machine completes with paper supply and dedicated Telephone Line.	1
Stationeries, Scientific Calculators, office utilities, marker pens etc.	As required

Following new Furniture and Equipment shall be provided and maintained for the Contract Period for **Project Manager's Office and Mobile/Field Office** as follows. These equipment and materials shall remain the property of the NWSDB.

Item	Each Project Manager's Office	Each Mobile/Field Office
Branded Laptops Computers with internet email facility and inclusive all with latest Microsoft Office Licensed Software.	5	1
Branded PC Computers (21inch monitors for the all desktop computers) with latest Microsoft Office Licensed Software and all with Network WiFi connectivity.	5	-
Pen Drivers - 16 GB – (Memory Sticks)	4	1
Mobile Phones complete with dedicated numbers (Corporate Package)	5	1
Minimum 12-Line Telephone Exchange (PABX System) with privacy of conversation to connections on 01 Telephone line + Fax Line	1 set	-
Biometric Hand Geometry Time & Attendance System	1 set	-
Digital Camera	1	1
White Boards (Large)	2	-
White Boards (Medium)	-	1
Executive Table (1.8 m x 0.92 m x 0.78 m with two Lockable Drawers)	2	-
Junior Executive Tables (1.5 m x 0.600 m x 0.770 m with two Lockable Drawers	6	-
Steel Tables 1.2 m x 0.6 m with one Lockable Drawer	2	2
Conference Table 2.4 x 1.2 m	1	-
Dining Table with 06 Suitable Chairs	1	-
Dining Table with 04 Suitable Chairs	-	1
Drawing Rack	2	1
High Back Chair with Plastic Rest and Plastic Base with Wheels	2	-
Medium Back Chair with Plastic Rest and Plastic Base with Wheels	6	0
Low Back Chair with Plastic Rest and Plastic Base with Wheels	2	2

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Item	Each Project Manager's Office	Each Mobile/Field Office
Visitor Chair with Plastic Arm Fabric Blue	6	2
Suitable Chairs for Conference Table	8	-
Filling Cabinets with four Drawers (18.5"x 24" x 53")	7	2
Steel /Wooden Cupboards (2.0 m x 0.9 x 0.5 m)	4	-
Bottled Drinking Water Dispenser with provision for Hot, Normal & Cold Water for the Contract duration	2	1
Automatic Electric Kettle 1500 W (2 L)	1	-
Automatic Electric Kettle 1500 W (1 L)	-	1
Kitchen/Lunch Room Utensils and Set of Cutlery, Crockery Items (Dining & Tea)	As required	
Window/Split Type Air Conditioners (minimum BTU 15,000)	6	1
Variable speed Floor Mounted Oscillating Fans	6	1
Refrigerator, 2 Door Min 225 Lt.	1	-
Wall Clock	5	1
Fire Extinguishers (CO2)	2	1
File Trays	8	5
Waste Paper Bins	8	2
Set of Garbage Bins (70 L) each for segregation of Wastes as per the regional requirements	1	1
Facsimile Machine	1	0
Printers (A3, A4 LaserJet Type)	3	-
Photocopier	1	0
Stationeries, Scientific Calculators (FX-991ES PLUS or above), office utilities, marking pens etc.	As required	As required

"For References ONLY" (Not for Bidding)

Following Furniture and Equipment shall be provided and maintained for the Contract Period for each Accommodation for Engineer's Staff as follows. These equipment and materials shall remain the property of the Contractor.

Item	Resident for PM & RE	Resident for Engineers & EAA
Sofa Set (03 pieces for 06 persons)	1	1
Entertainment Centre (TV Cabinet)	1	1
Lounge Chairs	6	6
Wardrobe (Single Unit)	4	7
Chest of Drawer with Mirror	4	7
Bed with Mattress (6'X4')	4	7
Bottled Drinking Water Dispenser with provision for Hot, Normal & Cold Water	1	1
Dining Table Set with 06 Suitable Chairs	1	1
Pedestal Fans	3	5
LED TV Set	1	1
Kitchen/Lunch Room Utensils and Cutlery, Crockery Items	As Required	
Kitchen Appliances (Gas Cooker, Electric Kettle 1.5 L, Rice Cooker, Refrigerator etc.)	As Required	

"For References ONLY" (Not for Bidding)

Note: ***Specifications provided below are only for guidance purposes. Specifications shall be submitted by the Contractor to Engineer/ER's prior to purchase.***

- **Photo Copier**

The Photocopying Machine to be supplied shall have minimum 18 cpm, page memory 64 MB, zoom 25% - 400%, two paper cassettes and 100 sheet stack by-pass, electronic sorting, 2400 x 600 dpi copy resolution, energy saving mode and shall be complete with toner and paper suitable for A4 & A3 printing and scan facilities.

The machine shall be procured from an accredited agent of reputed manufacturer with the approval of the Engineer/ER and shall have 12 months' manufacturer guarantee from the date of delivery. During this period, the equipment shall be serviced once a month by factory trained personnel and these services shall be carried out free of charge, Hardware found defective due to manufacturer defects during the one-year period shall be replaced free of charge. Adequate quantities of spares shall be readily

available with the supplier to facilitate immediate repairs. Similar backup machines shall be provided by the supplier in case the defective machines need more than 24 hours for the repair work.

The Contractor shall bear the costs of supplying toners, servicing and repairing the photocopier throughout the Contract Period.

The photocopier shall remain the property of NWSDB.

Digital Camera

18 Megapixels digital camera, LCD screen size equal or more than 3" with one-year manufacture warranty,30x optical zoom, high definition video resolution,35mm film type, CMOS–image sensor type.

The Digital Camera shall remain the property of NWSDB.

Laptop and Desktop Computers

All computers to be supplied shall be procured from an accredited agent of reputed manufacture with the approval of the Engineer/ER. The specifications will be given at the time of purchase, however must comply with the following features.

- **Laptop Computers**

  Intel® Core™ i5 8th Generation (8500) or better. Windows 10 Professional original pack with DVD (3 count). Mobile Intel® HM65 Express Chipset or better. 8 GB DDR4 system. 15.6" WXGA HD Clear Super View LED Black light HD Bright view display (16.9), resolution 1,366x768. ATI Mobility Radeon™ HD 5650. Storage 1TB (SATA) and 32 GB external pen drive. DVD Super Multi Double Layer Drive (DVD: RWRAM). Touchpad with multi-gesture support/Numerical key pad. Bluetooth V2.1w/Enhanced Data Rate, Integrated 802.11bgn, 10/100Mbps LAN. Built in Web Camera with Smart Face™ Technology. Stereo Speakers, 16-bit Stereo with Intel® High Definition Audio Support. 2XUSB 2.0, x USB/e – SATA combo port, RGB, HDMI, 4-in-1 Card Reader (Supports SD™ Card,

  Starting from 2.45Kg or better. Metallic Gray or better. 3-Year carry – in Regional Limited Warranty (parts & labour), 1-year battery (carry-in). Original carrying bag.

- **Desktop Computers**

  Intel® Core™ i5 8th Generation (8500) or better. Windows 10 Professional original pack with DVD (3 count). Mobile Intel® HM65 Express Chipset or better. 8 GB DDR4 system. 15.6" WXGA HD Clear Super View LED Black light HD Bright view display (16.9), resolution 1,366x768. ATI Mobility Radeon™ HD 5650. Storage 1TB (SATA) and 32 GB external pen drive. DVD Super Multi Double Layer Drive (DVD: RWRAM). Numerical key pad. 3-Year carry – in Regional Limited Warranty (parts & labour).650 VA UPS.

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The computers shall be provided with the latest Licensed Versions of MS Windows/MS Office including software of MS Project & other standard software including and Internet/E-mail services and latest Kaspersky License.

The computers shall have 3 years of comprehensive manufacturer guarantee from the date of delivery. Software and hardware found defective during the guarantee period shall be replaced free of charge. Adequate quantities of spares shall be readily available with the supplier to facilitate immediate repairs. Similar backup machines shall be provided by the supplier in case the defective machines need more than 24 hrs. of repair work.

The computers shall remain the property of NWSDB.

- **Anti-Virus Software shall be,**

Kaspersky Internet Security (Latest) or equivalent to be maintained and updated for three years from the date of installation.
Should also protect from the following;

- Viruses and worms
- Spyware and Trojans
- Hijacking and Botnets
- Identity theft
- Network attacks
- Spam

Should also include the following;

- Two-way firewall
- Virtual keyboard
- Parental control

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Software and hardware found defective during the period as specified above shall be replaced by the respective Agent. Adequate quantities of spares shall be readily available with the supplier to facilitate immediate repairs. Similar backup machines shall be provided by the supplier in case, the defective machines need more than 24 hours of repair work.

- **A4-A3 Color Laser Printer**

Speed: Up to 30 ppm, Print technology: Laser, Monthly print volume: 500 to 2500 pages, Memory: 16 MB, Paper handling: 250-sheet input, Interface: USB / Ethernet.

The printers shall remain the property of NWSDB.

Facsimile Machine

The Facsimile Machine to be supplied shall be procured from an accredited agent of reputed manufacture with the approval of the ER and shall be plain paper desktop transceiver type working on public-switch telephone networks. The specifications shall be given at the time of purchase. However, it shall be equipped with the following features.

Technology: Inkjet/Mono, Page memory: 200 Pages, Telephone: Handset, Transmission time shall be less than 20 seconds with modem speed: 33.6 Kbps with automatic fallback. Resolution shall be 600 DPI. Paper size shall be A4 size and shall be suitable to operate under temperature and humidity conditions prevailing in the project areas. The machines shall have the features of 100-sheet paper capacity, 10-sheet automatic document feeder and automatic dialer. The fax machines shall have 12 months guarantee.

The Fax machine shall remain the property of NWSDB.

Supply of Stationeries for each PMs Office

The Contractor shall bear the costs of supplying stationeries (05 packets of A4-80 GSM and 01 packets of A3-80 GSM per month), toners for the photocopier (02 Nos. of black, 01 No. of cyan, 01 No. of yellow & 01 No. of Magenta per every 02 months), toner bag for photocopier (01 for every 06 months), toners for the fax machine (01 No. for every 03 months) for the duration of Contract. Similarly, the Contractor also bears the costs supplying toners for the fax machine and printer

Biometric Hand Geometry Time & Attendance System

The Finger Print Machine to be supplied shall be procured from an accredited agent of reputed manufacture with the approval of the Engineer/ER. The Specifications will be given at the time of purchase, however must comply with the following features.

Composite algorithm system with high speed operating, Embedded LINUX system, easy to integrate into the various system Standalone or network environment, embedded multi-language interface, 3” color screen with more compatible usage, 24 hours continuous operation available, Saves data during a power outage.
Technical Specification:

- Display/Speaker: LCD Display: 3" TFT high-definition graphical interface
- Speaker: Voice Prompt (language can be selected)
- Language: English
- Fingerprint Capacity: 3,000
- Log Capacity: 100,000

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- Operation Temperature: 0°C ~ 45°C
- Operation Humidity: 20% ~ 80%
- Verification/Identification:
  FRR: ≤0.01%

  FAR: ≤0.0001%
- Machine Size: 205(L)*145(W)*53(H)mm
- Power: 110/220VAC ~ 12VDC
- Communication: TCP/IP, RS232/485, USB Host/Client
- Attendance Status: Check in, Check out, Break in, Breakout, OT in, OT out
- Standard Function: SMS, Work code, Scheduled-bell, T9 input, Web server, Auto status, DST

The Engineer approved model/brand shall have procured, install in the said Offices including of wiring, training and he shall maintain them in good working order until reverts to the Contractor on completion of the Project.

Telephone Facilities

The Contractor shall provide telephone connections at the Project Manager's Office, with internet connections in the name of the Employer. Also, the Contractor shall install in the said offices as indicated PABX Systems with extensions. The Contractor shall pay monthly bills, maintain them in good working order. In addition, the Contractor shall pay monthly bills for the mobile phones for Engineer and ERs Staff and maintain them until completion of the Project.

*Note that the Mobile Phones' Batteries shall be disposed at a minimum 03-year period and all the E-wastes disposals shall be in accordance with Clause PR.5.20.

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PR.5.4 Transport Facilities for Engineer's Staff

- **Hired Vehicles are to be provided for the sole use of Engineer and Engineer's Representative Staff**

Refer Specification Section 6B.19 - Specifications for Vehicles for the details.

The Vehicle Requirements are shown in the following Table.

Location	Cars	Mile age	Double Cab Pickups	Mile age	Van (08 Passengers)	Mile age	Motorcycle	Mile age
PM's Office Kabithigollewa	1	2500 km	1	3000 km	2	2500 km	1	2000 km
			2	2500 km	-	-	-	

PR.5.5 Survey & Measuring Instruments, Personal Protective Equipment and Services for Use of the Engineer

The Contractor shall make available personnel and facilities for assisting the Engineer and Engineer's Staff, as required for the supervision of the Works. The Contractor shall provide operating personnel and the use of new Survey and Measuring Instruments of every kind necessary for Engineer/ER during the execution of the Works, as required for Engineer measurements and checking of all parts of the Works, at any time when requested. The Contractor shall employ competent men and provide such tools, survey equipment, stakes and other materials as the Engineer and Engineer's site staff may require, to demonstrate and verify his control points, and to check surveys, setting-out works, levels, measurements of work, and the like, as performed by the Contractor.

Each Instrument shall be approved in writing by the Engineer before being provided, and shall be in the form of a calibrated and workable instrument at the start of the Contract. The Contractor shall include a list of survey instruments he is proposing for the execution of the Project with his Bid.

All instruments and equipment shall be maintained in good condition, and shall be replaced in the event of damage or loss. Should any additional material, instruments and equipment be instructed by the Engineer, then they shall be provided and maintained by the Contractor as aforesaid. Items shall be required to be replaced to the extent necessitated by fair wear and tear, in time as indicated in the table below. All instruments and measurement tools, which are provided for inspection and testing purposes shall be modern and of the latest makes, with sufficient degree of accuracy for the intended purpose.

The Contractor shall provide every assistance to the Engineer and Engineer's personnel in carrying out their duties on site in accordance with the specification requirements. Such assistance shall include the provision for the full duration of the contract, for the sole use of the Engineer's supervising personnel, the following as-new materials, survey plant and safety equipment and quantities thereof, handed over to the Engineer.

The Cost of Surveying and Measuring Equipment and Personal Protective Equipment shall be deemed covered within the respective price entered in the General Bill of the Bill of Quantities for the provision of the above specified labour, equipment and materials, and maintenance of the same for the full duration of the Contract.

The Contractor shall provide submittals within 28 days of the commencement date, containing all information and brochures for all such required items to the Engineer, in accordance with the requirements for Submittals. No ordering or purchasing for any items shall be carried out until the written approval is received from the Engineer.

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The Following shall be provided:

Description	Minimum Nos.
Survey & Measuring Equipment	
Electronic Leveling Instrument with tripod with Accessories	2
Ranging Rods	8
GPS (Latest Version)	4
100m x 10mm Steel rustles measuring band divided throughout and numbered at 1 m intervals	4
50m Tapes	4
Measuring Wheels	2
50m Fiber Glass Box Tape	2
Surveyors Umbrella	2
Boxes of Yellow marking crayon and white chalk	As required
Personal Protective Equipment	
Rubber Boots (sizes to be assessed)	20 / 2 years
Coloured Safety Visibility Vests	20 / 1 year
Hard Hats	20 / 2 years
Safety Glasses protective eye wear	06 / 2 years
Ear muffs noise protection	06 / 2 years
Breathing Mask, with replaceable activated carbon filters	06 / 2 years
Industrial grade working gloves	20 / 2 years
Rainproof Wear	20 / 1 year
Safety Working Shoes (sizes to be assessed)	06 / 2 years
Safety Wear	20 / 1 year
Large size umbrellas	10 / 1 year
Cloth or plastic, housed winding-type 30m measuring tape	06 / 2 years
Steel retractable-type 3 metre measuring tapes	10 / 2 years
Flood-light Torches (rechargeable type)	06 / 2 years
In case of Active Pandemic Alert Situation	
Hand held Body Temperature Equipment/Thermal Scanner of Medical Grade.	01 each for Office Facility

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Set of Face Masks/Shield and Hand Gloves as required by the Employer/Engineer's Staff	The Quantity shall be determined at the time of requirement and shall be adequate the use of Employer/ Engineer's Staff
In an extreme situation where the standard of protective mask is a requisite, a particulate Respirator at least as protective as a NIOSH certified N95, EU standard FFP2, or equivalent shall be provided for the sole use of Employer/Engineer's Staff.	The Quantity shall be determined at the time of requirement and shall be adequate the use of Employer/ Engineer's Staff

PR.5.6 Laboratory & Tests Facilities

The Contractor shall provide information on his designated Laboratory for Field Laboratory Tests which shall be a well-maintained facility operational during the entire construction period, located within close proximity to the Project Area, and shall be approved by the Engineer. The Field Laboratory shall be adequately furnished and equipped with sufficient equipment and apparatus for the purpose of carrying out the all required soil and concrete tests as required under the Contract. Equipment and apparatus shall be of approved types and shall be adequate in the opinion of the Engineer to carry out all the tests as listed throughout the Specifications. The Contractor shall carry out all testing in the presence of the Engineer/Engineer's Representative throughout the course of the Contract.

The Field Laboratory Building have effective Floor Area of not less than 40sqm and shall be designed, proposed and constructed by the Contractor after securing the approval of the Engineer.

The Contractor shall supply and furnish the Field Laboratory with Equipment & Furniture to facilitate to carry out all the Tests as listed throughout the Specifications and shall not be limited to the followings,

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Description	Quantity
Desk, 6 side drawers and 1 center drawer (size 1.8 X1.0 m)	01
Straight Chair	04
Table (size 1.8X3.6m)	02
Waste Basket Large, Solid Sides, No Wire	02
Wall Board, Not smaller than 250 cm X 150 cm	02
Cupboard with Shelves and Locks	02
File Cabinet Four Drawers, Lock Type, Legal Size with Metal Clip Hanging Files (20 per Drawer)	01
12,500 BTU Air Conditioner	02

The Contractor shall furnish all required Equipment, Tools and Apparatus for the purpose of carrying out the required Concrete, Soil and other Tests as stipulated in the Employer's Requirements.

The Laboratory Equipment and Apparatus shall be of approved types and shall be adequate in the opinion of the Engineer to carry out all the tests as listed in the Specifications.

The Contractor shall maintain the Field Laboratory and assist the Engineer in operation of the laboratory throughout the course of the Contract and shall supply one English speaking laboratory technician, and two laborer's for operation of the Laboratory.

The power, water and gas shall be supplied to the Field laboratory by the Contractor. The daily laboratory supplies shall also be supplied by the Contractor.

At the end of the Contract, all equipment, apparatus and furniture of the Field Laboratory shall become the property of the Contractor, and shall be removed from the site.

The costs for all Laboratory Testing, furniture & equipment shall be deemed to be covered by the Contractor within his relevant rates & prices as quoted in the General Bill Item of the Bill of Quantities.

Costs for the following facilities, services and arrangements shall be deemed covered generally by the Contractor within his rates and prices, unless specifically stated otherwise.

PR.5.7 Water

The Contractor shall be responsible for the provision and maintenance of adequate supply of potable water for the use of his own as well as sub Contractor's workmen for construction and domestic consumption at his own cost. The Contractor shall install and maintain necessary supply connections and piping for the same but only at such locations and in a manner as may be approved by the NWSDB and Engineer. These temporary connections and piping installed by the Contractor shall be removed to the satisfaction of the NWSDB and Engineer before final acceptance of the Works.

PR.5.8 Electricity

All electrical power required by the Contractor for the works shall be provided by the Contractor at own cost. All temporary connections for the power supply shall be subject to the approval of the Engineer. Temporary lines shall be arranged, furnished, installed, connected, all costs paid for, and maintained by the Contractor in a workmanlike manner throughout the contract in accordance to the acceptable safety standards and to the satisfaction of the Engineer. These facilities shall be removed by the Contractor in like manner prior to final acceptance of the works unless requested by the Engineer otherwise.

PR.5.9 Sanitary Arrangements

The Contractor shall provide and maintain temporary sanitary facilities such as pour flush latrines and septic tanks on the sites for the use of all persons connected with the work. The Contractor shall keep the site in a clean and sanitary condition, and shall post notices and take such precautions as may be necessary to keep the site clean. The Contractor shall carry out any cleaning whatsoever as may be directed by the Engineer to maintain such sanitary conditions acceptable.

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PR.5.10 First Aid & Emergency Medical Service

The Contractor shall provide all necessary medical services and first aid facilities, attendants and supplies for his labour force, all sub-Contractors and suppliers in accordance with government rules and regulations and all other statutory requirements and/or to the satisfaction of the appropriate government departments, the Employer and the Engineer.

Properly equipped First Aid Boxes shall be located at strategic points of the Site. The Contractor shall also have competent first aid men available during working hours and shall arrange for medical services when necessary. The Contractor shall afford the Engineer's Site Staff and the Employer's Staff, the full use of the emergency medical services and other first aid facilities when required. The Contractor shall make available transportation facilities at all times for affected parties in emergency medical situations. The Contractor shall file with the Engineer, the names, addresses, and contact numbers of representatives who can be contacted at any time in case of emergency. The representatives shall be fully authorized and equipped to rectify unsafe or excessively inconvenient conditions at short notice.

PR.5.11 Barricades and Lights

All streets, roads, highways and other public thoroughfares, which are allowed by the authorities to be closed to traffic, shall be protected by effective barricades on which lights and acceptable warning signs shall be placed. Barricades shall be located at the nearest intersecting public highway or street on either side of the blocked section.

All open trenches and other excavations shall have suitable barricades, warning signs, and lights to provide adequate protection to the public. Obstructions such as material piles and equipment shall be provided with similar warning signs and lights. All barricades and obstructions shall be illuminated with warning lights from sunset to sunrise. Material storage and conduct of the work on or alongside public streets and highways shall cause minimum obstruction and inconvenience to the travelling public.

All open trenches and other excavations shall have suitable barricades, warning signs, traffic cones and lights to provide adequate protection to the public, and clear throughways marked to safely direct the through-traffic around the site. Obstructions such as material piles and equipment within road easement areas shall also be provided with similar warning signs, traffic cones and lights. Such worksites, trenches and material piles shall have warning signage progressively placed upstream of the traffic flow, from a point 100metres from the site and one sign then placed at every 30 metres, to give public vehicle drivers sufficient time to adjust their driving direction, line and speed well prior to reaching the point of the site or material pile. On higher speed highways the distances for signs shall be increased. In addition, traffic cones shall be placed in a line to at least 40 metres or greater upstream of the site, to allow traffic to merge away from the direction of the site. At the furthest point of the traffic cones, a flag man shall be employed and placed full-time by the Contractor to direct traffic and generally manage the public to safely negotiate around the site. It is not acceptable that warning signs and personnel are simply only placed only at the point of the site. All barricades and obstructions shall be fully illuminated with warning lights from sunset to

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sunrise. Material storage and conduct of the work on or alongside public streets and highways shall cause the minimum obstruction and inconvenience to the public.

All barricades, traffic cones, warning tapes, signs, lights and other protective devices shall be installed and maintained in conformity with applicable statutory requirements and, where within railroad and highway right-of-way as required by the agency having jurisdiction thereupon.

The Contractor shall take all necessary actions for traffic safety, to the compliance of road authority regulations, labour regulations and all requirements stipulated in this Contract Document. The Contractor shall propose an overall safety proposal at the Bidding Stage, and shall provide details at the commencement of the Contract. Upon failure to reach the said safety requirements, the Engineer shall issue a Noncompliance report to the Contractor and impose a fine as follows:

Rs. 5,000/= per day per gang for pipe-works Sites.

The costs for providing and maintaining road and traffic safety provisions shall be deemed to be covered under the respective General Bill Item in the Bill of Quantities.

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PR.5.12 Fences

All existing fences affected by the works shall be maintained by the Contractor until completion of the works at no extra cost to the Employer. Fences which interfere with construction operations shall not be relocated or dismantled until written permission is obtained from the owner of the fence and the period the fence may be left relocated or dismantled has been agreed upon. Where fences must be maintained across the construction easement, adequate gates shall be installed. Gates shall be kept closed and locked at all times when not in use.

On completion of the work across any tract of land, the Contractor shall restore all fences to their original or to a better condition and at their original location without any additional cost to the Employer. It is the Contractor's responsibility to locate the fence correctly.

PR.5.13 Protection of Public and Private Property

The Contractor shall protect, shore, brace, support, and maintain all structures, underground pipes, conduits, drains and other underground constructions uncovered or otherwise affected by his construction operations. All pavement, surfacing, driveways, curbs, walks, buildings, utility poles, guy wires, fences and other surface structures affected by construction operations together with all trees and shrubs in yards and parking shall be restored to their original condition, whether within or outside the easement. All replacements shall be made with new materials.

The Contractor shall be responsible for all damage to structures, streets, roads, highways, shoulders, ditches, embankments, culverts, bridges, and any other public or private property, regardless of location or character, which may be caused by transporting

equipment, materials, or men to or from the works, or any part or site thereof, whether by him or his sub-Contractors. The Contractor shall make satisfactory and acceptable arrangements with the owner of, or the agency or authority having jurisdiction thereupon, the damaged property concerning its repair or replacement or payment of costs incurred in connection with the damage.

In the event of any claims for damage or alleged damage to property as a result of work under this Contract, the Contractor shall be responsible for all costs in connection with the settlement of or defence against such claims. Before the final certificate will be issued, the Contractor shall furnish satisfactory evidence to the Engineer that all claims for damage have been amicably and legally settled.
All fire hydrants and water control valves shall be kept free from obstruction and be available for use at all times. The Contractor shall minimise the cutting and removal of trees and other vegetation. All cutting and removal shall be with the approval of the Engineer, and if necessary, with the approval of the relevant Government Authority.

PR.5.14 Security

The Contractor shall be responsible for protection of the Site and all Works, Materials, Equipment and Existing Facilities thereof against vandals and other unauthorised persons. No claim shall be made against the Employer by reason of any act of an employee or trespasser and the Contractor shall make good all damage to the property of the owner resulting from his failure to provide security measures as specified. Security measures shall be at least equal to those usually provided by the NWSDB to protect the similar existing facilities during normal operation but shall also include any additional security fencing, barricades, lighting, watchman services or other measures as required to protect the site. Costs for all security measures shall be deemed covered generally by the Contractor within his rates and prices.

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PR.5.15 Access Roads

The Contractor shall arrange with property owners to establish and maintain temporary access roads to various parts of his site as required to complete the Project at his own cost. Such roads shall be available for the use of all others performing work or furnishing services in connection with the Contract. Existing public access roads used by the Contractor for the execution of the Works shall be maintained by the Contractor.

PR.5.16 Parking

The Contractor shall provide and maintain suitable and adequate parking areas for the use of all construction workers and others performing work or furnishing services in connection with the contract at the site as required to avoid parking personal vehicles where they may interfere with public traffic, property owner's operations or construction activities.

PR.5.17 Noise & Vibration Control during Construction

The Contractor shall take reasonable measures to avoid unnecessary noise. Such measures shall be appropriate to maintain the legal noise levels applicable to each area. All construction machinery and vehicles shall be equipped with practical sound muffling devices and operated in a manner to cause the least noise consistent with efficient performance of the work.

During construction activities on or adjacent to occupied buildings and when appropriate, the Contractor shall erect screens or barriers effective in reducing noise in the building and shall conduct his operations to avoid unnecessary noise which might interfere with the activities of building occupants.

The noise control is necessary for the following activities to reduce the inconvenience to Public and Residents and to be within the tolerable limits:

i. Use of Generators for Construction – Only sound proof generators will be allowed for construction purpose with the allowable noise level.

ii. Machinery and Equipment used for Excavation – All Machineries will be tested for noise levels and generally the excavators, wheel loaders, backhoes etc. used have noise levels below those specified by the EMP/CEA.

iii. All construction noise should be controlled to meet the requirement of CEA, i.e., maximum permissible noise level at the boundaries is 75 dB at day time and 50 dB at night time. Sheet Pile driving machines (if so required) used for excavation tends to create ground vibrations and high noise levels. In order to reduce noise, only silent type sheet pile driving machines will be allowing for the Works.

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PR.5.18 Dust and Mosquito Control

The Contractor shall take reasonable measures to control air pollution due to dust from his construction activities. Earth surfaces causing emission of dust shall be kept moist with water or by application of a chemical dust suppressant. Dusty materials in piles or in transit shall be covered as practicable as possible to prevent blowing.

Buildings or operating facilities that may be affected adversely by dust particles shall be adequately protected. Existing or new machinery, motors, instrument panels or similar equipment shall be protected by suitable dust screens. Proper ventilation shall be provided with dust screens.

No open receptacles capable of collecting water and forming breeding places for mosquitoes are to be left in the open and the Contractor is responsible during the course of the work for all measures necessary to prevent the breeding of mosquitoes on the site.

PR.5.19 Temporary Drainage Provisions

The Contractor shall provide for the drainage of storm water and such water as may be applied or discharged on the site in performance of the work at own cost. Drainage facilities shall be adequate to prevent damage to the work, the site, and adjacent property.

Existing drainage channels and conduits shall be cleaned, enlarged or supplemented as necessary to carry all increased runoff attributable to the Contractor's operations. Dikes shall be constructed as necessary to divert increased runoff from entering adjacent property (except in natural channels) to protect property owner's facilities and the works and to direct water to drainage channels or conduits. Stilling Pools shall be provided as necessary to prevent downstream flooding.

PR.5.20 Hazardous Waste and Solid Waste Management

The Contractor shall manage domestic waste generated by workers and solid waste shall be segregated and treated using procedures meeting all regulations applicable to the area of construction.

Rubbish collection skips shall be provided at the site, to avoid the accumulation of construction waste, and the potential for the escape of material off site. Waste shall be separated into different skips for either recycling or disposal. Safe disposal of all construction waste and garbage from all sections of the construction site shall be carried out and maintained in accordance with local regulations.

Electronic waste (E-Wastes) generated during the Project period shall be separately disposed of in accordance with the regulations and laws published under the National Environment Act No.47 of 1980 as amended by Act No.56 of 1988 and Act No.53 of 2000 and the regulations thereof. The Contractor shall take all necessary measures to handle and dispose of them without harm to the environment, only through the CEA approved licensed E-Waste collectors.

All chemicals shall be stored in appropriate chemical storage facilities.

"For References ONLY" (Not for Bidding)

PR.5.21 Erosion Control

The Contractor shall prevent erosion of soil on the site and adjacent property resulting from his construction activities, at his own cost. Effective measures shall be initiated prior to the commencement of clearing, grading, excavation or other operation that will disturb the natural protection.

Work shall be scheduled to expose areas subject to erosion for the shortest possible time and natural vegetation preserved to the greatest extent practicable. Temporary storage and construction buildings shall be located, and construction traffic routed properly to minimise erosion. Temporary fast-growing vegetation or other suitable ground cover shall be provided as necessary to control runoff.

PR.5.22 Pollution Control

The Contractor shall prevent pollution of drains and watercourses by sanitary wastes, sediment, debris and other substances resulting from construction activities. No sanitary wastes shall be permitted to enter any drain or watercourse other than sanitary sewers unless satisfactorily treated to the approval of the Engineer. No sediment, debris or other substance shall be permitted to enter sanitary sewers and reasonable measures shall be taken to prevent such materials from entering any drain or watercourses. Any proposed discharge to sewers or watercourses shall be to the approval of the authorised body. The requirements of this Clause shall not limit any of the Contractor's obligations or liabilities.

PR.5.23 Fire and Explosion Protection

The Contractor shall take all necessary precautions to prevent fires at or adjacent to the work, buildings, etc., and shall provide adequate facilities for extinguishing fires which may occur. No burning of trash or debris will be permitted anywhere on the Site.

When fire or explosion hazards or risks are created in the vicinity of the work as a result of the locations of fuel tanks, or similar hazardous utilities or devices, then the Contractor shall immediately notify the Engineer of such risks. The Contractor shall exercise all safety precautions and shall comply with all regulations and instructions issued by the local authorities and the Engineer to prevent the occurrence of fire or explosion.

Particular care must be exercised regarding the operation of welding and cutting equipment and other processes involving the use of naked flame.

"For References ONLY" (Not for Bidding)

PR.5.24 Site Clearance

Clearing

The Contractor shall clear the reservation widths for pipelines and the sites for structures free of all vegetation, and all superficial obstacles such as road surfaces, concrete surfaces, bricks, and rubbish. Removal of trees shall be dependent on the approval of the Engineer.

The extent of Contractor's clearing and grubbing operations shall be the minimum practicable necessary in the opinion of the Engineer for the construction of the Works, and shall be included under the respective item in the Bid.

All vegetation, trees, etc. arising from the clearing and grubbing operations shall be disposed at a depot at a suitable location selected by the Contractor and approved by the Engineer. Remnants of vegetation, including trees, stumps and roots, shall be disposed off-site by the Contractor as stated above.

Road Furniture

The Contractor shall re-install any road furniture (such as street lighting, traffic signs or traffic lights) that has to be removed during the progress of the Works. The installation of the road furniture shall take place at its original location, in a condition at least equal to that prior to removal and as soon as practicable after completion of pipe-works in that area. Costs shall be included generally within the rates and prices in the Bid.

Permission shall be taken by the Contractor prior to removing any road furniture. Also, for barricading the Contractor shall use the minimum of highway rules.

Protection from the Works

The Contractor shall not demolish or remove any existing buildings, structures or other objects including trees, whether indicated on the Drawings or not, unless on a specific written instruction from the Engineer. The Contractor shall take every care and precaution to protect from damage any of these objects, including houses, buildings, fences or trees, which are situated on or near the site. Every care shall be taken not to damage walls, and if pipework is crossing a wall, the Contractor shall burrow underneath it. Any property situated in close proximity to the works shall be protected against damage which may be caused by vehicles, subsidence, vibration, etc. Costs shall be included generally within the rates and prices in the Bid to protect and repair damage to any other objects in the vicinity of the Works.

Note: The above Sub-Clauses PR 5.7 to PR 5.24 shall read in conjunction with the requirements of the Environmental Management Plan (EMP) as provided under Technical General Specification 6B.18. The Contractor shall strictly comply and maintain the mitigating measures as mentioned and as listed in the approved EMP. The costs for maintaining the provisions as specified in the EMP shall be deemed to be covered under the respective Provision as provided in the Bill of Quantities.

"For References ONLY" (Not for Bidding)

PR.6 SPECIAL PROVISIONS

PR.6.1 General

The Conditions of Contract, Drawings and the Bills of Quantities, Rates and Unit Prices are to be read in conjunction with the Specifications. Matters referred to, shown or described in any of the former are not considered to be repeated in the latter.

Notwithstanding, the subdivision of the Specification under different headings, every part of it shall be deemed supplementary to and complementary to every other part.

The Contractor is required to carry out instructions set out below at no additional cost to the Employer. All costs relating to the following special provisions shall be deemed to be included generally, or within the relevant items provided in the Bill of Quantities.

PR.6.2 Work in Roads

(a). General

Procedures for dealing with Road/Local Authorities (RDA/PRDA/LA) for entering into and for cutting roads for the purposes of pipe-laying, junction connections, installation of chambers, valves etc., and making connections to existing pipelines, backfilling, testing, and temporary reinstatement etc. are set out below:

1. The Contractor shall produce his proposed overall programme and sub-programmes for each road section for installation works in roads for discussion with the Engineer and Employer at the specified time after award of Contract to show the date of start and completion of excavation, laying, temporary reinstatement, hydraulic pressure testing, backfilling, compaction and temporary reinstatement in each road for the following:

   (i) Pipelines along roads.
   (ii) Junction connections, installation of valves & chambers, tapping of existing lines.
   (iii) Pipelines across roads (Road Crossings).

   Note: Programmes for this work shall allow for the time needed for Pre-Construction Survey along the Laying stretch together with relevant authorities, prior RDA/PRDA/LA approvals, trial pits, and any ordering, manufacture, transport, and delivery of pipes and any special imported fittings.

2. When satisfied with the construction programme, the Employer shall present it to RDA/PRDA/LA who may propose changes to the sequence according to their own road improvement programme, if any. The Contractor shall allow for a reasonable amount of disruption to his programme and he shall not be entitled to specific extra cost or extension of time that reasonable may arise as a result of comments by the relevant authority.

3. The Contractor shall produce a final programme for action incorporating any changes requested by the Employer, following discussions with the RDA/PRDA/LA.

4. The Contractor shall carryout permanent reinstatement for RDA, PRDA, UC & PS roads as per the drawings and specifications to the Contractor's agreed programme or such other period as may be found more practical, or appropriate. The road works shall be under the supervision of the road authorities until handing over to them. Supervision charges to the relevant road authority shall be paid by the Contractor for which funds are allocated under the Provisional Sums (PS). The payments shall be reimbursed to the Contractor thro' the interim bills claim together with the percentages quoted by the Contractor for the particular Provisional Sum in the Bill of Quantities. Until permanent road reinstatements are done the Contractor shall carry out temporary road reinstatement as per the drawings and specifications and maintained. BOQ items are provided for both temporary and permanent road reinstatement works.

"For References ONLY" (Not for Bidding)

5. Road Crossings: Road Authority requirements are that Road Crossings may only be carried out at times of low traffic density such as at night, at weekends and during public holidays, and Contractor must prepare his programme accordingly. Contractor must allow in his rates for his extra costs involved in such work outside normal working hours.

6. The Type of Materials for Backfilling of Trenches in Road's Carriageways, Shoulders and Off-Shoulders shall be as follows, *(Please read the followings in conjunction with the Standard Drawing No. ANP2/LC1/STD/TD/C/002 & Drawing No. ANP2/LC1/STD/TD/C/003)*

   - For RDA/PRDA Roads *(Asphalt or Tarred)* Carriageways and at Road Shoulders - **Type 1 Backfill Materials compacted to 100% MDD.** *(Type 1 Material shall be soil having the maximum dry density under standard conditions of proctor compaction not less than 1600 kg/m3 with the properties plastic limit < 15, liquid limit (LL) < 40, CBR > 20)*

   - For Local Authority/PS Roads *(Asphalt or Tarred)* or Trenches of beyond the Shoulders of RDA/PRDA Roads - **Type II Backfill Materials OR Selected Excavated Materials Compacted to 95% MDD.** *(Type II Material shall be Soil having the Maximum Dry Density under Standard Conditions of Proctor Compaction not less than 1500 kg/m3 with the Properties Plastic Limit <25, Liquid Limit (LL) < 55, MDD 95%).*

   - The Type I or Type II Materials or Selected Excavated Material shall be free from boulders, any sharp stones larger than 25mm.

   - Bedding Materials shall be Fine Aggregates of Quarry Dust, Mine Sand, Washed Sea Sand conforms to SLS 1397:2010.

   - Granular Filling Materials *(In case at Paddy Field/Marshy Area/Causeway)* – shall be of group GW under Unified Soil Classification (USC) System, with Uniformity Coefficient Cu>4 and coefficient of Curvature Cc between 1 & 3.

   - Base Course (ABC Material, comply to Table 1701-5 – 37.5mm - CIDA Specification – Publication No. SCA/5-Second Edition-June 2009) compacted to 100% MDD

   - Asphalt Layer – Type I comply to Table 506- I - CIDA Specification – Publication No. SCA/5-Second Edition-June 2009

   The Contractor shall allow all costs for testing facilities for and for ensuring correct moisture content to achieve the required minimum compaction. Compaction tests of trench backfill shall be carried out each working day that backfilling is taking place in each of the locations or where-ever directed and results shall be to the satisfaction of the Engineer and or the relevant institutions.

"For References ONLY" (Not for Bidding)

7. The Contractor shall use Asphalt Cutters and Pneumatic Tyre Wheeled Excavators for road works to minimise damages to the adjacent road-wearing surface. The Contractor shall make all the arrangements for any temporary work, scaffoldings etc. at his own cost, with the permission of the relevant authorities where required. The Contractor is required to liaise closely with the Road Authorities (RDA/PRDA/LA), whose responsible officers are;

RDA Regional Offices in the Project Areas

PRDA Regional Offices in the Project Areas; and

Urban Councils and Pradeshiya Sabhas in the Project Areas

Road Crossings

The Contractor shall submit through the Engineer to the relevant Road authority or LA, a Method Statement and obtain prior approval before commencement of work on any road crossing. The method statement shall include traffic by-pass arrangements (where required) and the safety measures proposed during day and night. The Contractor shall maintain sufficient unobstructed width of the carriageway at any given time and this width shall not be less than an adequate length to permit single lane traffic.

The Contractor shall adequately protect all existing service mains throughout the construction and he shall ensure that all existing services operate without interruption. The Contractor shall provide adequate temporary supports to all existing service mains, which are either exposed or partially exposed or otherwise weakened by the trench excavation, as specified above.

"For References ONLY" (Not for Bidding)

PR.6.3 Works within Areas of Private and Public Property

All Construction operations of the Contractor shall be confined within the boundaries of the road stretch/es as approved from time to time by the Engineer with the consent of the relevant authorities such as RDA/PRDA/LA etc., unless otherwise approved by the Engineer for Construction Activities. The Contractor shall obtain the Engineer's approval of all his Temporary Facilities such as locations of worker camps, huts, stores, offices, entrances, fencing, etc., before mobilization at the Site.

The Contractor is to take special care to avoid unnecessary damage to private and public property and he shall pay the compensation for such damage as may in the opinion of the Engineer be due to the execution of the work in a careless or un-workmanlike manner. Should the Contractor require for any purpose additional land beyond the corridor widths as depicted on drawings, he shall provide it at his own cost and shall forward to the Engineer a copy of the permits from the owner and occupier of such additional land before entering thereon. No additional payment shall be allowed for such costs in the rates and prices of the Bill of Quantities.

Where works involving pipelines is carried out through, between or under buildings or other structures, gardens, orchards or cartilage of private houses, business premises, or in other cases which, in the opinion of the Engineer, render it impracticable or unreasonable for a specified width to be obtained for the construction of the works, then the Contractor

shall be deemed to have made allowance in his bid during visits to the site for any extra expense which may be incurred in carrying out the work in the restricted width available.

The Contractor shall not disturb any monuments, property corners or survey markers without permission from the Engineer and he shall bear the expense or resetting any monuments, property corners or survey markers, which may be disturbed. The Contractor shall be responsible for all damages to streets, utilities, railways, roads, highways, ditches, embankments, canals, bridges, culverts or other public or private property which may be caused by transporting equipment, materials, or men to or from the work. The Contractor shall make satisfactory and acceptable arrangements with the property owner over the damaged property concerning its repair or replacement.

PR.6.4 Sites to be Kept Tidy

Throughout the progress of the works the Contractor shall keep the Sites and all working areas in a tidy and workmanlike condition and free from rubbish and waste materials. Any Temporary Works, Constructional equipment, materials or other things which for the time being are not required for use by the Contractor may with the consent of the Engineer be removed from the site but otherwise shall be kept in the Site in an orderly fashion and shall be properly and securely stored thereon.

PR.6.5 Connections of New Mains to Existing Service Mains

The Contractor shall carry out connections to existing mains as shown on the Drawings.

Connections to existing mains shall be carried out, under the supervision and presence of and be coordinated closely with the NWSDB and Engineer in order to avoid water supply disturbances to the highest extent possible. No existing valve shall be operated by persons other than authorized Water Board Staff. Prior to any connections, the Contractor shall liaise with the Operations and Maintenance Division of NWSDB at least 2 weeks in advance. The Contractor ascertain the pipe materials, diameters, depths, existing lines, extra fittings and specials, etc., necessary and shall prepare a method statement including construction drawing for major connections and shall obtain NWSDB and Engineer's prior approval.

The Contractor shall carefully plan and organise all works and fittings, and any associated construction works before interruption to the existing water supply to ensure a rapid cut-in and connection for the works. The Contractor shall ensure that all the necessary pipes, fittings, & equipment required for the works and bypasses, including those for an emergency situation are available before commencement of the works. If necessary, trials pits shall be carried out by the Contractor to ascertain that the fittings are of the required dimensions and all such costs are deemed to be included in the rates and prices for the Works. The Contractor is required to properly organise the works and carry out construction works in the most efficient manner and ensure that the period of interruption to the water supply is reduced to the minimum.

"For References ONLY" (Not for Bidding)

PR.6.6 Quality Assurance/Quality Control and Quality Plan

The Contractor shall implement and maintain a quality management system in accordance with ISO 9001:2008/2015.

The Contractor must develop and implement a Quality Plan, which documents the quality system specific for this Project inclusive of works of Subcontractors and Suppliers.

The Contractor shall submit a Quality Management Plan within twenty-one (21) days after the date of the Letter of Acceptance, which complies with a recognised international Quality Assurance System Standard.

The Cost for adequate Quality Assurance, Quality Management Plan and Quality Control as Specified herewith shall deemed to be included in the Contractor's Rates and Prices in the BoQ.

Plant and Materials incorporated into the Permanent Works

All Equipment and Materials supplied to the Site, and fabrications off-site, for incorporation into the Works shall be supplied from formally compliant manufacturing companies to the specific item of manufacture and with compliant Quality management Systems in place to applicable international standards for quality assurance. The manufacturing facility shall comply with the specified international technical production standards applicable to such plant, material or fabricated item, as formally certified by an accredited international third-party inspection and certification agency to the specified international technical standards for the production of such Plant, Equipment, Material or fabricated item. Copies of such certified quality management system compliance documents and technical manufacturing compliance certificates shall be supplied to the Engineer/ER prior to any order being processed.

Quality Procedures

The Contractor shall establish documented procedures for all aspects of the Works such as Site Survey Control; Procurement, manufacture and Delivery of Plant and Materials; Quality Control Tests and Inspections; Earthworks; Design and Erection of Shoring & Formwork; Shop Drawings and Placement of Reinforcement; Placement of Concrete; Transport of Pipes and Equipment; Safety and OHS Plan; Installations; Pipe-Laying, Jointing, Backfilling, Compacting, Testing, disinfection and Commissioning; Site-Works; Document Control and Distribution/Communication and the like.

Procedures shall identify personnel suitably qualified to lead various parts of the Works, and at least one representative shall be available at site. Procedures for each part of the works shall identify work practices to be used and typical plant and standby plant available at site.

A draft Quality Assurance and Control Plan/Procedures shall be submitted to the Engineer/ER's approval, prior to Work commencing. The Contractor shall maintain the QA/QC Plan and Engineer/ER will monitor the Plan every Month in order to assure the compliance.

"For References ONLY" (Not for Bidding)

The Draft Quality Assurance and Control Plan which demonstrates that the design, manufacturing, testing, production, delivery, and construction of the Works requirements for the Plant, Materials, Works and Services, are to the standards to which the plant, materials and constructed works are specified, is to be submitted. The Quality Plan shall include the following as appropriate:

- Design of all water supply systems included in the Contract;
- Procurement of plant, components and materials;
- Calibration of test equipment;
- Sampling, destructive/ non –destructive testing, frequencies of sampling and testing;
- Inspection procedures;
- Monitoring and Testing;
- Rectification of non-conformities;
- Record systems;
- Quality Audits;
- Inventory control, packing;
- Proposed production, transportation, delivery and installation program; and
- Site safety plan for all construction activities.

"For References ONLY" (Not for Bidding)

Records

The Contractor shall maintain all documentation dated and signed, demonstrating that the quality control procedures and activities specified, and within his Quality Plan are in compliance and are being carried out throughout the entire Contract Period. The Contractor shall keep a system of records available for inspection by the Engineer on the site. Records shall include, but not be limited to:

- Signed set of contract documents;
- An up-to-date set of contract drawings;
- Notices of amendments to drawings;
- Field instructions and notices from the Engineer;
- Material and fabrication orders;
- Records of all material deliveries to site, and location of incorporation into the works;
- Certification records of all manufacturers of materials delivered to site;
- Plant, Equipment and instrumentation orders, including product data and documentation;
- Copies of all test certificates, with test type, location and result;
- Details of As-constructed work marked up on project drawings, updated weekly.
- Any other quality control records to be maintained, as specified.

PR.6.7 Training of Employer's Staff on ArcGIS Data Base System

The Scope of Training shall include formal class room training and on the job training (OJT) to the Engineer's Staff & Employer's O&M Staff who supervised the Construction Activities and will operate and maintain the System respectively. Such Training shall be started prior to the commencement of the Works. It shall cover comprehensive ArcGIS Data Base System as required under Clause PR 3.7 above and shall be compatible to the NWSDB's Standard. Training shall also cover the working with relevant Software and the Equipment/Instruments. It shall be necessary to develop written instructions on the implementation of ArcGIS System in Pipeline Transmission/Distribution System.

A. The Training shall be conducted in the English Language and all literature/presentation materials shall be prepared in English Language.

B. Prior to the issuance of the Taking Over Certificate, the Contractor shall provide detailed training in the operation and maintenance of ArcGIS System.

C. The Scope of Training shall also cover the use of the Computerized Maintenance System and Computerized Asset Register.

D. The number of Employer's Trainees for both Class Room & OJT shall be 25 persons.

The Contractor shall provide/hired an experienced Trainer having experience in the water industry to organize and supervise the Training Programme, and shall be present full-time on Classroom/Site during the Training.

"For References ONLY" (Not for Budding)

PR.6.8 Pressure and Leakage Tests

(1) General

Before taking-over, all pipelines shall be pressure tested by the Contractor in the presence of the Engineer. Pressure tests shall be carried out as specified in the Standard Technical Specification.

A large quantity of clean water needs to be used intermittently to carry out the above tests. The Contractor should note that there is no NWSDB town water system near the works. Hence, the Contractor shall locate other reliable sources of water for the requirement. Drawing large quantities of water from existing or new dug wells is not recommended as it will meet with strong opposition from the public. Construction of borewells shall be carried out in consultation with the Engineer.

The Contractor shall furnish all equipment, materials, tools, labor, fuel, oil, grease, water and power required for testing purposes. This shall be for the time necessary to indicate to the satisfaction of the Engineer that the work is in conformance with the specifications.

The Contractor shall furnish suitable temporary connections, testing plugs or caps, pressure pumps pipe connections, meters, pressures gauges, thrust supports and other equipment required to carry out the tests. No water may be pumped into the tanks, conduits or channels or tests commenced in any way, without the Engineer's approval.

- Pressure Tests for DI Pipes is provided separately under Standard Technical Specifications - Section 6B 16 of this Volume 2 of 4.

- Pressure Tests for HDPE Pipes is provided separately under Standard Technical Specifications - Section 6B 17 of this Volume 2 of 4.

Contractor shall carry out tests and confirm that the water from whatever source obtained for pressure and leakage tests are suitable, and shall provide the reports to the Engineer and obtain approval before commencing the activity. The costs for obtaining the suitable water and for providing necessary materials, tools, equipment, skilled and unskilled labor, vehicle etc. shall be included in the particular item in the BoQ.

PR.6.9 Disinfection

(1) General

Before being placed in service all works including pipes, concrete tanks, conduits, channels and all other appurtenances which are to be in contact with, contain or convey potable water are to be disinfected as specified in CIDA Specifications. Disinfection shall be done after completion and acceptance of the specified leakage and pressure tests. Definition of potable water is water after treatment by water treatment plant.

Potable water for testing shall be obtained by the Contractor from the Employer at the prevailing commercial water rate at the time of use. The Contractor will be required to transport the water to sites, which are not adjoining any of the Employer's water distribution system.

After completion of the specified tests, pipes, tanks, conduits, channels and appurtenances shall be thoroughly cleaned out. Cleaning may be by flushing as specified, hose stream, brush or other proper means as may be required for successful removal of all foreign material. All oil, grease and foreign material not removed with water shall be removed with appropriate solvents in such a manner as not to injure the concrete or other materials, impart a harmful residue to the potable water system after completion.

The Contractor shall furnish all materials including disinfection chemicals, labor, equipment and incidentals necessary to disinfect the works as specified. After completion of the disinfection, the water shall be flushed, pumped, drained or otherwise removed from the works. Proper precaution must be taken to ensure that the resultant chlorine concentration in the water shall not be harmful to the fish, plants or crops. The Contractor shall make the necessary chlorine residual tests to ascertain to the satisfaction of the Engineer, that the concentration is not excessive. Disinfection of pipelines is described in Section 5.4.5 of the CIDA Specifications SCA/3/2.

"For References ONLY" (Not for Bidding)

PR.6.10 Cleaning

The Contractor shall remove from the Site and dispose of all debris and rubbish resulting from his operations at least once a day, and more often if the same interferes with the work under any contract or the work of other service, or presents a fire or accident hazard. Unless otherwise stated in the specifications or Drawings, all debris, rubbish and scrap pieces resulting from clean-up operations shall become the property of the Contractor and shall be removed from the Site in an acceptable safe manner and shall be legally disposed of.

After completing and testing (as required) the Works, the Contractor shall remove all rubbish and excess soil from and in the vicinity of the works, and all temporary structures, construction signs, tools, scaffolding, materials, supplies and construction machinery or equipment which he or any of his subcontractors may have used in the performance of the works. The Contractor shall clean all the Works and leave the Site and surroundings in a clean and neat condition.

Should the Contractor fail, refuse or neglect to remove rubbish and waste materials and temporary work, or clean his working areas as required herein, then the Employer may, without any obligation to do so, remove and dispose of the said rubbish, waste materials and temporary work, clean the Contractor's working areas and deduct the cost thereof from any money due, or that becomes due to the Contractor under this Contract.

PR.6.11 Environmental Management Plan (EMP)

The Contractor shall (a) establish an operational system for managing environmental impacts, (b) carry out all of the monitoring and mitigation measures set forth in the approved Environmental Management Plan (EMP) and in the relevant environmental approval document (c) The Contractor shall submit monthly reports on the carrying out of such measures to the Engineer. The costs for following all requirements of the EMP and for carrying out monitoring and mitigation measures shall be paid through the Provisional Sum Bill Item as provided in the BoQ.

The Contractor shall comply with all applicable national, provincial and local environmental laws and regulations including rules and regulations of the Central Environmental Authority of Sri Lanka.

The Contractor shall prepare his EMP for the contract works in accordance with the requirements of the standard specifications for the EMP in Section 6B.18. The format for monthly reporting of the EMP requirements, monitoring and mitigation activities to be carried out, shall be prepared by the Contractor, and approval shall be obtained by the Engineer at the onset of the Contract Works. The contractor shall submit the relevant monthly reports approved by the Engineer with each interim bill and failing to comply with the monitoring procedures and mitigation measures or submitting report will carry a penalty of deduction of maximum 1% of the billed value of the works done within the billing period.

The specifications for the EMP is provided in Section 6B.18.

"For References ONLY" (Not for Bidding)

PR.6.12 Safety

a. General

Working conditions shall conform to all specified safety requirements, and comply with local regulations and conditions of authorities, and all works sites and field offices shall be maintained in a clean safe orderly condition for the duration of the contract. The Contractor shall comply with the approved OHS Health and Safety Plan under the Contractor's Documents, the Safety Assurance plan, and the local and applicable international health and safety standards, labour conditions, and all other safety provisions and requirements listed and specified under the Specification and all other parts of the Contract.

The Contractor shall exercise full-time adequate safety arrangements on a continuous basis, with all measures necessary to ensure the safety of all construction personnel, the Engineer's staff, the public, and the public road users during both working and non-working hours at each and every work site. Special precautions shall be exercised during rain and adverse weather conditions.

The Contractor shall manage all safety requirements by developing a Safety Plan and a Safety Assurance Plan, and administrate such plans throughout the Works duration.

The Contractor shall employ a Safety Officer to oversee the provisions, and prepare a risk assessment (to workers, public and environment), and prepare an occupational health and Safety Plan (OHS) and Safety Assurance Plan specific to the site(s), and submit to the Engineer for approval. The Contractor must, thereafter comply with the approved Safety Plan and Safety Assurance Plan. The Contractor will include in his Monthly Reports regular updates on safety and OHS issues and the labour conditions. Safety Plans shall include for all items as specified, working practices, site practices, first aid facilities, first aid equipment and medication, firefighting equipment, emergency and evacuation plans (and training), provisions for documenting complaints from labour and public, emergency notification forms and procedures, and site and camp security. In addition to workplace safety, the Plan shall also include for conditions at site camps, hygiene maintenance at site accommodation and worker's code of conduct.
The Contractor and any other persons engaged on work for this Contract shall be required to comply with the Safety Plan.

"For References ONLY" (Not for Bidding)

The Employer will notify the Contractor in full of the safety regulations, which the Employer imposes on his own employees and the Contractor shall comply with all such regulations. Further health and safety provisions of this and other relevant clauses, or any safety directive given by the Engineer, shall not relieve the Contractor of any provisions of the contract, any obligation of the Conditions of Contract, or the obligations of the relevant National laws, rules, regulations, and public safety requirements. The Contractor shall pay any fees for permits required, and all costs for this and other safety provisions shall be deemed covered within the rates and prices as provided in the General Bill of the BoQ.

The Contractor shall organise the Site according to the approved Method Statement(s) and assure that his methods of working are safe. The Contractor shall be responsible for the prevention of unsafe or unhealthy conditions and practices in all offices, accommodation and work areas of the site under his control. The Contractor, his agents and employees shall ensure that all work under this contract is performed in such a

manner that prevents risk of injury or damage to any of the Contractor's or Employer's staff, or property or public.

The Contractor shall be solely responsible for the safe conduct of the Works. The Contractor shall deploy separate adequate qualified staff to execute his Safety Plans and Safety Assurance Plan and inform the Engineer of the names of such staff and their responsibilities and shall gain approval before commencing the works. The Contractor shall ensure that any person he makes responsible for the safe conduct of any part of the operations carries out his duties in a proper manner. The Contractor shall arrange adequate security to safeguard all safety equipment including, but not limited to, those required for illumination, barricading, warning signs, traffic cones, and the like, etc. placed at sites and those to be continuously available throughout the entire construction period for the site, during working as well as non-working hours.

The Contractor shall refer to all other relevant Sub-Clauses of the Contract relevant to safe working practices and safety including, but not limited to, for open trench safety, safe excavation, prevention of slips and falls, traffic safety and pedestrian safety, access to residents, hazards, fire safety, cleanliness of site, and the like.

The Contractor shall also institute a safety training program on site upon commencing work to train all labour, foremen and supervisory staff, and Employer's representatives, in environmental, health and safety procedures, including works procedures, lifting and loading, transport, accident prevention, site accommodation, first aid, electrical, operation of plant, safe chemical and equipment handling practices and their maintenance and upkeep, and the like for all aspects of the works. Detailed procedures and plans of action shall be laid out to combat emergency situations, including the location and proper use of the emergency equipment, procedures for raising alarm and proper response actions for each foreseeable emergency situation.

The Engineer reserves the right to suspend the works at any site which displays a case of major non-compliance or emergency condition towards occupational health and safety or danger to the public or environment, up until the time that the Engineer is satisfied that proper corrective actions have been taken to fix such non-compliance or emergency. The Contractor shall take full responsibility for any resultant costs and/or delays caused by such suspension.

"For References ONLY" (Not for Binding)

The Costs for all safety measures shall be deemed covered by the Contractor in his Rates & Prices as quoted in the General Bill Item of the BoQ.

b. Site Safety

For each work area, the Contractor shall designate a Safety Officer / Accident Prevention Officer who will be responsible for safety and security at the particular site, assigned in accordance with the Conditions of Contract. The foremen and other professional or trade staff engaged shall only be those as qualified.

All persons employed on the Works, from supervisory personnel to labourers and all other persons admitted to the Works sites, are to be provided with safety equipment PPE appropriate to the tasks upon which they are engaged such as safety-helmets and reflective vests for all site attendees, protective workwear, footwear for all workers, rain gear, protective goggles, dust masks, ear protection, gloves, safety shoes, rubber boots,

etc. Such safety equipment shall be compulsory as deemed necessary by the Engineer. Where there is risk of injury to ears or eyes, suitable protection devices shall be provided.

Operators of grinding and cutting equipment (for e.g. cutting concrete, asphalt, etc.) shall wear adequate eye protection, ear noise-protection and dust masks.

The Contractor shall make particular reference in his Method Statement of his safety measures to be employed towards personnel working within deep excavations, confined spaces, manholes, drains, culverts, and sewers, so as to ensure that the air is safe and mitigating the effects of potential gas accumulation (e.g. including but not limited to oxygen detectors, harmful/combustible gas detectors, and allowing no flames near manholes). Ventilation equipment shall be used as necessary, and always personnel shall be stationed at the top ground level as link man to any personnel in deep excavations, drains or manholes.

Only authorised operators shall be allowed at the site for using and operating the heavy equipment and excavators, and they shall follow all necessary safety precautions.

Adequate working lights for the type of work in progress sites shall be provided.
Safety equipment shall be maintained in clean condition and in good order at all times.

All facility sites shall house adequate first aid kits, all required types of fire extinguishers, and alarms.

The site area shall be limited to only that necessary to construct the works as approved by the Engineer.

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c. Working in Trenches

The construction of open trenches shall, at any one time, be limited to maximum lengths as previously approved by the Engineer, in writing, depending on the particular surrounding conditions, and in accordance with the approved method statement. The maximum length of opened trench at any one site, suggested for agreement with the Engineer for the works along roads shall be 30 metres for trenches deeper than 2.0 metres, and 60m for trenches less than 2m depth, unless otherwise agreed with the Engineer. Unless otherwise approved by the Engineer in writing, work on each approved length(s) shall be practically complete to the satisfaction of the Engineer before work on any new length is commenced. If the authorities permit the Contractor to temporarily close off to the public an entire street, then the length of open trench may be increased, if and as approved. However, the Contractor shall note his overall final responsibility towards safety protection around open trenches, and shall accept full responsibility for any related accident if such occurs.

All material excavated from trenches shall be stored at least 60cm from the trench. Workers in trenches shall face in the direction of the mechanical equipment used for excavation. In deep trenches or excavations greater than 1.4 metres deep, adequate exit measures such as ladders or steps shall be provided for workers.

The Contractor shall be responsible for the stability and prevention of slips and falls in trenches and excavations

The Contractor shall exercise full-time adequate safety arrangements on a continuous basis, with all measures necessary to ensure the safety of both construction personnel, Engineer staff, the public and public road users during both working and non-working hours at each and every work site. Special precautions shall be exercised during rain and adverse weather conditions.

To provide the public with the necessary safety and protection, the Contractor shall at his expense provide barricades, tapes, lights, warning signals and sign boards, guard rails, pedestrian crossings over trenches, supervision and watchmen services to the satisfaction of the Engineer and all other safety measures in accordance with local regulations and these General Requirements and other applicable sections of the Employer's Requirements. Costs for all safety measures shall be deemed covered by the Contractor in his bid under the relevant General Bill Item for provision of safety measures in the Bill of Quantities.

d. Traffic Safety

Street Closures

All streets, roads, highways and other public thoroughfares, which are allowed by the authorities to be closed to traffic, shall be protected by effective closing-off barricades on which lights and acceptable warning signs shall be placed. Barricades shall be located at the nearest intersecting street on either side of the blocked section. Flag men shall be employed by the Contractor positioned full-time at each barricade, in order to prevent unauthorised entry to the site and to direct pedestrian and street traffic away from the site and towards detours as required. Signs shall be placed further upstream of the blocked street on the connecting roads to inform road users that the road ahead is in the state of "ROAD CLOSED".

The Contractor shall provide detours for the traffic, which is disrupted due to the road closure. Such detour routes shall be fully signed with large arrow signage, the entire route of the detour or diversion route, and with carefully placed signs at every turn and intersection, from the point of the closed road to the corresponding point to reach a point on the other side after the site. The Contractor shall expedite construction operations to minimise the disruption. Flag men shall be provided at the entry to the detours, to direct the traffic and assist the public commuters, and to prevent the public from removing barriers and entering the site. The Contractor shall maintain all requirements for the detour routes up until the time that the detour routes are no longer required, and the road is re-opened.

Open Trench Safety

At the end of works each and every day, trenches in roads shall not be left open overnight, and heavy-duty trafficable metal plate trench covers shall be used.

All open trenches, open chambers and other open excavations shall be adequately safeguarded by providing adequate precautions through suitable temporary barricades, warning signs, traffic cones and flashing amber warning lights and night lights and other means to provide adequate protection to the public and to prevent accidents and injury to third parties. Clear throughways shall be marked to safely direct the through-traffic

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around the works. Obstructions such as material piles and equipment within road easement areas shall also be provided with similar warning signs, traffic cones and lights. Such worksites, trenches and material piles shall have warning signage progressively placed upstream of the traffic flow, from a point 100metres from the site and one sign then placed at every 30 metres, to give public vehicle drivers sufficient time to adjust their driving direction, line and speed well prior to reaching the point of the site or material pile. On higher-speed highways the distances for signs shall be increased. In addition, traffic cones shall be placed in a line to at least 40 metres or greater upstream of the site, to allow traffic to merge away from the direction of the site. At the furthest point of the traffic cones, a flag man shall be employed and placed full-time by the Contractor to direct traffic and generally manage the public to safely negotiate around the site. It is not acceptable that warning signs and personnel are simply only placed only at the point of the site. All barricades and obstructions shall be fully illuminated with warning lights from sunset to sunrise.

All excavated material, vehicles, equipment, or other obstacles which may be dangerous to the third parties shall be adequately illuminated from half an hour before sunset until half an hour after sunrise and other times when the visibility is poor. All personnel at the sites shall wear adequate safety visibility vests. The position and the number of warning signs and lights shall be such that the extent and position of the works is clearly defined.

In any case, all barricades, traffic cones, warning tapes, signs, lights and other protective devices shall be installed and maintained in conformity with applicable statutory requirements of the local road authorities, provincial road authorities or national road authorities, as applicable to the location of the site, and, where the site is within railroad and highway right-of-ways, as required by the agency having jurisdiction thereupon.

The Contractor shall provide all necessary signs for the Works. These shall include, but not be limited to:

- standard road signs;
- warning signs;
- advance information signs for drivers, indicating works ahead;
- works information signs at site entry;
- "No Entry" signs;
- pedestrian signs;
- danger signs;
- control signs;
- safety signs; and
- traffic direction signs.

Wording on all signs shall be in English and Singhalese languages, and shall comply with regulations of the local authorities. The size, colour, lettering and location of all signs will be subject to approval, and attention shall be paid to international system of signs.

The Contractor shall maintain all signs.

No open trench shall be left unattended by the Contractor at any time, and shall otherwise be fully covered by heavy 10mm thick trafficable steel plates.

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If the Engineer considers that the system of signs provided by the Contractor is inadequate to ensure safety, or unsatisfactory in other respects, the Contractor shall add to, amend, or otherwise change the system to the satisfaction of the Engineer.

Material storage and conduct of the work on or alongside public streets and highways shall cause the minimum obstruction and inconvenience to the public.

Storage of materials and excavated backfill material in lanes and streets shall not create an unnecessary inconvenience or hazard to public, and shall be suitably signed or fenced where required, and as specified. Such materials shall not be stored in streets for lengthy periods of time, and such times shall be authorised by the Engineer. The Contractor's supply, excavation and construction work method and schedule shall satisfy such time periods, or materials storage shall be ordered elsewhere at the Contractor's own expense. Work sites may be in close proximity to buildings and houses, and the Contractor must maintain at all times safe and necessary access to houses, commercial establishments, public offices, schools, hospitals, fire hydrants, etc., unless otherwise approved by the Engineer or where the construction may prevent vehicle access for a reasonable short period of time.

The Contractor shall take all reasonable precautions to prevent roads and lanes becoming littered or damaged as a result of his construction or transporting operations, and shall carry out dust control measures. Transportation of any material by the Contractor shall be in suitable vehicles which when loaded do not cause spillage, and all loads shall be suitably secured, else such vehicles shall be ordered removed off site. Trucks transporting sludge and other waste from wastewater pipelines shall be leak tight. Further, the compliance of all vehicles with local traffic regulations and laws shall be the responsibility of the Contractor.

All costs associated with any traffic closures, diversions, regulatory control, road safety measures, or any temporary access roads required, shall be covered by the Contractor within his relevant General Bill Item priced in the Bill of Quantities.

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Security of Sites

Sufficient security arrangements shall be made available to protect all such site equipment placed at the sites from theft or sabotage, and to maintain the safety requirements to compliant standards without interruption.

Work Sites and store yards shall be fenced with lockable gate, as specified, preventing unauthorised entry, and have fixed signs detailing the Employer property, as specified.

Security measures at the Contractor's sites shall be at least equal to those usually provided by the Employer to protect the similar existing facilities, but shall also include any additional security fencing, barricades, lighting, signage, flag men, watchman services, security guards, or other measures as required for the Contractor to fully protect the site against unlawful entry or damage.

The Contractor shall be responsible for protection of the sites and all works, materials, plant, equipment and existing facilities thereof against vandals and other unauthorised persons. No claim shall be made against the Employer by reason of any act of an employee or trespasser and the Contractor shall make good all damage to the property of

the owner resulting from his failure to provide security measures as specified. Costs for all security measures shall be deemed covered generally by the Contractor within his rates and prices.

The Contractor shall be responsible for protection against vandalism, theft or malicious mischief of all of his works, plant, materials and equipment at all times. Watchmen and lighting of the works shall be provided by the Contractor at his own expense for the duration of the contract.

e. Notification of Hazards

The Contractor shall inform the Engineer in writing in full of any special dangers anticipated during the execution of the Works. Where hazards exist, suitable signs shall be provided, as specified, and at suitable locations. Wherever practical, the Contractor shall safely and securely fence, or limit access to, potentially dangerous works areas.

f. Notification of Accidents

The Engineer shall be notified by the Contractor immediately any accident occurs whether on-site or off-site, in which the Contractor is directly involved, which results in any injury to any person whether directly concerned with the site or third party. Initial notification may be verbal, and shall be followed by a written report within 24 hours.

g. Protection of Property

The Contractor shall be responsible for the preservation and protection of property, private or public, as specified, on or adjacent to the work sites against damage or injury as a result of his operations under this Contract.

To provide the public with the necessary safety and protection, the Contractor shall at his expense provide barricades, tapes, lights, warning signals and sign boards, guard rails, pedestrian crossings over trenches, supervision and watchmen services to the satisfaction of the Engineer and all other safety measures in accordance with local regulations and these General Requirements and other applicable sections of the Employer's Requirements.

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h. Noise

The noise levels of the Contractor's plant and equipment shall meet the requirements of the local regulations for the Contractor's equipment operated on public roads. The maximum noise level of the Contractor's operations in public and residential areas shall meet the requirement set out the local regulations. Equipment, machinery and tools shall comply with all relevant health and safety regulations and requirements, and public safety requirements or shall be ordered removed from site.

i. Particular Requirements for Confined Spaces, Manholes and Deep Excavations

For below-ground deep excavations, deep trenches, pump wells, manholes, sewers, tanks, vessels, sumps, or any other confined space, the Contractor shall maintain on site all necessary safety measures, including but not limited to the following:

- Worker's harness gear and safety rope/cable to surface, full cover safety clothes suitable for entering confined spaces, deep trenches, and manholes for workers;
- Entry into the wet wells, deep trenches or manholes shall make use of a tripod for attaching a retrieving lifeline to the surface, including winches and fall arrest accessories;
- Below ground deep excavations, deep trenches, pump wells, manholes, drains, or any other confined space shall never be entered until the Contractor is assured that the air is safe. Gas detectors shall be used to check for toxic, flammable, explosive or harmful gases and for sufficient oxygen. If such working space should contain insufficient oxygen or harmful gases, then the space shall be ventilated until the condition is corrected, and the air maintained as such during the works;
- Proper ventilation from surface to bottom of the confined working space, manhole, sewer, wet well, trench or pit, or any other structure that does not have adequate ventilation, or employ the use of air-supplied respirators. Fresh air should be pumped into deep structures or excavations that do not have adequate ventilation, with the hose of the air pipe discharging at the base of the structure or excavation;
- Lighting from surface to reach the full depth of trench, pit or manhole,
- Full-time responsible supervision personnel as stationary observers at the ground level, outside of the confined space, to constantly monitor and watch over the person in the confined space, manhole, trench or pit.

The Contractor shall provide for the use of protective respiratory devices when the air quality exceeds local or international standards, or the following threshold limit values (TLVs):

- Carbon Monoxide = 29 mg/m3
- Nitrogen Dioxide = 6 mg/m3
- Particulate (Inert or Nuisance Dust = 10 mg/m3)
- Sulphur Dioxide = 5 mg/m3

For when there is need for any person to enter a deep trench, concrete tanks, manhole, wet well, or pit for trenchless works, or any other confined space, then the Contractor shall further supply and make available on site all necessary harness gear and cable to surface, tripod and cables, buckles, full cover safety clothes suitable for entering confined spaces, deep trenches, or chambers or manholes, with proper ventilation from surface to bottom of trench or pit, with lighting reaching the full depth of trench or pit, full-time responsible supervision personnel at the ground level constantly monitoring the person in trench or pit, and all other safety requirements as needed for entering confined spaces, as specified. Entry into wells and deep manholes shall make use of a tripod for attaching a retrieving lifeline to the surface, including winches and fall arrest accessories.

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j. Summary Requirements for Contractor's Safety Plan

The Contractor's Safety Plan prepared by the Contractor shall address the points listed below and shall be arranged in a similar manner unless otherwise approved by the Engineer:

(i) Safety Organization and Communication

- Safety control staff organizational structure, which should identify the personnel to be engaged solely for safety assurance (including the Contractor's Safety Officer who will be responsible for all safety on the Site), their responsibilities and authorities.
- proposed interaction and communication procedures between the Contractor's construction personnel and safety assurance staff.
- frequency, coverage and intent of site safety meetings, and regular site safety reports;
- safety information and training
- records to be prepared and maintained by the Safety Officer.

(ii) Measures for compliance of Subcontractors

(iii) Safety equipment and facilities

- Safety equipment, rescue apparatus and protective clothing which will be required for the Works. Such equipment shall include, but not limited to, eye protectors, hearing protectors, safety harnesses, safety equipment for working underground, in water ways and in the confined spaces, rescue equipment, fire extinguishers, first aid equipment, lanyards, hard hats, safety shoes, reflective vests, and, where appropriate, associated shock absorbers, chest harnesses;
- All traffic safety signage (advance warning of works, speed control, diversion signs, job information, etc), barriers, fencing around all open excavations, pedestrian trench bridges, warning tape, lights as required, proper store areas in streets and warning signs, and the like;
- Underground manholes and structures shall never be entered until personnel are assured that the air is safe. Oxygen and gas detectors shall be used to check for harmful gases and for sufficient oxygen. Manholes that contain insufficient oxygen or dangerous gases shall be ventilated until the condition is corrected. Fresh air shall be pumped into deep structures and any structures that do not have adequate ventilation. Supervisory personnel should always accompany and be stationed above at the surface for the person in the manhole. Rescue equipment and safety harnesses shall remain on standby.
- testing, inspection, and replacement of safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing, and guarding equipment.
- operation and equipment of the specified first aid base;
- emergency and rescue procedure and associated equipment;
- training in resuscitation.

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(iv) Protection of authorized and unauthorized visitors to site (including people of vicinity);

(v) Supervision of Safety systems

The means by which the Safety systems will be supervised, monitored and audited by the Safety officer to ensure due compliance with the principles and objectives of the Safety Plan. Procedures for updating the Safely Plan;

(vi) Safety Compliance of Construction methods

Proposals to ensure that construction methods do not compromise the Contractor's commitment to the Safety Plan or his compliance with regulations.

(vii) Hazards and Emergency

an appreciation of the industrial health hazards relevant to the Works, and proposals for minimization of the risks associated with such hazards.

k. Summary Requirements for Safety Assurance Plan

The Contractor shall develop and administer a Safety Assurance Plan for works under the Contract. The Safety Assurance Plan shall be included as part of the Contractor's mobilization schedule. The Contractor's Safety Assurance Plan shall include, but is not necessarily limited to, the following:

- A full description of each construction process;
- A hazard survey for each work area;
- Safety provisions for each construction process or operation;
- An occupational health and safety checklist for each construction process; and
- An environmental control plan based on the Environmental Monitoring Plan of the Contract.

The provisions of the Safety Assurance Plan shall ensure that people on or adjacent to the site (even if unauthorised) are not exposed to any safety hazards.

The safety provisions shall cover areas such as:

- Safety equipment and trained personnel on-site for particular operations;
- Staffing levels on-site for all stages when working with particular items of machinery;
- Staff qualifications in relation to the activities they will be performing;
- Post-accident procedures and responsibilities and
- Fire, fuel and chemical spill prevention.

The Contractor shall further comply with all relevant Government and local level Regulations and Codes of Practice.

The Contract will be responsible for the safety of the public legitimately passing through the Site. All excavations, piling operations, equipment or items of potential danger to the public must be barricaded and sign-posted to the satisfaction of the Engineer and the Contractor must provide sufficient watchmen to ensure the safety of the public at all times. All existing traffic, water traffic and pedestrian routes shall be maintained in a safe condition unless an alternative route is provided to the satisfaction of the Engineer.

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Deep excavations, underground culverts and manholes, and underground structures shall never be entered until the personnel are assured that the air is safe. Oxygen and gas detectors shall be used to check for harmful gases and for sufficient oxygen. Such underground spaces and manholes that contain insufficient oxygen or dangerous gases should be ventilated until the condition is corrected. Fresh air should be pumped into deep structures or excavations and any structure that do not have adequate ventilation. Supervisory personnel should always accompany and be stationed above at the surface for the person in the excavation, underground space or underground structure or manhole. Rescue equipment and safety harnesses shall remain on standby. In deep holes, where there is risk of low oxygen, personnel shall be equipped with rescue harnesses and cable to surface.

The Contractor shall comply with any safety instruction given by the Engineer. In the performance of the Works, the Contractor shall exercise every reasonable precaution to protect from injury persons or property. The Contractor shall erect and maintain all necessary temporary fencing, barricades, buoys, barriers, signs and lights and provide fire alarm, fire extinguishing and fire-fighting services at strategic points on the Site and adequate ventilation, lighting and safe working conditions for his workmen engaged in the performance of the Works. The Contractor shall adopt and enforce such rules and regulations as may be necessary and desirable in the work and in its supervision. Safety measures shall include but shall not be limited to those measures mentioned in this Specification.

The Contractor shall be responsible for protection against vandalism, theft or malicious mischief of all of his works, materials and plant at all times. Watchmen and lighting of the works shall be provided by the Contractor at his own expense for the duration of the contract.

The Contractor shall constantly employ during the progress of the Works an employee qualified in safety, and familiar with the type of work being performed, whose assignment as Safety Officer shall include initiation of measures for the protection of health and the prevention of accidents and who shall see, by personal inspection, that all safety rules and regulations are enforced. The Contractor shall hold regularly scheduled safety meetings at least once each month with his engineers, supervisors and foremen and, when instructed by the Engineer. The Contractor shall keep the Engineer advised as to when these meetings are to be held and shall provide the Engineer with a copy of the proposed agenda.

All costs associated with protection against the works, as described in the Specification shall be deemed covered generally by the Contractor within his rates and prices.

The Contractor shall submit the Safety Assurance Plan to the Engineer for approval as part of the mobilisation procedures. Costs for the Safety Assurance Plan shall be deemed included generally within the Contractor's Rates & Prices.

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PR.6.13 Excavation in Difficult Locations

This type of excavation item includes for locations where construction access is difficult, such as insides houses, shops, residences, pavements, gardens, paved floors and any other difficult areas which have constrained access.

The works include, but are not limited to, excavation, backfilling, pipelaying, dewatering, earthworks, excavation supports, and all other requirements to complete the installation of the pipeline.

PR.6.14 Trenchless Pipeline Installation

a. Summary

The Contractor shall use trenchless (no-dig) construction methods, such as mico-tunnelling, drilling / boring, or pipe jacking, for all pipelines crossing RDA roads and for pipelines located in areas or at depths where open cut is not allowed or not possible. The construction shall be carried out using one or more of the following trenchless technology methods:

1. Horizontal directional drilling
2. Pipe jacking
3. Micro tunneling with slurry type machines, combined with pipe jacking.

Bidders shall indicate their proposed trenchless methods in their bid.

The Contractor shall propose a trenchless method of installation and shall submit a proposal, with proposed Method Statement to suit the geotechnical conditions and depths, for review of the Engineer. The Contractor shall submit design calculations and drawings for all such temporary works for trenchless construction.

The Contractor shall nominate suitable personnel for pipe installation by trenchless methods.

The design details for the installation of ducts and pipelines across RDA roads are shown in the Standard Detail Drawings.

The Contractor may also use trenchless installation methods in other locations, as requested by the Contractor, where it is agreed with the Engineer that it is necessary.

For all access shafts, the sides shall be supported by sheet piles and shoring, and groundwater shall be controlled through dewatering at all times, as specified. Shaft safety shall include perimeter fences, traffic signs, steel plate covers, watchmen, and all as specified in the Clauses for Safety in this specification.

For micro tunnelling operations the Contractor shall provide:

- Micro-tunnel boring machines (MTBM) matched to the expected subsurface conditions and the pipe diameter to be installed,

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- hydraulic jacking system to jack the pipeline,
- closed loop slurry system to remove the excavated tunnel spoil,
- slurry cleaning system to remove the spoil from the slurry water,
- lubrication system to lubricate the exterior of the pipeline during installation,
- guidance system to provide installation accuracy,
- An electrical supply and distribution system to power all of the above equipment.

Trenchless pipe installation of any kind shall include settlement monitoring, contact grouting of sleeves and soil improvement measures.

b. General

The trenchless pipe installation works consists of installation of pipelines by methods of directional boring, thrust boring, or micro-tunnelling.
The work generally includes:

- Construction of a micro tunnel drive shaft;
- closed loop slurry system to remove the excavated tunnel spoil,
- slurry cleaning system to remove the spoil from the slurry water,
- lubrication system for the exterior of the pipeline during installation,
- guidance system to provide installation accuracy,
- hydraulic jacking system to jack the pipeline,
- electrical supply and distribution system to power all of the above equipment.
- Installing Jacking steel sleeves or reinforced concrete pipe
- Installation of pipeline
- Construction of a receiving shaft to remove the micro-tunnel machine
- Contact grouting around sleeves and jacked pipe
- A settlement monitoring system
- Construction of manholes in the drive shafts and receiving shafts as per drawings
- Related work activities including but not limited to surface reinstatement, site restoration and coordination with other work items

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c. Submittals

(1) Bid Submittals:

Bidders shall provide the following information as part of their bid proposal:

(i) Experience references of similar projects including project descriptions, and reference contacts.

(ii) Manufacturers' specifications and data sheets for micro-tunnelling boring machines (MTBM).

(iii) Schematic Layout and description of operational sequence.

(iv) Pipe Manufacturer's data.

(v) Size, construction and restoration plan for drive and receiving shafts.

(vi) Estimate of jacking loads.

(vii) Methods to control, handle, treat and dispose of slurry/waters.

(viii) Contingency plans for damage to casing pipe, loss of line or grade, bentonite or grout spills or blowouts, MTBM failure and recovery plan.

(2) Construction Submittals:

The Contractor shall provide the following information as a submittal:

(i) Detailed layout plan and schedule.

(ii) Design of temporary drive and receiving shaft signed and stamped by a professional structural Engineer.

(iii) Detailed plan for monitoring ground movement.

(iv) Certification by the Pipe Manufacturer that the pipe is suitable for the intended application.

(v) Tie-in to existing manhole details.

(vii) Video inspection record and hardcopy narrative log (VHS format) of the completed pipeline

(viii) Micro-tunnel operating log.

(ix) As-Constructed survey data.

d. Micro-tunnel Boring Machine (MTBM)

The MTBM shall be mechanically articulated to enable steering of the shield and shall be capable of incremental adjustments to maintain face stability for the soil conditions encountered. A remotely controlled steering mechanism shall be provided that allows for the operation of the system without the need for personnel to enter the tunnel.
The measuring and balancing of earth and groundwater pressure shall be achieved by use of a slurry system. The MTBM cutter face shall at all times be capable of supporting the full excavated area without the use of ground stabilization and have the capability of measuring the earth pressure at the face and setting a calculated earth balancing pressure.

The MTBM shall be advanced by jacks mounted in a jacking frame and located in the drive shaft. The MTBM shall be moved forward by the jacks advancing a successive string of connected pipes toward a receiving shaft.

The control equipment shall integrate the method of excavation and removal of soil and its simultaneous replacement by a pipe. Line and grade shall be controlled by a guidance system that relates the actual position of the MTBM to a design reference (e.g. by a laser beam transmitted from the drive shaft along the centre line of the pipe to a target mounted in the shield). As each pipe section is jacked forward, the control system shall synchronize spoils removal, excavation, and jacking speeds. The MTBM display equipment shall continuously show and automatically record the position of the shield with respect to the project design line and grade.

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e. Jacking Pipe

General

- 300 mm steel casing pipe for smaller HDPE pipe, if approved
- Reinforced concrete jacking pipe specifications
- For Use In Microtunneling and Pipe Jacking

Casing pipe shall be welded steel pipe meeting ASTM A-139, Grade B, and ASTM A-252 or approved equal. Pipe shall have a wall thickness of 10mm and a diameter to allow passage of pipe on skids.

The allowable jacking strength capacity of pipe shall be capable of withstanding the maximum jacking forces imposed by the operations. The allowable jacking capacity of the pipe shall be 3.0 times greater than the maximum jacking forces imposed by jacking operations as identified by theoretical calculations.

Selection of the appropriate class or dimension of jacking pipe for each given installation, shall take into account the installation, fill depth and foundation conditions, geotechnical conditions, traffic loads, and the construction loads that will be applied through the Contractor's methods of installation. It shall be ensured that the pipes can withstand the jacking loads to which they will be subjected to during installation, without cracking or spalling. The Contractor shall submit all details and working drawings for the manufacture of the jacking pipes prior to placing orders, for the acceptance of the Engineer.

A certificate shall be supplied, confirming that the pipes are suitable for jacking and stating the distributed jacking loads, which they were designed.

Jacking pipes shall be of sufficient diameter to house the pipelines, with special consideration given towards the outside diameter of the pipe sockets, before concrete pipe selection.
Submittals shall include shop drawings and calculation of jacking strength of the pipe. The drawings shall show dimensions of pipes including inside diameter and wall thickness, details of pipe joints and gaskets showing cushion packing ring and laying length of each pipe.

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Reinforced Concrete Jacking Pipes

Reinforced concrete jacking pipes shall be of pre-cast centrifugal-spun reinforced concrete, incorporating flexible rubber ring joints, as specified in the Standard Specifications.

All pipes and fittings shall be transported, stored and handled in accordance with the manufacturer's instructions or recommendations, or as specified herein.

Pipes shall be inspected for shape, fractures or cracks passing through the shell or other defects and deficiencies. Any pipe, which is deemed to be unsatisfactory, shall be rejected. Repair of minor imperfections shall only be permitted upon approval of the Engineer.

f. Construction

General

It shall be the Contractor's responsibility to provide and maintain a safe work site for all phases of construction. In no case shall any work be completed in such a manner as to endanger or damage adjacent facilities. Material to remain in place shall be adequately supported to prevent undermining of existing facilities adjacent to excavated areas.

Coordinate the Microtunneling work with other activities. Divert flow to micro tunnel piping only after channel improvement vegetation has been installed and is stabilized.

Establish horizontal and vertical control on site and tie-in to supplied datum.

Coordinate and verify utility locations. Protect utilities during construction and repair any utilities damaged immediately.

If the Contractor determines that dewatering is required for shaft construction, the design and operation of the dewatering system is the sole responsibility of the Contractor. The design of the dewatering system shall consider the potential for damage to adjacent facilities due to settlement by lowering of the groundwater table. Dispose of groundwater in accordance with all applicable local and national regulations.

Power systems and electrical equipment installations shall be in conformance the applicable sections of the National Electrical Code (NEC) and Ceylon Electricity Board regulations.

Settlement / Monitoring

Perform tunnel excavation in a manner that will minimize the movement of the ground in front of, above, and surrounding the tunnelling excavation, and minimize subsidence of the surface above and in the vicinity of the excavation. Support the ground in a manner to prevent loss of ground and keep the perimeter and face of the tunnel stable at all times including shutdown periods. Contractor shall, at his expense repair any damages caused by ground movement.

Settlement shall be monitored at 30-meter intervals along the pipe centreline and a minimum of 10 additional locations to be established by the Contractor as instructed by the Engineer.

Daily readings shall be taken on all monitoring points from a period 5 days before Microtunneling is initiated to establish baseline conditions, until the overall construction period is substantially complete. Such monitoring points shall be referenced to temporary benchmarks set by the Engineer. Benchmarks and monitoring points sha1l be installed in such a manner as to remain in place and undisturbed for the duration of the construction and warranty periods. All survey readings shall be recorded to the nearest 3 mm.

Operations shall be stopped when monitoring points indicate a vertical change in elevation 20 mm or more or any surface disruption is observed. The Contractor shall propose immediate action for review and approval by the Engineer to remedy the problem at no additional cost to the Employer.

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Drive and Receiving Shafts

Construct temporary drive and receiving shafts for the micro-tunnelling equipment. All temporary shafts shall be designed to be free of flowing or standing water while in use.

Perform shaft and tunnel excavation in a manner that will minimize the movement of the ground in front of and surrounding the excavation and minimize subsidence of the surface, structures, and utilities above and in the vicinity of the excavation. Support the ground in a manner to prevent loss of ground and keep shafts stable. Support the excavation by positive means and as necessary during all shutdown periods.

Coordinate backfilling of the shaft with downstream piping construction requirements.

Backfill and seal the shafts upon completion of the micro-tunnelling. Remove shaft supports to 3 meters below the ground surface and restore the disturbed site area to existing grades and original material conditions.

Pipe Installation

(1) General

Inspect all pipe prior to lowering into the drive pit to ensure that no cracked, broken, or otherwise defective materials are being used. Use the pipe manufacturer's recommended method for inspection or job site determination for damage. Pipe delivered with visible cracks, scars, chips, or any damage in excess of the limitations specified, shall not be used. Damaged or defective pipe shall be marked as rejected and shall be promptly removed from the job site.

Use proper tools and equipment to handle pipe. Slings shall be made of rope, non-metallic webbing, or other materials that will not damage the pipe. Lifting eyes shall be used only when approved by the pipe manufacturer.
Clean ends of pipe thoroughly. Remove foreign matter and dirt from pipe joints during laying. Lubricate joints per manufacturer's recommendations.

Damaged pipe shall be jacked through to the receiving shaft and be removed. Other methods of repairing the damaged conduit may be used, as recommended by the manufacturer and approved by the Engineer.

Skids shall be pressure treated lumber, 4 equally spaced on each pipe, of a thickness when strapped to the pipe shall protect the pipe bells from damage when sliding the pipe through the casing.

Lubricant used on the skids shall not be injurious to the pipe joint gaskets.

Fill casing pipe with grout before sealing ends.

Enclose ends of casing with concrete masonry units laid up with waterproof mortar with a 25 mm weep hole placed in the low end.

Coordinate with the relevant road authority for special conditions relative to each location.

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(2) Grade and Alignment Tolerances

The tolerance in the grade and alignment of the final tunnel lining shall comply with the following such that a continuous slope is maintained, and no portion of the alignment slope is flat or sagged:

Maximum Departure from Established Grade: Not to exceed a total of 25 mm.

Maximum Departure from Established Line: Not to exceed 50 mm.

The return to line and grade shall not exceed 25 mm in 7.5 meters.

The overcut diameter shall not exceed the outside pipe diameter by more than two (2) percent, unless approved by the Engineer.

PR.6.15 Rock Blasting

Should rock be encountered, in the course of excavation, it must be removed with excavator-mounted rock breaker tools, other breaker tools, wedges and levers. Rock blasting works include for the use of blasting to break up rock, with the approval of the Engineer and authorities, for areas where the use of rock breaking measures is proved insufficient.

For rock blasting operations, the Contractor shall provide his complete specific Method Statement, and with emphasis on safety of the sites and surrounding areas, for the approval of the Engineer and other relevant authorities.

Blasting shall not be allowed without the written permission of the Engineer, who must be fully informed by the Contractor as to the steps taken by him to safeguard the surrounding property. Such permission shall not absolve the Contractor from any of his obligations or liabilities under the Contract. Blasting operations shall be carried out as per the applicable British Standard Code of Practice for rock blasting and the local regulations of Sri Lanka.

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Responsibility

The Contractor shall be solely responsible for injury to persons, or property that may result from his use of explosives, and the exercise of, or failure to exercise control on the part of the Engineer shall in no way relieve him of responsibility for injury or damage resulting from their use.

Supervision

All blasting shall be done under the supervision of a competent blasting expert, and subject to Sri Lanka regulations for blasting.

Blasting Caps

If electric blasting caps are used, precautions should be taken to warn operators of radio equipment to stop transmitting in any area in which blasting operations are in progress.

Location

Explosives shall not be used within any distance that the Engineer may direct from concrete placed in the Works, any existing structure, water main, electric cable, sewer, conduit, or other service.

License

The Contractor shall obtain the necessary licenses for the storage, transport and handling of explosives and shall provide a store or stores suitable for explosives in accordance with local regulations.

Warning

Adequate warning shall be given to neighbouring residents before blasting operations are carried out. A siren should be sounded and men with red flags posted, on all roads at close proximity to the area, to warn traffic.

Safety in handling, Transport and Storage

a. Explosives, detonators, detonating fuse etc., shall not be stored except in a proper magazine, which is clean, dry, well ventilated, well locked and approved by the controller of explosives.

   Explosives and detonators shall be stored separately either in separate magazines or in a separate compartment of the magazine. Detonating fuse shall be stored with explosives and not with detonators

   Smoking, matches or open light shall not be allowed in or near the magazine or while handling explosives and detonators. A permanent notice board in Sinhalese, Tamil and English warning "NO SMOKING" shall be displayed in a prominent place near the magazine.

b. Only wooden tools shall be used to open cases of explosives. No metal tools shall be kept in the magazine or used. Cases shall not be opened inside the magazine.

c. Cases of explosives shall be handled with care and shall not be dropped, pushed or slid in a rough manner.

d. When a case has been opened its contents shall be used before opening other cases.

e. Explosives and detonators shall be issued in the sequence of manufacturing dates marked on the boxes.

f. Primer cartridge shall not be made in the magazine

g. Explosives shall not be transported with any other materials, particularly with tools or inflammable liquids

h. Whenever possible, explosives and detonators shall be transported in separate vehicle or conveyed by different men. If both have to be carried in the same vehicle, they shall be placed in separate compartments

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i. When transporting, the explosives shall be kept furthest from the engine. Explosives shall not be carried in the driver's cabin

j. Loading and unloading of explosives to the vehicle shall be done as gently as possible

k. No explosives or detonators shall be transported without a valid transport pass

l. Only the essential quantity of explosives and detonators shall be transported to the blasting site. Explosives and detonators shall be kept apart until they are us

m. A monthly return of explosives indicating the quantity of each kind of explosives used, the quantity of rock blasted, opening and closing stock balances shall be sent to the Engineer and to the responsible authority for the district in which the explosives are kept.

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SECTION 6A –1 - PARTICULAR SPECIFICATIONS

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PARTICULAR SPECIFICATIONS

(These Particular Specifications (PS) shall read in conjunction with the CIDA Specifications for Water Supply, Sewerage and Storm Water Drainage Works SCA/3/2 – Second Edition (Revised) – April 2002 and the General (Technical) Specifications of NWSDB attached herewith. The following Particular Specification (PS) Clauses shall supplement the above. Whenever there is a conflict, the provisions herein shall prevail over those in the above. However, any information, requirements which are not covered by these PS, the above Specifications are prevail)

PS.1 Materials - General

PS.1.1 Materials Standards and Quality

All manufacturing and production Standards for the construction of the Works and supply of materials required in the Contract shall be in compliance to the latest editions of the relevant National or International Product Standards.
Manufacturing facilities for pipes, fittings, valves, specials and accessories shall be operating and established in conformity with BS, BS EN or ISO Standards along with ISO 9001:2015 Quality Management System.

No substitutions of materials and any other items forming part of the Permanent Works included in the Contract will be permitted.

The Specifications for the Pipes, Fittings, Valves and Accessories as in the Contract Document under 6B Technical (General) Specifications are superseding the relevant CIDA Specifications and to be adopted in Design, Manufacturing, Testing and all other Contractual requirements.

The supply of Ductile Iron & HDPE Pipes, Fittings, Valves Couplings & Adaptors and Manhole Covers & Surface Boxes shall be in accordance with the standard specifications under Section 6B.

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PS.1.2 Accredited Agents and After Sales Services

All Material supplied and installed under this Contract shall be supported by an Accredited Agents in Sri Lanka who shall have minimum five years' experience for the proposed Material/Equipment/plant. He shall be equipped with adequate technically qualified staff, work shop repair facilities and sufficient stock of spare parts/repair materials etc., in order to render effective after sales services.

PS.1.3 Warranty Requirements

The Manufacturer shall provide original Warranty Certificate at the time of delivery. The Comprehensive Warranty shall be in accordance to the Clause PR 3.6 of the Particular Requirements in this Section VI.

It shall be addressed to the General Manger, National Water Supply & Drainage Board, P O Box 14, Galle Road, Ratmalana, Sri Lanka.

PS.1.4 Operation and Maintenance Manuals

Operation and Maintenance Manuals shall be prepared for, but not limited to, the following:

Type of Item
Water Supply Network System Manual
Gate Valves
Butterfly Valves, if any
Air Valves
Non-Return Valves and Flap Gates
Ductile Iron Pipes & Fittings
HDPE Pipes & Fittings
Watermeters
DI Manhole Access Covers and Frames
DI Valve Surface Boxes
Fire Hydrants

PS.1.5 Packing

All imported Pipes, Fittings, Valves, Specials and all other products shall be packed in such a manner as to prevent damage in ordinary handling and transportation. Each box, bundle or crate shall be legibly marked identifying the contents, and giving the name and address of Manufacturer, name of the Contract " SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS, ANWSP – PHASE II", and the Consignee as "NATIONAL WATER SUPPLY & DRAINAGE BOARD, PO BOX 14, GALLE ROAD, RATMALANA, SRI LANKA", and the date of dispatch.

"For References ONLY" (Not for Binding)

PS.2 Ductile Iron Pipes and Fittings for Water Supply

All Ductile Iron pipes and fittings shall be to PN10 Pressure Class and shall be in accordance with Standard Specification 6B-1.
Ductile Iron Fittings except tees shall be integrally cast to Class K12.

Ductile Iron Tees shall be integrally cast to Class K14.

Standard ductile iron flanged straight pipe fittings of standard lengths *(e.g. 300mm, 500mm, 800mm, 1000mm)*, and straight pipe fittings with puddle or thrust flanges, shall be of Class K12 integrally cast.

Ductile iron straight flanged pipe specials and long pipes for crossings shall be Class K9 centrifugally cast pipes with factory-welded flanges.

Ductile iron pipes and fittings and valves, housed within chambers, shall be epoxy coated.

Flange adaptors and couplings shall be to suit ductile iron pipe, and incorporate EPDM gaskets. Couplings are VJ-type, or similar. Repair clamps are not used.

Polyethylene Sleeving:

Polyethylene (LDPE) tubular film shall be in accordance with the Standard Specification 6B-1 and such protection shall be required, with approval of the Engineer, where the DI Pipes are buried within soils of:

- Low Resistivity *(an indication of high Corrosion)*
- Stray Current Areas,
- Where analysis shows High Chloride or Sulfate contents, or Bacterial Activity.
- Rice paddy areas

It is preferable to supply the sleeving by the manufacturer of the ductile iron pipes.

The Tubular Sleeve should be slipped over and snugly fitted to the Pipe by means of adhesive plastic tape at each end as recommended and care shall be taken to avoid the ingress of water, soils or any foreign particle in to the barrel. The Contractor shall submit and obtain the Engineer's approval for the Method of Statement explaining the technique inserting, joining etc., prepared based on the manufacturers recommendations.

PS.3 High Density Polyethylene (HDPE) Pipes and Fittings for Water Supply

As shown in the Drawings, the Minimum Required Strength (MRS) designation for materials of all HDPE pipes and fittings for the permanent works shall be PE100 polyethylene to EN 12201. The nominal pressure rating for HDPE pipes and fittings under Lot C1 shall be PN10 in accordance with EN 12201, unless shown otherwise.
All HDPE pipes and HDPE fittings shall be suitable for and be jointed by Butt-Welding or Electrofusion Welding techniques. Compression jointed HDPE pipes and fittings are not used under this Contract (except for temporary fittings and temporary end caps which are not part of the permanent works).

The HDPE pipes and fittings shall be manufactured of blue colour compounds.

HDPE pipes and fittings manufacturers shall consider the temperature correction on required pressure class, based on the temperature in the Project Area of Sri Lanka and the working pressure.

HDPE flanged stub connector pipe-fittings, for connection of HDPE pipe to a ductile iron flanged end, shall always include the appropriate sized stainless steel backing ring to be supplied by the same manufacturer as the HDPE flanged stub connector, and with bolts, nuts and washers.

The Contractor shall be solely responsible for ensuring that, flotation of HDPE pipework does not occur during construction.

Butt-fusion welded pipes and fittings and electrofusion welded fittings must be installed by qualified individuals trained and certified in butt-welding and electrofusion installation procedures.

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PS.4 Valves, Hydrants, Surface Boxes and Manhole Covers for Water Supply

PS.4.1 Gate Valves and Butterfly Valves

Gate valves shall be in accordance with Standard Specification 6B-3. Gate Valves shall be Standard Water Works pattern Double Flanged Ductile Iron and appropriate for Clockwise Closing. In case of hand-wheel operated Valves, the handwheels shall be indelibly marked with words "Open" and "Close" with direction arrows.
The Employer requires that all DI/CI Gate Valves and Butterfly Valves supplied under this Contract be tested for 1.5 times of the Nominal Pressure (PN) of the valve *(Refer Clause 7.3 of Contract Data).*

The Standard Specification shall be amended to state that "Bypass arrangements shall be provided for Gate Valves of DN 350 and above."

Gate Valves within chambers shall be short-type flanged gate valves, as specified in the standard specifications.

Buried gate valves, incorporating surface box installations, may be proposed as long-type flanged gate valves.

Butterfly valves shall be double-flanged double-eccentric type butterfly valves, and be as specified in the Standard Specification.

All gate valves and butterfly valves shall be epoxy coated.

PS.4.2 Fire Hydrants

Fire Hydrants shall be dry barrel type as shown in the drawings and as specified in Standard Specification 6B-3.

PS.4.3 Maintenance Materials & Tools

The Contractor shall supply the following additional materials for use of the Employer as replacement parts for the Valves furnished under this Contract, in quantities of:

1) For every five (5) Gate Valves of the same size and type or fraction thereof:

   1 Set Stem Seal

   1 Pc Gasket with O-Ring seals

   1 Pc Bonnet Gasket

   1 Pc Stem

   1 Pc Operating Nut

2) For every five (5) Butterfly Valves of the same size and type or fraction thereof:

   1 Pc Shaft Seal

   1 Pc Rubber-Sealing Ring

   1 Pc Thrust Bearing

   1 Pc Operating Nut

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3) For every five (5) fire hydrants of the same size and type or fraction thereof:

1 Pc Shaft Seal

1 Pc Rubber-Sealing Ring

1 Pc Thrust Bearing

1 Pc Operating Nut

1 Pc Outlet Stand-Pipe (1m high)

When each type of Valve to be installed is less than five (5) Sets, each one (1) set of the materials specified above shall be provided.

Spare parts shall be provided for every 5 non-return valves including spare hinge pin, and every 5 air valves including float seals.

All Tee-Key operated Valves shall be provided and fixed with Valve Spindle Caps as per BS 5163 :1986.

Four Tee-Keys for each size of Valves shall be supplied, for each Zone of the Works.

The Contractor shall supply two complete sets of tools adequate for the erection and maintenance of all valves, hydrants and other fittings supplied, for each Zone of the Works.

Costs of these Maintenance Materials & Tools shall be deemed to be included in the rate of each type of Valve.

PS.4.4 Surface Boxes & Manhole Covers

Manhole Cover and frames and Surface Boxes shall have cast in-letters of Words in English to indicate the function of the fittings "FH, WO, SV, METER" and "NWSDB – WATER" in size as Specified, cast-in raised letters.
Manhole Covers and Frames shall be equipped with Captive Hinge arrangement to deter vandals and with suitable Water Tight arrangement to prevent ingress of surface water into the Manhole and Non-Rock, Black Bitumen coated.

The Manhole Covers shall be of following Types:

- For Air Valves – Ventilated Type
- For Gate Valves and Butterfly Valves – Watertight-type
- For Flowmeters – Watertight-type

The Contractor shall supply 2 nos. of lifting keys suitable for each type of manhole cover and surface box, for each Zone of the Works, and handover to the Employer.

PS.5 Consumer Water-meters (Volumetric Type)

Domestic consumer watermeters shall be Vertical-Type, as shown in the Drawings, and otherwise be in accordance with the Standard General Specification 6B-8 "Specification for Volumetric Displacement Type Water Meters and Spare Parts".

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PS.6 Water Supply Consumer Connections

The Contractor shall install EF tapping tees and consumer connection pipework at the locations where existing and new connections are required, as instructed by the Engineer. For existing connections, the Contractor shall finish the works with a temporary end cap on the 20mm diameter HDPE connection pipe, just outside the consumer boundary, as shown on the Standard Detail Drawing for service connections. The detailed design drawing for consumer connections supersedes the Drawings as shown on the last 2 pages of the Technical (General) Specifications 6B-15.

For new connections, the Contractor shall finish the works with a temporary end cap on the 20mm diameter HDPE connection pipe, backfill the end cap, and installed just outside the consumer boundary, as shown on the Standard Detail Drawing for service connections, and record the location by GIS coordinates and measurements to existing features at the site.

The consumer connection installations shall be constructed in accordance with the Standard Drawing for Consumer Connections, and the Contractor shall allow an average of 10 metres of 20mm HDPE pipe for each connection.

EF Tapping Tees

Injection molded electrofusion tapping tees for consumer service connections shall be electrofusion type, incorporating an integral cutter tool, that cuts vertically down into the pipe. The cutter tool shall be housed within the tapping and protected by a closed threaded heavy duty plastic cap. Tapping tees shall be mounted on the top of the mating pipelines, and be suitable for potable water supply. Tappings shall be of PE100 HDPE, and rated to minimum PN10, fusible to PE100 HDPE pipe systems. The tapping tee shall be of welded type around the upper side (fusion zone) of the tee. During jointing and welding of tapping tees, to firmly restrain the tee in place, then the tapping tees shall incorporate restraints of either full PE saddle, or by bolted lower straps. Fittings shall be compliant to EN12201.

EF HDPE/brass male threaded adaptors (20mm HDPE)

The Contractor shall provide male threaded adaptor fittings which have a threaded brass male end ½ inch diameter, and the other end that can connect by electrofusion welding to 20mm HDPE pipe. The adaptors shall be of PE100 HDPE and be compatible with the same HDPE pipe that has been supplied by the Contractor, and be rated to minimum PN10. Fittings shall be compliant to EN12201.

PS.7 Protection of Bolted Joints

All buried and exposed bolted flanged joints, coupling joints, flange adaptor joints, including those bolted joints in valve chambers and flowmeter chambers, shall be protected by corrosion resistant protection material in accordance with the Standard Specification 6B-12.

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PS.8 Pipeline Marker Tape

For all buried water supply pipelines, detectable-type luminous blue colour Marker Tape, which can be detected by underground pipe locater operating by induced magnetic field, shall be installed 500mm above the pipe.

The Contractor should make sure the connectivity of magnetic field at the joints of tape. The Manufacturer should provide necessary joining facility to maintain the conductivity.

PS.9 Access to Sites and Working Areas

No mobilisation or excavation shall be permitted at a new sites unless the Contractor has obtained prior approval of the aforesaid programme and demonstrated that all necessary materials, pipes, fittings, labour, temporary installations and Contractor's equipment, are available on site for the continuous working and prompt completion of all the works at the particular site.
Construction of pipelines, pipe branches, chambers, consumer connection tees and lateral pipes shall be carried out in parallel for each particular works site, enabling the sites to be formed and barricaded and subsequently later re-opened to the public, during a single time period, without repeated use of the same sites being revisited and re-excavated for different aspects of the installation works. The Contractor shall request the required working areas and times needed accordingly from the authorities and the Engineer, and shall provide for all necessary controlled traffic protection, throughways, traffic diversions as needed, and ensure all provisions for access to residents adjacent the works sites.

Unless otherwise approved by the Engineer in writing, work on each works site, including associated items such as chambers, crossings, branch tees and pipes, and house connection pipes, shall be fully completed for the site, with the trenches and excavations closed, and including temporary backfill reinstatement, to the satisfaction of the Engineer, before access to a new works site for the relevant work crew and subsequent start of new excavations can be approved for mobilisation.

The Contractor shall then inform the Engineer for an inspection of his completed mobilization of all equipment, materials, labour, temporary works, plans, and services, sufficient for the continuous uninterrupted progress of the works, in order to gain approval to start the works at the new site.

Costs for such mobilisation shall be covered by the Contractor under the relevant Item prices in the General Bill of Quantities.

PS.10 Contractor's Staff and Labour

The Contractor shall provide all necessary offices, accommodation, sanitary and other necessary facilities and services for his own and any other personnel under his control, all as set out in the Contract requirements. The location of the Contractor's main project office shall be permanent for the duration of the Contract.
The Contractor's Representative shall be present in this office at all times (or on-site working from this office) while works are in progress, or his authorised representative as approved shall be present during reasonable leave periods. Instructions from the Engineer

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delivered to the Contractor's main field office shall be deemed as delivered to the Contractor's Representative.

The Contractor's Field offices shall be proposed to be established in proximity to each works site, at locations acceptable to the Engineer. Field offices shall be maintained as specified herein, in a clean safe orderly condition by the Contractor. In accordance with the Particular Requirements, the land, boundaries and full set-out details of the Contractor's proposed temporary offices, work-yards, staff housing and camps, workshops, depots and stores, demonstrating compliance with all applicable parts of the requirements, shall be submitted for acceptance by the Engineer within the times as specified for submittals of details of temporary works.

Secure fencing, including lockable gates, shall be provided along the agreed boundaries of all temporary field offices.

Prior to constructing workshops or dwellings at the job site, permission shall be obtained from the Engineer. Any workshops shall be constructed in such a manner that they are not be an obstacle to the movements of the general public, and the area shall be kept clean at all times. Living accommodation for those employed by the Contractor shall be maintained in a clean and sanitary condition. Each dwelling unit shall be properly furnished and provided with electricity, potable water supply and sanitary facilities, at Contractor's own cost.

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PS.11 Sign Boards

The Contract includes project signboards, to the amount as specified in the Bill of Quantities. The signboards shall be erected prior to the commencement of the construction works.
The permitting procedure for the signboards is as follows:

1) The Employer shall indicate the exact location of each sign board on map;
2) The Contractor shall obtain advertising permit from the relevant authority; and
3) The Contractor shall obtain the excavation permit from the relevant authorities for the erection of the signboards.

The Contractor shall pay the applicable fees for permitting steps 2 and 3.

The Contractor shall provide the supply, painting, erection and maintenance of the project signboards throughout the period of the works. No other such signboards may be erected without the express approval of the Engineer. The signboards shall be in colour. The signboards shall be painted over with a fully weatherproof paint system prior to lettering. All supports shall be painted with the same paint system as the sign.

Costs for manufacture, delivery, erection, maintenance and final removal of sign boards shall be covered within the respective item in the General Items Bill of Quantities.

PS.12 Pipe-Laying Works

The Contractor shall undertake a survey of all the underground existing utilities/obstructions/culvert foundations at the Sites and shall determine the exact locations and depths of all such underground utilities and obstructions. The results of the survey shall be incorporated in the "As-Built" Drawings.
Site Clearance/Excavations within the boundaries of the Sites for the Works shall only be carried out within the boundary of the Permanent Works.

The Contractor shall engage a Geotechnical Expert who should study the Site Ground Water condition, Existing Water-Logged Areas, Existing Water Table, Seepage of Water across the Excavation, Soil Layer Properties and Soil Types etc., to ensure the safety of existing structures/properties before or during construction. The Geotechnical Expert shall consider all of the above studies and investigations and the safety of the existing structures/properties when preparing the method statement for both excavation and backfilling. The Contractor should inform the Engineer of all necessary precautions to be taken based on his own investigations and study. The proposed methods of excavation and backfilling shall be approved by the Engineer prior to commencement of any such Works.

All the levels (Spot Levels and Contours) shall be recorded by a licensed surveyor prior to Commencement the Site Clearing and Earthwork and these Levels and Contours shall be compared with the levels shown in the relevant Drawings and to be agreed with the Engineer. In case of any discrepancy between the levels on the Drawings and the actual levels, the Contractor shall notify the Engineer prior to commencement of any further works.

The Employer, his Engineers, and the Engineer do not warrant the accuracy and / or completeness of the geotechnical/topographic information provided as part of this Document, and the Contractor shall be solely responsible for its interpretation and verification. Where the Contractor elect to interpret and use this data, it shall be entirely at his own risk and strictly subjected to relevant clauses of the Condition of Contract.

The Contractor shall submit design calculations and details for supporting trenches, including for shoring and bracing of trenches. The calculations and details shall be prepared by a certified geotechnical expert and submitted to the Engineer for approval prior to carrying out any trench excavation for which the Engineer requests such details considering the Site Condition.

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For pipeline structures such as thrust blocks and valve chambers, etc., excavation shall allow 800mm working space for purposes of establishing Contractor's liability for permanent reinstatement costs (to be measured).

During backfilling, heavy compaction equipment shall not be used over HDPE pipelines that have less than 300mm cover of backfill material.

The Contractor shall complete the Pipe Laying, Backfilling and Compaction Works of excavated trench on the same day before leaving the Site. Open pipe ends shall be covered and secured with a temporary end cap at the end of every working day at all sites, and maintained closed until the continuation of the works.

Bridge, culvert and causeway crossing Works shall be carried out simultaneously with the pipelaying works, such that pressure testing, flushing and disinfection may be carried out as a continuous system. However, the Contractor shall take this into account during the preparation of his programmes for commencement of pipe works, testing, etc.

Excavation in Rock

For the purpose of payment, rock shall be defined as all materials, including natural rock or artificial hard material that, in the opinion of the Engineer, cannot be reasonably excavated by means of picks or excavators or by ripping with a tractor of at least 180 brake HP with a single, rear mounted heavy duty ripper; and for which the use of a compressor driven pneumatic drill, metal wedges, rock-breaking wedge hammer attachments to excavator equipment, sledgehammers or blasting is essential. An individual boulder, brickwork or concrete structure below 1.0 m^3 total volume shall not qualify for payments as rock. If the Contractor encounters any such material, which he considers cannot be reasonably excavated by means as defined in the first sentence above, then he shall immediately inform the Engineer so that the latter may decide whether excavation of such material qualifies for payment for rock excavation. Rock excavation for general earthworks shall be measured in cubic metres, and only to within the maximum allowable extents for excavation. Rock excavation in trenches shall be measured in cubic metres to within the maximum trench width only, as shown. The Contractor shall make allowances for the possibility of permission not being granted for the use of explosives for blasting.

The breaking of concrete surfaces or of road surfaces or of road base materials shall not be considered or paid for as rock excavation. The breaking, removal and reinstatement of road and concrete surfaces are provided for under separate payment items for reinstatement of surfaces.

Damages to Existing Water Supply Pipelines

The Contractor shall inform any damages to the existing pipe lines immediately to the relevant Officer in charge of NWSDB. Water loss shall be borne by the contractor. The rectification works to be done by the contractor and service restoration shall be completed within 24 hours. If rectification work is delayed beyond this time period, then the contractor shall make provision to supply water to the effected parties at his own costs.

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PS.13 Hydrostatic Pressure Testing of DI and HDPE Pipelines

Hydrostatic pressure tests for ductile iron and HDPE pipelines shall be carried out in accordance with Standard Technical Specifications 6B16 and 6B-17 to the pressures as specified. The working pressures for the pipelines shall be provided by the Engineer, as required.

PS.14 Indicator Plates and Marker Posts

Indicator Plates shall clearly identify Hydrants, Valve Types etc., as per the Standard Drawings.
They shall be mounted at the back of footpath or in the boundary wall of the public thoroughfare nearest to the hydrant or valve. Each water dispensing outlet shall be labelled as “Fire Hydrant”.

PS.15 Watertightness Tests for Chambers

The Contractor shall accept full responsibility for the watertightness of all water retaining structures and chambers. Tests to confirm watertightness shall be planned together with the Engineer, with at least 2 days' notice, and shall be carried out before backfilling to leave the external walls exposed for inspection. The sites shall be suitable and safely protected from entry of public. All debris, material and waste shall be removed from the inside of the structure, and the inside face of the walls and floor thoroughly hosed to the satisfaction of the Engineer.

Repairs or patching to concrete shall not be carried out prior to the tests. Concrete shall **not** have porous or damaged areas patched over with mortar prior to the tests. If such works are identified, then the tests shall be cancelled and all mortar patching removed so as to inspect the cast concrete.

Prior to installation of valves and flowmeters, the chambers shall be filled with water, let stand for some time for water absorption into the concrete, and allowed to stand for a further sufficient time (e.g. 24 hours), after which the Engineer shall inspect the structure for watertightness by suitable measurement of acceptable water loss over time. Visual inspections of the walls shall also be carried out, during the testing days period, to inspect for damp patches, leaks, and other evidence of leakage. Leaks shall be repaired by methods as approved by the Engineer. Approved methods shall involve chipping out of all porous areas, profiling of repair areas with squared off straight-cut voids, scabbling and roughening of areas to expose homogenous hard concrete surface, bond bridge adhesive application, and filling of voids with approved repair compounds.

"For References ONLY" (Not for Bidding)

PS.16 Concrete Casting for DI Insert Pipes and Conduit Inserts

Pipes, conduits and other items passing through concrete structures and valve chambers shall be cast into the respective structures as in-situ concrete work proceeds, with pipes and fittings having already been temporarily or permanently installed and connected to the external pipes and fittings to ensure proper fit, on both sides of the structure walls, internally and externally, at the time that the formwork is erected, but prior to the start of any concreting.

Before placing concrete, all pipes, conduits, hangers, bolts, supports or other fixtures, to be built in, shall be fixed in correct positions, and shall be held fast by fixing to the formwork or otherwise supported by temporary supports, outside and adjacent to the structure, and **not** connected or supported by the reinforcement.

Before setting these items, the Contractor shall check all Drawings and Shop Drawings which indicate pipe, conduit and other items' locations and the Contractor shall be responsible for the proper location of all items during construction.

Pipe inserts through concrete walls shall be carried out by casting-in the ductile iron pipe, with the thrust flange, if applicable, to be located at the centre of the concrete wall, as detailed in the Drawings. Before concrete casting, the pipes shall be placed at correct level, aligned, and supported each side of the wall formwork, in a way as to prevent damage to the coatings, independently of the reinforcement steel or formwork. Changes in direction shall be made using proper fittings, external to the structure. Piping shall run parallel and at right angles to walls, unless specifically shown otherwise. An expandable (swelling

type) polyurethane waterstop shall be applied around the full circumference of the pipe, just behind the thrust flange, on the outside side of the thrust flange (which is facing towards the groundwater "wet" external side of the wall). The pipes shall be temporarily or permanently connected and bolted to the pipe system external to the structure, to ensure proper fit of all pipe fittings, prior to the start of any concreting. All fittings and valves within the structure or chamber shall be well covered with protective coverings during concrete works.

The Contractor shall take due care to adequately support the pipework until sufficient curing and permanent supports and anchorages have been completed. The Contractor shall ensure that no excessive loads or stresses are imposed upon the fittings, pipework or structure during connection. Pipework systems shall be complete, checked and inspected for correct position and alignment before and after being embedded in concrete, where applicable.

The Contractor should place orders for these pipe insert items and conduit inserts in good time before construction, and make every effort possible to ensure early delivery to Site. The supply and delivery of the cast-in pipe inserts should be clearly shown on the Programme to be submitted by the Contractor.

Boxing-out openings in concrete walls and chambers shall not be permitted.

PS.17 Site Diary / Daily Report

The Contractor shall keep, for each section of the Works separately, a Site Diary / Daily Report in English in a form acceptable to the Engineer. The Diary shall be kept daily, the pages shall have running numbering and the Contractor and the Engineer or his authorised representative(s) shall sign the Diary daily. The original Site Diary shall be kept on each work site and signed copies shall be submitted weekly to the Employer and the Engineer. Upon the completion of a section of Works the original Site Diaries shall be submitted to the Engineer. Reports shall contain the following:

- Weather conditions throughout the working day;
- Nos. Staff and labour employed on the work site;
- Nos. for each Contractor's Equipment mobilised to the Site;
- Materials and Plant on the Site, and delivered to site;
- Work completed, including locations and estimates of day's production;
- Work in progress and preparation;
- Day to day site instructions of the Engineer's on-site representative, if provided, including safety requirements for the works;
- Accident reports and OHS issues;
- any reason causing a suspension of the work;
- Occurrence of any event or condition that might delay the progress of work; and
- All other information relevant to the progress of the Works.

"For References ONLY" (Not for Bidding)

6A.2 - GENERAL SPECIFICATIONS
(Specifications for Civil Engineering Construction)

"For References ONLY"
(Not for Bidding)

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6A.2 Specifications for Civil Engineering Construction

In case, the attach Specifications in the Contract Document not adequate/covered the Technical Requirements in respect of the Contract, the following specifications published by the Construction Industry Development Authority (CIDA), shall be used.

a) Specifications for Building Works (Volume I & II)– SCA/4/I & SCA/4/2
b) Specifications for Water Supply, Sewerage and Storm Water Drainage Works SCA/3/2 – Second Edition (Revised) – April 2002
c) Specifications for irrigation and Land Drainage Works SCA/3/1
d) Specifications for Construction & Maintenance of Roads & Bridges – SCA/5
e) Specifications for Electrical and Mechanical Works associated with Building and Civil Engineering

Specifications in addition to the above CIDA Specifications are included in the Contract Document. Such Specifications supersedes the CIDA specifications or which are not covered by the above specifications. Any others relevant Technical Details/Specifications required by the Contractor shall be issued by the Employer on request, provided it is deemed necessary.

(These Specification Documents are not attached to the Contract Documents. The Employer assumed, the Contractors already owned such copies of the referred Specification Documents or to purchase the latest Versions published by the Construction Industry Development Authority (CIDA), in order to competence the requirements)

"For References ONLY" (Not for Bidding)

"For References ONLY"
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6B. TECHNICAL (GENERAL) SPECIFICATIONS

(Specifications for Engineering Construction and Materials)

"For References ONLY"
(Not for Bidding)

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6B.2 Specifications for Polyethylene (PE) Pipes & Fittings for Water Supply Applications

6B.3 Specifications for Valves, Hydrants, Surface Boxes and Manhole Covers for Water Supply Applications

6B.4 Specifications for Couplings and Flange Adaptors

6B.5 Specification for Galvanized Iron Pipes and Fittings

6B.6 Specification for Inspections and Testing of Goods

6B.7 (Not Used)

6B.8 Specification for Water Meters (Volumetric Type)

6B.9 Specification for Brass Lockable Ball Valves

6B.10 Specification for Brass Stop Valves

6B.11 Specifications for Pipeline Marker Tapes

6B.12 Specifications for Bolted Joint Protection Materials

6B.13 Specifications for Pipe Laying

6B.14 Specifications for Trench Excavation, Backfilling & Road Reinstatement

6B.15 Specifications for Provision of Service Connection

6B.16 Specifications for Pressure Testing of DI, CI & PVC Pipe Lines

6B.17 Specifications for Pressure Testing of HDPE Pipelines

6B.18 Environmental Management Plan

6B.19 Specifications for Hired Vehicles

6B.20 Guideline for COVID 19

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Correction Index for Technical (General) Specifications

Item No.	Section//Page/Clause References	Existing Status	Correction
1	6B-3 6m-10 2.6	a. Hydrostatic Test	Shall be corrected as (iii) Hydrostatic Test
3	6B-15 6c-3 & 6c-4 and 6-14 6d-15 & 6d-16	Typical Drawing for PE Service Connection Details- Horizontally mounted Water Meters Arrangement.	These two sheets shall be replaced by Standard Drawing for HDPE Service Connection Details- Vertically mounted type Water Meters Arrangement as Specified in the Particular Specifications and as per the Contract Drawings.
4	6B-15 6c-1 Point.5	"The contractor shall not use additional material (pipes, special, valves etc.) other than provided by the Engineer, and in the service connection. In cases of deviation from this rule, contractor shall obtain prior approval of the Engineer."	Shall be amended to "The Contractor shall Supply all necessary pipes, valves and Materials for Service Connections. For further details, refer to the relevant Clauses of Particular Specification, the Drawings and the BoQ.
5	6B-14	Clause 15. Road reinstatement shall be done as stated in the drawing Nos. WT 403/BT/01A & WT 403/BT/02A and as specified in the ICTAD Specification No. SCA/5, Second Edition June 2009 for Construction and Maintenance of Roads and Bridges.	These two sheets shall be as well as the Service Connection details Sheets shall be replaced by Standard Drawing for Trench Excavation, Backfilling Drawings and HDPE Service Connection Details- Vertically mounted type Water Meters Arrangement as Specified in the Particular Specifications and as per the Contract Drawings.

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6B.1 SPECIFICATION FOR DI PIPES AND FITTINGSFOR WATER SUPPLY APPLICATIONS

- GENERAL
- TECHNICAL REQUIREMENTS FOR DIPIPES & FITTINGS FOR WATERSUPPLY APPLICATIONS

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SPECIFICATIONS FOR DI PIPES, FITTINGS, SPECIALS, ACCESSORIES, DI/CI VALVES, MANHOLE COVERS AND SURFACE BOXES FOR WATER SUPPLY APPLICATIONS

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"For References ONLY" (Not for Bidding)

1.0 GENERAL

1.1 Ambient Conditions

All items of materials and equipment shall be in every respect suitable for storage, installation, use and operation in the conditions of temperature and humidity appertaining in Sri Lanka.

The annual average temperature is 35 °C while the relative humidity varies generally from 70% during the day to 90% at night.

The temperature of potable water to be conveyed in the pipelines will be about 32 °C at the depth of 1.5m.

1.2 Suitability for Potable Water

Pipes and pipeline components, including their protective coatings and joint materials, that will or may come into contact with potable water shall not constitute a toxic hazard; shall not support microbial growth; shall not cause taste or odour, cloudiness or discolouration of the water.

1.3 Definitions

The definitions given in the relevant standards which are referred to in the specification shall apply for the terms used in this specification.

1.4 Non-metallic Materials

All non-metallic materials supplied shall be listed in the current "Water Fittings and Materials Directory" published by the Water Research Centre, UK, or approved equivalent publication, as a recognized certifying authority having passed full tests of effect on water quality under the requirements for the testing of non-metallic materials for use in contact with potable water.

1.5 Flanges

All flanges dimensionally shall be in accordance with EN 1092-2 : 1997 Specification for Steel Flanges - Metric Series. The screw threads in all pipes and fittings shall comply with ISO Metric Screw Threads.

1.6 Inspection and Testing

The Contractor shall supply, furnish and prepare the necessary test pieces and samples of all materials and supply the labour facilities and appliances for such testing as may be required to be carried out on his premises according to this specification. If there are no facilities at his own works for making the prescribed tests the Contractor shall bear the cost of carrying out the tests elsewhere.

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The Engineer or nominated Inspection authority shall have full access to all parts of the plant that are concerned with the testing, furnishing or preparation of materials for the performance and testing of work under this Specification.

The Contractor shall furnish the Engineer with reasonable facilities and space (without charge) for the inspection, testing and obtaining of such information, as he desires regarding the character of material in use and the progress and manner of the work.

Further all valves shall be tested to the appropriate test pressure at the manufacturer's works and shall be supported by a test certificate from the manufacturer.

The format for test certificate shall be in accordance with the format given in the schedule of particulars.

1.7 Marking of Pipes, Fittings, Valves and Specials

All markings described below shall be legible and durable unless otherwise specified.

All pipes and fittings shall be marked with the information specified in clause 4.7 of EN 545 : 2010, or clause 4, 6 of ISO 2531:2009. The mark of the manufacturers and class of pipe shall be embossed or cold stamp on all pipes and fittings. Other markings may be cast on, cold stamped or painted with an indelible paint.

The Sluice valves, Butterfly valves, Check valves and Hydrants shall be marked in complying with the relevant provisions of BS 5163 : 2004, EN 1171 : 2002, EN 593 : 2004, EN 12334 : 2001 , BS 750 : 2006 respectively. The mark of the manufacturer, pressure rating (PN designate), nominal size, direction of closing and the standard to which the valve conforms shall be embossed or cast on all valves.

All other valves which are not mentioned above but covered under this specifications shall be marked with at least nominal size, manufacturer's name (or trade mark), directions of closing, body material designation.

The manhole covers and surface boxes shall be marked in complying with clause 9 of EN 124:1994.

In addition to what is specified above the additional markings and the lettering sizes shall be made with details as per the table 1 hereof.

"For References ONLY" (Not for Bidding)

Table 1 – Additional Markings

Item	Diameter (mm)	Details required	Lettering Heights Details (mm)
Pipes	above 350	"NWSDB"; Pipe standard (EN or other); Class or type ; Nominal dia., Manufacture's name & Year of manufacture (at intervals not more than 3 m)	50
	150 to 350 (both inclusive)	as above	25
	50 to 150	as above	10
Fittings and Specials	above 350	"NWSDB"; Pipe standard (EN 545 or ISO 2531; Class or type (C class); Nominal dia., Manufacture's name & year of manufacture, PN (for flanges)	25
	150 to 350 (Both inclusive)	as above (except "NWSDB")	10
		"NWSDB"	25
	50 to 150	"NWSDB"; Pipe standard (EN 545 or ISO 2531; Class or type (C class); Nominal dia., Manufacture's name & year of manufacture, PN (for flanges) Bend angle for bends	10
Manhole Covers	All sizes	"NWSDB"; "WATER" or "SEWAGE" (whichever is applicable); Standard (EN or other); Class or type ; Size of clear opening.	50
Surface Boxes	All sizes	As for manhole covers	20
Valves	All sizes	Weight of valve	As appropriate

"For References ONLY" (Not for Bidding)

The Contractor shall label and clearly mark all crates and boxes in indelible paint as specified in the notes forming a part of this Specification.

In addition, all fittings shall be marked with the corresponding item number in the Bills of Quantities or other number specified by the Engineer.

1.8 Protection during Delivery

The Contractor shall provide protection, to the approval of the Engineer, for the ends of all pipes and fittings prior to the pipes and fittings leaving the place of manufacture and shall maintain such protection until the items reach their destination in order to guard effectively against damage during transit and storage and the ingress of foreign matter inside the pipes and fittings.

All valves and fittings shall be securely packed in crates and boxes to prevent damage during delivery. The cost of packing shall be deemed to be included in the Contract Rates and crates will not be returned.

Each box and package therein shall be clearly labeled stating the number, size and description of the contents.

All details of the proposed method of providing such protection shall be submitted at the time of tendering.

The cost of providing protection to the ends of pipes and fittings shall be included in the unit prices tendered in the Bills of quantities.

"For References ONLY"
(Not for Bidding)

1.9 Storing, Handling and Hauling of Pipes, Fittings, Valves and Specials

All materials shall be stored in an approved location and in such a manner as to preserve their quality and condition.

Storage shall be in accordance with the manufacturers recommendation.

Materials and components shall be handled in such a manner as to avoid any damage or contamination and in accordance with all applicable recommendations of the manufacturers.

The Contractor shall give instructions to the shipper on precautions to be taken in the handling of the pipes, valves and other components during loading, towage and unloading, and shall give particulars of these instructions to the purchaser. Also particular attention shall be paid when handling pipes and fittings, to avoid damages to external and internal coatings.

1.10 Packing of Bolts, Joint Rings and Gaskets

Bolts of the same length and size (and their accompanying nuts and washers) shall be packed together in boxes not exceeding 100 kg. gross weight.

Joint rings and gaskets shall be packed in boxes and separate packages shall be provided for each size and description of ring or gasket.

1.11 Manufacturer's Certificate

The Contractor shall supply to the Engineer a certificate stating that each item supplied has been subjected to the tests laid down herein and conforms in all respects to this Specification or such other Specification which has been submitted to and approved by the Engineer.

1.12 Quality and Workmanship

The Bidder shall provide ISO 9001 : 2015 Quality Management System requirement certificate for Quality Assurance for the goods manufacturing factory from an accredited agency for all pipes, fittings, accessories, valves, hydrants, surface boxes, and manhole covers. Accredited Agency shall be a member of International Accredited Forum (IAF) and shall have the authority for the accreditation of mentioned goods in their scope of accreditation. Scope of the production shall be clearly specified in the certificate. Manufacturer shall maintain the validity of this certificate during the supply and delivery of the materials for contract Period. If the supply is made from several factories, ISO 9001 : 2015 certificates for quality management system requirement shall be submitted for each factory. This certificate shall clearly indicate the location of the place of manufacture of pipes, fittings and accessories, etc.

"For References ONLY" (Not for Bidding)

1.13 Flanged Joint Protection

All flanged pipes and sluice valves shall be supplied with complete 'Corrosion' protection materials in accordance with the manufacturers recommendation. The complete joint protection include the materials, namely profiling mastic or primer, paste, tape and PVC or polyethylene outer wrapping. The quantity of materials required for each diameter joint shall be calculated in accordance with the manufacturer to cover the whole joint including nuts and bolts. The supplier shall provide the required details of quantities in the schedule of particulars.

1.14 Final Acceptance at site

All pipes, fittings, valves and accessories shall conform to the specification at site. Engineer shall carryout necessary inspections at site prior to final acceptance.

2.0 TECHNICAL REQUIREMENTS FOR DUCTILE IRON PIPES AND FITTINGS FOR WATER SUPPLY APPLICATIONS

2.1 Scope

This section covers the requirement for the supply of Ductile Iron pipes and fittings. In addition to the contents of the following standards, this particular specification shall apply. **If there is any discrepancy between following standards and the particular specification, this particular specification supersedes the contents of the following standards.**

2.2 Reference Standards

The following standards are referred to ;

ISO 2531 : 2009	Ductile iron pipes, fittings and accessories for pressure pipe lines
EN 545 : 2010	Ductile Iron pipes, fittings, accessories and their joints for water pipelines. Requirements and test methods.
BS 7874 : 1998	Method of tests for microbiological deterioration of Elastomeric scales for Joints in pipe work and pipe lines.
EN 681 -1 : 1996 (with Amendments)	Elastomeric seals- material requirement for pipe joint seals used in water and drainage application. (Vulcanized rubber)
ISO 4633:2015	Rubber seals – Joint rings for water supply drainage and sewerage pipe lines – specification for materials.
BS 3416 : 1991	Bitumen based coatings for cold application, suitable for use in contact with potable water.
EN 10 300 : 2005	Steel tubes & fittings for onshore and offshore pipe lines. Bitumen hot applied material for external coating.
EN 1092-2 : 1997	Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN Designated, Cast iron flanges.
EN 14399 : Part 1 : 2005	Specification for high strength structural bolting assemblies for pre-loading. General requirements.
EN 14399 : Part 2: 2005	Specification for high strength structural bolting assemblies for pre- loading. Suitability test for Pre-loading.

"For References ONLY" (Not for Bidding)

BS 1514: Part 1:1997	Dimensions of non-metallic Flanges and their joints. Dimensions of gaskets for PN designated flanges. Non metallic flat gasket with or without inserts gaskets for pressures up to 64 bar.
BS 4320: 1968	Metal washers for general engineering purposes metric series.
ISO 9001 : 2015	Quality Management System Requirement
ISO 4179 : 2005	Ductile iron pipes for pressure and non pressure pipelines Centrifugal cement mortar lining.
ISO 6600 : 1980	Ductile iron pipes centrifugal cement mortar lining (composition controls for freshly applied mortar).
ISO 18468:2017	Ductile iron fittings, accessories and their joints and valves -- Epoxy coating
JIS G 5528: 2006	Epoxy powder coating for interior of DI pipes and fittings
ANSI A214	Cement Mortar lining for cast iron and Ductile iron pipes and fittings for water.
ISO 8179 : 2004:Part 1 ISO 8179:1995: Part 2	Metallic Zinc with finishing layer. Zinc rich paint with finishing layer
ISO 2081 : 2008	Metallic and other inorganic coatings. Electro plated coatings of zinc with supplementary treatments on iron or steel.
EN 14161 : 2011	Petroleum and natural gas industries. Pipeline transportation systems
EN 10088: Part 2: 2005	Stainless steel – Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes.
BS 6076:1996	Polymeric film for use as a protective sleeving for buried iron pipes and fittings (for site and factory application)
ISO 8180:2006	Ductile Iron pipes – polyethylene sleeving for site application.
ISO 10804 – 2010	Restraint Joint System for DI Pipe lines.

The year of publication of the standards referred to in the following clauses shall be the year as given above.

"For References ONLY" (Not for Binding)

2.3 Definitions

The definitions given in the relevant standards which are referred to in the specification, shall apply for the terms used in this specification.

2.4 Classes of Pipes & fittings and Pressure Ratings

The class of Ductile iron pipes and fittings shall be in accordance with ISO 2531 : 2009 or with EN 545:2010. The standard pressure class designation of Ductile Iron pipes and pipes and fittings shall be as given in the Table 14 of ISO 2531:2009 or Table 16 of EN 545:2010, the preferred pipe pressure class. Pipes are classified based on the pressure class and denoted by "C".

Socket and spigot pipes

- Upto and including 300 mm C40
- 350 mm to 600 mm (including both) C30
- Above 600 mm C25

If higher pressure class is required it shall be mention specifically in the Bills of Quantities.

Flanged pipes shall be classified by PN Number, The pressure class of the barrel of the Flanged pipe shall be equal to or greater than a value in bar equal to the PN of the flanges.

Pressure class of PN member is given in Table 2 of ISO 2531:2009 or Table – A-2 of Annex-A of EN 545:2010.

Flanged pipes shall be of two types namely either integrally cast or welded.

Flanged tees shall be according to the Table 30 to 32 of EN 545:2010 or Table 26 to 28 of ISO 2531:2009.

The allowable operating pressures shall comply with section A2 Tables – A.1 and Table – A.2 of EN 545:2010 or Table1, Table 2 and Table 3 of ISO 2531:2009.

"For References ONLY" (Not for Bidding)

2.5 Dimensions of Pipes and Fittings

Dimensions of standard pipes and fittings shall be to ISO 2531 : 2009 or BSEN 545 : 2010 unless otherwise shown on the Drawings or required for special purposes. Where pipes or fittings are required in dimensions other than those specified in ISO 2531 : 2009 or EN 545 : 2010, they shall be of the same classes as listed above and shall be designed for the works proof test pressures specified in Table 13 of ISO 2531 or Clause 6:5:2 and Clause 6:5:3 of EN 545 : 2010 for the relevant nominal diameter.

Manufacturer's product catalogue, showing dimensions, mass and other details of all standard fittings shall be submitted to the Engineer for his approval prior to manufacture.

Manufacturer's detailed drawings of all special fittings shall be submitted to the Engineer for his approval prior to manufacture.

Standard pipe lengths shall comply with Table 4 and 5 of EN 545 : 2010 for socket and spigot and flanged pipes respectively or Table 4 & 5 of ISO 2531 : 2009 or their latest revision for socket and spigot pipes and flanged pipes unless otherwise stated**.**

2.6 Method of Manufacture of Pipes and Fittings

All straight pipes shall be spun or centrifugally cast and fittings and joint components shall be cast in sand moulds or lost foam method. Prior approval of the Engineer shall be required for any alternative casting methods.

At all stages of manufacture, rigid control shall be exercised and the pipes and fittings shall be sound and free from surface or other defects.

Foundries shall comply with the requirements of ISO 9001:2015 Quality Management Systems.

Manufacturing process of Pipes and Fittings shall comply with the ISO 9001: 2015 Quality Management System requirements and such quality management system possessed by the manufacturer should be from an organisation accredited to issue such certification. Documentary evidence regarding accreditation together with the scope of certification should be provided. Certificate shall clearly indicate the name and address of the location of factory.

The Bidder shall also submit full details of the manufacturing process he intends to use with his tender. Such details shall include but not be confined to;

(1) Casting and heat treatment processes.

(2) Cleaning process and preparation of surface of iron before application of coating and lining.

(3) Specification of all lining and coating materials, their thickness and application procedures.

(4) Ductile Iron Pipes and Fittings shall be from the same manufacturer.

"For References ONLY" (Not for Bidding)

2.7 Coating and Lining

All ductile iron pipes and fittings shall be protected internally and externally against corrosion. The external protection shall comprise a coating of metallic zinc or zinc rich paint complying with clause 4.5.2.2 of EN 545:2010. The mean mass of zinc per unit area shall be not less than 200 mg/m^2. The mean thickness of finishing layer shall be not less than 70 µm and the local minimum thickness not less than the 50 µm. The internal protection shall be a cement-mortar lining complying with specified

thickness in Table 9 of EN 545:2010 or Table 01 in ISO 4179:2005 or ISO 6600:1980.

All such coatings and linings shall be applied under factory conditions, in complying with EN 545 : 2010 or ISO 4179 : 2005/ ISO 6600 : 1980.

2.8 Socket and Spigot Joints

Standard pipes and fittings for pipelines of ductile iron shall be supplied with push-in socket and spigot joints similar to joint Type A.1 illustrated in EN 14161: 2011.

2.9 Joint Rings and Lubricants

The physical properties of elastomeric joint rings shall comply with Table 2 of EN 681-1 : 1996. The joint rings shall also comply with the relevant provisions in EN 681-1 :1996 for effects on water quality and resistance to microbiological deterioration.

The material of joint rings shall be of EPDM and shall be dual hardness punching type with preferably 76-84 IRHD at the heel of the ring and 46-55 IRHD at the bulb of the ring.

Joint rings shall be supplied by the pipe manufacturer.

Each joint ring shall be marked clearly and durably in accordance with the following information in a manner that does not interfere with the sealing function of the ring, in complying with clause 10 of EN 681-1 :1996.

a) The nominal size

b) Manufacturer's identification

c) The number of the BS or BS EN or EN with seal type designation.

d) Abbreviation for the elastomer

Joint Lubricants for sliding joints have no deleterious effects on either the joint rings or pipes, and be unaffected by the liquid to be conveyed. Lubricants shall not impart to water taste, colour or any effect known to be injurious to health and shall be resistant to bacterial growth.

2.10 Flanged Joints for Pipes and Pipeline Fittings

Flanges for pipes and pipeline fittings shall unless otherwise stated comply with EN 1092 – 2: 1997. Flanges shall be of PN 16 nominal pressure rating and shall be raised faced, unless otherwise stated.

Note: Flanges in accordance with EN 545:2010 and ISO 2531:2009 are dimensionally compatible with EN 1092-2 : 1997.

"For References ONLY" (Not for Bidding)

Flanged joints shall be complete with all nuts, bolts, gaskets and two washers per bolt. All bolts shall be of high tensile.

The flanges of all fittings shall be integrally cast. The flanges of flanged pipes shall either be integrally cast or factory welded unless otherwise stated. 'Factory welded' means that the flanges are welded to the pipes at the point of manufacture under factory conditions with inspection agency certification.

The supplier/Manufacturer shall be responsible for checking and ensuring that mating flanges are compatible in all cases, including where connections are required to pipe work and valves associated with pumping plant and inlet/outlet pipe work at service reservoirs or other structures.

2.11 Gaskets for Flanged Joints

Gaskets for flanged pipe joints shall be of type B (raised face) and the inside bolt circle type and the dimensions shall comply with BS 1514 – Part 1 : 1997.

The physical properties of gaskets shall comply with Table 2 of EN 681-1:1996.
The Gaskets shall also comply with the relevant provisions in EN 681-1:1996 for effects on water quality and resistance to microbiological deterioration.

The Gasket material shall be EPDM and shall be of hardness preferably 76-84 IRHD.

The Gaskets shall be supplied by the manufacturer and shall suit for PN 16 flanges unless otherwise stated.

Each gasket shall be marked clearly and durably in accordance with the following information in a manner that does not interfere with the sealing function of the gasket, in complying with clause 10 of BS 1514 – Part 1: 1997.

a). The nominal size

b). Manufacturer' s identification

c). The number of the BS or BS EN with seal type designation.

d). Abbreviation for the elastomer

2.12 Restrained Self Anchoring Joints

The design of restrained joints shall comply with ISO 10804:2010 or equivalent. The joint may be either internally or externally restrained, however in the case of internally restrained joints the locking system and the rubber gaskets shall not be combined together (gasket and the system taking the axial load to be separate pieces).

The spigot of the restrained joint pipes shall be compatible, with or without modification at site, with the standard and restrained joint fittings.

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These joints shall be designed by the pipe manufacturer to transmit axial pipe to pipe forces generated due to change in direction of the pipeline and possible pipe line settlement in weak soil areas without thrust blocks. Rubber gasket shall be of EPDM. Locking ring and possible set bolts shall be ductile iron.

2.13 Nuts, Bolts and Washers

The nuts, bolts and washers for flanged joints shall be of high tensile steel and shall comply with EN 14399 – Part II – 2005, and shall comply with the highest strength class.

The bolting shall comply with the relevant provisions of EN 1092-2 : 1997.

The Bolt lengths shall be sufficient to ensure that nuts are full threaded when tightened in their final position with two threads showing.

Two washers per each bolt shall be supplied for providing under the head of the bolt and under the nut.

2.14 Polyethylene Sleeving for DI pipes & Fittings

Where specified Tubular polyethylene protective sleeving for burried DI pipes & fittings shall comply with the relevant provisions of BS 6076 : 1996 and shall be in accordance with ISO 8180 : 2006.

The polyethylene sleeving shall be coloured blue.

2.15 Tolerances

Tolerances on wall thickness weights and lengths shall be in accordance with EN 545:2010 and/or ISO 2531:2009, and the specific references for compliance are as follows.

	EN 545 : 2010	**ISO 2531 : 2009**
Wall thickness	Table 17	Table 14
Weights	-	
Lengths	Table 4 & 5	Table 4 & 5

The tolerances on flange thickness and flange diameter shall be in accordance with EN 1092-2 : 1997.

2.16 Tensile properties of pipes and fittings

The tensile properties and testing methods shall be in accordance with EN 545:2010 or ISO 2531:2009 and the specific references for compliance are as follows:

	EN 545:2010	**ISO 2531 : 2009**
Tensile Properties Test methods	Table 8 Clause 6.3	Table 8 Clause 4.3.1 Clause 6.3

"For References ONLY" (Not for Bidding)

2.17 Hardness of Pipes and Fittings

The Hardness of pipes and fittings shall not exceed the following superficial values, when tested in accordance with brinell hardness tests complying with clause 6.4 of EN 545 : 2010 or clause 4.3.2. of ISO 2531 : 2009.

	Superficial Hardness
Pipes	230 HB
Fittings & accessories	250 HB

2.18 Works Leak Tightness Test for Pipes and Fittings

All pipes and fittings shall comply with works leak tightness requirements of EN 545 : 2010 and ISO 2531 : 2009 and the specific references for compliance are as follows:

	EN 545 : 2010	**ISO 2531 : 2009**
Method of testing	Clause 6.5.2 and Clause 6.5.3	Clause 6.5.2 and 6.5.3
Minimum work test pressures	Table 16 & 17 (For pipes not centrifugally cast, fittings & accessories)	Table 16 (for pipes not cast centrifugally and fittings)

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2.19 Leak Tightness of Flexible Joint

Manufacturer shall carryout leak tightness of flexible joints for positive internal pressure, according to clause 7.2.2 of EN 545:2010, for negative internal pressure according to clause 7.2.3 of EN 545:2010 and for positive external pressure according to clause 7.2.4 of EN 545:2010.

2.20 Work Leak Tightness Test for Pipe Joints and Fitting Joints

Manufacturer shall carryout test for leak tightness and mechanical resistance of flange joint according to the clause 7.3 of EN 545:2010.

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6B.2 SPECIFICATIONS FOR POLYETHYLENE (PE) PIPES & FITTINGS FOR WATER SUPPLY APPLICATIONS

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SPECIFICATIONS FOR POLYETHYLENE (PE) PIPES, FITTINGS, SPECIALS, ACCESSORIES FOR WATER SUPPLY APPLICATIONS

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1.0 GENERAL

1.1 Ambient Conditions

All items of materials and equipment shall be in every respect suitable for storage, installation, use and operation in the conditions of temperature and humidity appertaining in Sri Lanka.

The annual average temperature is 35^0C while the relative humidity varies generally from 70% during the day to 90% at night. The pH of water to be conveyed ranges from 6.5 – 7.9.

The climate of Sri Lanka is at times, hot and the sunlight is intense. Ambient temperature of up to 40^0C is possible and surfaces exposed to the sunlight may rise to even higher temperatures.

1.2 Suitability for Potable Water

Pipes and pipeline components, including their protective coatings and joint materials, that will or may come into contact with potable water shall not constitute a toxic hazard; shall not support microbial growth; shall not cause taste or odour, cloudiness or discolouration of the water and shall be approved by recognized certifying authority listed below, as being suitable for using portable water supply schemes.

NSF International, World Headquarters, 789 N. Dixboro Road, Ann Arbor, MI 48105 USA

Water Regulations Advisory Scheme (WRAS), Fern Close, Pen-Y-Fan Industrial Estate, Oakdale, Gwent, UK, NP11 3EH

IAPMO Research & Testing, 5001 E, Philadelphia St., Ontario, CA 91761-USA

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1.3 Definitions

The definitions given in the relevant standards which are referred to in the specification shall apply for the terms used in this specification.

1.4 Materials

Material shall be as specified in clause 2.5 of the Technical Specification.

1.5 Inspection and Testing

The Contractor shall supply, furnish and prepare the necessary test pieces and samples of all materials and supply the labour facilities and appliances for such testing as may be required to be carried out on his premises according to this specification. If there are no facilities at his own works for making the prescribed tests the Contractor shall bear the cost of carrying out the tests elsewhere.

The Engineer or his representative or nominated inspection authority shall have full access to all parts of the plant that are concerned with the testing, furnishing or preparation of materials for the performance and testing of work under this Specification.

The Contractor shall furnish the Engineer or his representative or nominal inspection authority with reasonable facilities and space (without charge) for the inspection, testing and obtaining of such information, as he desires regarding the character of material in use and the progress and manner of the work.

The manufacturer shall provide results of tests conducted, in accordance with the BSEN or ISO standards given in the Specification.

1.6 Marking of Pipes, Fittings and Specials

All markings described below shall be legible and indelible unless otherwise specified.

All pipes and fittings shall be marked as specified in clause 12 of ISO 4427 - 2:2019 or BSEN 12201-2:2011 and as specified in the Table 1 hereof. The manufacturer's name Identification mark and the PN rating and SDR shall be marked legibly and indelibly on the pipes together with the information shown below.

Markings should be in such a way that it does not initiate cracks or other types of failures and that normal storage, weathering, handling, installation and use shall not affect the legibility of the markings.

During the manufacturing process, the pipe should be marked with pertinent product and process information at approximately 1m intervals along the pipe.

Specifications require at least the following information to be included.

- Manufacturer's identification or logo,
- Standard number (Specification number)
- The designation of the pipe material (PE 100).
- The dimensions (Nominal outside diameter, nominal wall thickness).
- Third party certification mark by the inspection agency approved by the Engineer.
- The Production Period (date and code).
- The Nominal Pressure (PN)
- Standard Dimension Ratio (SDR)

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The marking should be printed in the following colours:

PE 100	SDR 11	Black
	SDR 17.6	Red
	SDR 26	Yellow
	SDR 33	Orange

In addition to the markings specified above, following information shall be marked on the fittings:

- In case of a bend, bending angle and incase of unequal tee branch line size and main line size.
- Pressure rating at relevant temperature
- Standard Dimension Ratio (SDR)
- Fusion time (Seconds)
- Cooling time (minutes)
- System voltage
- Moulded-in identification and appropriate product information
- Terminal pin size of electro fusion fittings

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Table 1 – Marking

Item	Diameter (mm)	Details required	Lettering Heights Details (mm)
Pipe Lengths(at intervals not more than 3m)	above 350	"NWSDB"; "WATER"(at 3m intervals) "SDR" Production Date, PN outside diameter, nominal wall thickness and other (at 3 m intervals)	50
	160 to 350 (both inclusive)	as above	25
	50 to 160	as above	10
	Below 50	as above (except "NWSDB")	05
		"NWSDB"	10
Fittings & Specials	Above 350	"NWSDB", "WATER" "SDR" , Production date, PN, outside diameter and other	25
	160 to 350 (both inclusive)	As above (except "NWSDB")	10
		"NWSDB"	25
	50 to 160	As above	10
	Below 50	As above (except "NWSDB")	05
		"NWSDB"	10

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All fittings must be packed in such a way to allow instant use on site without additional cleaning. All electro-fusion fittings must be packed in transparent protective bags. The electro-fusion fittings must then be packed in carton boxes. The Contractor shall label and clearly mark all crates and boxes legibly and indelibly as specified in the notes forming a part of this Specification.

All fittings shall be marked with the corresponding item number in the Bills of Quantities or any other number specified by the Engineer. An individual data carrier card in compliance with ISO 7810 and ISO 7811 containing a magnetic strip and appropriate bar codes as well as manual setting information for data transfer purposes must be supplied with each item as appropriately.

1.7 Protection during Delivery

The Contractor shall provide methodology of protection of pipes and fittings, to the approval of the Engineer and obtain written approval prior to the pipes and fittings leaving the place of manufacture and shall maintain such protection until the items reach their destination in order to guard effectively against damage during handling, transit and storage and ingress of foreign matter inside the pipes & fittings.

All fittings shall be securely packed in crates and boxes to prevent damage during delivery. The cost of packing shall be deemed to be included in the Contract Rates and crates will not be returned.

The manufacturer shall provide necessary details to the shipping line on precautions to be taken during loading/unloading, handling & transport of the pipes & fittings and other components, in the sea. Manufacturer shall provide to the purchaser a set of recommendations of manufacturer for handling, loading, unloading, transporting and storing of polyethylene pipes and fittings.

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1.8 Storing, Handling and Hauling of Pipes, Fittings and Specials

All materials shall be stored in an approved location and in such a manner as to preserve their quality and condition as recommended by the manufacturer.

All materials should be carefully inspected at the time of delivery and any defective material set aside before accepting the delivery into stores. Any such defects should be notified to the manufacturer immediately.

Materials and components shall be handled in such a manner as to avoid any damage or contamination and in accordance with all applicable manufacturers recommendations.

1.8.1 General Principles

The recommendations for handling and storage of PE pipes shall have greater care in the handling of PE pipe coils too shall have greater care as of pipes of similar wall thickness.

Polyethylene is a tough resilient material which is relatively light and easy to handle although it is prone to damage through scoring by sharp objects. Therefore careful handling is always required and the dragging of straight pipe and coils should be avoided.

The maximum allowable depth of scoring of the external surface of the pipe is 5% of the wall thickness. Pipes and fittings showing obvious defects or excessive scoring should be withdrawn, clearly identified as unsuitable and, where appropriate, returned to the source of supply.

The general properties of polyethylene are unaffected by low ambient temperatures but, having very smooth surfaces, the pipes and fittings become slippery in wet or frosty weather. Particular attention should be given to effective securing and storage under such conditions. Extra care should also be taken when handling large diameter prefabricated fittings during very cold weather.

The packaging of pipes by the manufacturer is normally consistent with the requirement to prevent damage and to comply with safety considerations. Usually pipes are delivered strapped into convenient bundles or banded coils. Fittings are normally supplied in separate cartons together with any associated small items, such as bolts and gaskets.

As far as practicable the protective packaging (pallets, strapping, bags etc.) should be kept intact until the material is required for use. The temporary capping or plugging of pipe ends is recommended.

Pipes and fittings likely to be stored outside should be covered by a tarpaulin or black polyethylene sheeting to prevent ultra violet degradation from sunlight. Electro fusion fittings should be stored under cover and in their protective packaging.

For hygiene purposes, the pipe ends must be protected from the ingress of dirt/water etc. This protection should be carefully disposed of following use.

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1.8.2 Transport and Delivery

For transporting bulk loads, vehicles should be provided with a clean flat bed, free from nails or other projections, which may cause damage. If high sided lorries are used, special care must be taken to prevent slippage or excessive bowing of the pipes and extra protection given at all sharp edges.

Care should be taken to avoid positioning pipes and fittings near or adjacent to exhaust systems or other heat sources and to avoid possible contamination from materials such as lubricating or hydraulic oils, gaseous, solvent and other aggressive chemicals.

Metal chains or slings should not be brought into direct contact with the material. Webbed slings of polypropylene or nylon are recommended. Straight pipes should be fully supported and bound together. Pipes must not rest on the integral socket, if one is incorporated.

When transporting 'pupped' fittings, these should not be loaded in a way that it could distort the pupped end.

Both vertical and horizontal deliveries of coiled pipes are permissible, although in the case of horizontal transportation special notification may be required for highway authorities in respect of wide load regulations.

Following the quality control inspection and testing, caps or plugs are to be provided to protect the jointing surfaces during transportation and storage. The finished and protected pipes are then carefully packed into manageable units (bundles or coils) prepared for shipments.

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1.8.3 Off Loading

1.8.3.1 Bundled Pipes

When lifting by crane, non metallic wide band slings or ropes should be used, and for pipe lengths greater than 6m, load spreading beams of a length at least equivalent to one quarter of the length of the pipe or bundle pack should be employed.

Chains or end hooks should not be used. Care should be taken to avoid damage to pipes and pipe ends during lifting, particularly those pipes with couplers.

Some bending should be allowed for in the middle of the lift when loading and unloading pipes and, because of this, lifting points should always be well spread and evenly spaced.

Standard bundle packs, 6m long, may be handled by fork lift trucks but due allowance should be made for the flexible nature of the pipes in the positioning of the forks and the raising of the load.

Bundle packs greater than 6m long should be handled either by a side loader with a minimum of four supporting forks, or by a crane using a spreader beam and suitable slings. Individual pipes may be and led in the same way. Off-loading on site may be made easier by using skid timbers and rope slings.

1.8.3.2 Coiled Pipes

Pipe coils shall be transported inside containers from place of manufacture. Manufacturer/ Contractor shall ensure that coils of pipes are not exposed to direct sunlight at any place, during transit. Contractor shall deliver the pipe containers in closed condition to site stores as directed and only inside the site warehouse, the containers shall be opened for inspection. Contractor in coordination with the Engineer shall make arrangements for customs clearance if imported, when the containers are brought to site warehouse.

Reinforced adhesive tape at least 50 mm wide should be used for banding. Complete coils are secured by outer and intermediate bands and individual layers are also independently secured. These should not be removed until the pipe is required for actual use.

Pipe less than 63 mm in diameter should be moved and uncoiled using an approved dispensing trailer.

Before unstrapping pipe form the coil or drum, both pipe ends must be firmly mechanically restrained. The band securing the outer end of the pipe should be removed first and the movement of the free end carefully controlled. This removal should be followed with those securing successive layers. No more bands should be removed than necessary to release the length of pipe immediately required. After sufficient pipe has been cut from the coil the protective end cap must be replaced on the remainder. The outer end of the pipe should be suitably re-marked as such.

When removed form the coil or drum, the pipe will be oval and curved. The extent of ovality and curvature will depend upon the temperature, SDR rating, pipe diameter, coil diameter and material type. Although both ovality and curvature will reduce naturally with time, special hardware is available to facilitate handling and jointing.
(refer the fig. 1 in Annex - VI hereof, showing the proper handling methods for coils)

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1.8.3.3 Fittings

Hooks should not be used to lift fittings which are generally supplied in cardboard boxes or polyethylene bags.

1.8.3.4 Storage at Depot

Materials of different polymer manufacture should be kept separately and clearly identified.

Blue polyethylene pipe should preferably be stored under cover and protected from direct sunlight until required for use. Where storage facilities necessitate the material to be exposed externally, suitable good protective sheeting should be used.

All pipe stacks should be made on sufficiently firm, leveled ground and free from stone to support the weight of the pipes and any necessary lifting equipment. Stacking heights should be kept to a minimum and without exceeding the manufacturer's

recommendation and adequate space allocated for lifting machinery to manoeuvre (more carefully and often with difficulty) without causing accidental damage.

For safety and the convenience of handling, the stacking height for bundles should not be more than 3 metres. To prevent possible deformation of the pipes, bundles must be stored timber to timber.

The Bidder shall make arrangements to stack wrapped/bagged coils neatly on robust pallets (free from projections), in Central Stores, conforming to the following maximum stack heights.

- 7 coils for 20 mm diameter pipe
- 6 coils for 25 mm diameter pipe
- 5 coils for 32 mm diameter pipe
- 4 coils for 50 mm diameter pipe
- 3 coils for 63 mm diameter pipe
- 2 coils for 90 mm diameter pipe
- 1 coils for 110 mm diameter pipe
- 1 coils for 125 mm diameter pipe
- 1 coils for 180 mm diameter pipe

Forklift trucks shall not be used to load and unload pipes except where coils are neatly stacked on pallets or coils and are provided with slings.

For similar reasons, pipe coils should be stored flat and the number of coils per stack should be limited to;

Where individual pipe lengths are stacked in pyramidal fashion, deformation may occur in the lower layers, particularly in warm weather. Such stacks should therefore be no more than 1 metre high. Socketed pipes should be stacked with the sockets at alternate ends and with the sockets protruding to avoid uneven stacking which may permanently distort the pipes.

Polyethylene fittings should be stored under cover, preferably on racking and in the manufacturer's protective wrapping or cartons which should be kept intact until the fitting is required for use.

At all times pipes and fittings should be stored away from exhaust outlets and all other high temperature sources. Care should also be taken to avoid contact with lubricating or hydraulic oils, gasoline, solvents and other aggressive chemicals.

All special tools and equipment associated with the jointing of PE pipes and fittings should be stored separately and securely until they are required for use. The heating

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faces of fusion tools should be kept in a position where the surfaces are protected from scratching or other damage. Tools incorporating cutting edges should likewise be protected from damage that could cause poor joint preparation.

1.9 Packing of Bolts, Joint Rings and Gaskets

Bolts of the same length and size (and their accompanying nuts and washers) shall be packed together in boxes not exceeding 100 kg. gross weight.

Joint rings and gaskets shall be packed in boxes and separate packages shall be provided for each size and description of ring or gasket.

Each box and package therein shall be clearly labeled stating the number, size and description of the contents.

1.10 Manufacturer's Certificate

The Contractor shall supply to the Engineer a certificate stating that each item supplied has been subjected to the tests laid down herein and conforms in all respects to this Specification or such other Specification which has been submitted to and approved by the Engineer.

1.11 Quality and Workmanship

All pipes, fittings and accessories shall be manufactured in compliance with the ISO 9001 : 2015 quality management system standards for the manufacturing factory. In addition to product quality control tests the manufacturers also must perform and satisfy long term type tests to demonstrate long term performance of pipe as detailed in relevant standards. Quality Management System Certification should be from an organization which is a member of International Accreditation Forum (IAF) having the scope of the accreditation for PE pipes and fittings to issue such certification and the manufacturer shall have this certification valid during the supply and delivery of the materials. Document evidence regarding accreditation together with the scope of certification should be provided.

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1.11.1 Quality Assurance (Q/A) at Manufacturer's Works

The manufacturer shall operate a quality assurance scheme to the ISO 9001: 2015 and on award of order shall submit a copy of his quality assurance guidelines, as issued to his production works sections. This shall include the following items, detailing the frequency of quality assurance checking.

a. Raw Materials

i. Vetting and recording of certificates provided by the raw material manufacturer (s).

ii. Chemical testing of raw material and frequency of tests.

b. Pipe Manufacture (for each pipe diameter)

i. Checking of extrusion compound temperature at the extruder (state the temperature) and state its consequence on quality.

ii. Temperature of water bath/sprayed water cooling system on extruded pipe.

iii. Maintenance of pull force on extruded pipe.

i. Procedure for resumption of production after an interruption on the production line (e.g. power failures, change of pipe production batches, etc.)

ii. Hourly production records.

iii. Frequency of calibration of testing equipments

iv. Inspection of stock yards (visually) and packing methods.

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2.0 TECHNICAL REQUIREMENTS FOR POLYETHYLENE (PE) PIPES, FITTINGS, SPECIALS AND ACCESSORIES FOR WATER SUPPLY APPLICATIONS

2.1 Scope

This specification covers polyethylene pipes and associated fittings for the use of cold drinking water.

2.2 Reference Standards

ISO 4427-1:2019	Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE) – Part 1: General
ISO 4427-2:2019	Part 2- Pipes
ISO 4427-3:2019	Part 3- Fittings
ISO 4427-5:2019	Part 5- Fitness for purpose of the system
EN12201-1:2011	Plastics piping systems for water supply, and for drainage and sewerage under pressure. Polyethylene (PE). Part 1- General
EN12201-2:2011	Part 2- Pipes
EN12201-3:2011	Part 3- Fittings
EN12201-4:2011	Part 4- Valves
EN12201-5:2011	Part 5- Fitness for purpose of the system
EN ISO 1167-1:2006	Thermoplastics pipes for the conveyance of fluids. Determination of the resistance to internal pressures. General Method.
EN ISO 1167-2:2006	Thermoplastic pipes for the conveyance of fluids. Determination of the resistance to internal pressures. Preparation of pipe pieces.
EN 1092-2:1997	Flanges & their joints circular flanges for pipes, valves, fittings & accessories PN designated Cast iron flanges
EN 1515:2000	Flanges & their joints, bolting, selection of bolting
EN 1514-2:2014	Flanges and their joints. Gaskets for PN-designated flanges. Spiral wound gaskets for use with steel flanges
EN ISO 12162:2009	Thermoplastics materials for pipes and fittings for pressure applications. Classification, designation and design coefficient
DIN 16963 1-15 series	Pipes joints and elements for high Density Polyethylene (PE) pressure pipe lines.

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BS 7874:1998	Method of test for microbiological deterioration of elastomeric seals for joints in pipe work and pipes.
BSEN 681-1:1996	Elastomeric seals, material requirements for pipe joint seals used in water and drainage applications. Vulcanized rubber.
BS 6920-1:2014	Suitability of non-metallic materials and products for use in contact with water intended for human consumption with regard to their effect on the quality of the water. Specification
ISO 12176-1:2012	Plastics pipes and fittings – Equipment for fusion jointing polyethylene systems – Part 1 : Butt Fusion.
ISO 12176-2:2008	– Part 2 : Electrofusion.
PD CEN/TS 12201-7:2014	Plastics piping systems for water supply, and for drainage and sewerage under pressure. Polyethylene (PE). Guidance for the assessment of conformity
ISO 6259-1:2015	Thermoplastics pipes — Determination of tensile properties — Part 1: General test method
ISO 6964:2019	Polyolefin pipes and fittings — Determination of carbon black content by calcination and pyrolysis — Test method
ISO 1133-1:2011	Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method
ISO 2505:2005	Thermoplastics pipes — Longitudinal reversion — Test method and parameters
ISO 9001: 2015	Quality management system

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2.3 Definitions

The definitions given in the relevant standards which are referred to in the specification, shall apply for the terms used in this specification.

2.4 Classification

2.4.1 The terms PE 100 are a classification developed in line with a decision taken at CEN/TC 155, the European Technical Committee drafting plastics piping system standards for polyethylene products for water supply.

2.4.2 According to this classification, as detailed in ISO 12162:2009, material has a Minimum Required Strength (MRS) value of 8 Mpa and PE 100 has a MRS value of 10 Mpa. The international Standards Organization (ISO) technical procedure ISO 9080: 2012 identifies these MRS values derived from the 50 year extrapolated 97.5% Lower Confidence Limit (LCL) failure stress.

2.5 Materials

Pipes and fittings shall be manufactured by using polyethylene as main raw material. The raw material used in manufacturing process shall be of reputed suppliers and comply with the following characteristics tabulated in Table 2 in Annex I, except Carbon black content (black compound).

All pipes & fittings shall be manufactured of blue colour compounds and shall comply to the Technical Specification hereof.

Required manufacturing pressure class due to temperature correction

For imported PE Pipes and fittings manufacturer shall calculate the required manufacturing pressure class for the required pressure class specified in the Bills of Quantities based on the temperature in Sri Lanka. Relevant factors shall be obtained from Annex A of EN 12201 -1:2011or ISO 4427 Part -1:2019.

The continuous allowable operating pressure (PFA) is derived from the following formula

$$PFA = f_T \times f_A \times PN$$

Where,

f_T = Co-efficient according to Table A-1

f_A = derating factor related to the application (for the conveyance of water, the maximum value of $f_A = 1$)

PN = nominal pressure

Accordingly, manufacturer shall supply higher pressure class pipes & fittings based on the above calculation.

2.5.1 Non-metallic Materials

All non-metallic materials supplied shall be in conformity with the BS 6920 Part 1:2014 to BS 6920 –Part 2 and Part3:2000, BS EN 15768:2015; suitability of non

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metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of water or approved equivalent publication, as a recognized certifying authority having passed full tests of effect on water quality under the requirements for the testing of non-metallic materials for use in contact with potable water.

2.5.2 Pipes

Polyethylene pipes shall be flexible and in pipe form or coil form complying with standards given in the reference standards in the document. Pipe jointing methods shall be as follows.

Jointing Methods

1. Electro-fusion – Temperature, time, alignment
2. Butt-fusion – Temperature, time, alignment
3. compression – Gaskets

2.5.3 Fittings

Polyethylene fittings shall be manufactured by injection moulding, factory welding or formed in the factory complying with the standards referred in the document.

Fittings shall be suitable either for electrofusion or butt welding as specified in the Bill of quantities. All dimensions of electro fusion fittings must be fusible with one fusion machine.

Diameters upto 32mm shall be manufactured using injection moulded only.

2.5.3.1 Types of pipe fittings

The following types of fittings shall comply to EN 12201-3:2011/ ISO 4427-3:2019

a) Spigot fittings
b) Electro-fusion fittings and
c) Mechanical fittings and joints

"For References ONLY" (Not for Bidding)

2.5.3.1.1 Spigot Fittings

Spigot fittings fall under two clauses as shown below.

Class	Description
Moulded	Injection moulded fittings
Fabricated	Fitting which are assembled using butt-fusion joints

2.5.3.1.2 Electro-fusion Fittings

Electro-fusion fittings shall be injection moulded fittings made of PE but incorporating integral heating element(s) to enable fusion jointing with PE pipes.

2.5.3.1.3 Mechanical Joints and Fittings

i. General

Metal and plastic fittings available for use with PE pipe are:

- Polymeric coated Flanged and other adaptors
- Mechanical type couplers c/w restrainer

The materials and constituent elements used in making the fitting (including elastomers, greases and any metal parts) shall be as resistant to the external and internal environments as the other elements of the piping system and shall have a life expectancy under the following conditions as least equal to that of the PE pipe conforming to EN 12201:2011 or ISO 4427 :2019 with which they are intended to be used:

a) During storage :
b) Under the effect of the fluids being conveyed :
c) Taking account of the service environment and operating conditions.

The requirements for the level of material performance for non-polyethylene parts shall be at least as stringent as that of the PE pipe systems.

All mechanical joints and fittings shall be of approved types designed specifically for PE pipe system. They shall be supplied with all necessary coupling, rings, nuts, bolts, washers, rubber rings/sealing gaskets and restrainers/stiffeners.

All mechanical joints, fittings and systems shall conform to the requirements specified in BS EN 12201-5:2011/ISO 4427-5:2019 of Table below as applicable.

Characteristics for fitness for purpose of the joint, fitting of system

Characteristics	**Test Method**
Hydrostatic strength at room temperature	EN ISO 1167-3:2007
Peel decohesion test PE electrofusion assemblies of nominal outside diameter $\geq$ 90mm	ISO 13954:1997 ISO 13955:1997
Resistance to tensile force	ISO 13953:2001
Mechanical Joints	
Leak tightness under internal pressure including end thrust	EN ISO 3458:2015
Leak tightness under internal pressure when subjected to bending	EN ISO 3503:2015
Plastics piping systems, Elastomeric sealing rings type joints and mechanical joints for thermoplastic pressure piping for leak tightness under external hydrostatic pressure	EN ISO 3459:2015
Resistance to pull out under constant longitudinal force	EN ISO 3501:2015

"For References ONLY" (Not for Bidding)

2.5.3.2 Compression Fittings, Nuts for PE Pipes

Couplings, flange adaptors etc shall be compatible with the pipes specified in item 2.5.2 hereof; together with following;

- All bodies shall be injection moulded from recognized top quality poly propylene.
- Bodies shall be coloured black
- Bodies must have moulded in manufacturer identification, material and series information and dimension of the outside pipe diameter.
- All male and female threads shall be injection moulded to the ISO 7/1 standards.
- Nuts must have UV resistance of grade 8 of ASTM D2585.

2.5.3.3 Joint Rings

The physical properties of elastomeric joint rings shall comply with Table 2 of EN 681-1:1996 or ISO 4633:2015. The joint rings shall also comply with the relevant provisions in BS 7874-1:1998 for effects on water quality and resistance to microbiological deterioration.

Joint rings shall be supplied by the pipe manufacturer.

Each joint ring shall be marked clearly and durably in accordance with the following information in a manner that does not interfere with the sealing function of the ring, in complying with clause 10 of EN 681-1:1996 or clause 9 of ISO 4633:2015.

a). The nominal size

b). Manufacturer's identification

c). BS or ISO standard with seal type designation

d). Abbreviation for the elastomer

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2.5.3.5 Flanges

All flanges dimensionally shall be in accordance with EN 1092-2:1997 (Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Cast iron flanges) and EN 1515-1:2000 Flanges and their joints Bolting. The screw threads in the pipes and fittings shall be complying with ISO Metric Screw Threads (ISO 7-1:1994 and ISO 7-2:2000).

2.5.3.6 Flange Joints for Pipes and Pipeline Fittings

Flanges for pipes and pipeline fittings shall unless otherwise stated comply with EN 1092: Part 2: 1997. Flanges shall be of PN16 nominal pressure rating and shall be raised faced, unless otherwise stated.

Flanges in accordance with EN545, ISO2531 are dimensionally compatible with EN1092-2:1997.

Flanged joints shall be complete with all nuts, bolts, gaskets and two washers per bolt.

The flanges of all fittings shall be integrally cast. The flanges of flanged pipes shall either be integrally cast or screwed or factory welded unless otherwise stated. 'Factory welded' means that the flanges are welded to the pipes at the point of manufacture under factory conditions with inspection agency certification.

The Contractor shall be responsible for checking and ensuring that mating flanges are compatible in all cases, including where connections are required to pipe work and valves associated with pumping plant and inlet/outlet pipe work at service reservoirs or other structures.

2.5.3.7 Steel Flange Converter

Steel Flange Converter shall be made out of polyethylene and shall conform to the EN 12201-3:2011 & EN 12201-5:2011 or ISO 4427:2019 specification for mechanical fittings and joints including flanges for polyethylene pipes for conveyance of cold potable water for the size range 90-1000 mm inclusive made of metal or plastics or a combination of both.

2.5.3.8 Gaskets for Flanged Joints

Gaskets for flanged pipe joints shall be of the inside bolt circle type and the dimensions shall comply with EN 1514-2:2014 (Flanges and their joints. Gaskets for PN-designated flanges. Spiral wound gaskets for use with steel flanges)

The Gasket material shall be EPDM and shall be of average hardness of 65-75.

The Gaskets shall be supplied by the manufacturer and shall suit for PN 16 flanges unless otherwise stated.

Each gasket shall be marked clearly and durably in accordance with the following information in a manner that does not interfere with the sealing function of the gasket, in complying with clause 10 of EN 681-1:1996.

a). The nominal size

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b). Manufacturers identification
c). The number of the BS or BSEN with seal type designation.

d). Abbreviation for the elastomer

2.5.3.9 Nuts, Bolts and Washers

The nuts, bolts and washers for flanged joints shall be of high tensile steel and shall comply with EN 14399-1:2015.

The bolting shall comply with the relevant provisions of EN 1092-2:1997.

The Bolt lengths shall be sufficient to ensure that nuts are full threaded when tightened in their final position with two threads showing.

Two washers per each bolt shall be supplied for providing under the head of the bolt and under the nut.

The bolts and nuts shall be hexagonal and shall be in accordance with BS 4190:2001 ISO metric black hexagon bolts, screws and nuts, Specification, the bolts, studs, nuts and washers used shall be made of stainless steel or hot-dipped galvanized carbon steel coated with fusion bonded epoxy powder or polyamide 11 to the finished thickness of coating between 75 mm and 125 mm according to WIS 4-52-03-1994. Cold applied high solid epoxy shall be used to repair the damaged coatings on the bolts and nuts after fastening.

2.5.4 Testing

Testing shall be carried out fully in accordance with the requirements of ISO 4427 :2019 and DIN 8075 (2011-12)- (Polyethylene (PE) pipes PE 100 - General quality requirements, testing)or equivalent standard acceptable to the purchaser.

Test parameters of physical and mechanical characteristics for pipes & fittings shall be as indicated in Table 3, 4, 5, 6 in Annex II.

"For References ONLY" (Not for Bidding)

2.6 Dimensions of Pipes and Fittings

Dimension of standard pipes shall conform to the following standards.

ISO 4427:2019	Plastics piping systems for water supply, and for drainage and sewerage under pressure — Polyethylene (PE)
EN 12201:2011	Plastics piping systems for water supply, and for drainage and sewerage under pressure. Polyethylene (PE)
EN ISO 1167-1:2006	Thermoplastics pipes for the conveyance of fluids. Determination of the resistance to internal pressures. General Method.
EN ISO 1167-2:2006	Thermoplastic pipes for the conveyance of fluids. Determination of the resistance to internal pressures. Preparation of pipe pieces.
BS ISO 4065 – 1996	Thermoplastic pipes – universal wall thickness table
ISO 11922 – 1:1997	Thermoplastic pipes for the conveyance of fluid - Dimensions & tolerances – Part I metric series

Standard lengths of a straight pipe shall be 12 m.

Dimensions of fittings shall conform to the following standards.

EN 12201-3:2011	Plastic piping System for Water Supply – Polyethylene (PE) 3 - Fittings
ISO 4427:2019	Plastic piping System for Water Supply – Polyethylene (PE) 3 - Fittings
DIN 16963 1-15 series	Pipes joints and elements for high Density Polyethylene (PE) pressure pipe lines.

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2.7 Method of Manufacturing of Pipes & Fittings

2.7.1 Manufacturing of PE Pipes and Fittings

2.7.1.1 The contractor shall submit full details of manufacturing process that he intended to use with the bid. The Material Quality Certificates shall be from one of the **Independent Testing Agencies,** which is indicated in the Condition of Contract, shall be provided by the contractor.

Base Polymer Compound position, antioxidants, rework material and colour shall be in accordance with WIS 4-32-15, BS 3412:1992 and EN ISO 12162:2009.

2.7.2 Production Quality Control

2.7.2.1 The manufacture of PE pipe is a continuous processing which necessitates strict and accurate control of both materials and plant to achieve the required quality. A range of quality control tests pressures in the relevant standards should be applied within the scope of a quality assurance in accordance with ISO 9001: 2015.

These control procedures shall include:

- quality testing of raw materials, i.e. base compound.
- Checks on the uniformity and consistency of the granules
- control of processing parameters in terms of temperature, pressure, flow rates, haul off speed and energy input
- visual inspection of the pipes to check general appearance, dimensional compliance and any indication of inclusions or processing flaws in pipe barrels and jointing ends,
- production short term tests, to identify any variations in the plant function.

2.7.2.3 Essential short-term quality control tests and procedures are described in the relevant Water Industry Specifications include the following

- appearance and surface condition
- dimensions
- thermal stability
- elongation at break
- hydrostatic pressure test at 80^0 C
- short term pressure test

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2.7.2 Product Type Tests

2.7.3.1 In addition to 'production quality control' tests, there are a number of important longer-term "Type Tests" that must be undertaken to demonstrate the long-term performance of the pipe. These tests are also required whenever there is any change in such parameters as formulation, size, classification or processing technique.

2.7.3.2 These "Type Tests" are again detailed in the relevant specifications and include the following:

- effect on water quality
- resistance to weathering
- long term hydrostatic pressure testing
- resistance to fracture on impact tensile strength,
- elongation and weld test

2.7.3.3 Perhaps the most fundamental Type Test is the long term hydrostatic test which is a standard means of predicting the long-term performance of the pipe. In this test, samples are subjected different circumferential (hoop) stresses by pressurization and the subsequent time to pressure is recorded. The individual results are plotted as a log stress versus log time graph. They are then subjected to regression analysis to obtain an extrapolated 50 year stress level.

2.7.3.4 It is worth bearing in mind that the above requirements for long-term performance levels are minimum values and manufacturers usually ensure that their products can comfortably meet these standards, i.e. the pipes have an additional factor of safety built into them to cover any manufacturing variables.

"For References ONLY" (Not for Bidding)

2.8 Tolerances

Tolerances on wall thickness & weight, and length shall be in accordance with ISO 4427:2019 or EN 12201:2001.

The tolerances on flange thickness, flange diameter and bolt holes in polyethylene Steel flange converters to be used of connecting different type of material shall conform to EN 1092-2:1997.

2.9 Final Acceptance at site

All pipes, fittings, valves and accessories shall conform to the specification at site. Engineer shall carryout necessary inspections at site prior to final acceptance.

2.10 Specification for Butt Fusion Welding Machine

i. Machine shall be hydraulically operated and suitable for welding of PE pipes .

ii. Machine shall consist of self –aligning frame and compact dimensions, to be suitable for working on narrow roads.

iii. Machine shall comprised of four clamps in lightweight alloy of which the third one is easily adjustable in order to weld special pieces, and the automatic disconnecting devices to detach the pipes the heating mirror at the end of heating time.

iv. Heating mirror shall be silver stone coated with electronic thermostat and separate thermometer in order to continuously check the temperature of the heating mirror. Operating electricity requirement of the heating mirror shall be 220±10 V 50Hz.

Also it shall include removable electric facing tool complete with reducing gear, double cutting edged blades, safety micro switch all which allow the engine to start only in operating position.

i. An electrically operated mechanical block device avoiding dislocation during the facing operation. Operating electricity requirement shall be 220±10, 50Hz.

ii. A support for facing tool and heating mirror suitable to carry the two part and to hold them when it is not in use.

iii. Hydraulic double throw pump with precision pressure gauge (class 1.0-100 bar scale and 100mm face to easy reading) incorporates a device which maintains pre-set line pressure even when motor is not running. Allows continuous pressure adjustments and features flexible hoses with quick disconnect dry-lock couplings. Mounted in a tough protective frame, with two transport handles. Operating electricity requirement is 220±10 50Hz.

iv. Light weight aluminium reducing inserts (8 inserts per set including 6 inserts for pipes and 2 inserts for fittings) sizes 200,225,250,280,315,355,400,450mm.

v. Upper fitting clamp 500mm for short fittings.

vi. Stub end device with size range 200 to 500 mm.

vii. A Generator of adequate capacity.

viii. A 2 year warranty to cover all the equipments offered.

"For References ONLY" (Not for Bidding)

ANNEX I

Table 2 – Characteristics of the PE compound as granules

Characteristics	Requirements [a]	Test parameters		Test method
		Parameter	Value	
Compound density	> 930 kg/m [b]	Test temperature Number of Samples	23^{0}C shall conform to ISO 1183:1 or ISO 1183:2	ISO 1183-1:2019or ISO 1183-2:2019
Carbon black content [c]	(2.0 to 2. 5)% by mass	Shall conform to ISO 6964		ISO 6964:2019
Carbon black dispersion [c]	grade ≤ 3 Rating of dispersion A1,A2,A3, or B	Preparation of test pieces [d]	Free	ISO 18553:2002
		Number of test pieces [b]	Shall conform to ISO 18553	
Pigment dispersion [e]	grade ≤ 3 Rating of dispersion A1,A2,A3, or B	Preparation of test pieces [d]	Free	ISO 18553:2002
		Number of test pieces [b]	Shall conform to ISO 18553	
Water content [f]	≤300 mg/kg (Equivalent to <0.03% by mass)	Number of test pieces [b]	1	ISO 15512:2019
Volatile content	≤350 mg/kg	Number of test pieces [b]	1	EN 12099:1997
Oxidation induction time (Thermal stability)	≥ 20 min	Test temperature [g]	210 ^{0}C	ISO 11357-6:2018
		Number of test pieces [b]	3	
		Test atmosphere	Oxygen	
Melt mass-flow rate (MFR) for PE40	0, 2 ≤ MFR≤ 1,4 g/10 min[h] Maximum deviation of ± 20% of the nominated value	Loading mass	2,16kg	ISO 1133-1:2011
		Test temperature	190^{0}C	
		Time	10min	
		Number of test pieces [b]	shall confirm to ISO 1133:1	
Melt mass-flow rate (MFR) for PE80 and PE 100	0, 2 ≤ MFR≤ 1,4 g/10 min[h,i] Maximum deviation of ± 20% of the nominated value	Loading mass	5kg	ISO 1133-1:2011
		Test temperature	190^{0}C	
		Time	10min	
		Number of test pieces [b]	shall confirm to ISO 1133:1	

[a] Conformity to these requirements shall be proved by the compound producer.

[b] The number of test pieces given indicates the number required to establish a value for the characteristic described in the table 1. The number of test pieces required for factory production control and process control should be listed in the manufacturer's quality plan. Guidance on assessment of conformity can be found in CEN/TS 12201-7([2]).

[c] Only for black compound.

[d] In case of dispute, the test pieces shall be prepared by microtome method.

[e] Only applicable for non-black compound.

[f] Only applicable if the measured volatile content is not in conformity with its specified requirement. In case of despite, the requirement for water content shall apply. As an alternative method, ISO 760 may be used. The requirement applies to the compound producer at the stage of compound manufacturing and to the compound user at the stage of processing (if the water content exceeds the limit, drying is required prior to use).

[g] The test may be carried out at 200 ^{0}C or 220 ^{0}C provided that a clear correlation has been established. In case of dispute, the reference temperature shall be 210 ^{0}C.

[h] Nominated value given by the compound manufacturers.

[i] Materials of nominated value 0.15 ≤ MFR < 0.20 can be introduced, in such case attention is drawn to the fusion compatibility. The lowest MFR value resulting from the maximum lower deviation of the nominated value should be not less than 0.15.

"For References ONLY" (Not for Bidding)

ANNEX II

Table 3 - Physical Characteristics of PE Pipes

Characteristics requirements	Requirements	Test parameters		Test method
Elongation at break for $e \leq 5$mm	$\geq$ 350%	Test piece shape Test speed Number of test pieces [a]	Type 2 100 mm/min shall confirm to ISO 6259-1:2015	ISO 6259-1:2015 and ISO 6259-3:2015
Elongation at break For 5 mm < $e \leq$ 12 mm	$\geq$ 350%	Test piece shape Test speed Number of test pieces [a]	Type 1 [b] 50 mm/min shall confirm to ISO 6259-1:2015	ISO 6259-1:2015 and ISO 6259-3:2015
Elongation at break for $e \geq$ 12 mm	$\geq$ 350%	Test piece shape Test speed Number of test pieces [a]	Type 1 [b] 25 mm/min shall confirm to ISO 6259-1:2015	ISO 6259-1:2015 and ISO 6259-3:2015
		OR		
		Test piece shape Test speed Number of test pieces [a]	Type 3 [b] 10 mm/min shall confirm to EN ISO 6259-1:2015	
Longitudinal reversion [c]	$\leq$3 % No effect on surface	Length of pipe [d] and number of test pieces Test temperature: PE 80, PE 100 Time	According to ISO 2505 110 $\pm$ 2 ^{0}C See ISO 2505	ISO 2505:2005
Melt mass-flow rate MFR for PE 40	Change of MFR by processing $\pm$ 20% [e]	Load Test temperature Time Number of test pieces [a]	2.16 kg 190^{0}C 10 min shall confirm to ISO 1133:2011	ISO 1133-1:2011
Melt mass-flow rate MFR for PE 100	Change of MFR by processing + 20% [c]	Load Test temperature Time Number of test pieces [a]	5 kg 190^{0}C 10 min shall confirm to ISO 1133:1999	ISO 1133-1:2011
Oxidation induction time	$\geq$ 20 min	Test temperature Test environment Number of test pieces [a, d]	200^{0}C [f] Oxygen 3	ISO 11357-6:2018
Effect on water quality	National regulations apply			

[a] The number of test pieces given indicates the quantity required to establish a value for the characteristic described in this table. The number of test pieces required for factory production control and process control should be listed in the manufacturer's quality plan.

[b] Where practical, machined type 2 test pieces may be used for pipe wall thickness $\leq$ 25 mm. The test may be terminated when the requirement is met, without continuing until the rupture of the test piece.

[c] Only applicable for pipes with thickness $\leq$ 16mm

[d] For pipes with an outside diameter >200mm, longitudinally cut segments may be used.

[e] Value as measured on the pipe relative to the value measured on the compound used.

[f] Test may be carried out as an indirect test at 210^{0}C or 220 ^{0}C provided that there is clear correlation has been established. In case of dispute, the test temperature shall be 200^{0}C.

[g] Samples are to be taken from the inner wall surface.

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ANNEX III

Table 4 - Mechanical Characteristics of PE Pipes

Characteristics requirements	Requirements	Test parameters		Test method
		Parameters	Value	
Hydrostatic strength at 20^0C	No failure of any test pieces during test period	End caps Conditioning period Number of test pieces [b] Type of test Test temperature Test period Circumferential (hoop) stress for : PE 100	Type a) [a] According to ISO 1167-1:2006 3 Water-in-water[d] 20^0C 100 h 12,0 MPa	ISO 1167-1[b]:2006 ISO 1167-2:2006
Hydrostatic strength at 80^0C	No failure of any test pieces during test period	End caps Conditioning period Number of test pieces [c] Type of test Test temperature Test period Circumferential (hoop) stress for : PE 100	Type a) [a] According to ISO 1167-1:2006 3 Water-in-water[d] 80^0C 165 h [c] 5,4 MPa	ISO 1167-1[f]:2006 ISO 1167-2:2006
Hydrostatic strength at 80^0C	No failure during test period of any test pieces	End caps Conditioning period Number of test pieces [b] Type of test Test temperature Test period Circumferential (hoop) stress for : for PE 100	Type a) [a] According to ISO 1167-1:2006 3 Water-in-water[d] 80^0C 1000 h [c] 5,0 MPa	ISO 1167-1[b]:2006 ISO 1167-2:2006

NOTE The characteristic resistance to slow crack growth is dealt with in ISO 4427-1 as a material property measured in the form of pipe

[a] Type b) end caps may be used for batch release tests for diameters > 500 mm.

[b] The test shall be realized on basis of measured dimensions (OD and thickness), in accordance with ISO 1167-1:2006, 7.2.

[c] The number of test pieces given indicate the quantity required to establish a value for the characteristic described in this table. The number of test pieces required for factory production control and process control should be listed in the manufacturer's quality plan

[d] For d_n >1000mm, the test can also be performed water –in-air. In case of dispute, water in water shall be used

[e] Premature ductile failures are not taken into account. For retest procedure , apply 8.3

[f] The test shall be realized on basis of nominal dimensions (OD and thickness), in accordance with ISO 1167-1:2006, 7.3.

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ANNEX IV

Table 5 - Physical Characteristics of PE Fittings

Characteristics requirements	Requirements	Test parameters		Test method
		Parameters	Value	
Oxidation induction time (Thermal stability)	≥ 20 min	Test temperature	200^0 C [b]	ISO 11357-6:2018
		Number of test pieces [a]	3	
		Test environment	Oxygen	
Melt mass-flow rate (MFR)	After processing maximum deviation of ±20% of the value measured on the batch used to manufacture the fitting	Loading mass	5 kg	ISO 1133-1:2011
		Test temperature	190^0 C	
		Time	10 min	
		Number of test pieces [a]	Shall conform to ISO 1133-1 :2011	

[a] The number of test pieces given indicate the quantity required to establish a value for the characteristic described in table 7. The number of test pieces required for factory production control and process control should be listed in the manufacturer's quality plan. Guidance on assessment of conformity can be found in CEN/TS 12201-7. (Reference [2] in the Bibliography).

[c] Test may be carried out as an indirect test at 210^0C or 220^0C provided that there is clear correlation to the results at 200^0C : in cases of dispute the reference temperature shall be 200^0C.

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ANNEX V

Table 6 - Mechanical Characteristics of PE Fittings

Characteristics	Requirements	Test parameters			Test method
		Parameters		Value	
Hydrostatic strength (20^0C, 100 h)	No failure during test period of any test piece	End caps		Type A of ISO 1167-1:2006	ISO 1167-1:2006 and ISO 1167-4:2007
		Orientation		Free	
		Conditioning time		Shall conform to ISO 1167-1:2006	
		Number of test pieces [a]		3	
		Type of test [b]		Water-in-water	
		Circumferential (hoop) stress in pipe [c] for :	PE 80	10,0 MPa	
			PE 100	12,0 MPa	
		Test period		100 h	
		Test temperature		20^0C	
Hydrostatic strength (80^0C, 165 h)	No failure during test period of any test piece[d]	End caps		Type A of ISO 1167-1:2006	ISO 1167-1:2006 and ISO 1167-4:2007
		Orientation		Free	
		Conditioning time		Shall conform to ISO 1167-1:2006	
		Number of test pieces [a]		3	
		Type of test [b]		Water-in-water	
		Circumferential (hoop) stress in pipe [c] for :	PE 80	4,5 MPa	
			PE 100	5,4 MPa	
		Test period		165 h	
		Test temperature		80^0C	

NOTE Each assembly shall be prepared from components (pipes and fittings) of the same pressure class.

[a] The number of test pieces given indicate the number required to establish a value for the characteristic described in Table 4. The number of test pieces required for factory production control and process control should be listed in the manufacturer's quality plan. Guidance on assessment of conformity can be found in CEN/TS 12201-7. (See Reference [2] in the Bibliography).

[b] Alternatively, for d_n > 450 mm, the test can also be performed in air. In case of dispute, water-in-water test shall be used. For fitting type (B) d_n > 450mm, alternative testing is allowed (e.g. pressurization through saddle outlet).

[c] The test pressure shall be calculated using the design standard dimension ratio (SDR) of the fitting.

[d] Only brittle failures shall be taken into account. If a ductile failure occurs before 165 h, the test can be repeated according to 8.4.

[e] Longest length of brittle failure in any of the test samples.

[f] Test sample can be mechanically reduced in wall thickness for testing purpose of large diameter fittings by keeping a minimum of 15 mm wall thickness of each component.

[g] Alternatively, for fittings type (B) d_n > 450mm, this characteristic can be checked by the strip-bend test according to ISO 21751. (See Reference [7] in the Bibliography).

[h] Applicable to d_n 90 mm and above.

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Table 4 – *(Continued)*

Characteristics	Requirements	Test parameters		Test method
		Parameters	Value	
Hydrostatic strength (80^0C, 100 h)	No failure during test period of any test piece	End caps	Type A of ISO 1167-1:2006	ISO 1167-1:2006 and ISO 1167-4:2007
		Orientation	Free	
		Conditioning time	Shall conform to ISO 1167-1:2006	
		Number of test pieces [a]	3	
		Type of test [b]	Water-in-water	
		Circumferential (hoop) stress in pipe [c] for : PE 80	4,0 MPa	
		Circumferential (hoop) stress in pipe [c] for : PE 100	5,0 MPa	
		Test period	1000 h	
		Test temperature	80^0C	
Decohesive resistance (A)	Length of initiation rupture $\leq L_2/3$ in brittle failure [e]	Test temperature Number of test pieces [a,f]	23^0C Shall conform to ISO 13954:1997 and ISO 13955:1997	ISO 13954:1997 ISO 13955:1997
Evaluation of ductility of fusion joint interface (B)[g]	Surface of repture Ld $\leq$ 50% and Ad $\leq$ 25%, brittle – failure	Test temperature Number of test pieces [a,f]	23^0C Shall conform to ISO 13956:2010	ISO 13956:2010
Tensile strength for butt fusion (C)[h]	Test to failure: Ductile – pass Brittle – fail	Test temperature Number of test pieces [a,f]	23^0C Shall conform to ISO 13953:2001	ISO 13953:2001
Impact resistance (B: Tapping tees only)	No failure, no leakage	Test temperature Falling height Mass of the striker Number of test pieces [a]	0^0C 2m 2,5kg 1	ISO 13957:1997

NOTE Each assembly shall be prepared from components (pipes and fittings) of the same pressure class.

[a] The number of test pieces given indicate the number required to establish a value for the characteristic described in Table 4. The number of test pieces required for factory production control and process control should be listed in the manufacturer's quality plan. Guidance on assessment of conformity can be found in CEN/TS 12201-7. (See Reference [2] in the Bibliography).

[b] Alternatively, for d_n > 450 mm, the test can also be performed in air. In case of dispute, water-in-water test shall be used. For fitting type (B) d_n > 450mm, alternative testing is allowed (e.g. pressurization through saddle outlet).

[c] The test pressure shall be calculated using the design standard dimension ratio (SDR) of the fitting.

[d] Only brittle failures shall be taken into account. If a ductile failure occurs before 165 h, the test can be repeated according to 8.4.

[e] Longest length of brittle failure in any of the test samples.

[f] Test sample can be mechanically reduced in wall thickness for testing purpose of large diameter fittings by keeping a minimum of 15 mm wall thickness of each component.

[g] Alternatively, for fittings type (B) d_n > 450mm, this characteristic can be checked by the strip-bend test according to ISO 21751. (See Reference [7] in the Bibliography).

[h] Applicable to d_n 90 mm and above.

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Note : Loop of sling should be adequately long and strong for lifting the coil

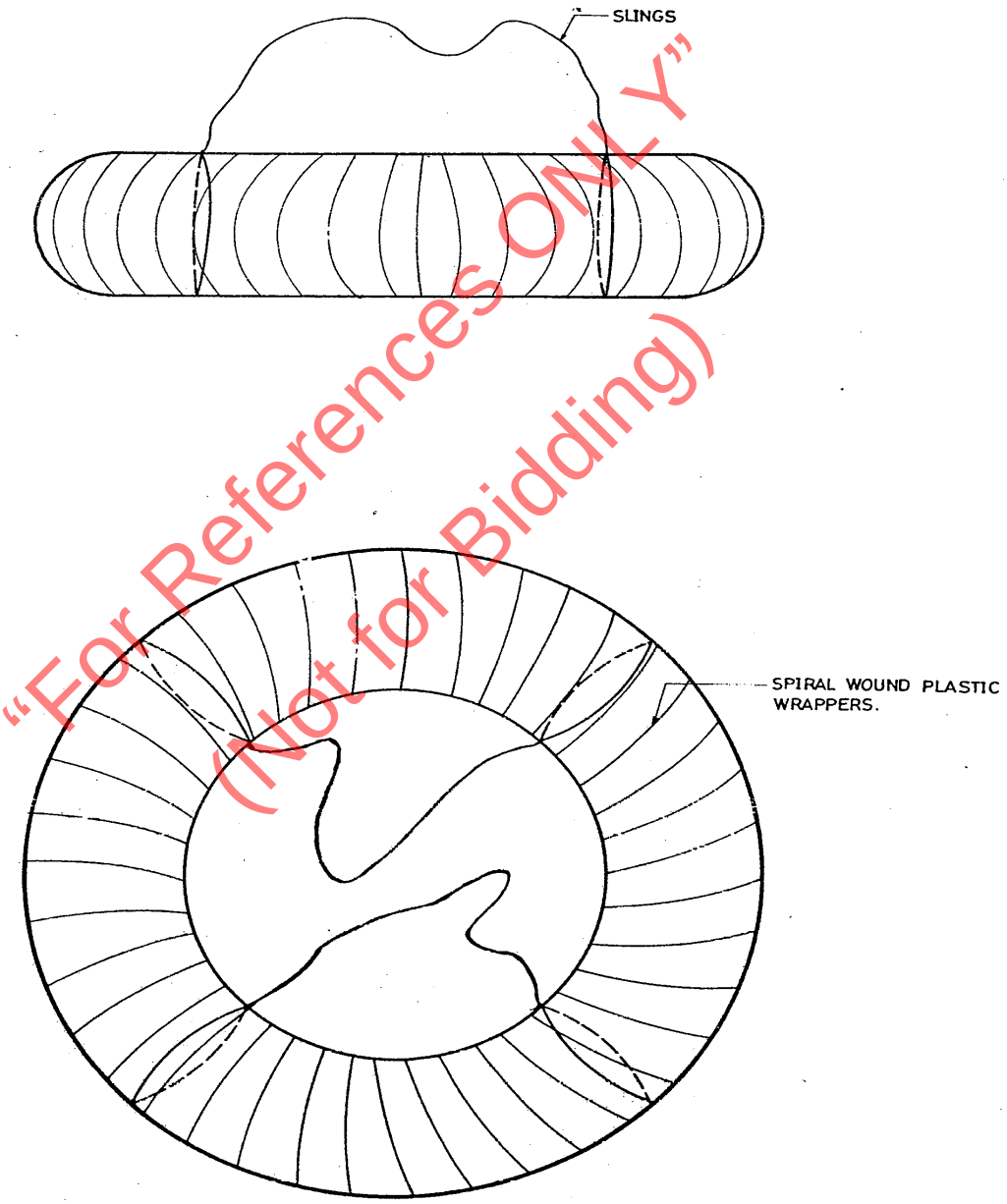


Fig. 1 - SLING ARRANGEMENT FOR LIFTING 63 mm ϕ COILS

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6B.3 SPECIFICATION FOR VALVES, HYDRANTS, SURFACE BOXES AND MANHOLE COVERS FOR WATER SUPPLY APPLICATIONS

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SPECIFICATIONS FOR
DI/CI VALVES, HYDRANTS, MANHOLE COVERS AND SURFACE BOXES FOR WATER SUPPLY APPLICATIONS.

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"For References ONLY" (Not for Bidding)

1.0 GENERAL

1.1 Ambient Conditions

All items of materials and equipment shall be in every respect suitable for storage, installation, use and operation in the conditions of temperature and humidity appertaining in Sri Lanka.

The annual average temperature is 35 °C while the relative humidity varies generally from 70% during the day to 90% at night.

The temperature of potable water to be conveyed in the pipelines will be about 32°C at the depth of 1.5m.

1.2 Suitability for Potable Water

Valves including their protective coatings and joint materials, that will or may come into contact with potable water shall not constitute a toxic hazard; shall not support microbial growth; shall not cause taste or odour, cloudiness or discolouration of the water.

"For References ONLY"
(Not for Bidding)

1.3 Definitions

The definitions given in the relevant standards which are referred to in the specification shall apply for the terms used in this specification.

1.4 Non-metallic Materials

All non-metallic materials supplied shall be listed in the current "Water Fittings and Materials Directory" published by the Water Research Centre, UK, or approved equivalent publication, as a recognized certifying authority having passed full tests of effect on water quality under the requirements for the testing of non-metallic materials for use in contact with potable water.

1.5 Flanges

All flanges dimensionally shall be in accordance with EN 1092-2 : 1997 Specification for Steel Flanges - Metric Series. The screw threads in all pipes and fittings shall comply with ISO Metric Screw Threads.

1.6 Inspection and Testing

The Contractor shall supply, furnish and prepare the necessary test pieces and samples of all materials and supply the labour facilities and appliances for such testing as may be required to be carried out on his premises according to this specification. If there are no facilities at his own works for making the prescribed tests the Contractor shall bear the cost of carrying out the tests elsewhere.

The Engineer or nominated Inspection authority shall have full access to all parts of the plant that are concerned with the testing, furnishing or preparation of materials for the performance and testing of work under this Specification.

The Contractor shall furnish the Engineer with reasonable facilities and space (without charge) for the inspection, testing and obtaining of such information, as he desires regarding the character of material in use and the progress and manner of the work.

Further all valves shall be tested to the appropriate test pressure at the manufacturer's works and shall be supported by a test certificate from the manufacturer.

The format for test certificate shall be in accordance with the format given in the schedule of particulars.

1.7 Marking of Valves & Manhole Covers

All markings described below shall be legible and durable unless otherwise specified.

The Sluice valves, Butterfly valves, Check valves and Hydrants shall be marked in complying with the relevant provisions of BS 5163 : 2004, EN 1171 : 2015, EN 593 : 2017, EN 16767 : 2016 , BS 750 : 2012 respectively.

All other valves which are not mentioned above but covered under this specifications shall be marked with at least nominal size, manufacturer's name (or trade mark), directions of closing, body material designation.

The manhole covers and surface boxes shall be marked in complying with clause 9 of EN 124:1994.

In addition to what is specified above the additional markings and the lettering sizes shall be made with details as per the table 1 hereof.

"For References ONLY" (Not for Bidding)

Table 1

Item	Diameter (mm)	Details required	Lettering Heights Details (mm)
Manhole Covers	All sizes	"NWSDB"; "WATER" or "SEWAGE" (whichever is applicable); Standard (BS EN or other); Class or type ; Size of clear opening.	50
Surface Boxes	All sizes	As for manhole covers	20
Valves	All sizes	Weight of valve	As appropriate

The Contractor shall label and clearly mark all crates and boxes in indelible paint as specified in the notes forming a part of this Specification.

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1.8 Protection during Delivery

All valves and fittings shall be securely packed in crates and boxes to prevent damage during delivery. The cost of packing shall be deemed to be included in the Contract Rates and crates will not be returned.

Each box and package therein shall be clearly labeled stating the number, size and description of the contents.

All details of the proposed method of providing such protection shall be submitted at the time of tendering.

The cost of providing protection to the ends of pipes and fittings shall be included in the unit prices tendered in the Bills of quantities.

1.9 Storing, Handling and Hauling of Valves

All materials shall be stored in an approved location and in such a manner as to preserve their quality and condition.

Storage shall be in accordance with the manufacturers recommendation.

Materials and components shall be handled in such a manner as to avoid any damage or contamination and in accordance with all applicable recommendations of the manufacturers.

The Contractor shall give instructions to the shipper on precautions to be taken in the handling of the valves and other components during loading, towage and unloading,

and shall give particulars of these instructions to the purchaser. Also particular attention shall be paid when handling goods to avoid damages to external and internal coatings.

1.10 Packing of Bolts, Joint Rings and Gaskets

Bolts of the same length and size (and their accompanying nuts and washers) shall be packed together in boxes not exceeding 100 kg. gross weight.

Joint rings and gaskets shall be packed in boxes and separate packages shall be provided for each size and description of ring or gasket.

1.11 Manufacturer's Certificate

The Contractor shall supply to the Engineer a certificate stating that each item supplied has been subjected to the tests laid down herein and conforms in all respects to this Specification or such other Specification which has been submitted to and approved by the Engineer.

1.12 Quality and Workmanship

The Bidder shall provide ISO 9001 : 2015 Quality Management System requirement certificate for Quality Assurance for the goods manufacturing factory from an accredited agency for all valves, hydrants, surface boxes, and manhole covers. Accredited Agency shall be a member of International Accredited Forum (IAF) and shall have the authority for the accreditation of mentioned goods in their scope of accreditation. Scope of the production shall be clearly specified in the certificate. Manufacturer shall maintain the validity of this certificate during the supply and delivery of the materials for contract Period. If the supply is made from several factories, ISO 9001 : 2015 certificates for quality management system requirement shall be submitted for each factory. This certificate shall clearly indicate the location of the place of manufacture of goods.

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1.13 Flanged Joint Protection

All sluice valves shall be supplied with complete 'Corrosion' protection materials in accordance with the manufacturers recommendation. The complete joint protection include the materials, namely profiling mastic or primer, paste, tape and PVC or polyethylene outer wrapping. The quantity of materials required for each diameter joint shall be calculated in accordance with the manufacturer to cover the whole joint including nuts and bolts. The supplier shall provide the required details of quantities in the schedule of particulars.

1.14 Final Acceptance at site

All valves and accessories shall conform to the specification at site. Engineer shall carryout necessary inspections at site prior to final acceptance.

2.0 TECHNICAL REQUIREMENTS FOR VALVES, HYDRANTS, SURFACE BOXES, MANHOLE COVERS FOR WATER SUPPLY APPLICATIONS

2.1 Scope

This section covers the requirements for the supply of valves, hydrants, surface boxes and manhole covers.

Accessories associated with the valves are also specified.

2.2 Definitions

The definitions given in the relevant standards, which are referred to in the specification, shall apply for the terms used in this specification.

2.3 Reference Standards

The following standards are referred to in this section;

EN ISO 1461:2009	Hot dip galvanized coatings on fabricated iron and steel articles. (Specifications & test methods)
EN 1982 : 2017	Copper and copper alloys. Ingots and castings.
EN 1092-2:1997	Flanges and their joints- Circular flanges for pipes, valves, fittings and accessories, PN designated for Cast iron flanges
EN 1171 : 2015	Industrial Valves. Cast Iron Gate Valves.
EN 16767:2016	Industrial valves. Steel and cast iron check valves
EN 1563:2018	Specification for Spheroidal graphite cast iron.
EN 593 : 2017	Industrial valves. Metallic butterfly valves for general purposes
BS 5163 : 2004	Predominantly Key-operated cast iron gate valves for waterworks purposes.
BS 750 : 2012	Underground fire hydrants and surface box frames and covers
EN 10293: 2005	Steel castings for general engineering purposes
BS 5834 :Part 2 :2011	Specifications for small Surface boxes. Surface Boxes, guards and underground chamber for gas and water work purposes.

"For References ONLY" (Not for Bidding)

EN 124 : 1994	Gully tops and manhole tops for vehicular and pedestrian areas. Design requirements; type testing, marking quality control.
AWWA C 502-80	Dry Barrel Fire Hydrants
BS 1212 : Part 2 : 1990	Diaphragm type float operated valves (copper alloy body) (excluding floats)
BS 1212 : Part 3: 1990	Diaphragm type float operated valves (plastic bodied) for cold water services only (excluding floats)
EN 558: 2008	Industrial Valves. Face to face and centre to face dimensions of metal valves for use in flange pipe systems. PN and class designated valves.
EN 1074 –1: 2000	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. General Requirements.
EN 1074 –2: 2000	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Isolating valves.
EN 1074 –3: 2000	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Check valves.
EN 1074 –4: 2000	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. Air valves.
EN 681-1:1996	Elastomeric seals. Material requirements for pipe joint seals used in water and drainage applications. Vulcanized rubber.
ISO 4633:2015	Rubber seals -- Joint rings for water supply, drainage and sewerage pipelines -- Specification for materials

Note: The year within brackets gives the year of amendments made.

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2.4 Records and Drawings for Items (Valves and other Ancillary items) to be Supplied

The following records and drawings of all types of valves shall be made available by the supplier for inspection.

- Drawings showing overall dimensions, valve construction and settings
- Data related to pressure ratings, weights and materials of manufacture (each component)
- Test certificates of works tests
- Performance data of air valves
- Seating design and the seating materials of butterfly valves

2.5 Materials of Manufacture

All materials of manufacture shall be suitable for use with water at temperatures up to 45 deg. C.

Valve body casting shall be ductile iron complying with EN 1563 :2018 for diameters above DN 150, while CI valve body casting is acceptable for below DN 150 and shall be capable of withstanding the test pressures specified. The castings shall be close grained, sound, smooth and symmetrical, and shall be carefully cleaned and dressed off. No stopping or plugging will be permitted in the case of air holes appearing in the castings.

Unless otherwise specified, all standard valves shall be flanged type where flanges shall be of PN 16 and complying with EN 1092-2 :1997.

The direction of closing of valves shall be “clockwise” and hand wheels shall be permanently marked with the words "open" and "closed" and a direction arrow.

All materials shall comply with the appropriate British Standards or equivalent. All castings shall be free of blowholes and other defects.

Sluice valves and butterfly valves shall be suitable for flow in either direction.

All standard valves shall be suitable for frequent operation and for infrequent operation after long periods in the open or closed condition.

All non-metallic materials to be provided shall be listed in the current "Water Fittings and Materials Directory" published by the Water Research Centre, UK, or approved equivalent publication, as having passed full tests of effect on water quality under the requirements for the testing of non-metallic materials for use in contact with potable water.

The Engineer shall have the right to reject any casting, forging, bearing etc and the contractor shall replace any such defective parts at his own expense.

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2.6 Testing

General

The manufacturer shall notify the Engineer at least thirty working days prior to factory tests. The Engineer reserves the right to witness all tests.

(i) Performance Test

Each valve, gate and appurtenance shall be shop-operated three times from the fully closed to the fully opened position, and the reverse, under a no-flow condition, to demonstrate that the complete assembly is workable.

(ii) Leakage Test (Closed Position)

(a) For Internal Pressure

Valves, gates and appurtenances shall be shop-tested for leaks in the closed positions. The hydrostatic pressure shall be applied to one face of the disc for the full test duration at the working pressure when the valve is in closed position. This shall be repeated to the other face of the valve too. The length of test shall be at least 3 minutes and there shall be no indication of leakage past the valve during the test period. The test pressure shall be given in the Table below.

PN	*Test Pressure (PFA) (Bars)*	*Duration (Minutes)*
16	25	3
25	35	3

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(b) For External Pressure

Valves shall be leak tight to ingress of air, water or any other foreign matter.

a. Hydrostatic Test

Valves specified shall be hydrostatically tested. Hydrostatic tests shall conform to the following;

With the valve disc in fully open and a slightly open position, internal hydrostatic pressure equivalent to 150% of the specified working pressure a specified in the table below shall be applied to the inside of the valve body of each valve for a period of 3 minutes. During the hydrostatic test, there shall be no leakage through the metal, the end joints, or the valve shaft seal; nor shall any part be permanently deformed. While undergoing testing, the valve body shall be struck with a hammer several times.

PN	*Test Pressure (PFA) (Bars)*	*Duration (Minutes)*
16	25	3
25	35	3

(iv) Seat Tightness Test

Type of valve	Test Procedure
Sluice valve Ball float valve	1. Fill in the valve cavity including if appropriate, the bonnet cavity with water. 2. Move the obturator to the closed position. 3. Apply the test pressure, which is 1.1 times the allowable differential pressure at room temperature, and maintain the test pressure for 3 minutes. 4. Determine the leakage rate. 5. Repeat 3 and 4 inclusive for the other side of the valve. *See NOTES 1,2,3 and 4*
Butterfly Valve	1. Fill the valve cavity with water. 2. Move the obturator to the closed position. 3. Apply the test pressure, which is 1.1 times the allowable differential pressure at room temperature in the direction to unseat the obturator and maintain the test pressure for 3 minutes. 4. Determine the leakage rate. *See NOTE 5*
Check Valve	1. Fill in the downstream valve cavity including, if appropriate, the cover cavity with water. 2. The test pressure, which is 1.1 times the allowable differential pressure at room temperature in the direction tending to close the obturator and maintain the test pressure for 3 minutes. 3. Determine the leakage rate.

NOTE

1. *The procedure described may not ensure pressurization of the integrate space of double seated valves and may not therefore permit verification of the leakage rate of the downstream seat. When such pressurization is a requirement of the product or performance standard or is required by the purchaser, it is necessary to carry out step 3 before step 2.*
2. *Valves which incorporate "double block and bleed" design feature have the bleed plug removed prior to the test in order to prove the "double block and bleed" capability.*
3. *Valves with independent double seating (such as two piece obturator or double-seated valves) may be tested by applying the test pressure between the seats and checking each side of the closed valve.*
4. *Soft seated ball float valves previously subjected to a liquid seat test pressure may have a reduced performance capability in some subsequent services at low differential pressures. If a liquid seat test pressure is specified and is carried out before a low pressure gas seat test, it may be necessary to allow time for the seat material cover.*
5. *Valves with symmetrical seating may be tested in either direction.*

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(v) Field Testing

When the valves, gates and appurtenances have been completely installed and as soon as operation conditions permit, they shall be given a field test by the Engineer to demonstrate that they have been suitably installed, that they meet all requirements, are in good operating condition and are, in every way, adequate for the service intended.

2.7 Coating

All exposed cast iron or ductile iron components of valves to the external environment or to the water contained in the valve shall be fully coated to provide protection against corrosion.
The external and internal surfaces except mating surfaces of all valves shall be treated with an epoxy coating, a bitumen solution or any other material acceptable to the purchaser at the place of manufacture. Threaded and exposed machined surfaces liable to rusting shall be adequately protected in accordance with BS 5163 : 2004.

3.0 Types of Valves

3.1 Sluice Valves

The sluice valves for pipeline installation shall comply with BS 5163:2004 or EN 1171:2015. EN 1074:1-2000 and EN 1074:2–2000, shall be of PN 16 pressure rating, for potable water applications. Flanges shall confirm the EN 1092-2. However higher PN shall be provided as given in the item of BOQ.

Sluice valves shall be standard inside screw, wedge gate valves with resilient seating for diameter from DN 50 – DN 300 inclusive and metal to metal seating from diameters above DN 300. The valve body shall be ductile iron or cast iron upto and including DN 150 complying with BS 5163-1 : 2004 and EN 1563 : 2018. For diameters above 150mm, the valve body shall be ductile iron complying with EN 1563: 2004. Valves shall have stainless steel stems, machined bronze or gunmetal mating faces securely fixed to the valve body, stuffing box and gland type or approved type stem seal, EPDM seals confirming to EN 681-1:1996 or ISO 4633:2015 type WA at joints between castings.

All Tee-Key operated valves shall be provided with valve cap as per BS 5163 : 2004.
By pass arrangement shall be provided for valves of DN 300 and above. Directions of closure of the valves shall be ‘clockwise”. In case of hand wheel operated valves, the hand wheels shall be indelibly marked with words “open” and “close” with direction arrows.

The maximum differential pressure in operation for valves shall be as given in items description of the valves in the BOQ or as given in the drawings. Where necessary valves above 300mm diameter shall be provided with gearing to achieve the designed manual operation of valves where it should be assumed that the maximum torque exerted by one man is 130 Nm.

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Motorized (Motor operated) valves shall be provided for diameters 500mm and above as given in the item description of BOQ or as given in the drawings.

Valve spindles shall be of the internal non-rising type. Hand wheels shall be made of cast iron and shall have arrows and words 'open' and 'close' cast on to indicate direction of rotation for opening and closing the valve.

All sluice valves shall be subjected to all type testing in accordance clause 1.6 above including 'open ended' works test of which the test certificates issued by the manufacturer to this effect, shall be submitted.

The face-to-face (FTF) dimensions of the sluice valves as specified in EN 558:2008 shall be as follows.

Sluice Valves - Series 3

Diameter (mm)	*FTF dimension (mm)*	
	PN 10/PN 16	*PN 25*
10	102	-
15	108	140
20	117	152
25	127	165
32	140	178
40	165	190
50	178	216
65	190	241
80	203	283
100	229	305
125	254	381
150	267	403
200	292	419
250	330	457
300	356	502
350	381	572
400	406	610
450	432	660
500	457	711
600	508	787
700	610	-
800	660	-
900	711	-
1000	813	-

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3.2 Butterfly Valves

Standard butterfly valves shall conform to EN 593: 2017 for PN 16 (i.e. 16 bar) pressure rating and EN 1074:2-2000. However higher PN range shall be provided as given in the item of BOQ.

Except where otherwise specified, all butterfly valves shall be equipped with manual operators with hand wheels and shall be resilient seated and shall give tight closure against unbalanced water pressure in either direction. The unbalanced water pressure shall be the design pressure rating of the valve.

The valve body shall be ductile iron complying with EN 1563: 2018 and shall be designed to withstand the maximum working pressure specified and the maximum differential pressure of 0.6 MPa.

The manufacturer's preferred direction of flow for the valve shall be clearly marked on it.

The valve seat shall be replaceable and be formed of EPDM confirming to EN 681-1:1996 OR ISO 4633:2015 type WA or other approved resilient material. Seats shall be of a design that permits removal and replacements at the site of installation. The valve seat shall be securely clamped into a machined groove in the valve body or to the edge of the disc by seat retention members or other equivalent retention device, in such a manner as to prevent leakage of water under the seats and to hold the seat securely in position during opening and closing of the valve disc. The seat retention members shall be of stainless steel and shall be securely fastened to the body or disc with stainless steel fasteners.

The valve disc shall be made of ductile iron. Disc edges shall be machined with rounded corners and shall be polished to a smooth finish. The valve disc shall rotate through an angle of 90 degrees from the fully opened to the fully closed position and the seat shall be of such design as to allow the valve disc to seat at an angle normal to the axis of the pipe when the disc is in the fully closed position. Adjustable mechanical stops shall be provided in the valve body to be capable of absorbing full operating torque with a minimum design safety factor of 5 (five).

The shaft and nuts and bolts shall be fabricated of stainless steel complying with relevant provisions of BS 970:1996. The shaft and disc fixing shall be capable of absorbing the full operating torque with a minimum design safety factor of five. Shaft seals, when used, shall be EPDM rubber O-ring type. Packing shall be either rubber O-ring or self-adjusting chevron type.

When all the seat retention members are in place, the finished edges shall fit closely and the surface shall be smooth with all fastenings set flush in the water passage so as to offer the least resistance possible to the flow of water through the valve.

Valve seats which extend over the face of the flanges to secure the seat in place, or which require surface grinding and/or hand fitting of the disc; or designs which require the adjoining pipe flange to retain the seat in place and resist line pressure, shall not be supplied.

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Operating gear for butterfly valves shall be of the fully enclosed type. Valves shall be suitable for operation by one man at all pressure conditions that can apply. A valve position indicator shall be provided for butterfly valves in chambers. Where a hand wheel is used for operating such a valve, the indicator shall be clearly visible from the hand wheel operating position. Where a containing chamber is not shown, butterfly valves shall be specially adapted for buried use. Inline valves shall be operated by means of a hand wheel or tee key and be provided with gearing to prevent rapid closure of the valve. Gear ratios shall be at least 20:1. The valve bodies shall be protected by a bitumen coating and the valve discs by a Nylon Coating or similar.

All butterfly valves shall be tested at the manufacturer's works in accordance with EN 593:2017 and EN 1074-2:2000 as specified here and as per clause 1.6 above and under 'open-end' conditions. The seat test shall be for tight closure under maximum unbalanced water test pressure in either direction. The maximum permissible leakage for each valve shall be 0.05 liter per hour per 100 mm nominal diameter of the valve. The word “CLOSE” or its abbreviation and the arrow mark indicating the direction of rotation to close the valve shall also be cast on the cover of the body.

The face-to-face (FTF) dimensions of the sluice valves as specified in EN 558:2008, Table 4 shall be as follows

Diameter (mm)	***FTF dimension (mm)***		
	PN 2.5,6,10,16,25		***PN 40***
40	106	140	140
50	108	150	150
65	112	170	170
80	114	180	180
100	127	190	190
125	140	200	200
150	140	210	210
200	152	230	230
250	165	250	250
300	178	270	270
350	190	290	290
400	216	310	310
450	222	330	330
500	229	350	350
600	267	390	390
700	292	430	430
800	318	470	470
900	330	510	510
1000	410	550	550
1200	470	630	630
1400	530	710	710
1600	600	790	790
1800	670	870	870
2000	760	950	950

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3.3 Air Valves

All air valves for water supply shall comply with the EN 1074-4:2000. Air valves shall be constructed so that internal working parts, which may become necessary for repairs shall be readily accessible, removable and replaceable without use of special tools and removing the valve from the line. Standard air valves shall be designed so that the floats seat against orifices without leakage at all pressures between 0.1 bar and the maximum field test pressure. The design for the floats and seats shall be such that the risk of adhesion is a minimum and shall be of a type proved by experience to be suitable for the duties required. All valves shall be suitable for operation under working pressures conforming to clause 4.3 and Table 1 of EN 1074-1:2000, Valves shall be so designed that the floats cannot be held or blown shut against the orifices by air pressure or turbulence due to escaping air.

Standard air valves shall have a minimum pressure rating of 16 bar and in all cases shall be supplied with PN 16 (i.e. 16 bar) flanges, complying with EN 1092-2: 1997.

However higher PN range shall be provided as given in the item of BOQ.

3.3.1 Single Orifice Type

Single orifice type air valve shall be of cast iron or ductile iron body and single float actuated air valves with flanged ends.
Small orifice air valves shall have an orifice diameter of not less than 1.5 mm and shall be designed for automatically releasing air accumulated in pipelines during normal working conditions so as to prevent accumulations of air interfering with pipeline capacity. Small orifice air valves shall be provided with an isolating valve.

General components of the single orifice air valves is given in Annex D1.

Large orifice air valves shall be required to release or admit air while the pipeline is being filled or emptied and also to perform surge control functions. The airflow characteristics of air valves shall be in accordance with EN 1074-4:2000.

Large Orifice air valves shall be provided with separate isolating valve.

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3.3.2 Double Orifice Type

Double orifice valves shall comprise one large orifice air valve and one small orifice air valve integrated into a single unit assembly and having a single pipeline connection. It shall have cast iron or ductile iron body and double float actuated air valves with flanged ends.

Double orifice air valves shall be provided with a separate isolating valve. Isolating valves must be so arranged that they can be closed from the ground surface above, with a tee key even when the air valve chamber is flooded. Where required, a short length of double-flanged pipe could be supplied to increase the height above the main to suit the operational requirements depending on the depth of installation of Air valve. Air valves shall be insect proof at the outlet vents leading to the atmosphere.

Tests shall be carried out on all types of air valves, as specified in EN 1074-4:2000 and EN 1074-1:2000 and as mentioned below and the contractor shall submit the manufacturer's certificates certifying that such tests have been conducted satisfactorily.

General components of Double Orifice Air Valve is given in Annex D2.

(a) Body Strength Test

Each complete valve shall be water tested for strength using a test pressure 1.5 times the specified working pressure. No damage or permanent deformation of the valve body, ball or seat shall occur and there shall be no leakage through the metal or any joints of the body.

(b) Leakage Test

Each complete valve shall be water tested at all pressures between 0.1 bar and the maximum field test pressure for the valve and the seat shall be drop tight throughout this range of pressure.

(c) Performance Tests

One valve of each size shall be tested as follows;

(i) Air shall be introduced under the flange at the minimum outflow rate specified above for the size of pipeline being tested. The pressure difference required to maintain this flow shall not be more than 0.5 bars.

(ii) Air shall be exhausted from beneath the flange at the minimum inflow rate specified above for the size of valve being tested. The pressure difference required to maintain this flow shall not exceed 0.2 bars.

All air valves shall be coated as given in clause 2.7 above.

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3.4 Check Valves

Unless otherwise specified, check valves shall be swing type conforming to EN 16767:2016 with a pressure rating of PN 16 (i.e. 16 bar). Check valves shall be constructed so that disc, seat, seat rings and other internal working parts, which may become necessary for repairs, shall be readily accessible, removable and replaceable without use of special tools and removing the valve from the line. The valve body and the disc shall be of ductile iron complying with EN 1563 : 2018 and having smooth operating stainless steel hinge pins with gun metal bushes, EPDM encapsulated discs. They shall possess high speed closing characteristics with minimum shock on closing. All valves shall be tested to EN 16767:2016 and as specified in EN 12266-1 : 2003 and the test certificates issued by the manufacturer shall be submitted. All check valves shall be coated to as specified in clause 2.7 above. The flange drilling shall comply with EN 1092-2:1997.

3.5 Pressure Reducing Valves

Pressure reducing valves shall be designed to reduce a constant or variable inlet pressure to a predetermined constant outlet pressure, at flows varying from the maximum capacity of the valve to zero flow.

All valves shall be suitable for use with water temperature up to 40^0C and in climatic conditions encountered in Sri Lanka such as humidity 85%, dusty environment, corrosive atmosphere etc. Valves shall be minimum rating of 10 bars and shall provide to higher ratings of 16, 25 or 40 when specified in the item of BOQ.

The valve operation shall be achieved by the inter-action of the inlet pressure, outlet pressure and an intermediate pressure, which is produced by a pilot valve or relay system acting on the upper side of the main valve. Other equally effective and reliable systems may be accepted by the Engineer. Operating primary pressure of 16 bar and at an adjustable secondary pressure range 0f 25 or 40 bars shall be as specified in the BOQ.

The pilot valve or relay system shall be actuated by a diaphragm connected to the outlet pressure on its underside and a constant pressure on its upper side derived either from weights or from a spring. The weights or spring shall be capable of an adjustment. Gauge indicating upstream pressure and downstream pressure shall be incorporated. Two pressure gauges shall be provided with the valve.

Nominal pressure rating shall be 16 bars, unless otherwise stated.

Body ends shall be flanged and drilled to EN 1092-2:1997, with a pressure rating of PN 16. Materials for construction of the valve shall be ductile iron, grey cast iron, stainless steel (SS316 or higher) or Equivalent and shall be non-corrodible, hard wearing and suitable for use with potable water. Gunmetal, aluminum bronze and stainless steel shall be used for internal components.

Marking of valves shall include the manufacturing standard; manufacturer's name or trademark; nominal diameter (N.D.) in mm; pressure rating in bars; Flow direction; an individual serial number which relates directly to the manufacture's test certificate; and month and year of manufacture.

All valves shall be tested to the appropriate test pressure as specified in Clause 4 of EN 1074 – 1 : 2000 and as given below at the manufacturer's works, and shall be supported by a test certificate from the manufacturer. The Supplier shall provide the original manufacturer's test certificate. The certificate shall relate to the individual number cast on each valve and shall give the date of test and the performance of test with test pressure and the time.

PN	***Test Pressure (PFA) (Bars)***	***Duration (Minutes)***
16	25	3
25	35	3

"For References ONLY" (Not for Bidding)

3.6 Pressure Sustaining/Relief Valves

Pressure sustaining valves shall be capable of maintaining a constant pressure in the main upstream of the valve. They may be used to reduce excess pressure when installed in a branch main.

Operation shall be achieved in a similar manner to the pressure reducing valve except that the relay system shall be actuated by the upstream pressure.

Manufacturing of the valve shall generally be in accordance with the specification for pressure reducing valves.

Testing shall be carried out according to clause 1.6 hereof.

3.7 Flow Control Valves

Flow control valves shall be designed to prevent the rate of flow rising above that specified for the particular application, regardless of the operating pressure in the system upstream or downstream of the valve.

The valve operation shall be achieved by the operation of a relay system responding to the pressure difference measured across an orifice in the flow upstream of the valve.

The manufacturing of the valve shall be generally in accordance with that specified for pressure reducing valves above.

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3.8 Altitude Valves

Altitude valves shall be designed to control inflow into an overhead tank or reservoir, the valve being installed in the main line to the tank and controlled by a small diameter ball valve in the tank, so that when the tank is full, the ball valve closes, which in turn shuts the main valve. The valve operation shall be achieved by the interaction of the inlet pressure, the pressure in a small bore pipe in to the ball cock and an intermediate pressure produced by a pilot valve or relay system acting on the upper side of the main valve which in turn shuts the main valve.

The pilot valve or relay system shall be actuated by a diaphragm connected to the small bore pipeline to the ball valve on its underside and having a constant pressure on its upper side derived from either weights or a spring. Manufacturing of the valves shall generally be in accordance with the specification for pressure reducing valves.

3.9 Ball Float Valves

Ball float valves shall be designed for installation on the inlet pipe to a storage tank to shut the water off automatically when it reaches a predetermined level. They shall be of the single or double beat type or pilot operated with direct float and lever operation.

Valves shall be designed for the working pressure specified and shall be tested for leakage at that pressure, when they should be drop tight. They shall be tested for body and valve element strength with the valve closed and a test pressure 1.5 times the working pressure applied to the inlet end.

The body end shall be flanged, faced and drilled to EN 1092 – 2 : 1997

Valves shall not contain brasses containing more than 5% zinc. Gunmetal (to EN 1982:2017 Grade LG 2), aluminum bronze or nickel copper alloy may be used for internal components.

The body or stopper shall be of ductile iron or grey or Meehanite cast iron.

Floats shall be copper or glass fibre. The lever and links shall be of mild steel with bronze pins.

Where a stilling tank arrangement is required it shall accommodate a cheese type float mounted on a central tube connected to the valve operating lever and sliding vertically on a guide rod secured to the base of a galvanized wrought iron cylindrical tank perforated at the base.

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3.10 Flap Valves

Flap valves shall have frames and doors of ductile iron to EN 1563 : 2018, sealing faces of gunmetal to EN 1952:2008 Grade LG 2 or LG 4 and hinge pins and links of ductile iron, steel nickel iron or stainless steel. They shall be flanged for mounting to pipe work or bolting to concrete. Sealing surfaces of flaps and frames shall be of non-ferrous metal (excluding aluminium) accurately machined to ensure a watertight fit in the closed position. All flaps shall be double hung and seat off the vertical.

In case of plastic flap valves they shall have doors constructed from non-toxic, ultraviolet stabilized, flexible reinforced plastic material and the frames shall be fabricated from mild steel, blast cleaned and painted with 25 microns of two pack epoxy blast primer and one 75 micron coat of micaceous iron oxide two pack epoxy.

All immersed steelwork shall be hot dipped galvanized to BS 729 or as appropriate. Nuts and bolts shall be galvanized.
Flanges shall be of PN 16 conforming to EN 1092 – 2 : 1997., coated in either fusion bonded epoxy, minimum thickness 150 microns or cold applied black bitumen.

4.0 Extension Spindles, Tee - Keys and Caps

The depths of installation of all valves are as indicated in the BOQ descriptions (or as shown on the drawings) and a Tee - Key for the operation of valves shall be supplied in the following manner.

Four Tee - Keys for each size of valves to be supplied**.** The maximum length of Tee key shall be limited to 1m and Valves shall be provided with extended spindle to the Valve.

The material of Tee - Keys shall be galvanized mild steel.

In case extension spindles are necessary, extension spindles shall be provided with suitable bearings, which are rigidly held on brackets or stays. Bearings and extension spindles shall be suitably protected against corrosion.

Where a valve does not require an operating or extension spindle, the valve spindle shall be protected with a properly fitting cap as per BS 5163: 2004.

5.0 Fire Hydrants

General

Fire hydrants shall be supplied and installed at the locations shown on the key plan and drawings and distribution pipelines. The exact locations of the fire hydrants shall be identified at site in the presence of the Engineer's Representative and approved by the Engineer.

(a) Screw down Type

Screw down fire hydrants shall conform to BS 750 : 2012 (type 2) with "captive" internal valve. The hydrant body material shall be ductile iron, which complies with EN 1563 : 2018.

The inlet flange shall be of PN 16 complying with BS EN 1092 – 2 : 1997 and shall be faced and drilled to table 'E' of BS 10:1962. The outlet piece shall be Gunmetal complying with EN 1982:2017 Grade LG 2 or stainless steel complying to EN 10088-1 with minimum chromium content of 13% or copper alloy. The hydrants shall be of round threaded conforming to BS 750 : 2012.

The hydrant body shall be capable of withstanding a pressure of 24 bars and the valve and seat pressure of 16 bars. The test certificates of body and seating tests shall be submitted.

The outlet cap shall be of polypropylene or equivalent, without threads and shall be securely attached.

The direction of closing of hydrant valve shall be clockwise.

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(b) Dry - Barrel Type

Dry-Barrel type Fire Hydrants shall comply with ANSI/AWWA C 502-80 standards or an equivalent with the following requirements;

i. Buried length shall be 4.5 feet. (1.35m)

ii. Number of hose and pump outlet nozzles shall be two.

iii. 2.5 inches (63.5 mm) nominal inside diameter two number outlet nozzles shall be provided with round threads to BS 750:201 Revised on 02-11-2018

iv. Size of hydrant shall be 4 inches (100 mm).

v. Inlet connection shall be 6 inches (150 mm) in diameter flange type (side inlet). Suitable Double Flanged Ductile Iron Reducers shall be supplied to connect the Fire Hydrants to the existing pipe diameter flanges.

The bonnet, foot piece or elbow, packing plate, gate, bottom plate and outlet nozzle cap should be of ductile iron while miscellaneous structural parts can be grey iron, ductile iron or malleable iron. Valve seats, seat rings for the main valve and the drain valve and outlet nozzle shall be made of grade A,B, D or E bronze. The threaded portion of the operating stem or threaded stem nut (or sleeve) shall be made of grade A,B,C,D or E bronze too. The Supplier shall supply the necessary gaskets, conforming to BSEN 681-1 and nuts, bolts and washers for the 6 inches (150 mm) flange joint between the reducer and the Fire Hydrant.

vi. Direction of rotation of the operating wheel to open the hydrant shall be counter clockwise.

vii. Colour of the finish paint above the ground line shall be red.

viii. The following parts may be made out of grey or ductile cast iron, but the Bidder has to submit with the tender the material he is going to use: Barrel, top or bonnet, foot piece or elbow, packing plates, gates, bottom plates, outlet nozzle caps and miscellaneous structural parts.

"For References ONLY" (Not for Binding)

6.0 Tools

The Contractor shall supply two complete sets of tools adequate for the erection and maintenance of all valves, hydrants and other fittings supplied.

7.0 Surface Boxes

Surface boxes shall be Ductile iron, grade "A" heavy duty complying to BS 5834 Part 2 : 2011 with the minimum clear opening sizes (mm), of 100mm, 135mm,225mm and 300mm depending on the location and as specified in the BOQ.

Surface boxes shall be painted before installation with two coats of bituminous paint.

They shall be with captive hinge arrangement to prevent vandals and with suitable watertight arrangement to prevent ingress of surf ace water into the keyhole. The hinge pin shall be made from steel or ductile iron manufactured to suit the design and dimension of the unit. The diameter of the hinge pin shall not be less than 6mm.

The lids or covers of surface boxes shall have cast in-letters of words in English to indicate the function of the fittings as “FH, WO, SV, METER” and also the marking “NWSDB – WATER” in suitable size, cast in raised letters.

8.0 Manhole Covers and Frames

Manhole covers and frames shall be of class D 400 as per EN 124: 1994 unless otherwise stated. They shall be made from Ductile Iron.
The covers shall be non-ventilating non rock, black bitumen coated. The keyways shall be closed and the couplings bolts, etc. shall be galvanized.

They shall be with clear opening of 600 mm, with captive hinge arrangement to prevent vandals and with suitable watertight arrangement to prevent ingress of surface water into the manhole.

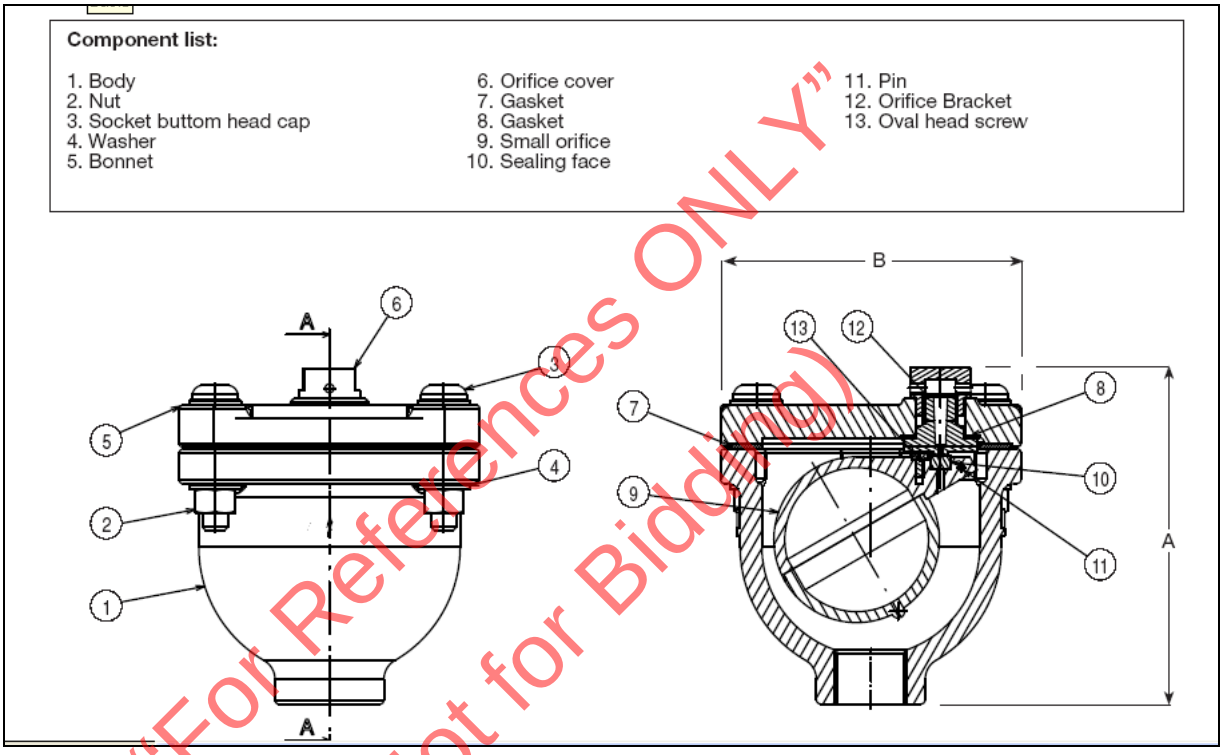
Manhole covers for fire hydrants shall comply with requirements of fire authority while the manhole covers for air valves and washouts shall be ventilated type. The manhole covers for sluice valves shall be watertight.

The manhole covers shall have letter or words in English to indicate the function of the fitting, “FH, WO, SV” and also marking “NWSDB – WATER ” in suitable size, cast in raised letters.

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ANNEX D1

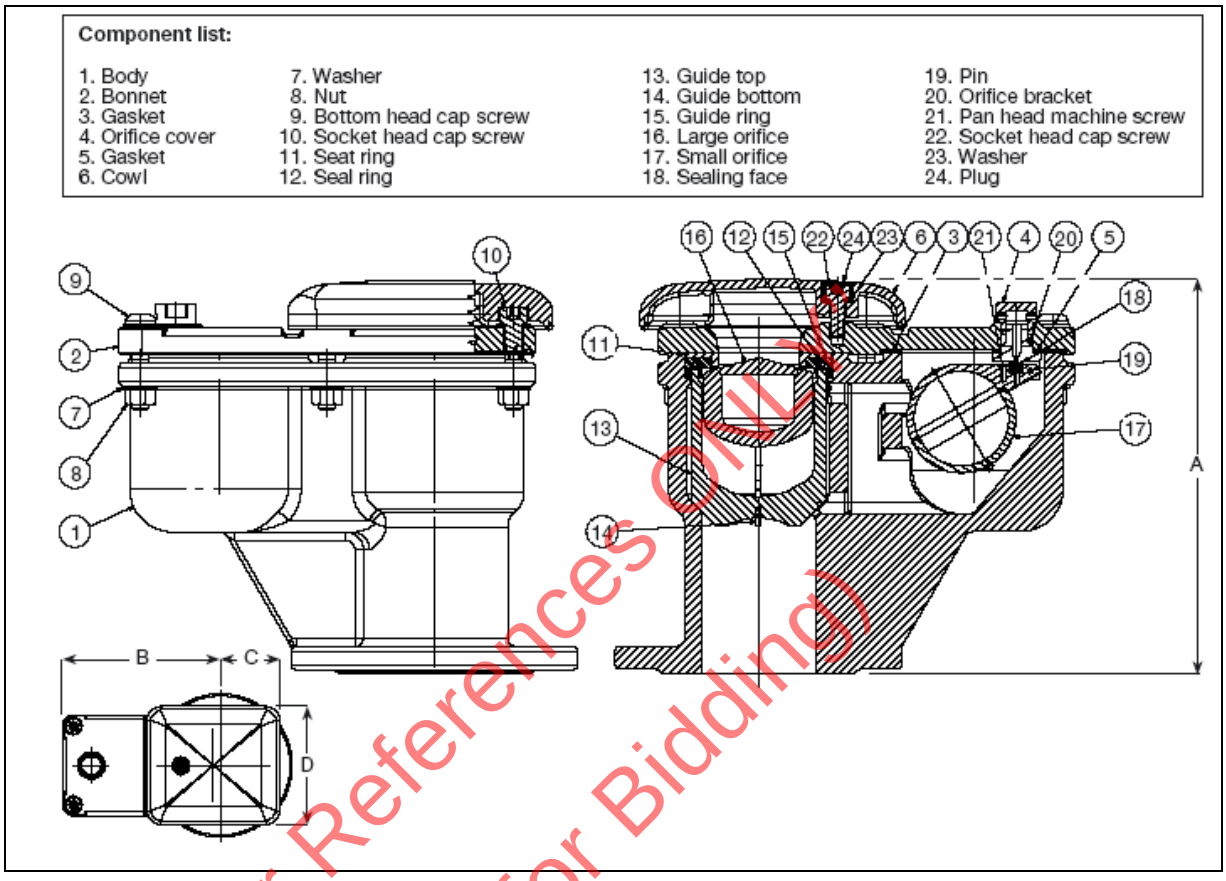
General Components of the Single Orifice Air Valve



"For References ONLY" (Not for Bidding)

ANNEX D2

General Components of the Double Orifice Air Valve



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6B.4 SPECIFICATION FOR

- COUPLINGS
- FLANGE ADAPTORS
- COUPLINGS & FLANGE ADAPTORS FOR PE AND PVC CONNECTIONS
- STEPPED COUPLINGS
- DISMANTLING JOINTS

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Reference Standards

The following standards are referred to in this specification.

ISO 9001: 2015	Quality Management Systems Requirements
EN 14525:2004	Ductile iron wide tolerance couplings and flange adaptors for use with pipes of different materials: ductile iron, grey iron, steel, PVC-U, PE, fibre-cement
WIS 4-21-02	Specification for mechanical couplings and repair clamps for iron pipes for the conveyance of cold potable water (underground use) for the size range 40 to 1600mm/1.5 to 48" inclusive
ASTM F 1476	Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications
ASTM A 536	Standard Specification for Ductile Iron Castings
WIS 4-52-01 Class B	Specification for Polymeric Anti – Corrosion (Barrier) Coatings
EN 681-1:1996	Elastomeric seals - Material requirements for pipe joint seals used in water and drainage applications
ISO 4633:2015	Rubber seals- Joint rings for water supply drainage and sewerage pipe lines – specification for materials
ISO 898-1:2013	Mechanical properties of fasteners made of carbon steel and alloy steel. Bolts, screws and studs with specified property classes, Coarse thread and fine pitch thread
BS 4190:2001 Grade 4	ISO metric black hexagon bolts, screws and nuts - Specification
BS 1449:Part 2:1983	Steel plate, sheet and strip. Specification for stainless and heat-resisting steel plate, sheet and strip
WIS 4-52-03	Specification for Anti – Corrosion Coatings on Threaded Fasteners
BS 6001:Part 1:1999	Sampling procedures for inspection by attributes. Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
EN 10025-2:2004	Technical delivery conditions for non-alloy structural steels
EN 1563:2011	Founding - Spheroidal graphite cast irons
EN 12844:1999	Zinc and zinc alloys, Castings - Specifications
ISO 3506-1:2009	Mechanical properties of corrosion-resistant stainless steel fasteners -- Part 1: Bolts, screws and studs
AWWA C219	Bolted, Sleeve-Type Couplings for plain – Ended pipe

"For References ONLY" (Not for Bidding)

1 Specification for Couplings

1.1 Large Diameter Couplings (diameter above 350 mm)

1.1.1 Scope

This specification covers large diameter couplings for pipelines.

1.1.2 General Requirements

All large diameter couplings shall be manufactured in a factory which comply with ISO 9001:2015 Quality Management System requirement and shall be certified by an accredited agency which is a member of International Accreditation Forum (IAF) and have been authorized to issue a certification in their scope. The Documentary Evidence for accreditation together with the scope of certification shall be provided.

1.1.3 Marking

The markings shall be casted in to metal components marking shall include the following information.

i. Manufacturer's identification
ii. Date of Manufacture
iii. Standard to which it conform
iv. Nominal size
v. Maximum working pressure
vi. Flange to flange dimension and overall adjustment length
vii. Torque recommendation for long-term

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1.1.4 Design

1.1.4.1 All fittings, and their components, shall be fit for the purpose for which they are to be used, and effect a completely leak-free seal under all specified working conditions.

1.1.4.2 All fittings referred to in this specification shall comply with the requirements of the EN 14525:2004 or ANSI/AWWA C219 Standard for "Bolted, Sleeve-Type Couplings For Plain-Ended Pipe". This shall include the requirement for cold expansion of centre sleeves and end rings after welding. It shall also exclude the use of circumferential welding of the End Ring or Compression Flange.

1.1.5 Technical Requirements

1.1.5.1 General

i) Large diameter coupling shall comply with EN 14525:2004 or AWWA C219 or WIS 4-21-02 or ASTM F 1476 and shall be of PN 16 pressure rating unless otherwise stated. The test pressure shall be 24 bars (350 psi) and working pressure of 16 bars (232 psi).

ii) Maximum allowable expansion/contraction of couplings shall be 10 mm.

iii) All water contact materials shall have the approval for the use in potable water piping system.

iv) The Center Sleeve /End rings shall be of steel confirming to BS EN 10025-2:2004 Grade S275 JR.

v) The overall length of the large diameter Couplings shall be 348mm for OD range of 351mm to 727mm.

"For References ONLY (Not for Bidding)"

1.1.5.2 Materials and their relevant standards

- Sleeve
  Rolled Steel to BS EN 10025-2:2004 Grade S275
- End Ring
  Rolled Steel to BS EN 10025-2:2004 Grade S275
- Gasket
  EPDM Grade "E" to BS En 681-1:1996 Type WA
- Bolt, Nuts & Washers
  Bolts – Steel to BS EN ISO 898-1:2013 Property Class 4.8
  Nuts – Steel to BS EN 4190:2001 Grade 4
  Washer – Stainless Steel to BS 1449:Part 2:1983 Grade 304 S15
- Coating
  Sleeve & End ring – Rilsan Nylon 11 to WIS 4-52-01 Part 1
  Bolts & Nuts – Sheraplex to WIS 4-52-03

1.1.5.3 Material in contact with water

All materials in contact with the fluid in the pipe shall be listed in the current Water Research Centre (WRC) 'List of materials approved for use in contact with portable water'. All materials shall comply with the latest editions of any relevant codes of practice or standard.

1.1.5.4 Coatings

All internal and external parts of coupling shall be protected against corrosion by the application of polymeric anti corrosion coating complies with WIS 4-52-01 Class B.

The minimum coating thickness at edges shall be 150 microns and at the surfaces 250 microns.

1.1.5.5 Gaskets & Rubber Rings

Gaskets & rubber rings shall be of EPDM. The physical properties shall comply with EN 681-1 or ISO 4633:2015. The preferable hardness range for gaskets is 70-84 IRHD.

All elastomeric gaskets shall be suitable for contact with portable water.

Manufacturers shall identify from which compound gaskets are fabricated and shall mark the gasket by colour flash, or other visual means, the grade of gasket, the standard applicable and adequate size information to ensure correct gaskets are used.

1.1.5.6 Nuts & Bolts

Nuts & Bolts shall be of stainless steel and shall be coated with an anti-seizing material to prevent galling during tightening.

Bolts/studs : steel shall comply to ISO 898-1:2013 property class 4.8.

Nuts : Steel shall comply to BS 4190:2001 Grade 4.

Washers : Stainless Steel shall comply to BS 1449: Part 2: 1983 Grade 304 S15.

Nuts & Bolts shall be sheraplex coated to WIS 4-52-03.

All Fasteners shall be of stainless steel comply to EN 3506:2009 and nuts coated with anti-galling compound.

Design life expectancy of couplings/ flange adaptors shall be 50 years.

Adequate washers of an approved material shall be provided to avoid damage to coatings.

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1.1.5.7 Performance

1.1.5.7.1 Angular Deflection

All fittings shall be capable of allowing angular deflection of the pipes about their axes within the centre sleeve, without leakage and distortion of any metallic component of the fitting. The amount is a function of diameter as detailed below:

Upto DN450 nominal bore	$\pm 6^0$
DN450 to DN600 nominal bore	$\pm 5^0$
DN600 to DN750 nominal bore	$\pm 4^0$
DN750 to DN1200 nominal bore	$\pm 3^0$
DN1200 to DN1800 nominal bore	$\pm 2^0$
Over DN1800 nominal bore	$\pm 1^0$

1.1.5.7.2 Expansion/Contraction

All fittings shall be capable of accommodating the total of 10mm expansion or contraction due to longitudinal pipe movement without leakage.

1.1.5.8 Sampling & Testing

1.1.5.8.1 Production quality testing shall be carried out to comply with the sampling plan of BS 6001-Part 1:1999.

1.1.5.8.2 Following type tests shall be carried out by the manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure test
ii. Short term negative pressure test
iii. Bolt load relaxation test
iv. Leak-tightness test under angular deflection
v. Resistance to differential pressure movement test
vi. Resistance to shear test
vii. Leak tightness test under axial draw

1.1.5.8.3 Quality control tests for the following characteristics shall be carried out by the Manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure
ii. Short term negative pressure

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1.1.5.8.3 (i) Short term internal hydrostatic pressure test

The pipe/fittings assembly shall be connected to a suitable device capable of applying and maintaining the relevant internal hydrostatic pressure as specified in table 2 of this specification, and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature without signs of leakage.

1.1.5.8.3 (ii) Short term negative pressure test

The pipe/fitting assembly shall be connected to a suitable device capable of applying and maintaining the relevant negative pressure as specified in Table 2 of this specification and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature. Fittings shall be tested with the test pipes withdrawn to the manufacturer's maximum recommended gap which shall be declared before the test is commenced.

Table 2 – Test Pressure

Size Ranges	Test pressure	
	Short-term Hydrostatic Pressure at 1 hour (bar)	Short-term Negative pressure (bar)
DN 40-600	PN x 1.5	0.8 (0.2*)
DN > 600	PN + 3	
* Absolute pressure (i.e below atmospheric)		

"For References ONLY" (Not for Bidding)

1.2 Small Diameter Couplings (OD< 350 mm)

1.2.1 Scope

This specification covers small diameter couplings for DI/CI piping systems.

1.2.2 General Requirements

The Bidder shall provide ISO 9001: 2015 Quality Management System requirement certificate for Quality Assurance for the goods manufacturing factory from an accredited agency for All small diameter couplings. Accredited Agency shall be a member of International Accredited Forum (IAF) and shall have the authority for the accreditation of mentioned goods in their scope of accreditation. Scope of the production shall be clearly specified in the certificate. Manufacturer shall maintain the validity of this certificate during the supply and delivery of the materials for contract Period. If the supply is made from several factories, ISO 9001 : 2015 certificates for quality

management system requirement shall be submitted for each factory. This certificate shall clearly indicate the location of the place of manufacture of pipes, fittings and accessories, etc.

1.2.3 Marking

The markings shall be casted into metal components. Marking shall include the following information.

i. Manufacturer's identification
ii. Date of Manufacture
iii. Standard to which it conform
iv. Nominal size
v. Maximum working pressure
vi. Flange to flange dimension and overall adjustment length
vii. Torque recommendation for long-term

1.2.4 Technical Requirements

1.2.4.1

i) Small diameter coupling shall comply with EN 14525:2004 or AWWA C219 or WIS 4-21-02 or ASTM F 1476 and shall be of PN 16 pressure rating unless otherwise stated. The test pressure shall be 24 bars (350 psi) and working pressure of 16 bars (232 psi).

ii) Maximum allowable expansion/contraction of couplings shall be 10 mm while 5 mm.

iii) All water contact materials shall have the approval for the use in potable water piping system.

iv) The Center Sleeve /End rings shall be of ductile iron confirming to EN 1563:2011. Flange adaptor body shall be ductile iron confirming to EN 1563:2011

v) Gripper ring shall be of zinc alloy conform to EN 12844:1999 designation ZP3.

vi) Intermediate ring up to and including 160 mm shall be of ductile iron confirm to EN 1563:2011

vii) Intermediate ring from 180 mm and above shall be of Aluminium Alloy 6063 condition T6.

viii) The overall length of the small diameter Couplings shall be accordance with the following table.

"For References ONLY" (Not for Bidding)

Nominal Size (mm)	Size Range (mm)	Overall Length (mm)
Standard Sleeve Coupling		
DN 40-150	47.9-184.0	190
DN 175-300	189.0-349.0	230
Long Sleeve Coupling		
DN 50-200	57.0-244.0	285
DN 225-300	243.0-349.0	350

1.2.4.2 Materials and their relevant standards

- End Ring and Adaptor Body/Centre Sleeve
  Ductile Iron to BS EN 1563:2011 Symbol EN GJS-450-10
- Gasket
  EPDM compound Grade E to BS EN 681-1:1996, Type WA, WC
- Tee Bolts/ Bolts
  Steel to BS EN ISO 898-1:2013 Property Class 4.8
- Bolt Torque/ Spanner
  Bolt torque 55-65Nm, Spanner size A/F 19mm
- Nuts
  Steel to BS EN 4190:2001 Grade 4
- Washers
  Stainless Steel to BS 1449:Part 2:1983 Grade 304S15 Standard

"For References ONLY" (Not for Bidding)

1.2.4.3 Material in contact with water

All materials in contact with the fluid in the pipe shall be listed in the current Water Research Centre (WRC) 'List of materials approved for use in contact with portable water'. All materials shall comply with the latest editions of any relevant codes of practice or standard.

1.2.4.4 Coatings

Centre Sleeve, end ring, body and intermediate ring shall be coated with Rilsan Nylon II. Griper shall be of Cataphoretic coating, nuts, bolts shall be of Sherplex coated in conformity with WIS 4-52-03.

1.2.4.5 Gaskets & Rubber Rings

Gaskets & rubber rings shall be of EPDM. The physical properties shall comply with EN 681-1:1996 or ISO 4633:2015. The preferable hardness range for gaskets is 76-84 IRHD.

All elastomeric gaskets shall be suitable for contact with portable water.

Manufacturers shall identify from which compound gaskets are fabricated and shall mark the gasket by colour flash, or other visual means, the grade of gasket, the standard applicable and adequate size information to ensure correct gaskets are used.

1.2.4.6 Nuts & Bolts

Bolts shall confirm to ISO 898-1:2013 property class 8.8. If the bolts are with stainless steel, it shall confirm to ISO 3506-1:2009 Grade A4 property class 70.

Nuts shall confirm to EN 20898-2:1994 property class 8. If the nuts are with stainless steel, it shall confirm to EN ISO 3506-1:2009 Grade A4 property class 70.

Washers shall confirm to BS 1449:Part II 1983 Grade 304 S15.

Design life expectancy of couplings/ flange adaptors shall be 50 years. Adequate washers of an approved material shall be provided to avoid damage to coatings.

"For References ONLY" (Not for Bidding)

1.2.4.7 Performance

1.2.4.7.1 Angular Deflection

All fittings shall be capable of allowing angular deflection of the pipes about their axes within the centre sleeve, without leakage and distortion of any metallic component of the fitting. The amount is a function of diameter as detailed below:

Upto DN450 nominal bore	$\pm 6^0$
DN450 to DN600 nominal bore	$\pm 5^0$
DN600 to DN750 nominal bore	$\pm 4^0$
DN750 to DN1200 nominal bore	$\pm 3^0$
DN1200 to DN1800 nominal bore	$\pm 2^0$
Over DN1800 nominal bore	$\pm 1^0$

1.2.4.7.2 Expansion/Contraction

All fittings shall be capable of accommodating the total of 10mm expansion or contraction due to longitudinal pipe movement without leakage.

1.2.4.8 Sampling & Testing

1.2.4.8.1 Production quality testing shall be carried out to comply with the sampling plan of BS 6001-Part 1:1999.

1.2.4.8.2 Following type tests shall be carried out by the manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure test
ii. Short term negative pressure test
iii. Bolt load relaxation test
iv. Leak-tightness test under angular deflection
v. Resistance to differential pressure movement test
vi. Resistance to shear test
vii. Leak tightness test under axial draw

1.2.4.8.3 Quality control tests for the following characteristics shall be carried out by the Manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure
ii. Short term negative pressure

"For References ONLY" (Not for Bidding)

1.2.4.8.3 (i) Short term internal hydrostatic pressure test

The pipe/fittings assembly shall be connected to a suitable device capable of applying and maintaining the relevant internal hydrostatic pressure as specified in table 3 of this specification, and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature without signs of leakage.

1.2.4.8.3 (ii) Short term negative pressure test

The pipe/fitting assembly shall be connected to a suitable device capable of applying and maintaining the relevant negative pressure as specified in Table 3 of this specification and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature. Fittings shall be tested with the test pipes withdrawn to the manufacturer's maximum recommended gap, which shall be declared before the test is commenced.

Table 3 – Test Pressure

Size Ranges	Test pressure	
	Short-term Hydrostatic Pressure at 1 hour (bar)	Short-term Negative pressure (bar)
DN 40-600	PN x 1.5	0.8 (0.2*)
DN > 600	PN + 3	
* Absolute pressure (i.e below atmospheric)		

2 Flange Adaptors

2.1 Large Diameter Flange Adaptors (OD> 350 mm)

2.1.1 Scope

This specification covers large diameter flange adaptors for DI piping systems.

2.1.2 General Requirements

The Bidder shall provide ISO 9001 : 2015 Quality Management System requirement certificate for Quality Assurance for the goods manufacturing factory from an accredited agency for All mechanical couplings, repair clamps & flange adaptors. Accredited Agency shall be a member of International Accredited Forum (IAF) and shall have the authority for the accreditation of mentioned goods in their scope of accreditation. Scope of the production shall be clearly specified in the certificate. Manufacturer shall maintain the validity of this certificate during the supply and delivery of the materials for contract Period. If the supply is made from several factories, ISO 9001 : 2015 certificates for quality management system requirement shall be submitted for each factory. This certificate shall clearly indicate the location of the place of manufacture of all goods.

"For References ONLY" (Not for Bidding)

2.1.3 Marking

The markings shall be casted into metal components. marking shall include the following information.

i. Manufacturer's identification
ii. Date of Manufacture
iii. Standard to which it conform
iv. Nominal size
v. Maximum working pressure
vi. Flange to flange dimension and overall adjustment length
vii. Torque recommendation for long-term

2.1.4 Design

2.1.4.1 All fittings, and their components, shall be fit for the purpose for which they are to be used, and effect a completely leak-free seal under all specified working conditions.

2.1.4.2 All fittings referred to in this specification shall comply with the requirements of the EN 14525:2004 or ANSI/AWWA C219 Standard for "Bolted, Sleeve-Type Couplings For Plain-Ended Pipe". This shall include the requirement for cold expansion of centre sleeves and end rings after welding. It shall also exclude the use of circumferential welding of the End Ring or Compression Flange.

2.1.5 Technical Requirements

2.1.5.1 Flange Adaptors shall meet following minimum technical requirements:

i) Flange adaptors shall comply with EN 14525:2004 or AWWA C219 or WIS 4-21-02 or ASTM F 1476 and shall be of PN 16 pressure rating unless otherwise stated. The test pressure shall be 24 bars (350 psi) and working pressure of 16 bars (232 psi).

ii) Maximum allowable expansion/contraction of flanged adaptors shall be 5 mm.

iii) All water contact materials shall have the approval for the use in portable water piping system.

iv) The Center Sleeve and End rings shall be of steel confirming to EN 10025-2:2004 Grade S275 JR.

v) The minimum overall length of the large diameter Flange Adaptors shall be accordance with the following table.

Nominal Diameter (mm)	PN rating	Minimum Length (mm)
350-400	PN10/16	148
450-800	PN10/16	153
900-1000	PN10/16	169
1000-1600	PN10/16	182
350-600	PN25	155
700-800	PN25	169
900-1600	PN25	182

"For References ONLY" (Not for Bidding)

2.1.5.2 Materials and their relevant standards

- Flange/End Ring
  Steel to BS EN 10025-2:2004 Grade S275
- Bolt, Studs Nuts & Washers
  Bolts/studs – Steel to BS EN ISO 898-1:2013 Property Class 4.8
  Nuts – Steel to BS EN 4190:2001 Grade 4
  Washer – Stainless Steel to BS 1449:Part 2:1983 Grade 304 S15
- Coating
  Body, Flange & End ring – Rilsan Nylon 11 to WIS 4-52-01 Part 1
  Bolts & Nuts – Sheraplex coated to WIS 4-52-03
- Gasket
  LO2/LO3/YF2/YF3 – Rubber 80 IRDH moulded compound to BS EN 681-1:1996 Type WA, WC, WG
  A2E/A2H/XSXG - Rubber 70 IRDH moulded compound to BS EN 681-1:1996 Type WA, WC, WG

2.1.5.3 Material in contact with water

All materials in contact with the fluid in the pipe shall be listed in the current Water Research Centre (WRC) 'List of materials approved for use in contact with portable water'. All materials shall comply with the latest editions of any relevant codes of practice or standard.

2.1.5.4 Coatings

All internal and external parts of coupling shall be protected against corrosion by the application of polymeric anti-corrosion coating complies with WIS 4-52-01 Class B.

The minimum coating thickness at edges shall be 150 microns and at the surfaces 250 microns.

2.1.5.5 Gaskets & Rubber Rings

Gaskets & rubber rings shall be of EPDM. The physical properties shall comply with EN 681-1 or ISO 4633:2015. The preferable hardness range for gaskets is 70-84 IRHD.

All elastomeric gaskets shall be suitable for contact with portable water.

Manufacturers shall identify from which compound gaskets are fabricated and shall mark the gasket by colour flash, or other visual means, the grade of gasket, the standard applicable and adequate size information to ensure correct gaskets are used.

"For References ONLY (Not for Bidding)"

2.1.5.6 Nuts & Bolts

Nuts & Bolts shall be of stainless steel and shall be coated with an anti-seizing material to prevent galling during tightening.

Bolts/studs : steel shall comply to BS EN ISO 898-1:2013 property class 4.8.

Nuts : Steel shall comply to BS 4190:2001 Grade 4.

Washers : Stainless Steel shall comply to BS 1449: Part 2: 1983 Grade 304 S15.

Nuts & Bolts shall be sheraplex coated to WIS 4-52-03.

All Fasteners shall be of stainless steel and nuts coated with anti-galling compound.

Design life expectancy of couplings/ flange adaptors shall be 50 years.

Adequate washers of an approved material shall be provided to avoid damage to coatings.

2.1.5.7 Performance

2.1.5.7.1 Angular Deflection

All fittings shall be capable of allowing angular deflection of the pipes about their axes within the centre sleeve, without leakage and distortion of any metallic component of the fitting. The amount is a function of diameter as detailed below:

Upto DN450 nominal bore	$\pm 3^0$
DN450 to DN600 nominal bore	$\pm 2.5^0$
DN600 to DN750 nominal bore	$\pm 2^0$
DN750 to DN1200 nominal bore	$\pm 1.5^0$
DN1200 to DN1800 nominal bore	$\pm 1^0$
Over DN1800 nominal bore	$\pm 0.5^0$

2.1.5.7.2 Expansion/Contraction

All fittings shall be capable of accommodating the total of 5mm expansion or contraction due to longitudinal pipe movement without leakage.

"For References ONLY" (Not for Bidding)

2.1.5.8 Sampling & Testing

2.1.5.8.1 Production quality testing shall be carried out to comply with the sampling plan of BS 6001-Part 1:1999.

2.1.5.8.2 Following type tests shall be carried out by the manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure test
ii. Short term negative pressure test
iii. Bolt load relaxation test
iv. Leak-tightness test under angular deflection
v. Resistance to differential pressure movement test
vi. Resistance to shear test
vii. Leak tightness test under axial draw

2.1.5.8.3 Quality control tests for the following characteristics shall be carried out by the Manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure
ii. Short term negative pressure

2.1.5.8.3 (i) Short term internal hydrostatic pressure test

The pipe/fittings assembly shall be connected to a suitable device capable of applying and maintaining the relevant internal hydrostatic pressure as specified in table 4 of this specification, and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature without signs of leakage.

2.1.5.8.3 (ii) Short term negative pressure test

The pipe/fitting assembly shall be connected to a suitable device capable of applying and maintaining the relevant negative pressure as specified in Table 4 of this specification and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature. Fittings shall be tested with the test pipes withdrawn to the manufacturer's maximum recommended gap.

"For References ONLY" (Not for Bidding)

Table 4 – Test Pressure

Size Ranges	Test pressure	
	Short-term Hydrostatic Pressure at 1 hour (bar)	Short-term Negative pressure (bar)
DN 40-600	PN x 1.5	0.8 (0.2*)
DN > 600	PN + 3	
* Absolute pressure (i.e below atmospheric)		

2.2 Small Diameter Flange Adaptors (OD< 350 mm)

2.2.1 Scope

This specification covers small diameter flange adaptors for DI/CI piping systems.

2.2.2 General Requirements

All small diameter flange adaptors shall be manufactured in a factory which comply with ISO 9001: 2015 Quality Management System requirement and shall be certified by an accredited agency which is a member of International Accreditation Forum (IAF) and have been authorized to issue a certification in their scope. The Documentary Evidence for accreditation together with the scope of certification shall be provided.

"For References ONLY" (Not for Bidding)

2.2.3 Marking

The markings shall be casted in to metal components, marking shall include the following information.

i. Manufacturer's identification
ii. Date of Manufacture
iii. Standard to which it conform
iv. Nominal size
v. Maximum working pressure
vi. Flange to flange dimension and overall adjustment length
vii. Torque recommendation for long-term

2.2.4 Design

2.2.4.1 All fittings, and their components, shall be fit for the purpose for which they are to be used, and effect a completely leak-free seal under all specified working conditions.

2.2.4.2 All fittings referred to in this specification shall comply with the requirements of the EN 14525:2004 or ANSI/AWWA C219 Standard for "Bolted, Sleeve-Type Couplings For Plain-Ended Pipe". This shall include the requirement for cold expansion of centre sleeves and end rings after welding. It shall also exclude the use of circumferential welding of the End Ring or Compression Flange.

2.2.5 Technical Requirements

2.2.5.1

i) Small diameter flange adaptors shall comply with EN 14525:2004 or AWWA C219, WIS 4-21-02 or ASTM F 1476 and shall be of PN 16 pressure rating unless otherwise stated. The test pressure shall be 24 bars (350 psi) and working pressure of 16 bars (232 psi).

ii) Maximum allowable expansion/contraction of flanged adaptors shall be 5 mm.

iii) All water contact materials shall have the approval for the use in portable water piping system.

iv). The Center Sleeve /End rings shall be of ductile iron confirming to EN 1563:2011. Flange adaptor body shall be ductile iron conforming to EN 1563:2011

v) Gripper ring shall be of zinc alloy conform to BSEN 12844:1999 designation ZP3.

vi) Intermediate ring up to and including 160 mm shall be of ductile iron conform to BSEN 1563:2011

vii) Intermediate ring from 180 mm and above shall be of Aluminium Alloy 6063 condition T6.

viii) The overall length of the small diameter Flange Adaptors shall be accordance with the following table.

"For References ONLY" (Not for Bidding)

Size Range (mm)	Overall Length (mm)
57-107	124
107-184	134
189-212	133
218-244	134
243-269	144
266-295	146
315-349	155

2.2.5.2 Materials and their relevant standards

- End Ring and Adaptor Body/Centre Sleeve
  Ductile Iron to BS EN 1563:2011Symbol EN GJS-450-10
- Gasket
  EPDM compound Grade E to BS EN 681-1:1996, Type WA, WC
- Tee Bolts/ Bolts
  Steel to BS EN ISO 898-1:2013 Property Class 4.8
- Bolt Torque/ Spanner
  Bolt torque 55-65Nm, Spanner size A/F 19mm
- Nuts
  Steel to BS EN 4190:2001 Grade 4
- Washers
  Stainless Steel to BS 1449:Part 2:1983 Grade 304S15 Standard

"For References ONLY" (Not for Bidding)

2.2.5.2 Material in contact with water

All materials in contact with the fluid in the pipe shall be listed in the current Water Research Centre (WRC) 'List of materials approved for use in contact with portable water'. All materials shall comply with the latest editions of any relevant codes of practice or standard.

2.2.5.3 Coatings

Centre Sleeve, end ring, body and intermediate ring shall be coated with Rilsan Nylon II. Griper shall be of Cataphoretic coating, nuts, bolts shall be of Sherplex coated in conformity with WIS 4-52-03.

2.2.5.4 Gaskets & Rubber Rings

Gaskets & rubber rings shall be of EPDM. The physical properties shall comply with EN 681-1:1996 or ISO 4633:2015. The preferable hardness range for gaskets is 70-84 IRHD.

All elastomeric gaskets shall be suitable for contact with portable water.

Manufacturers shall identify from which compound gaskets are fabricated and shall mark the gasket by colour flash, or other visual means, the grade of gasket, the standard applicable and adequate size information to ensure correct gaskets are used.

2.2.5.5 Nuts & Bolts

Bolts shall conform to BSEN ISO 898-1:2013 property class 8.8. If the bolts are with stainless steel, it shall conform to EN ISO 3506-1:2009 Grade A4 property class 70.

Nuts shall conform to BSEN 20898-2:1994 property class 8. If the nuts are with stainless steel, it shall conform to BSEN ISO 3506-1:2009 Grade A4 property class 70.

Washers shall conform to BS 1449: Part II 1983 Grade 304 S15.

Design life expectancy of couplings/ flange adaptors shall be 50 years.

Adequate washers of an approved material shall be provided to avoid damage to coatings.

"For References ONLY" (Not for Bidding)

2.2.5.6 Performance

2.2.5.6.1 Angular Deflection

All fittings shall be capable of allowing angular deflection of the pipes about their axes within the centre sleeve, without leakage and distortion of any metallic component of the fitting. The angular deflection is $\pm 3^0$

2.2.5.6.2 Expansion/Contraction

All fittings shall be capable of accommodating the total of 5mm expansion or contraction due to longitudinal pipe movement without leakage.

2.2.5.7 Sampling & Testing

2.2.5.7.1 Production quality testing shall be carried out to comply with the sampling plan of BS 6001:Part 1.

2.2.5.7.2 Following type tests shall be carried out by the manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure test
ii. Short term negative pressure test
iii. Bolt load relaxation test
iv. Leak-tightness test under angular deflection
v. Resistance to differential pressure movement test
vi. Resistance to shear test
vii. Leak tightness test under axial draw

2.2.5.7.3 Quality control tests for the following characteristics shall be carried out by the Manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure
ii. Short term negative pressure

2.2.5.7.3 (i) Short term internal hydrostatic pressure test

The pipe/fittings assembly shall be connected to a suitable device capable of applying and maintaining the relevant internal hydrostatic pressure as specified in table 5 of this specification, and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature without signs of leakage.

2.2.5.7.3 (ii) Short term negative pressure test

The pipe/fitting assembly shall be connected to a suitable device capable of applying and maintaining the relevant negative pressure as specified in Table 5 of this specification and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature. Fittings shall be tested with the test pipes withdrawn to the manufacturer's maximum recommended gap.

"For References ONLY" (Not for Bidding)

Table 5 – Test Pressure

Size Ranges	Test pressure	
	Short-term Hydrostatic Pressure at 1 hour (bar)	**Short-term Negative pressure (bar)**
DN 40-600	PN x 1.5	0.8 (0.2*)
DN > 600	PN + 3	
* Absolute pressure (i.e below atmospheric)		

3. Couplings & Flange Adaptors for PE and PVC Connections

3.1 Large Diameter Couplings & Flange Adaptors (OD> 350 mm)

3.1.1 Scope

This specification covers couplings and flange adaptors for PE & PVC piping systems.

3.1.2 General Requirements

All couplings/flange adaptors shall meet the performance requirements of EN 14525:2004 or WIS 4-24-1 and shall conform to ISO 14236:2000. All couplings and flange adaptors shall be manufactured in a factory which comply with ISO 9001: 2015 Quality Management System requirement and shall be certified by an accredited agency which is a member of International Accreditation Forum (IAF) and have been authorized to issue a certification in their scope. The Documentary Evidence for accreditation together with the scope of certification shall be provided.

"For References ONLY" (Not for Bidding)

3.1.3 Marking

The markings shall be casted in to metal components marking shall include the following information.

i. Manufacturer's identification
ii. Date of Manufacture
iii. Standard to which it conform
iv. Nominal size
v. Maximum working pressure
vi. Flange to flange dimension and overall adjustment length
vii. Torque recommendation for long-term

3.1.4 Design

3.1.4.1 All fittings, and their components, shall be fit for the purpose for which they are to be used, and effect a completely leak-free seal under all specified working conditions.

3.1.4.2 All fittings referred to in this specification shall comply with the requirements of the EN 14525:2004 or ANSI/AWWA C219 Standard for "Bolted, Sleeve-Type Couplings For Plain-Ended Pipe". This shall include the requirement for cold expansion of centre sleeves and end rings after welding. It shall also exclude the use of circumferential welding of the End Ring or Compression Flange.

3.1.5 Technical Requirements

3.1.5.1

i) Flange adaptors & couplings shall comply with EN 14525:2004 or WIS 4-24-01and ISO 14236:2000 and shall be of PN 16 pressure rating unless otherwise stated. The test pressure shall be 24 bars (350 psi) and working pressure of 16 bars (232 psi).

ii) All water contact materials shall have the approval for the use in portable water piping system.

iii) The body of the flange adaptors/couplings shall be of SG Iron to EN 1563:2011 (dia. 280 mm and below) and Ductile Iron confirming to EN 1563:2011.

iv) Design life expectancy shall be 50 years.

v) The length from the Flange to the Clamp Band of the large diameter Flange Adaptors shall be accordance with the following table.

Size Range (mm)	Flange Diameter (mm)	Length from Flange to Clamp Band (mm)
315	405	170
355	460/520	138
400-450	580	134
455	640	134
500	580	175
500	640/715	134
560	640	235
560	715	180
630	840	220
710	910	310
800	910/1025	270

"For References ONLY" (Not for Bidding)

3.1.5.2 Materials and their relevant standards

- Flange Adaptor Body
  Mild Steel to BS EN 10025:2004: Grade S275
- Clamp Band
  Mild Steel to BS EN 10025:2004: Grade S275

- Gaskets
  70 IRHD EPDM to BS EN 681-1:1996: Type WA.
- Coatings
  Flange adaptor body and clamp bands are coated in Rilsan Nylon 11 (Black), WRAS listed.
  Bolt and nuts and washers are zinc plated followed by Grey Flurene 177.

3.1.5.3 Material in contact with water

All materials in contact with the fluid in the pipe shall be listed in the current Water Research Centre (WRC) 'List of materials approved for use in contact with portable water'. All materials shall comply with the latest editions of any relevant codes of practice or standard.

3.1.5.4 Coatings

All parts of coupling shall be protected against corrosion by the application of Resilient Nylon coating complies with WIS 4-52-01

3.1.5.5 Gaskets & Rubber Rings

Gaskets & rubber rings shall be of EPDM. The physical properties shall comply with EN 681-1:1996 or ISO 4633:2015. The preferable hardness range for gaskets is 70-84 IRHD.

All elastomeric gaskets shall be suitable for contact with portable water.

Manufacturers shall identify from which compound gaskets are fabricated and shall mark the gasket by colour flash, or other visual means, the grade of gasket, the standard applicable and adequate size information to ensure correct gaskets are used.

"For References ONLY" (Not for Bidding)

3.1.5.6 Nuts & Bolts

Nuts & Bolts shall be of stainless steel and shall be coated with an anti-seizing material to prevent galling during tightening.

Bolts/studs : steel shall comply to ISO 898-1:2013property class 4.8.

Nuts : Steel shall comply to BS 4190:2001 Grade 4.

Washers : Stainless Steel shall comply to BS 1449: Part 2: 1983 Grade 304 S15.

Nuts & Bolts shall be sheraplex coated to WIS 4-52-03.

All Fasteners shall be of stainless steel and nuts coated with anti-galling compound.

Adequate washers of an approved material shall be provided to avoid damage to coatings.

3.1.5.7 Performance

3.1.5.7.1 Angular Deflection

All fittings shall be capable of allowing angular deflection of the pipes about their axes within the centre sleeve, without leakage and distortion of any metallic component of the fitting. The amount is a function of diameter as detailed below:

	Couplings	Flange Adaptors
Upto DN450 nominal bore	$\pm 6^0$	$\pm 3^0$
DN450 to DN600 nominal bore	$\pm 5^0$	$\pm 2.5^0$
DN600 to DN750 nominal bore	$\pm 4^0$	$\pm 2^0$
DN750 to DN1200 nominal bore	$\pm 3^0$	$\pm 1.5^0$
DN1200 to DN1800 nominal bore	$\pm 2^0$	$\pm 1^0$
Over DN1800 nominal bore	$\pm 1^0$	$\pm 0.5^0$

3.1.5.7.2 Expansion/Contraction

All fittings shall be capable of accommodating the total of 10 mm expansion or contraction for couplings and 5mm expansion or contraction for flange adaptors due to longitudinal pipe movement without leakage.

3.1.5.7.3 The couplings and flange adaptors shall be suitable for use on pipes of PE100 material with SDR11, 17 or 21 without the need for a support liner for the pipe and uPVC pipes with SDR13.6 and PN16.

"For References ONLY" (Not for Bidding)

3.1.5.8 Sampling & Testing

3.1.5.8.1 Production quality testing shall be carried out to comply with the sampling plan of BS 6001-Part 1:1999.

3.1.5.8.2 Following type tests shall be carried out by the manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure test
ii. Short term negative pressure test
iii. Bolt load relaxation test
iv. Leak-tightness test under angular deflection
v. Resistance to differential pressure movement test
vi. Resistance to shear test
vii. Leak tightness test under axial draw

3.1.5.8.3 Quality control tests for the following characteristics shall be carried out by the Manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure
ii. Short term negative pressure

3.1.5.8.4 (i) Short term internal hydrostatic pressure test

The pipe/fittings assembly shall be connected to a suitable device capable of applying and maintaining the relevant internal hydrostatic pressure as specified in table 6 of this specification, and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature without signs of leakage.

3.1.5.8.4 (ii) Short term negative pressure test

The pipe/fitting assembly shall be connected to a suitable device capable of applying and maintaining the relevant negative pressure as specified in Table 6 of this specification and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature. Fittings shall be tested with the test pipes withdrawn to the manufacturer's maximum recommended gap.

"For References ONLY" (Not for Bidding)

Table 6 – Test Pressure

Size Ranges	Test pressure	
	Short-term Hydrostatic Pressure at 1 hour (bar)	**Short-term Negative pressure (bar)**
DN 40-600	PN x 1.5	0.8 (0.2*)
DN > 600	PN + 3	
* Absolute pressure (i.e below atmospheric)		

3.2 Small Diameter Couplings & Flange Adaptors (OD< 350 mm)

3.2.1 Scope

This specification covers small diameter flange adaptors for DI piping systems.

3.2.2 General Requirements

All small diameter flange adaptors shall be manufactured in a factory which comply with ISO 9001: 2015 Quality Management System requirement and shall be certified by an accredited agency who is a member of International Accreditation Forum (IAF) and have been authorized to issue a certification in their scope. The Documentary Evidence for accreditation together with the scope of certification shall be provided.

3.2.3 Marking

The markings shall be casted in to metal components marking shall include the following information.

i. Manufacturer's identification
ii. Date of Manufacture
iii. Standard to which it conform
iv. Nominal size
v. Maximum working pressure
vi. Flange to flange dimension and overall adjustment length
vii. Torque recommendation for long-term

3.2.4 Design

3.2.4.1 All fittings, and their components, shall be fit for the purpose for which they are to be used, and effect a completely leak-free seal under all specified working conditions.

3.2.4.2 All fittings referred to in this specification shall comply with the requirements of the EN 14525:2004 or ANSI/AWWA C219 Standard for "Bolted, Sleeve-Type Couplings For Plain-Ended Pipe". This shall include the requirement for cold expansion of centre sleeves and end rings after welding. It shall also exclude the use of circumferential welding of the End Ring or Compression Flange.

"For References ONLY" (Not for Bidding)

3.2.5 Technical Requirements

3.2.5.1

i) Small diameter flange adaptors shall comply with EN 14525:2004 or AWWA C219 or WIS 4-21-02 or ASTM F 1476 and shall be of PN 16 pressure rating unless otherwise stated. The test pressure shall be 24 bars (350 psi) and working pressure of 16 bars (350 psi).

ii) Maximum allowable expansion/contraction of couplings shall be 10 mm while 5 mm for flanged adaptors.

iii) All water contact materials shall have the approval for the use in portable water piping system.

iv). The Center Sleeve /End rings shall be of ductile iron conforming to BS EN 1563:2011. Flange adaptor body shall be ductile iron conforming to BS EN 1563:2011

v) Gripper ring shall be of zinc alloy conform to BSEN 12844:1999 designation ZP3.

vi) Intermediate ring up to and including 160 mm shall be of ductile iron conform to BSEN 1563:2011

vii) Intermediate ring from 180 mm and above shall be of Aluminium Alloy 6063 condition T6.

viii) The maximum length of the small diameter Couplings shall be accordance with the following table.

Pipe OD (mm)	Maximum Length (mm)
63-160	257
180-200	382
225-315	395

ix) The maximum length of the small diameter Flange Adaptors shall be accordance with the following table.

Pipe OD (mm)	Maximum Length (mm)
63-160	144
180-200	195
225	205
250	208
315	209

"For References ONLY" (Not for Bidding)

3.2.5.2 Materials and their relevant standards

- Centre Sleeve, End Ring and Adaptor Body
  Ductile Iron to BS EN 1563:2011 Symbol EN GJS-450-10
- Gripper Ring
  Zinc alloy to BS EN 12844:1999 Designation ZP3
- Intermediate Ring
  Upto and including 160mm: Ductile Iron to BS EN 1563:2011 Symbol EN GJS-450-10
  180mm and over Aluminium alloy 6063 condition T6
- Bolts
  BS EN ISO 898-1:2013 Property class 8.8

Stainless Steel BS EN ISO3506-1:2009 Grade A4 Property Class 70

- Nuts (M97)
  Steel to BS EN 20898-2:1994 Property Class 8
  Stainless Steel BS EN ISO3506-2:2009 Grade A4 Property Class 70
- Washers (M42)
  BS 1449:Part 2:1983 Grade 304S15
- Gasket (EPDM)
  BS EN 681-1:1996, Type WA/ BS 6920 hardness to 70 IRHD
- Coatings
  Centre Sleeve, end ring, flange adaptor body and intermediate ring: Rilsan Nylon 11
  Gripper: Cataphoretic coating
  Bolts, nuts: Sheraplex to WIS-4-52-03

3.2.5.3 Material

All materials in contact with the fluid in the pipe shall be listed in the current Water Research Centre (WRC) 'List of materials approved for use in contact with portable water'. All materials shall comply with the latest editions of any relevant codes of practice or standard.

3.2.5.4 Coatings

Centre Sleeve, end ring, body and intermediate ring shall be coated with Rilsan Nylon II. Griper shall be of Cataphoretic coating, nuts, bolts shall be of Sherplex coated in conformity with WIS 4-52-03.

3.2.5.5 Gaskets & Rubber Rings

Gaskets & rubber rings shall be of EPDM. The physical properties shall comply with EN 681-1:1996 or ISO 4633:2015. The preferable hardness range for gaskets is 76-84 IRHD.

All elastomeric gaskets shall be suitable for contact with portable water.

Manufacturers shall identify from which compound gaskets are fabricated and shall mark the gasket by colour flash, or other visual means, the grade of gasket, the standard applicable and adequate size information to ensure correct gaskets are used.

3.2.5.6 Nuts & Bolts

Bolts shall conform to ISO 898-1:2013 property class 8.8. If the bolts are with stainless steel, it shall conform to ISO 3506-1:2009 Grade A4 property class 70.

"For References ONLY" (Not for Bidding)

Nuts shall conform to EN 20898-2:1994 property class 8. If the nuts are with stainless steel, it shall conform to ISO 3506-1:2009 Grade A4 property class 70.

Washers shall conform to BS 1449:Part II 1983 Grade 304 S15.

Design life expectancy of couplings/ flange adaptors shall be 50 years.

Adequate washers of an approved material shall be provided to avoid damage to coatings.

3.2.5.7 Performance

3.2.5.7.1 Angular Deflection

All fittings shall be capable of allowing angular deflection of the pipes about their axes within the centre sleeve, without leakage and distortion of any metallic component of the fitting. The amount is a function of diameter as detailed below:

	Couplings	Flange Adaptors
Upto DN450 nominal bore	$\pm 6^0$	$\pm 3^0$
DN450 to DN600 nominal bore	$\pm 5^0$	$\pm 2.5^0$
DN600 to DN750 nominal bore	$\pm 4^0$	$\pm 2^0$
DN750 to DN1200 nominal bore	$\pm 3^0$	$\pm 1.5^0$
DN1200 to DN1800 nominal bore	$\pm 2^0$	$\pm 1^0$
Over DN1800 nominal bore	$\pm 1^0$	$\pm 0.5^0$

"For References ONLY" (Not for Bidding)

3.2.5.7.2 Expansion/Contraction

All fittings shall be capable of accommodating the total of 10 mm expansion or contraction for couplings and 5mm expansion or contraction for flange adaptors due to longitudinal pipe movement without leakage.

3.2.5.7.3 The couplings and flange adaptors shall be suitable for use on pipes of PE100 material with SDR11, 17 or 21 without the need for a support liner for the pipe and uPVC pipes with SDR13.6 and PN16.

3.2.5.8 Sampling & Testing

3.2.5.8.1 Production quality testing shall be carried out to comply with the sampling plan of BS 6001-Part 1:1999.

3.2.5.8.2 Following type tests shall be carried out by the manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure test
ii. Short term negative pressure test
iii. Bolt load relaxation test
iv. Leak-tightness test under angular deflection
v. Resistance to differential pressure movement test
vi. Resistance to shear test
vii. Leak tightness test under axial draw

3.2.5.8.3 Quality control tests for the following characteristics shall be carried out by the Manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure
ii. Short term negative pressure

3.2.5.8.3 (i) Short term internal hydrostatic pressure test

The pipe/fittings assembly shall be connected to a suitable device capable of applying and maintaining the relevant internal hydrostatic pressure as specified in table 7 of this specification, and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature without signs of leakage.

3.2.5.8.3 (ii) Short term negative pressure test

The pipe/fitting assembly shall be connected to a suitable device capable of applying and maintaining the relevant negative pressure as specified in Table 7 of this specification and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature. Fittings shall be tested with the test pipes withdrawn to the manufacturer's maximum recommended gap.

"For References ONLY" (Not for Bidding)

Table 7 – Test Pressure

Size Ranges	Test pressure	
	Short-term Hydrostatic Pressure at 1 hour (bar)	Short-term Negative pressure (bar)
DN 40-600	PN x 1.5	0.8 (0.2*)
DN > 600	PN + 3	
* Absolute pressure (i.e below atmospheric)		

4 Stepped Couplings

4.1 Scope

This specification covers stepped couplings for DI/CI piping systems.

4.2 General Requirements

All stepped couplings shall be manufactured in a factory which comply with ISO 9001: 2015 Quality Management System requirement and shall be certified by an accredited agency which is a member of International Accreditation Forum (IAF) and have been authorized to issue a certification in their scope. The Documentary evidence for accreditation together with the scope of certification shall be provided.

4.3 Marking

The markings shall be casted into metal components marking shall include the following information.

i. Manufacturer's identification
ii. Date of Manufacture
iii. Standard to which it conform
iv. Nominal size
v. Maximum working pressure
vi. Flange to flange dimension and overall adjustment length
vii. Torque recommendation for long-term seal

"For References ONLY" (Not for Bidding)

4.4 Design

4.4.1 All fittings, and their components, shall be fit for the purpose for which they are to be used, and effect a completely leak-free seal under all specified working conditions.

4.4.2 All fittings referred to in this specification shall comply with the requirements of the EN 14525:2004 or ANSI/AWWA C219 Standard for "Bolted, Sleeve-Type Couplings For Plain-Ended Pipe". This shall include the requirement for cold expansion of centre sleeves and end rings after welding. It shall also exclude the use of circumferential welding of the End Ring or Compression Flange.

4.5 Technical Requirements

4.5.1 General

i) Stepped coupling shall comply with AWWA C219, WIS 4-21-02 or ASTM F 1476 and shall be of PN 16 pressure rating unless otherwise stated. The test pressure shall be 24 bars (350 psi) and working pressure of 16 bars (232 psi).

ii) Maximum allowable expansion/contraction of couplings shall be 10 mm.

iii) All water contact materials shall have the approval for the use in potable water piping system.

iv) The housing shall be confirming to ASTM A-536.

vi) The overall length of the Stepped Coupling shall be accordance with the following table.

Size Range (mm)		Overall length (mm)
Small End	Large End	
Small Diameter Stepped Coupling		
57-107	63-132	210
107-158	132-184	220
158-269	189-295	230
Large Diameter Expanded Sleeve Stepped Coupling		
374.5-750	394.3-758	348

"For References ONLY" (Not for Bidding)

4.5.2 Materials and their relevant standards

For Small Diameter Stepped Coupling

- End Ring and Adaptor Body/Centre Sleeve
  Ductile Iron to BS EN 1563:2011 Symbol EN GJS-450-10
- Gasket
  EPDM compound Grade E to BS EN 681-1:1996, Type WA, WC
- Tee Bolts/ Bolts
  Steel to BS EN ISO 898-1:2013 Property Class 4.8
- Bolt Torque/ Spanner
  Bolt torque 55-65Nm, Spanner size A/F 19mm
- Nuts
  Steel to BS EN 4190:2001 Grade 4
- Washers
  Stainless Steel to BS 1449:Part 2:1983 Grade 304S15 Standard

For Large Diameter Expanded Sleeve Stepped Coupling

- Make Up Ring Sleeve
  Mild Steel to BS EN 10025-2:2004 Grade S275
  Rolled Steel to BS EN 10025-2:2004 Grade S275
- End Ring
  Rolled Steel to BS EN 10025-2:2004 Grade S275
- Gasket

EPDM compound Grade E to BS EN 681-1:1996, Type WA

- Bolts, Nuts & Washers
  Bolts- Steel to BS EN ISO 898-1:2013 Property Class 4.8
  Nuts- Steel to BS EN 4190:2001 Grade 4
  Washer- Stainless Steel to BS 1449:Part 2:1983 Grade 304S15 Standard
- Coating
  Sleeve & End Ring –Rilsan Nylon 11 to WIS 4-52-01 Part 1
  Bolts & Nuts – Sheraplex to WIS 4-52-03

4.5.3 Material in contact with water

All materials in contact with the fluid in the pipe shall be listed in the current Water Research Centre (WRC) 'List of materials approved for use in contact with portable water'. All materials shall comply with the latest editions of any relevant codes of practice or standard.

4.5.4 Coatings

All internal and external parts of coupling shall be protected against corrosion by the application of polymeric anti corrosion coating complies with WIS 4-52-01 Class B.

The minimum coating thickness at edges shall be 150 microns and at the surfaces 250 microns.

4.5.5 Gaskets & Rubber Rings

Gaskets & rubber rings shall be of EPDM. The physical properties shall comply with EN 681-1 or ISO 4633:2015. The preferable hardness range for gaskets is 70-84 IRHD.

All elastomeric gaskets shall be suitable for contact with portable water.

Manufacturers shall identify from which compound gaskets are fabricated and shall mark the gasket by colour flash, or other visual means, the grade of gasket, the standard applicable and adequate size information to ensure correct gaskets are used.

4.5.6 Nuts & Bolts

Nuts & Bolts shall be of steel and shall be coated with an anti-seizing material to prevent galling during tightening.

Bolts/studs: steel shall comply to BS EN ISO 898-1:2013property class 4.8.

Nuts: Steel shall comply to BS 4190:2001 Grade 4.

"For References ONLY" (Not for Bidding)

Washers: Stainless Steel shall comply to BS 1449: Part 2: 1983 Grade 304 S15.

Nuts & Bolts shall be sheraplex coated to WIS 4-52-03.

All Fasteners shall be of stainless steel comply to BS EN 3506:2009 and nuts coated with anti-galling compound.

Design life expectancy of couplings/ flange adaptors shall be 50 years.

Adequate washers of an approved material shall be provided to avoid damage to coatings.

4.5.7 Performance

4.5.7.1 Angular Deflection

All fittings shall be capable of allowing angular deflection of the pipes about their axes within the centre sleeve, without leakage and distortion of any metallic component of the fitting. The amount is a function of diameter as detailed below:

Upto DN450 nominal bore	$\pm 6^0$
DN450 to DN600 nominal bore	$\pm 5^0$
DN600 to DN750 nominal bore	$\pm 4^0$
DN750 to DN1200 nominal bore	$\pm 3^0$
DN1200 to DN1800 nominal bore	$\pm 2^0$
Over DN1800 nominal bore	$\pm 1^0$

4.5.7.2 Expansion/Contraction

All fittings shall be capable of accommodating the total of 10mm expansion or contraction due to longitudinal pipe movement without leakage.

4.5.8 Sampling & Testing

4.5.8.1 Production quality testing shall be carried out to comply with the sampling plan of BS 6001- Part 1:1999.

4.5.8.2 Following type tests shall be carried out by the manufacturer and Test reports shall be submitted.

i. Short term internal hydrostatic pressure test
ii. Short term negative pressure test
iii. Bolt load relaxation test
iv. Leak-tightness test under angular deflection
v. Resistance to differential pressure movement test
vi. Resistance to shear test
vii. Leak tightness test under axial draw

"For References ONLY" (Not for Bidding)

4.5.8.3 Quality control tests for the following characteristics shall be carried out by the Manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure
ii. Short term negative pressure

4.5.8.3 (i) Short term internal hydrostatic pressure test

The pipe/fittings assembly shall be connected to a suitable device capable of applying and maintaining the relevant internal hydrostatic pressure as specified in Table 1 of this specification, and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature without signs of leakage.

4.5.8.3 (ii) Short term negative pressure test

The pipe/fitting assembly shall be connected to a suitable device capable of applying and maintaining the relevant negative pressure as specified in Table 1 of this specification and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature. Fittings shall be tested with the test pipes withdrawn to the manufacturer's maximum recommended gap, which shall be declared before the test is commenced.

"For References ONLY" (Not for Bidding)

Table 1 – Test Pressure

Size Ranges	Test pressure	
	Short-term Hydrostatic Pressure at 1 hour (bar)	Short-term Negative pressure (bar)
DN 40-600	PN x 1.5	0.8 (0.2*)
DN > 600	PN + 3	
* Absolute pressure (i.e below atmospheric)		

5 Dismantling Joint

5.1 Scope

This specification covers Dismantling Joints for DI/CI piping systems.

5.2 General Requirements

All Dismantling Joints shall be manufactured in a factory which comply with ISO 9001: 2015 Quality Management System requirement and shall be certified by an accredited agency which is a member of International Accreditation Forum (IAF) and have been authorized to issue a certification in their scope. The Documentary Evidence for accreditation together with the scope of certification shall be provided.

5.3 Marking

The markings shall be casted in to metal components marking shall include the following information.

i. Manufacturer's identification
ii. Date of Manufacture
iii. Standard to which it conform
iv. Nominal size
v. Maximum working pressure
vi. Flange to flange dimension and overall adjustment length
vii. Torque recommendation for long-term

"For References ONLY"
(Not for Bidding)

5.4 Design

5.4.1 All fittings, and their components, shall be fit for the purpose for which they are to be used, and effect a completely leak-free seal under all specified working conditions.

5.4.2 All fittings referred to in this specification shall comply with the requirements of the ANSI/AWWA C219 Standard for "Bolted, Sleeve-Type Couplings For Plain-Ended Pipe". This shall include the requirement for cold expansion of centre sleeves and end rings after welding. It shall also exclude the use of circumferential welding of the End Ring or Compression Flange.

5.4.3 For applications where a full flange face is required, e.g. wafer style valves, both flanges of the Dismantling Joint shall provide a full flange sealing area.

5.5 Technical Requirements

5. 5.1 General

i) Dismantling Joints shall comply with AWWA C219, WIS 4-21-02 or ASTM F 1476 and shall be of PN 16 pressure rating unless otherwise stated. The test pressure shall be 24 bars (350 psi) and working pressure of 16 bars (232 psi).

ii) All water contact materials shall have the approval for the use in portable water piping system.

iii). The Body shall be of Ductile Iron conforming to EN 1563:2011 symbol EN-GJS-450-10 (Diameter 40-300 mm) for Cast Flange Adaptors or Rolled Steel conforming to EN 10025:2004 Grade S275 for Fabricated Flange Adaptors.

iv) End Rings or Sleeves shall be of Ductile Iron conforming to EN 1563:2011 symbol EN-GJS-450-10 (Diameter 40-300 mm) for Cast Flange Adaptors or Rolled Steel conforming to EN 10025:2004 Grade S275 or Grade S355 (Depending on section) for Fabricated Flange Adaptors.

v) Flange shall be of Rolled Steel conforming to EN 10025:2004 Grade S275 and spigot shall be of Steel Tube conforming to BS 10216-1:2013 Grade P265TR1 or Rolled Steel conforming to EN 10025:2004 Grade S275.

vi) A Dismantling Joint is essentially a double-flange pipe of adjustable length that permits removal of flanged components from a pipeline. In the assemble length that permits removal of flanged components from a pipe line. In the assembled condition, pipework pressure forces are transferred across the Dismantling Joint by means of a set of tie bars, which replace some or all, of the main flange connecting bolts.

vii) The Flange Adaptor component of the Dismantling Joint shall be manufactured to comply with American Water Works Association Standard AWWA C219.

viii) The minimum length of the dismantling joint shall be accordance with the following table.

"For References ONLY" (Not for Bidding)

Nominal Diameter (mm)	Minimum Length (mm)
40 (PN 10,16,25,40)	167
50-80 (PN 10,16,25,40)	175
100-300 (PN 10,16)	175
100-300 (PN 25,40)	174
350-400 (PN 10)	270
450-800 (PN 10)	275
900-1100 (PN 10)	277
1200-1800 (PN 10)	290
2000-2200 (PN 10)	390
2400 (PN 10)	412
350-400 (PN 16)	270
450-800 (PN 16)	275
900-1000 (PN 16)	277
1100-1800 (PN 16)	290
2000-2400 (PN 16)	412
350-900 (PN 25)	277
1000-1200 (PN 25)	290
1400-1800 (PN 25)	412

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5.5.2 Materials and their relevant standards

- Flange Drilling
  BS EN 1092-1, ISO 7005
- Cast Flange Adaptor
  Body – Ductile Iron to BS EN 1563:2011:Symbol EN-GJS-450-10
  End Rings – Ductile Iron to BS EN 1563:2011: Symbol EN-GJS-450-10
- Fabricated Adaptor
  Body – Rolled Steel to BS EN 10025-2:2004 Grade S275
  End Rings – Rolled Steel to BS EN 10025-2:2004 Grade S275
- Flanges Spigot
  Flange – Steel to BS EN 10025-2:2004 Grade S275
  Spigot – Upto and including 165.1mm – Steel to BS EN 10025:2004 Over 165.1mm Steel to BS10216-1:2002
- Gasket
  BS EN 681-1:1996 Type WA

- Tie Rods
  H.T Steel BS4882 Grade MB7 or B7 Yield 725N/mm^2
  M48- 2" Stainless Steel to BS EN 3506-1:2009 Grade A2/A4 Property Class 70 (450 N/mm^2)
  M52 and 21/4" and above Stainless Steel to BS EN 3506-1:2009 Grade A2/A4 Property Class 50 (210 N/mm^2)
- Bolt, Nuts & Washers
  Bolts – Steel to BS EN ISO 898-1:2013 Property Class 4.8
  Nuts – Steel to BS EN 4190:2001 Grade 4
  Washer – Stainless Steel to BS 1449:Part 2:1983 Grade 304 S15
- Coating
  Centre Sleeve– Rilsan Nylon 11
  End ring – Rilsan Nylon 11
  FA Studs & Nuts – Sheraplex to WIS 4-52-03
  Tie Rods – Zn3 coated

5.5.3 Material in contact with water

All materials in contact with the fluid in the pipe shall be listed in the current Water Research Centre (WRC) 'List of materials approved for use in contact with portable water'. All materials shall comply with the latest editions of any relevant codes of practice or standard.

5.5.4 Coatings

All internal and external parts of Dismantling Joint shall be protected against corrosion by the application of polymeric anti-corrosion coating complies with WIS 4-52-01 Class B.

All Flange Adaptors, Flange Spigot and End Rings shall be coated by Rilsan Nylon 11 and all tie rods and nuts shall be protected with Zn3 Zinc coating.

The minimum coating thickness at edges shall be 150 microns and at the surfaces 250 microns.

5.5.5 Gaskets & Rubber Rings

Gaskets & rubber rings shall be of EPDM. The physical properties shall comply with EN 681-1:1996 or ISO 4633:2015 The preferable hardness range for gaskets is preferably 76-84 IRHD.

All elastomeric gaskets shall be suitable for contact with portable water.

Manufacturers shall identify from which compound gaskets are fabricated and shall mark the gasket by colour flash, or other visual

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means, the grade of gasket, the standard applicable and adequate size information to ensure correct gaskets are used.

5.5.6 Nuts & Bolts

Nuts & Bolts shall be of steel and shall be coated with an anti-seizing material to prevent galling during tightening.

Bolts/ Studs: steel shall comply with BS EN ISO 898-1:2013 property class 4.8.

Nuts: Steel shall comply with BS 4190:2001 Grade 4.

Washers: shall conform to BS 1449:Part II 1983 Grade 304 S15.

Adequate washers of an approved material shall be provided to avoid damage to coatings.

Studs, Nuts & Bolts shall be sheraplex coated to WIS 4-52-03.

All Tie rods shall be of Steel comply with BS EN 10269:2013 name 42CrMo4 (Formerly MB7) and steel nuts comply with BS EN 898-2:2012 property class 8.0 or Stainless Steel comply with BS EN 3506-1:2009 Grade A2/A4 Property class 70 and Stainless Steel Nuts comply with BS EN 3506-2:2009 Grade A2/A4 Property Class 80.

5.5.7 Performance

5.5.7.1 Angular Deflection

All fittings shall be capable of allowing angular deflection of the pipes about their axes within the centre sleeve, without leakage and distortion of any metallic component of the fitting. The amount is a function of diameter as detailed below:

	Couplings	Flange Adaptors
Upto DN450 nominal bore	$\pm 6^0$	$\pm 3^0$
DN450 to DN600 nominal bore	$\pm 5^0$	$\pm 2.5^0$
DN600 to DN750 nominal bore	$\pm 4^0$	$\pm 2^0$
DN750 to DN1200 nominal bore	$\pm 3^0$	$\pm 1.5^0$
DN1200 to DN1800 nominal bore	$\pm 2^0$	$\pm 1^0$
Over DN1800 nominal bore	$\pm 1^0$	$\pm 0.5^0$

"For References ONLY" (Not for Bidding)

5.5.7.2 Expansion/Contraction

All fittings shall be capable of accommodating the total of 10 mm expansion or contraction for couplings and 5mm expansion or contraction for flange adaptors due to longitudinal pipe movement without leakage.

5.5.7.3 Sampling & Testing

5.5.7.3.1 Production quality testing shall be carried out to comply with the sampling plan of BS 6001-Part 1:1999.

5.5.7.3.2 Following type tests shall be carried out by the manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure test
ii. Short term negative pressure test
iii. Bolt load relaxation test
iv. Leak-tightness test under angular deflection
v. Resistance to differential pressure movement test
vi. Resistance to shear test
vii. Leak tightness test under axial draw

5.5.7.3.3 Quality control tests for the following characteristics shall be carried out by the Manufacturer and test reports shall be submitted.

i. Short term internal hydrostatic pressure
ii. Short term negative pressure

5.5.7.3.4 (i) Short term internal hydrostatic pressure test

The pipe/fittings assembly shall be connected to a suitable device capable of applying and maintaining the relevant internal hydrostatic pressure as specified in table 8 of this specification, and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature without signs of leakage.

5.5.7.3.5 (ii) Short term negative pressure test

The pipe/fitting assembly shall be connected to a suitable device capable of applying and maintaining the relevant negative pressure as specified in Table 8 of this specification and held at a constant temperature. Each jointed assembly shall withstand the applied pressure for a minimum of one hour at ambient temperature. Fittings

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shall be tested with the test pipes withdrawn to the manufacturer's maximum recommended gap.

Table 8 – Test Pressure

Size Ranges	Test pressure	
	Short-term Hydrostatic Pressure at 1 hour (bar)	**Short-term Negative pressure (bar)**
DN 40-600	PN x 1.5	0.8 (0.2*)
DN > 600	PN + 3	
* Absolute pressure (i.e below atmospheric)		

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6B.5 SPECIFICATION FOR GALVANIZED IRON PIPES AND FITTINGS

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GALVANIZED IRON PIPES AND FITTINGS

1. Standards

Pipes, bends and similar fittings shall comply with BS 1387: 1985 or ANSI/ASTM A 120 - 79 together with additional clauses and conditions set out in the Bills of Quantities or any other National Standards or Specifications acceptable to the Engineer.

2. Pipes

The pipes shall be of heavy quality and conform to the requirements of Table 5 of BS 1387: 1985.

3. Fittings

The dimensions of fittings shall be as indicated in the Bills of Quantities. Where no dimensions are given, they shall be at the option of the manufacturer and to the approval of the Engineer. The fittings shall conform to the requirements of BS 1387: 1985.

4. Joints

GI pipes of all diameters shall be joined by GI sockets of suitable strength, conforming to the requirements of Table 6 of BS 1387: 1985.

5. Flanges

GI screwed flanges shall be suitable for the nominal pressures stated in the Bills of Quantities as follows:

N.P. 10 for a nominal working pressure of 10 kgf/cm^2.
N.P. 16 for a nominal working pressure of 16 kgf/cm^2.

Dimensions of flanges shall be in accordance with BS 4504: 1969 or equivalent National Standards.

6. Galvanizing

Galvanizing shall be carried out in accordance with the requirements of Section 4.3 of BS 1387: 1985.

7. Protection of Ends

The threads of all pipes shall be effectively covered with a good quality grease or other suitable compound, and each pipe shall have a protecting ring affixed to the unsocketed screwed end.

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6B.6 INSPECTIONS AND TESTING OF GOODS

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1.1 Testing and Inspection Agencies

1.1.1 The Employer or his representative shall have the right to inspect and/or to test the Goods for their conformity to the Contract. The Technical Specifications shall specify what inspections and tests the Employer requires not specified and where they are to be conducted. The Employer shall notify the Supplier in writing of the identity of any representatives retained for these purposes.

1.1.2 The inspections and tests may be conducted on the premises of the Supplier or his subcontractor(s), at point of delivery and/or at the Good's final destination. Where conducted on the premises of the Supplier or its subcontractor(s), all reasonable facilities and assistance including access to drawings, documents and production data shall be furnished to the inspectors at no charge to the Employer.

1.1.3 Should any inspected or tested Goods fail to conform to the specifications, the Employer may reject them and the Supplier shall either replace the rejected Goods or make all alterations necessary to meet specification requirements free of charge to the Employer.

1.1.4 The Employer's right to inspect, test and, where necessary, reject the Goods after the Goods' arrival in the Employer's stores shall in no way be limited or waived by reason of the Goods having previously been inspected, tested and passed by the Employer or its representative prior to the delivery of Goods or Goods' shipment from the country of origin, in case of importing.

1.1.5 The Employer requires the goods to be supplied under this contract shall conform to the requirements given in the Specifications. The Supplier shall obtain the Certificates of Inspection for the specific requirement of this contract document carried out by one of the following inspection agencies acceptable to the Employer.

1. M/s Lloyds Register,
   Lloyds Register Industrial Division,
   Register House, 29 Wellesley Road,
   Croydon DRO-2AJ, U.K.

2. M/s Crown Agents,
   Quality assurance & Inspection Service
   Townend House, Walsall WSI INT
   U.K.

3. M/s Societe Generale de Surveillance S.A.,
   1, Place des Alpes,
   Case Postale 898, CH-1211 Geneva 1,
   Switzerland.

4. Bureau of Veritas,
   Cedex 44,
   92077 Paris Le Defense,
   France.

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1.1.6 The selected inspection authority's name and cost to same has to be given in general bill of price schedule. On the acceptance of the bid, the Employer shall inform directly to the selected inspection authority with a copy to Supplier, the specific requirements for testing including deviations accepted by the Employer, if any, to be tested. However, the payment to the Inspection Authority has to be made directly by the Supplier on production of test reports.

1.1.7 The Supplier shall obtain the approval of the Engineer to ship the goods to be imported for the Works or to deliver such materials and plant to the site. Applications for such consent to ship shall be accompanied by manufacturer's test certificates and certificates of inspection prescribed in the Contract or agreed with the Engineer. Application shall be made so as to give the Engineer a reasonable time to deal with such applications. The Engineer's approval shall in any way release the Supplier from any warranty or other obligations under this Contract.

1.1.8 Nominated Inspection Agency shall carryout inspection and testing during manufacturing process, after manufacturing and at any time prior to shipping and shall conform that goods are in conformity with specifications included in the contract document. He shall submit his inspection report to the Employer including all items given in the Terms of Reference (TOR) for the Nominated Inspection which is included contract document as Appendices.

1.2 Pre-shipment Inspection by NWSDB

The Contractor shall arrange for minimum of 4 NWSDB Engineers for pre-shipment inspection visit to country of manufacture before dispatching the DI, HDPE Pipes & Fittings, Valves, Specials and Accessories etc. The duration for inspection for each Inspection Visit shall not be less than ten (10) days excluding travelling to manufacturer's country and back.

Each inspection should be done by Two (02) NWSDB Engineers before dispatching at Manufacturer's Country and inspections shall be made in respect of;

(a) HDPE Pipes, Fittings & Specials
(b) DI Pipe & fittings
(c) Valves & Accessories

The Contractor shall in his bid provide detailed proposals for pre-shipment inspection visit he offers to provide under this clause. The following guidelines shall be used by the Contractor to formulate his proposals.

1.2.1 The duration of inspection for each officer shall not be less than Ten days excluding Travelling time to the Manufacturer's country and back.

1.2.2 Most time shall be centered round the manufacturer's goods which the Contractor proposes to use in the work.

1.2.3 The inspection at the specific manufacturer shall include;

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- A general introduction to the manufacturer's country, area, town & source of materials.

  Introduction to design standards and procedures adopted.
- Introduction to relevant procedures and quality control standards.
- Manufacturing process, and Quality Assurance procedure.
- Testing procedures, mill certificates, product conformity certificate, Quality Management System Certificate and any other relevant certificates etc. regarding the products.
- Packing & dispatching procedure
- Site visits to inspect installed similar products.

1.2.4 The officers shall be guided by experienced engineers and quality controllers who are also competent in English language.

1.2.5 Air tickets, all visas, insurance, permits, taxes, travelling expenses, accommodation on full board basis, transfer fees, transport within the Manufacturer's country, transport to the airport and all other facilities and other minor expenses to perform the inspection during pre-shipment inspection visit at manufacturer's country shall be arranged and paid for by the Contractor.

1.2.6 The Contractor shall arrange to pay each Engineer prior to departure in accordance with the Ministry of Finance and Planning (Sri Lanka) Circular No. MOFP 01/2010/01 dated 11/10/2010. The Contractor SHALL assist and bear all costs related to all aspects of inspection including arrangement of visas, booking accommodation, arranging transport within the manufacturer's country etc.,

1.2.7 The officers shall be provided with printed catalogues, manuals, illustrative videos etc., relevant to the manufacturing process and also obtain extra information requested by them, and shall arrange to dispatch these to NWSDB Engineers, by the Contractor at his own cost.

1.2.8 Contractor shall provide a detailed program showing Inspection, travelling, and all other arrangement etc. Hotel locations etc. for the pre-shipment Inspection and submit to the Inspection team prior to departure. The inspection Program shall be agreed with the Pre-shipment Inspection team

1.2.9 NWSDB Engineers shall test and inspect HDPE Pipes & Fittings, specials, accessories and Valves etc. as per the attached check list for pre shipment as given in Appendices. Manufacturers should perform any other tests which may be required by NWSDB Engineers.

1.2.10 Nominated inspection agency should be present during pre-shipment inspection by the NWSDB Engineers and should assist the NWSDB Engineers for the testing and inspection

1.2.11 Any inspections carried out by Inspection Agencies or NWSDB shall not relieve the Contractor of his obligations under the Contract.

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1.2.12 Contractor/Manufacturer shall not deliver / dispatch materials from the Factory or Stores without approval of the Engineer.

The cost of all foregoing expenses shall be given under the General Bill Item provided for this purpose. The Contractor shall bear all expenses and claim in the following interim bill.

Category of Countries

Category No.	Countries					Combined & Incidental Allowance
1st category	Afganistan Albania Algeria Azerbaijan Bahamas Balarus Barbados Belize Bhutan Bolivia Bosnia Botswana	Burundi Cambodia Canary Island Capevrde Cooks Island Domenica El Salvador Etihiyopiya Equatorial Gabon Gambia Gibraltar	Guam Kiribati Lao Peoples Dem.Rep. Lesothe Liechtenstein Nacedonia Rep. Malawi Malta Mauritania Mongolia Montenegro Myanmar	Nambia Nauru Netherlands Anti Nicaragua Palau Paraguay Samoa Sao Tome & Prince Serbia Sierra Leon Soloman Island Somalia	Tanzania Swaziland Tajikistan Tunisia Uganda Uzbekistan	US$ 200 + US$ 75
2nd category	Antigue Barbuda Armenia Argentina Bulgaria Bangaldesh Brunei Cameroon Coted Ivoria Costa Rica	Ecuador Fiji French Guiana Guyana Grenada Gerogia Guatemala Greenland	Guinea Bissaw Hawai Haiti Honduras Ireland Iraq Jamaica Korea Dem.Rep.	Liberia Mexico Micronesia Fed. Monaco Mozambique Papua new Guinea Suriname Yeman Rep.	Yogoslavia Tahiti Tonga Vanuatu	US$ 260 + US$ 75
3rd category	Baharain Chile Cyprus Egypt Arab Rep. Estonia Guinea Hungary Indinesia Iran Islamic Rep. Kenya	Kuwait Lithuania Madagascar Mauritius Malayasia Maldives Morocco Macedonia Rep Nepal Oman	Pakistan Panama Peru Pholippines Poland Quarter Romania Ruwada Saudi Arabia Solvenia	Sriyan Arab Rep. South Africa St.Lucia Sudan Thailand Togo Trinidad & Tobago Uruguay Ukrain Venezuela	Vietnam Zaire Zambia Zimbabwe	US$ 330 + US$ 75
4th category	Belgium Benin Burkina Faso Comoros Central African Rep. Colombia Congo	Croatia Cuba Czech Republic Dem.Rep.of Congo Djibouti Greece Iceland	India Ivory Coast Jordan Kazakhastan Latvia Lebanon Luxemburg	Mali New Caledonia Nigeria Portugal Slovak Rep. Spain Taiwan	Turkey United Arab Emirates	US$ 400 + US$ 75
5th category	Angola Australia Austria Brazil Canada Chad	China (Beijin) Denmark France Germany Finland Hongkong	Israel Italy Japan Libiya Netherland New Zealand	Niger Norway Russia Senagal Swedan Seychelles	Singapore South Korea Switzerland United Kingdom USA	US$ 530 + US$ 75

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6B.7 SPECIFICATION FOR WOLTMAN TYPE BULK WATER METERS SIZES FROM 50 mm TO 300mm

(NOT USED)

"For References ONLY"
(Not for Bidding)

"For References ONLY"
(Not for Bidding)

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6B.8 SPECIFICATION FOR WATER METERS (VOLUMETRIC TYPE) AND SPARE PARTS

"For References ONLY"
(Not for Bidding)

"For References ONLY"
(Not for Bidding)

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SPECIFICATION FOR VOLUMETRIC DISPLACEMENT TYPE WATER METERS AND SPARE PARTS

1. SCOPE:-

This contract is for the manufacture, supply & delivery of Domestic Water meters and spare parts for the National Water Supply & Drainage Board (NWS&DB), (Purchaser) Sri Lanka. The tender price shall include all labour, machinery and all materials necessary for the proper manufacture of the goods, for tests at the contractor's works and insurance and freight to the Port of Colombo and for discharging every requirement and obligation of the contract.

This specification applies to water meters for the measurement of cold potable water supplied to the domestic premises in Sri Lanka. It deals with the metrological and technical requirements of volumetric type domestic meters.

2. GENERAL

2.1 Technical Capabilities

The Products offered shall conform to specifications stipulated under this contract.

The manufacturer shall submit all technical literature and any other technical reports containing information with regard to design, manufacture and characteristics of water meters.

2.2 Relevant Standard

The meters shall comply with ISO 4064:2014 or OIML R 49-2:2013

"For References ONLY" (Not for Bidding)

3. TECHNICAL REQUIREMENTS

3.1 Definitions

3.1.1 Flow Rate (Q)

Q=dV/dt where V is actual volume and t is time taken for this volume to pass through the meter.

3.1.2 Actual Volume (Va)

Total Volume of water passing through the meter, disregarding time taken.

Notes: this is measurand. The actual volume is calculated from a reference volume as determined by a suitable measurement standard taking into account differences in metering conditions, as appropriate.

3.1.3 Indicated Volume (Vi)
Volume of water indicated by the meter, corresponding to the actual volume.

3.1.4 Maximum Permissible Error (MPE)
Extreme value of measurement error, with respect to a known reference quantity value permitted by specifications or regulations of given meter.

3.1.5 Rated Operation Condition (ROC)
Operating condition requiring fulfillment during measurement in order that a meter perform as designed.
Note : The rated operating conditions specify intervals for the flow rate and for the influence quantities for which the errors of indication are required to be within the maximum permissible errors.

3.1.6 Limiting Conditions (LC)
Extreme conditions including flow rate, temperature, pressure, humidity and electromagnetic interference (EMI) that a water meter is required to withstand without damage, and without degradation of its error of indication. when it is subsequently operated within it ROC.

3.1.7 Intrinsic Error
Error of a meter determined under reference conditions

3.1.8 Fault
Difference between the error of indication and the intrinsic error of a meter.

3.1.9 Permanent Flow Rate (Q_3)
Highest flow rate within ROC at which a water meter is required to operate in satisfactory manner within maximum permissible error.

3.1.10 Overload Flow Rate (Q_4)
Highest flow rate at which a water meter is required to operate for a short period of time within its MPE, whilst maintaining its metrological performances when it is subsequently operated within its ROC.

3.1.11 Minimum Flow rate (Q_1)

Lowest flow rate at which the water meter is required to operate within the MPE.

3.1.12 Transitional Flow Rate (Q_2)

Flow rate which occurs between the permanent flow rate (Q_3), and minimum flow rate (Q_1) that divides the flow rate range into two zones the “the lower zone” and the “upper zone”, each characterized by its own MPE.

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3.1.13 Minimum Admissible Working temperature (mAT)
Minimum temperature that a water meter can withstand permanently at a given internal pressure without deterioration of its metrological performances.

3.1.14 Minimum Admissible Working temperature (MAT)
Maximum temperature that a water meter can withstand permanently at a given internal pressure, without deterioration of its metrological performances.

3.1.15 Minimum admissible working pressure (mAP)
Minimum pressure that a water meter can withstand permanently within ROC, without deterioration of its metrological performances.

3.1.16 Maximum Admissible working pressure (MAP)
Maximum pressure that a water meter can withstand permanently within ROC, without deterioration of its metrological performances.

3.1.17 Working Temperature (T_w)
Average water temperature in the pipe, measured upstream and downstream of the water meter.

3.1.18 Nominal Diameter (DN)
Alphanumeric designation of size for components of a pipe work system, which is used for reference purpose.

Note : it comprises the letters DN followed by a dimensionless whole number that is indirectly related to the physical size in mm of the bore, or outside diameter of the end connection.

3.1.19 Pressure Loss
Head loss at a given flow rate caused by the presence of the meter in the pipe line.

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3.2 Operating conditions

Domestic meters shall be suitable in every respect for operation under following operating conditions

Temperature

The working temperature range shall be suitable for a country with following conditions:

a. Annual average ambient temperature = 35^0C
b. Maximum ambient temperature = 40^0C

Working Pressure

Meters shall function on a normal pressure of 3m H_2O for the forward flow. The water meters must be able to withstand constantly a continuous working pressure of 10 bar without defects in its functioning, leakage, seepage through the walls or permanent deformation.

Humidity & Immersion

A meter shall be suitable for installation in a pit or basement which may be subjected to flooding. Therefore, meters and their fittings shall be capable of operating normally even when submerged to a depth of 1m.

Installation & Position

Domestic meters shall be suitable for installation in vertical, horizontal and inclined positions without loss of its required accuracy and counter shall be so positioned that it shall be easy to read in vertical or horizontal or inclined positions.

3.3 Meter type

All domestic water meters and spare parts to be supplied under this contract shall be of volumetric type with threaded End connections.

Single or multi jet type meters class C accuracy will not be accepted for volumetric type meter.

3.4 Meter Size and overall dimensions

For each meter size there is a corresponding set of overall dimensions and the dimensions are given in table 01 in appendix B (see also figure 01 of appendix A)

$H_1 + H_2$, L, W1 + W_2 define the height, length and width respectively of a cuboids within which the water meter can be contained (the cover being at right angles to its closed position)

Dimensions of H_1 , H_2, L, W1, W_2 are given in appendix b table 01.

Dimension L for 15mm shall be 165, 134, or 115 mm. without any preference to any Figure

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3.5 Threaded Connections

All meters supplied shall have male threaded end connection and shall be provided with pipe connecting unions threaded to respective BSP Size, DN 15.
Union nut shall have provision for sealing the water meter and end connectors with metallic wires. The diameter of the sealing hole of the union nut and the meter shall be 2.5 mm.Union barrel shall be so designed that it can be tightened with a standard spanner.

Two minimum values 'a' and 'b' are specified in table in appendix B. Dimensions "a" and "b" are as per the figure 02 shown in appendix A.

3.6 Metrological requirements

Water meters are designated according to the permanent flowrate (Q_3) in cubic meter per hour and ratio of (Q_3) to the minimum flow rate (Q_1)

Meter Size (Nominal Diameter)(mm)	15
Permanent flow rate (Q_3) (m3/hr)	1.6
Measuring Range (Q_3 / Q1)	100
Minimum Flow rate(Q1) (l/hr)	16
Overload Flow (Q_4) (m3/hr)	2
Transitional Flow (Q_2) (l/hr)	25.6

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3.7 Maximum Permissible Error

3.7.1 MPE Lower Flow range

The maximum permissible error, positive or negative, on volumes delivered at flow rates between the minimum flow rate (Q1) and transition flow rate (Q_2) is ±5% for water having a temperature within ROC. (Accuracy class 2)

3.7.2 MPE upper Flow range

The maximum permissible error, positive or negative, on volumes delivered at flow rate between the transitional flow rate (Q_2) and the overload flow rate (Q_4) is ± 2%. (Accuracy class 2)

3.8 Materials and Construction

3.8.1 General

The water meters must be manufactured from materials of adequate strength and durability for the purpose for which it is intended. Namely internal and or external installation on domestic premises in tropical countries like Sri Lanka.

The meters must also be manufactured from materials which are resistant to or are protected against normal internal and external corrosion. However, the body of the meter shall be manufactured out of Brass.
The meter body shall be rigid and resistant to deformation that could impair the function of the moving parts.

When used under the conditions for which they are designed, materials in contact with or likely to come into contact with potable water shall not constitute a toxic hazard, shall not support microbial growth and shall not give rise to unpleasant taste or odour, cloudiness or discoloration of the water.

The indicating device of the water meter shall be protected by a transparent window (glass or other material). Further Protection shall be provided by a suitable cover.

3.8.2 Strainer

All volumetric type meters shall be provided with an internal strainer.

3.8.3 Pressure Loss

The pressure loss through the water meters shall not be greater than 1.3 (1.0) bar over the entire flow range when measured with non – return valve installed

3.8.4 Indication Devices

The meter shall incorporate an indicating device which must give an indication of the volume flow expressed in cubic meters. The device shall consist of a row of a minimum of four in line consecutive digits and can be of mechanical type.

(e.g. a series of numbered cylindrical drums). This device shall be clearly labeled "m^3".

Sub multiple of a cubic meter shall be shown by further in line digits. The discrimination of this subsidiary indicating device shall be to 0.1 liters indicated digitally or by graduations of a movable scale.

The cubic meter and its multiples shall be indicated in black and its sub-multiples in red. The actual or apparent height of the digits shall not be less than 4 mm.

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The advance of any digit must be completed while the digit of the immediately next lower value describes the last tenth of its travel. The numbers on the drums must be displaced upwards.

3.8.5 Anti Tamper Facilities

Revenue meters of all types are subject to fraud and tampering. The anti tamper facilities and construction of the meter shall deter attempts at tampering and indicate whether tampering has occurred.
Lead and wire seals shall be used to give local indications of meter removal or dismantling.

3.8.6 Non-Return Valve

An internal non-return valve which cannot be removed without tampering shall be incorporated within the meter body to prevent the contamination of distribution system and to avoid loss of revenue from the back flow from end users.

3.8.7 External Magnetic Interferences

If the drive between the metering rotor and the counter is magnetic, then it shall be unaffected by external magnetic interference.

Meters with magnetic drive between the metering rotor and the counter shall not be accepted and shall be rejected.

3.8.8 Marks & Inscriptions

The water meter must carry embossed on the body during casting of the body while manufacturing on its body, excluding the cover, in an unambiguous, indelible and clearly legible form the following information.

a. The model number & name or the trade mark of the manufacturer.

b. The permanent flow rate, size in DN and pressure loss in bars.

c. The year of manufacture and serial Number.

d. An arrow indicating the direction of flow.

e. The letters "NWS&DB" of height not less than 05 mm shall be engraved into the metal body of the water meter.

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4. SPARE PARTS

The bidder shall provide, with his tender a complete itemized priced list of spare parts recommended for 5 years operation. The lot of spare parts quoted shall include the following spare parts among others recommended by the manufacturer.
The prices quoted for the spare parts should be valid for a period of 02 years from the date of award of the contract.

1. Combine counter and reduction gear assembly.
2. Working chamber complete with Top plate assembly.
3. Ramp assembly.
4. Non return valve.
5. All "O" rings, seals, washers and circlips etc.
6. Lid
7. Hinge pin

5. SAMPLES

5.1 Submission of Samples

Every tenderer shall submit 07 (seven) samples meters of 15mm volumetric type complete with end connections and washers for inspection and testing by National Water Supply & Drainage Board.

All samples shall be well packed, sealed and labeled to facilitate identification.

The samples shall truly represent the meters offered to be supplied under this contract in every aspect. No samples will be returned and the cost of providing samples shall be borne by the tenderers.

Out of the 07 samples submitted 05 samples will be subjected to the tests at NWSDB as described in the document and the remaining 02 will be stored by NWSDB for future reference.

05 samples out of the submitted 07 nos. shall be selected randomly for testing in the presence of the tenderers and those 05 shall be the final selection for testing and the remaining 02 shall be reserved for future reference.

5.2 Non Submission of Samples

The bids that are not accompanied with the required no. of samples will be treated as substantially non-responsive.
All sample meters will be tested to evaluate meter performance on the NWS&DB water meter test benches at NWS&DB Central Workshop, Maligawa Road, Ratmalana only.

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All tenderers will be notified of the dates and times scheduled for testing samples and tenderer or his authorized representative will be allowed to witness these tests. No change in time schedule will be allowed.

5.3 Testing of Samples

All sample meters will be opened in the presence of bidders or their representatives before the commencement of the testing.

All sample meters will be tested with the non-return valve in position and any method for testing samples without non-return valves will not be accepted.

Following tests will be carried out to evaluate meter performance.

1. % Error Tests at Q_1, Q_2, and Q_3

   % Error at all the above flow rates shall be within maximum permissible errors specified.

2. Non return valve function test

   Non return valve shall withstand a maximum of 1 bar pressure applied on it without showing any leakage.

3. Magnetic Influence

   All meters with magnetic drives shall not be influenced by a magnet.

4. Pressure Tests

   Meters shall be Table to withstand a working pressure of 10 bar without defects in its functioning, leakage or seepage through walls and water pressure class of the meter shall be MAP 10

5. Pressure Loss

   Pressure loss through a meter at Q_4 overload flow rate shall not exceed 1.3 bar with the non – return valve installed.

6. Measurement of Overall Dimensions.
   Overall measurement of the sample meters will be measured.

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6. EVALUATION OF WATER METER PERFORMANCES

The test results obtained from above tests will be final and following criteria will be applied to evaluate meter performance.

6.1 Criteria For Evaluation

a) All performance tests will carry equal weightage of 1.

b) A minimum of 4 out of 5 sample meters shall pass all tests and sample lots meeting this criteria shall be considered for evaluation and those failing shall be rejected.

A meter determined as passed, shall have passed all tests shown below.

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Test	Weightage allocated per pass per sample	Sample size	Weightage for 2nd level of screening according to para 6.1 b
1.%Error Tests			
1.1 Q1 Test	1	5	4
1.2 Q2 Test	1	5	4
1.3 Q3 Test	1	5	4
2. Non Return Valve Test	1	5	4
3. Magnetic Influence Test	1	5	4
4. Pressure test	1	5	4
5. Minimum overall performance requirement			24

Note

In addition to the above, average pressure loss per meter at Q4 flow rate & overall dimensions of the meters offered shall comply with the following.

e. Pressure loss

Total pressure loss of 5 meters in series will be measured at flow rate of Q4. The average pressure loss per meter at Q4 shall be calculated and this figure shall not exceed 1.3 bar with the non – return valve installed. Samples not conforming to above will be rejected.

f. Overall Dimensions

In addition to the above, overall dimensions of the meters offered shall conform with the values given in the table in appendix b.

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7. DURABILITY TEST

7.1 The supplier shall submit a copy of the Endurance Test Certificates for each size of the models of the water meters offered for this tender with the bid. The test should have been done for 03 Nos. meters of the models offered, less than 03 years before the closing date.

Endurance Test Certificates should have been obtained from one of the designated independent testing agencies described I to IV below and the reports shall be from such independent agency.

I. Test shall be carried out by one of the Independent Inspection Agency complying with the acceptance requirement for their laboratories given in clause 7.2 of the specification.
   i. Crown Agents
   ii. Lloyds Register
   iii. Bureau Veritas
   iv. Societe Generale de Surveillance S.A

II. Test shall be carried out by one of the Independent Testing Agencies which is accredited to perform this test and shall be a member of the International Accreditation Forum (IAF) complying with the acceptance requirement for their laboratories given in clause 7.2 of the specification. A certified copy of the membership which authorizes the agency to perform relevant test shall be attached with the bid document. The test certificate shall be issued by the Independent Inspection and Testing Agency.

III. Test shall be carried out in a accredited Laboratory which is accredited to perform this test by International Laboratory Accreditation Cooperation

(ILAC) complying with the acceptance requirement for Laboratories given in Clause 7.2 of the Specification. A certified copy of the which authorizes the lab to perform this test shall be attached with the bid document.

IV. In case the tests are carried out at the manufacturer's facilities, tests shall be witnessed by one of the designated inspecting agencies complying with the acceptance requirement for Laboratories given in Clause 7.2 of the Specification in the tender document and the reports shall be by the said agency. If the test shall not be witnessed by one of the designated inspection agencies, it shall be witnessed by an accredited inspection and testing agency which shall be a member of International Accreditation Forum (IAF) or accredited laboratory which is a member of International Laboratory Accreditation Corporation (ILAC) and shall fulfill the acceptance criteria of Laboratories for endurance testing as specified in clause 7.2.

Three meters exactly identical in description, specifications etc to the meters being offered shall be subjected to the following tests and test reports shall be submitted along with the offer. Offers not accompanying the said reports shall be considered as substantially non – responsive.

Full contact details of the laboratory must be accompanied with the bid.

Endurance test should be carried out according to Section 7.11.3, Continuous Flow Test and 7.11.2 Discontinuous Flow Test of ISO 4064-2:2014 (E) and acceptance criteria shall be class 2 or OIML R 49-2:2013(E) for class 2 accuracy.

The report contents shall include all details/requirements in the above sections (7.11.2 & 7.11.3 of both the above standards) as a minimum.

Meters shall remain within the maximum permissible error ranges/deviations as specified before and after carrying out the tests for accuracy class 2 meters in the above two standards.

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A. <u>Endurance test</u>

Accuracy of the meters shall be measured at the given flow rates during normal operation, during operation after discontinuous endurance test and during operation after continuous endurance test.

I. measure the percentage accuracy of flow measurement at the following flow rates
   - 2000 l/hr.
   - 1600 l/hr.
   - 25.6 l/hr.
   - 16.0 l/hr.

II. Measure the percentage accuracy of flow measurement at the same flow rates after discontinuous endurance test*.

III. Measure the percentage accuracy of flow measurement at the same flow rates after continuous endurance test*.

* (discontinuous type test shall be 100,000 interruptions, 15 sec. duration pauses, 15 sec. duration operation at 1600 l/hr , Continuous type test shall be with operation at 2000 l/hr. flow rate for 48 hr for accuracy class 2)

Meters shall remain within the maximum permissible error ranges as given in the standards ISO 4064 -2 – 2014 (E) or OIMLR 49-2 2013(E) before & after carrying out all the tests described here.

Failure to comply with this requirement shall lead to the rejection of the offered meters.

7.2 Acceptance criteria of laboratories for endurance testing

7.2.1 The following laboratories shall qualify:

1) National Measurement Institute (National Metrology Laboratory) of the country of the laboratory.
or

2) An ISO/IEC 17025 accredited metrology /measurement institute authorized by the National Measurement Institute (National Metrology Laboratory) of the country of the laboratory, as dissemination of the National Standards of the country.

Accreditation schedule shall include water meter testing according to ISO 4064-2014(E) or OIMLR 49-2 2013(E) requirements.

3) Independent third party "Industrial Calibration/Test Laboratory" where the reference standards have been calibrated by an Accredited Calibration Laboratory, authorized by the National Measurement Institute (National Metrology Institute) of the country.

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7.2.2 Qualification

1) Laboratory shall be a third party, independent laboratory

2) Certificates shall comply with the details/ reporting requirements of ISO 4064-3:2014 (E) OIMLR 49-2 2013(E) as a minimum.

3) Certificate shall be issued directly from a third party, independent laboratory, printed on paper with laboratory /company makings of the laboratory and seal/ signature on every page of the report.

4) Copies of a Accreditation certificate shall be submitted with the bid, in case of laboratories (2) of Cl. 7.2.1.

Copies of relevant pages of accreditation schedule showing the inclusion of water meter testing according to ISO 4064-2014 (E) or OIMLR 49-2 2013(E) shall be submitted with the bid.

5) All pages of copies of submitted certificates (endurance, accreditation etc.) shall be certified as true with seal and signature of the bidder.

6) Report shall include all details/requirements stipulated in the sections 7.11.2 & 7.11.3 of ISO 4064-3:2014 (E) or OIMLR 49-2 2013(E).

7) Accreditation Quality Assurance Certification of the laboratory shall be based on the requirement of Uncertainty of Measurement of the actual volume to be according to Cl. 5.5.17.4.2.2.6.1 of ISO 4064-2:2014(E) or OIMLR 49-2 2013(E).

If needed, NWSDB, Procurement Committees and TEC etc shall require bidders to substantiate the above with supporting certificates/ documents whenever the bidders are notified.

8. TECHNICAL LITERATURE

8.1 Tender Drawings

The Bidder shall submit together with his tender a drawing or drawings showing the salient features of the meters, the materials used, methods of manufacture and tolerances allowed and other details to enable determination and assessment of the meters.

The Bidder shall supply a calibration curve (flow rate against % error) for each size and type of meter offered.

8.2 Services Manuals

The successful Bidder shall submit 3 copies of the Service Manuals for each type of meter to NWS&DB at the time delivery of meters.

The manuals shall contain complete list with number, name, drawing of spare parts, information, tools and equipment necessary for dismantling each item for repairing or replacing parts, maintenance instructions including charts showing lubrication, if required, and checking, calibration, testing and procedures.

9. INSPECTION & TESTING AT MANUFACTURE'S WORKS BEFORE SHIPMENT AND PRE – SHIPMENT APPROVAL

Selected samples using random tables according to ISO 2859 – 1:1999 (E) and ISO 3951 : 1989 (E) from the particular lot to be supplied under this contract shall be inspected and tested for conformity to specifications, prior to shipment at the bidders own cost by one of the inspecting agencies stated in the clause 8.5 of the General Conditions of Contract. Bidder shall indicate the name of the inspection agency selected with the bid.

Number of samples to be tested according to sampling procedure described in clause 13, inspection of delivery lots.

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It is mandatory to include the complete meter numbers for all meters of the sample in the test certificates submitted.

Tests to be carried out are as follows,

1. Q_1 - min. flow
2. Q_2 - transitional flow
3. Q_3. - Permanent flow
4. Pressure test (acc. to the pressure rating in cl.4.2.10 of ISO 4064-1-2014(E) or OIMLR 49-1 2013(E).
5. Non return valve test.
6. Pressure loss test (acc. to the figures in cl. 6.5.4.2.10 of ISO 4064-1-2014(E) or OIMLR 49-1 2013(E).
7. Overall dimensions & thread dimensions
8. Magnetic test (if applicable)

Pre – shipment approval :

Tenderer shall submit the above test certificates from the inspection agencies for the samples selected according to the procedure given for testing at site at NWSDB to be supplied to NWSDB for approval and only upon such approval by the Purchaser that the manufacturer shall be allowed to ship the relevant lot.

Non approval of the above certificates by Purchaser shall cause the relevant lot being rejected and not being shipped to Sri Lanka.

"For References ONLY" (Not for Bidding)

10. APPROVAL

Approval by the Purchaser to ship the Water Meters or acceptance of the design or drawings by NWS&DB shall in no way relieve the supplier of any of his obligations or liabilities with regard to the design, materials used, workmanship and the proper execution of the contract.

11. GUARANTEE

All meters shall be guaranteed for performance and accuracy by the contractor for a period of 36 months from the date of delivery in respect of conformation with the specifications and defects in materials and workmanship.

The Supplier shall warrant to the Purchaser that the meters supplied under this contract will comply strictly with the Contract and shall be first class in every case and shall be free from defects. The Supplier further warrants to the Purchaser that all meters and their accessories furnished by the Supplier under this contract will be new, merchantable of the most suitable grade, and fit for their intended purposes.

Any part of the meters supplied under this contract, which fails or does not give satisfactory performance during this period of warranty, shall be replaced within 15 days from the date the Contractors has been notified to do so.

All expenses involved in this connection shall be borne by the Contractors who should take this into consideration when tendering.

12. PACKING

Each water meter and its accessories namely a set of seals and 02 Nos. end connections (Union nut + Threaded branch) shall be packed in box. These units shall then be packaged or otherwise enclosed or protected for overseas shipment, handling & storage in tropical climate. Suitable special provision shall be made to avoid damage resulting from handling by all carriers. All packages shall be clearly marked for identification including indication of upper side of packages.

Each meter of same size shall be marked with a unique serial number and then packed according to ascending order of such serial numbers. Starting Serial No., Last serial No and No. of meters in the each package shall then be marked on the package boxes.

13. INSPECTION OF DELIVERY LOTS

Delivery lots handed over to the main stores according to the delivery schedule in the tender document will be subjected to an Inspection procedure as described below, which has been formulated by NWSDB using data tables etc. from ISO 2859 – 1:1999(E) and ISO 3951:1989(E).

Delivery lots failing the inspection procedure shall be wholly rejected without any payment for such meters and the tenderer shall take over and remove the whole lot from the nwsdb premises.

In the case of non – acceptance of a lot, the entire lot and any other remaining lot(s), if any, shall be cancelled and no payment whatsoever regarding any lot(s) cancelled in such a manner shall be made.

Inspection Procedure

Sample size selection from the lot delivered:
Sample size code letter shall be selected from Table 1 – Sample Size Code Letters in Appendix d depending on the Lot size and General Inspection Level I.

Then the Table 2 – A – Single Sampling Plans for Normal Inspection (Master Table) in Appendix e shall be employed for sample size determination and allowable failure percentage.

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Following are the inspection levels used by NWSDB.

Acceptance Quality Limit – 2.5

Single sample

Normal Inspection

From the above data, sample size shall be obtained from Table 2 – A in Appendix e. Subsequently, a sample of the above size is selected from among the lot using standard Random Tables.

Each meter in the sample shall be subjected to the following parameters & features.

1. Q_1
2. Q_2
3. Q_3
4. Pressure Test(No leak – pass, any leak fail)
5. Magnetic Test(Response to the magnet – fail, No – response – pass)
6. Non – return valve test(function – pass, not function – fail)
7. Pressure loss test
8. Overall dimensions & thread dimensions

Any Meter failing in any of the above eight tests shall be considered as rejected.

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6B 9 - SPECIFICATION FOR BRASS LOCKABLE BALL VALVES

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SPECIFICATION FOR BRASS LOCKABLE BALL VALVES -15mm (1/2")

1. General

Lockable Ball Valve shall be Magnetic Type.

Shall consists of: - (Ball Valve, Lock, Key)

1. Ball Valve functioning as an Isolating Valve.
2. Lock securing the Valve's operating mechanism.
3. Key for releasing the Lock from the Valve and to open and close the valve.

1.a Design shall be Magnetic type only with ring key to be inserted onto the Lock when it is needed to open the Valve.

1.b Compatibility with the existing Valves - Only designs having compatible magnetic keys, which can be used for opening/closing of the lockable ball valves already installed by the NWSDB shall be accepted.

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2. Specification

2.1 Lock

Shall be applied to keep the Valves is either the "on" or "off" position and not able to be operated without the key to open /shut off water supply.

2.2 Features

1. Valve shall be weather proof
2. Materials shall be corrosion resistant
3. Ball Valve shall be full bore design
4. Lock shall have no visible aperture leading to vandalism or tampering

2.3 Dimensions

Valve Body shall be ½ inches for 15 mm

2.4 Threads

Female BS parallel threads on both sides of size ½ inch. Inlet & Outlet threads shall comply with the BS 21 Standard

2.5 Markings on the Body

Stop valve shall be legibly marked with the following, by embossing integrally during casting.

I. Trade name of the product (make)

II. The nominal size & pressure rating of the valve

2.6 Materials

General – Cast, pressure die cast, forged and other methods of manufacture mentioned in the relevant standards of this specification are acceptable, if they satisfy other conditions included in the specifications.

I. Metallic parts shall be Brass.

II. Composition of Brass (Cast) excluding die castings, for body& components shall confirm to BS 1400:1985 SCB 1 or SCB 6 or equivalent grades in BSEN 1982:1999.

III. Brass gravity die casting for body & components shall confirm to BS 1400:1985 DCB 1 or DCB 3 or equivalent grade in BSEN 1982:1999.

IV. Brass for pressure die castings for body & components shall confirm to BS 1400:1985 PCBI or equivalent grade in BSEN 1982:1999.

V. Brass for hot pressings for body & components shall confirm to BS 2872:1989 CZ 122 or equivalent grade in BS EN 12420:1999.

VI. Seals – Seals shall P.T.F.E (Teflon)

VII. O – rings-shall be EPDM or NBR.

VIII. Magnetic Key – Shall be fully metallic (Brass Ring Body)

IX. Lock – shall be UV resistant, weather proof, non-polymeric, metal based Material

"For References ONLY" (Not for Budding)

X. Springs – Non corrosible materials only. Shall be Carbon Steel with blackening treatment or similarly manufactured and finished.

XI. Steel Balls – Shall be Stainless Steel – Gr.304, 316, 316L

XII. Magnets – Non corrodible rare earth materials.

XIII. Lock Parts (inner or outer) Plating –Nickel -5 – 10 micro m or Chromium–0.15– 0.25 micro m

XIV. Pins–Brass (HPb 59-1, HPb 58-3, HPb 61-1, HPb 60-2, HPb –59-3)

XV. Chrome plated Brass Cavity Ball –

- Composition of Brass (Cast) excluding die castings, for body & components shall conform to BS 1400:1985 SCB 1 or SCB 3 or SCB 6 equivalent grades in BSEN 1982:1999
- Brass gravity die castings for body & components shall conform to BS 1400:1985 DCB 1 or DCB 3 or equivalent grade in BSEN 1982:1999
- Brass for pressure die castings for body & components shall conform to BS 1400:1985 PCBI or equivalent in BSEN 1982:1999
- Brass for hot pressings for body & components shall conform to BS 2872:1989 CZ 122 or equivalent grade in BS EN 12420:1999.

Note: All components shall be made of non – corrosible materials to withstand salty and humid environment. Bidders shall provide description of materials/finishes of all components to show that they can withstand salty and humid environments.

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2.7 Pressure Test

I. Seat Test

Every Lockable Ball Valve, in the closed position shall show no leakage when subjected to an internal hydraulic pressure of 20 bars.

II. Body Test

In the open position and with the outlet sealed, shall be capable of withstanding without leakage an internally applied hydraulic pressure of 20 bars.

2.8 Independent Inspection

The Manufacturer shall obtain a confirmation for the compliance with the Specifications from one of the following agencies at his own cost and submit with the delivery.

1. M/s Lloyds Register
2. M/s Crown Agents
3. M/s Societies General de Surveillance S.A
4. Bureau of Veritas

2.9 Submittals

The following shall be submitted at the time of delivery.

1. Original printed literature giving all technical details substantiating the specifications and other details given in this document.
2. ISO 9001:2008/2015 certificate (quality assurance) for the manufacturing facility valid for the current year.
3. Certificate from independent agency for the product material compliance to relevant BS Standard.

2.10 List of Tests

The list of tests carried out on the samples submitted with the offer and samples drawn from the delivered lots are as Specified.

Composition of materials will be tested at Industrial Technology Institute OR Industrial Development Board or at any other recognized laboratory.

2.11 Warranty

12 months' warranty period for the whole Valve shall be provided by the Manufacturer/Supplier.

Any and all Valves failing to give the required complete performance due to failure of a single part or failure as a whole, shall be replaced within a reasonable time by the same make product/s.

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6B.10 SPECIFICATION FOR STOP VALVES

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BRASS STOP VALVES

1.0 General

1.1 Stop valves shall provide leak- free, tight closure (complete stop) of water flow through the valve in the closed position.

1.2 It shall comprise of a body on which head, handle, spindle, gland, stuffing box etc. with seals and washers mounted.

1.3 During operation washer plate & stem assembly with the spindle is screwed down causing the washer to shut on the seat against the water pressure.

1.4 All components shall be of "water works" standard and shall be of a well proven robust design and manufacture.

1.5 The castings, forgings, and die castings shall be close grained, sound, smooth and shall be carefully cleaned & dressed.

1.6 All castings shall be free of blowholes & other defects. No plugging will be permitted in case of blowholes.

1.7 All non-metallic materials to be provided shall be listed in current "water fittings and materials directory."

1.8 If the washer plate is sand or shell casting, it shall be machined all over.

2.0 Specification

2.1 List of components

i. body
ii. spindle
iii. gland
iv. handle
v. stuffing box
vi. washer plate
vii. washer
viii. washer seat
ix. washer in gland
x. packing
xi. head
xii. head seal

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2.2 Applicable Standards

The stop valves shall comply with BS 1010:Part 2:1973 in every respect unless otherwise stated in the specifications.

2.3 Markings on the body

Stop valves shall be legibly marked with the following, by embossing integrally during casting.

i. Trade name of the product
ii. BS number
iii. The nominal size and direction of flow

2.4 Size

Sizes of the valves shall be ½ inches and ¾ inches.

2.5 Materials

General - Cast, pressure die Cast, forged and other methods of manufacture mentioned in the relevant standards of this specification are acceptable, if they satisfy other conditions included in the specifications.

i. Metallic parts shall be Brass.

ii. Composition of Brass (Cast) excluding die castings, for body & components shall conform to BS 1400:1985 SCB 1 or SCB 3 or DCB1or DCB 3 or PCB 1 equivalent grades in BSEN 1982 : 1999.

iii. Brass gravity die castings for body & components shall conform to BS 1400:1985 DCB 3 or equivalent grade in BSEN 1982 : 1999.

iv. Brass pressure die castings for body & components shall conform to BS 1400:1985 PCBI or equivalent grade in BSEN 1982 : 1999.

v. Brass for hot pressings for body & components shall conform to BS 2872:1989 CZ 122 or equivalent grade in BS EN 12420 : 1999.

vi. Washers - Vulcanized synthetic Rubber complying with clause 06 of BS 3457:1973.

vii. Head Seals -

- Head Seals shall be fiber joint washers to BS 5292:1980.

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viii. O – rings -
according to the appendix A to E of BS 1010:1973.

ix. Jointing materials & components for portable water installations – BS 5292:1980 / BS 6956:1988.

2.6 Construction

i. seat - seat shall be integrally cast in the body & machined

ii. threads - inlet & outlet threads shall be female BS pipe parallel threads of the nominal Size as the valve.

iii. head seal - when 'O' rings are used, the dimensions shall be in accordance with the requirement of BS 1806:1989 or BS 4578:1970 and rubber shall conform to the specifications in Appendix A of BS1010:1973.

- flat head seats shall be made from specially selected fiber complying with the requirements of BS 1737:1951 or BS 5292:1980 or a no less suitable material.

iv. Washer plate & washer plate unit -

- the washer plate with its stem shall be made in one piece.

- the washer plate shall have a stud for the attachment of the washers, if not screwed, shall be of such shape and size as will prevent the valve from becoming detached under working conditions.

- the valve plate shall be free to rotate in the hole in the spindle and shall be so secured as to lift with the spindle.

- the top of the washer plate shall be clear of the bottom of the head when fully open.

v. Body, head, spindle

- the construction, dimensions etc. of body, head, spindle etc shall be according to the requirements given in BS 1010:1973.

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vi. Method of attaching handle

- handle shall be fixed on a squared spindle or the handle shall be secured on a serrated spindle or by the use of a similar positively engaging method.

- all handles shall be a close sliding fit on the spindle (without shake)

- handles shall be fixed by on axial screw with the handle on a sliding fit on the spindle but without shake.

vii. Spindle - spindle shall be of rising type.

viii. Clearance between head & handle

- the distance between the underside of the handle and the top of the head, with the valve closed, shall be according to the values given for each size of valve in Tables 5 and 6 of BS 1010:1973.

ix. Seat Washer - washer shall be of vulcanized synthetic rubber complying with the requirements of Clause 6 of BS 3457:1973.

x. Gland packing - the gland packing shall be a type of packing suitable for potable water. A suitable washer shall be fitted in the bottom of the gland. This may be omitted if the packing is in the form of moulded composition packing.

- when 'O' rings are to be employed a minimum of 2 rings shall be employed and these shall be made of synthetic rubber as specified in Appendix A of BS 1010:1973 and dimensions shall be according to BS 1806:1989 or BS 4518:1999.

- they shall be capable of being renewed.

- the 'O' rings shall not be less than 1.6 mm. in sectional diameter.

2.7 Pressure Test

i. Seat Test

Every Stop Valve, in the closed position shall show no leakage when subjected to an internal hydraulic pressure of 20 bars.

"For References ONLY" (Not for Bidding)

ii. Body Test

In the open position and with the outlet sealed, shall be capable of withstanding without leakage an internally applied hydraulic pressure of 20 bars.

2.8 List of tests

The list of tests carried out on the samples submitted with the offer and samples drawn from the delivered lots are as shown in **Annex 1.**

Composition of materials will be tested at an accredited testing laboratory.

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Annex - I

TESTING REPORT OF STOP VALVES

Tests for Stop Valves at National Water Supply & Drainage Board Work Shop

1. Nominal Size

   - Bore of seating
   - Height of seating
   - Width of seal on face of body for joint washer
   - Depth of bore for internal thread BS pipe (parallel)
   - Width across flats of unflanged Hexagon on stop valve ends.

2. Testing

   - Test Pressure
   - Seat Test
   - Body Test
   - Comments

3. Marking

   - Manufacture's name or mark
   - The number of BS
   - The nominal size and direction of flow

4. Water way

   - System Flow rate
   - Flow rate through the value
   - Pressure before the value
   - Pressure after the value
   - Area through the seat of the value
   - Minimum area of water way

5. Inlet and Outlet threads (BS 21)

   - Inlet thread
   - Outlet thread

6. Washer plate and washer plate unit

   - The washer plate with its stem shall be made in one piece
   - If the washer plate is a sand or shell casting, it shall be machined all over
   - The washer plate in all tap sand valve shall be free to rotate in the hole in the spindle and shall be so secured as to lift with the spindle.

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7. Dimensions of heads and glands

- Dia. of face of flange for head seal
- Min. No. of threads in full engagement with body.
- Axial length of stuffing box
- Length of external thread on gland
- Thickness of flange of gland
- Axial length of hexagon.
- Size of hexagon over flats.

8. Dimensions of spindle, washer, washer plate and handle

- Size across flats of squire end of spindle
- Dia. of stem of washer plate
- Outside dia of washer plate (flat type)
- Inside dia. of washer plate (Shrouded type)
- Inside dia of washer plate (Shrouded type)
- Length of washer plate stem
- Thickness of washer plate
- Thickness of washer
- Lift of washer plate (with washer in position)
- Outside dia. of washer.

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6B.11 SPECIFICATIONS FOR PIPELINE MARKER TAPE

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Pipeline Maker Tape Specification

For Non Metallic Pipe lines

All pipelines shall be marked with an acid and alkali resistant polyethylene detectable warning tape with a minimum width of 300 mm and shall consist of all accessories necessary for installation at the chambers, splicing, junctions etc. The tape shall be blue in colour and Cleary marked in back lettering with "CAUTION – WATER MAINS BELOW" in both English, Sinhala & Tamil languages with a maximum repeat distance of not more than 1 m. The tape shall be placed during backfilling of the pipeline trench at a 300 mm above the pipeline or as indicated on the drawings.

The tape shall have a minimum strength of 125 kg/sq. cm in the longitudinal direction and 105 kg/sq. cm transversely. The minimum thickness of the tape shall be not less than 0.4 mm comprising of minimum polyethylene sealing layer of 0.1mm, minimum aluminum foil of 0.075 mm.

The warning tape shall meets the following requirements.

- Minimum ultimate tensile strength at break (longitudinal and transverse) shall be 10 MN/m^2 as determined by BS 2782 method 301E.
- Minimum Elongation shall be 300% (Longitudinal) and 350% (Transverse).
- Shall be resistant to chemical attack from the ground conditions with pH ranging from 3.0 to 9.0.

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The metallic conductor(S) shall be either aluminum foil having a width of not less than 50 mm and a thickness of not less than 0.075 mm or stainless steel wires. The aluminum foil shall be not less than 99.5% pure. The foil/wires shall be totally enclosed within the Polyethylene/PVC laminate such that the edges of the foil are totally protected against corrosive attack. The aluminum foil/wires shall be detectable from the ground surface using a buried cable detector. The manufacture of the tape shall provide methods for joining and terminating the tape to enable a low resistance connection to be made to the foil/wires. Electrical connection points (Aluminium foil connection) shall be made at each chamber or each discontinuations of tape along the pipeline route.

For all Metallic Pipe lines

All non metallic pipelines shall be marked with an acid and alkali resistant Polyethylene/PVC warning tape with a minimum width of 300 mm and shall consist of all accessories necessary for installation at the chambers, splicing, junctions etc. The tape shall be blue in colour and Clearly marked in back lettering with "CAUTION – WATER MAINS BELOW" in both English, Sinhala & Tamil languages with a maximum repeat distance of not more than 1 m. The tape shall be placed during backfilling of the pipeline trench at a depth 300 mm above the pipe line. The tape shall have a minimum strength of 125 kg/sq.cm in the longitudinal direction and 105 kg/sq. cm transversely. The minimum thickness of the tape shall be not less than 0.4 mm.

The warning tape shall meets the following requirements.

- Minimum ultimate tensile strength at break (longitudinal and transverse) shall be 10 MN/m^2 as determined by BS 2782 method 301E.
- Minimum Elongation shall be 300% (Longitudinal) and 350% (Transverse).
- Shall be resistant to chemical attack from the ground conditions with pH ranging from 3.0 to 9.0.

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6B.12 SPECIFICATION FOR BOLT JOINT PROTECTION (MASTIC) MATERIALS

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SPECIFICATIONS FOR MASTIC MATERIAL

1.0 General Requirement

"Mastic" is a cold applied, self-applied, self-supporting material for sealing, filling and caulking application where a protective, waterproof and non-setting material is required. Profiling mastic shall not contain volatile organic compounds and shall be self supporting and non cracking. Mastic should remain permanently plastic while being impervious to moisture. This shall be highly resistant to mineral acid, alkalis, salts and mechanical stress over a wide temperature range. Mastic shall be Suitable for application in a wide range of climatic conditions. It is specially recommended around pipes to prevent the water seeping through the joint. This is used for moulding around irregular profiles such as flanges, mechanical joints, and valves to provide a contour suitable for wrapping with anti-corrosion tapes.

2.0 Technical Properties:

Properties of Primer, Mastic Paste and Mastic Tape shall be as given below.

Mastic Primer

TYPICAL PROPERTIES	DATA
Specific Gravity	>1 g/cm^3
Flash Point	>100^{0}c

Mastic Paste

TYPICAL PROPERTIES	DATA
Specific Gravity	More than 1.1 g/cm^3
Specific Volume	Less than 730cm^3/kg
Flash Point	180^{0}c
Maximum Service Temperature	70^{0}C
Solid content	98% or more

Mastic Tape

TYPICAL PROPERTIES	DATA
Flash Point	>160^{0}c
Maximum Service Temperature	>70^{0}C

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3.0 Application

The following procedure shall be applied for the protection of flanged joints.

1. Pipe joints and adjacent area of pipe shall be cleaned and all loose scale rust and dirt, etc removed before protection materials are applied.
2. The application of continuous coating of petroleum paste over the whole area to be protected as a primer, including bolt heads, nuts, flanges etc.
3. Where bolt heads, nuts, flanges and other projections arises, profiling mastic shall used to give a smooth external profile, extending upto the end of the special wrapping to form a tapered profile.
4. Flange joint including Bolt heads, nuts, flanges and other projections and hollows shall be filled with a profiling mastic to give a smooth external profile to suit the smooth wrapping.
5. The joint shall be spirally wrapped with a self adhesive protective tape. Minimum application shall be a spiral wrap with 55% overlap. Care should be taken to ensure that tape is in contract with the under laying surface to prevent wrinklers or air pockets. The tape shall extent minimum of 150mm along the barrel of the pipe on each side of the joint and finished smooth so that no water shall seep through the wrapping.

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6B.13 SPECIFICATION FOR PIPE LAYING

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SPECIFICATIONS FOR PIPE LAYING

General Specifications for Pipe laying

Latest Edition of the following specifications published by the Institute for Construction ,Industry Development Authority (CIDA) shall be used in respect of this contract.

a) Specifications for Building Works (Volume 1 & 2) 3rd obtain July, 2004

b) Specifications for Water Supply, Sewerage and Storm Water Drainage Works

c) Specifications for Irrigation and Land Drainage Works

d) Specifications for Electrical and Mechanical Works associated with Building and Civil Engineering.

Specifications in addition to the above specifications are included in the contract document. Specifications included in this Document supersedes ICTAD specifications. Any specifications which are not covered by the above specifications will be issued by the employer on the request.

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6B.14 SPECIFICATIONS FOR TRENCH EXCAVATION, BACKFILLING & ROAD REINSTATEMENT

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Specification for Trench Excavation, Backfilling and Road Reinstatement for Pipe Laying

1. Pipe Trench Excavation - General

Trench excavation means excavation in all materials of whatever nature encountered for trenches into which pipes are to be laid or pipe appurtenances constructed. Pipe shall mean pipe of all kinds and for whatever purposes.

The contractor would be required to provide shoring for the trenches in order to minimize damage to the roads and also other utilities. If the Contractor is required to excavate a trench, wider than the maximum trenches width, prior approval of the Engineer should be obtained. However, the contractor shall bear the total responsibility for damages to utilities, backfilling and compaction of the trench as per specifications and reinstatement of roads occurred as a results of collapse of side of the trench. Road reinstatement both temporary and permanent shall be measured in linear meters along the top surface of trenches for different diameters of pipes.

Disruption to traffic should be minimized. The Contractor should provide necessary measures for the safety of pedestrians, vehicles etc. All open trenches and backfilled areas should be protected by providing proper barricading, night lighting and also steel plates etc. when necessary. Road signs at either ends of the road warning motorists and pedestrians should be erected. Any damage to vehicles or injured to public and the damage to third party property due to the above excavation work or during movement of machinery should be the responsibility of the Contractor. It may be necessary to transport the excavated material temporarily to other locations. Required traffic control arrangements in concurrence with the traffic police and Local Authority should also be provided by the Contractor.

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Contractor shall take every precautions to minimize damages to third party property due to excavation and backfilling of pipe trenches. Any damages to third party property shall be rectified and made to the good condition at the contractor's cost.

Trenches shall be carried out manually if excavation using machinery poses a potential danger to the roads and third party property including other utilities. The trench shall be excavated to required depth and trimmed the bottom to specified gradient as shown in the drawings. Any excessive excavation shall be filled and compacted by the contractor at his own cost as directed by the Engineer.

Asphalt cutters should be used when damaging asphalt concrete and concrete paved roads.

Prior to the commencement of pipe laying as far as practicable, Engineer shall nominate a soil testing laboratory and inspected the pipeline trace jointly with the Contractor to decide on the suitability of the materials to be excavated for backfilling of the trenches.

Engineer along with the soil laboratory personnel will decide on the locations where the soil tests are to be carried out to determine the soil parameters setout in Clause 2(v) and details given in the drawing Nos. WT 301/BT/01 & WT 301/BT/02 and

decide on the suitability of the excavated material for backfilling based on the test results and recommendations of the soil laboratory personnel.

If the excavated soil is found to be unsuitable, Engineer shall inform the Contractor of the sections of the pipeline trace to be backfilled with imported soil from the approved borrow pits.

2. Trench Alignment and Grade

Before starting excavation in any road the Contractor shall have obtained the approval of the Engineer and Engineer shall obtain the approval of the relevant Road Authority for Contractor's detailed work programme for the trench excavation in roads ahead of the particular work. This programme shall contain the names of the roads and chainages to be excavated, date of commencement and planned completion date of backfilling, planned dates of completion of temporary and permanent road reinstatement, and the dates of handing over to the relevant Road Authority. No excavation shall be permitted unless the Contractor shall have obtained approval of the said programme as aforesaid and can demonstrate that all necessary pipes fittings materials and plant are available on site for the speedy completion of all the work.

i Construction Alignment and Grade

The line and level of trenches shall be as shown on the Drawings or as determined from the Drawings or as may be directed by the Engineer. Before commencing trench excavations, the route of the trench shall be pegged out accurately and the natural ground levels shall be agreed with the Engineer. Strong sight rails shall then be fixed and maintained at each change of gradient, and at as many intermediate points as may be necessary. On these rails shall be marked the centre line and the level to which the excavation is to be carried out, such rails being not more than 50 m. apart and at changes of direction and grade.

ii. Changes in Line and Grade

In the event obstructions not shown on the plans are encountered during the progress of the work which will require alternations to the plans, the Engineer shall have the authority to change the plans and order the necessary deviation from the line and/or grade. The Contractor shall not make any deviation from the specified line and/or grade without approval by the Engineer. Should any deviations in line and/or grade be permitted by the Engineer in order to reduce the amount of rock excavation or for other similar convenience to the Contractor, any additional costs for thrust blocks, valves, air and vacuum assemblies, blow-off assemblies, extra pipe footage , manholes or other appurtenances shall be borne by the Contractor. The Contractor shall include in his unit rates in the contract provision to cover any deviation from the invert grade shown on the plans to facilitate extra depth required to eliminate possible conflicts between culverts and other utilities.

"For References ONLY" (Not for Bidding)

iii. Trench widths

Trench excavation shall be carried out by such methods and to such lines, dimensions and depths as shall allow for the proper construction of the works, provided always that, unless the Engineer permits otherwise, for trench excavation, the Table 1, shall be referred for nominal trench widths and depths. Any changes to Table 1, if necessary depending on the special conditions shall be authorized by the Engineer.

Trenches shall have vertical sides or battered trench as specified herein unless otherwise authorized by the Engineer.

Notwithstanding the foregoing, any rock in trench excavation shall be so excavated that the clearance between the pipe when laid and the rock sides and bottom of the trench is kept to the minimum limits necessary to provide for the specified thickness of bedding and concrete protection of the pipe. Bell holes and holes and depressions for couplings, valves and the like shall be excavated the same distance below these installations.

iv. Working Space

Excavation for structures such as valve chambers etc. shall be allowed 30 cm working space for purposes of establishing Contractor's liability for permanent reinstatement costs.

v. Backfill Material

Soils used as backfilling material shall be naturally occurring soils and shall not be highly plastic clays, silts, peat of other organic soils or any soil that is mixed or contaminated with the top soil, vegetation and other deleterious matter. Material used for backfilling shall conform to the requirement of Type 1 materials as given below.

Type 1 material shall be soil having the maximum dry density under standard conditions of proctor compaction not less than 1600 Kg/m^3 with the properties plastic limit <15, liquid limit (LL) < 40, CBR >20.

Materials excavated from the trenches may be used as backfill provided it meets the requirements specified for backfill material. Surplus materials from excavations shall be removed and disposed of by the Contractor as required by the Engineer and as specified on contractors cost. The trench shall be dug only so far in advance of pipe laying as the Engineer shall permit.

Where in the opinion of the Engineer sufficient supplies of the aforesaid material for trench refilling cannot reasonably be obtained from excavations, the Engineer may order the Contractor to carryout following.

"For References ONLY" (Not for Bidding)

a) Remove Stones

To carry out such work as may be necessary to sieve out stones, from the excavated material at contractors cost.

b) Borrow

If the excavated soil from trench is not satisfy the requirements, imported soil to be used for backfilling of trench. The Contractor shall take every steps to excavate suitable material from borrow areas and transport it to the length of trench to be backfilled, and the Contractor shall do any or all of these things as directed and as specified in the drawings and the specifications with own cost.

TABLE 1. DETAILS OF TRENCH WIDTH AND DEPTH UPTO THE INVERT FOR THE PIPE LAYING
(Minimum Recommended)

"For References ONLY"
(Not for Bidding)

PE Pipes

Dia. (mm)	Trench	
	Width (m)	depth (m)
90	0.30	1.00
110	0.40	1.12
125	0.40	1.14
140	0.40	1.15
160	0.45	1.17
180	0.45	1.19
200	0.45	1.21
225	0.50	1.24
250	0.50	1.26
280	0.60	1.29
315	0.60	1.33
355	0.70	1.37
400	0.70	1.41
450	0.70	1.46
500	0.75	1.51
560	0.90	1.64
630	0.90	1.64

DI Pipes

Dia. (mm)	Trench	
	Width (m)	depth (m)
80	0.60	0.95
100	0.60	0.95
150	0.60	1.00
200	0.60	1.20
250	0.60	1.25
300	0.60	1.30
350	0.75	1.35
400	0.90	1.40
450	0.90	1.45
500	0.90	1.50
600	1.10	1.60
700	1.20	1.70
800	1.30	1.90
900	1.50	2.00
1000	1.60	2.10
1100	1.70	2.25
1200	1.80	2.40
1400	2.00	2.60

PVC Pipes

Dia. (mm)	Trench	
	Width (m)	depth (m)
63	0.30	0.90
90	0.45	1.10
110	0.45	1.20
160	0.60	1.20
225	0.60	1.30
280	0.60	1.30
315	0.75	1.35

Note :- Thickness of beddings are excluded.

3. Trial Holes

Trial holes shall be excavated well ahead of the trench excavation to such depths as necessary to determine and confirm the alignment for the trench. Trial holes may also be required by the Contractor to determine the position of underground services, sub-soil drains or rock profile for any other reason. The Contractor shall obtain all necessary permissions from the Road Authorities for the excavation of trial holes. Trial holes shall be excavated at a distance of 50 m or as directed by the Engineer.

3.1 Reinstatement of Trial Holes

The Contractor shall arrange the refilling and reinstatement of trial holes to be carried out immediately after the required information is obtained. The reinstatement of the surfaces of trial holes shall be carried out to the approval of the Engineer and the relevant Roads Authority at the contractor's cost.

4. Trench Excavation in Roads

When excavating trenches along public roads, the Contractor shall comply with the requirements and conditions of the relevant road maintenance authority having jurisdiction over the particular road, viz, the Road Development Authority (for major roads) the Provincial Road Development Authority (for secondary roads) for the Local Government Authorities (for minor roads).

The information provided regarding jurisdictions in the drawings titled 'Key Plan – Miscellaneous Information' is only as a guide and not to be taken as the final status. The Contractor shall obtain the information regarding the final status from the relevant authorities.

All trench excavation and other work carried out within the limits of any public road shall be completed as rapidly as possible and the Contractor shall make every effort to ensure that no more than half of the width of the carriageway shall be obstructed at one time. Road drains and kurbs shall be kept free from obstruction. The Engineer may direct that trench excavation in highways shall be located in footpaths or in verges rather than in the carriageway. If that is the case, trench excavation shall

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wherever practicable be carried out in such a way that every part of the excavation is at least 1m clear of the existing edge of the carriageway. In any event the Contractor shall take special precautions, which shall include the continuous support of the sides of the excavation, from the time when excavation is begun until the refilling of the trench is completed, to ensure that there is no disturbance of the adjacent road or road foundation. Where excavated material has temporarily been deposited on an adjacent surface, the surface shall on completion of refilling be restored entirely to its original condition and left free of loose stones.

4.1 Excavation in carriageway

The excavation of trenches in RDA roads shall be in the shoulders as far as possible. However, when excavations are needed within the carriageway, the Contractor shall take all the necessary care to minimize the area of damage to the road surface. Before starting excavation, the Contractor shall use asphalt cutting apparatus comprising a diamond disc or similar, to cut the surface of the carriageway along the intended line of excavation. Necessary shoring and road barricades, traffic diversion etc shall be provided by the Contractor.

4.2 Security requirements

The Contractor shall inform the relevant local police station regarding the excavation in public road at least one week prior to commencement.

4.3 Safety precautions

The Contractor shall erect and continuously maintain road signs and adequate lighting through out the night ahead of each end of excavation of trenches, warning about the excavation, until the temporary and Permanent reinstatement are completed. The road signs should be written in red luminous paint on white background so that they are visible at night to the vehicle drivers.

Safety precautions of workers and public shall always be taken during day time and also in night if night works are done.

Contractor shall take all precautions to protect workers, public and third party property during or in the process of rock excavation. In case of rock blasting, all precautions specified in the safety guidelines or Manuals or any other acceptable Manuals to the Employer by the Department of Labour, Sri Lanka shall be strictly followed. Suitable blasting technique shall be selected. Any damages to workers, public, third party property shall be compensated by the contractor at his cost.

Adequate protection shall be provided along the trench excavation to the approval of the Engineer. The excavated material shall not be deposited or dumped along the trench so that it will obstruct the movement of vehicles or pedestrians. If the Engineer or the Road Maintenance Authority directs so, Contractor shall remove the excavated material and store it elsewhere, until it is used for backfilling, at his own cost.

The Contractor shall maintain warning lights and barricades throughout the night at the road crossings until it is temporarily reinstated, or at the trench excavations if it has to be kept open overnight, or at any road excavation as directed by the Engineer.

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The Contractor shall supply any reasonable materials and/or manpower necessary to maintain a smooth traffic flow as required and as directed by the Engineer.

4.4 Road Closure

The Contractor shall make every effort to avoid complete closure of the roads for traffic due to the Construction activities.

In any event that this is unavoidable, the Contractor shall obtain the approval of the Engineer to that effect, furnishing all the details of the work. Contractor shall also obtain the permission from the Road Maintenance Authority, Local Government Authorities (MC, UC, PS) the Local Police Station and any other relevant authority, and shall abide by their requirements. The Contractor shall allow in his work programme for any delays which may arise in obtaining such permissions.

Contractor shall obtain necessary Insurance coverage or any other means to compensate the loss of Revenue of the Third Party Business Men, Transport Agencies, Bus Services etc. contractor shall relieve the Employer from any claims what so ever arising out of the closure of road.

5. Trench Excavation in Surfaces Other than Roads

Trench excavation in surfaces other than roads shall include all surfaces except those asphalt surfaces which require road reinstatement. These surfaces include but are not limited to fields, paddy fields, pasture land and the like, footpaths, verges, non-asphalted roads, lanes, alleys, bund embankment and all public and private lands.

Trench excavation located in fields shall, if the Engineer so requires, have temporary fencing erected around that length. Temporary fencing shall not normally be removed until the trench excavation has been refilled and reinstated. The Contractor is hereby notified that generally pipe alignments not in streets are covered with a vegetation growth which must be removed and disposed off the site of work. The Contractor shall have particular regard to the safety of livestock which may be in the area, and shall ensure that all open excavations, access routes and steep or loose slopes arising from the Contractor's operations are adequately fenced and protected. After the erection of temporary fencing where required, the Contractor shall remove top soil to such depth and over such area as may be necessary to provide sufficient material to ensure adequate surface reinstatement of the working areas occupied by the Contractor for construction of the pipeline.

Excavation in Asphalt roads and concrete paved roads shall be done using Asphalt cutter and concrete cutter to avoid damages to other parts of the road. Contractor shall remove re-concrete and Asphalt parts of the excavated soil as directed by the Engineer at this own cost.

6. Temporary Buildings

Temporary buildings sites (squatters) may also occupy pipeline rights-of-way. The Employer will remove the occupants and the Contractor may demolish the buildings

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as directed by the Engineer. The Employer, under the laws of Sri Lanka, is not required to obtain easements or be liable for loss of business for construction of water pipelines and appurtenances. However, the Contractor is required to limit the damage to any existing improvement and to make full compensation for any damage done as a result of the construction activities.

7. Bedding Types and Special Protection

It should be ensured that the trench bed is leveled in conformity with the levels as indicated in the drawing. The pipe bedding material shall be well graded and free from organic matter. Excavated material also could be used if it satisfies the requirements laid down in the drawing and with the approval of the Engineer.

The Contractor shall adopt the special bedding type A,B, C and D specified in the relevant type drawing where appropriate. When ground conditions requiring the use of special bedding types are encountered, the Contractor shall inform the Engineer, and with his approval, adopt the proper bedding type. The chainages indicate in the LS drawings for special bedding types, are only for guidance. Decision of the Engineer in this regard shall be final.

The filling material shall be the soil having the maximum dry density under standard conditions of compaction not less than 1600 Kg/m3 with the properties PL<15, LL<40, CBR >20 and the particle sizes not greater than 25mm.

The bedding material shall be Quarry dust, Mined sand or Crushed stone as specified in the relevant type drawing. When sand is used as bedding material, 100mm wide RCC grade 20 barriers at 50m intervals across the trench to cover full widths of the trench and full depth of the bedding shall be provided.

The trench shall have special protection when the soil condition is unfavorable in such a way the bearing capacity is less than 75 KN/m2. The Geotextiles shall be used to bear the soil load above where it is specified in the type drawing Nos. WT 403/BT/01A & WT 403/BT/02A (attached) or directed by the Engineer. The Table 2 given below shall be referred for the properties of Geotextiles.

The Geotextiles shall be wholly synthetic and is tropic fibrous material. It shall have properties not inferior to those listed in Table 2.

When the minimum specified cover to the pipe line from the surface cannot be maintained due to some special reason, the Contractor shall adopt the special protection type using concrete pre-cast slabs as specified in the relevant type drawing and as instructed by the Engineer.

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TABLE 2

Property	Test Method	Value	Unit
Tensile strength (wet and dry) under uniform applied stress		7500	N/m^2
Grab tensile strength	ASTM 1682 100m	660	N
Trapezoidal tear strength	ASTM 117	300	N
CBR Puncture resistance	DIN 54307E	1600	N
Burst Strength	ASTM 3786	1400	KPA
Pore Size		> 0.03 < 0.10	mm mm
Permeability to water under 100mm head		50	$l/m^2/sec$

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8. Supporting Trench Excavation

The Contractor shall effectively support the sides of all trench excavations which shall include the use of steel sheet piles where necessary to prevent any fall or sliding of the embankments or run from any portion of the ground outside the excavation into the trench and to prevent settlement of or damage to structures adjacent to the excavation. The Contractor shall be deemed to have made his own allowance for shoring up the sides of trenches, any extra excavation necessary to provide space for such support and for any other working space. If for any reason any portion of trench excavation shall give away, the Contractor shall at his own expense take all necessary remedial measures including the excavation and removal of all the ground thereby disturbed.

8.1 Battered Trench Sides

Where the Contractor elects and is permitted by the Engineer to execute trench excavations with battered sides instead of providing support as aforesaid they shall be excavated to stable slopes and heights as a slope of not steeper than one to one from a point of 30 cm above the top of the pipe. The toe shall be set back not less than 30 cm from the vertical face of the trench.

9. Trimming Trench Excavation

When excavating to specified levels for trench excavation or to specified limits for the face of any structure therein required to about undisturbed ground, the Contractor shall not excavate the last 15 cm until the Engineer permits otherwise. Should the Contractor have excavated to within 15 cm above these specified levels or to within 15 cm of these specified limits before he is ready or able to commence the constructional work he shall where required by the Engineer excavate further so as to remove not less that 15 cm and any such further excavation and additional foundation material ordered by the Engineer shall be at the cost of the Contractor. The bottom of trench excavations shall be carefully boned in and trimmed true to grade with the aid of a straight edge at least 6 m long as to ensure a continuous support for the pipes. Any stones or flints either likely to cause the pipe to bed unevenly or to damage the pipe and its coating of greater than 15 mm in size shall be picked out of the trench bottom and any holes so formed shall be filled in with soft material and trimmed to the correct level. All shattered and loose material shall be removed from the bottom of the trench excavations so that the bedding material rests on a solid and clean foundation.

10. Inspection by Engineer

When the specified levels of trench excavation are reached the Engineer will inspect the ground exposed and if he considers that any part of the ground is by its nature unsuitable, he may direct the Contractor to excavate further and to refill the further excavation with such materials as he may direct. Should the bottom of any trench excavation while acceptable to the Engineer at the time of the inspection subsequently become unacceptable due to exposure to weather conditions or due to flooding or have become puddled, soft or loose during the progress of the works, the Contractor shall remove such damaged, softened or loosened material and excavate further by hand. In this case the cost of the extra excavation and of the additional foundation materials required will be the Contractor's responsibility.

11. Disposing Material from Trench Excavation

Subject to any specific requirements of the Contract, the Contractor shall make his own arrangements for the temporary storage of any excavated material which is required for use in refilling trench excavations, including any necessary double handling. In this connection the Contractor shall have regard to the working areas available to him for the construction of the pipeline particularly where this is located in roads or in other places to which the public has free access. Any temporary tips alongside the trench excavations shall be to stable slopes and heights. Where the nature the excavated materials is suitable, the Contractor's temporary storage as aforesaid shall include for separate storage as the Engineer may direct of any of the various grades of material hereinafter specified for the refilling and surface reinstatement of trench excavation, namely, soft material , coarse material, hard material and topsoil. Any excavated material not required for or not suitable for use as refilling as aforesaid or use elsewhere in the Works shall become the property of the Contractor and he shall be entirely responsible for its removal from the Site and for its ultimate disposal. Contractors are reminded that when working along the carriageways it is often not possible to stack or place excavated materials along the

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trench and they may be required to remove such materials required for backfill to temporary sites to be provided by the Contractor and to return these materials on completion of pipe laying.

12. Trenches not to be Left Open

Trench excavation shall be carried out expeditiously and; subject to any specific requirements of the Contract, the refilling and surface reinstatement of trench excavations shall be commenced and completed as soon as reasonably practicable after the pipes have been laid and jointed. Pipe laying shall follow closely upon the progress of trench excavation, and the Contractor shall not permit more than 20 m of trench excavation ahead of pipe laying to remain open. The Contractor shall take precautions to prevent floatation of pipes in locations where open trench excavations may become flooded, and these precautions may include the partial refilling of the trench. If the Engineer considers that the Contractor is not complying with any of the foregoing requirements he may prohibit further trench excavation until he is satisfied with the progress of laying and testing of pipes and refilling of trench excavation. The Contractor shall not excavate trenches in more than one location in any one road at a given time without the Engineer's permission.

13. Control of Water

All excavation and placement of backfill and fill shall be carried out in the dry. The Contractor shall furnish, install and operate all necessary machinery, appliances and equipment to keep excavations free from water during construction, and shall dewater and dispose of the water so as not to cause injury to public or private property, or to cause a nuisance or a menace to the public. He shall at all times have on hand sufficient pumping equipment, potable Generators and other machinery in good working condition for all ordinary emergencies, including power outage, and shall have available at all times competent workmen for the operation of the pumping equipment. During excavation, construction of pits, etc. installation of pipelines and fittings, placing of structure and trench backfill and the placing and setting of concrete, excavations shall be kept free of water. The Contractor shall control surface runoff so as to prevent entry or collection of water in excavations. The static water level shall be drawn down a minimum of one of foot below the bottom of the excavation so as to maintain the undisturbed state of the foundations soils and allow the placement of any fill or backfill. The dewatering system shall be installed and operated so that the ground water level outside the excavation is not reduced to the extent that would damage or endanger adjacent structure or property.

"For References ONLY" (Not for Binding)

i Submittals

Before dewatering is started the Contractor shall file for record purposes only with the Engineer the method, installation and details of the dewatering systems he proposes to use.

ii Release of Groundwater

The release of ground water to its static level shall be performed so as to maintain the undisturbed state of the natural foundation soils, prevent

disturbance of compacted fill or backfill and prevent flotation or movement of structures, pipelines and sewers.

14. Backfilling Trench Excavations and Compaction

The backfilling material to be used shall be as specified above and indicated in drawings for type of pipes at different level in trench. Accordingly the backfill material which shall be used upto 300mm from the top of the pipe, or as indicating shall be a sandy material or quarry dust free of stones, hard objects etc. Excavated earth may be used for this purpose provided it meets the requirements and approved by the Engineer. For the remaining backfill excavated earth could be used if suitable. However the backfill material shall be free of particle size as specified in different level of layers in trench. If excavated material is not suitable the Contractor should bring specified material from outside.

During wet condition, if the excavated material from the trench cannot be compacted to the required degree, the Contractor may be required to use imported materials as backfilling. However if the excavated material have been spoiled by the Contractor due to his negligence, the Contractor shall be required to use imported material as directed by the Engineer at his own cost.

The standard compaction test shall be carried out as per test 12 of BS 1377 – 75 or ASTM D 698 – 98.

The backfill material shall be placed in layers of 150mm thick and well compacted. Where necessary the Contractor shall adjust the moisture content of the fill material either by drying out or by adding water to assist the compaction of the materials. During the compaction the backfill shall have a uniform moisture content equal to or a little above the optimum moisture content recorded in the compaction test. Backfill shall be compacted to a dry density of not less than 98% [or as indicated in the relevant drawing at different layers in the trench] of the maximum dry density. Suitable approved mechanical rammers shall be used for compaction.

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The remainder of the refilling may consist of coarse material including broken rock from excavation not greater than 25mm, free and clods of earth larger than 15 cm in size and boulders of any size and shall satisfy the soil properties given in Clause 2(v) hereof provided that the compacted backfill is, in the opinion of the Engineer, sufficiently dense to prevent material from the superimposed layers being washed into the voids in such backfill. This coarse material shall be spread in layers of not greater depth than 20 cm and be thoroughly rammed by an approved mechanical rammer.

The coarse filling is to be carried up to the surface level existed before the commencement of the Works (in roads and footpaths) or (elsewhere) to such level as with the surface reinstatement. Hard material such as broken rock and original road metalling shall not be used for the reinstatement of road.

i. Compaction

Where necessary, the Contractor shall adjust the moisture content of the refill material either by drying out or by adding water to assist the compaction of

the materials. During the compaction, the backfill shall have a uniform moisture content equal to or a little above the optimum moisture content recorded in the Compaction Test. Backfill shall be compacted to a dry density of not less than 98% of the Laboratory Proctor Density when tested in accordance with these specifications. The Contractor shall carry out a minimum of one compaction test each working day that back filling is taking place. The Contractor is advised to use clean sand or other clean granular material approved by the Engineer to obtain the required compaction in the presence of wet conditions, if the excavated materials or selected backfill materials cannot be compacted and the compaction work is held up.

The Contractor is advised to consider the cost of such materials in his rates. Sand backfilling shall only be laid on level areas and the sand water jetted to consolidate completely. When sand or clean granular materials are used, they shall be protected from washing away by capping with 150 mm of lateritic soil with proper moisture content compacted to 98%.

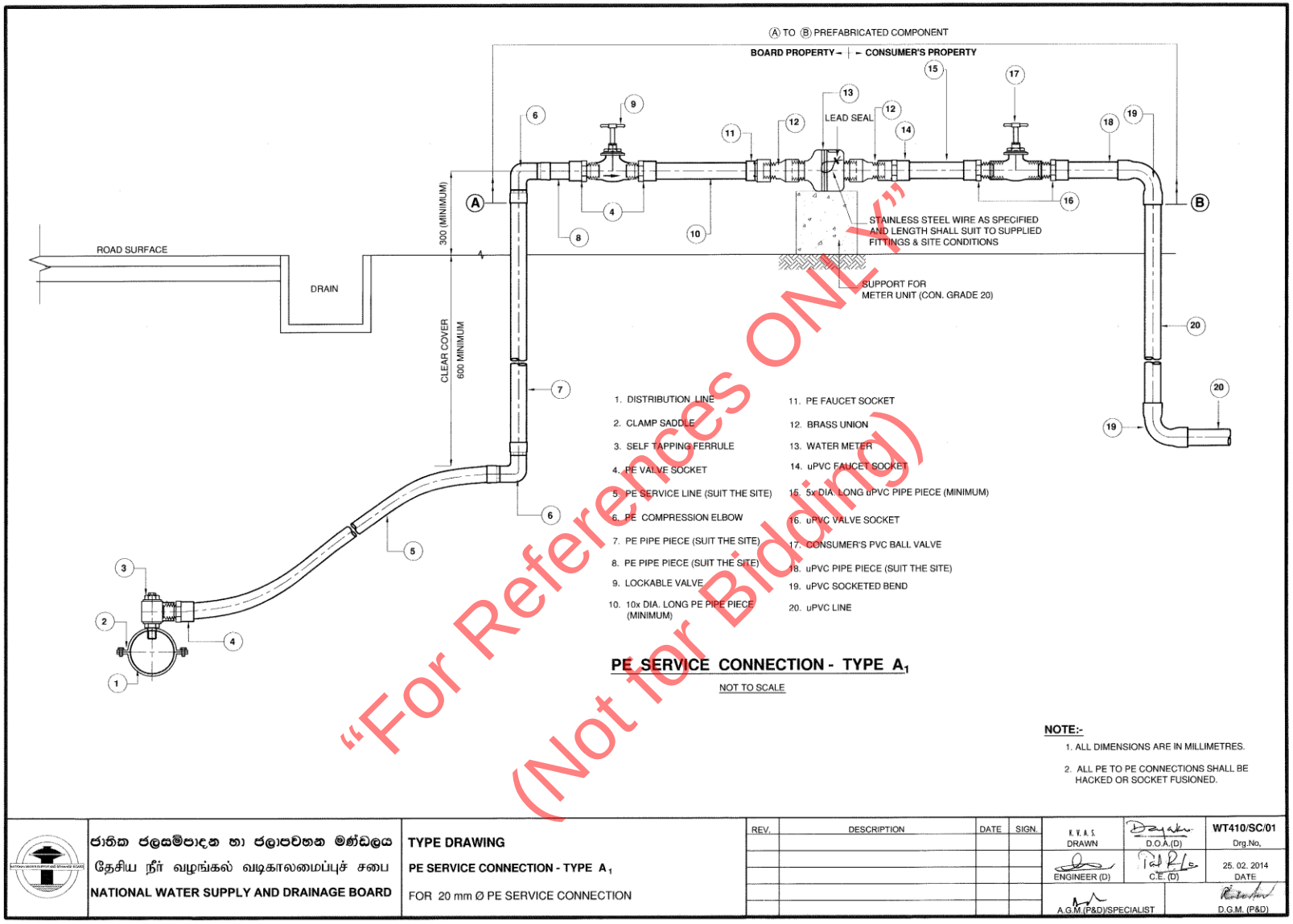
ii Miscellaneous

Should the material being placed as backfill, while acceptable at the time when approved, become unacceptable to the Engineer due to exposure to weather conditions or due to flooding or have become puddled, soft or segregated during the progress of works, the Contractor shall at his own expense remove such damaged, softened or segregated material and replace it with fresh approved material. To permit the proper consolidation of backfill into the voids behind trench sheeting and supports, trench sheeting shall be withdrawn gradually as backfill progresses in depth and along the trench. On no account shall any excavated material be dozed back when refilling trenches in roads and no backfilling shall be carried out unless in the opinion of the Engineer, sufficient mechanical rammers are in operation on that portion of the work. Where directed by the Engineer, trench excavations shall be refilled with concrete.

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15. Road Reinstatement

Road reinstatement shall be done as stated in the drawing Nos. WT 403/BT/01A & WT 403/BT/02A and as specified in the ICTAD Specification No. SCA/5, Second Edition June 2009 for Construction and Maintenance of Roads and Bridges.



PE SERVICE CONNECTION - TYPE A_1

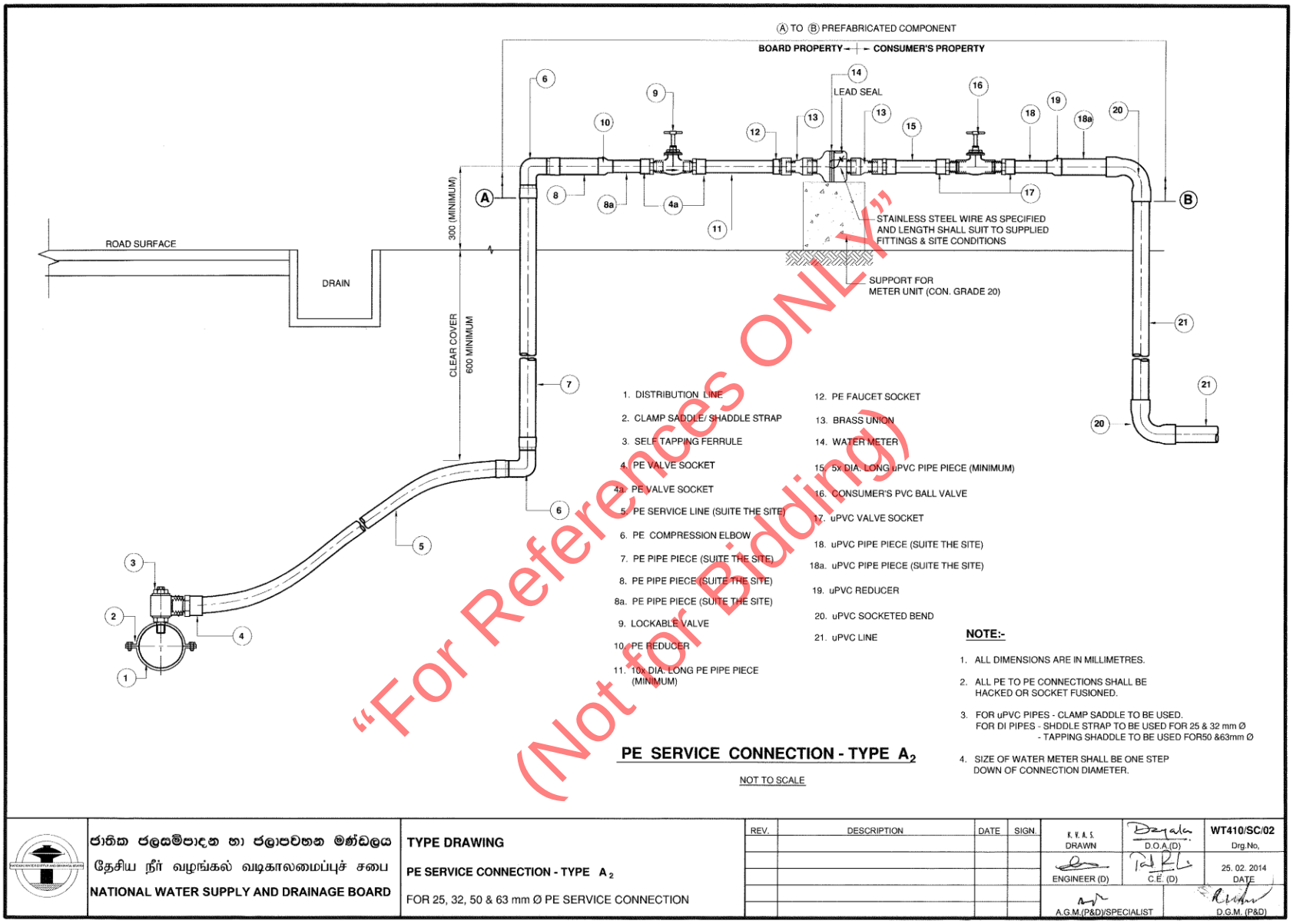
NOT TO SCALE

NOTE:-

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL PE TO PE CONNECTIONS SHALL BE HACKED OR SOCKET FUSIONED.

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ජාතික ජලසම්පාදන හා ජලාපවහන මණ්ඩලය தேசிய நீர் வழங்கல் வடிகாலமைப்புச் சபை NATIONAL WATER SUPPLY AND DRAINAGE BOARD	TYPE DRAWING PE SERVICE CONNECTION - TYPE A_1 FOR 20 mm Ø PE SERVICE CONNECTION	REV.	DESCRIPTION	DATE	SIGN.	K.V.A.S. DRAWN	D.O.A.(D)	WT410/SC/01 Drg.No,
						ENGINEER (D)	C.E. (D)	25. 02. 2014 DATE
						A.G.M (P&D)/SPECIALIST	D.G.M. (P&D)	



ජාතික ජලසම්පාදන හා ජලාපවහන මණ්ඩලය தேசிய நீர் வழங்கல் வடிகாலமைப்புச் சபை NATIONAL WATER SUPPLY AND DRAINAGE BOARD	TYPE DRAWING PE SERVICE CONNECTION - TYPE A_2 FOR 25, 32, 50 & 63 mm Ø PE SERVICE CONNECTION	REV.	DESCRIPTION	DATE	SIGN.	K.K.A.S. DRAWN	D.O.A.(D)	WT410/SC/02 Drg.No,
						ENGINEER (D)	C.E. (D)	25. 02. 2014 DATE
						A.G.M.(P&D)/SPECIALIST		D.G.M. (P&D)

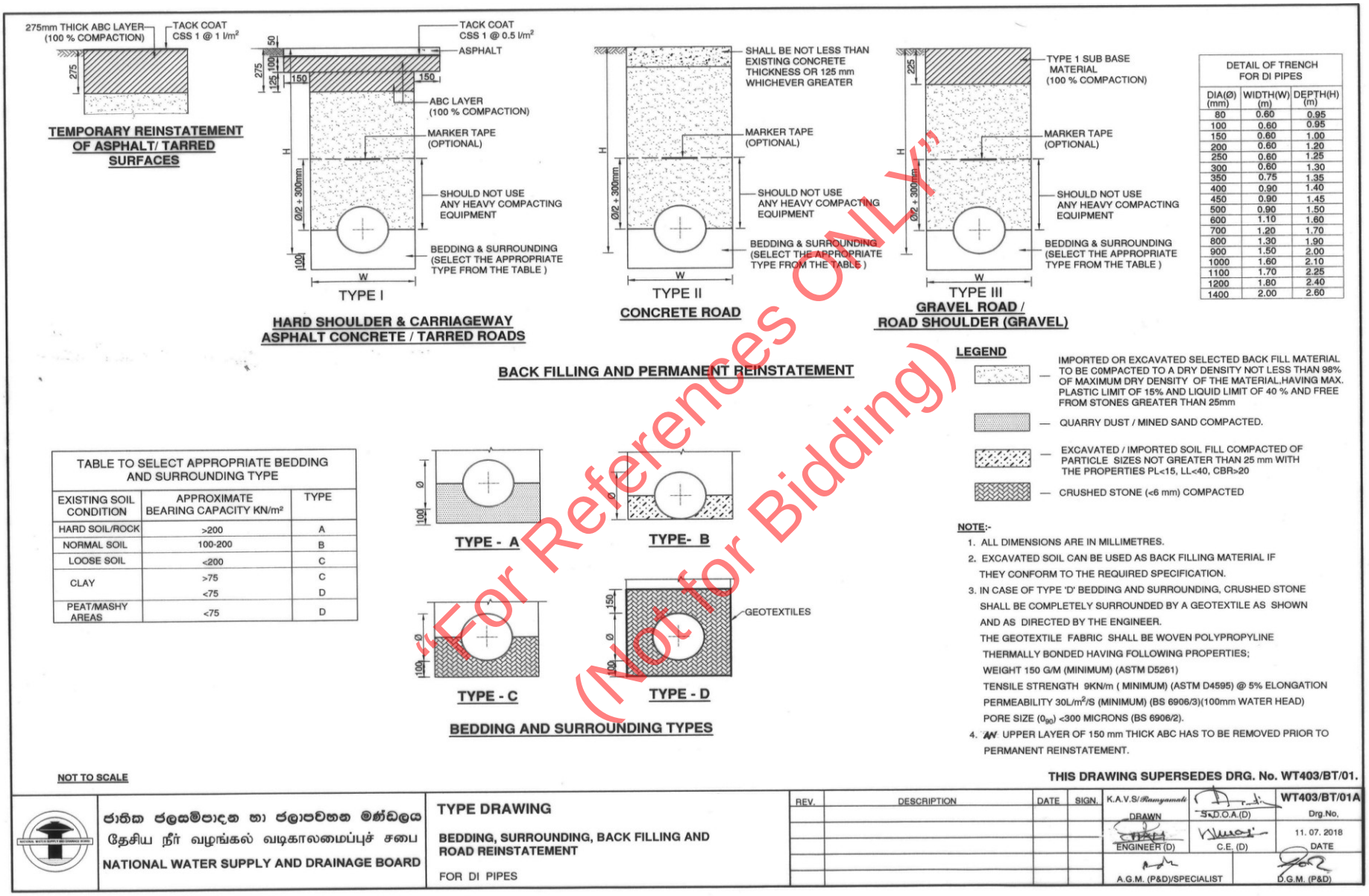
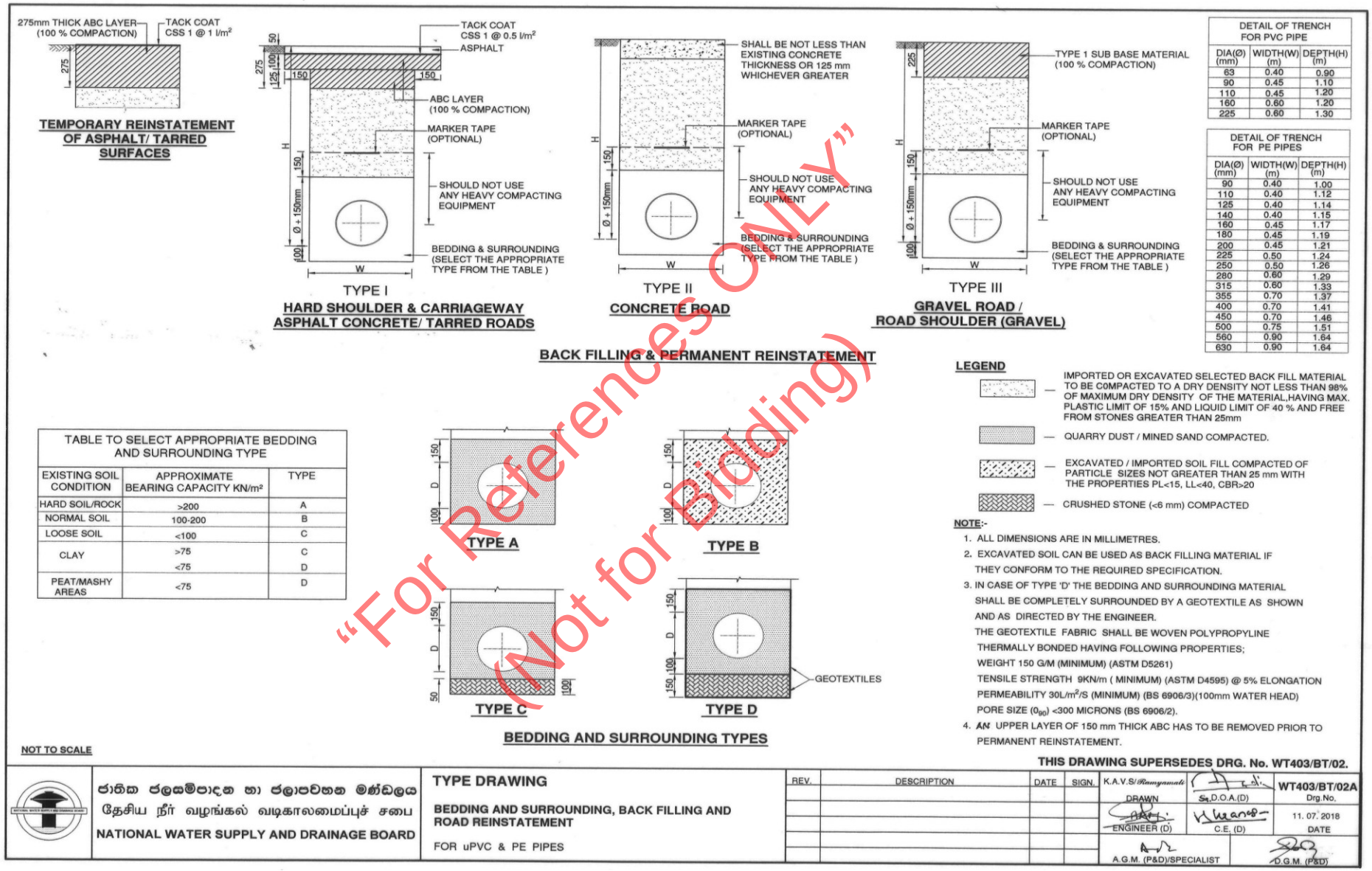


TABLE TO SELECT APPROPRIATE BEDDING AND SURROUNDING TYPE		
EXISTING SOIL CONDITION	APPROXIMATE BEARING CAPACITY KN/m²	TYPE
HARD SOIL/ROCK	>200	A
NORMAL SOIL	100-200	B
LOOSE SOIL	<200	C
CLAY	>75	C
	<75	D
PEAT/MASHY AREAS	<75	D

DETAIL OF TRENCH FOR DI PIPES		
DIA(Ø) (mm)	WIDTH(W) (m)	DEPTH(H) (m)
80	0.60	0.95
100	0.60	0.95
150	0.60	1.00
200	0.60	1.20
250	0.60	1.25
300	0.60	1.30
350	0.75	1.35
400	0.90	1.40
450	0.90	1.45
500	0.90	1.50
600	1.10	1.60
700	1.20	1.70
800	1.30	1.90
900	1.50	2.00
1000	1.60	2.10
1100	1.70	2.25
1200	1.80	2.40
1400	2.00	2.60

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Drawing No. WT 403/BT/01A



DETAIL OF TRENCH FOR PVC PIPE		
DIA(Ø) (mm)	WIDTH(W) (m)	DEPTH(H) (m)
63	0.40	0.90
90	0.45	1.10
110	0.45	1.20
160	0.60	1.20
225	0.60	1.30

DETAIL OF TRENCH FOR PE PIPES		
DIA(Ø) (mm)	WIDTH(W) (m)	DEPTH(H) (m)
90	0.40	1.00
110	0.40	1.12
125	0.40	1.14
140	0.40	1.15
160	0.45	1.17
180	0.45	1.19
200	0.45	1.21
225	0.50	1.24
250	0.50	1.26
280	0.60	1.29
315	0.60	1.33
355	0.70	1.37
400	0.70	1.41
450	0.70	1.46
500	0.75	1.51
560	0.90	1.64
630	0.90	1.64

TABLE TO SELECT APPROPRIATE BEDDING AND SURROUNDING TYPE		
EXISTING SOIL CONDITION	APPROXIMATE BEARING CAPACITY KN/m²	TYPE
HARD SOIL/ROCK	>200	A
NORMAL SOIL	100-200	B
LOOSE SOIL	<100	C
CLAY	>75	C
	<75	D
PEAT/MASHY AREAS	<75	D

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Drawing No. WT 403/BT/02A

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6B.15 SPECIFICATIONS FOR PROVISION OF SERVICE CONNECTION

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TECHNICAL SPECIFICATIONS

1 Pipes to be laid with a minimum cover of 750mm from the road surface irrespective of the depth of the distribution main and the class or the category of the road. Common mains shall be laid at depths specified in the specification for Trench Excavation and Backfilling.

2. Width of the trench excavated for shall be minimum of 400mm required for efficient work after allowing for shoring. Material excavated from trenches shall be laid such a way that it would not obstruct the road as to prevent the passage of traffic. The soil filled over the top of the pipe shall be free from stones & filled with care. Re-filling of excavated area should be carried out in layers, and as specified in the specification.

3. In regulating traffic flow sufficient barricades, signboards, warning tapes and lightings should be provided. Blinking light shall be provided during night work.

4. Deviation to the specifications/BOQ should be obtained in writing from the Engineer. Excavation to be done from the main distribution pipe up to 1.5 meter beyond the boundary of the premises (1.5m inside the premises).

5. The contractor shall not use additional material (pipes, special, valves etc.) other than provided by the Engineer, and in the service connection. In cases of deviation from this rule, contractor shall obtain prior approval of the Engineer.

6 The contractor shall submit a demand note, for the materials required for service connections assigned by the Board, which should be approved by the Engineer and shall supply the materials according to the work programme.

7. No pipe lines shall be passed through by breaking drains, walls of canals, culverts or permanent structures, if any, and shall always be laid below the same. Where such breakages are necessary, contractor shall obtain prior approval of the Engineer.

8. The excavated pit at the tapping point at the main pipe line shall be filled with sand up to 300 mm below the road surface and with ABC mixture upto the road surface and well compacted. The excavated trench upto the boundary of the premises shall be filled with ABC mix in 150 mm thick layers upto the road surface and well compacted on Asphalt roads. Excavated soil may be used for gravel roads depending on the properties of the soil. Proper compaction shall be carried out to the satisfaction of the Engineer.

9. Contractor shall at his cost remedy/re-do any work which is completed or in progress if such works are found to be not conform to the specification.

10. The contractor shall provide all labour plant and equipment as specified in the schedule for the performance of the contract according to the specifications, drawings & Bill of Quantities. If contractor feels that additional labour, plant and equipment in addition to specified in the schedule required for the completion of the work, he shall so provide at his cost.

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11. Contractor shall take every precautions to avoid damages or injuries to his own Staff, Gang, Employers staff at site, public and any property belongs to the employer public and third party.

    Any damage or injury or disablement to his staff Employer staff and Public due to his work or in connection with the work shall be compensated by the Contractor at his cost.

    Any damage to Employers property, public property or any private property shall be remedied by the contractor at his cost and shall be compensated by the contractor at his cost and contractor shall indemnify the Employer from all such claims.

    In the event of the contractor failing to act accordingly, the NWS&DB may make all compensations or do all making good or settle all claims, damages, costs & expenses and the cost of such procedure as well as the amount paid will be deducted from and act of any sum or sums that is due or may become due to the contractor under the terms of the agreements or otherwise.

12. The Contractor shall carryout the excavation for main tapping work according to the recommended dimensions given in Appendix 5 & Appendix 6.

13. The contractor should not operate the valves and other accessories of the distribution system under any circumstances.

14. Prior approval from Road Authority is a mandatory requirement for the excavations for service connections. For leak repair at least verbal approval should be obtained from the relevant road authority and should inform the relevant road authority and confirm the verbal approval in-writing later.

15. Back filling of service connections from the tapping point up to the meter chamber on Asphalted roads and tarred roads shall be carried out using the following materials.

    i. Quarry dust/ Sand filling for pipe bedding and upto 200 mm above the crown of pipe and compacted
    ii. Rest with the ABC upto the road level and well compacted in 100 mm thick Layers to obtain 98% compaction.
    iii. Excavated soil shall be disposed properly away from the location.

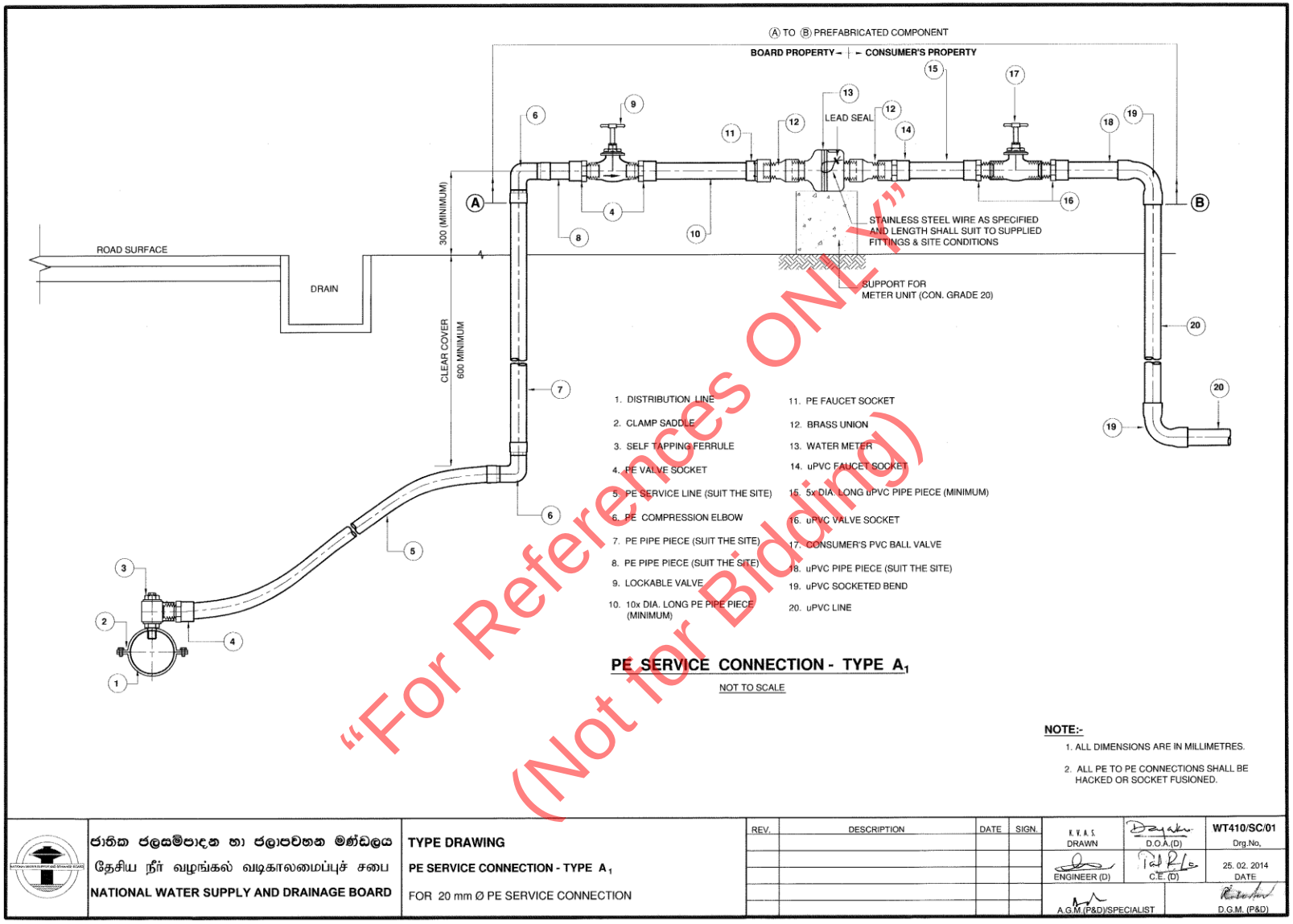
    For gravel roads, use excavated soil and compact in 150 mm thick layers to obtain 98% compaction without causing any damage to the under ground utilities or pipeline. If excavated soil is not good for the compaction, suitable soil shall be imported to the site or quarry dust/ ABC shall be used as directed by the Engineer.

    All excavations shall be backfilled, compacted and finished on the same day. No trench shall be left open in any case. If work is partly done for the day, trench shall be backfilled completely and re-excavate in next day. All costs associated with the re-excavation and backfilling shall be borne by the Contractor.

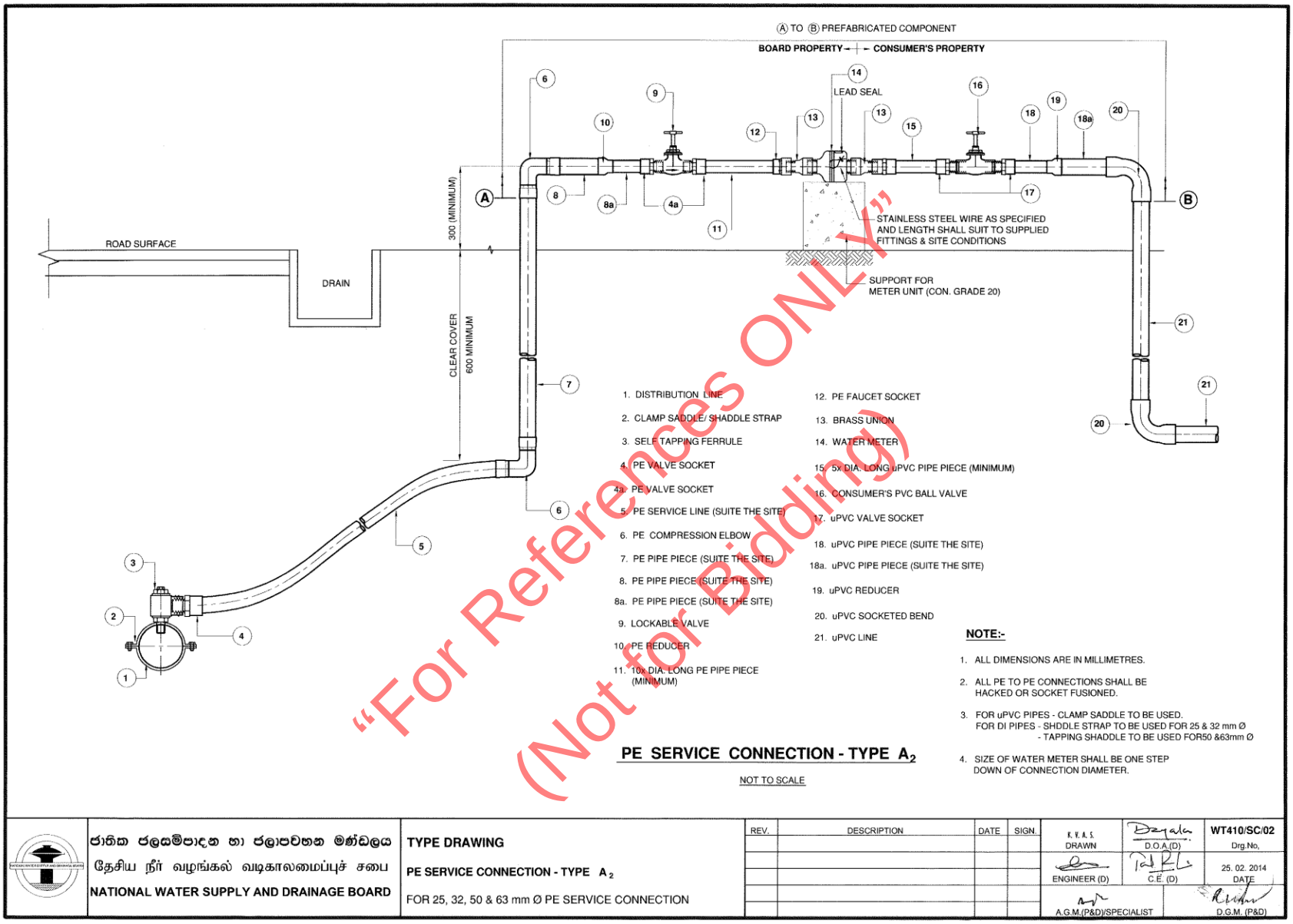
16. Safety is very important and shall be equipped with Barricades and tapes, cones, safety jackets with luminous tapes.

17. Contractor shall employ suitable persons with sign boards for traffic diversion until the work is completed.

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Ⓐ TO Ⓑ PREFABRICATED COMPONENT
BOARD PROPERTY
CONSUMER'S PROPERTY
LEAD SEAL
STAINLESS STEEL WIRE AS SPECIFIED AND LENGTH SHALL SUIT TO SUPPLIED FITTINGS & SITE CONDITIONS
SUPPORT FOR METER UNIT (CON. GRADE 20)
ROAD SURFACE
DRAIN
300 (MINIMUM)
CLEAR COVER 600 MINIMUM
A
B
1. DISTRIBUTION LINE
2. CLAMP SADDLE/ SHADDLE STRAP
3. SELF TAPPING FERRULE
4. PE VALVE SOCKET
4a. PE VALVE SOCKET
5. PE SERVICE LINE (SUITE THE SITE)
6. PE COMPRESSION ELBOW
7. PE PIPE PIECE (SUITE THE SITE)
8. PE PIPE PIECE (SUITE THE SITE)
8a. PE PIPE PIECE (SUITE THE SITE)
9. LOCKABLE VALVE
10. PE REDUCER
11. 10x DIA. LONG PE PIPE PIECE (MINIMUM)
12. PE FAUCET SOCKET
13. BRASS UNION
14. WATER METER
15. 5x DIA. LONG uPVC PIPE PIECE (MINIMUM)
16. CONSUMER'S PVC BALL VALVE
17. uPVC VALVE SOCKET
18. uPVC PIPE PIECE (SUITE THE SITE)
18a. uPVC PIPE PIECE (SUITE THE SITE)
19. uPVC REDUCER
20. uPVC SOCKETED BEND
21. uPVC LINE
NOTE:-
1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. ALL PE TO PE CONNECTIONS SHALL BE HACKED OR SOCKET FUSIONED.
3. FOR uPVC PIPES - CLAMP SADDLE TO BE USED. FOR DI PIPES - SHDDLE STRAP TO BE USED FOR 25 & 32 mm Ø - TAPPING SHADDLE TO BE USED FOR50 &63mm Ø
4. SIZE OF WATER METER SHALL BE ONE STEP DOWN OF CONNECTION DIAMETER.
PE SERVICE CONNECTION - TYPE A2
NOT TO SCALE
"For References ONLY" (Not for Bidding)
ජාතික ජලසම්පාදන හා ජලාපවහන මණ්ඩලය
தேசிய நீர் வழங்கல் வடிகாலமைப்புச் சபை
NATIONAL WATER SUPPLY AND DRAINAGE BOARD
TYPE DRAWING
PE SERVICE CONNECTION - TYPE A2
FOR 25, 32, 50 & 63 mm Ø PE SERVICE CONNECTION
REV. DESCRIPTION DATE SIGN.
K. K. A. S. DRAWN
D.O.A.(D)
ENGINEER (D)
C.E. (D)
A.G.M.(P&D)/SPECIALIST
D.G.M. (P&D)
WT410/SC/02
Drg.No,
25. 02. 2014
DATE

6B.16 SPECIFICATION FOR PRESSURE TESTING OF DI, CI & PVC PIPE LINES

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Inspection

If stipulated by the purchaser, all materials are subject to inspection and approval at the manufacturer's plant.

Inspection on delivery

All pipe and appurtenances are subject to inspection on delivery. Neither inspection nor failure to provide inspection shall relieve the manufacturer of the responsibility to provide materials meeting the requirements of the contract documents. Materials not conforming to the requirements of this standard shall be made satisfactory or replaced. Pipe or appurtenances that fail to comply with specified tests shall be made satisfactory or replaced.

Workmanship

All pipe and appurtenances shall be tested under pressure for defects and leaks in accordance with these Specifications.

Hydrostatic Testing

The testing methods described in this Specification are specific for water-pressure testing only. These procedures should not be applied for air-pressure testing because of the serious safety hazards involved with compressed air. Also, pipelines intended for buried service should generally be tested with the backfill in place.

Hydrostatic pressure test

Test restrictions

The test pressure shall not be less than 1.25 times the stated working pressure of the pipeline measured at the highest elevation along the test section and not less than 1.5 times the stated working pressure at the lowest elevation of the test section.

The test pressure shall not exceed the thrust restraint design pressure or 1.5 times the pressure rating of the pipe or joint, whichever is less (as specified by the manufacturer)

Valves shall not be operated in either direction at a differential pressure exceeding the rated valve working pressure. A test pressure greater than the rated valve working pressure can result in trapped test pressure between the gates of a double-disc gate valve. For tests exceeding the rated valve working pressure, the test setup should include a provision, independent of the valve, to reduce the line pressure to the rated valve working pressure on completion of the test. The valve can then be opened enough to equalize the trapped pressure with the line pressure, or the valve can be fully opened if desired.

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The test pressure shall not exceed the rated working pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves or butterfly valves.

Test setup and pressurization

Following the installation of any new pipeline, all newly laid pipe or any valved section thereof shall be subjected to a hydrostatic pressure test. Each valved section of pipeline shall be slowly filled with water. When venting air from pipelines, it is important to limit the pipeline fill rate to avoid excessive surge pressures when the water reached the air venting opening (s). The specified test pressure shall be applied using a suitable pump connected to the pipeline. (Note: The specified test pressure shall be based on the elevation of the lowest point of the pipeline or section under test and corrected to the elevation of the test gauge-see test restrictions). Before applying the specified test pressure, air shall be expelled completely from the pipeline section under test. If permanent air vents are not located at all high points, corporation cocks (cocks which are used to give service connections from the main pipeline) shall be installed at these points to expel any air as the line is filled with water. Use of corporation cocks above rated pressure must be at the risk of the user and authorized specifically by the manufacturer. Following removal of any air, the corporation cocks shall be closed and the test pressure applied (at the conclusion of the pressure test, the corporation cocks shall be removed and the pipe plugged, or left in place as required by the contract documents). The pipeline shall be allowed to stabilize at the test pressure before conducting the hydrostatic test. This may require several cycle of pressurizing and bleeding trapped air prior to beginning the test. The hydrostatic test shall be of at least a 2-hr duration. The test pressure shall not vary by more than $\pm$ 34.5kPa for the duration of the test. Test pressure shall be maintained within this tolerance by adding makeup water through the pressure test pump into the pipeline. The amount of makeup water added shall be accurately measured (liters per hour) by suitable methods and shall not exceed the applicable testing allowance as specified below.

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Examination

Any exposed pipe, fittings, valves, hydrants, and joints shall be examined carefully during the pressure test. Any damaged or defective pipe, fittings, valves, hydrants, or joints that are discovered during or following the pressure test shall be repaired or replaced with reliable material, and the test shall be repeated until satisfactory results are obtained.

Testing allowance

Testing allowance shall be defend as the maximum quantity of makeup water that is added into a pipeline undergoing hydrostatic pressure testing, or any valved section thereof, in order to maintain the specified test pressure (after the pipeline has been filled with water and the air has been expelled) No pipe installation will be accepted if the quantity of makeup water is grater than that determined by the following formula.

In metric units,

$$Lm = \frac{SD\sqrt{P}}{794{,}797}$$

Where

Lm = testing allowance (makeup water), in liters per hour

S = length of pipe tested, in meters

D = nominal diameter of the pipe, in millimeters

P = average test pressure during the hydrostatic test, in kilopascals

When hydrants are in the test section, the test shall be made against the main valve in the hydrant.

Acceptance of installation

Acceptance shall be determined on the basis of testing allowance only. If any test of a new pipeline discloses a testing allowance greater than that specified above, repairs or replacements shall be accomplished. All visible leaks are to be repaired regardless of the allowance used for testing.

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6B.17 SPECIFICATIONS FOR PRESSURE TESTING OF HDPE PIPELINES

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1. Introduction

It is of paramount importance that new pipeline installations are fit for purpose and it therefore follows that the new systems should be demonstrated to be secure and watertight. In 2000, BS EN 805 was published and provides advice on different test methods that may be used to assess pipelines for leakage.

2. Scope

The procedure for the testing of HDPE pipelines involves raising pressure in a controlled manner to the System Test Pressure (STP) and allowing the pressure to decay after isolating the main. The assessment follows the principle of specifying an acceptable limit of the pressure loss over test time and test length.

For HDPE pipelines, viscoelastic stress relaxation effects affect the simple linear decay in pressure since they will lose pressure without any leakage being present as the molecular structure relaxes, a phenomenon usually referred to as 'creep'. These effects dominate the pressure decay until some 24 hr. - 36 hr. after reaching STP.

It is good practice to also test joints and connections to the pipeline to ensure a leak free system.

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3. General considerations

3.1 Safety

In all hydraulic testing, there are dangers involved when high pressures are being employed. All applicable national health and safety regulations should be taken into account.

Specific hazards:

- High pressures could be dangerous if there is an unexpected pipeline failure.
- Forces on end fittings or thrust blocks during testing are high and insecurely anchored ends could lead to the end caps blowing off.
- Air in the pipeline is compressed during testing and can lead to a massive and sudden release of stored energy.

Care needs to be taken:

- Only competent and trained staff who are aware of the risks should be allowed near to any exposed part of the pipeline when it is under pressure.

- The test area should be cordoned off and a warning notice erected when the test is in progress.
- When a long length of main is under test, staff involved in the test should be in radio / mobile phone contact at all times.
- Air in the pipeline should be minimized through release through air valves, flushing, and the careful and correct operation of valves while charging the main.

3.2 Selection of Testing Section and Length

There is no theoretical limit to the maximum length of main that can be tested, but there are a number of practical issues which limit the length. These are:

- The diameter of the HDPE pipe
- The number of joints and fittings on the main.
- The availability of potable water to pre-charge the main.
- The point of discharge of water after the test.
- The differences in elevation on the main to meet the System Test Pressure.
- The ability to identify the source of any leak detected.
- The time available in which to obtain a valid test result.

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Good engineering practice recommends lengths of test sections up to 500m for distribution network. Testing of shorter sections (as recommended) will provide better control, maintenance & inspection during testing than testing of longer sections which would require additional manpower, multiple pumps for achieving System Test Pressure, and difficulty in reaching a stable pressure during testing, etc.

However, the length to be tested shall be decided jointly with the Engineer.

3.3 Choice of System Test Pressure (STP)

The method for choosing the System Test Pressure in BS EN 805 is that STP should be Maximum Design Pressure (MDP) X 1.5. The MDP is defined by BS EN 805: 2000 (clause 3.1.5) as the maximum continuous operating pressure (Working Pressure) of the pipeline

4 Testing

4.1 General

New pipelines, shall be tested successively in lengths concurrently in parallel with the progress of construction, in accordance with the approved work programme, and in accordance with the local standards and regulations. All flushing and cleaning, and testing operations shall be performed in the presence of the Engineer or his representatives. Tests shall be notified in writing to the Engineer with at least 3 days' notice.

During the works, and prior to the completion of backfilling, site inspections and measurements shall be carried out, as specified, to demonstrate with the Engineer's representatives that pipelines and chambers are to correct lines and levels, the joints and connections are sound, and there is no damage or deformation. Following the site inspections, if necessary the Contractor shall promptly make good any defect and correct any works not in accordance with the contract, in accordance with methods approved by the Engineer, before further repeat inspections shall again be required.

After the installation pipework and chambers, but before completion of final reinstatement of road surfaces the Contractor shall carry out cleaning, flushing, visual tests, and hydrostatic pressure testing in accordance with this Sub-Clause, and in accordance with the local standards and regulations, and generally in accordance with BS EN 805: 2000.

The Contractor shall supply and mobilize all necessary labour, materials, water supply, equipment, pipe sections, test apparatus, calibrated pressure gauges, safety equipment and apparatus, personnel access equipment, personnel PPE, and all as necessary for carrying out the cleaning and hydrostatic pressure tests. The Contractor shall provide all means and apparatus necessary for introducing the water into the pipelines, firstly for flushing and then again for testing, including all necessary pumps, gauges, meters, plugs, caps, blow off piping, etc. as well as necessary struts, and thrust blocks for end caps during the flushing and testing.

The Contractor shall submit to the Engineer his programme of cleaning, testing and commissioning works with sketches for each section to be tested, showing each section schematically in profile with the point of water filling and point of monitoring levels or pressure. Details of the sequence of operations to be followed, such as observation times, closing of air-valves, and release points shall be shown. The Contractor shall submit the measuring equipment to be used in the testing to the Engineer for his prior approval, and shall give notice of the time for the calibration tests for measuring equipment with the laboratory location, 1 week in advance, for the Engineer’s potential attendance.

Pressure pipelines shall be tested by means of a hydrostatic pressure test as specified, in lengths determined through the course of construction, in accordance with a programme approved by the Engineer, but in test-lengths not exceeding the lengths as specified. All pressure pipelines shall be cleaned and flushed, and then tested, as specified.

The further tests-on completion, in accordance with the General Conditions of Contract, will be carried out after final backfilling and after final surface reinstatement is complete.

The Contractor shall be responsible for all associated risks involved, and be deemed to have allowed for all expenses in connection with testing, in the relevant unit rates and prices in the Bill of Quantities. Water necessary for all tests shall be supplied by the Contractor at his own expense, and deemed covered in his bid Price.

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A test report shall be prepared in respect of each and every test performed, containing as a minimum, the number and date of the test, name of the pipeline section being tested, duration, results obtained, and decisions relating to rectification works transpiring and conclusions, and plans for any re-test if applicable. This report shall be signed by the Contractor and the Engineer, and successful tests fully signed before backfilling and final surface trimming.

Pipelines requiring repair, shall have water tests repeated following the completion of the repairs.

The Contractor is responsible for final tests-on completion and commissioning of the finished works and pipelines.

4.2 Cleaning and Flushing

On completion of the pipework, and connections, all pipelines shall be removed of all dirt, stones earth, pieces of wood, etc. which may have entered the works, by flushing, and by other additional means as necessary to achieve a clean clear pipe. The Contractor shall not use methods of cleaning that cause downstream accumulation of waste, silt, debris, etc. to occur within downstream drains or in downstream lakes and channels. If, in the opinion of the Engineer, the cleaning method used by the Contractor is causing significant damage to any other pipeline, chamber, manhole, culvert or property, then the Contractor shall implement, at his own expense, an alternative method approved by the Engineer. Upon completion of cleaning of each section, the Contractor shall immediately remove all objectionable matter and other debris from the site surrounds and dispose off-site.

Prior to hydrostatic pressure tests, the contractor shall flush all pipelines. Pipes shall be flushed at high rates of flow (velocity shall exceed 1.5 m/sec). This shall be carried out by releasing flows through washout valves at the low points. Pipework shall be flushed in sections for a period of time to be approved by the Engineer. Flushing of any section of pipework shall be repeated as required by the Engineer until a satisfactory result has been realized and the wash water runs clear.

The flushing sequence shall be such that wash water does not pass through works already flushed and cleaned. If this occurs, then the downstream pipework shall be re-flushed and cleaned at the Contractor's expense.

The Contractor shall prepare a flushing plan and submit it to the Engineer for prior approval.

The Contractor shall supply all necessary pipe fittings, equipment, transport and labour required for the flushing operations, including the water used for the operations.

Costs for the flushing and cleaning, prior to testing, shall be deemed included by the Contractor within his respective rates and prices for flushing and testing.

4.3 Hydrostatic Pressure Tests for Pressure Mains

Pressure pipelines shall be tested as specified herein this Sub-Clause and generally in compliance with the international standards BS EN 805-200.

All HDPE welded joints shall be completed and allowed time to cool (at least 1 hour after last welding process) prior to hydrostatic pressure testing. All pipework must be fully well-

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compacted backfilled prior to testing. Some joints may be left exposed if practical and at the discretion of the Engineer (however, the requirement of preventing direct sunlight shall be maintained).

All concrete thrust blocks shall be completed at all bends, tees, reducers, valves and end caps. prior to the start of testing. Typical minimum curing times are 36 hours for early strengths and 7 days for normal strengths.

For pressure pipelines up to PN10 and PN16, the imposed hydrostatic test pressure shall be 1.5 x Working Pressure (operating pressure) of the pipeline. The test pressure shall be that pressure measured at the lowest point in the pipeline.

All HDPE pipes shall be covered and kept relatively cool during hydrostatic pressure testing. No pressure testing shall be carried out while HDPE pipelines are exposed to direct sunlight, which can cause very high concentrated temperatures, particularly in black PE pipe. Pipework shall not be tested at temperatures in the pipe in excess of 30 degrees Celsius.

Polyethylene and some other plastic pipelines are manufactured from visco-elastic materials which exhibit creep and stress relaxation. With a visco-elastic thermoplastic pipe sealed under a pressure test, there will be characteristic non-linear pressure decay (reduction) in the pipe due to the visco-elastic creep response of the material. The pressure reduction occurs even in leak-free pipelines. The test procedure will need to allow for several initial periods of pressurizing and expansion / pressure decay / and re-pressurizing, in order to account for the effects of creep and stress relaxation of the visco-elastic plastic pipelines, as described below, before carrying out and monitoring the final hydrostatic test.

Poor backfilling compaction will cause the HDPE pipe to expand and move in excess of normal pipe adjustment during high pressurization. So, it is imperative that proper backfilling compaction has been carried out throughout the works, to achieve successful and stable pressure testing.

Tests shall be carried out in isolated sections of usually 500 metres length for practical reasons, to settle the creep and relaxation in the pipelines within a reasonable amount of time, and to keep the highly pressured pipelines reasonably stable. Tests shall be allowed to an absolute maximum of 1,000 metres length, but only at the acceptance of the Engineer, and depending on the diameter of the pipeline. The maximum overall test duration shall be 8 hours. including for the plastic creep and expansion period – otherwise the test has to be abandoned and a shorter pipeline length of testing attempted.

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The installation of the air valves shall have been completed along the pipeline before testing.

Before the start of the test, the pipes shall be filled with water for at least 24 hours, and the air shall be released from the pipeline from all high points. A Test Form shall record the Test Number, location. date (or re-test date if applicable), length, diameter, and start of filling time, with a sketch map of the section under testing.

Following the above, the pressure shall be applied to the pipeline by carefully charging the pipeline with water (so as to avoid waterhammer) and all air shall be released from all high points and from the upper end of the pipeline. A pressure gauge shall be installed to monitor the pressure at the lowest point. When the test pressure is reached, the pipeline shall be closed-off and isolated. The above Initial Pressure in the pipeline and the relevant Base Time and Base Date shall be recorded.

The hydrostatic pressure shall be monitored early in the test period, and the pressure recorded after one (1) hour. If the pressure loss seems unacceptable and is larger than expected during

this initial period. then the test should be abandoned and the pipeline investigated for leaks. With experience of testing the plastic pipelines, or by using pressure decay calculations in accordance with the instructions from the pipe manufacturer, then the initial 1-hour pressure measurement can be taken as an early indicator of leakage and subsequent failure of the test.

Otherwise, if the pressure decay seems reasonable, then the test shall continue, under the responsibility of the Contractor. After the initial one (1) hour period, the pressure should again be increased to the test pressure by pumping make-up water into the pipeline.

After a further hour (i.e. two hours since initial pressurization at the Base Time), the pressure shall be measured again and recorded against the time. The pressure should again be increased to the test pressure by pumping make-up water into the pipeline.

Dependent on whether the pressure in the pipeline appears stable, with such decision made by the testing personnel of the Contractor, then the pressure shall again be measured and recorded against the time, at 2.5 or 3.0 hours and at 3.0 or 4.0 hours after the time of initial pressurization, and the pipeline re-pressurized each time up to the test pressure with pumped make-up water recorded each time.

Once the pressure and the creep and stress relaxation response in the pipeline has stabilized, then the pipeline shall be closed-off and isolated, and the Test Start Time and Test Start Pressure recorded for the commencement of the actual Test Period. At the start of the test period, the pumping equipment and water tank shall be removed from the site and the pipeline secured from being opened. After a period of two (2) hours, the Test End Pressure and End Time shall be recorded from the pressure gauge. For a successful test the allowable loss of pressure shall be 2 metres or 0.2 bar.

If a test fails, and a further test is necessary, then a period of at least 5 times the first test period shall elapse before re-testing, to allow the pipeline to recover from the previous pressurization.

On successful completion of a hydrostatic pressure test, then the remaining pressure should be released slowly from the pipeline.

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EXAMPLE HYDROSTATIC PRESSURE TEST CERTIFICATE FOR HDPE PIPELINE

ANURADHAPURA NORTH WATER SUPPLY PROJECT -PHASE II			
Contract Title		Contract Number:	
Contractor			
Test Number			

Lot: _____

Location (Street): _____ (Sketch of section is Attached)

Date of Test: _____ Re-Test Date (if applicable): _____

Nominal HDPE Pipe Diameter (mm): _____

Set Up Fill pipe to test pressure and remove air

First Pressurized at: _____am/pm Pressure: _____bar (test pressure at lowest point)

After 1 Hour: _____am/pm Pressure: _____bar (then add make-up water)

(If pressure loss is unreasonably large during this initial set-up phase, then abandon test and investigate for a leak or a potentially open pipe)

After 2 Hours: _____am/pm Pressure: _____bar (then add make-up water)

Then add again at 2.5 hours and 3 hours, if and as per necessary.

Test (this is after initial compensating for PE expansion has settled, and the pressure is stabilized)

0 Hours: Test Started at: _____ am/pm Pressure: _____ bar (a) is test pressure

2 Hours: At end of test: _____ am/pm Pressure: _____ bar

(maximum overall test duration shall be 8 hours, including PE expansion period).

Contract Document Reference: The allowable loss of pressure 2 metres or 0.2 Bar.

This test is verified as **PASSED / FAILED**

Remarks (e.g. visually check joints during the 2-hour test, noted moved thrust blocks, etc.): _____

_____

Engineer/Site Engineer: Contractor:

_____ _____

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6B.18 ENVIRONMENTAL MANAGEMENT PLAN

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6B.18 ENVIRONMENTAL MANAGEMENT PLAN

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1 Policy, Legal and Administrative Framework for Environmental Management

1.1 Major Environmental Policies in Sri Lanka

Major Environmental Policies in Sri Lanka mainly includes the following (For more details please see Annex 1)

- National Environment Policy – 2003
- National Forestry Policy – 1995
- The National Policy on Wildlife Conservation – 2000
- National Air Quality Management Policy – 2000
- National Watershed Management Policy – 2004
- Cleaner Production Policy – 2004
- National Biosafety Policy – 2005
- National Air Quality Management Policy – 2000
- National Policy on Wetlands – 2005
- National Policy on Sand as a Resource for the Construction Industry – 2006
- National Policy on Elephant Conservation – 2006
- National Policy on Solid Waste Management – 2007

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1.2 Applicability to the Project

The National Environmental Act (1980, 1997) is the highest level environmental legal basis in Sri Lanka, and there are enacted regulations under the Act regarding environmental issues such as EIA, natural resource management, waste management, environment protection, environmental qualities and environmental sensitive areas (Annex 2)

According to the regulations stipulated by CEA, following conditions could relate with the project.

- Construction and operation of Water treatment plants of capacity exceeding 500,000 cubic meters per day
- discharged of the effluent waters and
- disposal of sludge

However, if the supplementary construction activities such as supply of construction material or disposal of waste involve any of the sensitive areas listed in regulations specified by CEA, an environmental clearance in the form of EIA approval or an Environmental Protection License (EPL) is required. Hence the construction contractors must obtain such supply of

materials needed; only from sources with required environmental approval and ensure that such demands do not violate environmental regulations.

Following is an indicative list of regulations and laws and the limits where such regulations are applicable. All contracted staff should be aware and comply these provisions during the implementation of the project activities.

1) Any erodible area declared under the Soil Conservation Act (1951, 1953)2) Any Flood Area declared under the Flood Protection Ordinance (1924, 1955) and any Flood Protection Area declared under the Sri Lanka Land Reclamation and Development Corporation Act (1968, 1982)

2) Any reservation declared or demarcated beyond the Full Supply Level of a reservoir

3) Any archaeological reserve, ancient or protected monument as defined or declared under the Antiquities Ordinance (1965)

4) Any area declared under the Botanic Gardens Ordinance (1928, 1973)

5) Areas within or less than 100m from the boundaries of any area declared under the National Heritage and Wilderness Act (1988): The Forest Ordinance

6) Areas within or less than 100m from the boundaries of any area declared as a protected area under the Fauna and Flora Protection Ordinance (1937)

7) Areas within, or less than 100m from the high flood level contour of a public lake as defined by the Crown Lands Ordinance (1947, 1949, 1956) including those declared under Section 71 of the Ordinance

8) Areas 60m or less from the bank of a public stream as defined in the Crown Lands Ordinance, with a width of more than 25m at any point.

There are several protected areas under the purview of the Forest Department, located within the Project Area that includes surrounding area have been declared as one of the protected areas under the purview of the Department of Wildlife Conservation. It has been named as a sanctuary. Several archaeological reserves and protected monuments may have located within the Project Area.

However, the planned construction sites are located outside the protected sites. And also the Irrigation Department has set aside reservations for protection and safety of the structural components of all the schemes by the Department Circular No. 10/1986. This will apply to all the schemes managed by the Irrigation Department within the Project Area.

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2 Environmental Standards and Clearance

The specific regulations and standards regarding environment and social consideration that is applicable to the project are given in Annex 4.

Environmental standards: (noise, vibration and Air quality,)

Main expected sources of noise and vibration are due to the operation of vehicles and heavy machinery used for construction work. The permissible noise level for construction work is set by Gazette 924/12 21th May 1996. It is said that noise levels caused by such activity shall not be carried on for a period which in aggregate exceeds three months at any given point, without the written consent of the Authority given in respect of a particular activity. Maximum permissible noise levels at the boundaries during the construction and operational stages are given in Annex 6.

One of the possible causes of air pollution during construction is the dust due to excavations along the transmission lines. This will increase the particulate matter in the air during the dry weather and windy conditions and hence should be prevented thru regular wetting. Another air quality problem that can arise near the WTP area is due to accidental chlorine gas leakage from gas storage place and chlorine injection facility. The discharge standards and air quality standards as well as standards for chlorine emission are also given in Annex 6. In addition to the above possibilities that directly affect the air quality, exhaust gas by vehicles and heavy machineries especially during the construction phase may decrease the air quality in the area surrounding the work sites.

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3 Organizational Arrangement

3.1 Organizational arrangement for the implementation of the EMP

An effective arrangement must be established by the contractor within the organization to implement the EMIP. The organizational arrangements with clearly defined responsibilities and procedures are important and necessary for the successful implementation of the EMP recommendations. As per the EMP the contractor is expected to appoint an Environmental and Safety Officer (ESO), to be the primary focal point of contact on all environment and safety related issues. This person should be appointed at early stages since many initial activities involving land clearance, training of the deployment of contract staff etc., have to comply with the EMP recommendations. If delayed the damage done to the environment by oversight actions may not be repaired and could be costly. Moreover, considering the extent of the project and for the safety issues the contractor should establish much broader institutional arrangements for EMP implementation not leaving the responsibility only to the Environmental Officer alone. Also the responsibility of compliance with the EMP rests fully with the contractor and his senior management. Proposed organizational arrangement for implementing EMP is given in figure 3.

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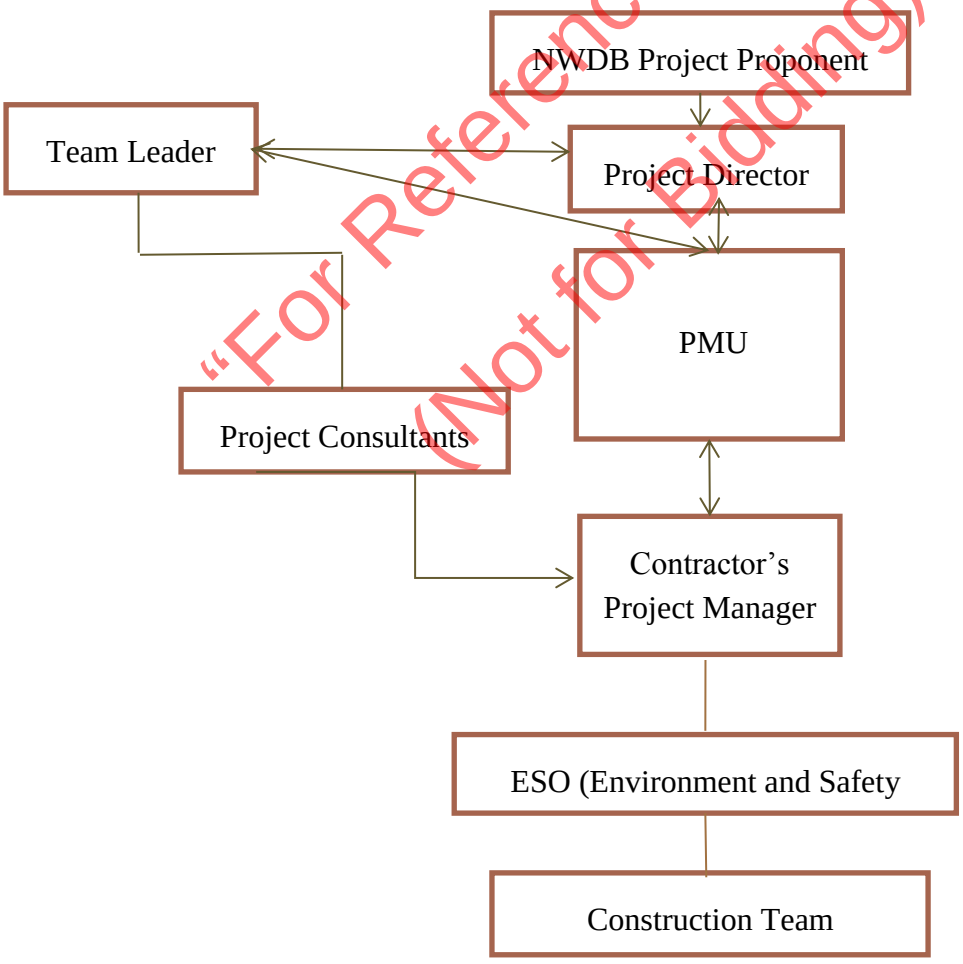


Figure 1 : Proposed Organizational Arrangement for the Implementation of the EMP

3.2 The responsibilities of the Environmental Team

Environmental team during the construction comprises all the players listed above figure. Once the construction phase is over the responsibility of environmental safeguards and compliance monitoring will stay with the NWSDB and the respective stakeholder organizations having the jurisdiction over subject areas. Hence it is important to fully define the tasks and responsibilities of personnel/organizations involved with the EMP implementation. The tasks assigned to the environmental team in the EMP matrix given in this report can provide guidance in defining the tasks and responsibilities of the staff and organizations.

3.3 Responsibility of Construction Team

The implementation of the environmental management plan is a joint responsibility of the project proponent, management and construction teams of the Contractor. The responsibility of implementing regular environmental safeguards and mitigation measures mentioned in the EMP and reflected in the EMIP shall rest with the construction staff. The overall implementation of the EMP/EMIP should therefore form a part of the contract agreement with all the construction companies hired for performing different tasks under the project. Hence the environmental responsibilities entrusted on construction team members shall be included in their job descriptions.

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3.4 Training of Personnel

The contractor shall ensure employees/sub-contractors are adequately experienced and trained to conduct work in a manner to minimize environmental impacts and carry out responsibilities under the EMIP. The following measures but not limiting to following only, are recommended.

- Consider previous experience in environmental management of construction activities when recruiting executive and supervisory level staff and selection of sub-contractors.
- Recruit a suitable candidate or assign task to a person with experience the responsibilities of ESO early on (before deployment of contractor's staff) in the contract implementation.
- Provide construction staff and sub-contractors briefings on environmental management requirements and how they are to be implemented prior to commencement of the works.
- Develop written instructions on the implementation of EMIP measures and provide to relevant staff and display at sites.
- Provide induction and training to relevant employees on implementation of the EMP measures, if necessary using experienced trainers and/or training institutions.
- Those who are deployed for work near or in environmentally protected and/or sensitive areas must be given strict instructions on importance of compliance with the relevant laws and regulations.
- The EMIP should be prepared and approved by the project proponent (NWSDB Project Office) who shall ensure the adequacy and compliance of the mitigation action proposed by the contractor prior to deployment of the contractor's staff in the field.

3.5 Reporting

The Contractor will provide the Environment and safety status reports based on the implementation of the EMIP on a monthly basis. First report shall cover the baseline status on the parameters to be monitored. Parameters are given later in this report (Item 5of this Section) The reports will cover all environmental aspects that include: (a) a construction activity summary for the month; (b) environmental issues that may be encountered; (c) safeguard and mitigation measures implemented; (d) effectiveness of the measures implemented; (e) test or audit results, if any done during the reporting period; (f) visits and recommendations given by inspecting authorities during the reporting period (g) corrective actions taken if any; (h) environmental induction and training provided; (i) a complaints summary; (j) a non-compliance report; (l) a monitoring report; and (m) any other relevant information.

The report of each calendar month shall be submitted by the ESO on an agreed upon date of the month. The ESO should submit the report to Project Director, with his comments thru the Senior Manager of the Project contractor. The Project Director shall share this report with the Team Leader of the Consultants and seek advice as needed to make decisions.

In the event the employee is from a sub-contractor, the main contractor who hires such sub-contractors shall be responsible for all the actions and compliance and should have the ESO tasked with monitoring the work of sub-contractors (such as labour or transport or machine operator contractors).

3.6 Auditing

The Contractor shall carry out internal audits to ensure that the EMP is properly implemented. This responsibility will rest with the ESO. The Contractor agrees to provide all necessary support to his Project Manager and ESO in carrying out independent audits on implementation of the EMP. It is recommended that compliance auditing be performed at least once in six months to ensure that the project complies with all recommendations of the EMP.

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3.7 Environmental Monitoring

Environmental monitoring falls into two areas: i.e. compliance monitoring and effect monitoring. The Contractor shall establish an arrangement for self-monitoring of the environmental performance (compliance and effect) as part of its EMS. The Engineer/Employer will carry out independent supervision and monitoring of the Contractor's environmental performance as is deemed necessary.

3.8 Compliance Monitoring

The Contractor shall carry out compliance monitoring of: (a) the effectiveness of the EMS installed within its organization; and (b) compliance with the mitigation and safeguard measures during construction.

3.9 Effects Monitoring

Effects monitoring evaluates the residual environmental impacts/effects which could not be contained by the mitigation measures and validity of assessments made in the EMP. This should be carried out by the proponent who may hire consultants or use one of its trained staffs to do this on regular basis. Thus it can also determine the effectiveness of the mitigation measures. This report shall be used by the Project director in making decisions and adjustments to minimize or avoid potential environmental impacts or consult and seek advice from or inform the relevant authorities as necessary. The PD of the PMU may table this report at the monthly progress review meeting of the project as status of Environment safeguard report.

"For References ONLY" (Not for Bidding)

4 Environmental Management Plan

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
Pre-construction and land clearance phase	A. Effect on the surrounding environments								
	Clearing land	Destruction of habitats can occur during land clearing activities in pre-construction phase	minor (remote)	Cut and filling of land and cutting trees for clearing the land must be planned to avoid unnecessary destruction of the habitats in and around the work sites or workers camp sites.	Complete Land clearing site inspections and the site baseline report compiled with pictures	All related sites where clearing and land preparations is involved	Before clearing is done	ESO/Contractor supervised by PMU/NWSDB	CEA, FD, and DWLC RDC, ID or any other depending on the area of jurisdiction
		Damage on special habitats if any (rare flora and fauna species) and archeological items in the project site	Medium (medium)	Workers must be made aware of any important flora and fauna inhabiting the sites and adjacent areas be identified if encountered and not to harm them unknowingly.	General ecos system and environmental practices as recommended in code of conduct	Where clearance of land is needed			Wildlife department, CEA

"For References ONLY" (Not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				The contractor to prepare a code of conduct for the workers which should explain how the workers should react if encountered with rare wildlife, protected archeological reserves etc. If the contractor field staff encounters accidentally or otherwise, any rare or endangered wild species or archeological items they should be instructed to stop work immediately and inform the ESO		Where clearance of land is needed			PMU, Wildlife department, CEA
	B. Effect due to Noise and Vibration								
	Vibration due to moment of testing and land preparation and from vehicles	Noise and Vibration during land preparation operations may cause damages to the structures and	Minor to major (common)	Due consideration must be paid on vibration impacts on adjoining structures. If any vulnerable structures such as bunts, ancient building are found	Map the vulnerable structure and monitor them before	Where land clearing is needed		NWSDB, RDC, AD, PCEA	PMU (CEA)

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
		the ambient environment		precautions should be taken to avoid potential damages	and after situations				
		Parking and maneuvering of heavy land clearance vehicles may interfere with the other day to day activities in the area	Minor to medium and temporary (common)	Adequate notice should be given if access roads are to be blocked or noise and vibration to be created. Especially if schools, hospitals and temples are nearby be mindful of the events taking place and schedule activities accordingly	Map the items to be monitored	Where land clearing is needed		NWSDB, RDC, PCEA	PMU (CEA)
		Noise will be generated due to improper maintenance of the land machinery.	Minor (common)	All machinery and equipment should be well maintained and fitted with noise reduction devices in accordance with manufacturer's instructions.		Where land clearing is needed		NWSDB, HO	

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
	Contaminants	Vehicle/Machinery or equipment servicing, maintenance or accidents during pre-construction phase may contaminate soil and nearby water bodies.	Minor (common)	Vehicle/machinery and equipment servicing and maintenance work shall be carried out only in designated locations/ service stations	Vehicle maintenance procedure and road worthiness inspections	Where pre construction activities are taking place	During the usage of vehicles	ESO/ Contractor	PMU
		Contamination of soil can be occurred by fuel and lubrications emitted by vehicles, machinery and equipment	Minor (common)	Waste oil, other petroleum products and untreated wastewater shall not be discharged on ground.					
				Adequate measures shall be taken against pollution of soil by spillage of various contaminants.					
				All contaminants shall be disposed of in accordance with the guidelines issued by the CEA					

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
	C. Social impacts								
	Unfounded fears and concerns	If the community is not fully aware of the project benefits and proposed activities may stage protests fearing possible land acquisitions or prevention of access to resources	Medium (common)	Discussion and making agreement about construction schedule, procedure and project benefits and impacts should be done through conducting stakeholder meeting	Community views	At all project community interaction locations	During the pre-construction phase	NWSDB,	PMU, PCC
			Medium (common)	Public relation activities/ meetings must be held to provide explanations to the local residents and to develop understanding about construction work schedule, expected impacts, mitigation measures, etc. during the initial stages of the project.	Community views	At all project community interaction locations		NWSDB, RSC	PMU,DS
	Resettlement	Only a one family Resettlement is required to continue with the proposed project at the WTP as of	Minor (common)	A proper resettlement arrangement must be arranged and the progress of resettlement and its fairness should be well-monitored	Resettlement arrangements, compensation payment	Where such resettlement is needed eg WTP		NWSDB, RSC	PMU, DS

"For References ONLY" (Not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
		present Other sites are being purchased either from state or private parties on payment of land prices			and house construction				
	Timing of work on road excavations	The road sides are to be excavated and if not times properly with other road works will inconvenient many road users as the road will be blocked for prolong time periods	Medium (Common)	Proper coordination with the other utilities provided including RDC/PRDC and Local authorities will be useful when scheduling the excavation process to minimize road blockages	No monitoring needed	Along the roads	Na	PMU NWSDB	NA
	D. Effect due to Solid Waste Generation during land clearance								
	Land clearance waste	If not properly disposed could cause public nuisance during transportation and disposal	Minor (common)	All disposal sites should be approved by relevant local authority/ies. It should not be disposed in any place that may not cause disruption to	Disposal site	Land clearing sites	During clearing operation	NWSDB, RSC	PMU, DS,CEA

"For References ONLY" (Not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
		Disposal sites may create problems to other land users	Minor and Temp (but common)	wildlife or human activities. Temporally dumping area or a pit for the purpose must be secured.					
Construction phase	A. Effect on physical environment								
	Exhaust gas	Emission of exhaust gas from the transporting land vehicles will generate air pollutants	Minor (common)	Actions must be taken to ensure the use of vehicles and machineries officially registered, and also the vehicles must be properly maintained.	Inspection of vehicles road worthiness certificate	At the project contractors office	Whenever new vehicle is enlisted	ESO Contractor	PMU
	Dust	Emission of dust from the site during construction will cause air pollution.	Minor (common)	The earth or dusty materials used during construction must be covered properly stored and handled to reduce dust emission. If needed spray water to prevent dust in sensitive areas where public is frequented.	Dust levels to be monitored visually daily during dry period extending for more than one week (5 days) at marked locations	Where there is sensitive public buildings or activities	Every week during the dry weather and windy conditions		

"For References ONLY" (not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				Storage locations of sand, cement and metal, soil should be located away from settlements. Cement should be stored safely away from workers quarters and public places	storage practices	Where storage is done and work sites	Monthly		
				Measures must be taken to minimize dust generation during handling of material. Make the workers aware of the health hazards involved and encourage them to use masks	Work sites			ESO/ Contractor	PMU
				All access roads within the storage site and roads used for material transportation should be sprinkled with water for dust suspension.	Road along the pipe laying path				
				To sprinkle water to prevent the dust during dry periods.	Transport routes and excavated areas				

"For References ONLY" (Not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
	Leakage of Chlorine gas	Leakage of Chlorine gas can cause adverse effects during construction	Minor (rare)	Guidance of proper installation must be followed Safety training on this matter should be given to laborers					
	Vehicles and machinery	Heavy equipment and trucks for construction will increase noise and vibration	Minor and temporary (common)	It must be ensured that the vehicles and machineries used are officially registered, and properly maintained and carry a road worthiness certificate issued by DoM. All machinery and equipment should be fitted with noise reduction devices in accordance with manufacturer's instructions. Maintenance of vehicles, equipment and machinery shall be regular and proper, to the satisfaction of the relevant guidelines, to	Vehicle road worthiness and drivers licenses and vehicle registrations are valid and current	Work sites	At the time of vehicle enlisting or replacement	ESO/ Contractor	PMU

"For References ONLY" (Not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				keep noise from these at a minimum level.					
				Unnecessary idling must not be allowed					
				Route of transportation must be properly and regularly examined to prevent noise or other effect on vicinity.					
	Construction Work	Construction activities will generate noise and vibration	Minor (temporary)	Actions should be taken to avoid noise and vibration generating activities at nighttime and during festival times.	Measure Noise levels during construction from the boundary of the sites	Boundary of the sites where construction takes place	When complaints are received when consulted	ESO	PMU
				If generators are to be used for construction work use sound prof or minimizing devices					
	Discharge of pollutants and soil to Water bodies	Water source can be polluted due to the mixing of construction debris or oil from the	Medium (common)	Proper guidelines must be given to contractors and the ESO for protecting water bodies from being polluted	Water bodies near the construction sites to be	Select the main water bodies that are near the constructio	Before start of the construction activities	ESO/ Contractor	PMU

"For References ONLY" (Not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
		vehicle washing and hence the water quality will be reduced.		Avoid/ minimize construction works near/ at such drainage or water bodies during heavy rain seasons	inspected on monthly basis. Water quality samples from the water bodies near each constructio n sites to be taken for measure of COD, BOD and turbidity levels by a reputed laboratory.	n sites to be predetermi ned in consultatio n with the PMU	near main water bodies		
		Turbid water can be generated during construction activities due to erosion of soil into the water bodies	Medium (common)	Actions must be taken to prevent the mixing of muddy materials with the clean water in the tank and water canals near the sites and road sides	General practices along the excavation sites and constructio n sites to be	Along the transmissio n excavations and constructio n sites	Monthly and more often during the rainy seasons	ESO/Contr actor	PMU

"For References ONLY" (Not for Binding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				Turbid water generated by earthwork can be leached to water bodies	monitored for signs of erosions				
	Domestic effluent from worker camps	Domestic effluent may be mixed with the water body.	Minor (remote)	The domestic effluent can be treated using the soak pit to reduce the level of pollution due to its mixing with natural water body.				Contractor	PMU
	Oil and Grease from machines	Oil and grease may be leaked during construction activities	Minor (remote)	Oil and grease should be collected separately in a container.		Work sites	Monthly	Contractor	PMU
		Contamination of water can occur due to fuel and lubricants emitted during construction and also from transportation vehicles	Minor (remote)	All vehicle and plant maintenance and servicing stations shall be located and operated as per the conditions and /or guidelines stipulated under the EPL issued by CEA.	Vehicle service records from the hired vehicles to be made mandatory for hiring	Work sites	Monthly	Contractor	PMU

"For References ONLY" (Not For Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				All vehicles to be services in the certified service stations and avoid doing such services in adhoc manner by the drivers and owners in unauthorized places by insisting on proper service to be done on all vehicles used for the project work (hired or owned)					
	B. Effect due to Solid Waste Generation during construction								
	Construction Waste	Waste materials will be generated during construction and should be disposed properly	Minor (common)	Request that waste reduction plan and disposal method to be proposed in the tender document The temporally dumping yard or pits for construction waste must be secured for depositions	Waste generation	Work sites	Monthly	ESO/ Contractor	PMU

"For References ONLY" (Not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				Segregate waste in order to be used in the recycling purpose. Recyclable material can be transferred to the recycling agents					
				Disposal of construction waste and debris must be carefully taken away immediately from the work sites and disposed properly as these could lead to accidents if left on road sides or work sites	Debris on site and road sides	Along the roads and work sites	Monthly and before the release of payments for work completed	ESO /Contractor	PMU
				All disposal sites should be approved by the relevant local authority/ ies.	Disposal sites nominated and to be used	Sites for disposal	Before finalizing the contract	ESO/ Contractor	PMU

"For References ONLY" (Not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
	Domestic Waste generated by the laborer	Domestic waste will be generated by the laborer's activities	Minor (common)	Domestic waste is placed at the temporally dumping yard, and transferred to the officially operated disposal sites. Burning of the waste with the plastics are not advisable and should be avoided. Advise the workers from dumping waste along the road sites indiscriminately while working.	Work camps to be monitored and inspected for hygiene conditions	Work camps and work sites	Regularly	ESO/ Contractor	PMU
	C. Effect on the Ecological systems								
	Contractors may carry out unscheduled activities such as earth cuts and	These activities could affect other social and ecological elements in the	Minor (rare)	The activities approved in the construction plan should be strictly adhered to.	General ecos system and environmental	All construction sites and camp sites	Monthly	ESO/ Contractor	PMU

"For References ONLY" (Not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
	diversion of natural streams, cutting or burning vegetation to facilitate clearing that could have ecological and hydrological consequences	neighborhood and create problems		Training and awareness program for laborer must be done. Scheduled patrol of the site must be done in regular basis and the officer in charge should be held responsible of rules are violated.	practices as recommended in code of conduct				
		Trees may be cut in selected areas and hence reduce the habitat diversity	Minor (Common)	Clearing land should be minimized and the large tree must remain as far as possible .					
				Prepare a code of conduct for the work forces to avoid accidentally breaching the rules.					

"For References ONLY" (Not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
		Adverse effect may be occurs on rare species	Minor (remote)	If the special species found out at the site, it should be reported to NWSDB and the guidance of CEA or Wildlife department must be received before taking actions.				Contractor	PMU, CEA, Wildlife Department
	D. Archaeological impacts								
	Excavating antiquity	If any sites/places of archaeological importance found in the site there is a possibility of them to be excavated during construction	Medium to high (remote)	If the antiquity will be excavated at the site, report to NWSDB and receive the guidance of Archaeological Department During construction activities all necessary and adequate care should be taken to minimize impacts on cultural properties found on the site and the vicinity.	Daily work practices and reports	All excavated sites	As and when the locations are excavated	Contractor	PMU, Archaeological Department

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				Precaution must be taken to prevent the workmen or any other persons from removing and damaging any such article or thing if found from the site					
	E. Social impacts								
	Social conflict caused by migratory laborers	Conflicts may arise among the workers and the villagers specially if the work force involves migratory labor special attention should be extended to HIV and similar ST diseases that can be introduced to the community	Minor (common)	Training and awareness program for laborer are to be planned and conducted Labour camps should be located in a manner that ongoing settlements activites are not disturbed. Provide sufficient health care and advises to work force resident in the work camps.	Labor camp sanitary facilities and health care	Labor camps	Once In every three months	ESO/ Contractor	PMU
	Inconvenience to livelihood and social activities	Construction activities may impose disturbances to the existing community	Minor and temp (common in townships involved)	Any noise generating activity / high voice which disturb the livelihood should be minimized and reduced to shortest possible time	Measure the noise levels	Noise generating locations	When complaints are received	Contractor	PMU

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
		livelihood by way limiting accessibility (shops and workplaces), noise generation (teaching), religious and private functions		Pipe laying work on the road is planned carefully to prevent inconvenience as much as possible witout hindering accessibility	Review Constructio n process	Road sides	When traffic is to be blocked to lay pipelines		
				Refraining from working during peak hours should be done to prevent road traffic blocks	Review Traffic control	Road sides			
				It would be useful if a public notice is given prior to construction					
				The maintenance and rehabilitation of any irrigation canal during construction should not cause inconvenience to the livelihood					
				The maintenance and rehabilitation of any access roads during construction should not cause inconvenience to the livelihood					

"For References ONLY" (not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
	F. Effect on the working condition for the workers								
	Occupational Safety	Workers can be affected by the construction activities	Minor (common)	Workers in vicinity of strong noise, and workers working with or in crushing, compaction, batching or concrete mixing operations shall be provided with protective gear and make it compulsory to wear them.	Issue and Use of safety gear	Work sites	Regularly	Contractor	PMU
		Workers can be affected by poor sanitary facilities and vector control in workers camps	Minor (common)	Locating, sanitation and waste disposal in construction camps workers camps should be provided with adequate and appropriate facilities for disposal of sewerage and solid waste. The sewage systems shall be properly designed, built and operated so that no pollution to ground or adjacent water bodies/watercourses	General sanitary conditions in workers quarters	Workers camps		Senior management/ESO Contractor staff	PMU

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				takes place. Garbage bins shall be provided the camps and regularly emptied. Garbage should be disposed off in a hygienic manner, to the satisfaction of the relevant norms. Compliance with the relevant regulations and guidelines issued by the CEA/LA shall be strictly adhered to.					
				Training and awareness program for laborer should be done	No of training programs and number of workers participated	Work place	When new contract is signed		
				Necessary measures shall be taken to prevent breeding of vectors at work sites	General sanitary conditions				

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				If any outbreak of infectious in a labour camp is identified that must be informed to the ESO and the Medical Officer of Health (MOH) or to the Public Health Inspector (PHI) of the area immediately.					
				At every workplace, first aid kit shall be provided as per the regulations. At every workplace an ambulance room containing the prescribed equipment and nursing staff shall be provided.					
				At every workplace and labour camps sufficient number of bathing facilities, latrines and urinals shall be provided in accordance with the Health and Safety regulations. These bathroom and					

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				toilet facilities shall be suitably located within the workplace/buildings. Latrines shall be cleaned at least three times daily in the morning, midday and evening and kept in a strict sanitary condition. If women are employed, separate latrines and urinals, screened from those for men and marked in the vernacular shall be provided. There shall be adequate supply of water, within and close to latrines and urinals.					
	G. Traffic Control during construction phase								
	Traffic and road blockages and safety issues	Unnecessary traffic will be generated due to unscheduled construction activities	Minor (common)	Use of flagmen and/or temporary traffic lights to control traffic flows at constricted sites, including safe crossing for pedestrians	Traffic flow during construction times and adequacy	All affected road sides	When needed	NWSDB	NA

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
		If the road work areas are not properly illuminated and warned (signage) can cause accidents.		especially at town areas and near schools. It is important to use adequate back yellow striped safety tapes to demarcate road work areas and warning signage should be in place.	of warning signage				
				Special consideration shall be given to schedule the road side works to continue immediately after or before the other road repair or excavation works begin or end to avoid repetitive closure or breaking of roads surfaces and causing inconveniences to public.	No monitoring task	Road sides	Before road work begins at the planning time		

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
Operational phase	A. Impact on physical environment (air, water and land)								
	Leakage of chlorine gas	chlorine gas of leakage from chlorine gas storage place and chlorine injection facility may generate air pollution	Minor (rare)	It should be monitored that whether the Gas monitor is working always at proper condition or not. Chlorine Gas leakage detectors to be installed	Conditions of the gas storage and its monitoring devises	Storage rooms	During storage	NWSDB, RSC	NWSDB HO
				Safety training should be given to the laborer .					
	Emission of dust	Dust will be emitted during operational activities.	Minor (common)	Storage locations of sand, metal, soil should be located away from settlements and other sensitive receptors and must be covered (with artificial barriers or natural vegetation).				NWSDB, RSC	NWSDB HO
				Measures should be taken to minimize dust during handling of material during operational phase					

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				Vehicle speed limits should be enforced and followed to minimize dust generation.					
				The sites which prone to dust emission and the roads used for transportation during operational phase should be sprinkled with water for dust suspension.					
	B. Adverse effects due to noise and vibration								
	Noise generation due to Pump, generator and other noise generating activities	The machinery, equipment and other noise generating activities may cause noise pollution Noise pollution and vibration can occur due to the use of pumps and the generators at site.	Minor (common)	Maintenance of vehicles, equipment and machinery shall be regular and proper, to keep noise from these at a minimum.				NWSDB RSC	NWSDB HO
				Low noise/ vibration pump and generator must be used as specified in tender document.					

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
	vibration	Vibration during operations may cause damages to the structures and the environment	Minor (common)	Due consideration must be paid on vibration impacts of blasting on adjoining structures.				NWSDB RSC	NWSDB HO
	C. Adverse effect on water Quality								
	Discharge water	Water source will be polluted if discharged into potable water sources and hence the water quality will be reduced.	Major (common)	Water from sludge drying bed should be managed to meet the standards before discharging Treated effluent to be discharged during operation should be introduced to the sedimentation basin and turbidity must be treated. The effluent discharged should meet the CEA stipulated standards for effluent discharged into inland surface flowing water body	Water quality standards as specified in CEA regulations	Discharged point of the WTP	Weekly	NWSDB RSC	NWSDB HO

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				In case the operational activities going to adversely affect the quantity or quality of water, a serve notice must be given to the relevant authorities and downstream users of water sufficiently in advance.					
				Employees must be made aware on water conservation and waste minimization.					
	Domestic effluent	Domestic waste will be generated by the work force laborer activities	Minor (common)	Effluent should be treated by the soak pit.	Domestic effluent discharge			NWSDB RSC	NWSDB HO
	Oil and grease	Oil and grease will be added during operational activities	Minor (rare)	Oil and grease must be kept separately in the container				NWSDB RSC	NWSDB HO
	D. Effect on the environment due to Solid Waste Generation								
	Waste	Domestic waste will be generated during the operational phase	Minor (common)	Domestic waste should be placed at the temporally collection place, and transferred to	Domestic garbage disposal	Work sites	Regularly	NWSDB RSC	NWSDB HO

"For References ONLY" (Not for Bidding)

Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
		that may impact surrounding areas if discharged indiscriminately		the officially operated disposal field					
				Garbage bins must be provided in the work sites and regularly emptied and the garbage disposed off in a hygienic manner.			Regularly		
	Sludge	Sludge will be generated during operational activities	Minor (common)	Sludge should be dried up at the drying bed to reduce its quantity and properly disposed Dried sludge should be dumped by the contract with the approval of land owner	Sludge produced	Sludge beds in WTP	Regularly	NWSDB RSC	NWSDB HO
	E. Watershed Protection								
	blocking of irrigation canal or disruption to regular irrigation patterns	The proposed system may cause problems with irrigation during dry seasons	Minor	The sources of water (potable or otherwise) used by the settled community must be protected so that continued use of these water sources will not be disrupted by the				NWSDB RSC	NWSDB HO

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
				There shall not be any diversion, closure or blocking existing canals and streams in a manner that adversely affect down – stream intakes. If diversion or closure or blocking of canals and streams is required during operational phase of work, relevant approval in writing must be obtained.					
	temporary structures	Existing temporary structures will create problems to the society	Minor	On completion of the works, all temporary obstructions to shall be cleared away.				NWSDB RSC	NWSDB HO
	F. Environmental Enhancement								
	Destructions to the existing landscape	Roadside Landscape will be affected by operational activities	Minor (common)	Road landscape plantation, re-vegetation of road embankments and other slopes, edge treatment of water bodies shall be established				NWSDB RSC	NWSDB HO

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Project Stage	Project Activity/ objects which cause the impacts	Impact	Level of risk and its (possibility)	Mitigation measures	Parameters to be monitored	Location	Frequency	Responsibility in implementation	Responsibility in compliance monitoring and Supervising
	G. Effect on the working condition for the workers								
	Safety and health	Workers can be affected by accidents during operational activities	Minor (common)	At every workplace, first aid kit shall be provided as per the regulations. At every workplace an ambulance room containing the prescribed equipment and nursing staff shall be provided.				NWSDB RSC	NWSDB HO
				In every workplace and labour camps portable water shall be available throughout the day in sufficient quantities.					

"For References ONLY" (Not for Bidding)

Annex 1 Important Environmental Legislative Instruments

National Environment Policy – 2003

The policy aims to promote the sound management of Sri Lanka's environment balancing the needs for social and economic development and environment integrity. It also aims to manage the environment by linking together the activities, interests and perspectives of stakeholders and to assure environmental accountability.

National Forestry Policy – 1995

The policy was drawn up to provide clear directions for safeguarding the remaining natural forests of the country in order to conserve biodiversity, soil and water resources.

The National Policy on Wildlife Conservation – 2000

The policy renews the commitment of the government to conserve wildlife resources through promoting conservation, maintaining ecological processes and life sustaining systems, managing genetic diversity and ensuring sustainable utilization and sharing of equitable benefits arising from biodiversity. It emphasizes the need for effective protected area management with the participation of local communities.

National Air Quality Management Policy – 2000

The policy aims to maintain good air quality to reduce morbidity due to air pollution and in turn reduce national health expenditures.

National Watershed Management Policy – 2004

The policy aims to conserve, protect, rehabilitate, sustainably use and manage the watersheds while managing their environment characteristics with the involvement of people.

Cleaner Production Policy – 2004

The objective of this policy is to incorporate the cleaner production concept and practices into all development sectors of the country.

National Biosafety Policy – 2005

The policy on biosafety set the overall framework in which adequate safety measures will be developed and put into force to minimize possible risks to human health and the environment while extracting maximum benefits from any potential that modern bio technology may offer.

National Air Quality Management Policy – 2000

The purpose of this policy is to maintain good air quality to reduce morbidity due to air pollution and in turn reduce national health expenditures.

National Policy on Wetlands – 2005

"For References ONLY"
(Not for Bidding)

The policy seeks to give effect to National Environment Policy and other relevant national policies, while respecting national commitments towards relevant international conventions, protocols, treaties and agreements to which Sri Lanka is a party.

National Policy on Sand as a Resource for the Construction Industry – 2006

The policy statement reflects Sri Lanka's constitutional, international and national obligations, including the Mines and Minerals Act No. 33 of 1992, the National Environmental Act of 1980, the Coast Conservation Act of 1981 and other relevant legislation, regulations and policy statements. It defines the commitment of Government, in partnership with the people, to effectively manage the construction-sand resource for the benefit of present and future generations.

National Policy on Elephant Conservation – 2006

The policy was developed to ensure the long-term survival of the elephant in the wild in Sri Lanka through the mitigation of the human-elephant confect.

National Policy on Solid Waste Management – 2007

The policy has been prepared to ensure integrated, economically feasible and environmentally sound solid waste management practices for the country at national, provincial and Local Authority level. The main objectives of the policy are (a) to ensure environmental accountability and social responsibility of all waste generators, waste managers and service providers (b) to actively involve individuals and all institutions in integrated and environmentally sound solid waste management practices (c) to maximize resource recovery with a view to minimize the amount of waste for disposal and (d) to minimize adverse environmental impacts due to waste disposal to ensure health and well-being of the people and on ecosystems.

"For References ONLY"
(Not for Bidding)

Annex 2 National Environmental Act (NEA)

The NEA was established as No.47 of 1980 and it was amended (Act No. 56 of 1988) to include a provision relating to EIA Regulations contained in Part IV C of the statute entitled "Approval of Projects". This section was further amended by Act No. 53 of 2000.

Prescribed project and EIA/IEE procedure

The prescribed projects which are requested to implement EIA/IEE are defined and listed in the Gazette no 772/22 of 24th June, 1993 and 859/14 of 23rd February 1995. Only large-scale development projects that are likely to have significant impacts on the environment are listed as prescribed projects. There are two categories.

1. By type and the magnitude

   In case of Water Supply Project, the conditions are;

   - All ground water extraction projects of capacity exceeding 1/2 million cubic meters per day.
   - Construction of water treatment plans of capacity exceeding 1/2 million cubic meters

2. By location (e.g. if projects are located wholly of partially within environmentally sensitive areas such as forest and wildlife reserves, stream or lake reservation, archaeological reserve, declared erodible areas etc.

Environmental recommendation

The any projects to establish industrial activities, which are not subject to EIA are advised to obtain environmental recommendation from the CEA for the proposed sites. The purpose of environmental recommendation is to minimize the environmental impact. The potential of the environmental impact of a proposed project is evaluated with respect to the zoning plans of relevant local Authorities surrounding land use, land availability for buffer zones, and the capacity of the area to receive additional pollution load and waste disposal requirements. The document contains the conditions, and the project should take mitigation measures to satisfy the conditions.

EPL

The potential polluting activities are requested to obtain Environmental Protection License (EPL) under the section 23.A of NEA. The prescribed activities for which a license is required are listed in the Gazette Notification No 1533/16 dated 25.01.2008. Water treatment plants having a treatment capacity of 10,000 or more cubic meters per day is stated as the prescribed activity in part A. The license for a project is issued by Provincial Offices or District Offices of the CEA, and it has maximum one-year validity. The project proponent has to renew the license.

"For References ONLY" (Not for Bidding)

Annex 3 - Basis of Regulations and Standards and A Summary of Environmental Compliance Requirements for the Project Activities

Table Summary of basis of regulations and the standards

Air Quality (discharge and ambient)	Discharge: No standard Ambient: The National Environmental (Ambient Air Quality) Regulations, 1994, published in Gazette Extraordinary, No. 850/4 of December, 1994 amended No. 1562/22 - Friday, August 15, 2008
Water Quality (discharge and ambient)	Discharge: National Environmental (Protection and Quality) Regulations, No. 1 of 2008 - Schedule I Ambient: Proposed standard
Drinking Water Quality	Sri Lanka Standards for potable water – SLS 614: 1983
Wastes (domestic and water treatment operation)	As specified in Environmental Protection License
Noise and Vibration	Noise: National Environmental (Noise Control) Regulations No.1 1996 Vibration: Proposed standards
Forest	Forest Ordinance No. 16 of 1907 (as amended) and the Rules and Regulations under the Ordinance
Wildlife	Fauna and Flora Protection Ordinance No. 2 of 1937 (as amended by Act Nos. 49 of 1993, 12 of 2005) and the Regulations under the Ordinance
Landscape	UDA Act No. 41 1978 and No. 4 of 1982
Heritage (Archeology)	Antiquities Ordinance No. 9 of 1940 as amended
Involuntary Resettlement	National Involuntary Resettlement Action Plan; Land Acquisition Act No.09 of 1950 (As Amended)
Protection of minority	The Constitution of Sri Lanka, 1978 as amended
Land expropriation and compensation	National Involuntary Resettlement Action Plan; Land Acquisition Act No.09 of 1950 (As Amended)
Safety of Labor	Factories Ordinance

"For References ONLY" (Not for Bidding)

Table Summary of Environmental Compliance Requirements for the Project Activities

	Project activity	**Applicable Legislation**	**Statutory Requirement**	**Authorizing Body**
1	Groundwater extraction projects of capacity exceeding 500,000 cubic meters per day	National Environment Act (NEA)	Environmental Clearance (EC)	Central Environment Authority (CEA)
2	Water treatment plant exceeding 500,000 cubic meters per day	NEA	EC	CEA
3	All activities in sensitive areas	NEA	EC	CEA
4	All activities that require site clearance	Municipal Councils Ordinance No. 29 of 1947, the Urban Councils Ordinance No. 61 of 1939 and the Pradeshiya Sabha Act No. 15 of 1987 as amended	Clearance	Municipal Councils, Urban Councils and Pradeshiya Sabhas
5	All activities that require cutting of trees	Felling of Trees (Control) Act No 9 of 1951	Tree-cutting Permit	Forest Department
6	All s activities within a 1 mile (1.6 km) radius of a national reserve	Section 14 of Fauna and Flora Protection (Amendment) Act, No. 22 of 2009	Clearance	Department of Wildlife Conservation
7	All activities in close proximity of a reserve forest	Forests Ordinance No. 16 of 1907 as amended	Clearance	Forest Department
8	All s activities in and around fishery reserves	Fisheries and Aquatic Resources Act No. 2 of 1996	Clearance	Director of Fisheries and Aquatic Resources
9	All activities in proximity of archaeological reserves	Antiquities Ordinance No. 9 of 1940 as amended	Clearance	Department of Archaeology
10	All activities in and around irrigation development	Irrigation Development Act	Clearance	Director, Irrigation Department

"For References ONLY (Not for Bidding)"

	Project activity	Applicable Legislation	Statutory Requirement	Authorizing Body
11	All activities in and around declared urban development areas	Urban Development Authority Act No. 41 1978 and No. 4 of 1982	Clearance	Regional Director UDA
12	Water treatment plants having a treatment capacity of 10,000 or more cubic meters per day.	Gazette Notification No 1533/16 dated 25.01.2008	Environmental Protection License	CEA

"For References ONLY"
(Not for Bidding)

Annex 4 Environmental Standards Applicable to the Project

Air quality standards

Table Discharge Standards for Petrol Vehicles

Type of Vehicle	Pollution Standard		Remarks
	Carbon Monoxide(CO (%vol)	Hydrocarbon HC (ppm v/v)	
Petrol wo/cc	a. > 5 years 3.0 < 5 years	1200	Low idling
Petrol w/cc	2	400	Low idling

wo/cc - Without catalytic converter

w/cc - with catalytic converter

>5 years - vehicles more that 5 years old from the year of manufacture (used / unused)

< 5 years - vehicles less than 5 years old from the year of manufacture

Table Discharge Standards for Diesel Vehicles

Type of Vehicle	Smoke Capacity% (k factor m-1)	
	Idle	Load
Diesel – Tare less than 1728 Kg Including three wheelers	65 (2.44)	75 (3.22)
Diesel – Tare more than 1728 kg	65 (2.44)	75 (3.22)

Table Ambient Air Quality Standards

	Pollutant	Averaging Time*	Maximum Permissible Level		
			μgm^{-3}	ppm	
1	Particulate Matter - Aerodynamic diameter is less than 10 µm in size (PM_{10})	Annual	50	—	Hi-volume sampling and Gravimetric or Beta Attenuation
		24 hrs.	100	—	Hi-volume sampling and Gravimetric or Beta Attenuation
2	Particulate Matter - Aerodynamic diameter is less than 2.5 µm in size ($PM_{2.5}$)	Annual	25	—	
		24 hrs.	50	—	
3		24 hrs.	100	0.05	

"For References ONLY" (Not for Bidding)

	Pollutant	Averaging Time*	Maximum Permissible Level		
			µgm^{-3}	ppm	
	Nitrogen Dioxide (NO_2)	8 hrs.	150	0.08	Colorimetric using Saltzman Method or equivalent Gas phase chemiluminescence
		1hr.	250	0.13	
4	Sulphur Dixoxide (SO_2)	24 hrs.	80	0.03	Pararosaniliene Method or equivalent Pulse Flourescent
		8 hrs.	120	0.05	
		1hrs.	200	0.08	
5	Ozone (O_3)	1 hr.	200	0.1	Chemiluminescence Method or equivalent Ultraviolet photometric
6	Carbon Monoxide (CO)	8 hrs.	10,000	9	Non-Dispersive Infrared Spectroscopy"
		1 hr.	30,000	26	
		Anytime	58,000	50	

Table Occupational Safety and Health Guideline for Chlorine

	ppm	mg/m3	Source
Permissible exposure limit	1	3	United States Department of Labor
Advisable limit	0.5	1.5	National Institute of Occupational Safety & Health
Evaluation standard	0.5	1.5	Notification No. 53 Department of Labor （Japan）

"For References ONLY"
(Not for Bidding)

Water quality standards

Table Tolerable Limit of Discharge to Inland Surface Water

No.	Parameter	Unit type of limit	Tolerance Limit values
1	Total suspended solids	mg/1, max.	50
2	Particle size of the total suspended solids	µm, less than	50
3	pH at ambient temperature	-	6.0 - 8.5
4	Biochemical oxygen demand (BOD_5 5 days at 20℃ or BOD3 $_3$ days at 27℃)	mg/1, max.	30
5	Temperature of discharge	℃, max.	Shall no exceed 400℃ in any section of the stream within 15 m downstream from the effluent outlet.
6	Oils and greases	mg/1, max.	10
7	Phenolic compounds (as C_6H_5OH)	mg/2, max.	1
8	Chemical oxygen demand (COD)	mg/3, max.	250
9	Colour	Wavelength Range 436 nm (Yellow range) 525nm (Red range) 620nm (Blue range)	Maximum spectral absorption coefficient $7m^{-1}$ $5m^{-1}$ $3m^{-1}$
10	Dissolved phosphates (as P)	mg/1, max.	5
11	Total Kjeldahl nitrogen (as N)	mg/1, max.	150
12	Ammoniacal nitrogen (as N)	mg/1, max.	50
13	Cyanide (as CN)	mg/1, max.	0.2
14	Total residual chlorine	mg/1, max.	1
15	Flourides (as F)	mg/1, max.	2
16	Sulphide (as S)	mg/1, max.	2
17	Arsenic (as As)	mg/1, max.	0.2
18	Cadmium (as Cd)	mg/1, max.	0.1
19	Chromium, total (as Cr)	mg/1, max.	0.5
20	Chromium, Hexavalent (as Cr6+)	mg/1, max.	0.1
21	Copper (as Cu)	mg/1, max.	3
22	Iron (as Fe)	mg/1, max.	3
23	Lead (as Pb)	mg/1, max.	0.1

"For References ONLY"
(Not for Bidding)

No.	Parameter	Unit type of limit	Tolerance Limit values
24	Mercury (as Hg)	mg/1, max.	0.0005
25	Nickel (as Ni)	mg/1, max.	3
26	Selenium (as Se)	mg/1, max.	0.05
27	Zinc (as Zn)	mg/1, max.	2
28	Pesticides	mg/1, max.	0.005
29	Detergents/surfactants	mg/1, max.	5
30	Faecal Coliform	MPN/100 ml, max	40
31	Radio Active Material : (a) Alpha emitters (b) beta emitters	 micro curie/ml, max micro curie/ml, max	 10^{-8} 10^{-7}

Noise and vibration

Table Maximum permissible noise levels

	Duration	Laeq', T
Day time	6:00 ~ 18:00	75
Night time	18:00 ~ 6:00	50

Table Maximum Permissible Noise Levels at Boundaries in LAeq, T, for Industrial Activities

Area	Day time	Night time
Rural Residential Area	55	45
Urban Residential Area	60	50
Noise Sensitive Area	50	45
Mixed Residential	63	55
Commercial Areas	65	55
Industrial Area	70	60
Japanese Environmental Standard		
A (residential area)	55	45

"For References ONLY"
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6B.19 - SPECIFICATIONS FOR VEHICLES

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6B.19 SPECIFIATIONS FOR VEHICLES

- **Hired Vehicles are to be provided for the sole use of Engineer and Engineer's Representative's Staff**

1. The vehicles are intended to be used exclusively by the staff of Engineer and Engineer's Representative (ER).

2. The vehicles must be assigned to the officers nominated by the Engineer/Engineer's Representative.

3. It is expected that, each vehicle will travel the specified *(Refer General/Particular Requirements, Sub Clause 5.4 – Transport Facilities for Engineer's Staff for the details)* mileage (km) per month. For additional km, BOQ rate will be applied.

4. If each vehicle runs specified mileage or less during month, payment quoted for specified mileage/month will be paid for a month.

5. If the contractor fails to provide the service of any vehicle for one day, the penalty of 2 days' payment will be imposed and the amount will be deducted from the monthly payment bill. Payment per day is calculated by dividing the monthly rate (amount quoted for specified mileage) by 25. If any case vehicle is not available for 3 days or more, Engineer/ER will hire a vehicle for their use and the contractor should make the payment to the hired vehicle based on the rates of the hired vehicle. Board shall pay to the contractor based on quoted rates for the distance traveled by the hired vehicle. If the contractor fails to make the payment, board will pay the amount to the hired vehicle and deduct such amount from the contractor's bill for the month.

6. Vehicles should be made available during all working days (from Monday to Saturday) from 7.00 am till 6.00 pm. If Engineer/ER requires the service of the vehicles before 7.00 am or after 6.00 pm or on holiday or Sunday, vehicle should be made available for the use.

7. If the contractor fails to provide vehicles at 7.00 am, Rs. 150/= per hour will be deducted from his payment. This will be applicable for first 4 hours in the day. If the delay exceeds 4 hours, it will be considered as a one day absent and a penalty, as mentioned in clause 5 above, will be imposed.

8. Running distance of the vehicle is calculated based on the distance traveled from and to the site office. In case, that the vehicle commences running directly from any other place without coming to the office/ site or stopped at a place other than the site office, the lesser distance of either is taken as the running distance.

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9. Vehicles should be inspected by the Engineer/ER before granting the acceptance for the vehicle. The contractor should bring the vehicles to the PD Office or any other location nominated by the Engineer/ER.

10. The vehicles shall comprise with the following requirements.

    i. Fully air-conditioned Motor Car (Sedan Type) with engine capacity more than 1500 CC.

    ii. Fully air-conditioned diesel Vans with engine capacity more than 2500 CC with seating capacity for at least 08 passengers.

    iii. Fully air-conditioned diesel 4WD Double Cabs with engine capacity more than 2500 CC.

    iv. Must be in good condition and the time since the registration must not exceed 05 years in June 2021.

    v. Must be covered with a full insurance cover including all the passengers and goods. Each passenger shall have an insurance cover not less than LKR. 2.0 Million. Insurance for the passengers shall be provided by the Contractor.

11. The contractor must provide sufficiently experienced, skilled drivers with a valid driving license and a mobile phone with an active connection. The officer in charge of the vehicles shall be satisfied with the driver's behavior, carefulness and the neatness of the vehicle. If not, the contractor must replace the driver to the satisfaction of the officer in charge of the vehicles.

12. Salary of the drivers, fuel charge, monthly bill of mobile phone of the driver and all repairs and maintenance costs of the vehicles shall be included to the monthly rate of the vehicle. No payment will be made other than the cost of running distance based on the monthly quoted price in the BOQ.

13. Drivers must maintain proper running charts showing all the daily traveling details and shall be certified by the officer in charge of the vehicle daily.

14. Bidder must complete the questionnaires in the page below and certify as required.

"For References ONLY"
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- **Purchased Motor Cycles are to be provided for the sole use of Engineer and Engineer's Representative Staff & subsequently maintained by the Contractor as Specified until the end of the Project Period. The duly maintained Motorcycles to be handed over to the NWSDB at the end of the Contract Period.**

1. The Contractor is to purchase, provide and maintain the Brand-New popular Brand Motor Cycles ***(Engineer's approval should be sought before the procuring)*** for the sole use of the Engineer's Supervisory Staff. The Contractor is required to arrange for registration, license and insurance in the name of the Employer and maintain the Motor Cycles for the use of the Engineer and Engineer's Representative's Field Supervisory Staff.

2. Motor Cycles shall be with engine capacity not less than 125 cc, complete with all accessories, registration at RMV, number plates, insurance, revenue license, 02 Nos. each safety helmets, 02 Nos. each luminous safety jackets etc., essential for use on public roads.

3. The comprehensive insurance including cover for rider & one passenger for a sum not less than Rupees 2 million per person for the duration of the Contract.

4. All motor cycles shall be brand new and shall be of a popular model used in Sri Lanka. The Contractor is required to forward details such as manufacturer's printed catalogues, manuals etc., to be purchased to the Engineer for prior approval.

5. Maintenance shall include fuel, repairs, provision of similar replacement motor cycle in the event of provided one being out of service, servicing and routine maintenance (oil, battery, tyres etc.) The cost of fuel supply shall be estimated on the basis of 2000 km of total running distance per month for each motor cycle referred to above. In case this limit is exceeded, due to special circumstances the excess fuel cost shall also be borne by the Contractor, to the limit of 300km, with the prior approval of the Engineer.

6. Bidder must complete the questionnaires in the page below and certify as required.

"For References ONLY" (Not for Bidding)

QUESTIONNAIRE FOR HIRING VEHICLES

(a) QUESTIONNAIRE FOR CARS/VANS/DOUBLECABS
(*Shall submit separate sheet for each type of vehicle)*

1.	Brand & Engine Capacity	
2.	Plate No. and the date of Registration of the Vehicle	
3.	Type of the Vehicle and the year of Manufacture	
4.	Country of Manufacture and Make	
5.	Total Traveled distance as at the Date of Bid Closing	
6.	No. of Passengers (except driver)	
7.	Is the dual AC working satisfactorily (in case of Van)	
8.	Name of the Owner	
9.	Address	
10.	Details of Major Repairs done for the Vehicle (if any)	
11.	Name of the Driver	
12.	Address of the Driver	

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I certify that the details given above are correct and compatible with the Conditions of this Contract.

Signature of the Bidder/Contractor	
Name	
Address	
Telephone No.	
Fax No.	
Date	

Note: The Bidder shall fill and submit the duly completed separate questionnaires for each hiring Vehicle.

QUESTIONNAIRE FOR PURCHASE VEHICLES

(a) QUESTIONNAIRE FOR MOTOR CYCLE (125 CC)

1.	Brand/Engine Capacity	
2.	The year of Manufacture	
3.	Country of Manufacture and Make	
4.	The Name and Address of the Agent in Sri Lanka	

I certify that the details given above are correct and compatible with the conditions of this contract.

Signature of the Bidder/Contractor	
Name	
Address	
Telephone No.	
Fax No.	
Date	

"For References ONLY"
(Not for Bidding)

Note: The Bidder shall fill and submit the duly completed separate questionnaires for Motor Cycle.

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(Not for Bidding)

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6B.20 SPECIFICATION FOR HEALTH AND SAFETY GUIDELINES FOR SRI LANKAN CONSTRUCTION SITES TO BE ADOPTED DURING COVID-19 OUTBREAK.

"For References ONLY"
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Construction Industry
Development Authority

Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID 19 outbreak

"For References ONLY"
(Not for Bidding)

Version 29th April, 2020

Ministry of Urban Development, Water Supply & Housing Facilities

Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID 19 outbreak published by Construction Industry Development Authority, Operating under Ministry of Urban Development, Water Supply & Housing Facilities.

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This information will be made available to interested parties upon request, from CIDA Head Office. Tel: 94-11-2699801, Fax: 94-11-2699738, Email: info@cida.gov.lk

Acronyms

CDC	Center for Disease Control& Prevention of US
CIDA	Construction Industry Development Authority
COVID-19	Coronavirus disease of 2019
CSOH	Construction Safety and Occupational Health
EOT	Extension of Time
EU	European Union
GDP	Gross Domestic Product
LD	Liquidated Damages
NIOSH	US National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
US	United States
USA	United States of America
v/v	Volume per Volume
WHO	World Health Organization

"For References ONLY"
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"For References ONLY"
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1.0 Introduction

These Guidelines are prepared by the CIDA established under the Construction Industry Development Act No.33 of 2014 with the view to be used as a mandatory Health & safety Guidelines at the construction sites operating in Sri Lanka during the critical observation period of Coronavirus COVID 19 epidemic, as a precautionary measure, in preventing the spreading of the virus.

These Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID 19 outbreak are not a Rule, Regulation or Legislation and does not create any legal obligations. It contains instructions and information of mandatory safety and health standards. The instructions are advisory in nature, informational in contents, and are intended to assist the construction workers working in construction sites within the country, providing a safe and healthful worksite. The Guidelines are not static in nature and needs revisions and additions to suit the needs of the situation from time to time. These Guidelines require construction workers to comply with safety and health instructions and information embedded therein. In addition, the Guidelines requires Contractors/Clients of the construction project to provide their workers with a worksite free from recognized hazards likely to cause death or serious physical harm, during the epidemic of COVID 19.

Since the virus has adversely affected many human lives causing thousands of deaths, and millions of infected people in the world and since the epidemic is gradually raising in Sri Lanka as well, the spreading of the virus shall be curbed and the COVID -19 shall be eradicated from Sri Lanka.

The Construction Industry is an important industry in Sri Lanka, contributing approximately 10% to the country's GDP and providing employment for over 650,000. Construction Projects have to be continuously carried on for the progress of the work, and timely completion, in order to minimize the Overhead Costs, claims of compensations resulting EOT, burden of LD upon the construction contractors etc. Therefore, construction workers are required to be deployed in construction work sites with effective and protective health & safety measures continuously, curbing the spreading of the epidemic.

In order to curb the spreading of the virus and reduce the impact of COVID-19 outbreak on the construction industry, its stakeholders and the general public associating such stakeholders, it is important for all Clients/Employers and Contractors of construction projects to introduce and implement Health & Safety Guidelines to be adhered in construction sites.

CIDA, the Apex Regulatory Agency in the construction industry, has developed this "Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID 19- outbreak" in collaboration with the Industrial Safety Division of Department of Labor and References were made to the WHO- Infection prevention and control during health care when COVID-19 is suspected- Interim guidance 19 March 2020 and the Guidelines of the OSHA of USA.

These Health and Safety Guidelines for Sri Lankan Construction Sites are to be adopted during COVID- 19 outbreak. Employers/Clients, Contractors and construction workers shall adhere to this Guidelines to help identify and curb the spread of this epidemic in worksites settings and to determine any appropriate control measures to implement. Additional guidance may be needed as COVID-19 outbreak conditions change, including as new information about the virus, its transmission, and impacts, becomes available.

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2.0 About COVID-19

The Disease of Coronavirus 2019 (COVID-19) is a highly contagious respiratory disease which is caused by the SARS-CoV-2 virus. Although there are no confirmed sources as to where the virus has been originated, it has been spread to most of the countries world over including Sri Lanka. The COVID-19 at present has arisen in an outbreak becoming a pandemic which has affected all aspects of daily life in Sri Lanka as well as in many countries around the world, including free travel, trade, tourism, food supplies, and financial markets, which in turn has affected the National Economy.

2.1 Symptoms of COVID-19

Infection caused by the virus that causes COVID-19, SARS-CoV-2, can cause illness ranging from mild to severe and, in some cases, can be fatal. These symptoms include fever, cough, and shortness of breath. Some infected people have reported experiencing other non-respiratory symptoms. The people, referred to as *asymptomatic cases*, do not experience symptoms at all.

According to the CDC, symptoms of COVID-19 may appear in a minimum of 2 days up to around 14 days after exposure to the virus.

2.2 How COVID-19 Spreads

The virus is considered to spread mainly from person-to-person, including:

- Among people who are in close proximity with one another (within about 6 feet).
- Through the respiratory droplets produced by an infected person's cough or sneezing. These droplets can reach the mouths or noses of other people who are in close proximity or possibly be inhaled into the lungs.

Possibility is there for a person to be infected by COVID-19 by touching a surface or object that is contaminated with the virus on it and then touching their own mouth, nose, or possibly their eyes, with such contaminated hands. However, this is not considered to be the primary way of spreading the virus. Infected persons are considered most contagious when they are most symptomatic (i.e., experiencing fever, cough, and/or shortness of breath). Spreading might even be possible before people show the symptoms; there have been reported cases of this type of asymptomatic transmission with this new coronavirus, but this is also not considered to be the main way of spreading the virus.

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2.3 The survival of the virus

This virus is spread out with droplets when coughing or sneezing and survives in following surfaces for durations given against, while it remains in Air for 03 hours;

- Cardboard – 03 hours
- Copper – 24 hours
- Un-tarnished iron – 02 days
- Plastic – 05 days
- Paper – 04 to 05 days
- Wood – 04 days
- Glass – 04 days
- Aluminum – 02 to 08 days

Therefore, these surfaces shall be properly disinfected, and the construction workers must be educated on the above facts.

3.0 Employer/Engineer /Contractor

1. Employer /Engineer/ Contractor shall adhere to the Government Instructions released from time to time, which will also appear in the CIDA web site to mitigate the spread of COVID-19 in all Construction Projects operated under their purview, during the entire period declared as critical by the authorities.
2. Employer of construction sites shall ensure that Public Health Inspectors visit the sites in order to monitor whether adequate precautions for the safety of the workers and also to curb the spreading of virus, are being taken at such sites.
3. Contractor shall sufficiently appoint CSOH supervisors at site to closely monitor whether the instructions are strictly adhered by the occupants of the sites.
4. Contractor may introduce a suitable system imposing a fine for defaulters to maintain the discipline.
5. Contractor of the construction project shall provide soap, running water and hand sanitizer at the entrance of the construction site, for the use of workers.
6. Body temperature of the workers shall be checked at the entrance of each construction site, by a hand held equipment. The Thermal scanner has to be of Medical grade.
7. All precautions shall be used to prevent entry of persons recording a temperature above 98.4 0 F or 37.0 C, whom should be re-checked after 10-15minutes of rest and if positive for second time sent him/her back.
8. In large projects where number of workers are high which prevents manual body temperature checking procedures, employers/contractors shall use available latest technologies such as equipment operating on Infra-Red Rays to check body temperature at the entrance. One or more equipment shall be fixed based on the number of workers.
9. If any construction worker has developed symptoms of COVID-19 or high fever he shall be directed to a qualified doctor/ nearest Government Hospital.
10. Contractor shall preferably use a check-list and check whether each worker has symptoms of COVID-19 such as cough, sneezing, body pains, difficulty in breathing, fever etc. and direct the worker for treatment, in case of a detection.
11. Employer / Engineer/ Contractor shall make sure unauthorized visitors are not allowed to enter into construction sites during this critical period unless extremely necessary.
12. When visitors are taken inside the site, the above-mentioned safety precautions / hygiene etiquettes have to be strictly followed.
13. Employer shall appoint a Health and Safety Committee for every work site, with representations from the Contractor. The said committee shall be convened at least once a week and discuss with the workers about the current status of the epidemic, situation in the construction site and potential threats and decisions have to be taken providing solutions.
14. Employer / Engineer / Contractor shall ensure that Construction workers are provided with face masks and hand gloves. Masks and gloves shall not be re-used.
15. In extreme situations where the standard of protective mask is a requisite, a particulate respirator at least as protective as a NIOSH certified N95, EU standard FFP2, or equivalent shall be used.

"For References ONLY" (Not for Binding)

16. If a finger scan machine is used to mark presence at the work site workers shall be instructed to clean hands in the manner described by the Health authorities, after using the finger scan machine. Preferably a hand sanitizer (70%v/v alcohol based) shall be placed near the Machine for an easy operation.
17. The construction site, its machines, equipment, tools, stocks of material have to be regularly disinfected using a disinfectant.
18. Metal and plastic surfaces could contain virus for number of days; therefore, these surfaces shall be properly disinfected.
19. All metal surfaces shall be disinfected with minimum of 70% v/v alcohol solution. All non-metal surfaces be disinfected with 0.1% sodium hypochlorite solution.
20. Construction sites must be kept clean, disinfected with provision of clean air, minimizing the spreading of the virus.
21. Construction workers shall be educated to refrain from touching their face, eyes, nose or mouth and shall not touch the mask frequently having worn the same.
22. Posters & Placards promoting respiratory hygiene etc., shall be adequately displayed.
23. All the doors in buildings and structures of the construction site must be opened as long as possible providing ventilation and fresh air, thereby minimizing the spreading of virus.
24. If by any chance, it is known that one or more workers in the work site is infected withCOVID-19, he shall be at once sent to a specified government hospital by an ambulance.
25. The details of the other workers who closely worked or associated with the infected person shall immediately be notified to the nearest Hospital or to Special Units appointed by the Health Ministry / President's Task Force.
26. Until an action is taken, they shall be isolated and be advised for self-quarantining.
27. In such a situation, services of a qualified physician or one or more male nurses shall be obtained to monitor the symptoms shown by the workforce.
28. Employer/ Contractor shall make sure that the PPEs such as respirators N95 certified or equivalent, eye protection goggles or a face shields, non-sterile long-sleeved gown and gloves, waterproof aprons are sufficiently provided as per WHO guidelines for those who monitor persons having any kind of illness.
29. The instructions of Presidential Special Task Force for COVID-19 shall be strictly followed by all parties to the Contract (Employer/ Engineer/ Contractor) in this regard.
30. Owner of construction sites must maintain a register and the contact details of all construction workers at the site.
31. Monitoring and Tracking of the construction workforce will be essential, by manual operations or using the tracking / monitoring technologies.
32. Construction workers shall be provided by owners of construction sites, warm water to consume from time to time and such workers shall avoid taking cold water or beverages.
33. Contractor shall ensure to maintain a safe area distribution considering the 1-meter distance between workers as and when the nature of the work permits to do so, in order to keep a safe environment.

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34. All parties to the Contract (Employer/ Engineer / Contractor) shall ensure the Government Health Guidelines/ etiquettes issued from time to time in order to combat the spread of COVID-19 or any other epidemic are strictly adhered by the Construction Site staff.

4.0 Employee/ Worker

1. Workers must keep a distance of one meter in carrying out site work and in all possible occasions such as when checking the temperature, washing hands and when during tea and dining etc.
2. All construction workers must wash hands with soap or hand sanitizer containing alcohol and running water when entering the construction site.
3. All workers shall ensure that their body temperatures are checked at the entrance of the construction site, for their own safety in order to curb the spread of this decease.
4. Construction workers while at work must wash hands at intervals, especially when using equipment commonly used, with soap / hand sanitizer containing alcohol and running water.
5. Construction workers must engage in work at site wearing face masks and hand gloves. After removing the mask, it has to be discarded into a pedal operated closed bin and hands should be washed subsequently.
6. There should be minimal handling of the mask when removing.
7. Before and after using the finger scanning machine, workers shall ensure cleaning of hands in the manner mentioned above.
8. Construction workers must use a handkerchief or paper tissue when coughing or sneezing or at least the inner side of the elbow to be used.
9. Construction workers shall refrain from spitting or sneezing/coughing, putting out the discharge of phlegm in public places.
10. Contaminated waste and used tissues, hankies shall be either buried or disposed in a pedal operated closable garbage bin.
11. Disposal of waste shall be carried out as per the guidelines routinely followed except for the waste of suspected persons which has to be managed in accordance with the guidelines on waste management.
12. Construction workers shall not be indulged in smoking or consuming any drugs, which lower the immunity levels.
13. Construction workers shall not get together after finishing the day's work for discussions, group games, to consume food, water or alcohol.
14. Each construction worker shall keep separately a plate, water bottle glass/cup, tooth paste, tooth brush, razor of their own and shall not use these in common.
15. Used hankies, paper tissues, disposable razors, tooth brushes, shall be disposed in a pedal operated closable garbage bin or be buried.
16. Construction workers shall not touch each other, hand shake, hug etc., during this period under observation.

"For References ONLY"
(Not for Bidding)

17. Each construction worker shall keep separately his clothes, suits, towels, shoes, overalls, etc. and must not borrow these of each other.
18. Construction workers shall not go out of construction site once reported to work in the morning and before completing work at the end of the day without due permission of owner.
19. In order to maintain the body immune system healthy, Construction workers shall consume a nutritious and balanced diet and take a good rest after work and a good sleep.
20. Construction workers shall avoid crowds, avoid visiting public places as much as possible, during the outbreak under observation.

5.0 General

5.1 Administration

1. All the parties to the Contract shall ensure that the precautionary items elaborated under this Guideline are adequately adopted.
2. Definitions of parties to the Contract shall be as defined in CIDA Standard Bidding Documents.
3. Composition of Sanitizing liquids, body temperature values and all other medical instructions and general work place safety practices shall be as per the Operational Guidelines on Preparedness and Response for COVID-19 outbreak for work settings - Interim Guidance 17th April 2020, published by the Directorate of Environmental Health, Occupational Health and Food Safety of Ministry of Health and Indigenous Medical Services

"For References ONLY"
(Not for Bidding)

5.2 Meetings

1. Avoiding face to face meetings shall be practiced as much as possible. Employer, Engineer and Site staff, Project Management staff may use latest communication tools such as teleconferencing / video conferencing whenever possible.
2. Attendance for the meetings shall be minimum as possible whence face to face meetings are required.

5.3 Using Lift or Elevator

1. When construction workers are inside the buildings being constructed, using Electric Stairways, Lifts/Elevators, they must specifically use face masks.
2. Minimize the spreading of virus by minimizing the use of the Electric Stairways and Lift/Elevators.
3. The operating buttons and handles of Lifts/Elevators must be regularly disinfected.
4. When using the lift/elevator, the persons so using must face the walls of the same and thereby minimizing the spread of the virus. The number of persons traveling in the elevator shall be minimized. A ground plan must be made for this purpose.

5.4 Sanitary Facilities

1. The sanitary facilities in the buildings, structures in the worksite shall be disinfected. The number of occasions to disinfect shall be decided on the number of workers in a worksite, and thereby minimizing the spread of the virus.
2. The sanitary facilities, lavatories, bathing rooms etc. shall be provided in the worksites, and such facilities/places, handles, and taps in them, shall be disinfected. These shall provide running water, soap, hand sanitizer containing alcohol, detergent etc.

5.5 Lunch Room

1. Lunch room or the eating place of the construction site must always be kept clean and disinfected.
2. Water taps of the lunch room be automated or disinfected regularly. Automated taps could be made with the use of a pedal
3. The chairs in the lunch room must be kept at one meter's distance.
4. The chairs in the lunch room shall be arranged not facing each other but facing the same direction as much as possible.
5. The number of persons using the lunch room at one time shall be minimized.
6. The lunch shall be provided to the workers who are provided with lunch, as lunch packets.
7. Hygienic and healthy ways shall be adopted by the catering services which provide lunch and food packets.

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5.6 Changing Room

1. Changing room shall always be kept clean and disinfected, ventilation shall be provided properly.
2. Clothes and garments of each worker shall be kept separately, thereby minimizing the spread of the virus.
3. The chairs of the changing room must be kept at a distance of one meter
4. The number of people using changing rooms at one time shall be minimized.

5.7 Transport Facilities

1. Spread of the virus in the public transport such as buses and trains could be minimized by providing transport facilities to the workers to the construction site.
2. The workers who travel by public transport such as buses and trains shall always wear the face mask.
3. A fair distance could be maintained in the bus/train by minimizing number of people traveling on them at one time.
4. If transport facilities are provided to construction workers to and from work site, workers shall keep the required distance and shall always wear the masks, while travelling.
5. The vehicles used for providing transport facilities to construction workers, shall be cleaned regularly and disinfected.

"For References ONLY"
(Not for Bidding)

5.8 Accommodation

Spreading of virus through bed cloth, garments in accommodation facilities:

1. The clothes, bed sheets, pillow cases, garments of the workers shall be washed regularly using a detergent and with warm water (60°C - 90°C)
2. Clothes and bed clothes, washed, shall be dried under excessive heat or direct sunlight.
3. Hostels, Barracks, Dormitories, Lodges and sleeping areas, which are used by the construction workers shall be frequently disinfected and kept clean and ventilated.

6.0 Bibliography

(1) WHO- Infection prevention and control during health care when COVID-19 is suspected- Interim Guidance 19th March, 2000

(2) Operational Guidelines on Preparedness and Response for COVID-19 Outbreak for Work Settings Interim Guidance 17th April, 2020
Directorate of Environmental Health, Occupational Health and Food Safety
Ministry of Health and Indigenous Medical Services

(3) Guidance on Preparing Workplaces for COVID-19 by US Department of Labour, OSHA

(4) Precautions to prevent Coronavirus infections at workplaces – Note released by Industrial Safety Division of Department of Labor March, 2020

"For References ONLY" (Not for Bidding)

CIDA

"For References ONLY"
(Not for Bidding)

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Ministry of Urban Development, Water Supply and Housing Facilities

HEALTH AND IMMUNITY ENHANCEMENT GUIDELINES FOR COVID -19 and DENGUE

CIDA Health Guidelines for Construction Industry

Version 3(Revised)

"For References ONLY"
(Not for Binding)

Construction Industry Development Authority

Sri Lanka

August 2020

"For References ONLY"
(Not for Bidding)

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Health and Immunity Enhancement Guidelines for COVID-19 and DENGUE

This guideline for the Sri Lankan Construction Sites has been prepared by the Construction Industry Development Authority which is empowered by the parliamentary ACT, No. 33 of 2014.

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HEALTH AND IMMUNITY ENHANCEMENT GUIDELINES FOR COVID-19 & DENGUE

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This information will be made available to interested parties upon request, from CIDA Head Office. Tel: 94-11-2699801, Fax: 94-11-2699738,

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Acronyms

CIDA	Construction Industry Development Authority
CDC	Center for Disease Control & Prevention of US
COVID-19	Corona virus disease of 2019
CSOH	Construction Safety and Occupational Health
EOT	Extension of Time
EU	European Union
GDP	Gross Domestic Product
LD	Liquidated Damages
NDCU	National Dengue Controlling Unit
NIOSH	UN National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
SARS-CoV-2	Severe Acute Respiratory Syndrome Corona virus 2
US	United States
USA	United States of America
v/v	Volume per Volume
WHO	World Health Organization

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Chairman's Foreword

As the Chairman of the Construction Industry Development Authority It is my privilege to contribute to the "Health & Immunity Enhancement Guidelines for COVID-19 & Dengue" for the industry stakeholders to practice by taking sufficient precautions to avoid the threat due to these two epidemics.

Today, Construction Industry plays a very important role in National Economy contributing approximately 7% to the Gross Domestic Product. It has provided more than 500,000 employments directly and indirectly while serving the public to improve their living standards. Therefore, any decline in the industry due to these epidemics would be detrimental to the national economy.

COVID-19 is spreading all over the world reporting millions of deaths. In a situation where the world is struggling to find a vaccine, the construction industry has to perform. In the recent past, the construction sites due to their nature of activities and site situations had been blamed for the creation of easy breeding grounds for dengue mosquitoes. Threat of COVID-19 and Dengue both are causing a negative impact in the public participation in the construction industry activities. This affects the activities in the construction industry and in future this will adversely impact the national economy.

Therefore, considering the responsibility vested to assure best health in the constructions workforce, CIDA decided to publish this guideline to educate the industry stakeholders to ensure safety from both COVID-19 and Dengue. The main aim of the Guideline is to protect human lives associated with the construction sites, from the dangers due to COVID-19 & Dengue, thereby leading to the sustenance of construction industry.

This report which a combination of the "Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID-19 Outbreak- Version 2 (Revised)" and "Guidelines on Dengue prevention by CIDA and guidelines of the Ministry of Health and Indigenous Medical services, Sri Lanka". This Guideline is

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well supported by Guidelines of Ministry of Health of Sri Lanka on COVID-19 & DENGUE.

As the Chairman of the Construction Industry Development Authority, I am taking this opportunity to extend my gratitude to all those in CIDA who contributed to this national endeavor by contributing as preparers and reviewers. Among the contributors and reviewers, I am I especially thankful to Ms Muditha Priyanwada for taking a special interest in this Version 3. I trust the construction industry will make full use of this guideline and make construction sites safe from the two epidemics.

A healthy construction site will be able to deliver the best infrastructure to the public thereby serving the nation better. This guideline has been developed as a service to the registered contractors and others involved in the construction industry.

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EXECUTIVE SUMMARY

Health and Immunity Enhancement Guidelines for COVID-19& Dengue in construction industry is an utmost important consideration and should pay high attention to practice throughout the process. It is required to ensure that all aspects of health should have been properly arranged before stepping into the sites as construction environment is prone to health hazardous situations very often nowadays.

This technical publication discusses the sources of COVID -19 & DENGUE, its symptoms and discusses health precautions in detail that need to be taken during this outbreak of COVID-19 and Dengue which cause critical health issues.

It also elaborates the obligations of each party of the industry including Contractors, Employers and Workers. Further it gives a detailed account of improved welfare facilities to ensure the best health in construction sites. Employers' commitment on allocation of funds for site cleaning as a mandatory requirement for preventing Dengue, has also been highlighted.

In the Part 2 of this document, important links that include health information is mentioned for easy reference of the stakeholders. The Forms to be submitted by each Contractor to Ministry of Health and simple informative posters which can be used to educate the staff are also in this document for reference.

In preparation of this Guideline, CIDA has referred Industrial Safety Division of Department of Labor, Sri Lanka, the WHO guidance of 19th March 2020 for infection prevention and control during health care when COVID-19 is suspected, and the guidelines of the Ministry of Health and Indigenous Medical services, Sri Lanka and OSHA of USA.

This Guideline is to be available to personnel concerned with construction projects, specially to the technical staff of contractors and the staff for the purpose of improving site control, periodical checkups and mitigating risk of this deadliest viruses

CIDA wishes all entities engaged in construction projects to utilize this guideline for enhancing the health culture in the industry and promoting the industry among the public as a health industry to survive.

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PART 1

Health and Immunity Enhancement Guidelines

for

COVID -19 and DENGUE

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1. INTRODUCTION

1.1. CIDA Guidelines on COVID-19, DENGUE and Health and Safety Guidelines

This document on Health and Safety Guidelines on COVID - 19 and Dengue is prepared by the Construction Industry Development Authority (CIDA) established under the Construction Industry Development Act No.33 of 2014 and is meant to be followed by construction sites operating in Sri Lanka as the controlling mechanism The guidelines aim to prevent spreading of COVID-19 and Dengue and to promote good health among construction workers and staff.

This 'Health and Safety Guidelines on COVID-19 and Dengue' is a culmination of Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID-19 Outbreak-Version 2 by CIDA published on 26th May 2020 and Guidelines for prevention of Dengue of CIDA. The new set of guidelines consists of two parts. Part 1 contains good practice guidance including the mandatory requirements of the health authorities and directions from selected guidelines of the Ministry of Health and Indigenous Medical Services for construction sector addressing COVID-19 and Dengue related issues.

CIDA has also carefully considered the guidelines that had been developed by the Industrial Safety Division of Department of Labour, Sri Lanka, the WHO guidance of 19th March 2020 for infection prevention and control during health care when COVID-19 is suspected, and the guidelines of the Ministry of Health and Indigenous Medical services, Sri Lanka and OSHA of USA.

The Part 2 contains supplementary practices to ensure the sustenance of the sector by enhancing the immunity as recommended by Traditional Native and Ayurveda medical practice. The fervent hope of CIDA is to achieve a steady input from the construction workforce thereby ensuring the much-needed contributions to the national economy.

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Sri Lanka and elsewhere in the world, construction sites are places with workers performing a wide variety of tasks manually. Cutting down fund allocations for site overheads leads to serious concerns which affect the sustainability of the projects in the long run. Garbage stagnation, water stagnation and less use of Personal Protective Equipment creating an environment prone to COVID-19 spreading and dengue breeding are some of the issues erupting as end results of these cost restrictions.

Also, workers are working fairly close proximity by sharing tools, working in groups for efficiency, using machines operated on a shift basis, experiencing frequent labour group transport both horizontally and vertically supporting quick spread of any kind of virus. These significant differences at construction sites when compared with other factories, business, or work places require a special attention to face the threat of COVID- 19.

Therefore, CIDA as the apex regulatory institution, has taken a special effort to develop a comprehensive, detailed, yet easy to practice guideline for the safety and protection of the Sri Lankan construction work forces from these two deadliest deceases. This Guideline contains instructions which are both mandatory and advisory. The health authority directives are mandatory while the immunity enhancement practices recommended are advisory. CIDA expects the construction workers to comply with the instructions and the construction site managers to enhance the awareness among the work force. It is expected that each construction site will take extra precautions to be free from recognized hazards likely to cause death, in case of COVID-19 or Dengue.

CIDA will affect responsible action to update this guideline as new information about the virus, its transmission, and impacts, becomes available. However, it is the responsibility of the managers and others in the workforce to take sufficient steps to refer reliable sources for updates related to the developments associated with COVID-19 to ensure the control of this pandemic.

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HEALTH ISSUES IN CONSTRUCTION SITES

2.1 **COVID**- 19

2.1.1. Beware of COVID- 19

2.1.1.1.About COVID-19

The Coronavirus 2019 (COVID-19) sickness is a highly contagious respiratory disease which is caused by the SARS-CoV-2 virus. Although there are no confirmed sources as to where the virus has originated, it has spread to most of the countries in the world including Sri Lanka. As at present, COVID-19 outbreak has become a pandemic that has infected millions and has become responsible for the death of hundreds of thousands worldwide. The lockdown situations imposed to curb the outbreak has affected the life styles of all around the world and also in Sri Lanka. Since late February 2020, the COVID-19 has prevented free travel, trade, tourism, food supplies, and even functioning of financial markets. In Sri Lanka in the second week of March 2020, the COVID-19 closed down all construction sites of both public and private sectors. Since the COVID-19 virus has adversely affected many human lives causing thousands of deaths, and millions of infected people in the world it is extremely important to be cautious and take necessary preventive steps to protect our construction industry from this virus.

2.1.1.3 Symptoms of COVID-19

Infection triggered by the virus that causes COVID-19, (SARS-CoV-2), can create illness ranging from mild to severe and, in some cases, can be fatal. These symptoms include fever, cough, and shortness of breath. Some infected people have reported experiencing other non-respiratory symptoms. The people, referred to as asymptomatic cases, do not experience symptoms at all. According to the Center for Disease Control & Prevention of US (CDC), symptoms of COVID-19 may appear in

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a minimum of 2 days up to around 14 days after exposure to the virus.

2.1.1.3 Survival of the Virus

The COVID-19 virus is spread out with droplets when coughing or sneezing. The survival duration of virus on surfaces depend on the type of surface. The COVID-19 virus remains in air for approximately 03 hours. The types of surfaces and corresponding survival durations are given in Table 1.

Table 1: Survival of COVID-19 on Surfaces

Type	**Duration**	**Type**	**Duration**
Cardboard	03 hours	Paper	04 to 05 days
Copper	24 hours	Wood	04 days
Un-tarnished iron	02 days	Glass	04 days
Plastic	05 days	Aluminum	02 to 08 days

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2.2. DENGUE

2.2.1 Beware of DENGUE

2.2.1.1.About DENGUE

Dengue is fast emerging pandemic-prone viral disease in many parts of the world. The Aedes aegypti mosquito is the main vector that transmit the deadly virus. Dengue. Dengue fever flourishes in urban poor areas, suburbs and the countryside but also affects more affluent neighborhoods in tropical and subtropical countries.

In recent times, construction industry is booming in Sri Lanka particularly in urban cities. This situation has created several environmental health concerns including an abundance of mosquito breeding places in construction sites. As a result, vector borne diseases such as Dengue fever has seen an exponential increase. Recent mosquito surveys have concluded that 70% of inspected construction sites have water collection suitable for mosquito breeding. Further, more than 10% of construction sites inspected in 2018, had positive dengue mosquito breeding places.

2.2.2.2 Symptoms of DENGUE

Symptoms of Dengue usually begin four to six days after infection and last for up to 10 days. It may include sudden high fever, severe headaches and pain behind the eyes, muscle pain, fatigue, nausea, vomiting and skin rash.

Sometimes, symptoms are mild and can be mistaken for those of the flu or another viral infection. If neglected this may include high fever damaging to lymph and blood vessels, bleeding from the nose and gums, enlargement of the liver, and failure of the circulatory system. The symptoms may progress to massive bleeding, shock, and death.

2.2.2.3 Survival of the Virus

The best way to prevent the disease is to prevent bites by infected mosquitoes, particularly if you stationed in or traveling in urban area. This involves self-protection and making efforts to keep the mosquito population down. Though there are certain attempts to invent a vaccine, there is no vaccine to prevent the general population from contracting it.

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3. BEWARE OF RISKS OF COVID-19 AND DENGUE IN CONSTRUCTION INDUSTRY

3.1. COVID-19 and DENGUE

Infected persons due to Covid-19 and Dengue is reported high fever. If any person is infected Covid-19 it is considered most contagious when they are most "symptomatic" (i.e., experiencing fever, cough, and/or shortness of breath). Spreading might even be possible before people show the symptoms and there have been many reported cases of this type of "asymptomatic" transmission with this new corona virus.

Though the following has been briefed previously, it is important to stress the risks of spreading COVID-19 and Dengue in the construction industry. Due to the very nature of work at Sri Lankan construction sites, construction workers often have to work in close proximity, share tools, attend to tough and hard work such as placing shuttering, reinforcements, scaffoldings, receiving and returning of tools, attend to awareness pocket meetings, and adhere to common meal or tea-breaks. These would make it very difficult for the construction workers to keep social physical distancing as required by the authorities. Social physical distancing and preventive measures will become most difficult at the beginning because of the already built up inertia due to the habits which would be impossible to change overnight. Tendency of using the same face mask without replacing or cleaning could be very high. Furthermore, there might be cases where those with respiratory issues may be unknowingly assigned to work at dangerous or risky places. In the construction industry workers are commonly transported from site to site in trucks and trailers, packed close to each other. In high rise building construction, the practice is for many workers to use a small cubical for vertical transport. Most of the construction workers are with some common/bad habits such as chewing beetle, smoking and even alcohol consumption, dumping garbage everywhere, ignorance of water

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accumulation etc. Frequently many workers share the use of mobile phones and chargers.
Due to all these and many more manners that prevailed in the construction sites prior to the COVID-19 attack, the workers at construction sites would become very vulnerable and get exposed to a high risk of getting infected or spreading the disease, unless appropriate remedial measures are taken.

Nevertheless, Dengue prevention has been the real challenge before the devastation COVID-19 brought. Hence, construction workers must be carefully guided to protect from the risks of getting infected from both COVID-19 and Dengue and thereby ensuring high contribution to the sustenance of the industry.

As the principle of preventing measures is the best solution for controlling the deadliest two viruses, stakeholders of the industry have to adhere to best practices, especially given in Section 5, 6 and 7 of this document.

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4. DUTIES AND RESPONSIBILITIES

4.1. Role of CIDA in preventing COVID-19 and Dengue

CIDA as the apex body for construction industry has taken actions as mentioned below to prevent spreading COVID- 19 and Dengue.

1. CIDA has established a Surveillance team for monitoring health practices at construction sites to prevent dengue in line with the Special Presidential Task Force for Dengue Prevention. This surveillance team consists of members of National Dengue Control Unit (NDCU) of Ministry of Health, Environmental Police, Area MOH and members of CIDA.

2. Surveillance team advises and monitored on the precautions to be taken to maintain the site as a dengue free zone to each construction site staff.

3. A check lists (Attached as Form 1 in Part 2) has been issued by CIDA with the support of NDCU to check the site conditions. Each month, the summary of checklists (Attached as Form 2 in Part 2) has to be returned by the Contractor to CIDA. CIDA has taken necessary steps to update NDCU based on the Summary received.

4. CIDA has prescribed Employers to provide cost incurred in site cleaning. This has been included in the standard preliminary list of Preliminary Bill No 1 of CIDA(ICATAD/04)

5. Any Contractor who is not capable of maintaining the sites as Dengue free zone will be considered as guilty of an offence as per disciplinary procedure laid down in the evaluation "Criterion for Registration, Grading and Monitoring of Main Construction Contractors of CIDA".

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6. In addition to this Guideline, CIDA has issued Health and Safety Guidelines for Sri Lankan Construction sites to be adopted during COVID-19 Outbreak" and also a Guidelines for Safety and Health in Construction (CIDA/STD/04) as a guide to overall safety and health management in construction sites.

4.2 Employers Duties

1. Employer has to play a key role in prevention of spreading COVID-19 and Dengue. Employers are responsible to follow below mentioned actions during their constructions.

2. Employers, workers, and their organizations should collaborate with health authorities to prevent and control COVID-19 and Dengue.
3. Employers, in consultation with workers and their representatives, should plan and implement measures to prevent and mitigate COVID-19 and Dengue at the workplace through engineering and administrative controls, and provide personal protective equipment and clothing according to the risk assessment. Such measures should not involve any expenditure on the part of the workers.
4. If COVID-19 is contracted through occupational exposure, it could be considered as an occupational disease and, if so determined, should be reported and compensated according to the Area MOH or Close by Government hospital for employment injury benefits as stated in the Section 5 and 7.

4.2.1 Allocation of funds

1. Employer has to allocate necessary funds for Dengue prevention as an Overhead as stated in Guidelines for the preparation of Bill No 1 – Preliminaries of Building Works. It is to be paid as an Item as mentioned in the below;

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Table 2: Guidelines for the preparation of Bill No 1 – Preliminaries of Building Works

Item No	Description	Qty	Unit	Amount, Rs
28	Allow lump sum for maintaining the site in a clean and orderly manner during the entire contract period. The contractor shall take due care to prevent water stagnation, eliminate mosquito breeding places at the site and this is to be ensured through internal monitoring mechanism.	E	Item	

2. In addition to that Employer may provide financial allocations for safety precautions and PPEs required safeguarding Contractor's Workers against COVID-19 and Dengue. Available contractual provisions may be used in this connection with the approval of the Engineer to the project.

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4.3 Contractual Obligations of the Contractor

Contractor is the most responsible person for controlling COVID-19 and Dengue in Construction sites. Contractor should implement Section 5: Preventive Hygiene best practices at Construction Sites for COVID-19 described in this document to avoid spreading COVID-19.

In addition to that following special Dengue preventive actions should be carried out by the Contractor.

1. A dedicated programme for regular inspection and elimination of mosquito breeding places should be in place throughout entire construction period.

2. Assign an Officer (Safety & Occupational Health supervisor) and a subordinate team (Health and Safety Committee) responsible for keeping the site free of mosquito breeding and free of garbage. All mosquito breeding places detected should remove on a daily basis.

3. Train members of the site inspection team regularly on control methods of mosquito breeding according to the guidelines prepared by National Dengue Control Unit (NDCU).

4. Regular Capacity Building and training workshops to be conducted by MOH/NDCU in respective areas.

5. Daily site inspection should be carried out covering entire construction area, storage yard, living quarters, cooking/washing area and toilets as explained in Form 01. Assigned officer must complete Form No 01 indicating positive and potential breeding places. Filled Form No 01 should be kept filed in site office for inspection by any authorized officer.

6. Weekly update/findings of Form No 01 should be communicated to the Main Contractor of the Construction site.

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7. Consolidated monthly summary report, Form No 02 should be prepared based on Form No 01 findings.
8. All construction sites must send this monthly summary report, Form No 02 to the respective local authority (Municipality/Urban Council) with copies to the area MOH and CIDA.

9. In case of COVID-19, special measures are needed to protect workers at higher risk of developing severe disease, such as that age 60 and over, or with underlying medical conditions, upon recommendation of the occupational health services.

10. Workers in the informal categories such as material suppliers, security officers, stores keepers, tea boys etc. should not be left behind in the protection of their health and safety at work.

11. Chemical management (Fogging) and environmental management as preventive measure should be done with the support of Area MOH after confirmation of an outbreak (Circular No: ROP/PSC/2017/01). Suitable List of pesticides management agencies registered under the Registrar of Pesticides (ROP) received by National Dengue Control Unit (NDCU) is listed for contractors to obtain services and is available in CIDA Web site.

12. Use recommended larvicides (Bti H-14: Bacto Bti, Bactivec, Mosquito Dunk, Pyriproxyfen (Similarv 0.5 G), Novaluron, Polydimethylsiloxane (Aquatain AMF) in a scientific manner with the technical advice and supervision of area MOH. Refer to circular no ROP/PCS/2017/1 and ROP/PCS/2018/2 issued by Registrar of Pesticide.

13. Services from a professional Pest Management Agency (PMA) shall be required for continuous application of larvicide for potential breeding places. Selection of professional pest

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management agency shall be done as per the attached list in CIDA website.

14. Maintain records on type of larvicides and frequency of application by the Contractor is required.

15. Application of Larvicides shall be used as per the instructions of medical experts and PHIs, and also as the last option as it destroys most environmentally friendly species such as butterflies.

4.4 How Workers should support in preventing COVID-19 and Dengue

1. Workers has to have a volunteer contribution in COVID-19 and Dengue preventing actions as they are the most vulnerable team to the two epidemics.

2. Workers are responsible to follow the measures for occupational safety and health and infection prevention and control implemented in the workplace, and to participate in training provided by the employer. Workers should wear PPEs as instructed by the Supervisor without any hesitate.

3. Workers should report to their in-charge/supervisor any situation which may present if they have any symptoms of COVID-19 or Dengue are appeared.

4. Workers have to leave themselves from any work situation that they have reasonable justification to believe of having COVID-19 or Dengue with the aim of avoiding spreading COVID-19.

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5. PREVENTIVE HYGIENE BEST PRACTICES AT CONSTRUCTION SITES FOR COVID-19 AND DENGUE

5.1. Health tips

5.1.1. Health checks-Body Temperature

Continuous health checks are very important to prevent spreading COVID-19. Following main health checks are recommended to carry out at each site.

1 Body temperature of the workers shall be checked at the entrance of each construction site, by hand held equipment that can be used by maintaining social physical distancing. Such Thermal scanners should be of Medical grade.

2 All precautions shall be taken to prevent entry of persons recording a temperature above 98.4 ^{0} F or 37.0^{0} C. Such persons should be re-checked after 10-15 minutes of rest and if positive for second time then the concerned person must be referred to appropriate medical attention.

5.1.2 Health tips- Washing hands and sanitization

Following health tips facilitating the workers washing hands and sanitization is recommended,

1 Construction projects are to be provided with soap, running water and hand sanitizers at the entrance of the construction site, for the workers to wash their hands. Facilitation of hand washing and frequent hand washing is mandatory.

2 All efforts must be taken to install foot operated taps in order to ensure water on demand: This is considered as the best for all wash basins.

3 As an additional measure, step can be taken to provide a foot bath with 0.1% sodium hypochlorite solution at the entrance and vulnerable places.

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4 Directions mush be given to change shoes at the entrance of a work site and provisions must be made for each individual to use a separate set of shoes while inside the premises.

5.1.3 Health Tips -Personal hygiene

Care on personal hygiene is very important to control COVID-19. Each worker has to pay attention on following tips to maintain good care on personal hygiene.

1. Construction workers shall be educated to refrain from touching their face, eyes, nose or mouth. They shall not touch the mask frequently. If the face masks are of disposable type, then must not be used after a single use. Multi use face masks must be of good hygiene for repeated use.

2. If a finger scan machine is used to mark attendance at a work site, then workers shall be instructed to clean their hands. It is necessary to note that, after using the finger scan machine the workers must wash hands or clean with a hand sanitizer. Preferably a hand sanitizer (70%v/v alcohol based) must be placed near the finger scanning machine for easy use.

3. Workers must refrain from sharing mobile phones, pens and other common utilities such as, telephones, fax machines, desks, work tools and equipment unless they are carefully sanitized.

4. Each construction worker shall keep his clothes, suits, towels, shoes, overalls, etc. separately and must refrain or borrowing from each other unless they have been carefully sanitized.

5. Each construction worker shall keep a plate, water bottle glass/cup, tooth paste, tooth brush, razor of their own use. They must keep them separately and shall not make them available for common use.

6. At all times during the outbreak and during the periods under observation, construction workers shall avoid mixing with crowds, keep away from crowded places and evade visiting public places,

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7. In order to maintain the body immune system healthy, construction workers shall consume a nutritious and balanced diet and take a good rest after work and ensure a good continuous sleep.

8. Contaminated waste, handkerchiefs, paper tissues, disposable razors, tooth brushes, etc., shall be disposed in a pedal operated closable garbage bin.

9. Disposal of waste shall be carried out hygienically and following the guidelines of a health inspector or an appropriate health authority. The waste of a suspected person shall be managed in accordance with the guidelines on waste management given by a health inspector. The suspected person must also be carefully taken care of.

10. Construction workers shall not be indulged in smoking or consuming any drugs, which lower their immunity levels.

11. After finishing the day's work, construction workers shall not get together for discussions, group games, recreation or to consume food, water or alcohol.

12. Construction workers should refrain from physical contacts such as handshakes, embracing, etc., until the COVID-19 threat has been declared as over.

13. Once reported to work, construction workers must refrain from leaving the construction site without obtaining due permission from the person in charge and without taking appropriate health precautions. If a re-entry is required then all steps described earlier as appropriate, must be practiced.

5.2. Welfare facilities

Arranging welfare facilities of the construction workers for avoiding spreading COVID-19 is very important aspect to be paid attention. Transport Facilities, Accommodation, sanitary facilities, lunch room and canteen arrangements, changing rooms and water stagnation should be well planned and organized to manage social distancing and minimum contacts.

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Following minimum actions are to be implemented at sites and responsible officers are requested to implement best practice as per the nature of the site.

5.2.1 Exit procedure after work

There are several measures that needs to be taken when returning home from work place, upon returning home and then prior to entering the house or the dwelling unit. All workers must care to adhere to the following to avoid contamination and chances of spreading the decease.

i. Wash both hands thoroughly by using soap and water.

ii. Remove the clothing and shoes/slippers and leave them outside, and wash them before taking inside or wearing them again.

iii. Leave all your belongings outside. If any item is taken inside the house, either wash it with soap and water or disinfect with alcohol sanitizer. (This applies to your mobile phone, spectacles, wrist-watch etc.). Enter the house only after a bath.

5.2.2 Transport facilities

1. Chances of construction worker contamination while using public transport such as buses and trains could be minimized by providing transport facilities to workers from the residence to the construction site and back.

2. Using own bicycle, motor cycle, or a car can be considered as an option to avoid the use of public transport. In case of such an option, the vehicle must be provided with a health-safe location for parking. In case such transport utility has to be brought into a site, then proper disinfection must be carried out.

3. The workers who are compelled to travel by public transport such as buses and trains shall always wear a face mask and gloves.

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4. Each worker using public transport must be advised to maintain a fair distance between him/her and others. In isolated cases of a breach in condition, the worker must resort to a sufficient method of disinfection.

5. If site organized and site-specific transport facilities are available then workers shall keep the health authority required physical distance and shall always maintain wearing face masks.

6. The vehicles of a construction site used to provide such transport facilities shall be regularly cleaned and disinfected under the supervision of the health inspector.

7. Resorting to on-site or nearby accommodation is a favorable option to minimize risks of contacting COVID-19 while travelling. Walking to site must be encouraged for the employees residing at close proximity.

5.2.3 Accommodation

Spreading of virus through bed linen garments in accommodation facilities:

1. Clothing, bed sheets, pillow cases, and other garments of workers shall be washed regularly using a detergent and with water heated to a temperature between 60°C - 90°C. The construction workers must refrain from sharing the garments and linen in places of accommodation.

2. Clothes and bed linen, washed, shall be dried by exposing to adequate heat or under direct sunlight.

3. Hostels, barracks, dormitories, lodges and sleeping areas, used by the construction workers shall be frequently disinfected and kept clean and ventilated.

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5.2.4 Sanitary facilities

1. Adequate sanitary facilities, lavatories, bathing rooms, changing rooms, etc., shall be provided in the worksite/s, and in such facilities/places, the handles, and taps shall be disinfected to minimize the spread of the COVID-19 virus.

2. The number of occasions of disinfection shall be decided by the health inspector by considering the frequency of use and the number of workers in the worksite.

5.2.5 Lunch rooms and canteens

1. At each construction site the lunch breaks should be staggered to ensure meaningful and successful implementation of the guidance given to avoid the spreading of COVID-19 due to possible lack of social physical distancing at canteens/lunch rooms.

2. The number of persons using the lunch room at any given time shall be minimized to ensure congestion and social physical distancing requirements. The locations must be suitably ventilated.

3. Lunch rooms or the eating places of each construction site must always be kept clean and disinfected.

4. Water taps of the lunch room be automated or disinfected regularly. Automated taps could be made with the use of a pedal.

5. The chairs/seating arrangements in the eating places and lunch rooms must be kept at distances fulfilling social physical distancing requirements.

6. As much as possible steps must be taken to arrange the chairs in the lunch room ensuring that they are not facing each other but facing the same direction.

7. Construction workers must be encouraged to use disposable wrapping and containers to take or carry meals. Any waste

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disposal must be carried out according to the guidance of the health inspector and for this purpose foot operated bins are recommended.

8. Catering services deployed at the construction sites must adhere to Hygienic and healthy ways and this should be guided by and ensured by the health inspectors.

5.2.6 Changing rooms

1. Changing room/s shall always be kept clean and disinfected. Proper ventilation shall be ensured. Hand washing must be facilitated at or near the changing rooms.

2. In order to minimize the spread of the virus, clothes and garments of each worker shall be kept separately,

3. The chairs of the changing room must be kept at a distance of one meter, cleaned and disinfected regularly.

4. The number of people using changing rooms at any given time shall be minimized to prevent undesirable social physical distancing.

5.3 Waste Disposal at construction sites

In the context of dengue control, non-biodegradable items, community and industrial waste collected should be properly disposed and managed at sites avoiding water stagnation.

1. Proper storage, collection and disposal of waste are essential for protecting site staff including Dengue.

2. Waste should be collected in plastic sacks and water stagnation should not be allowed. Waste collected should be disposed regularly and should not stagnated.

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5.4 Personal Protective Equipment

Employers have duties concerning the provision and use of personal protective equipment (PPE) at work. .PPE will protect the workers against health or safety risks at work, specially from the deadliest deceases such as COVID-19 and Dengue.

1. Each Construction site must ensure that all construction workers are provide with face masks and hand gloves. Masks and gloves shall not be shared or re-used

2. It is necessary to make workers aware of the proper use of Personal Protective Equipment (PPE) to avoid cross contamination. These include, removing and placing the face mask once again, taking off and wearing the gloves again.

5.5 Water stagnation in construction sites

Management of irremovable stagnant water collections in the site should be paid attention to avoid potential breeding places. Following actions are recommended to implement by the Safety & Occupational Health Supervisor and to be monitored by the Health and Safety Committee.

Water-storage containers can be designed to prevent mosquitoes from laying eggs on the surface of the water. Containers can be fitted with tight lids or, if rain-filled, tightly-fitted mesh screens can allow for rainwater to be harvested from roofs while keeping mosquitoes out. Removable covers should be replaced every time and any water shall be removed. Such places should be well maintained to prevent damage that permits mosquitoes to get in and out.

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Applying larvicides and immersing BTI dungs in water collected areas where removal of water is difficult shall also be an option. However periodical replacing of dungs and applying larvicides shall be done as guided by the Registrar of Pesticides / NDCU, for effective preventive actions.

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6. ADMINISTERING A CONSTRUCTION SITE AGAINST COVID-19 and DENGUE

Stakeholders of the construction Industry should strictly ensure the practice of preventive measures introduced in this guideline to ascertain the prevention of the spread of COVID-19 and Dengue in construction sites. Any construction site contradicting these guidelines or any government guideline on COVID-19 or Dengue is liable to legal action and /or temporary closure of site.

6.1 General

1. Contractor shall suitably appoint Construction Safety & Occupational Health Supervisors at site/s to closely monitor whether the instructions are strictly adhered by the occupants of the sites.

2. Every construction site shall facilitate Public Health Inspectors (PHI) to visit the sites to inspect and provide guidance with respect to the adequacy of precautionary measures taken to ensure the safety of the workers and steps taken to curb any possible spread of the COVID-19 virus and Dengue.

3. Contractor may introduce a suitable system imposing a fine for violators of this health guideline to maintain work place discipline.

4. Every construction site must strive to operate only with resident workers. However, if workers are permitted to move in and out of the premises, then it must be done under unavoidable circumstances and by responsibly adhering to health guidelines such as disinfection and social physical distancing.

5. Every construction site must appoint a Health and Safety Committee to ensure that the guideline conditions are met and adhered to. These committees are recommended to meet at least once a week to evaluate the management of the threat

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due to COVID-19 and Dengue and then to effect any remedial action if required.

6. Construction sites should arrange a shift work system to limit the number of workers to the required minimum, and also establish specific movement arrangements to minimize interaction.

7. At each construction site there must be sufficient space to ensure safe social physical distancing between people waiting to enter and exit the site. Each site is recommended to use signage such as floor markings, to ensure the maintenance of safe social physical distance between people when queuing. A similar method can be used at applicable work area to avoid contact between worker teams.

8. Each construction site must ensure non mixing of members in work teams as a precaution of arresting a possible outbreak of COVID-19.

9. While sanitizing hands after use of a finger print machine, disinfecting the machine after each shift may not be necessary.

10. In large projects where the number of workers are high there would be a difficulty to carryout manual body temperature checking procedures. In such situations, it is advisable to acquire equipment using technologies such as Infra-Red Rays. Prior to deciding on the number of equipment, it may be appropriate to evaluate the number of workers entering at a time.

11. Each construction site must take steps to postpone the non-essential training and non-essential site visits from external parties.

12. Each work site is advised to develop a COVID-19 Preparedness plan; considering the occupational exposure level of employees, the individual risk factors and other recommended good practices mentioned in this guideline. Each member of the work force must be aware that this plan will not only enable

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the prevention/ control of the spread of infection but also prevent panic situations in the event of detecting a suspected case.

13. Safety of each activity to be undertaken must be carefully re-evaluated under the COVID-19 situation. In case any activity cannot be safely undertaken, then such activity should be postponed or cancelled as appropriate.

14. Where loading and offloading arrangements on site is allowed, drivers shall remain in their vehicles. Where drivers are required to get down from their vehicle, they should wash or sanitize their hands before handling any materials.

6.2 Preparation for resumption

As a pre-requisite to the opening at a site after the closure of construction sites Due to COVID-19 lockdown, each site must be prepared and inspected to ascertain the following.

1. It is necessary to verify whether there are any breeding spots likely to have harbored dengue-mosquitoes and implement effective action to curb the situation.

2. Ensure an effective site clearing operation to remove weeds and similar vegetation, dispose undesirable extraneous matter and then perform a disinfection exercise.

3. Verify whether toilet and other sanitary facilities are adequate to fulfill the COVID-19 safety considerations. If necessary, take steps to upgrade the existing or erect new facilities ensuring the adequacy to support the new conditions stipulated for safety from COVID-19 pandemic.

4. Ensure effective communication by clear and specific notices to all potential workers indicating that It is extremely important for

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them to remain in their locations if they are experiencing either a mild cough or low-grade fever (37.3^0 C or more).

5. Employees returning from other Districts must be carefully scrutinized by checking with the Health Ministry quarantine requirements such as MOH certificates, and then in case of a clear necessity, further quarantine should be pursued.

6. Proper investigations must be carried out to ensure that any person with symptoms, or having been in contact with a positive case in the last 14 days, or quarantined by health authorities is not allowed to commence work.

7. Each construction site must ensure a clear site plan indicating the key designated locations such as exits, hand washing facilities, cafeteria/lunch rooms, changing rooms, office of the health inspector locations for washing/temperature check etc. The plan must ensure clear labels, using applicable language(s) for easy understanding of construction workers.

8. At each construction site the order of actions that has to be adhered to after entering the premises must be very clearly stated by using notices and verbal instructions. The following indicates the desired sequence to be ensured.
    - Handing over personal belongings
    - Washing hands
    - Temperature check
    - Second temperature check (if required)
    - Finger scan (if available)
    - Use of Hand-Sanitizer

9. Posters and placards promoting respiratory hygiene, with instructions for wearing masks, washing hands shall be adequately displayed.
10. During the critical period each construction site must take precautions and prior to commencement each site must make arrangements to display notices to prevent the entry of unauthorized visitors

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11. In case of granting permission to allow temporary/short period visitors, then precautionary measures must be arranged prior to the commencement. These arrangements must ensure requirements such as temperature measurements, washing hands, social physical distancing etc., clearly mentioned in this guideline. After the departure of such a visitor, the places occupied must be disinfected to the satisfaction the health inspector.

6.3 Site Cleaning and Maintenance

Cleansing the sites, material and machines also form a very important part when attempting to achieve the desired hygienic conditions in construction sites. There are several tasks that need to be carried out under site cleansing and maintenance. They are as listed below.

1. The construction site, its machines, equipment, tools, stocks of material have to be regularly sanitized using a disinfectant.

2. Metal and plastic surfaces could contain the COVID-19 virus over a number of days. Hence such surfaces shall be properly disinfected. All metal surfaces shall be disinfected with minimum of 70% v/v alcohol solution. All non-metal surfaces shall be disinfected with 0.1% sodium hypochlorite solution.

3. Construction sites must be kept clean and disinfected. The surrounding atmosphere must be kept with clean air to minimize the spreading of the virus.

4. All the doors in buildings and structures of the construction site must be opened as long as possible providing ventilation and fresh air, thereby minimizing the spreading of virus.

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6.4 Construction Site Meeting

1. Physical meetings must be called only for essential reasons such as wider discussions, opinion sharing with back and forth idea exchange etc. However physical presence for meetings shall be kept at a minimum. In such essential and unavoidable physical meetings, the participation must be kept low, staggered and preferably held in batches. Safety precautions must be taken by cleansing, disinfection, wearing face masks and gloves, maintaining social physical distancing etc., mentioned earlier as mandatory health requirements. Greetings by means of shaking hands, embracing each other etc., must be avoided. The traditional "Sri Lankan - Äyubowan" by keeping hands together; must be used for greetings.

2. Conducting meetings with a face to face arrangement shall be avoided to the maximum possible extent. Whenever the participants possess the capability, all meetings must be conducted using communication tools such as teleconferencing / video conferencing.

3. Conducting construction site meetings must include a careful selection of meeting location. Each construction site manager must ensure that site meetings are held in wide open spaces where workers can maintain minimum social physical distance. Each meeting must ensure the social physical distancing and safe hygienic measures that have been imposed by health authorities and also clearly described in this guideline.

4. As a prerequisite, each meeting manager or meeting host must pre-order sufficient supplies including face masks tissues, and hand sanitizer dispensers adequate for all participants.

5. As a prerequisite, each meeting manager or meeting host must confirm the availability of the health officer and also ensure the availability of emergency requirements such as surgical masks

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for use by anyone who develops respiratory problems or any other COVID-19 symptoms.

6.5 Using Lift or Elevator

1. Minimize the spreading of COVID-19 by minimizing the use of the Electric Stairways and Lift/Elevators.

2. The operating buttons and handles of Lifts/Elevators must be regularly disinfected.

3. When using the lift/elevator, the persons so using must face the walls of the same and thereby minimizing the spread of the virus. The number of persons traveling in the elevator shall be minimized. A ground plan must be made for this purpose.

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7. ADMINISTERING AN EMERGENCY COVID- 19 SITUATION

7.1 Preliminaries

COVID-19 emergency situations vary from the general construction site emergencies. Hence is very important for each construction site to plan ahead to ascertain safety of the affected person or persons, the co-workers and also the construction site.

The identification of a COVID-19 suspect case alone is considered as a state of emergency within a construction site. Hence appropriate action as the care for the suspected patient and as measures to arrest spreading of COVID-19 must be affected immediately. The degree of urgency at a construction site after a suspect case had been identified, should also be attributed to the place, elevation and type of work a worker is carrying out at the time of detection.

Following preliminaries are considered as essential for successful handling of a COVID-19 emergency situation,

1. It is fundamentally mandatory for each construction site to nominate a Safety & Occupational Health officer/supervisor health inspector, maintain an on-site, designated first aid room and an isolation room. These areas must be properly labelled and placed with important notices. Among other notices, there must be clear notices displayed to understand the procedure that must be followed during a COVID-19 emergency situation" .

2. At each construction site a register of deployed workforce must be made available. This register must contain name, national identity card (NIC) reference number and other details as in the NIC, current address, name and address of a person to be contacted in case of an emergency, and important telephone

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numbers etc., corresponding to each person working in the particular construction site. This "Site Workforce" register must be complete, updated and verified on a daily basis.

3. The above register must provide space to note information related to persons who are most vulnerable. This can include a classification according to the age, prior records of other critical illnesses, habits critical in terms of COVID-19, a record of whether a person is from a place known to have COVID-19 cases, whether a person is or had been either directly or indirectly connected to a COVID-19 patient, consideration of the risk level of residential district, a classification of the vulnerability of the transport arrangement from home up to the worksite etc. Each construction site must use these details to identify employees of concern, ensure continuous vigilance and deploy safety precautions.

4. At each construction site the information in the register must also be used to identify vulnerable workers from a point of view of prior health and age. Persons under vulnerable category must be instructed and monitored for strict adherence of guideline requirements. The following may be used with other considerations to assess vulnerability status of workers.

   - Persons with respiratory ailments (asthma, etc)
   - Persons with single or multiple non-communicative deceases such as diabetes, high cholesterol levels, high blood pressure, etc.
   - Heavy smokers
   - Persons with compromised immunity systems
   - Persons above 60 years of age.

5. The information required for the register must be captured by using a questionnaire filled and signed by each worker and such records must be kept for inspection and use in incase of a COVID-19 emergency. Such personal information must be handled ensuring confidentiality. All workers should be

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educated to inform any change of status to ensure their own safety in case of an emergency.

6. Monitoring and Tracking of the construction workforce within the premises must be carried out. Each construction site must deploy a method to track and monitor the geographical position of each worker at any given time. Such tracking details must be used to identify the location of a suspected COVID-19 case, to provide instruction to re-locate in case of an emergency, or to seek help from others to overcome a possible emergency situation. The functioning of a tracking system may be either by using physical/manual methods or by using communication technologies.

7. In extreme situations in which a construction site is compelled to handle a suspected worker, the stipulated procedures must be strictly adhered by using the recommended PPEs. Each site must strictly adhere to the timely provision and use of PPEs for COVID-19, such as respirators, N95 certified or equivalent face masks, eye protection goggles or a face shields, non-sterile long-sleeved gown and gloves, waterproof aprons. It is necessary to ascertain that all construction sites are equipped with such items as recommended by health authorities, well before the recommencement of construction activities.

7.2 Detecting a suspected COVID-19 Case

The following must be adhered to in case of detecting a suspected COVID-19 or Dengue case at a work site. The Safety & Occupational Health officer/supervisor of each site must ensure that all members of the work force in that are with enhanced awareness.

1. The COVID-19 suspected worker must be advised to continue wearing the mask and kept in isolation. Until the suspected person(s) are transferred to a hospital, all relevant precautions as mentioned in previous sections must be taken to arrest the

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spread of the disease. The emergency room and available PPEs must be used to handle the situation. Immediate action must be taken to inform the MOH of the area.

2. Transferring of a suspected case to a designated hospital must be by using an ambulance or as instructed by Health Authorities. **'Suwasariya' ambulance** service can be contacted **by dialing 1990.** In case an alternative is required, then the Health officer of the construction site may use any other ambulance or seek assistance from the contact numbers mentioned below to obtain assistance and instructions.

- ☐ **The Ministry of Health hotline, available 24 hours – 011 3071073**
- ☐ **The Government media unit hotline – 117**
- ☐ **'Suwa Sariya' Health line – 071 0107107**
- ☐ **Medical Officer of Health of the area or other responsible persons in the area, whose contact numbers are displayed in the emergency room**

3. Construction site must take all possible actions to assist the PHI of the relevant area / other authorities / special units appointed by the Health Ministry / Presidential Task Force to trace the contact-persons associated with the suspected case. The details of such contact-persons available with the site must be urgently made available to the relevant authorities. Each construction site must take all possible steps to assist health authorities the contact tracing exercise and facilitate to enforce self-quarantine, If COVID-19 case is reported.

7.3 Cleansing after a suspected Case

1. construction sites must incorporate a recommended site cleansing procedure after the identification of a suspected COVID-19 case.

2. The entire work force must be made aware of the facts to avoid any further danger from new cases of COVID-19.

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3. The entire work force must be instructed to re-ensure the application of precautionary measures against COVID-19 such as, disinfection, face masks, social physical distancing etc.
4. All general and other waste from a suspected or confirmed case shall be incinerated or disposed by following the guidelines for waste management issued by the Ministry of Health.

7.4 Training including emergency situations

Regular Capacity Building and training workshops to be conducted in respective areas by the relevant Institutions. Each worker should release for participation of such programme without any barriers.

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8. INFORMATION

8.1 More information and Training

CIDA has taken all efforts to include the important information for construction sites of Sri Lanka. However, in case of gaps the construction industry is advised to use the following and other reliable sources to ensure the safety of the industry, the economy of Sri Lanka and our nation.

8.2 Information about COVID-19 infection and Dengue

More information about the COVID-19 infection can be obtained by vising the following websites

- ☐ http://www.epid.gov.lk
- ☐ https://hpb.health.gov.lk/en/covid-19
- ☐ https://www.who.int/srilanka/covid-19

8.3 Other Awareness Enhancements and training

1. Definitions of parties to the Contract (Employer/ Engineer / Contractor) shall be as defined in CIDA Standard Bidding Documents http://www.cida.gov.lk/sub_pgs/publications.html.

2. CIDA from time to time will take steps to publish further developments related to the COVID-19 Guidelines in the official website at http://www.cida.gov.lk/index_en.html

3. Composition of Sanitizing liquids, body temperature values and all other medical instructions and general work place safety practices shall be as per the Operational Guidelines on Preparedness and Response for COVID-19 outbreak for work settings - Interim Guidance 17thApril 2020 published by the Directorate of Environmental Health, Occupational Health and Food Safety of Ministry of Health and Indigenous Medical Services http://www.health.gov.lk/moh_final/english/public/elfinder/files/fetureArtical/2020/2020-04-22circular.pdf)

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PART 2

Supplementary Provisions

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1. IMPORTANCE OF IMMUNITY

1.1 Traditional Practice

Government directives on "Guidance for Work Place Preparedness for COVID-19" and "Strengthening Environment Management in Construction industry to prevent Dengue" provide very clear and vital course of action with respect to the prevention of "COVID-19 and Dengue" threat and the Part 1 of this guideline (Revised-version 3) elaborates the application of these cautionary activities for the construction industry of Sri Lanka. People with weakened immune systems as well as those with a second or subsequent dengue infection are believed to be at greater risk for developing dengue hemorrhagic fever damaging to lymph and blood vessels, bleeding from the nose and gums, enlargement of the liver, and failure of the circulatory system. The symptoms may progress to massive bleeding, shock, and death.

The native, traditional and Ayurveda medicine practices of Sri Lanka also provide supplementary advice to Sri Lankans and others. Most of these advices are known and had been practiced over a long period of time. These advices and practices have bonded with Sri Lankan culture and presently even western nations have embraced many of them. Good examples are the "Ayubowan" method of greeting each other which automatically ensures avoiding physical contact and enables easy social physical distancing, practice of avoiding hugging to show affection, drinking warm plain tea with a drop of fresh ginger etc. Among example practices commonly used by Sri Lankans are, drinking of coriander with ginger, "Veni-vel" in case of an influenza threat, chewing of "Vel-mee" in case of coughs, and drinking a dose or two of "Peyawa"- a commonly known decoction, in case of an advancing cough and a cold.

As the apex agency for the construction industry in Sri Lanka, the prime intention of CIDA is to protect the construction workforce from an attack of these two deadliest deceases. After a careful evaluation, CIDA recognized the important need to enhance the immunity of the workforce as a prime role that has to be

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taken care in parallel to preventive actions required by the Health Department Directives.

Though the native, traditional and Ayurveda medicine practices of Sri Lanka and associated ministries have thus far not made public announcements or issued directives with regards to the practices that can be opted by the public, there are many individuals who have taken the leadership to provide advice over the internet and other methods. In this connection CIDA referred available documentation while consulting registered medical practitioners to obtain advice. At the same time, CIDA also made attempts to capture the food practices that were administered in some of the quarantine centers. The sources that are used to compile the information of Part 2 are in Annex 2.

1.2 Personal immunity

Immunity' of a person is the ability of a person's body to resist diseases through activities of specialized blood cells or antibodies produced by the body. Further it is the ability of the body to recognize and dispose of substances which it interprets as foreign and harmful to its well-being. Generally, each and every person possess natural immunity. Natural immunity is a genetic characteristic of an individual and the immunity level varies from a person to person. In addition, personal immunity can be acquired; Immunity can be acquired by vaccination to get protection from certain diseases. However, as no vaccination has yet been developed for the COVID -19 virus and also for Dengue, the general public and especially the construction workers have to depend on individual immunity or even follow methods to boost self-immunization to be safe from getting infected.

Ayurveda, Traditional and Native practices which are time tested medical practices in the world has a strong reliance on "the power of the body can prevent or even resist developing

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diseases ". Hence, if personal immunity enhancement practices of such commonly known practices can be incorporated to the day to day routines of the construction industry, and if they become effective, then it will be a huge bonus for the industrial sector of Sri Lanka.

In this backdrop CIDA has consulted many persons, professionals, documents, internet sources and extracted useful information to recommend the construction industry to practice as a measure of immunity enhancement of construction workers.

1.3 Conditions which improves/boosts

As indicated previously, strengthening the immune system of a construction worker is of utmost importance especially because of the economic status of those workers and also because of unique nature of construction activities in Sri Lanka.

Having recognized the importance of the construction sector, the non-western medical practices also recommend that workers should be encouraged to maintain good personal health, hygiene and practice. Accordingly, the construction site managers must facilitate the following to boost immunity of its work force. Then are by encouraging/advising/supporting,

- A healthy lifestyle supported by a good continuous sleeping habit
- Healthy food choices and a balanced diet
- Regular physical exercises and a possible introduction of yoga exercises
- To drink adequate amounts of clean water and preferably warm water.

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- To abstain from unhealthy habits such as smoking and alcohol consumption

Apart from the above, the references on Non-Western medical practices enabled the extraction of a daily setting that a construction site manager is able to practice during working hours.

These immunity enhancement recommendations which include steam inhaling, herbal beverages, and add-ons for meals are included in five breaks mentioned in the daily menu in order to ensure ease of application at a construction site. These can be recommended with suitable modifications and further medical advice if required.

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1.4 Supplementing the Health Directives

1. The health directives of the government concentrate on preventing a threat of COVID-19. CIDA feels that the construction industry can affect no-risk action to act as an insurance against COVID-19. The situation that has arisen due to this pandemic or the impact from COViD-19 shows a close similarity to climate change impacts. In case of climate change, though the entire globe is affected, many countries are aware of their inability to mitigate impacts. Therefore, such countries contribute by taking adaptation measures for anticipated scenarios. Since most of such adaptation methods are expensive, the common first choices are the "No-risk" options. The advantage of "No risk" options are that even if the intended objective is not fulfilled, the option would still serve as a positive for the country.

2. Similarly, CIDA feels that in case of COVID-19, the Sri Lanka's construction industry can take a "No-risk" action path by incorporating an immunity enhancement option that would also may battle and win against the COViD-19. Though the traditional, native and Ayurveda doctors claim to have solutions for the COVID-19 pandemic, the western medical practice shuns such claims by citing the absence of clinical test results for diagnostic decision making.

3. In this back drop CIDA after an evaluation of the ongoing practices and after consulting an Ayurveda medical practitioner recommends a daily practice advice for the favorable consideration of the construction industry.

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2. DAY TODAY PRACTICE ADVICE

The CIDA recommendation for construction industry to practice as a daily menu for its work force, which has also been confirmed as suitable by an Ayurveda medical practitioner is as given below.

Recommended Daily Work Place Menu for Construction Sites

1 Prior to or at the commencement of Work

- **Steam Inhaling:** Boil water with or without additives such as coriander leaves, citrus leaves, vinegar and inhale steam for approximately 2-3 minutes
- **Provide a Drink:** a cup of Coriander boiled with Ginger

2 Morning Tea Time

- **Provide a Drink:** a cup of Coriander boiled with Ginger

3 Lunch Time

- **Provide to Eat**: a few raw red onions and/or 2-3 raw cloves of garlic with the main meal

4 Afternoon Tea Time

- **Provide a Drink:** In lieu of tea, prepare a warm beverage using 20 grams of ginger, 10 grams of cinnamon, 5 grams of Turmeric and 50 grams of Garlic for each 90 milliliters of water and boil to provide as a drink for the work force

5 After work (at the time of leaving site)

- **Provide a Drink**: the same beverage used for the afternoon tea time.

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3. MEDICINE FOR COVID-19 AND DENGUE

There are many documentation and practitioners that have publicly indicated that there are cures for COVID-19. As this is beyond the purview of CIDA guideline, the advice that can be extended is to follow the guidance given by the registered medical authorities. This is because our consultations revealed that the medicine for COVID-19 and Dengue depends on the stage of the development of the virus within a body at the time of identification.

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1. WHO- Infection prevention and control during health care when COVID-19 is suspected- Interim Guidance: 19th March 2020

2. Operational Guidelines on Preparedness and Response for COVID-19 Outbreak for Work Settings Interim Guidance 17th April, 2020:

3. Directorate of Environmental Health, Occupational Health and Food Safety http://eohfs.health.gov.lk/

4. https://epid.gov.lk/web/images/pdf/Publication/guidelines_for_the_management_of_df_and_dhf_in_adults.pdf

5. Strengthening Environmental Management in Construction Industry to prevent Dengue, National Dengue Control Unit, Ministry of Health, Nutrition and Indigenous Medicine.

6. https://www.google.lk/search?q=Health+ministry+poster+for+COVID+19+SRI+LANKA&sxsrf=ALeKk00sM1dpJ7fv-zEE21SQYHaAiwLJZA:1595081409214&source=lnms&tbm=isch&sa=X&ved=2ahUKEwiwtakm_dbqAhUpILcAHZYIBfsQ_AUoAXoECAsQAw&biw=1366&bih=695#imgrc=QXYomn37FeUA8M&imgdii=DY_dwDSDr-lKJM

7. Ministry of Health and Indigenous Medical Services http://www.health.gov.lk/moh_final/english/

8. Guidance on Preparing Workplaces for COVID-19 by US Department of Labour,OSHA(USA) https://www.osha.gov/Publications/OSHA3990.pdf

9. Notes on Work Place Safety by Department of Labour, Sri Lanka

   http://www.labourdept.gov.lk/images/PDF_upload/leaflets/1.pdf
   http://www.labourdept.gov.lk/images/PDF_upload/leaflets/10.pdf

10. WHO Information on COVID-19 https://www.who.int/srilanka
    https://www.who.int/srilanka/news/detail/02-02-2020-information-on-novel-coronavirus

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11. Construction sites and COVID-19 https://www.weightmans.com/insights/construction-sites-and-covid-19/
12. COVID-19 coronavirus: State of Emergency Declarations https://www.wa.gov.au/government/document-collections/covid-19-coronavirus-state-of-emergency-declarations

13. Power Point Presentation on Precautions for COVID-19 (In Sinhala Language): Eng. E. Abeysiriwardena, District Factory Inspecting Engineer (Colombo), Dept. of Labour

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ANNEXURES AND POSTERS

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Annex 1: Important web sites for Sri Lankan Government Directives and Contacts that assisted in the Acquisition and Preparation of Information in Part 2

- hpb.health.gov.lk › covid-19
- https://ath.army.lk/covid19/
- https://news.lk/news/covid-19
- www.epid.gov.lk › web
- https://www.who.int/srilanka/covid-19
- http://www.pmoffice.gov.lk/download/press/D00000000011_EN.pdf

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Contacts that assisted in the Acquisition and Preparation of Information in Part 2

Dr. Lokuge Jayasiri, Gampaha Siddaurveda Dispensary, Matara Road, Megalle, Galle

- Mr. Ruwan De Silva, No.06, S.H Dahanayake Mawatha, Kaluwella, Galle
- Mr. Susantha Ranjith Liyanarachchi, No 10 B, Thalgaspe, Elpitiya
- A set of selected staff members of CIDA
- Web sites local and regional on non-western medicine for covid-19
- http://www.businessnews.lk/blog/2020/04/06/ayurvedic-medical-practitioners-requested-to-find-alternative-indigenous-medicine-against-covid-19/
- https://pubmed.ncbi.nlm.nih.gov/7464187/
- https://newsin.asia/its-time-we-returned-to-wedakama-and-ayurveda-to-fight-covid-19/
- https://economynext.com/sri-lanka-invites-indigenous-medical-practitioners-to-help-fight-covid-19-gmoa-chief-recommends-dum-elleema-to-contain-spread-64381/
- https://timesofindia.indiatimes.com/life-style/health-fitness/health-news/ayurveda-tested-immunity-practices-to-follow-during-the-coronavirus-pandemic/photostory/74912589.cms
- https://www.thehindu.com/news/national/government-recommends-homoeopathy-ayurveda-to-prevent-coronavirus-infection/article30686644.ece
- https://www.google.com/search?client=firefox-b-d&sxsrf=ALeKk022CU3w0btEWuYDxEoXpzPo8ASqOQ:1590211633182&q=COVID+19+relief+assistance+from+Traditional,+Native+or+Ayurveda+medical+practice.https://mail.yahoo.com/d/folders/1&spell=1&sa=X&ved=2ahUKEwjjq438n8npAhXIQ30KHVNFCDIQBSgAegQIDBAI

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Annex 2: Checklist for Mosquito Breeding Sites in Construction Sites

Form 01

Contractor : ..... **Site / Project :** .....

Client : ..... **Date :** .....

Inspected by : ..... **Inspected by :** .....

Item	Description	1st week						2nd week						3rd week						4th week					
		Checked	Findings*		Actions Taken			Checked	Findings*		Actions Taken			Checked	Findings*		Actions Taken			Checked	Findings*		Actions Taken		
			Stagnant water	Mosquito breeding	Cleared stagnant water	Larvicide applied	Kept under shelter		Stagnant water	Mosquito breeding	Cleared stagnant water	Larvicide applied	Kept under shelter		Stagnant water	Mosquito breeding	Cleared stagnant water	Larvicide applied	Kept under shelter		Stagnant water	Mosquito breeding	Cleared stagnant water	Larvicide applied	Kept under shelter
1	**Construction Area**																								
a	Concrete or cement floors - ground / all levels																								
b	Puddles - ground																								
c	Building materials																								
d	Demolition debris																								
e	Equipment and machineries																								
f	Water storage tanks, drums, containers																								
g	Barriers																								
h	Trenches																								
i	Bulk waste containers, skips & refuse bins																								
j	Sump pits/ silt traps																								
k	Drains/ temporary channels constructed for drainage																								
l	Vehicle wash bays																								
m	Lift wells																								
n	Planter boxes (concrete)																								
o	Discarded items & receptacles/tyres																								
2	**Living Quarters**																								
a	Freight containers/ Sink Sheet Hut																								
	i) Roof																								
	ii) Ground below																								
b	Plastic containers/ cooking pots & pans/ domestic containers																								
c	Discarded items & receptacles																								

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Item	Description	1st week						2nd week						3rd week						4th week					
		Checked	Findings*		Actions Taken			Checked	Findings*		Actions Taken			Checked	Findings*		Actions Taken			Checked	Findings*		Actions Taken		
			Stagnant water	Mosquito breeding	Cleared stagnant water	Larvicide applied	Kept under shelter		Stagnant water	Mosquito breeding	Cleared stagnant water	Larvicide applied	Kept under shelter		Stagnant water	Mosquito breeding	Cleared stagnant water	Larvicide applied	Kept under shelter		Stagnant water	Mosquito breeding	Cleared stagnant water	Larvicide applied	Kept under shelter
3	**Storage yard**																								
a	Puddles- ground / all levels																								
b	Freight containers																								
	i) Container roof																								
	ii) Ground below containers																								
c	Building materials																								
d	Equipment and machineries																								
e	Concrete test cube tanks																								
f	Tool boxes																								
g	Paint tins/ cans																								
h	Discarded items & receptacles																								
4	**Toilet & bathroom**																								
a	Concrete floor																								
b	Pails/ plastic containers																								
c	Toilet cisterns & toilet bowls																								
d	Bathing point concrete tanks																								
e	Drain holes of unused sinks																								
f	Gully/ floor traps																								
5	**Cooking & washing Area**																								
a	Cooking pots & pans																								
b	Discarded items & receptacles																								

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Annex 3: Monthly report on inspection of dengue breeding places in construction sites.

General information

- Contractor…… ➢ Site/Project:……
- Name of the contact person and contact number: ……
- Client:…… ➢ Month:……
- MOH Division:……

Information about site inspection and dengue cases reported

➢ Availability of a dedicated team for regular inspection of mosquito breeding places.	Yes/No
➢ Number of potential breeding places detected during previous month.	.....
➢Received services by pest control agency during previous month.	Yes/No
➢ If yes, Name of the agency…… No. of times the service provided	.....
➢MOH health team made inspection visits during the previous month	Yes/No
➢Any warnings given / Red notice issued.	Yes/No
➢Number of fever patients reported during previous month.	.....

Information aboutthe actions taken on detection of breeding places/ to prevent breeding places

Potential water collected machinery and equipment in the premises and in the vicinity was kept under a shelter	
Unused containers were stored under a shelter	
The floors, balconies, flower pots, temporary covers (polythene), concrete roofs and canopies were placed without clogging water	
Other fittings including iron / PVC pipes were covered with endcaps to prevent water collection	
Water storage containers / tanks were covered to prevent mosquito breeding and the water collecting containers were cleaned daily	
Scrub/brushed the inner surface of water collected tanks/containers at least once in three days.	
Drains and gullies were set up to flow	
Collected water in the lift wells were removed every 3 days	
Discarded material, debris and unused goods were discarded properly	
Solid waste was recycled	
The reusable or discarded tyres were stored/sand filled/pierced to prevent accumulation of water.	
Larvicides were applied to the mosquito breeding places/containers where water could not be removed	
Technical advice was obtained from the respective Medical Officers of Health	

- Please send this report to local government (Municipality/ Pradeshiya Saba), MOH office of the area and CIDA before 10th of the subsequent month.

Your assistance as a construction contractor to this National programme on Dengue Prevention, is highly appreciated.

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Posters for COVID-19

Poster 1: Instructions to Prevent COVID-19 at your work place



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https://www.slagm.lk/wp-content/uploads/2020/05/COVID-Control-workplace-Poster-English.jpg

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Posters for Dengue

Poster 1: Instructions to prevent Dengue breeding in



Source: http://www.cida.gov.lk/sub_pgs/dengue_prevention.html

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Poster 2: Instructions to prevent Dengue breeding in Construction sites & Factories



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Source: http://www.cida.gov.lk/sub_pgs/dengue_prevention.html

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GOVERNMENT OF THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
MINISTRY OF WATER SUPPLY

JAPAN INTERNATIONAL COOPERATION AGENCY

NATIONAL WATER SUPPLY & DRAINAGE BOARD

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

JICA LOAN No: SL – P115

BIDDING DOCUMENT

FOR

LOT C 1 : SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

VOLUME 3 OF 4
(BILL OF QUANTITIES)

JULY 2021

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Section II. Bid Data Sheet BDS-1
Section III. Evaluation and Qualification Criteria (Without Prequalification) ... EQC-1
Section IV. Bidding Forms *(Bills of Quantities bound separately as Volume 3 of 4)*.... BF-1
Section V. Eligible Source Countries of Japanese ODA Loans ESC-1

PART 3 – Conditions of Contract and Contract Forms

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PART 2 –Works Requirements *(Drawings bound separately as Volume 4 of 4)*

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Summary Description
Abbreviations

PART 1 – Bidding Procedures

Section IV. Preamble to Bills of Quantities
Day Work Schedules
Bills of Quantities

Volume 4 of 4

PART 2 –Works Requirements

Section VI. Drawings – (For the List of Drawings, refer to Drawing No. ANP2/LC1/DL)

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(Not for Bidding)

Summary Description

Procurement of Works

Invitation for Bids (IFB)

A Form of Invitation for Bidding Without Prequalification is provided.

PART 1 – BIDDING PROCEDURES

A brief description of this Bidding Document is given below;

One-Envelope Bidding

Section I: **Instructions to Bidders (ITB)**
This Section provides relevant information to help Bidders prepare their Bids. Information is also provided on the submission, opening, and evaluation of Bids and on the award of Contracts.

Section II. **Bid Data Sheet (BDS)**
This Section includes provisions that are specific to each procurement and that supplement the information or requirements included in Section 1, Instructions to Bidders.

Section III. **Evaluation and Qualification Criteria**
This Section specifies the criteria to determine the lowest evaluated Bid and the qualifications of the Bidder to perform the contract.

Section IV: **Bidding Forms**
This Section includes the Forms which are to be completed by the Bidder and submitted as part of his Bid.

Section V. **Eligible Source Countries of Japanese ODA Loans**
This Section contains information regarding eligible source countries under Japanese ODA Loans.

PART 2 – WORKS REQUIREMENTS

Section VI. **Works Requirements**

This Section contains the Specification, the Drawings, and supplementary information that describe the Works to be procured.

PART 3 – CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VII. **General Conditions (GC)**
This Section contains the general clauses to be applied in all contracts.

Section VIII. **Particular Conditions (PC)**

This Section consists of Part A, Contract Data, which contains data, and Part B, Specific Provisions, which contains clauses specific to each Contract.

Section IX: **Annex to the Particular Conditions - Contract Forms**
This Section contains Forms which, once completed, will form part of the Contract. The Forms for **Performance Security** and **Advance Payment Security**, when required, shall only be completed by the successful Bidder after Contract Award.

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B I D D I N G D O C U M E N T S

for

Procurement of

LOT C 1: SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO. AN/PH II/JICA/DM/LOT C1

Employer : *National Water Supply & Drainage Board*

Country : *Sri Lanka*

Project : *Anuradhapura North Water Supply Project – Phase II*

Loan No. : *SL-P115*

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ABBREVIATIONS

AGM	Assistant General Manager
ANWSP-PII	Anuradhapura North Water Supply Project – Phase II
APP	Appendix
BF	Bidding Forms
BOQ	Bills of Quantities
CA	Current Assets
CBO	Community Based Organization
CEA	Central Environmental Authority
CEB	Ceylon Electricity Board
CL	Current Liabilities
DB	Dispute Board
DED	Detailed Engineering Design
DI	Ductile Iron
DN	Nominal Diameter
DNP	Defects Notification Period
DSD	Divisional Secretariat Divisions
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPDM	Ethylene Propylene Diene Monomer Rubber
FIDIC	International Federation of Consulting Engineers
GCC	General Conditions of Contract
GIS	Geographical Information System
GOSL	Government of Sri Lanka
GPRS	General Pocket Radio Service

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GSM	Global System for Mobile Communication
HDPE	High Density Poly Ethylene
HO	Head Office, NWSDB
IESL	Institute of Engineers, Sri Lanka
ITB	Instructions to Bidders
JICA	Japan International Cooperation Agency
JPY	Japanese Yen
JV	Joint Venture
LA	Local Authority
LKR	Sri Lankan Rupee
LS	Longitudinal Section
MDB	Multilateral Development Bank
MOU	Memorandum of Understanding
NA	Not Applicable
NC	North Central
NW	Net Worth
NWSDB	National Water Supply & Drainage Board
O&M	Operation & Maintenance
O.D.	Outside Diameter
ODA	Official Development Assistance
OHS	Occupational Health and Safety
PAT	Profits After Taxes
PBT	Profits Before Taxes
PCC	Particular Conditions of Contract
PD	Project Director

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PH II	Phase II
PMU	Project Management Unit
PN	Nominal Pressure
PPE	Personal Protective Equipment
PQ	Pre-Qualification
PRDA	Provincial Road Development Authority
PS	Pradeshiya Sabha
QA/QC	Quality Assurance/Quality Control
QCR	Qualification Criteria
QM	Quality Management
RDA	Road Development Authority
RSC	Regional Support Centre
SBD	Standard Bidding Document
SLS	Sri Lankan Standards
SOW	Scope of Work
SPD	Standard Pre-Qualification Documents
TA	Total Assets
TL	Total Liabilities
TOR	Terms of Reference
TR	Total Revenue
UDA	Urban Development Authority
USD	United States Dollar
WTP	Water Treatment Plant

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PREAMBLE

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PREAMBLE TO BILLS OF QUANTITIES

GENERAL

1. The Bills of Quantities are to be read in conjunction with all the documents as specified in Clause 1.5 of Conditions of Contract (FIDIC 2010 MDB Harmonized Version); the Conditions of Contract, Special Conditions of Contract, the Specifications, General Requirements, Drawings, Preamble to BOQ, schedules etc. These documents shall be taken as mutually complementary of one another.

2. The Bills of Quantities have generally been prepared in accordance with the Civil Engineering Standard Method of Measurement, Third Edition (1991) (CESMM3) with additions and amendments as detailed hereinafter, to suit to the local conditions. The work done shall be measured as depicted in CESMM3 unless otherwise provided subject to Clause 12 of Conditions of Contract.

3. In so far as any clause of the Preamble may conflict or be inconsistent with any provision of the CESMM3, the Preamble shall always prevail.

4. Differences in the method of billing and in the phraseology used in various parts of the Bill of Quantities will not to be recognized as a basis of any claim for an increase in the Contract Price.

5. The relevant clause of this Preamble shall be deemed to apply equally to work subsequently ordered for execution by the Contractor, either under Provisional Sums or Variation Orders except where specifically varied therein.

6. The Contractor shall undertake a survey of all the above & underground existing utilities/obstructions/culvert foundations along all pipeline routes, structures, any damaged or deteriorated areas of the roads (with photographs, names of roads and chainages to be shown to the road authorities) etc. and shall determine the exact locations and depths of all such above & underground utilities and obstructions before commencement of works and indemnify the Employer of any additional cost arisen out of them.

7. The Contractor shall deem to be allowed in his rates and prices for maintaining the pipe works and other works until the end of the defects liability period after the expiry of the contract period as per Conditions of Contract and Specifications.

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8. The quantities given in the Bills of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices bid in the Priced Bills of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.

9. It is deemed that the Bidder has taken into account all costs of machinery, equipment, tools, materials, fuel, allowance for wastage, labour, etc. required to do the works complete and included in the offered rates and prices unless otherwise stated.

10. No additional items shall be inserted into, nor shall any alterations be made to any Bills of Quantities.

11. VAT shall not be included in the rates quoted in the BOQ. The total VAT component shall be included in the Grand Summary of the BOQ in the space provided and the Local Bidders shall include the VAT registration number.

    Any Customs Duties, Taxes & VAT levied on imported goods by Sri Lanka Customs (as given in the Customs Assessment Notice) following declaration of items by the Contractor used for Permanent Works shall not be included in the Rates for Import and Supply items. The Employer shall arrange for the Payments directly to the Sri Lanka Customs Department as per NWSDB procedure on submission of certificates (Assessment Notice) issued by the Customs Department by the Contractor. The Letter of Credit (LC) for Imported Items for Permanent Works shall be opened by the Contractor with the provision that, NWSDB shall be the Consignee in the Commercial Invoice. The Contractor shall bear all the bank charges (foreign & local).

    However, other Port charges, taxes, clearing, handling, double handling, local transport to site, storing properly, insurance in transport shall be included in the supply rates.

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CESMM3, SECTION 1 - DEFINITIONS

1. Contrary to CESMM3 Clause 1.2, the Conditions of Contract for Construction for Building and Engineering works designed by the Employer – FIDIC 2010 MDB Harmonized Version shall apply.

CESMM3, SECTION 2 – GENERAL PRINCIPLES *[No amendments]*

CESMM3, SECTION 3 – APPLICATION OF THE WORK CLASSIFICATION *[No amendments]*

CESMM3, SECTION 4 - CODING & NUMBERING OF ITEMS

1. Paragraph 4.4 of CESMM3 shall be deleted and the following substituted: -

   "In so far as the text of an item description may conflict or be inconsistent with the CESMM3 code then the text shall always prevail".

2. The reference to the CESMM3 (CESMM3 Code) is given only for easy reference. The Bills of Quantities are to be read in conjunction with all the documents specially the Condition of Contract, the Specifications and the Drawings. Therefore, any conflict of CESMM3 code given in Bills of Quantities will not to be recognized as a basis of any claim.

CESMM3, SECTION 5 - PREPARATION OF THE BILLS OF QUANTITIES

[BOQ has been prepared with following amendments to the CESMM3 guide]

1. Paragraph 5.6 and 5.7 of CESMM3 are amended and substituted as in Schedule of Day Works.

2. Paragraph 5.17 of CESMM3 shall be deleted:

3. Items marked "LS" and “Sum” in the Bills of Quantities are Lump Sum and shall submit break down with tender.

4. Items marked “PS” in the Bills of Quantities are Provisional Sums and shall not to be executed unless ordered by the Engineer. This may be expended wholly or in part as directed by the Engineer and shall be dealt with as provided in the Clause 13.5 of Conditions of Contract. The Provisional Sum items are followed by an item where the Employer indicated, as a percentage, all Contractor’s financial and administrative costs including cost of liaison with external agencies, profits, overheads and any other costs for the “Provisional Sum” item. This percentage shall be the basis of assessing the actual amount payable to the Contractor.

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5. Items in the Bills of Quantities designated as "Provisional Quantity" or "Provisional" in the description column indicate that the quantities for the work covered by such items are the best possible estimates that can be made in advance of the execution of the work or that the provision of such facilities as are described in the items may not be required under the Contract. All items so designated will be used only at the direction and discretion of the Engineer, these shall be paid based on the actual quantity carried out against the unit rates and item prices as inserted by the Bidder for the "Provisional Quantity" item, irrespective of the difference between the specified provisional quantity in the Bill of Quantities and the actual work quantity carried out as instructed during construction of the Works. If not used these "Provisional Quantity" items either wholly or in part shall, as to amount not used, be deducted from the Contract Price. No claim will be entertained in respect of overhead charges or any other costs which may allegedly result from the omission of all or part of the work covered by such "Provisional Quantity" or "Provisional" items.

6. In the Bills of Quantities, the sub-headings and item descriptions identify only definitive permanent components and do not state the tasks either basic or incidental required to be carried out by the Contractor nor do they comprehensively register all the materials required. The exact nature and extent of the work to be performed shall be ascertained by reference to the all the documents as specified in Clause 1.5 of Conditions of Contract (Conditions of Contract for Construction for Building and Engineering works designed by the Employer – FIDIC 2010 MDB Harmonized Version, especially the Condition of Contract, the Specifications and the Drawings. These documents shall be read in conjunction with the matters listed against the relevant heading and item description as described in the Bills of Quantities.

7. All sizes and quantities have been entered in the Bills of Quantities in metric units. Figures with decimals, including sums of money are written with a full stop in the integer position.

8. The net measurement or weight of the finished work in place shall be taken except where otherwise stated or where separate items are provided and no allowance will be made for cutting, wastage, working space, overlaps, circular work etc. and no deduction will be made for grout nicks, rounded arises, bulking or shrinkage and the like. All unit rates shall represent the total cost of the finished work complete and as specified in the Employer's Requirements and as shown in the Drawings.

9. The measurement for depths shall not be according to the depth bands but shall be according to the total depth in different depth zones.

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CESMM3, SECTION 6 - COMPLETION, PRICING AND USE OF THE BILLS OF QUANTITIES

1. The format of the Bills of Quantities is such that it allows the Tenderer to insert both local currency (Sri Lanka Rupees) and foreign currency (Yen) components for each item. The total of Local Currency Components together with the Foreign Currency Components for each item (including all taxes and duties for those inputs to the Works supplied from within the Employer's country, but excluding all taxes and duties of imported goods as stipulated) will be the Contract rate for the item.

2. Any services not provided in the Bill No. 01(General Items) shall be deemed to be included in the rates of other items in the BOQ.

3. The Contractor shall be deemed to have taken into account all of the following in his Tender prices and his Construction Programme;

   - All recognized holidays, festivals, religious and other customs
   - Any stoppage of work or delays due to adverse weather conditions
   - Any stoppages directed by utility agencies, public, authorities etc., due to Contractor's negligence.

4. The rates and sums entered by the Contractor against all items in the BOQ must bear proper relationship to the cost of carrying out the work described in the Contract including Preamble. All on costs and similar charges which are applicable to the Contract as a whole are to be spread over all the rates in the BOQ, whilst those which are applicable only to particular sections of the Contract are only to spread over items which these sections refer. Further Contractors are encouraged to insert Method Related Charges in sufficient detail and to a sufficient extent.

5. Paragraph 6.3 & 6.4 of CESMM3 shall be deleted and the following substituted:

   Adjustment Item

   The Adjustment Item, if any, shall apply to all Bill Items (excluding General Requirements Bill & Provisional Sums Bill, Foreign Currency Components of Column No. (a) & (e) in JPY of the Bills of Quantities, Local Currency Component in the Delivery to Sites such as Transport,

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Transit Insurance, Port Charges and Handling Charges etc., in Column No. (b) & (f) in LKR of the Bills of Quantities, Local Currency Component of Supply of Materials within the Employer's Country in Column (c) & (g) in LKR of the Bills of Quantities). During this Contract, the adjusted rates shall be applied for the valuation of Variations if BOQ rates are used, but not for new rates.

6. Clause 6.5 of CESMM3 is deleted.

7. All items of work specified and or shown on the drawing shall be valued by the measurement of such items only as are included in the Bills of Quantities which items shall cover all costs incurred by the Contractor in fulfilment of his obligations under the Contract.

8. Each item in the Bills of Quantities is to be priced. Items against which no rates or sums are entered by the Contractor, whether quantities are stated or not, will not be paid for when executed, but will regard as covered by rates and sums set against other items in the Bills of Quantities. No claim for omissions on the part of the Contractor will be entertained.

9. Allowance must be made in the rates for full compliance with the specified requirements and procedures for obtaining approval for materials, manufactured items and work methods including the provision of all drawings, manufacturer's specifications, literature, samples and copies of manufacturing standards.

10. Bids which group several items together in the Bill of Quantities under one price will not be acceptable.

11. Unless otherwise indicated in the relevant item in the Bill of Quantities, payment against lump sums will be made based on the accepted/agreed break down for lump sum items. The final payment will be made only for the completed work evaluated based on the accepted/agreed break down for lump sum items. In addition, interim payment against lump sums will be made;

Fixed charges	-	When work complete
Time related charges	-	By equal monthly instalments spread over the approved time of completion and payment
Method related charges	-	Fixed charges- When work complete. Time related charge -According to Percentage of work done.

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12. In addition to the breakdown of the tendered rates and lump sums in the Schedule of Rates attached to the Bills of Quantities, the Contractor shall provide the Engineer with a full and detailed Rate Break Down within 48 hours of being so requested. The breakdown is to show actual calculations of the Labour, Plant/Equipment and Materials costs for the works, the build-up of measured rates with profit and overheads and any other allowances used to derive the Tender Prices.

CESMM3, SECTION 7 – METHOD RELATED CHARGES

1. The reference to Clauses 52(1), 52(2) and 56(2) of paragraph 7.6 of CESMM3 is now provided in Clause 13.3 of the Condition of Contract.

2. Paragraph 7.7 of CESMM3 shall be deleted and substituted with the following: -
"Method-Related charges shall be certified and paid pursuant to Clause 14.6 &14.7 of Conditions of Contract. The time for a time-related charge shall relate to the approved programme and time for completion in accordance with the requirements of Clause 8.3of Conditions of Contract or other such time period as may be determined by the Engineer."

CESMM3, SECTION 8 – WORK CLASSIFICATION

CESMM3, CLASS A: GENERAL ITEMS

1. Notwithstanding any limits which may be implied by the wording of the individual items and/or explanation in this preamble, it is to be clearly understood by the Contractor that the rates and sums which are entered in the Bills of Quantities shall be the full inclusive value for the work, finished complete in every respect, whether separately or specifically described in the Contract documents or not. The Contractor shall be deemed to have taken full account of all requirements and obligations, whether expressed or implied, covered by all parts of this Contract and to have priced the items herein accordingly. The rates and sum must include for all incidental and contingent expenses and risks of every kind necessary to construct, complete and maintain the whole of works in accordance with the Contract. Full allowance shall be made in the rates and/or sums for the items which are referred to and/or specified herein inter alia, unless separate item(s) are not provided in the Bills of Quantities for such items.

1.01 Paying fees and giving notice to authorities

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1.02 Payment of all patent rights and royalties

1.03 Safety precautions and all measures to prevent and suppress fire and other hazards

1.04 Interference to the works by persons, vehicles, vessels and the like using the existing land and water facilities

1.05 Full maintenance of access to the existing roads in motorable condition and waterways during the period of construction

1.06 Works in connection with the protection and safety of adjacent utilities and structures

1.07 Maintaining public roads and footpaths and maintaining access upon existing roads or recognized routes which damaged due to the Contractor's use

1.08 Temporary fencing, watching and lighting

1.09 Provision and maintenance of Contractor's temporary facilities such as Contractor's site office, mobile offices, workshops, stores, site laboratory, yard for storing pipes and materials, dwelling for workmen including all facilities, sanitary aspects, water supply, electricity, first aid, health, hygiene and safety aspects.

1.10 All the costs associated with providing electricity, telephone, water etc for the works and staff including Engineer's staff

1.11 All costs of design, drawings and related data for materials, pipe work and equipment

1.12 Design, Construction & Maintenance of all temporary works

1.13 All costs arising out of inspection and testing at manufacturers' works before dispatch of materials, pipe work and equipment etc.

1.14 All related costs of

- Ancillary parts

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- Whether specified or not, requiring mortar/sealant
- Assembling, building in or fixing to block work, concrete, metal work or timber
- Painting and protective treatment
- Welding and drilling
- Minor fittings
- Bolting inclusive of bolts, nuts, gaskets, washers and fixings, etc.
- Screws, nails and plugs
- Conduits and fittings
- Jointing and jointing materials
- Sleevings
- Cutting and Waste
- Packing and bedding/surrounding
- Insulation between different metals
- Labour and Materials for above
- And other items not specifically listed but necessary for the proper installation

1.15 All costs of packaging and protection for export and storage for materials, pipe work and equipment

1.16 All costs of freight, insurance and related documentation for shipment to Sri Lanka for materials, pipe work and equipment

1.17 All costs of unloading at the port, road transport, offloading, stacking, security and safety of those and storage in temporary sheds or whether proof sheds, or covered with dark polythene etc. and, double handling as required at site for materials, pipe work and equipment

1.18 Supply of equipments, pipes, fittings, specials, valves, and other materials and goods including relevent accessories, security and safety of those, storage facilities unless itemized seperatly and costs in connection there with including waste, delivery to site, and double handling.

1.19 Fixing erecting and installing or placing of pipes, fittings, specials, valves, and other materials and goods in position

1.20 Protection of above ground and overhead cables, utility pipes etc.

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1.21 Supporting faces of excavation, temporary or permanent shoring, shuttering and scaffolding etc.

1.22 Dewatering if required and working in the dry except where otherwise permitted by the specification

1.23 Traffic diversion as necessary

1.24 Construction maintenance works

1.25 Supply, inspection, sampling and testing of materials and workmanship of the works under construction including the provision and use of equipment as required by the specifications

1.26 Bringing plant to the site and removing on completion, for providing, transporting to site, setting to work, operating (including all fuel and consumable stores), maintaining and removing from the site upon completion all construction plant and equipment necessary for the execution of the works, including the cost of all tests and other requirements in respect to such plant and equipment

1.27 The recruitment, bringing to and from the site, accommodating and feeding and all incidental costs and expenses involved in the provision of all necessary skilled and unskilled labour and supervision.

1.28 Supplying, maintaining and removing on completion the Contractor's own accommodation, offices, stores, workshops, transport, welfare services and all charges in connection therewith

1.29 Reinstatement of the yard to the satisfaction of the Engineer

1.30 Test on completion, operation and maintenance manuals, handing over, and close out reports

1.31 Protecting completed work from subsequent operations, making good all damages to completed work, for clearing away all rubbish as it accumulates and leaving the site in a tidy condition to the satisfaction of Engineer.

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1.32 Environmental Management Plan for mitigation of environmental hazards during construction.

1.33 QA/QC management.

1.34 The Contractor's profit & overheads for above.

The Contractor shall be deemed to have allowed in his rates for the above if separate items are not provided in the BOQ.

No Contractual requirement for Contractor's methods are itemized separately, and no opportunity is provided for inserting specific or separate Method-Related-Chargers by Bidders, or for relating any of the unit rates or item prices to specific methods. The costs of all such work's methods are deemed to be covered generally by the unit rates and lump sum item prices in the Bill of Quantities.

General items' lump sum item prices (or unit rates, if applicable) shall cover all requirements as specified in the Employer's Requirements and as shown in the Drawings.

2. No claim will be considered for further payment in respect of any work or method of execution, which may be described in the Contract or is inherent in the construction of the work and detailed on the drawings or account of;

(1). Items have been omitted from the Bill of Quantities, but depicted in the preliminary drawings

(2). Any omission from the wording of the items or from a clause in the Preamble or

(3). No mention of such work or method of execution having been in the Preamble

(4). Delay due to seasonal rains as it is deemed that the Contractor has made allowance for these in the construction schedule submitted.

Items against which no rates or sum is entered by the Contractor, whether quantities are stated or not, will not be paid for when executed, but will be regarded as covered by other rates in the Bill of Quantities.

3. The quantities set out in the Bill of Quantities are the estimated quantities of the work and they

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shall not be taken as the actual and correct quantities of the works to be executed by the Contractor in fulfilment of his obligation under the Contract. It shall be the responsibility of the Contractor to assess the actual quantities of work and the materials needed based on his detailed drawings, investigations, surveys, etc.

4. Payments will be made for only those materials, which are specified and permanently installed in the works to the approval of the Engineer unless separate items are provided in the BOQ for temporary works. Construction materials supplied and delivered to the site by the Contractor which becomes surplus to the requirements of the works shall become the property of the Contractor who shall reimburse the Employer any money that was paid to the Contractor for the supply and delivery to site of the surplus materials.

5. Payments for items which are measured on a monthly basis will not be made until the full facilities described in the items and the specifications have been provided to the satisfaction of the Engineer. Payment will continue until such time as the Engineer shall signify that facilities are no longer required.

6. The sums entered to cover the cost of Engineer's offices are to include for erection and subsequent removal on completion, for the supply of electricity, water supply, telephone connection, electrical and electronic appliances and other facilities, and maintenance as given in General Requirements.

7. The payment for technical personnel will be made only for the approved programme and time for completion in accordance with the requirements of Clause 8.3 of Conditions of Contract or other such time period as may be determined by the Engineer.

8.. All bank charges including JICA percentages if any and any other cost/expenditure involved shall be borne by the Contractor when following JICA commitment/payment procedure. i.e. that cost shall be included in any other rates or prices as no provision has been made for separate payment in this regard.

CESMM3, CLASS B: GROUND INVESTIGATION

1. Unless specifically provided for in the Bill of Quantities, no separate items are provided for all site investigations including, site testing, site observations, subsequent testing, or investigative sub-soil drillings and sampling and their associated laboratory tests, required borehole drillings, chartering of underground utilities, above ground utilities and obstacles expressed or required otherwise and backfilling or any further ground investigation works required for the works, as specified and costs of all such undertakings are deemed covered generally across other unit

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rates and item prices in the Priced Bill of Quantities.

2. Setting-out shall be provided as a separate item to cover the entire site of the permanent works.

CESMM3, CLASS D: DEMOLITION AND SITE CLEARANCE

1. Trees include, cutting down of trees causing obstruction to the construction works as approved by the Engineer. Rate shall include for cutting and stacking of timber at an approved location and uprooting of stumps and disposal of debris away from site at a dump selected by Contractor approved by LA/Engineer.

2. Removal of stumps & roots (Existing roots along the pipe line trace which need to be removed to complete the laying work.).

CESMM3, CLASS E: EARTHWORKS

1. Removal of 150mm thick top soil in areas with structures is included under general excavation, i.e. earth works up to finished ground level measured under site works. The top soil removal to be done only in areas where permanent filling to be carried out. i.e. not required to be done in general excavation areas.

2. General excavation means the volume of earth occupied by the multiplication of defined plan area to be excavated and mean depth below original ground level to finished ground level. Before starting foundation excavation for structures, General excavation shall be carryout up to finished ground level.

3. For structures the volume of material excavated shall be the product of the horizontal plan area of the base of permanent work constructed and the mean depth below original ground level or finished ground level where General excavation to be done. The mean depth shall be measured to the underside of the specified blinding concrete.
4. Excavation shall be deemed to include for upholding sides of excavation, additional excavation to provide working space, removal of dead services, care for abandoned underground structures, excavation to the correct depth to the net dimensions as indicated on the drawings, preserving the bottoms of excavations in a state suitable for the reception of concrete, pipes or pipe bedding and dewatering where necessary.

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5. Where excavation that may endanger any existing structure or services, are being executed, the Contractor should take necessary precautions, subject to the approval of the Engineer, to protect the existing structure either from being damaged or from being rendered unserviceable. There shall not be any extra payment for protection works in any form carried out for the above-mentioned purpose.

6. Excavation shall include for taking all precautions by supporting faces of excavation to ensure the safety of the workmen and to prevent any damage to adjacent walls, buildings and all other structures and services.

7. Rates for excavations shall include for all temporary and permanent measures required to protect and support all existing pipes, cables and services, including all chambers, gullies and foundation there to or repair or replace them should they become damaged due to the Contractor's activities including design works necessary.

8. Provision shall include for storage areas for the temporary storage of any material required for backfilling which cannot be store alongside the excavation for any reason, together with the cost of loading, transporting, including disposal of surplus at a site selected by the Contractor and approved by LA/Engineer.

9. Where the ground surface is to be covered with embankment or fill of any description, the depth of excavation shall be measured from ground surface before being so covered, and after removal of top soil.

10. Excavated material shall be deemed to be material other than top soil, hard rock or artificial hard material unless otherwise stated in item description. An isolated volume of artificial hard material or hard rock occurring within other materials to be excavated shall not be measured separately unless its volume exceeds 1.0 m^3. Where the net width of the excavation is less than 2.0m the volume of artificial hard material or hard rock will not be measured separately unless it exceeds 1.0 m^3. The Contractor must make allowance at the time of pricing for rock blasting for the possibility of permission not being granted for the use of explosives.
11. The quantities of material excavated and used as filling are measured net using dimensions from the drawings, with no allowance for bulking, shrinkage or waste. No allowance shall be made for any extra transport required due to bulking.

12. The volume of disposal of excavated material measured shall be the difference between the total

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net volume of excavation and the net volume used for filling, with no allowance for bulking or shrinkage. Disposal of excavated material shall be deemed to be disposed off the site unless otherwise stated in item description, and where disposal on site is required, the location shall be stated in the item description. The Contractor is responsible for find a suitable place for disposal of excavated material unless otherwise provided.

13. Fill shall be measured as the net volume, above ground level or commencing surface, of the permanent earthwork to the dimensions shown on the Drawings or directed by the Engineer, irrespective of source of material. The rate shall include for but not be limited to selection, handling, placing and compaction of excavated or imported material.

14. For unsuitable material below the specified level, the excavated material shall be measured as the volume of material directed to be removed by the Engineer.

15. In no case shall any of the following be included in the measurement for payment;
    - Quantity of any excavations performed prior to the taking of measurements of the undisturbed, original, natural ground
    - Removal of slides, cave-ins, silting or filling due to the action of the elements or weather and/or carelessness of the Contractor

16. No payment will be made for any concrete or pipe bedding required for filling over-excavated volumes or disturbed areas

17. Rates for landscaping shall be deemed to include for fertilizing, trimming and preparation of surfaces and protecting and maintaining ground and plants for a period of one year from the date of handing over of landscaping in addition to the supply of material and carrying out for landscaping complete as per specification and drawings.

18. Any test required for the testing of soil shall be done in the laboratory set up by the Contractor approved by the Engineer

CESMM3, CLASS F: INSITU CONCRETE

1. Rates for provision of concrete shall include for;
    - the supply of all necessary materials, piling, storing, gauging, mixing and transporting up to the required locations,

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- all costs incurred in determining the mixes and testing of materials, making and testing of all test cubes complying with the specification,
- any admixtures required,
- all remedial or rectification work ordered by the Engineer due to non complying with the specification.

2. Rates for placing of concrete shall include for;
   - placing and compacting,
   - curing the concrete and all measures to protect freshly poured concrete,
   - all remedial or rectification work ordered by the Engineer consequent to the result of test falling below the minimum specified
   - preparing the surface of previously excuted work to provide the necessary bond with new concrete
   - leakage testing of water retaining structures including legal disposal of water
   - cleaning and disinfection of structures including provision of water and chemicals required for the operation and legal disposal

CESMM3, CLASS G: CONCRETE ANCILLARIES

1. The rates for formwork shall include for the supply, centering, fabricating, assembly, cutting, fittings, erection in position, use and waste of forms, all measures necessary to produce the required shapes of concrete whether straight or curved, fillets and chamfers up to 150 mm wide on the splay, for coating to prevent adherence of concrete, for the provision of temporary openings to facilitate inspection and cleaning, for dismantling, for all scaffolding and every other expense, in strict conformity with the Specifications.

2. Deductions will be made for openings more than 0.50 square metre in area.

3. Rates for reinforcements shall include for providing drawings and bar bending schedules, samples, testing, supplying, transporting, storing, cleaning, cutting, bending, fabricating, distributing through- out the works, placing in position, holding and supporting including temporary fixing supports, hangers and binding wire (and for welding where indicated), laps, tying wires, spacers, stools, chairs, cover blocks wastage etc. and all labour necessary to complete the work.

4. No separate payment for water bars, water stops, all construction joints, stop ends, temporary

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stops etc. and associated cost with supply and installation of those should be included in other rates for relevant items in the Bills of Quantities.

5. No separate measurement will be made for shuttering/formwork of mass concrete. The cost thereof shall be deemed to be included in the rates for concrete work.

CESMM3, CLASS H: PRECAST CONCRETE

1. Rates of items for pre-cast concrete shall be deemed to include for reinforcement, formwork, joints, lifting hooks and finishes etc. and full compensation of labour including multiple handling etc. to complete the work.

CESMM3, CLASS I: PIPEWORK– PIPES

1. Rates for pipe work shall include all required undertakings to complete the installation, including but not limited to the supply, transport and delivery of manufactured pipes, handling and temporary storage, trimming, handling and placement of pipes, pipe laying including excavation up to the depth as specified, jointing (butt welding for HDPE pipes), backfilling with material as shown in drawing, upholding sides of excavations, dewatering where necessary and removal and proper disposal of surplus excavated material at a dump selected by Contractor approved by LA/Engineer and all other things necessary to complete the pipeline installation except for those measured separately under Class J, K and L. Rates shall not include for pressure testing, cleaning & flushing and disinfection for pipelines as these itemized separately under Class K. Prices are based on the net quantities for completed works and no extra payment shall be considered for waste pipe or left over fittings.

2. Rates for pipe work shall include General clearance and disposal off site, as specified, for all objects and obstructions above commencement surface level including demolition and removal of articles, removal of trees of girth less than 500 mm, stumps of diameter less than 150 mm, Roots with less than 500mm dia. and obstructions which are expressly required to be cleared, except those for which separate items are given as set out in Class D.

3. Rates for pipe work shall include continuous upholding for the sides of trench excavations, and any additional excavation required to provide for working space. No extra payment shall be allowed for excavation in excess of the maximum trench width as shown on the Drawings.

4. Suitability of excavated material for backfilling will be decided by the Engineer after carrying out

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soil testing, cost of testing for this purpose will be paid separately under the Provisional Sum Bill.

5. Rates for pipes in trenches shall include for protection of flanged joints, flanged adaptors, couplings, by applying and application of primer, mastic profile, mastic tape and PVC or polyethylene outer wrapping as specified.

6. Rates for pipes not in trenches shall include for supplying, laying and jointing pipes, brackets, straps, r/c concrete columns, support blocks/tools, concrete bases for vertical bends, thrust blocks, other anchoring system, nuts, washers, bolts/anchor bolts and all other things necessary for pipeline installation and commissioning except for pipes not in trenches measured separately under Class J, K and L.

7. Rates shall also be included for rectification activities of pipelines.

8. The Contractor's rate and sums shall include for 2 Nos. movable sign boards and 1 No. site safety sign board for each working crew.

9. The quantities of supply of pipe shall be measured as follows;

   For PVC/HDPE pipes – from the end of the socket to the end of the spigot
   For DI pipe – from the socket end to the limit on the spigot end going in to the socket as detailed in the specification

10. The method of measurement of completed pipeline installation works for payment shall be according to the measured length along the centreline of the pipeline, as constructed, and verified by the Engineer, inclusive of lengths of pipe fittings and the lengths occupied by chambers. Such fittings and valves measured extra over to the pipe line under Class J and K. The quantities for laying of pipes shall be measured by length of pipe along centre line, for each material, class and size, along their centre line as included in different depth zones. The depth shall not divide into depth bands but shall measure according to the total depth in different zones. The depth is defined as the distance from the original surface level to the invert level of the pipe. Pipe diameter is defined as the nominal diameter associated with the particular type of pipe, as designated in the specifications and the Bill of Quantities.

11. The lengths of pipes entering manholes and other chambers shall be measured to the inner surfaces of the chambers except that pipes and fittings comprising backdrops to manholes shall be included in items for manholes measured in class K. No deductions will be made for fittings and

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valves occupied.

12. No separate valuation shall be made in respect of cutting and forming short length of pipes, jointing and welding when approved, concrete barriers, interconnecting pipe work, installation of polyethylene sleeve for DI pipe lines where specified, protection of ferrules, saddle straps, nuts bolts and washers. The Contractor's costs for meeting his obligations under the Contract with respect to these items shall be deemed to be included in the rates for pipe laying.

13. Pipework quantities and pipe fittings incorporation into temporary diversion works, or pipework for temporary maintenance of existing services are excluded from the rates and the prices for pipework and are not to be measured for payment. All costs for such temporary works shall be deemed covered by the Contractor within the respective lump sum item prices in the General Items of the Bill of Quantities.

CESMM3, CLASS J: PIPEWORK – FITTINGS AND VALVES

1. Unit rates and prices for pipe fittings and valves, but for only those fittings and valves actually itemized under separate items in the Bill of Quantities, shall be payable at extra-over costs to the rates for pipe laying, and shall include for the supply, delivery and installation, cutting – in to the pipe, jointing, finishing, and all other ancillary works extra over the works for pipes to complete the installations as shown and as specified . Pipe diameters are defined the same method as specified for pipes.

2. For valve boxes or valve chambers, the supply, transport, handling and installation of the valves and flap gates and all other fittings, fixings, gasket seals, and coatings, as required, including jointing, bolting, and testing, and all as shown and as specified, shall be deemed included within the separate item (lump sum item price) for the valve box or valve chambers as applicable, in the Bill of Quantities.

3. Rates and item costs for buried ductile iron pipework shall include the provision and installation of polythene sleeving for all buried ductile iron pipes and fittings in contact with soil.

4. Tees, crosses and bends used for Inspection Tees and Direct Connections are itemized separately for payment under the relevant items for tees, bends and crosses, under pipework-fittings and valves.

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5. Tees used for air release valves and washout's installations are itemized separately for payment under the relevant items for tees, under Pipe work- fittings and valves. The prices for all air release valve arrangements and washout arrangements include all fittings and works after the tee.

6. Air release valves installed for bridge crossings shall be included within the price for the crossings, and such bridge air release valves are not included separately in the quantities for air release valve arrangements.

7. Rates for the installation of buried gate valves, if itemized separately in the Bill of Quantities, shall include the supply and installation of all items to complete the valve installation works, such as supply and install gate valves, flange adaptors, flanged fittings, fillers and coatings for buried flanges, cutting-in to the pipe, couplings, short pipes, cast iron surface boxes and concrete surrounds, PVC spindle housing and brick or concrete foundation, and all to complete as specified and as shown.

8. Buried gate valves and fittings used for washout arrangements shall be included within the prices for the washout arrangements, and shall not be itemized separately. Gate valves and pipe fittings used for air release valve arrangements shall be included within the prices for the air release valve arrangements, and shall not be itemized separately.

9. Valves and pipe fittings in valve chambers and valve boxes shall be included within the prices for the valve chambers and valve boxes, and shall not be itemized separately.

10. The method of measurement of completed pipework in valve chambers for payment shall be to the lump sum item prices in the Bill of Quantities for either the valve chamber or valve box item as itemized in the BOQ. Prices for valve chamber pipe work shall include all undertakings, supply and installation of all materials, all pipe fittings, valves, pipe cutting, welding, flanges, couplings, bolts, nuts, washes, jointing, supports, brackets, fixings, pipe inserts, water stops, fillers and coatings for buried flange, final painting, and all appurtenances necessary to supply and install the pipework complete, as specified.

11. The method of measurement of completed swabbing chambers and other valve chambers for payment shall be to the lump sum item prices in the Bill of Quantities. Prices shall include all undertakings, supply and installation of all materials, reinforced concrete, access cover, valve key inserts, step rungs, vents, all pipe fittings, valves, pipe cutting, welding, flanges, couplings,

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bolts, nuts, washer, jointing, supports, brackets, fixings, pipe inserts, water stops, fillers and coatings for buried flange, final painting, and all appurtenances necessary to supply and install the pipework and chamber complete, as specified.

12. Rates for valves and fittings for pipes in trenches shall be deemed to include for supplying, laying and jointing and extra excavation, preparation of surfaces, disposal of surplus excavated materials at a dump selected by the Contractor and approved by LA/Engineer, upholding sides of excavation, backfilling, removal of dead services and dewatering where necessary.

13. Rates for valves and fittings for pipes not in trenches to be included for supplying, laying and jointing including supports as necessary where separate items are not provided in the Bills of Quantities.

14. In the case of valves and penstocks the rates to be included for necessary extension spindles, brackets, headstocks, keys and all other materials for proper functioning of the valves and penstocks.

16. In the case of straight fittings with a length, rates to be included for 10mm plus or minus (+/-) deviation.

CESMM3, CLASS K: PIPEWORK – MANHOLES AND PIPEWORK ANCILLARIES

1. The depth of manholes and other chambers shall be measured from tops of covers to channel inverts or tops of base slabs, whichever is lower.

2. Rates of items for work in this class shall be deemed to include for extra excavation, dewatering, preparation of surfaces, disposal of excavated material at a dump selected by the Contractor and approved by LA/Engineer, upholding sides of excavation, dewatering, backfilling, compaction and removal of dead services, except to the extent that such work is included in Classes I, J and L.

3. Rates of items for work in this class shall be deemed to include for pre-cast or in situ concrete, reinforcement, formwork, joints and finishes.

4. Extra-over costs involved for the installation of pipe crossings across only those culverts and drains larger than 450mm internal width and 450mm height as being payable, are covered under separate items for “Crossings”, and include all extra costs for concrete, sleeve pipes, pipe collars or extra welds, pipe couplings, extra fittings, flanged pipes and fittings, fillers and coatings for

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buried flanges, reinforced concrete supports, and all as shown on the drawings and as specified.

Rate for the installation and construction of pipe-bridges, shall include for supply and installation of all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, couplings, flange-stub connectors, HDPE welds, flanged pipe specials, concrete supports and foundations, piles, steel brackets, and all other items to complete the self-supporting pipe-bridges as shown in the drawings and as specified.

Rates for culvert crossings and pipe-bridges shall be deemed to include for Supply of DI/HDPE pipes and fittings, nuts and bolts laying (to spans as per the limits shown in the drawings for particular culvert) and jointing or fixing in position PVC/Steel/DI pipes, cutting of pipes to suit the site conditions, specials, fittings, valves, nuts and bolts and other materials as shown in the drawings which are not measured under Class I or J. And rates shall include for excavation, upholding sides, coffer damming if necessary, excavation, dewatering, bedding, watering and compacting, backfilling ,supplying and placing rip rap as required, disposal of surplus material at a dump selected by the Contractor and approved by LA/Engineer, diversion of water ways, providing suitable anchor blocks, concrete column supports, brackets, and all other necessary materials and breaking through abutments/wing walls and making the same good to complete the crossing not measured under other item in this Class and Class L. Rates shall also include for supplying and laying of RCC pipe encasing, rubble and sand packing etc. where necessary. Rate shall also include for wrapping flange joints with mastic material and primer compound and exposed pipes to be painted with anticorrosive paint approved by the Engineer.

5. Extra over costs involved for the installation of pipelines on support are covered under separate item for “pipe installation on support”. Rate for pipe installation on support shall include for the supply, installation and construction of pipes on column supports, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, dismantling joints, couplings, flanged pipe specials, flange-stub connectors, HDPE welds, steel brackets, and all other items to complete as shown in the drawings. Rate shall not include for the column supports as it is separately itemized.

6. Rate for the supply and construction of the column supports associated with pipe installation on supports, shall include for all necessary foundation measures including excavation, upholding sides, coffer damming if necessary, excavation, dewatering, bedding, watering and compacting, backfilling, disposal of surplus material at a dump selected by the Contractor and approved by LA/Engineer, reinforced concrete columns and/or pile lengths, and all other items to complete as shown in the drawings, for column and/or pile supports of combined above-ground and embedded

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underground depth from foundation level to invert.

7. Rates for bridge crossings/canal crossings shall be deemed to include for Supply of DI, HDPE and uPVC pipes, fittings, flanged bends, tees, air valve and isolation valve, dismantling joints, nuts & bolts, provision and fabrication of steel trusses, steel brackets, support logs, straps, all sizes of nuts and bolts, piling or constructing column supports, laid as relevant on trusses/on piles/on RCC column supports/bracketed to the bridge, welding if necessary, (to spans as per the limits shown in the drawings) including coupling/flange adaptors and jointing or fixing in position PVC/Steel/DI/HDPE pipes, cutting of pipes to suit the site conditions, specials, fittings, valves and other materials as shown in the drawings and as specified. And rates shall include for any coffer damming, excavation, upholding sides of excavation, dewatering, beddings, watering, compacting, backfilling, disposal of surplus material at a dump selected by the Contractor approved by LA/Engineer, diversion of water ways, providing pipe supports and brackets etc., breaking through abutments/wing walls if found necessary and making good, providing suitable anchor blocks and all other necessary materials to complete the bridge crossing not measured under other item in this Class and Class L. Rates shall also be included for supplying and laying of RCC pipe encasing, rubble and sand packing etc. where necessary, removing coffer dam, and any obstructions made during construction to allow free flow of water.

8. Rates for causeway crossing shall include for diversion of waterways, coffer damming, dewatering, supply pipes, fittings, specials, nuts & bolts, laying and jointing pipes (a per limits shown in drawing), filling pipe bedding and surrounding with material as shown in the drawing, backfilling with material as shown in the drawing, supply and placing rip-rap. Rate to include for removal of cofferdam, removing all surplus material at a place selected by Contractor approved by LA/Engineer, clearing site free form any obstruction to the water way. Connection to Existing Pipelines - In addition to other requirements of this preamble, rates for connecting to, or capping off, existing pipe work shall include but not by way of limitation for;

    - Coordinating the work with the NWSDB to minimise the interruption,
    - Contractors shall provide his programme before 14 days to the NWSDB and get prior approval
    - Interruption period of maximum 12hrs at a time shall be allowed
    - Gap between two interruption shall be 14days or more
    - Ascertaining the precise outside diameters of existing pipes prior to placing orders for couplings etc., prepare and submit drawing for the approval of the Engineer.
    - Arranging for the location,
    - Isolating and drainage of the existing main

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- Re-commissioning.

9. Permanent Reinstatement (PR) of roads shall be carried out as shown in the drawings. For the carriageways and crossings PR may be done by the main Contractor only if he is experienced for Grade C1 (as per the ICTAD Contractor registration scheme) category of road works. Otherwise by a Grade C1 category road sub-Contractor or appropriate road sub-Contractor approved by the Engineer including testing of materials such as Aggregate Base Course (ABC), Gravel, Concrete, Asphalt concrete etc.in accordance with the RDA (Road Development Authority)/ICTAD Publications No. SCA - 05 specifications. Road reinstatement shall be measured in linear meter along the top surface of trenches. Rates for carriageways and crossings shall include for reinstatement of the full width damaged or the width specified in the drawings whichever is lesser. Any extra damages caused by the Contractor due to negligence during the works shall be made good and any additional cost shall be borne by the Contractor at his own cost.

10. Any other areas damaged due to the act of the Contractor shall be borne by the Contractor at no additional cost to the Employer.

11. The reinstated roads shall be maintained by the Contractor until handing over to the relevant road authority at no additional cost to the Employer.

12. Permanent Reinstatement (PR) of road shoulders shall be carried out as shown in the drawings with the base material to be filled to a depth as shown in the drawings. Reinstatement shall be measured in linear meter along the top surface of trenches.

13. Temporary reinstatement of roads shall be carried out by the main Contractor/subContractor as shown in the drawings. Temporary road reinstatement shall be measured in linear meter along the top surface of trenches. Rates for carriageway and crossings shall include for reinstatement of the full width damaged or the width specified in the drawings whichever is lesser. Any extra damages caused by the Contractor due to his negligence during the works shall be made good and any additional cost shall be borne by the Contractor without additional cost to the Employer.

14. Concrete, tiled and paved surfaces shall include for all as detailed above for reinstatement works, plus supply and placement of all new reinforced concrete, sand bedding, plastic layers if shown, tiling or paving materials, jointing and filling, grouting, trowelling of the surfaces, clean up and disposal of all waste, and all as required to complete the works.

15. Rates for reinstatement of private properties shall include for reinstatement of damaged steps, floors, boundary walls, fences etc. in private premises for full compensation of labour, plant and

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material etc. as necessary.

16. Rates for supply and erection of marker posts shall include supply and erection of marker and posts, but not be limited to for all excavation, refilling, ramming, and disposing of surplus, concreting, shuttering, reinforcement, making good ground surface, fixing and information plates. In addition, marker posts shall be engraved with the NWSDB logo and the letters "NWSDB" and marker posts engraved as shown in the drawings.

17. Rate for marker tapes laid in trenches above the pipe line shall include for all supply, labour, tools, materials required for placement of detectable type marker tape of the type specified at a depth above the crown of the pipe as shown in the drawings.

CESMM3, CLASS L: PIPEWORK – SUPPORTS AND PROTECTION, ANCILLARIES TO LAYING AND EXCAVATION

1. Excavation of hard material mean excavation of hard rock or artificial hard material required blasting. An isolated volume of artificial hard material or hard rock occurring within other material to be excavated shall not be measured separately unless its volume exceeds 1.0 m^3.

2. Pipe Bedding: Rates of items for pipe bedding shall be deemed to include, preparation of surfaces/base, fill bedding as per the different types (A, C, C, D, E, F & G) with material and to depths as shown in drawings watering and compacting to 100% MDD including shoring and dewatering if necessary, removal of dead services, except to the extent that such work is included in Classes I, J and K or in the items for extras to excavation and backfilling in this class.

   If the bedding is filled with sand, the rate shall also include for placing concrete slabs 100mm height, 100mm thick across the trench at every 40 m intervals to contain the sand in the event of a leak.

   If the trench is on soft marshy ground, the rate shall include for supply and placing Geotextile material and filled as per the standard drawing.

4. Pipe Surround: Rates of items for pipe surround shall be deemed to include, filling pipe surrounding as per the different types with material and to depths as shown in drawings watering and compacting manually with steel rods on the sides of pipe so as not to damage the

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pipes but compacting the top layer to achieve satisfactory compaction so that no subsidence occur, including shoring and dewatering if necessary.

5. The costs of supply, delivery, temporary storage, compaction and placement of sand bedding and sand pipe surround bedding layers below and surrounding the pipes as shown on the Drawings, shall be included within the relevant rates for pipework.

   Bidders shall well take note that the borrow sites for sand bedding and sand surround bedding material will be at distances of up to 20km from the sites of the works. Bidders shall carefully investigate the source of sand bedding materials prior to determining and proposing rates and prices for pipework in his bid.

6. Rates of items for work in this class shall be deemed to include for concrete, reinforcement, formwork, joints and finishes.

CESMM3, CLASS M: STRUCTURAL METAL WORK

1. Rates of items for structural metal work shall be deemed to include for supply, fabrication and erection of base plates, shoe plates, haunches, cleats and sloping cleats to match to roof slopes, anchors where specified, bolts, nuts, washers etc. which required for erection complete.

CESMM3, CLASS N: MISCELLANEOUS METAL WORK

1. Rates of items for miscellaneous metal work shall be deemed to include for fixing to other work, supply of fixing components and drilling or cutting of other work.

2. Rates of items for plate flooring, open grid flooring, welded mesh panelling and duct covers shall be deemed to include for supporting metal work unless otherwise stated.

3. Rates of items for tie rods shall be deemed to include for concrete, reinforcement and joints.

CESMM3, CLASS P: PILES

PRECAST CONCRETE PILES

1. Rates for piles shall include for mobilisation and demobilisation of plant, equipment and personal, supply of piles, each site mobilisation, cast iron shoes, straps, jointing plates, driving piles, testing of piles, disposal of surplus material off site at a dump selected by the Contractor

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and approved by LA/Engineer, which require for the work complete except to the extent that such work is included in Classes Q.

2. Rates and prices shall include for making necessary accesses, setting out of piling locations, preparation of working platform etc. which are necessary for the work complete.

CESMM3, CLASS Q: PILING ANCILLARIES

1. Rates and prices shall include for full compensation of work complete except to the extent that such work is included in Classes P.

2. Rates shall exclude for the cost related to casting of pile caps as measured separately under Class F and G.

CESMM3, CLASS R: ROADS AND PAVINGS

1. Rates for laying Granular sub base shall include for supply and laying, preparation of sub grade including compaction and testing of sub base as specified in the RDA (Road Development Authority) specification and as shown in the drawings

2. Rates for laying Aggregate Base Course (ABC) shall include for supply and laying, preparation of sub base for roads including compaction and testing of ABC as specified in the RDA (Road Development Authority) specification and as shown in the drawings.

3. Rates for laying Asphalt concrete in carriage way or foot walk shall include for supply and laying of asphalt concrete and testing of Asphalt as provided in the RDA (Road Development Authority) specification and including maintenance of one year period after the handing over the roads to NWSDB.

4. Rates for pre-cast concrete slab paving shall include for supply and laying of pre-cast concrete cover slab as provided in the RDA (Road Development Authority) specification, bedding, joints, cuttings and necessary compaction etc. required for the completion of work as per the Contract.

5. Rate for items for work in this class involving in-situ concrete shall be deemed to include for concrete, formwork and reinforcement required for the finishing of concrete.

6. Rates for replacing of road kerbs shall include for supply and placing of road kerbs as provided

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in the RDA (Road Development Authority) specification, channels, edgings, beds, backing, joints, cuttings and necessary compaction etc. required for the completion of work as per the Contract.

CESMM3, CLASS U: BRICK WORK, BLOCKWORK AND MASONRY.

1. Rate for items for work in this class shall be deemed to be included for but not be limited to;
    - Shop drawings
    - Sample for the Engineer's approval
    - Supply, installation and fixing all materials including supports
    - All cutting and finishing at openings
    - Wastages
    - All temporary works
    - All testing
    - Leaving the whole of the work in perfect condition on completion

CESMM3, CLASS V: PAINTING.

1. Rates for items for painting of smooth concrete surfaces, plastered concrete / brick work, metal work or pipe work shall be deemed to include for preparation of surfaces before painting.

2. Rates for painting of metal sections shall be deemed to include for painting the surfaces of connecting plates, brackets rivets, bolts nuts and similar projections.
3. Rates for painting of pipe shall be deemed to be included for painting the surfaces of flanges, valves other projecting fittings and hangers.

4. Rates for painting of plastered surfaces shall be deemed to include for the supply, preparation of plastered surfaces, apply prime coats, two coats of emulsion painting with approved colour by the Engineer and all labour required for full compensation of painting works.

5. Rates for painting of structural steel in bridges shall be deemed to include for supply preparation of surface, apply prime coats, and painting coats as specified in specification with approved colour by the Engineer and all labour etc. required for full compensation of painting works as specified in system 'A' in the specification Section 09870

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Note: A copy of Bills of Quantities in digital version (CD-R) coded in MS Excel format will be provided along with the Bid Dossier to the Bidders to facilitate pricing of the Bills of Quantities. However, the Bidder shall return the CD complete with quoted Rates and Prices. The Bidder must assure that, the original descriptions or any other texts remain unchanged.

For evaluation purposes, the Rates and Prices written in ink in the purchased original Bid Documents shall be taken into account and not the digital versions. If there is a discrepancy between the soft version and the hand written version the latter shall prevail. The Bidder's Name etc. to be marked with Contract Number.

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PREAMBLE NOTES ON DAYWORK SCHEDULES

General

Reference should be made to Clause 13.6 of the General Conditions of Contract. Work shall not be executed on a day work basis except by written order of the Engineer. The rates specified shall apply to any quantities of daywork ordered by the Engineer. Basic rates are exclusive of VAT.

The day work rates for Labour, Plant and Materials shall not include percentages to cover Contractor's over heads and profits. The Contractor shall quote % (percentage) over and above the basic rates to cover his over heads and profits under relevant PS item.

Daywork: Labour

The Contractor shall be entitled to payment in respect of labour used for daywork at the specified rates in the SCHEDULE OF DAYWORK RATES for LABOUR together with a percentage payment on the basic rates as quoted under daywork in PS items in the Bills of Quantities.

Only the time of different classes of labour directly doing the work ordered by the Engineer and for which they are competent to perform will be measured. The time of gangers (charge hands) actually doing the work with the gangs will also be measured but not the time of foremen or other supervisory personnel.
The rates for labour shall cover all direct costs to the Contractor, including the amount of wages paid to such labour, transportation time, overtime, subsistence allowances and any sums paid to or in on behalf of such labour for social benefits in accordance with Sri Lankan Law. The Contractor shall include for those in overhead and profit factor, if not covered by the rates given in schedule of daywork rates.

The overhead and profit component covers the Contractor's profit, overhead, superintendence, liabilities and insurance and allowances to labour, time keeping, clerical and office work, the use of consumable stores, utilities, the cost of using, repairing and maintaining the tools necessary to each class of workman and any other expenses not covered by the basic rate for the labour.

Daywork: Materials

The Contractor shall be entitled to payment in respect of materials used for daywork at the specified rates in the SCHEDULE OF DAYWORK RATES for MATERIALS together with a percentage payment on

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the basic rates as quoted under daywork in PS items in the Bills of Quantities. The payment to the Contractor will be certified as follows;

(a) The basic rates for materials have been calculated on the basis of the invoiced price, freight, insurance, handling, expenses, damages, losses, wastages, etc., and for delivery to store or for stock piling at the Site. The Contractor shall include for those in overhead and profit factor, if not covered by the rates given in schedule of daywork rates.

(b) The cost of hauling materials for use on work ordered to be carried out as daywork from the store or stockpile on the Site to the place where it is to be used will be paid in accordance with the terms for Labour and Plant.

The cost of any materials supplied by NWSDB for use on Daywork shall not be taken into account when calculating the amount of the materials on cost as described above.

The Contractor must submit his receipted bills to the Engineer in support of all claims with respect to Daywork materials if rates are not available in schedule of daywork rates for materials for a particular material.

Daywork: Plant

The Contractor shall be entitled to payments in respect of Plant already on Site and employed on daywork at the specified rental rates in the SCHEDULE OF DAYWORK RATES for PLANT, the rates include due and complete allowance for depreciation, interest, indemnity and insurance, repairs, maintenance, supplies, fuel, lubricants, and other consumables. Contractor may add the percentage as an overhead and profit component on the basic rates to cover his profit, overhead, superintendence, administrative costs related to use of such equipment, liabilities, time keeping and any other allied works. The cost of drivers, operators and assistants will be paid for separately as described under the section on Daywork Labour.

In calculating the payment due to the Contractor for Plant employed on daywork, only the actual number of working hours will be eligible for payment, except that where applicable and agreed with the Engineer, the traveling time from the part of the Site where the construction Plant was located when ordered by the Engineer to be employed on daywork and the time for return journey thereto shall be included for payment.

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SCHEDULE OF DAYWORKS 1: LABOUR

ITEM NO.	DESCRIPTION	UNIT	Nominal Q'ty.	Rate LKR	Amount LKR
1.	Unskilled labour	day	20		
2.	Pipe Layer	day	20		
3.	Mason	day	10		
4.	Carpenter and Joiner	day	10		
5.	Steel Work Erector	day	10		
6.	Pneumatic Tool Operator	day	10		
7.	Fitter	day	20		
8.	Tiller	day	10		
9.	Plumber	day	10		
10	Welder	day	20		
11.	Painter	day	10		
12.	Electrician	day	10		
13.	Mechanic	day	10		
14.	Bar bender	day	20		
15.	Operator(heavy machine)	day	20		
16.	Driver for Tractor	day	20		
	Total for Dayworks Labour: **(Carried forward to Dayworks Summary on Page 37)**				

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SCHEDULE OF DAYWORKS 2: MATERIALS

ITEM NO.	DESCRIPTION	UNIT	Nominal Q'ty.	Rate LKR	Amount LKR
1.	concrete Gr.15	Cu.m	10		
2.	concrete Gr.20	Cu.m	10		
3.	concrete Gr.25	Cu.m	10		
4.	concrete Gr.35 A	Cu.m	10		
5.	Cement Ordinary Portland or Equivalent in Bags (50 Kg)	Bags	20		
6.	Ribbed TOR Steel Reinforcing Bar	Tonne	1		
7.	Mild Steel Reinforcing Bar	Tonne	1		
8.	Coarse Sand	Cu.m	10		
9.	Fine Sand	Cu.m	10		
10.	Quarry dust as Bedding material	Cu.m	10		
11.	Quarry dust as Surrounding material	Cu.m	10		
12.	Aggregate 20mm	Cu.m	05		
13.	Aggregate 40mm	Cu.m	05		
14.	ABC	Cu.m	05		
15.	Timber (Class l)	Cu.m	02		
16.	Timber (Class ll)	Cu.m	02		
17.	Timber (Class lll)	Cu.m	02		
18.	Asphalt	litre	10		
19.	Petrol	litre	50		
20.	Diesel	litre	50		
21.	Shuttering Planks	Sq. m	10		
22.	River sand	Cu. m.	10		
23.	Paints (Enamel/Emulsion)	litre	20		
24.	Bitumen Paints	litre	10		
25.	Thinner	litre	05		
26.	Masonry Blocks (400 x 200 x 400)	No.	10		
27.	Sheet Piles	Tonne	01		
28.	Bricks standard size	No.	1000		
29.	Rubble 6" x 9"	Cu. m.	10		
30.	Rubble 6" x 4"	Cu. m.	10		
	Total for Dayworks Materials: (Carried forward to Dayworks Summary on Page 37)				

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SCHEDULE OF DAYWORKS 3: PLANT

ITEM NO.	DESCRIPTION	UNIT	Nominal Q'ty.	Rate LKR	Amount LKR
1.	Hydraulically operated HDPE Butt-welding machine with all necessary equipment*	month	1		
2.	Electrofusion HDPE Automatic-type pipe welding machine with all necessary equipment**	month	1		
3.	Asphalt Cutter	hr.	10		
4.	Excavator (.18 m^3)	hr.	20		
5.	Excavator (.35 m^3)	hr.	20		
6.	Wheel Loader (.9 m^3)	hr.	20		
7.	Wheel Loader (1.4 m^3)	hr.	20		
8.	Backhoe Loader (101HP)	hr.	20		
9.	Backhoe Loader (90HP)	hr.	20		
10.	Bull Dozer (Crawler Tractor) (95HP)	hr.	20		
11.	Tractor with Trailer	hr.	50		
12.	Motor Grader (3.1 m)	hr.	10		
13.	Baby Dumper	hr.	20		
14.	Hand Rammers (60 Kg)	day	20		
15.	Plate Compactor (Mechanical) (90 Kg)	day	20		
16.	Soil Compactor – Vibrating Roller (01 T)	hr.	20		
17.	Soil Compactor – Vibrating Roller (10 T)	hr.	20		
18.	Pneumatic Roller (8 -10 Ton)	hr	20		

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SCHEDULE OF DAYWORKS 3: PLANT (CONTD.)

ITEM NO.	DESCRIPTION	UNIT	Nominal Q'ty.	Rate LKR	Amount LKR
19.	Pneumatic Roller (10 -12 Ton)	hr	20		
20.	Dump Truck (3 Ton)	day	20		
21.	Boom Truck (3 Ton)	day	20		
22.	Water Bowser (with driver) (6000 lts)	day	20		
23.	Water pump 4" dia.	hr	20		
24.	Water pump 2" dia.	hr	20		
25.	Low Loader Truck (30 – 40 Ton)	km	50		
26.	Fork Lift (minimum 5 hrs.) – 2.5 ton	5 hrs	1		
27.	Air Compressor (including tools, breakers etc) - 250 cfm	hr	10		
28.	Air Compressor (including tools, breakers etc) - 750 cfm	hr	10		
29.	Truck with Tipper (3 – 8 Ton)	km	50		
30.	Sludge pump 4" dia.	hr	10		
31.	Concrete mixer complete with scales etc. ($0.25m^3$)	hr	10		
32.	Concrete mixer complete with scales etc. ($0.5m^3$)	hr	10		
33.	Concrete Vibrator (38mm dia.)	hr	10		
34.	Sprayer emulsion hand cart	hr	05		
35.	Mobile Crane (2t)	hr	10		

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SCHEDULE OF DAYWORKS 3: PLANT (CONTD.)

ITEM NO.	DESCRIPTION	UNIT	Nominal Q'ty.	Rate LKR	Amount LKR
36.	Van or similar utility vehicle	km	10		
37.	Welding Generator (16kVA)	hr	10		
38.	Generating Set (30KVA)	hr	10		
	Total for Dayworks Equipment: (Carried forward to Dayworks Summary on Page 37)				

*Two (2) units hydraulically operated HDPE pipe butt-welding machine for butt welding of HDPE pipes up to 500mm diameter.

**Two (2) units Electro-fusion HDPE Automatic-type pipe welding machine. The unit shall be capable of operating in both automatic and manual mode

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DAYWORKS SUMMARY

Note:

1. **The Total Dayworks shall be taken for evaluation, but shall not be included in the Contract price.**

Description	**Amount LKR**
1. Total for Daywork: Labor	
2. Total for Daywork: Materials	
3. Total for Daywork: Plant	
Total Day Works	

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BILL OF QUANTITIES

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 1 : GENERAL REQUIREMENTS **ANURADHAPURA NWSP - PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE LKR	TOTAL PRICE LKR
		CLASS A : GENERAL ITEMS **General obligations, site services and facilities, temporary works, testing of materials and work, etc.** **Allow for all costs and expenses for complying with the General Conditions of Contract, General requirement and Technical Specifications.** **(Note: Any services not specifically provided for herein will be deemed to be included in the rates of other items in the BOQ)** **Specified Requirements:**				
1.1	A 211.1	Establishment of Project Manager Office for Engineer's Staff at Kebithigollewa zone of minimum area 170m^2 complete with air-conditioning, water supply, electricity & sanitation including furniture, office equipment, computers, printers, fax machine, stationery, first aid facilities, etc. as specified in clause 5.3 of section 6A General Requirements and removal after completion (for the period of 27 months).	Sum	Item		
1.2	A 211.2	Maintenance of Project Manager Office for Engineer's Staff at Kebithigollewa zone including paying of water supply, electricity bills and provision of security, janitorial services, office aide and provision of all stationary needs and any other services required for provide good working environment as specified.	months	27		
1.3	A 211.3	Establishment of Mobile/Field Office for Engineer's Supervisory Staff at Padaviya of minimum area 35m^2 complete with air-conditioning, water supply, electricity & sanitation including furniture, office equipment, computers, printers, fax machine, stationery, first aid facilities, etc.. as specified in clause 5.3 of section 6A General Requirements and removal after completion (for the period of 27 months).	Sum	Item		
1.4	A 211.4	Maintenance of Mobile/Field Office for Engineer's Supervisory Staff at Padaviya including paying of water supply, electricity bills and provision of security, janitorial services, office aide and provision of all stationary needs and any other services required for provide good working environment as specified.	months	27		
		Total of Page BOQ - 1 to Page BOQ - 5 Summary				

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 1 : GENERAL REQUIREMENTS **ANURADHAPURA NWSP - PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE LKR	TOTAL PRICE LKR
		CLASS A : GENERAL ITEMS (CONTD.)				
		Services for the Engineer's staff:				
1.5	A 221.1	Provide and maintain 2 Nos. hired 08 seater, duel AC passenger vans 2500cc or above capacity for exclusive use of Engineer's staff as specified in clause 5.4 of section 6A General Requirements and clause 6B.19.	Vehicle months	54		
1.6	A 221.2	Provide and maintain 4 Nos. hired, AC Double Cab Pickups 2500cc or above capacity for exclusive use of Engineer's staff as specified in clause 5.4 of section 6A General Requirements and clause 6B.19.	Vehicle months	108		
1.7	A 221.3	Provide additional payment for use of vehicles beyond the specified limit of mileage as in clause 5.4 based on the necessity of project activities subject to the approval of the engineer.	km	6750		
1.8	A 221.4	Provide brand new motor cycles of popular make with capacity not less than 125cc for Engineer's field staff as specified in clause 5.4.1 of section 6A General Requirements.	nr	1		
1.9	A 221.5	Maintenance of 01 no. motor cycles including supply of fuel, servicing, repairs, etc; as specified.in clause 6B.10	Cycle months	27		
1.10	A 222.1	Provide telephone connection with 12 line telephone exchange, internet connection, PABX system, fax, etc; as specified in clause 5.3(6) of section 6A General Requirements.	Sum	Item		
1.11	A 222.2	Maintenance of above telephone facilities including paying of bills including all taxes for telephone and other services. (maximum usage Rs.15,000/= per month)	Phone months	27		
1.12	A 222.3	Provide mobile phones including connections as specified in clause 5.3(6) of section 6A General Requirements and as directed by the Engineer. (Cost per unit Rs.30000/=)	nr	6		
1.13	A 222.4	Maintenance of above mobile phones facilities including paying of bills including all taxes for mobile phone and other services. (maximum usage Rs 2500/= per month per unit)	Phone months	135		
1.14	A 222.5	Maintenance of above mobile phones facilities including paying of bills including all taxes for mobile phone and other services. (maximum usage Rs 3000/= per month per unit)	Phone months	27		
1.15	A 229.1	Provide monthly progress reports in 04 colour printed copies with 10 nos. of photo prints and soft copies as specified in clause 3.2 of section 6A General Requirements.	months	27		
		Total of Page BOQ - 2 to Page BOQ - 5 Summary				

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 1 : GENERAL REQUIREMENTS **ANURADHAPURA NWSP - PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE LKR	TOTAL PRICE LKR
		Services for the Engineer's staff (Contd.):				
1.16	A 229.2	Provide original (01 set) "As Built drawing" in A1 papers and 03 sets of copies in A3 size paper including 4 sets of electronic files (editable) in CDs and ArcGIS data Files/Maps as specified in clause 3.7 of section 6A General Requirements.	Sum	Item		
		Equipment for use of Engineer's staff:				
1.17	A 231	Provide for the sole use of Engineer's and his staff, survey and measuring instruments,PPE etc.; as specified in clause 5.5 of section 6A General Requirements.	Sum	Item		
		Attendance upon the Engineer's staff:				
1.18	A 250	Provide pre-shipment inspection for 4 (four) NWSDB Engineers as specified in clause 6B.6 (HDPE Pipes & fittings and DI HDPE Pipes & fittings, valves)	Sum	Item		
		Temporary works:				
1.19	A 271.1	Allow for measures required for maintenance of traffic flows, traffic safety and all as specified, diversion of traffic if necessary and making road surfaces motorable immediately after the pipe laying until the roads are handed over to Road Authorities.	months	27		
1.20	A 271.2	Supply and erection of Name Boards (size 2.4m x1.2m) to be displayed at sites and offices as specified.	nr	4		
1.21	A 271.3	Allow for safety measures, safety sign boards, barricading, night light etc. and all as specified for maintaining safety of all personal at the site and property during construction period as specified.	months	27		
		Miscellaneous				
1.22	A 290.1	Construct, furnish and maintain the Field Laboratory complete with furniture lab equipment etc. including provision of required personnel as specified in clause 5.3 of section 6A General Requirements. Rate to include for provision of electricity, water, gas, stationery, safety equipment etc. and all as specified and removal after completion.	Sum	Item		
1.23	A 290.2	Allow for keeping all the sites tidy and clean during the period of construction and for clearance of the sites to the satisfaction of the Engineer on completion of the contract including delivery of any remaining pipes and fittings and other relevant items to the NWSDB stores as required and as specified.	Sum	Item		
		Total of Page BOQ - 3 to Page BOQ - 5 Summary				

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 1 : GENERAL REQUIREMENTS **ANURADHAPURA NWSP - PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE LKR	TOTAL PRICE LKR
		Miscellaneous				
1.24	A 290.3	Allow for testing & commissioning of the whole system, as specified.	Sum	Item		
		Total of Page BOQ - 4 to Page BOQ - 5 Summary				

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

SUMMARY OF BILL NO.1

BILL NO. 1 : GENERAL REQUIREMENTS **ANURADHAPURA NWSP - PHASE II**

BOQ BILL NO.	PAGE TOTAL	TOTAL PRICE LKR
Bill No. 1	Page BOQ - 1 of Bill No.1	-
	Page BOQ - 2 of Bill No.1	-
	Page BOQ - 3 of Bill No.1	-
	Page BOQ - 4 of Bill No.1	-
	TOTAL OF BILL NO. 1 CARRIED TO GRAND SUMMARY	**-**

"For References ONLY"
(Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO.: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 2 : PROVISIONAL SUMS **ANURADHAPURA NWSP - PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE LKR	TOTAL PRICE LKR
		CLASS A : GENERAL ITEMS				
		General obligations, site services and facilities, temporary works, testing of materials and work, provisional items and prime cost items				
		Provisional Sums may be used in whole or in part or not at all as directed by the Engineer.				
		Contractual Requirements				
2.1	A 190.1	For payment of actual charges incurred for all insurance policies taken under the contract as per clause 18 of GCC and PCC	P.Sum		30,000,000.00	30,000,000.00
2.2	A 190.2	Percentage adjustment to above Provisional Sum item.	%	2		600,000.00
		Daywork				
2.3	A 411	Daywork labour	P.Sum		500,000.00	500,000.00
2.4	A 412	Percentage adjustment to provisional sum for daywork labour).	%	15		75,000.00
2.5	A 413	Daywork Materials	P.Sum		1,000,000.00	1,000,000.00
2.6	A 414	Percentage adjustment to provisional sum for daywork Materials.	%	6		60,000.00
2.7	A 415	Daywork Plants	P.Sum		1,500,000.00	1,500,000.00
2.8	A 416	Percentage adjustment to provisional sum for daywork Plants.	%	10		150,000.00
		Other Provisional Sums				
2.9	A 211.1	Establishment, maintenance and removal after completion of 2 Nos of Residential Accomodations for Engineer's Staff as specified in clause 5.3 of section 6A General Requirements (Maintenance for the period of 27 months).	P.Sum		8,100,000.00	8,100,000.00
2.10	A 420.1	Allow for soil testing for suitable excavated material for backfilling.	P.Sum		1,000,000.00	1,000,000.00
2.11	A 420.2	Allow for testing of material and works for special encounters as directed by the Engineer.	P.Sum		1,000,000.00	1,000,000.00
2.12	A 420.3	Allow for payment for provided of procure Software for Project staff use ArcGIS, AutoCAD, WaterGEM & SAP 2000.	P.Sum		5,000,000.00	5,000,000.00
2.13	A 420.4	Allow for Providing training of Employer's staff on Arc GIS Data Base System as specified.	P.Sum		2,000,000.00	2,000,000.00
2.14	A 420.5	Allow for conducting the HIV/AIDS, prevention programme as per the Clause 6.7 of General Conditions of Contract and maintain the health and hygienic condition at site through out the Contract period.	P.Sum		200,000.00	200,000.00
2.15	A 420.6	Allow sum for Technical staff/Engineer's Representative for working during holidays and after working hours as assigned by the Engineer	P.Sum		100,000.00	100,000.00
2.16	A 420.7	Allow for Construction Management Services as specified in the Contract (Only for specialized services during contract period)	P.Sum		2,700,000.00	2,700,000.00
2.17	A 420.8	Percentage adjustment to above Provisional Sum items 2.9, 2.10, 2.11, 2.12, 2.13,2.14, 2.15 & 2.16.	%	8		1,608,000.00
2.18	A 420.9	Allow for diversion, support, protection or relocation of existing services or utilities as directed by the Engineer	P.Sum		1,000,000.00	1,000,000.00
2.19	A 420.10	Allow for main and by road connections as directed by the Engineer	P.Sum		1,000,000.00	1,000,000.00
		Total of Page BOQ - 6 to Page BOQ - 8 Summary				**57,593,000.00**

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO.: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 2 : PROVISIONAL SUMS **ANURADHAPURA NWSP - PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE LKR	TOTAL PRICE LKR
		Other Provisional Sums (Contd.)				
2.20	A 420.11	Allow for demolition and reinstatement of private properties as directed by the Engineer	P.Sum		800,000.00	800,000.00
2.21	A 420.12	Allow for removing and relocating of existing electrical posts as per the specifications given by relevant government authority.	P.Sum		100,000.00	100,000.00
2.22	A 420.13	Allow for removing and relocating of existing telephone posts as per the specifications given by relevant government authority.	P.Sum		100,000.00	100,000.00
2.23	A 420.15	Percentage adjustment to above Provisional Sum items 2.18, 2.19, 2.20, 2.21 & 2.22.	%	27		810,000.00
2.24	A 420.16	Allow for payment to RDA/PRDA/PS/LA for supervision and others.	P.Sum		60,000,000.00	60,000,000.00
2.25	A 420.17	Allow for payment to other authorities for supervision and others.	P.Sum		1,000,000.00	1,000,000.00
2.26	A 420.18	Percentage adjustment to above Provisional Sum items 2.24 & 2.25.	%	2		1,220,000.00
2.27	A 420.19	Allow provisional sum for payment to Dispute Board (50% only)	P.Sum		100,000.00	100,000.00
2.28	A 420.20	Allow for Price Escalation	P.Sum		138,000,000.00	138,000,000.00
2.29	A 420.21	Environmental Management plan, reports, and costs to satisfy all the requirements, as specified.	P.Sum			1,000,000.00
		Total of Page BOQ - 7 to Page BOQ - 8 Summary				**203,130,000.00**

"For References ONLY"
(Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

SUMMARY OF BILL NO.2

BILL NO. 2 : PROVISIONAL SUMS **ANURADHAPURA NWSP - PHASE II**

BOQ BILL NO.	PAGE TOTAL	TOTAL PRICE LKR
Bill No. 2	Page BOQ - 6 of Bill No.2	57,593,000.00
	Page BOQ - 7 of Bill No.2	203,130,000.00
	TOTAL OF BILL NO. 2 CARRIED TO GRAND SUMMARY	**260,723,000.00**

"For References ONLY"
(Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 3 : MISCELLANEOUS WORK ITEMS **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		NOTE: **Rates and Prices entered against BOQ items given hereunder shall be made in conjunction with Specifications, Drawings, General Requirements, Preamble to BOQ and Contractual requirements, not limited to the descriptions given in the captions.** ***If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Outside the Employer's Country", his Rates & Prices shall be quoted only in Column No. (a), (b), (d), (e), (f) & (h)** ***If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Within the Employer's Country", his Rates & Prices shall be quoted only in Column No. (c), (d), (g) & (h)**										
		CLASS B : GROUND INVESTIGATION										
		Trial pits										
3.1	B 13.1	Depth not exceeding 1.0m (Provisional Quantity)	nr	480	n/a	n/a	n/a		n/a	n/a	n/a	-
3.2	B 13.2	Depth 1.0m - 2.0m (Provisional Quantity)	nr	160	n/a	n/a	n/a		n/a	n/a	n/a	-
3.3	B 13.3	Depth 2.0m - 3.0m (Provisional Quantity)	nr	160	n/a	n/a	n/a		n/a	n/a	n/a	-
		CLASS D : DEMOLITION AND SITE CLEARING										
		General clearance										
3.4	D 900	Setting out for the whole of the Works	m	399650	n/a	n/a	n/a		n/a	n/a	n/a	-
		Trees										
		Cutting down of trees										
3.5	D 210	Girth 0.5m to 1.0m (measured 1m above ground level) (Provisional Quantity)	nr	240	n/a	n/a	n/a		n/a	n/a	n/a	-
3.6	D 220	Girth 1.0m to 2.0m (measured 1m above ground level) (Provisional Quantity)	nr	80	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 9 to Page BOQ - 12 Summary										-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 3 : MISCELLANEOUS WORK ITEMS **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS D : DEMOLITION AND SITE CLEARING (CONTD.)										
		Removal of stumps										
		(Note: Roots with diameter less than 500mm dia. Shall be Included to general clearance)										
3.7	D 321	Diameter 0.5m to 1.0m (measured 1m above ground level) (Provisional Quantity)	nr	30	n/a	n/a	n/a		n/a	n/a	n/a	-
		CLASS J : FITTINGS AND VALVES										
		Service Connections										
		Supply and installation of service connections including all connection pipes, electrofusion (EF) service tapping tees, elbows, EF couplings,temporary end caps and all other necessary items to complete the work.										
		Drawing No. ANP2/LC1/STD/TD/C/013										
3.8	J 900.1	20mm dia. service connections	nr	5950					-	-	-	-
3.9	J 900.2	25mm dia. service connections	nr	50					-	-	-	-
		Supply & handover to the Employer of;										
3.10	J 900.3	63mm dia HDPE PN 10 pipes	m	5000					-	-	-	-
3.11	J 900.4	20mm dia HDPE PN 10 pipes	m	20000					-	-	-	-
3.12	J 900.5	Vertical-type ½ inch (15mm dia) consumer watermeters	nr	20000					-	-	-	-
3.13	J 900.6	Lockable ½ inch threaded end ball valves	nr	20000					-	-	-	-
3.14	J 900.7	20mm dia PN10 HDPE/brass threaded adaptor fittings	nr	8000					-	-	-	-
		HDPE Electrofusion 20mm diameter service tapping tees										
3.15	J 900.8	225x20mm	nr	180					-	-	-	-
3.16	J 900.9	160x20mm	nr	420					-	-	-	-
3.17	J 900.10	110x20mm	nr	380					-	-	-	-
3.18	J 900.11	90x20mm	nr	820					-	-	-	-
3.19	J 900.12	63x20mm	nr	200					-	-	-	-
3.20	J 900.13	HDPE Electrofusion 20mm diameter couplings	nr	10000					-	-	-	-
3.21	J 900.14	HDPE Electrofusion 20mm diameter elbow	nr	2000					-	-	-	-
3.22	J 900.15	150mm square pre-cast reinforced concrete meter-mounting posts	nr	8000	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 10 to Page BOQ - 12 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 3 : MISCELLANEOUS WORK ITEMS **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPE WORK - SUPPORTS AND PROTECTION TO LAYING AND EXCAVATION										
		Extra over to pipelaying, for:										
3.23	L 111	Excavation in existing rock, as specified, to limits of pipe trench (Provisional Quantity).	m^3	6000	n/a	n/a	n/a		n/a	n/a	n/a	-
3.24	L 112	Excavation of mass concrete to the limits of pipe trench (Provisional Quantity).	m^3	10	n/a	n/a	n/a		n/a	n/a	n/a	-
3.25	L 113	Excavation of reinforced concrete to limits of pipe trench, exclusive of concrete surface which is covered under surface reinstatement (Provisional Quantity).	m^3	10	n/a	n/a	n/a		n/a	n/a	n/a	-
		Excavation in places where access is difficult. Rate shall include for excavation, backfilling, laying, earthwork supports and all to complete the pipework installation.										
3.26	L 114	Excavation in places where access is difficult as houses, shops, residences, pavements, gardens,paved floors and any areas which are difficult to access as directed by the Engineer (Provisional Quantity)	m^3	6000	n/a	n/a	n/a		n/a	n/a	n/a	-
3.27	L 119	Backfilling in pipe trenches with imported suitable backfill material at places where excavated material is unsuitable for backfilling	m^3	8000	n/a	n/a	n/a		n/a	n/a	n/a	-
		Horizontal drilling for construction of pipelines across RDA and PRDA road crossings (Where open trench excavation is not allowed by RDA)										
		Rate shall include for dewatering, upholding sides of excavation, pipe laying and all other items necessary to complete the work as specified and as directed by the Engineer.										
3.28	L 240.1	HDPE pipes of 160mm dia. and less (Provisional Quantity).	m	400	n/a	n/a	n/a		n/a	n/a	n/a	-
3.29	L 240.2	HDPE pipes of 225mm dia. (Provisional Quantity).	m	50	n/a	n/a	n/a		n/a	n/a	n/a	-
		Concrete Thrust Blocks										
3.30	L 700	Supply & place in-situ concrete thrust blocks and concrete anchor blocks Ref : ANP2/LC1/STD/TD/C/04 & 05	m^3	35	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 11 to Page BOQ - 12 Summary										-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

SUMMARY OF BILL NO.3

BILL NO. 3 : MISCELLANEOUS WORK ITEMS **ANURADHAPURA NWSP - PHASE II**

BOQ BILL NO.	PAGE TOTAL	TOTAL AMOUNT			
		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
		(e)	(f)	(g)	
		CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
		Yen	LKR	LKR	LKR
Bill No. 3	Page BOQ - 9 of Bill No.3	-	-	-	-
	Page BOQ - 10 of Bill No.3	-	-	-	-
	Page BOQ - 11 of Bill No.3	-	-	-	-
	TOTAL OF BILL NO. 3 CARRIED TO GRAND SUMMARY	**-**	**-**	-	**-**

"For References ONLY"
(Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		NOTE: Rates and Prices entered against BOQ items given hereunder shall be made in conjunction with Specifications, Drawings, General Requirements, Preamble to BOQ and Contractual requirements, not limited to the descriptions given in the captions. ***If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Outside the Employer's Country", his Rates & Prices shall be quoted only in Column No. (a), (b), (d), (e), (f) & (h)** ***If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Within the Employer's Country", his Rates & Prices shall be quoted only in Column No. (c), (d), (g) & (h)** **CLASS I : PIPE WORK - PIPES** **PIPE WORK IN RDA / PRDA ROAD RESERVE** **HDPE PE100 - SDR 17 - PN10 welded pipes as specified** **63mm HDPE pipes**										
4.1	I 712.1	pipe in trench, depth not exceeding 1.5m	m	25					-	-	-	-
		Total of Page BOQ - 13 to Page BOQ - 27 Summary							-	-		-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS I : PIPE WORK - PIPES (CONTD.)										
		90mm HDPE pipes										
4.2	I 712.2	pipe in trench, depth not exceeding 1.5m	m	6300					-	-	-	-
		110mm HDPE pipes										
4.3	I 712.3	pipe in trench, depth not exceeding 1.5m	m	1000					-	-	-	-
		160mm HDPE pipes										
4.4	I 712.4	pipe in trench, depth not exceeding 1.5m	m	400					-	-	-	-
		225mm HDPE pipes										
4.5	I 722.1	pipe in trench, depth not exceeding 1.5m	m	3010					-	-	-	-
4.6	I 723.1	pipe in trench, depth over 1.5m to 2.0m	m	600					-	-	-	-
4.7	I 724.1	pipe in trench, depth over 2.0m to 2.5m	m	100					-	-	-	-
		250mm HDPE pipes										
4.8	I 722.2	pipe in trench, depth not exceeding 1.5m	m	2300					-	-	-	-
4.9	I 723.2	pipe in trench, depth over 1.5m to 2.0m	m	500					-	-	-	-
4.10	I 724.2	pipe in trench, depth over 2.0m to 2.5m	m	70					-	-	-	-
		Total of Page BOQ - 14 to Page BOQ - 27 Summary										

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS I : PIPE WORK - PIPES (CONTD.)										
		280mm HDPE pipes										
4.11	I 722.3	pipe in trench, depth not exceeding 1.5m	m	50					-	-	-	-
4.12	I 723.3	pipe in trench, depth over 1.5m to 2.0m	m	10					-	-	-	-
		In Common trench										
		90mm HDPE pipes										
4.13	I 712.5	pipe in trench, depth not exceeding 1.5m	m	420					-	-	-	-
4.14	I 713.1	pipe in trench, depth over 1.5m to 2.0m	m	75					-	-	-	-
		280mm HDPE pipes										
4.15	I 722.4	pipe in trench, depth not exceeding 1.5m	m	420					-	-	-	-
4.16	I 723.4	pipe in trench, depth over 1.5m to 2.0m	m	75					-	-	-	-
		PIPE WORK IN LOCAL ROAD RESERVE										
		HDPE PE100 - SDR 17 - PN10 welded pipes as specified										
		63mm HDPE pipes										
4.17	I 712.6	pipe in trench, depth not exceeding 1.5m	m	5					-	-	-	-
		90mm HDPE pipes										
4.18	I 712.7	pipe in trench, depth not exceeding 1.5m	m	9520					-	-	-	-
		110mm HDPE pipes										
4.19	I 712.8	pipe in trench, depth not exceeding 1.5m	m	2010					-	-	-	-
		Total of Page BOQ - 15 to Page BOQ - 27 Summary							-	-		-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES										
		Extra over the above items for pipes for installation of fittings and valves										
		All HDPE Fittings shall be PE 100 - SDR 17 - for PN 10 pipes										
		HDPE PE100 PN 10 Bends										
		90mm dia.										
4.20	J 611.1	22 ^{0}	nr	10								
4.21	J 611.2	45 ^{0}	nr	5								
		110mm dia.										
4.22	J 611.3	22 ^{0}	nr	2								
		160mm dia.										
4.23	J611.4	22 ^{0}	nr	2								
		225mm dia.										
4.24	J 612.1	22 ^{0}	nr	10								
4.25	J 612.2	45 ^{0}	nr	2								
		250mm dia.										
4.26	J 612.3	22 ^{0}	nr	3								
		HDPE PE100 PN 10 plain ended Level Invert Tees										
4.27	J 621.1	90mm x 90mm dia.	nr	8								
4.28	J 621.2	110mm x 90mm dia.	nr	1								
4.29	J 621.3	160mm x90mm dia.	nr	2								
4.30	J 622.1	225mm x 90mm dia.	nr	9								
4.31	J 622.2	250mm x 90mm dia.	nr	6								
4.32	J 622.3	280mm x 90mm dia.	nr	2								
		Total of Page BOQ - 16 to Page BOQ - 27 Summary										

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES (CONTD.)										
		HDPE PE100 PN 10 plain ended Tees										
4.33	J 621.4	90x63mm dia.	nr	30								
4.34	J 621.5	90x90mm dia.	nr	12								
4.35	J 621.6	110x63mm dia.	nr	7								
4.36	J 621.7	110x90mm dia.	nr	2								
4.37	J 621.8	110x110mm dia.	nr	3								
4.38	J 621.9	160x90mm dia.	nr	2								
4.39	J 622.4	225x63mm dia.	nr	5								
4.40	J 622.5	225x90mm dia.	nr	9								
4.41	J 622.6	250x63mm dia.	nr	10								
4.42	J 622.7	250x90mm dia.	nr	3								
4.43	J 622.8	250x110mm dia.	nr	2								
4.44	J 622.9	280x90mm dia.	nr	3								
		HDPE PE100 PN 10 plain ended Reducers										
4.45	J 631.1	90-63mm dia.	nr	4								
4.46	J 631.2	110-63mm dia.	nr	2								
4.47	J 631.3	110-90mm dia.	nr	2								
4.48	J 631.4	160-110mm dia.	nr	2								
4.49	J 632.1	225-160mm dia.	nr	2								
4.50	J 632.2	250-225mm dia.	nr	2								
4.51	J 632.3	280-250mm dia.	nr	2								
		Total of Page BOQ - 17 to Page BOQ - 27 Summary										

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES (CONTD.)										
		HDPE PE100 PN 10 End Caps										
4.52	J 691.1	63mm dia.	nr	60					-	-	-	-
4.53	J 691.2	90mm dia.	nr	40					-	-	-	-
4.54	J 691.3	110mm dia.	nr	5					-	-	-	-
		DI double socket Tees, with flanged branch PN10/16										
4.55	J 321.1	80x80mm dia.	nr	9					-	-	-	-
4.56	J 321.2	100x80mm dia.	nr	5					-	-	-	-
4.57	J 322.1	200x80mm dia.	nr	8					-	-	-	-
4.58	J 322.2	250x80mm dia.	nr	6					-	-	-	-
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES										
		Valve Chambers										
		Rate to include extra over above items for pipelaying, for supply and installation of Valves, Flange Adaptor, couplings, flanged straight specials, pipe cutting, RC chamber, 600mm dia. heavy duty DI Class D-400 hinged type manhole cover, and all other items to complete as shown in the drawings.										
		Ref dwg no: ANP2/LC1/STD/TD/C/033										
4.59	K 232.1	80mm dia. PN10 Gate Valve Chamber	nr	9					-	-	-	-
4.60	K 232.2	100mm dia. PN10 Gate Valve Chamber	nr	3					-	-	-	-
4.61	K 232.3	150mm dia. PN10 Gate Valve Chamber	nr	1					-	-	-	-
4.62	K 232.4	200mm dia. PN10 Gate Valve Chamber	nr	4					-	-	-	-
		Total of Page BOQ - 18 to Page BOQ - 27 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Air Valve Chambers (exclusive of above-ground bridge air valves)										
		Rate to include for supply and installation of isolation Gate valve, Air Valve as specified, flanged straight specials, blank flanges, tappings, RC chamber, ventilation pipes, ventilated type heavy duty DI Class D-400 hinged type DI access cover, and all appurtenances to complete as shown in the drawings. The tee is included under the item for tees.										
		Ref drawing No: ANP2/LC1/STD/TD/C/031										
4.63	K 232.5	50mm dia. single orifice air valve (Type A)	nr	14					-	-	-	-
4.64	K 232.6	80mm dia. double orifice air valve (Type B)	nr	5					-	-	-	-
		Washout Valve Arrangements										
		Rate to include for supply and installation of Gate valve, Flange Adaptor, flanged straight specials, HDPE fittings, RC chamber, ventilated type heavy duty DI Class D-400 hinged type access cover, or DI Surface Box and concrete surround as detailed, washout outlet pipe, and all appurtencances to complete as shown in the drawings (excluding washout tee, which is covered under tees)										
		Ref drawing No: ANP2/LC1/STD/TD/C/034										
4.65	K 232.7	80 mm dia. washout	nr	25					-	-	-	-
		Total of Page BOQ - 19 to Page BOQ - 27 Summary							-	-		-

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Outlet Arrangements										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/034										
4.66	K 232.8	Type 'A'	nr	25	n/a	n/a	n/a		n/a	n/a	n/a	-
		Gate Valve and Surface Boxes, as detailed										
		Rate to include extra over the above items for pipelaying, for supply and installation of Gate valve, spindle cap, Flange Adaptor, flanged straight specials, 150x150mm DI Surface Box, concrete surface surround, riser pipe, foundation for riser, and all items to complete as shown in the drawings.										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/038										
4.67	K 272.1	80mm dia. flanged gate valve	nr	9					-	-	-	-
4.68	K 272.2	50mm dia. flanged gate valve	nr	9					-	-	-	-
		Total of Page BOQ - 20 to Page BOQ - 27 Summary							-	-		-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		CULVERT CROSSINGS										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction for all necessary pipes, fittings, couplings, concrete or steel sleeve protection, and all other items to complete as shown in the drawings.										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037										
		Culvert Crossing Type 'D', only for culvert pipes or box culverts greater than 450mm width or diameter and 450mm height, as specified and shown on the Drawings, for:										
		For pipelines crossing Box culverts or culvert pipes over 450mm width/dia. but less than 900mm width, for:										
4.69	K 671.1	280mm dia. PN10 HDPE pipe and 90 mm dia. PN10 HDPE	nr	1						-		-
4.70	K 671.2	225mm dia. PN10 HDPE pipe	nr	4						-		-
4.71	K 671.3	110mm dia. PN10 HDPE pipe	nr	3						-		-
4.72	K 671.4	90mm dia. PN10 HDPE pipe	nr	4						-		-
		For pipelines crossing Box culverts or culvert pipes over 900mm width/dia. but less than 1500mm width, for:										
4.73	K 671.5	250mm dia. PN10 HDPE pipe	nr	4						-		-
4.74	K 671.6	90mm dia. PN10 HDPE pipe	nr	6						-		-
		Total of Page BOQ - 21 to Page BOQ - 27 Summary								-		-

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		For pipelines crossing Box culverts or culvert pipes over 1500mm width/dia. but less than 2000mm width, for:										
4.75	K 671.7	250mm dia. PN10 HDPE pipe	nr	3					-	-	-	-
4.76	K 671.8	225mm dia. PN10 HDPE pipe	nr	5					-	-	-	-
4.77	K 671.9	90mm dia. PN10 HDPE pipe	nr	7					-	-	-	-
		For pipelines crossing Box culverts or culvert pipes over 2000mm width/dia. (measure total length), for:										
4.78	K 671.10	225mm dia. PN10 HDPE pipe	m	4					-	-	-	-
4.79	K 671.11	90mm dia. PN10 HDPE pipe	m	4					-	-	-	-
		Culvert Crossing Type 'E'										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037 & ANP2/LC1/STD/TD/C/012										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction of bridge crossings, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, couplings, flange stub connectors, HDPE welds, flanged pipe specials, concrete supports and foundations, piles, steel brackets, and all other items to complete the self-supporting pipe-bridges as shown in the drawings, for:										
4.80	K 631.1	DN150 PN10 DI pipes, 8 to 10m pipe-bridge at Ch.7200	nr	1					-	-	-	-
4.81	K 621.1	DN200 PN10 DI pipes, 10 to 12m pipe-bridge at Ch.5880	nr	1					-	-	-	-
4.82	K 631.2	DN200 PN10 DI pipes, 8 to 10m pipe-bridge at Ch.6720	nr	1					-	-	-	-
		Total of Page BOQ - 22 to Page BOQ - 27 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Extra over to HDPE pipelaying, for reinstatement of:										
		Breaking up Temporary Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
4.83	K 711.1	HDPE up to and including 160mm dia.	m	40	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
4.84	K 791.1	HDPE up to and including 160mm dia.	m	40	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of Local Gravel Roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
4.85	K 731.1	HDPE up to and including 280mm dia.	m	160	n/a	n/a	n/a		n/a	n/a	n/a	-
		Reinstatement of Concrete Surfaces										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
4.86	K 731.2	HDPE up to and including 280mm dia. (Provisional Quantity)	m	5	n/a	n/a	n/a		n/a	n/a	n/a	-
4.87	K 731.3	Reinstatement of Pavings Surfaces (Provisional Quantity)	m^2	5	n/a	n/a	n/a		n/a	n/a	n/a	-
4.88	K 820	Supply and fixing marker posts as per Dwg.No. ANP2/LC1/STD/TD/C/001	nr	79	n/a	n/a	n/a		n/a	n/a	n/a	-
4.89	K 900.1	Supply and laying of marker tape Ref. drawing no. ANP2/LC1/STD/TD/C/002	m	26890					-	-	-	-
		Total of Page BOQ - 23 to Page BOQ - 27 Summary							-	-		-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Testing										
		Pressure Testing of pipelines, of:										
4.90	K 900.2	280mm dia. PN10	m	555	n/a	n/a	n/a		n/a	n/a	n/a	-
4.91	K 900.3	250mm dia. PN10	m	2870	n/a	n/a	n/a		n/a	n/a	n/a	-
4.92	K 900.4	225mm dia. PN10	m	3710	n/a	n/a	n/a		n/a	n/a	n/a	-
4.93	K 900.5	160mm dia. PN10	m	400	n/a	n/a	n/a		n/a	n/a	n/a	-
4.94	K 900.6	110mm dia. PN10	m	3010	n/a	n/a	n/a		n/a	n/a	n/a	-
4.95	K 900.7	90mm dia. PN10	m	16315	n/a	n/a	n/a		n/a	n/a	n/a	-
4.96	K 900.8	63mm dia. PN10	m	30	n/a	n/a	n/a		n/a	n/a	n/a	-
		Cleaning and Flushing for pipelines of:										
4.97	K 900.9	280mm dia. PN10	m	555	n/a	n/a	n/a		n/a	n/a	n/a	-
4.98	K 900.10	250mm dia. PN10	m	2870	n/a	n/a	n/a		n/a	n/a	n/a	-
4.99	K 900.11	225mm dia. PN10	m	3710	n/a	n/a	n/a		n/a	n/a	n/a	-
4.100	K 900.12	160mm dia. PN10	m	400	n/a	n/a	n/a		n/a	n/a	n/a	-
4.101	K 900.13	110mm dia. PN10	m	3010	n/a	n/a	n/a		n/a	n/a	n/a	-
4.102	K 900.14	90mm dia. PN10	m	16315	n/a	n/a	n/a		n/a	n/a	n/a	-
4.103	K 900.15	63mm dia. PN10	m	30	n/a	n/a	n/a		n/a	n/a	n/a	-
		Disinfection for pipelines of:										
4.104	K 900.16	280mm dia. PN10	m	555	n/a	n/a	n/a		n/a	n/a	n/a	-
4.105	K 900.17	250mm dia. PN10	m	2870	n/a	n/a	n/a		n/a	n/a	n/a	-
4.106	K 900.18	225mm dia. PN10	m	3710	n/a	n/a	n/a		n/a	n/a	n/a	-
4.107	K 900.19	160mm dia. PN10	m	400	n/a	n/a	n/a		n/a	n/a	n/a	-
4.108	K 900.20	110mm dia. PN10	m	3010	n/a	n/a	n/a		n/a	n/a	n/a	-
4.109	K 900.21	90mm dia. PN10	m	16315	n/a	n/a	n/a		n/a	n/a	n/a	-
4.110	K 900.22	63mm dia. PN10	m	30	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 24 to Page BOQ - 27 Summary							-	-		-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION										
		Extra over to pipelaying, for construction of pipelines across RDA and PRDA road Crossings, including special backfilling material and disposal of excavated material, (except for those crossings where RCP conduit has already been provided for installation of pipes), for:										
4.111	L 240.1	HDPE pipes of 110mm dia. and less	m	40					-	-	-	-
		Pipe Bedding										
		Ref : ANP2/LC1/STD/TD/C/003										
		Extra over to pipelaying for the supply and placement of 100mm Sand bedding, as shown, for DI / HDPE pipes in trench, for:										
4.112	L 311	HDPE pipes not exceeding 160mm dia.	m	19755	n/a	n/a	n/a		n/a	n/a	n/a	-
4.113	L 312.1	HDPE pipes 225mm, 250mm and 280mm dia.	m	6640	n/a	n/a	n/a		n/a	n/a	n/a	-
4.114	L 312.2	HDPE pipes not exceeding 280mm dia. in common trench	m	495	n/a	n/a	n/a		n/a	n/a	n/a	-
4.115	L 310	Extra over to pipelaying and normal bedding construction, for the provision of 200mm thick sand bedding for pipelines requiring Type B construction (in rock)	m^3	10	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 25 to Page BOQ - 27 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION (CONTD.)										
		Pipe Surround Backfilling										
		Placement of Pipe Surround backfilling, as shown, with suitable selected excavated material for DI / HDPE pipes in trench:										
4.116	L 521	HDPE pipes not exceeding 160mm dia.	m	19755	n/a	n/a	n/a		n/a	n/a	n/a	-
4.117	L 522.1	HDPE pipes 225mm, 250mm and 280mm dia.	m	6640	n/a	n/a	n/a		n/a	n/a	n/a	-
4.118	L 522.2	HDPE pipes not exceeding 280mm dia. in common trench	m	495	n/a	n/a	n/a		n/a	n/a	n/a	-
4.119	L 540	Extra over pipe surround backfilling, for supply and placement of concrete slab covers protection for HDPE pipes, where shown	m^2	40	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 26 to Page BOQ - 27 Summary							-	-		-

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

SUMMARY OF BILL NO.4

BILL NO. 4 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA **ANURADHAPURA NWSP - PHASE II**

BOQ BILL NO.	PAGE TOTAL	TOTAL AMOUNT			
		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
		(e)	(f)	(g)	(h)
		CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
		Yen	LKR	LKR	LKR
Bill No. 4	Page BOQ - 13 of Bill No.4	-	-	-	-
	Page BOQ - 14 of Bill No.4	-	-	-	-
	Page BOQ - 15 of Bill No.4	-	-	-	-
	Page BOQ - 16 of Bill No.4	-	-	-	-
	Page BOQ - 17 of Bill No.4	-	-	-	-
	Page BOQ - 18 of Bill No.4	-	-	-	-
	Page BOQ - 19 of Bill No.4	-	-	-	-
	Page BOQ - 20 of Bill No.4	-	-	-	-
	Page BOQ - 21 of Bill No.4	-	-	-	-
	Page BOQ - 22 of Bill No.4	-	-	-	-
	Page BOQ - 23 of Bill No.4	-	-	-	-
	Page BOQ - 24 of Bill No.4	-	-	-	-
	Page BOQ - 25 of Bill No.4	-	-	-	-
	Page BOQ - 26 of Bill No.4	-	-	-	-
	TOTAL OF BILL NO. 4 CARRIED TO GRAND SUMMARY	-	-	-	-

"For References ONLY"
(Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 5 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAMBILIWEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		NOTE: Rates and Prices entered against BOQ items given hereunder shall be made in conjunction with Specifications, Drawings, General Requirements, Preamble to BOQ and Contractual requirements, not limited to the descriptions given in the captions. ***If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Outside the Employer's Country", his Rates & Prices shall be quoted only in Column No. (a), (b), (d), (e), (f) & (h)** ***If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Within the Employer's Country", his Rates & Prices shall be quoted only in Column No. (c), (d), (g) & (h)**										
		CLASS I : PIPE WORK - PIPES										
		PIPE WORK IN LOCAL ROAD RESERVE										
		HDPE PE100 - SDR 17 - PN10 welded pipes as specified										
		63mm HDPE pipes										
5.1	I 712.1	pipe in trench, depth not exceeding 1.5m	m	1560					-	-		-
		90mm HDPE pipes										
5.2	I 712.2	pipe in trench, depth not exceeding 1.5m	m	7880					-	-		-
		110mm HDPE pipes										
5.3	I 712.3	pipe in trench, depth not exceeding 1.5m	m	340					-	-		-
		Total of Page BOQ - 28 to Page BOQ - 34 Summary							**-**	**-**		**-**

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 5 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAMBILIWEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES										
		Extra over the above items for pipes for installation of fittings and valves										
		All HDPE Fittings shall be PE 100 - SDR 17 - for PN 10 pipes										
		HDPE PE100 PN10 plain ended Level Invert Tees										
5.4	J 621.1	63mm x 63mm dia.	nr	2					-	-		-
5.5	J 621.2	90mm x 90mm dia.	nr	2					-	-		-
		HDPE PE100 PN10 plain ended Tees										
5.6	J 621.3	63x63mm dia.	nr	2					-	-		-
5.7	J 621.4	90x63mm dia.	nr	10					-	-		-
5.8	J 621.5	90x90mm dia.	nr	7					-	-		-
5.9	J 621.6	110x90mm dia.	nr	3					-	-		-
		HDPE PE100 PN10 plain ended Reducers										
5.10	J 631.1	90-63mm dia.	nr	5					-	-		-
5.11	J 631.2	110-90mm dia.	nr	2					-	-		-
		HDPE PE100 PN10 End Caps										
5.12	J 691.1	63mm dia.	nr	15					-	-		-
5.13	J 691.2	90mm dia.	nr	10					-	-		-
		DI double socket Tees, with flanged branch PN10/16										
5.14	J 321.1	80x80mm dia.	nr	3					-	-		-
		Total of Page BOQ - 29 to Page BOQ - 34 Summary							**-**	**-**		**-**

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 5 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAMBILIWEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES										
		Air Valve Chambers (exclusive of above-ground bridge air valves)										
		Rate to include for supply and installation of isolation Gate valve, Air Valve as specified, flanged straight specials, blank flanges, tappings, RC chamber, ventilation pipes, ventilated type heavy duty DI Class D-400 hinged type DI access cover, and all appurtenances to complete as shown in the drawings. The tee is included under the item for tees.										
		Ref drawing No: ANP2/LC1/STD/TD/C/031										
5.15	K 232.1	50mm dia. single orifice air valve (Type A)	nr	3					-	-		-
		Washout Valve Arrangements										
		Rate to include for supply and installation of Gate valve, Flange Adaptor, flanged straight specials, HDPE fittings, RC chamber, ventilated type heavy duty DI Class D-400 hinged type access cover, or DI Surface Box and concrete surround as detailed, washout outlet pipe, and all appurtencances to complete as shown in the drawings (excluding washout tee, which is covered under tees)										
		Ref drawing No: ANP2/LC1/STD/TD/C/034										
5.16	K 232.2	50 mm dia. washout	nr	2					-	-		-
5.17	K 232.3	80 mm dia. washout	nr	2					-	-		-
		Outlet Arrangements										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/034										
5.18	K 232.4	Type 'A'	nr	4	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 30 to Page BOQ - 34 Summary							-	-		-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 5 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAMBILIWEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Gate Valve and Surface Boxes, as detailed										
		Rate to include extra over the above items for pipelaying, for supply and installation of Gate valve, spindle cap, Flange Adaptor, flanged straight specials, 150x150mm DI Surface Box, concrete surface surround, riser pipe, foundation for riser, and all items to complete as shown in the drawings.										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/038										
5.19	K 272	80mm dia. flanged gate valve	nr	10					-	-		-
		CULVERT CROSSINGS										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction for all necessary pipes, fittings, couplings, concrete or steel sleeve protection, and all other items to complete as shown in the drawings.										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037										
		Culvert Crossing Type 'D', only for culvert pipes or box culverts greater than 450mm width or diameter and 450mm height, as specified and shown on the Drawings, for:										
		For pipelines crossing Box culverts or culvert pipes over 450mm width/dia. but less than 900mm width, for:										
5.20	K 671.1	63mm dia. PN10 HDPE pipe	nr	3					-	-		-
5.21	K 671.2	90mm dia. PN10 HDPE pipe	nr	2					-	-		-
		For pipelines crossing Box culverts or culvert pipes over 900mm width/dia. but less than 1500mm width, for:										
5.22	K 671.3	63mm dia. PN10 HDPE pipe	nr	1					-	-		-
		Total of Page BOQ - 31 to Page BOQ - 34 Summary							**-**	**-**		**-**

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 5 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAMBILIWEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		For pipelines crossing Box culverts or culvert pipes over 1500mm width/dia. but less than 2000mm width, for:										
5.23	K 671.4	63mm dia. PN10 HDPE pipe	nr	1					-	-		-
		Extra over to HDPE pipelaying, for reinstatement of:										
		Permanent Reinstatement of Local Gravel Roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/02										
5.24	K 731.1	HDPE up to and including 110mm dia.	m	72	n/a	n/a	n/a		n/a	n/a	n/a	-
5.25	K 731.2	Reinstatement of Pavings Surfaces (Provisional Quantity)	m^2	1	n/a	n/a	n/a		n/a	n/a	n/a	-
		Other Pipework Ancillaries										
5.26	K 820	Supply and fixing marker posts as per Dwg.No. ANP2/LC1/STD/TD/C/001	nr	8	n/a	n/a	n/a		n/a	n/a	n/a	-
5.27	K 900.1	Supply and laying of marker tape Ref. drawing no. ANP2/LC1/STD/TD/C/002	m	9780					-	-		-
		Testing										
		Pressure Testing of HDPE pipelines, of										
5.28	K 900.2	110mm dia. PN10	m	340	n/a	n/a	n/a		n/a	n/a	n/a	-
5.29	K 900.3	90mm dia. PN10	m	7880	n/a	n/a	n/a		n/a	n/a	n/a	-
5.30	K 900.4	63mm dia. PN10	m	1560	n/a	n/a	n/a		n/a	n/a	n/a	-
		Cleaning and Flushing for pipelines of:										
5.31	K 900.5	110mm dia. PN10	m	340	n/a	n/a	n/a		n/a	n/a	n/a	-
5.32	K 900.6	90mm dia. PN10	m	7880	n/a	n/a	n/a		n/a	n/a	n/a	-
5.33	K 900.7	63mm dia. PN10	m	1560	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 32 to Page BOQ - 34 Summary							-	-		-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 5 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAMBILIWEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Disinfection for pipelines of:										
5.34	K 900.9	110mm dia. PN10	m	340	n/a	n/a	n/a		n/a	n/a	n/a	-
5.35	K 900.10	90mm dia. PN10	m	7880	n/a	n/a	n/a		n/a	n/a	n/a	-
5.36	K 900.11	63mm dia. PN10	m	1560	n/a	n/a	n/a		n/a	n/a	n/a	-
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION										
		Pipe Bedding										
		Ref : ANP2/LC1/STD/TD/C/003										
		Extra over to pipelaying for the supply and placement of 100mm Sand bedding, as shown, for DI / HDPE pipes in trench, for:										
5.37	L 310	HDPE pipes not exceeding 110mm dia.	m	9780	n/a	n/a	n/a		n/a	n/a	n/a	-
		Pipe Surround Backfilling										
		Placement of Pipe Surround backfilling, as shown, with suitable selected excavated material for DI / HDPE pipes in trench:										
5.38	L 520	HDPE pipes not exceeding 110mm dia.	m	9780	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 33 to Page BOQ - 34 Summary							-	-		-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

SUMMARY OF BILL NO.5

BILL NO. 05 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAMBILIWEWA

ANURADHAPURA NWSP - PHASE II

BOQ BILL NO.	PAGE TOTAL	TOTAL AMOUNT			
		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
		(e)	(f)	(g)	(h)
		CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
		Yen	LKR	LKR	LKR
BILL NO. 05	Page BOQ - 28 of Bill No.5	-	-	-	-
	Page BOQ - 29 of Bill No.5	-	-	-	-
	Page BOQ - 30 of Bill No.5	-	-	-	-
	Page BOQ - 31 of Bill No.5	-	-	-	-
	Page BOQ - 32 of Bill No.5	-	-	-	-
	Page BOQ - 33 of Bill No.5	-	-	-	-
	TOTAL OF BILL NO. 5 CARRIED TO GRAND SUMMARY	-	-	-	-

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		NOTE: Rates and Prices entered against BOQ items given hereunder shall be made in conjunction with Specifications, Drawings, General Requirements, Preamble to BOQ and Contractual requirements, not limited to the descriptions given in the captions. *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Outside the Employer's Country", his Rates & Prices shall be quoted only in Column No. (a), (b), (d), (e), (f) & (h) *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Within the Employer's Country", his Rates & Prices shall be quoted only in Column No. (c), (d), (g) & (h) CLASS I : PIPE WORK - PIPES PIPE WORK IN RDA / PRDA ROAD RESERVE HDPE PE100 - SDR 17 - PN10 welded pipes as specified 63mm HDPE pipes										
6.1	I 712.1	pipe in trench, depth not exceeding 1.5m	m	2120						-	-	-
6.2	I 713.1	pipe in trench, depth over 1.5m to 2.0m	m	1000						-	-	-
		Total of Page BOQ - 35 to Page BOQ - 58 Summary								-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS I : PIPE WORK - PIPES (CONTD.)										
		90mm HDPE pipes										
6.3	I 712.2	pipe in trench, depth not exceeding 1.5m	m	21800								
6.4	I 713.2	pipe in trench, depth over 1.5m to 2.0m	m	1850								
		110mm HDPE pipes										
6.5	I 712.3	pipe in trench, depth not exceeding 1.5m	m	6600								
6.6	I 713.3	pipe in trench, depth over 1.5m to 2.0m	m	250								
		160mm HDPE pipes										
6.7	I 712.4	pipe in trench, depth not exceeding 1.5m	m	20000								
6.8	I 713.4	pipe in trench, depth over 1.5m to 2.0m	m	2400								
		225mm HDPE pipes										
6.9	I 722.1	pipe in trench, depth not exceeding 1.5m	m	7650								
6.10	I 723.1	pipe in trench, depth over 1.5m to 2.0m	m	1600								
		280mm HDPE pipes										
6.11	I 722.2	pipe in trench, depth not exceeding 1.5m	m	1400								
6.12	I 723.2	pipe in trench, depth over 1.5m to 2.0m	m	630								
		In Common trench										
		90mm HDPE pipes										
6.13	I 712.5	pipe in trench, depth not exceeding 1.5m	m	1810								
6.14	I 713.5	pipe in trench, depth over 1.5m to 2.0m	m	60								
		280mm HDPE pipes										
6.15	I 722.3	pipe in trench, depth not exceeding 1.5m	m	1810								
6.16	I 723.2	pipe in trench, depth over 1.5m to 2.0m	m	60								
		Total of Page BOQ - 36 to Page BOQ - 58 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS I : PIPE WORK - PIPES (CONTD.)										
		PIPE WORK IN LOCAL ROAD RESERVE										
		HDPE PE100 - SDR 17 - PN10 welded pipes as specified										
		63mm HDPE pipes										
6.17	I 712.6	pipe in trench, depth not exceeding 1.5m	m	23545						-		-
6.18	I 713.6	pipe in trench, depth over 1.5m to 2.0m	m	750						-		-
		90mm HDPE pipes										
6.19	I 712.7	pipe in trench, depth not exceeding 1.5m	m	32530						-		-
6.20	I 713.7	pipe in trench, depth over 1.5m to 2.0m	m	440						-		-
		110mm HDPE pipes										
6.21	I 712.8	pipe in trench, depth not exceeding 1.5m	m	10770						-		-
6.22	I 713.8	pipe in trench, depth over 1.5m to 2.0m	m	340						-		-
		160mm HDPE pipes										
6.23	I 712.9	pipe in trench, depth not exceeding 1.5m	m	4100						-		-
6.24	I 713.9	pipe in trench, depth over 1.5m to 2.0m	m	340						-		-
		Total of Page BOQ - 37 to Page BOQ - 58 Summary								-		-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES										
		Extra over the above items for pipes for installation of fittings and valves										
		All HDPE Fittings shall be PE 100 - SDR 17 - for PN 10 pipes										
		HDPE PE100 PN10 Bends										
		90mm dia.										
6.25	J 611.1	22 ^{0}	nr	45								
6.26	J 611.2	45 ^{0}	nr	66								
6.27	J 611.3	90 ^{0}	nr	2								
		110mm dia.										
6.28	J 611.4	22 ^{0}	nr	25								
6.29	J 611.5	45 ^{0}	nr	15								
		160mm dia.										
6.30	J 611.6	22 ^{0}	nr	30								
6.31	J 611.7	45 ^{0}	nr	29								
		225mm dia.										
6.32	J 612.1	22 ^{0}	nr	8								
6.33	J 613.2	45 ^{0}	nr	5								
		Total of Page BOQ - 38 to Page BOQ - 58 Summary										

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES (CONTD.)										
		HDPE PE100 PN10 plain ended Level Invert Tees										
6.34	J 621.1	63mm x 63mm dia.	nr	15								
6.35	J 621.2	90mm x 90mm dia.	nr	28								
6.36	J 621.3	110mm x 90mm dia.	nr	10								
6.37	J 621.4	160mm x90mm dia.	nr	27								
6.38	J 622.1	225mm x90mm dia.	nr	13								
6.39	J 622.2	280mm x90mm dia.	nr	5								
		HDPE PE100 PN10 plain ended Tees										
6.40	J 621.5	63x63mm dia.	nr	20								
6.41	J 621.6	90x63mm dia.	nr	130								
6.42	J 621.7	90x90mm dia.	nr	37								
6.43	J 621.8	110x63mm dia.	nr	44								
6.44	J 621.9	110x90mm dia.	nr	10								
6.45	J 621.10	110x110mm dia.	nr	5								
6.46	J 621.11	160x63mm dia.	nr	62								
6.47	J 621.12	160x90mm dia.	nr	26								
6.48	J 621.13	160x110mm dia.	nr	2								
6.49	J 621.14	160x160mm dia.	nr	7								
6.50	J 622.3	225x63mm dia.	nr	15								
6.51	J 622.4	225x90mm dia.	nr	6								
6.52	J 622.5	225x110mm dia.	nr	4								
6.53	J 622.6	225x160mm dia.	nr	7								
6.54	J 622.7	280x90mm dia.	nr	2								
6.55	J 622.8	280x110mm dia.	nr	1								
		Total of Page BOQ - 39 to Page BOQ - 58 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES (CONTD.)										
		HDPE PE100 PN10 plain ended Reducers										
6.56	J 631.1	90-63mm dia.	nr	29								
6.57	J 631.2	110-63mm dia.	nr	2								
6.58	J 631.3	110-90mm dia.	nr	14								
6.59	J 631.4	160-63mm dia.	nr	2								
6.60	J 631.5	160-90mm dia.	nr	6								
6.61	J 631.6	160-110mm dia.	nr	13								
6.62	J 632.1	225-90mm dia.	nr	2								
6.63	J 632.2	225-160mm dia.	nr	2								
6.64	J 632.3	280-225mm dia.	nr	1								
		HDPE PE100 PN10 End Caps										
6.65	J 691.1	63mm dia.	nr	340								
6.66	J 691.2	90mm dia.	nr	50								
6.67	J 691.3	110mm dia.	nr	4								
6.68	J 691.4	160mm dia.	nr	3								
		DI double socket Tees, with flanged branch PN10/16										
6.69	J 321.1	50x25mm dia.	nr	5								
6.70	J 321.2	80x80mm dia.	nr	30								
6.71	J 321.3	100x80mm dia.	nr	6								
6.72	J 321.4	150x80mm dia.	nr	20								
6.73	J 322.1	200x80mm dia.	nr	12								
6.74	J 322.2	250x80mm dia.	nr	5								
		Total of Page BOQ - 40 to Page BOQ - 58 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES										
		Valve Chambers										
		Rate to include extra over above items for pipelaying, for supply and installation of Valves, Flange Adaptor, couplings, flanged straight specials, pipe cutting, RC chamber, 600mm dia. heavy duty DI Class D-400 hinged type manhole cover, and all other items to complete as shown in the drawings.										
		Ref dwg no: ANP2/LC1/STD/TD/C/033										
6.75	K 232.1	80mm dia. PN10 Gate Valve Chamber	nr	23								
6.76	K 232.2	100mm dia. PN10 Gate Valve Chamber	nr	17								
6.77	K 232.3	150mm dia. PN10 Gate Valve Chamber	nr	28								
6.78	K 232.4	200mm dia. PN10 Gate Valve Chamber	nr	7								
6.79	K 232.5	250mm dia. PN10 Gate Valve Chamber	nr	2								
		Total of Page BOQ - 41 to Page BOQ - 58 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Air Valve Chambers (exclusive of above-ground bridge air valves)										
		Rate to include for supply and installation of isolation Gate valve, Air Valve as specified, flanged straight specials, blank flanges, tappings, RC chamber, ventilation pipes, ventilated type heavy duty DI Class D-400 hinged type DI access cover, and all appurtenances to complete as shown in the drawings. The tee is included under the item for tees.										
		Ref drawing No: ANP2/LC1/STD/TD/C/031										
6.80	K 232.6	25mm dia. single orifice air valve (Type A)	nr	5					-	-		-
6.81	K 232.7	50mm dia. single orifice air valve (Type A)	nr	66					-	-		-
6.82	K 232.8	80mm dia. double orifice air valve (Type B)	nr	4					-	-		-
		Type C , offset to the side of te main pipeline air valves which are offset to the side of the main pipeline (Provisional Quantity) for:										
6.83	K 232.9	50mm dia. single orifice air valve	nr	1					-	-		-
6.84	K 232.10	80mm dia. double orifice air valve	nr	1					-	-		-
		Total of Page BOQ - 42 to Page BOQ - 58 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Washout Valve Arrangements										
		Rate to include for supply and installation of Gate valve, Flange Adaptor, flanged straight specials, HDPE fittings, RC chamber, ventilated type heavy duty DI Class D-400 hinged type access cover, or DI Surface Box and concrete surround as detailed, washout outlet pipe, and all appurtencances to complete as shown in the drawings (excluding washout tee, which is covered under tees)										
		Ref drawing No: ANP2/LC1/STD/TD/C/034										
6.85	K 232.11	50 mm dia. washout	nr	6								-
6.86	K 232.12	80 mm dia. washout	nr	81								-
		Outlet Arrangements										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/034										
6.87	K 232.13	Type 'A'	nr	87	n/a	n/a	n/a		n/a	n/a	n/a	-
6.87.1	K 232.14	Manholes for Washouts (Provisional Quantity)	nr	5								-
		Total of Page BOQ - 43 to Page BOQ - 58 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Gate Valve and Surface Boxes, as detailed										
		Rate to include extra over the above items for pipelaying, for supply and installation of Gate valve, spindle cap, Flange Adaptor, flanged straight specials, 150x150mm DI Surface Box, concrete surface surround, riser pipe, foundation for riser, and all items to complete as shown in the drawings.										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/038										
6.88	K 272.1	80mm dia. flanged gate valve	nr	40					-	-	-	-
6.89	K 272.2	50mm dia. flanged gate valve	nr	32					-	-	-	-
		Fire Hydrants										
		Rate to include for supply and installation of fire hydrant,flanged connections,Flange Adaptor, flanged straight specials, HDPE fittings,stub connectors,steel backing rings, ,double flanged duckfoot bends, flowmeter, gate valve, RC chamber, ventilated type heavy duty DI Class D-400 hinged type access cover, or DI Surface Box and concrete surround as detailed, double flanged riser pipe, and all appurtencances to complete as shown in the drawings (excluding plainended tee, which is covered under tees)										
		Ref drawing No: ANP2/LC1/STD/TD/C/030										
6.90	K 232.14	150mm dia. Fire Hydrants	nr	2					-	-	-	-
		Total of Page BOQ - 44 to Page BOQ - 58 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		CULVERT CROSSINGS										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction for all necessary pipes, fittings, couplings, concrete or steel sleeve protection, and all other items to complete as shown in the drawings.										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037										
		Culvert Crossing Type 'D', only for culvert pipes or box culverts greater than 450mm width or diameter and 450mm height, as specified and shown on the Drawings, for:										
		For pipelines crossing Box culverts or culvert pipes over 450mm width/dia. but less than 900mm width, for:										
6.91	K 671.1	280mm dia. PN10 HDPE pipe	nr	2					-	-	-	-
6.92	K 671.2	225mm dia. PN10 HDPE pipe	nr	13					-	-	-	-
6.93	K 671.3	160mm dia. PN10 HDPE pipe	nr	44					-	-	-	-
6.94	K 671.4	110mm dia. PN10 HDPE pipe	nr	25					-	-	-	-
6.95	K 671.5	90mm dia. PN10 HDPE pipe	nr	47					-	-	-	-
6.96	K 671.6	63mm dia. PN10 HDPE pipe	nr	12					-	-	-	-
		Total of Page BOQ - 45 to Page BOQ - 58 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		For pipelines crossing Box culverts or culvert pipes over 900mm width/dia. but less than 1500mm width, for:										
6.97	K 671.7	280mm dia. PN10 HDPE pipe and 90mm dia. PN10 HDPE pipe	nr	1								
6.98	K 671.8	280mm dia. PN10 HDPE pipe	nr	2								
6.99	K 671.9	225mm dia. PN10 HDPE pipe	nr	6								
6.100	K 671.10	160mm dia. PN10 HDPE pipe	nr	9								
6.101	K 671.11	110mm dia. PN10 HDPE pipe	nr	5								
6.102	K 671.12	90mm dia. PN10 HDPE pipe	nr	11								
6.103	K 671.13	63mm dia. PN10 HDPE pipe	nr	30								
		For pipelines crossing Box culverts or culvert pipes over 1500mm width/dia. but less than 2000mm width, for:										
6.104	K 671.14	225mm dia. PN10 HDPE pipe	nr	3								
6.105	K 671.15	160mm dia. PN10 HDPE pipe	nr	4								
6.106	K 671.16	110mm dia. PN10 HDPE pipe	nr	1								
6.107	K 671.17	90mm dia. PN10 HDPE pipe	nr	9								
6.108	K 671.18	63mm dia. PN10 HDPE pipe	nr	4								
		Total of Page BOQ - 46 to Page BOQ - 58 Summary										

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		For pipelines crossing Box culverts or culvert pipes over 2000mm width/dia. (measure total length), for:										
6.109	K 671.19	280mm dia. PN10 HDPE pipe and 90mm dia. PN10 HDPE pipe	m	5								
6.110	K 671.20	280mm dia. PN10 HDPE pipe	m	6								
6.111	K 671.21	225mm dia. PN10 HDPE pipe	m	9								
6.112	K 671.22	160mm dia. PN10 HDPE pipe	m	6								
6.113	K 671.23	90mm dia. PN10 HDPE pipe	m	11								
6.114	K 671.24	63mm dia. PN10 HDPE pipe	m	15								
		Culvert Crossing Type 'B', only for culvert pipes or box culverts greater than 450mm width or diameter and 450mm height, as specified and shown on the Drawings, for:										
		For pipelines crossing Box culverts or culvert pipes over 450mm width/dia. but less than 900mm width, for:										
6.115	K 671.25	160mm dia. PN10 HDPE pipe	nr	1								
		For pipelines crossing Box culverts or culvert pipes over 1500mm width/dia. but less than 2000mm width, for:										
6.116	K 671.26	90mm dia. PN10 HDPE pipe	nr	1								
6.117	K 671.27	225mm dia. PN10 HDPE pipe	nr	1								
		Total of Page BOQ - 47 to Page BOQ - 58 Summary							-	-	-	-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

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ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Pipe Installation "On Supports"										
		Ref Drawing No. ANP2/LC1/STD/TD/C/10										
		Extra over the above items for the installation of pipelines, for the Supply, installation and construction of pipes on column supports, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, dismantling joints, couplings, flanged pipe specials, flange-stub connectors, HDPE welds, steel brackets, and all other items to complete as shown in the drawings (the column supports are included under Item K688), for:										
6.118	K 680.1	150mm dia. DI pipeline at Ch.2658	m	6					-	-		-
6.119	K 680.2	80mm dia. DI pipeline at Ch. 4058	m	70					-	-		-
		Extra over the above items for the installation of pipelines and for pipelines "on-supports" for the Supply and construction of the column supports, including all necessary foundation measures, reinforced concrete columns and/or pile lengths, and all other items to complete as shown in the drawings, for column and/or pile supports of combined above-ground and embedded underground depth from foundation level to invert, of:										
		Up to but not exceeding 1.5m, for:										
6.120	K 688.1	150mm dia. DI pipeline	nr	1					-	-		-
6.121	K 688.2	80mm dia. DI pipeline	nr	11					-	-		-
		Total of Page BOQ - 48 to Page BOQ - 58 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Culvert Crossing Type 'C'										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction of culvert crossings, including all necessary pipes, fittings, flange-stub connectors, HDPE welds, flanged pipe specials,steel backing rings, and all other items to complete as shown in the drawings, for:										
6.122	K 671.26	160mm dia. PN10 HDPE pipe	nr	3					-	-	-	-
6.123	K 671.27	110mm dia. PN10 HDPE pipe	nr	1					-	-	-	-
6.124	K 671.28	90mm dia. PN10 HDPE pipe	nr	2					-	-	-	-
6.125	K 671.29	DN100 PN10 DI pipe at Ch.0085	nr	1					-	-	-	-
6.126	K 671.30	DN80 PN10 DI pipes at Ch.3605	nr	1					-	-	-	-
		Total of Page BOQ - 49 to Page BOQ - 58 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

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ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Culvert Crossing Type 'E'										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037 & ANP2/LC1/STD/TD/C/012										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction of bridge crossings, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, couplings, flange-stub connectors, HDPE welds, flanged pipe specials, concrete supports and foundations, piles, steel brackets, and all other items to complete the self-supporting pipe-bridges as shown in the drawings, for:										
6.127	K 631.1	DN80 PN10 DI pipes, 16 to 18m pipe-bridge at Ch.11075	nr	1					-	-		-
6.128	K 621.1	DN80 PN10 DI pipes, 8 to 10m pipe-bridge at Ch.5160	nr	2					-	-		-
6.129	K 631.2	DN100 PN10 DI pipes, 12 to 14m pipe-bridge at Ch.1070	nr	1					-	-		-
6.130	K 621.2	DN100 PN10 DI pipes, 6 to 8m pipe-bridge at Ch.130	nr	2					-	-		-
6.131	K 621.3	DN100 PN10 DI pipes, 2 to 4m pipe-bridge at Ch.1580	nr	1					-	-		-
6.132	K 631.3	DN150 PN10 DI pipes, 14 to 16m pipe-bridge at Ch.8100	nr	1					-	-		-
		Total of Page BOQ - 50 to Page BOQ - 58 Summary							-	-	-	-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.) Culvert Crossing Type 'E' (Contd.) Ref Drawing No. ANP2/LC1/STD/TD/C/037 & ANP2/LC1/STD/TD/C/012 Extra over the above items for the installation of pipelines for the Supply, installation and construction of bridge crossings, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, couplings, flange-stub connectors, HDPE welds, flanged pipe specials, concrete supports and foundations, piles, steel brackets, and all other items to complete the self-supporting pipe-bridges as shown in the drawings, for:											
6.133	K 631.4	DN150 PN10 DI pipes, 13 to 15m pipe-bridge at Ch.2190	nr	1					-	-	-	-
6.134	K 631.5	DN150 PN10 DI pipes, 30 to 32m pipe-bridge at Ch.550	nr	1					-	-	-	-
6.135	K 631.6	DN150 PN10 DI pipes, 17 to 19m pipe-bridge at Ch.9360	nr	1					-	-	-	-
6.136	K 631.7	DN200 PN10 DI pipes, 10 to 12m pipe-bridge at Ch.4750	nr	1					-	-	-	-
6.137	K 621.4	DN200 PN10 DI pipes, 8 to 10m pipe-bridge at Ch.9100	nr	1					-	-	-	-
6.138	K 621.5	DN200 PN10 DI pipes, 8 to 10m pipe-bridge at Ch.2020	nr	1					-	-	-	-
		Total of Page BOQ - 51 to Page BOQ - 58 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.) Extra over the above items for the installation of pipelines for the Supply, installation and construction of bridge crossings, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, dismantling joints, couplings, all other flanged pipe specials, flange-stub connectors, HDPE welds, concrete foundations, piles and column supports, steel trusses, steel brackets, and all other items to complete as shown in the drawings, for:											
6.139	K 631.8	150mm dia. PN10 DI pipes on bridge crossing Ch.3275 (PAD 15 - PAD 16A) (Ref Drawing No. ANP2/LC1/60/BC1/C/001)	LS	Item					-	-	-	-
6.140	K 631.9	50mm dia. PN10 DI pipes on bridge crossing Ch.6866 (PAD 15 - PAD 16A) (Ref Drawing No. ANP2/LC1/60/BC2/C/001)	LS	Item					-	-	-	-
6.141	K 631.10	100mm dia. PN10 DI pipes on bridge crossing Ch.2940 (PAD 33 - PAD 34) (Ref Drawing No. ANP2/LC1/60/BC3/C/001)	LS	Item					-	-	-	-
6.142	K 631.11	100mm dia. PN10 DI pipes on bridge crossing Ch.1325 (PAD 23 - PAD 24) (Ref Drawing No. ANP2/LC1/60/BC4/C/001)	LS	Item					-	-	-	-
		Total of Page BOQ - 52 to Page BOQ - 58 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Extra over to HDPE pipelaying, for reinstatement of:										
		Breaking up Temporary Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
		Depth not exceeding 1.50m										
6.143	K 711.1	HDPE up to and including 280mm dia.	m	500	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
6.144	K 791.1	HDPE up to and including 280mm dia.	m	500	n/a	n/a	n/a		n/a	n/a	n/a	-
		Breaking up, Temporary Reinstatement of Asphalt paved local roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
6.145	K 711.2	HDPE up to and including 280mm dia.	m	150	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of Asphalt paved local roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
6.146	K 791.2	HDPE up to and including 280mm dia.	m	150	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of Local Gravel Roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
6.147	K 731.1	HDPE up to and including 280mm dia.	m	250	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 53 to Page BOQ - 58 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Reinstatement of Concrete Surfaces										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
6.148	K 731.2	HDPE up to and including 280mm dia. (Provisional Quantity)	m	20	n/a	n/a	n/a		n/a	n/a	n/a	-
6.149	K 731.3	Reinstatement of Pavings Surfaces	m^2	20	n/a	n/a	n/a		n/a	n/a	n/a	-
		Other Pipework Ancillaries										
6.150	K 820	Supply and fixing marker posts as per Dwg.No. ANP2/LC1/STD/TD/C/001	nr	307	n/a	n/a	n/a		n/a	n/a	n/a	-
6.151	K 900.1	Supply and laying of marker tape Ref. drawing no. ANP2/LC1/STD/TD/C/002	m	143855						-		-
		Testing										
		Pressure Testing of pipelines of										
6.152	K 900.2	280mm dia. PN10	m	3900	n/a	n/a	n/a		n/a	n/a	n/a	-
6.153	K 900.3	225mm dia. PN10	m	9250	n/a	n/a	n/a		n/a	n/a	n/a	-
6.154	K 900.4	160mm dia. PN10	m	26840	n/a	n/a	n/a		n/a	n/a	n/a	-
6.155	K 900.5	110mm dia. PN10	m	17960	n/a	n/a	n/a		n/a	n/a	n/a	-
6.156	K 900.6	90mm dia. PN10	m	58490	n/a	n/a	n/a		n/a	n/a	n/a	-
6.157	K 900.7	63mm dia. PN10	m	27415	n/a	n/a	n/a		n/a	n/a	n/a	-
		Cleaning and Flushing for pipelines of:										
6.158	K 900.8	280mm dia. PN10	m	3900	n/a	n/a	n/a		n/a	n/a	n/a	-
6.159	K 900.9	225mm dia. PN10	m	9250	n/a	n/a	n/a		n/a	n/a	n/a	-
6.160	K 900.10	160mm dia. PN10	m	26840	n/a	n/a	n/a		n/a	n/a	n/a	-
6.161	K 900.11	110mm dia. PN10	m	17960	n/a	n/a	n/a		n/a	n/a	n/a	-
6.162	K 900.12	90mm dia. PN10	m	58490	n/a	n/a	n/a		n/a	n/a	n/a	-
6.163	K 900.13	63mm dia. PN10	m	27415	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 54 to Page BOQ - 58 Summary								-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Disinfection for pipelines of:										
6.164	K 900.14	280mm dia. PN10	m	3900	n/a	n/a	n/a		n/a	n/a	n/a	-
6.165	K 900.15	225mm dia. PN10	m	9250	n/a	n/a	n/a		n/a	n/a	n/a	-
6.166	K 900.16	160mm dia. PN10	m	26840	n/a	n/a	n/a		n/a	n/a	n/a	-
6.167	K 900.17	110mm dia. PN10	m	17960	n/a	n/a	n/a		n/a	n/a	n/a	-
6.168	K 900.18	90mm dia. PN10	m	58490	n/a	n/a	n/a		n/a	n/a	n/a	-
6.169	K 900.19	63mm dia. PN10	m	27415	n/a	n/a	n/a		n/a	n/a	n/a	-
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION										
		Extra over to pipelaying, for construction of pipelines across RDA and PRDA road Crossings, including special backfilling material and disposal of excavated material, (except for those crossings where RCP conduit has already been provided for installation of pipes), for:										
6.170	L 240.1	HDPE pipes of 160mm dia. and less	m	500					-	-		-
		Extra over to pipelaying, bedding, backfilling and surface reinstatement, for Type F construction across Causeway Crossings, as shown, for:										
		Ref : ANP2/LC1/STD/TD/C/011										
6.171	L 260	HDPE pipes of 160mm dia. and less	m	250	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 55 to Page BOQ - 58 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION (CONTD.)										
		Pipe Bedding										
		Ref : ANP2/LC1/STD/TD/C/03										
		Extra over to pipelaying for the supply and placement of 100mm Sand bedding, as shown, for DI / HDPE pipes in trench, for:										
6.172	L 311	HDPE pipes not exceeding 160mm dia.	m	130705	n/a	n/a	n/a		n/a	n/a	n/a	-
6.173	L 312.1	HDPE pipes 225mm and 280mm dia.	m	11280	n/a	n/a	n/a		n/a	n/a	n/a	-
6.174	L 312.2	HDPE pipes not exceeding 280mm dia. in common trench	m	1870	n/a	n/a	n/a		n/a	n/a	n/a	-
6.175	L 310	Extra over to pipelaying and normal bedding construction, for the provision of 200mm thick sand bedding for pipelines requiring Type B construction (in rock)	m^3	30	n/a	n/a	n/a		n/a	n/a	n/a	-
6.176	L 331	Extra over to pipelaying and normal bedding, for granular bedding as specified, for pipelines requiring Type G construction (in paddy field) (provisional quantity)	m^3	850	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 56 to Page BOQ - 58 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION (CONTD.)										
		Pipe Surround Backfilling										
		Placement of Pipe Surround backfilling, as shown, with suitable selected excavated material for DI / HDPE pipes in trench:										
6.177	L 521	HDPE pipes not exceeding 160mm dia.	m	130705	n/a	n/a	n/a		n/a	n/a	n/a	-
6.178	L 522.1	HDPE pipes 225mm and 280mm dia.	m	11280	n/a	n/a	n/a		n/a	n/a	n/a	-
6.179	L 522.2	HDPE pipes not exceeding 280mm dia. in common trench	m	1870	n/a	n/a	n/a		n/a	n/a	n/a	-
6.180	L 531	Extra over pipe surround backfilling, for placing imported material for pipe surround (Type C) (provisional quantity)	m^3	90	n/a	n/a	n/a		n/a	n/a	n/a	-
6.181	L 590	Extra over pipe surround backfilling, for supply and placing Geotextile wrapping protection (provisional quantity)	m^2	770	n/a	n/a	n/a		n/a	n/a	n/a	-
6.182	L 540	Extra over pipe surround backfilling, for supply and placement of concrete slab covers protection for HDPE pipes, where shown	m^2	155	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 57 to Page BOQ - 58 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

SUMMARY OF BILL NO.6

BILL NO. 6 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA — ANURADHAPURA NWSP - PHASE II

BOQ BILL NO.	PAGE TOTAL	TOTAL AMOUNT			
		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
		(e)	(f)	(g)	(h)
		CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
		Yen	LKR	LKR	LKR
BILL NO. 06	Page BOQ - 35 of Bill No. 6	-	-	-	-
	Page BOQ - 36 of Bill No. 6	-	-	-	-
	Page BOQ - 37 of Bill No. 6	-	-	-	-
	Page BOQ - 38 of Bill No. 6	-	-	-	-
	Page BOQ - 39 of Bill No. 6	-	-	-	-
	Page BOQ - 40 of Bill No. 6	-	-	-	-
	Page BOQ - 41 of Bill No. 6	-	-	-	-
	Page BOQ - 42 of Bill No. 6	-	-	-	-
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	Page BOQ - 44 of Bill No. 6	-	-	-	-
	Page BOQ - 45 of Bill No. 6	-	-	-	-
	Page BOQ - 46 of Bill No. 6	-	-	-	-
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	Page BOQ - 49 of Bill No. 6	-	-	-	-
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	Page BOQ - 51 of Bill No. 6	-	-	-	-
	Page BOQ - 52 of Bill No. 6	-	-	-	-
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	Page BOQ - 55 of Bill No. 6	-	-	-	-
	Page BOQ - 56 of Bill No. 6	-	-	-	-
	Page BOQ - 57 of Bill No. 6	-	-	-	-
	TOTAL OF BILL NO. 6 CARRIED TO GRAND SUMMARY	-	-	-	-

"For References ONLY"
(Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		NOTE: Rates and Prices entered against BOQ items given hereunder shall be made in conjunction with Specifications, Drawings, General Requirements, Preamble to BOQ and Contractual requirements, not limited to the descriptions given in the captions. *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Outside the Employer's Country", his Rates & Prices shall be quoted only in Column No. (a), (b), (d), (e), (f) & (h) *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Within the Employer's Country", his Rates & Prices shall be quoted only in Column No. (c), (d), (g) & (h) CLASS I : PIPE WORK - PIPES PIPE WORK IN RDA / PRDA ROAD RESERVE HDPE PE100 - SDR 17 - PN10 welded pipes as specified 90mm HDPE pipes										
7.1	I 712.1	pipe in trench, depth not exceeding 1.5m	m	415					-	-		-
		110mm HDPE pipes										
7.2	I 712.2	pipe in trench, depth not exceeding 1.5m	m	760					-	-		-
		Total of Page BOQ - 59 to Page BOQ - 72 Summary							-	-	-	-

"For References ONLY"
(Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS I : PIPE WORK - PIPES (CONTD.)										
		160mm HDPE pipes										
7.3	I 712.3	pipe in trench, depth not exceeding 1.5m	m	650					-	-		-
7.4	I 713.1	pipe in trench, depth over 1.5m to 2.0m	m	50					-	-		-
		PIPE WORK IN LOCAL ROAD RESERVE										
		HDPE PE100 - SDR 17 - PN10 welded pipes as specified										
		63mm HDPE pipes										
7.5	I 712.4	pipe in trench, depth not exceeding 1.5m	m	1100					-	-		-
		90mm HDPE pipes										
7.6	I 712.5	pipe in trench, depth not exceeding 1.5m	m	8510					-	-		-
7.7	I 713.2	pipe in trench, depth over 1.5m to 2.0m	m	20					-	-		-
		110mm HDPE pipes										
7.8	I 712.6	pipe in trench, depth not exceeding 1.5m	m	4850					-	-		-
7.9	I 713.3	pipe in trench, depth over 1.5m to 2.0m	m	290					-	-		-
		Total of Page BOQ - 60 to Page BOQ - 72 Summary							-	-	-	-

"For References ONLY"
(Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS I : PIPE WORK - PIPES (CONTD.)										
		160mm HDPE pipes										
7.10	I 712.7	pipe in trench, depth not exceeding 1.5m	m	3005					-	-		-
7.11	I 713.4	pipe in trench, depth over 1.5m to 2.0m	m	130					-	-		-
		225mm HDPE pipes										
7.12	I 722.1	pipe in trench, depth not exceeding 1.5m	m	690					-	-		-
7.13	I 723.2	pipe in trench, depth over 1.5m to 2.0m	m	130					-	-		-
		CLASS J : PIPE WORK - FITTINGS AND VALVES										
		Extra over the above items for pipes for installation of fittings and valves										
		All HDPE Fittings shall be PE 100 - SDR 17 - for PN 10 pipes										
		HDPE PE100 PN10 Bends										
		90mm dia.										
7.14	J 611.1	22^0	nr	15					-	-		-
7.15	J 611.2	45^0	nr	20					-	-		-
		Total of Page BOQ - 61 to Page BOQ - 72 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES (CONTD.)										
		110mm dia.										
7.16	J 611.3	22 ^{0}	nr	5					-	-		-
7.17	J 611.4	45 ^{0}	nr	5					-	-		-
		160mm dia.										
7.18	J611.5	22 ^{0}	nr	2					-	-		-
7.19	J611.6	45 ^{0}	nr	2					-	-		-
		225mm dia.										
7.20	J 612.2	45 ^{0}	nr	2					-	-		-
		HDPE PE100 PN10 plain ended Level Invert Tees										
7.21	J 621.1	90mm x 90mm dia.	nr	4					-	-		-
7.22	J 621.2	110mm x90mm dia.	nr	4					-	-		-
7.23	J 621.3	160mm x90mm dia.	nr	5					-	-		-
		HDPE PE100 PN10 plain ended Tees										
7.24	J 621.4	63x63mm dia.	nr	1					-	-		-
7.25	J 621.5	90x63mm dia.	nr	9					-	-		-
7.26	J 621.6	90x90mm dia.	nr	2					-	-		-
7.27	J 621.7	110x63mm dia.	nr	11					-	-		-
7.28	J 621.8	110x90mm dia.	nr	5					-	-		-
7.29	J 621.9	110x110mm dia.	nr	4					-	-		-
7.30	J 621.10	160x63mm dia.	nr	10					-	-		-
7.31	J 621.11	160x90mm dia.	nr	2					-	-		-
7.32	J 621.12	160x110mm dia.	nr	1					-	-		-
		Total of Page BOQ - 62 to Page BOQ - 72 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES (CONTD.)										
		HDPE PE100 PN10 plain ended Tees (Contd.)										
7.33	J 621.13	160x160mm dia.	nr	3					-	-		-
7.34	J 622.1	225x63mm dia.	nr	2					-	-		-
7.35	J 622.2	225x90mm dia.	nr	1					-	-		-
7.36	J 622.3	225x225mm dia.	nr	1					-	-		-
		HDPE PE100 PN10 plain ended Reducers										
7.37	J 631.1	90-63mm dia.	nr	5					-	-		-
7.38	J 631.2	110-63mm dia.	nr	2					-	-		-
7.39	J 631.3	110-90mm dia.	nr	5					-	-		-
7.40	J 631.4	160-110mm dia.	nr	5					-	-		-
7.41	J 632.1	225-160mm dia.	nr	2					-	-		-
		HDPE PE100 PN10 End Caps										
7.42	J 691.1	63mm dia.	nr	40					-	-		-
7.43	J 691.2	90mm dia.	nr	15					-	-		-
7.44	J 691.3	110mm dia.	nr	2					-	-		-
		DI double socket Tees, with flanged branch PN10/16										
7.45	J 321.1	80x80mm dia.	nr	4					-	-		-
7.46	J 321.2	100x80mm dia.	nr	3					-	-		-
7.47	J 321.3	150x80mm dia.	nr	6					-	-		-
7.48	J 321.4	200x80mm dia.	nr	2					-	-		-
		Total of Page BOQ - 63 to Page BOQ - 72 Summary							**-**	**-**	**-**	**-**

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES										
		Valve Chambers										
		Rate to include extra over above items for pipelaying, for supply and installation of Valves, Flange Adaptor, couplings, flanged straight specials, pipe cutting, RC chamber, 600mm dia. heavy duty DI Class D-400 hinged type manhole cover, and all other items to complete as shown in the drawings.										
		Ref dwg no: ANP2/LC1/STD/TD/C/033										
7.49	K 232.1	80mm dia. PN10 Gate Valve Chamber	nr	1					-	-		-
7.50	K 232.2	100mm dia. PN10 Gate Valve Chamber	nr	7					-	-		-
7.51	K 232.3	150mm dia. PN10 Gate Valve Chamber	nr	5					-	-		-
		Air Valve Chambers (exclusive of above-ground bridge air valves)										
		Rate to include for supply and installation of isolation Gate valve, Air Valve as specified, flanged straight specials, blank flanges, tappings, RC chamber, ventilation pipes, ventilated type heavy duty DI Class D-400 hinged type DI access cover, and all appurtenances to complete as shown in the drawings. The tee is included under the item for tees.										
		Ref drawing No: ANP2/LC1/STD/TD/C/031										
7.52	K 232.4	25mm dia. single orifice air valve (Type A)	nr	1					-	-		-
7.53	K 232.5	50mm dia. single orifice air valve (Type A)	nr	12					-	-		-
		Total of Page BOQ - 64 to Page BOQ - 72 Summary							-	-	-	-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Washout Valve Arrangements										
		Rate to include for supply and installation of Gate valve, Flange Adaptor, flanged straight specials, HDPE fittings, RC chamber, ventilated type heavy duty DI Class D-400 hinged type access cover, or DI Surface Box and concrete surround as detailed, washout outlet pipe, and all appurtencances to complete as shown in the drawings (excluding washout tee, which is covered under tees)										
		Ref drawing No: ANP2/LC1/STD/TD/C/034										
7.54	K 232.6	80 mm dia. washout	nr	13					-	-		-
		Outlet Arrangements										
		Complete as shown in drawing No: ANP2/LB/STD/TD/C/23										
7.55	K 232.7	Type 'A'	nr	13	n/a	n/a	n/a		n/a	n/a	n/a	-
		Gate Valve and Surface Boxes, as detailed										
		Rate to include extra over the above items for pipelaying, for supply and installation of Gate valve, spindle cap, Flange Adaptor, flanged straight specials, 150x150mm DI Surface Box, concrete surface surround, riser pipe, foundation for riser, and all items to complete as shown in the drawings.										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/038										
7.56	K 272.1	80mm dia. flanged gate valve	nr	3					-	-		-
7.57	K 272.2	50mm dia. flanged gate valve	nr	1					-	-		-
		Total of Page BOQ - 65 to Page BOQ - 72 Summary							-	-	-	-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		CULVERT CROSSINGS										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction for all necessary pipes, fittings, couplings, concrete or steel sleeve protection, and all other items to complete as shown in the drawings.										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037										
		Culvert Crossing Type 'D', only for culvert pipes or box culverts greater than 450mm width or diameter and 450mm height, as specified and shown on the Drawings, for:										
		For pipelines crossing Box culverts or culvert pipes over 450mm width/dia. but less than 900mm width, for:										
7.58	K 671.1	225mm dia. PN10 HDPE pipe	nr	1					-	-		-
7.59	K 671.2	110mm dia. PN10 HDPE pipe	nr	20					-	-		-
7.60	K 671.3	63mm dia. PN10 HDPE pipe	nr	6					-	-		-
		For pipelines crossing Box culverts or culvert pipes over 900mm width/dia. but less than 1500mm width, for:										
7.61	K 671.4	225mm dia. PN10 HDPE pipe	nr	1					-	-		-
7.62	K 671.5	160mm dia. PN10 HDPE pipe	nr	1					-	-		-
		Total of Page BOQ - 66 to Page BOQ - 72 Summary							-	-	-	-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Culvert Crossing Type 'C' Ref Drawing No. ANP2/LC1/STD/TD/C/037 Extra over the above items for the installation of pipelines for the Supply, installation and construction of culvert crossings, including all necessary pipes, fittings and all other items to complete as shown in the drawings, for: Type C										
7.63	K 671.6	160 mm dia. HDPE pipe (1m long approximately)	nr	7					-	-		-
		Culvert Crossing Type 'E' Ref Drawing No. ANP2/LC1/STD/TD/C/037 & ANP2/LC1/STD/TD/C/012 Extra over the above items for the installation of pipelines for the Supply, installation and construction of bridge crossings, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, couplings, flange-stub connectors, HDPE welds, flanged pipe specials, concrete supports and foundations, piles, steel brackets, and all other items to complete the self-supporting pipe-bridges as shown in the drawings, for:										
7.64	K 631.1	DN150 PN10 DI pipes, 8 to 10m pipe-bridge at Ch.5400	nr	1					-	-		-
7.65	K 621.1	DN150 PN10 DI pipes, 3 to 5m pipe-bridge at Ch.5885	nr	1					-	-		-
7.66	K 621.2	DN100 PN10 DI pipes, 4 to 6m pipe-bridge at Ch.8660	nr	1					-	-		-
		Total of Page BOQ - 67 to Page BOQ - 72 Summary							**-**	**-**	**-**	**-**

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Extra over to HDPE pipelaying, for reinstatement of:										
		Breaking up, Temporary Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
7.67	K 711.1	HDPE up to and including 225mm dia.	m	40	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
7.68	K 791.1	HDPE up to and including 225mm dia.	m	40	n/a	n/a	n/a		n/a	n/a	n/a	-
		Breaking up,Temporary Reinstatement of Asphalt paved local roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
7.69	K 711.2	HDPE up to and including 225mm dia.	m	10	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of Asphalt paved local roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
7.70	K 791.2	HDPE up to and including 225mm dia.	m	10	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of Local Gravel Roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
7.71	K 731.1	HDPE up to and including 225mm dia.	m	170	n/a	n/a	n/a		n/a	n/a	n/a	-
7.72	K 731.2	Reinstatement of Pavings Surfaces	m^2	10	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 68 to Page BOQ - 72 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Other Pipework Ancillaries										
7.73	K 820	Supply and fixing marker posts as per Dwg.No. ANP2/LC1/STD/TD/C/001	nr	39	n/a	n/a	n/a		n/a	n/a	n/a	-
7.74	K 900.1	Supply and laying of marker tape Ref. drawing no. ANP2/LC1/STD/TD/C/002	m	20600					-	-		-
		Testing										
		Pressure Testing of pipelines of										
7.75	K 900.2	225mm dia. PN10	m	820	n/a	n/a	n/a		n/a	n/a	n/a	-
7.76	K 900.3	160mm dia. PN10	m	3835	n/a	n/a	n/a		n/a	n/a	n/a	-
7.77	K 900.4	110mm dia. PN10	m	5900	n/a	n/a	n/a		n/a	n/a	n/a	-
7.78	K 900.5	90mm dia. PN10	m	8945	n/a	n/a	n/a		n/a	n/a	n/a	-
7.79	K 900.6	63mm dia. PN10	m	1100	n/a	n/a	n/a		n/a	n/a	n/a	-
		Cleaning and Flushing for pipelines of:										
7.80	K 900.7	225mm dia. PN10	m	820	n/a	n/a	n/a		n/a	n/a	n/a	-
7.81	K 900.8	160mm dia. PN10	m	3835	n/a	n/a	n/a		n/a	n/a	n/a	-
7.82	K 900.9	110mm dia. PN10	m	5900	n/a	n/a	n/a		n/a	n/a	n/a	-
7.83	K 900.10	90mm dia. PN10	m	8945	n/a	n/a	n/a		n/a	n/a	n/a	-
7.84	K 900.11	63mm dia. PN10	m	1100	n/a	n/a	n/a		n/a	n/a	n/a	-
		Disinfection for pipelines of:										
7.85	K 900.12	225mm dia. PN10	m	820	n/a	n/a	n/a		n/a	n/a	n/a	-
7.86	K 900.13	160mm dia. PN10	m	3835	n/a	n/a	n/a		n/a	n/a	n/a	-
7.87	K 900.14	110mm dia. PN10	m	5900	n/a	n/a	n/a		n/a	n/a	n/a	-
7.88	K 900.15	90mm dia. PN10	m	8945	n/a	n/a	n/a		n/a	n/a	n/a	-
7.89	K 900.16	63mm dia. PN10	m	1100	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 69 to Page BOQ - 72 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION										
		Extra over to pipelaying, for construction of pipelines across RDA and PRDA road Crossings, including special backfilling material and disposal of excavated material, (except for those crossings where RCP conduit has already been provided for installation of pipes), for:										
7.90	L 240.1	HDPE pipes of 160mm dia. and less	m	40					-	-		-
		Extra over to pipelaying, bedding, backfilling and surface reinstatement, for Type F construction across Causeway Crossings, as shown, for:										
		Ref : ANP2/LC1/STD/TD/C/011										
7.91	L 260.1	HDPE pipes of 160mm dia.	m	110	n/a	n/a	n/a		n/a	n/a	n/a	-
7.92	L 260.2	HDPE pipes of 225mm dia.	m	45	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 70 to Page BOQ - 72 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION (CONTD.)										
		Pipe Bedding										
		Ref : ANP2/LC1/STD/TD/C/003										
		Extra over to pipelaying for the supply and placement of 100mm Sand bedding, as shown, for DI / HDPE pipes in trench, for:										
7.93	L 311.1	HDPE pipes not exceeding 160mm dia.	m	15945	n/a	n/a	n/a		n/a	n/a	n/a	-
7.94	L 311.2	HDPE pipes 225mm dia.	m	820	n/a	n/a	n/a		n/a	n/a	n/a	-
7.95	L 310	Extra over to pipelaying and normal bedding construction, for the provision of 200mm thick sand bedding for pipelines requiring Type B construction (in rock)	m^3	10	n/a	n/a	n/a		n/a	n/a	n/a	-
		Pipe Surround Backfilling										
		Placement of Pipe Surround backfilling, as shown, with suitable selected excavated material for DI / HDPE pipes in trench:										
7.96	L 521	HDPE pipes not exceeding 160mm dia.	m	15945	n/a	n/a	n/a		n/a	n/a	n/a	-
7.97	L 522.1	HDPE pipes 225mm dia.	m	820	n/a	n/a	n/a		n/a	n/a	n/a	-
7.98	L 540	Extra over pipe surround backfilling, for supply and placement of concrete slab covers protection for HDPE pipes, where shown	m^2	10	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 71 to Page BOQ - 72 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

SUMMARY OF BILL NO.7

BILL NO. 7 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA — ANURADHAPURA NWSP - PHASE II

BOQ BILL NO.	PAGE TOTAL	TOTAL AMOUNT			
		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
		(e)	(f)	(g)	(h)
		CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
		Yen	LKR	LKR	LKR
Bill No. 7	Page BOQ - 59 of Bill No. 7	-	-	-	-
	Page BOQ - 60 of Bill No. 7	-	-	-	-
	Page BOQ - 61 of Bill No. 7	-	-	-	-
	Page BOQ - 62 of Bill No. 7	-	-	-	-
	Page BOQ - 63 of Bill No. 7	-	-	-	-
	Page BOQ - 64 of Bill No. 7	-	-	-	-
	Page BOQ - 65 of Bill No. 7	-	-	-	-
	Page BOQ - 66 of Bill No. 7	-	-	-	-
	Page BOQ - 67 of Bill No. 7	-	-	-	-
	Page BOQ - 68 of Bill No. 7	-	-	-	-
	Page BOQ - 69 of Bill No. 7	-	-	-	-
	Page BOQ - 70 of Bill No. 7	-	-	-	-
	Page BOQ - 71 of Bill No. 7	-	-	-	-
	TOTAL OF BILL NO. 7 CARRIED TO GRAND SUMMARY	-	-	-	-

"For References ONLY"
(Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 8 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAHATAGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		NOTE: Rates and Prices entered against BOQ items given hereunder shall be made in conjunction with Specifications, Drawings, General Requirements, Preamble to BOQ and Contractual requirements, not limited to the descriptions given in the captions. *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Outside the Employer's Country", his Rates & Prices shall be quoted only in Column No. (a), (b), (d), (e), (f) & (h) *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Within the Employer's Country", his Rates & Prices shall be quoted only in Column No. (c), (d), (g) & (h) CLASS I : PIPE WORK - PIPES PIPE WORK IN LOCAL ROAD RESERVE HDPE PE100 - SDR 17 - PN10 welded pipes as specified 63mm HDPE pipes										
8.1	I 712.1	pipe in trench, depth not exceeding 1.5m	m	10						-	-	-
		90mm HDPE pipes								-	-	-
8.2	I 712.2	pipe in trench, depth not exceeding 1.5m	m	2580						-	-	-
8.3	I 713.1	pipe in trench, depth over 1.5m to 2.0m	m	140						-	-	-
		Total of Page BOQ - 73 to Page BOQ - 80 Summary								-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 8 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAHATAGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES										
		Extra over the above items for pipes for installation of fittings and valves										
		All HDPE Fittings shall be PE 100 - SDR 17 - for PN 10 pipes										
		HDPE PE100 PN10 plain ended Level Invert Tees										
8.4	J 621.1	90mm x 90mm dia.	nr	2								
		HDPE PE100 PN10 plain ended Tees										
8.5	J 621.2	90x63mm dia.	nr	2								
		HDPE PE100 PN10 plain ended Reducers										
8.6	J 631	90-63mm dia.	nr	5								
		HDPE PE100 PN10 End Caps										
8.7	J 691	63mm dia.	nr	5								
		DI double socket Tees, with flanged branch PN10/16										
8.8	J 321	80x80mm dia.	nr	2								
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES										
		Air Valve Chambers (exclusive of above-ground bridge air valves)										
		Rate to include for supply and installation of isolation Gate valve, Air Valve as specified, flanged straight specials, blank flanges, tappings, RC chamber, ventilation pipes, ventilated type heavy duty DI Class D-400 hinged type DI access cover, and all appurtenances to complete as shown in the drawings. The tee is included under the item for tees.										
		Ref drawing No: ANP2/LC1/STD/TD/C/031										
8.9	K 232.1	50mm dia. single orifice air valve (Type A)	nr	2								
		Total of Page BOQ - 74 to Page BOQ - 80 Summary										

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 8 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAHATAGOLLEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Washout Valve Arrangements										
		Rate to include for supply and installation of Gate valve, Flange Adaptor, flanged straight specials, HDPE fittings, RC chamber, ventilated type heavy duty DI Class D-400 hinged type access cover, or DI Surface Box and concrete surround as detailed, washout outlet pipe, and all appurtencances to complete as shown in the drawings (excluding washout tee, which is covered under tees)										
		Ref drawing No: ANP2/LC1/STD/TD/C/034										
8.10	K 232.2	80 mm dia. washout	nr	4					-	-		-
		Outlet Arrangements										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/034										
8.11	K 232.3	Type 'A'	nr	4	n/a	n/a	n/a		n/a	n/a	n/a	-
		Gate Valve and Surface Boxes, as detailed										
		Rate to include extra over the above items for pipelaying, for supply and installation of Gate valve, spindle cap, Flange Adaptor, flanged straight specials, 150x150mm DI Surface Box, concrete surface surround, riser pipe, foundation for riser, and all items to complete as shown in the drawings.										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/038										
8.12	K 272.1	50mm dia. flanged gate valve	nr	2					-	-		-
		Total of Page BOQ - 75 to Page BOQ - 80 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 8 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAHATAGOLLEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		CULVERT CROSSINGS										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction for all necessary pipes, fittings, couplings, concrete or steel sleeve protection, and all other items to complete as shown in the drawings.										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037										
		Culvert Crossing Type 'D', only for culvert pipes or box culverts greater than 450mm width or diameter and 450mm height, as specified and shown on the Drawings, for:										
		For pipelines crossing Box culverts or culvert pipes over 450mm width/dia. but less than 900mm width, for:										
8.13	K 671.1	90mm dia. PN10 HDPE pipe	nr	4					-	-		-
		For pipelines crossing Box culverts or culvert pipes over 2000mm width/dia. (measure total length), for:										
8.14	K 671.2	90mm dia. PN10 HDPE pipe	m	2					-	-		-
		Total of Page BOQ - 76 to Page BOQ - 80 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 8 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAHATAGOLLEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Pipe Installation "On Supports"										
		Ref Drawing No. ANP2/LC1/STD/TD/C/10										
		Extra over the above items for the installation of pipelines, for the Supply, installation and construction of pipes on column supports, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, dismantling joints, couplings, flanged pipe specials, flange-stub connectors, HDPE welds, steel brackets, and all other items to complete as shown in the drawings (the column supports are included under Item K688), for:										
8.15	K 680	DN80 PN10 DI pipes, on supports Ch.2067 to 2097 (KAH-01 - KAH-02)	m	30						-		-
		Extra over the above items for the installation of pipelines and for pipelines "on-supports" for the Supply and construction of the column supports, including all necessary foundation measures, reinforced concrete columns and/or pile lengths, and all other items to complete as shown in the drawings, for column and/or pile supports of combined above-ground and embedded underground depth from foundation level to invert, of:										
		Upto but not exceeding 1.50m, for,										
8.16	K 688	150mm dia. DI pipeline	nr	5	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 77 to Page BOQ - 80 Summary								-		-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 8 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAHATAGOLLEWA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Extra over to HDPE pipelaying, for reinstatement of:										
		Permanent Reinstatement of Local Gravel Roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
8.17	K 731.1	HDPE 90mm dia.	m	5	n/a	n/a	n/a		n/a	n/a	n/a	-
		Other Pipework Ancillaries										
8.18	K 820	Supply and fixing marker posts as per Dwg.No. ANP2/LC1/STD/TD/C/001	nr	8	n/a	n/a	n/a		n/a	n/a	n/a	-
8.19	K 900.1	Supply and laying of marker tape Ref. drawing no. ANP2/LC1/STD/TD/C/002	m	2730					-	-		-
		Testing										
		Pressure Testing of HDPE pipelines, of										
8.20	K 900.2	63mm dia. PN10	m	10	n/a	n/a	n/a		n/a	n/a	n/a	-
8.21	K 900.3	90mm dia. PN10	m	2720	n/a	n/a	n/a		n/a	n/a	n/a	-
		Cleaning and Flushing for HDPE pipelines of:										
8.22	K 900.4	63mm dia. PN10	m	10	n/a	n/a	n/a		n/a	n/a	n/a	-
8.23	K 900.5	90mm dia. PN10	m	2720	n/a	n/a	n/a		n/a	n/a	n/a	-
		Disinfection for HDPE pipelines, of:										
8.24	K 900.6	63mm dia. PN10	m	10	n/a	n/a	n/a		n/a	n/a	n/a	-
8.25	K 900.7	90mm dia. PN10	m	2720	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 78 to Page BOQ - 80 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 8 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAHATAGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION										
		Pipe Bedding										
		Ref : ANP2/LC1/STD/TD/C/003										
		Extra over to pipelaying for the supply and placement of 100mm Sand bedding, as shown, for DI / HDPE pipes in trench, for:										
8.26	L 310	HDPE pipes not exceeding 90mm dia.	m	2730	n/a	n/a	n/a		n/a	n/a	n/a	-
		Pipe Surround Backfilling										
		Placement of Pipe Surround backfilling, as shown, with suitable selected excavated material for DI / HDPE pipes in trench:										
8.27	L 520	HDPE pipes not exceeding 90mm dia.	m	2730	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 79 to Page BOQ - 80 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

SUMMARY OF BILL NO.8

BILL NO. 8 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAHATAGOLLEWA **ANURADHAPURA NWSP - PHASE II**

BOQ BILL NO.	PAGE TOTAL	TOTAL AMOUNT			
		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
		(e)	(f)	(g)	(h)
		CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
		Yen	LKR	LKR	LKR
Bill No. 8	Page BOQ - 73 of Bill No. 8	-	-	-	-
	Page BOQ - 74 of Bill No. 8	-	-	-	-
	Page BOQ - 75 of Bill No. 8	-	-	-	-
	Page BOQ - 76 of Bill No. 8	-	-	-	-
	Page BOQ - 77 of Bill No. 8	-	-	-	-
	Page BOQ - 78 of Bill No. 8	-	-	-	-
	Page BOQ - 79 of Bill No. 8	-	-	-	-
	TOTAL OF BILL NO. 8 CARRIED TO GRAND SUMMARY	**-**	**-**	**-**	**-**

"For References ONLY"
(Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 9 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Suppy and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		NOTE: Rates and Prices entered against BOQ items given hereunder shall be made in conjunction with Specifications, Drawings, General Requirements, Preamble to BOQ and Contractual requirements, not limited to the descriptions given in the captions. *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Outside the Employer's Country", his Rates & Prices shall be quoted only in Column No. (a), (b), (d), (e), (f) & (h) *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Within the Employer's Country", his Rates & Prices shall be quoted only in Column No. (c), (d), (g) & (h)										
		CLASS I : PIPE WORK - PIPES										
		PIPE WORK IN RDA / PRDA ROAD RESERVE										
		HDPE PE100 - SDR 17 - PN10 welded pipes as specified										
		63mm HDPE pipes										
9.1	I 712.1	pipe in trench, depth not exceeding 1.5m	m	10								
		90mm HDPE pipes										
9.2	I 712.2	pipe in trench, depth not exceeding 1.5m	m	3950								
		110mm HDPE pipes										
9.4	I 712.3	pipe in trench, depth not exceeding 1.5m	m	1110								
		160mm HDPE pipes										
9.5	I 712.4	pipe in trench, depth not exceeding 1.5m	m	1640								
9.6	I 713.2	pipe in trench, depth over 1.5m to 2.0m	m	30								
		Total of Page BOQ - 81 to Page BOQ - 91 Summary										

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 9 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Suppy and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS I : PIPE WORK - PIPES (CONTD.)										
		PIPE WORK IN LOCAL ROAD RESERVE										
		HDPE PE100 - SDR 17 - PN10 welded pipes as specified										
		63mm HDPE pipes										
9.7	I 712.5	pipe in trench, depth not exceeding 1.5m	m	20					-	-	-	-
		90mm HDPE pipes										
9.8	I 712.6	pipe in trench, depth not exceeding 1.5m	m	10155					-	-	-	-
9.9	I 713.3	pipe in trench, depth over 1.5m to 2.0m	m	40					-	-	-	-
		110mm HDPE pipes										
9.10	I 712.7	pipe in trench, depth not exceeding 1.5m	m	1290					-	-	-	-
9.11	I 713.4	pipe in trench, depth over 1.5m to 2.0m	m	30					-	-	-	-
		CLASS J : PIPE WORK - FITTINGS AND VALVES										
		Extra over the above items for pipes for installation of fittings and valves										
		All HDPE Fittings shall be PE 100 - SDR 17 - for PN 10 pipes										
		HDPE PE100 PN10 Bends										
		90mm dia.										
9.12	J 611.1	22 ^{0}	nr	10					-	-	-	-
9.13	J 611.2	45 ^{0}	nr	10					-	-	-	-
		110mm dia.										
9.14	J611.3	45 ^{0}	nr	5					-	-	-	-
		160mm dia.										
9.15	J 611.4	22 ^{0}	nr	2					-	-	-	-
9.16	J 611.5	45 ^{0}	nr	2					-	-	-	-
		Total of Page BOQ - 82 to Page BOQ - 91 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 9 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Suppy and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES (CONTD.)										
		HDPE PE100 PN10 plain ended Level Invert Tees										
9.17	J 621.1	90mm x 90mm dia.	nr	4								
9.18	J 621.2	110mm x 90mm dia.	nr	2								
		HDPE PE100 PN10 plain ended Tees										
9.19	J 621.3	90x63mm dia.	nr	10								
9.20	J 621.4	90x90mm dia.	nr	14								
9.21	J 621.5	110x63mm dia.	nr	3								
9.22	J 621.6	110x90mm dia.	nr	4								
9.23	J 621.7	110x110mm dia.	nr	1								
9.24	J 621.8	160x90mm dia.	nr	1								
		HDPE PE100 PN10 plain ended Reducers										
9.25	J 631.1	90-63mm dia.	nr	5								
9.26	J 631.2	110-90mm dia.	nr	2								
9.27	J 631.3	160-110mm dia.	nr	1								
		HDPE PE100 PN10 End Caps										
9.28	J 691.1	63mm dia.	nr	15								
9.29	J 691.2	90mm dia.	nr	17								
9.30	J 691.3	110mm dia.	nr	2								
		DI double socket Tees, with flanged branch PN10/16										
9.31	J 321.1	80x80mm dia.	nr	4								
9.32	J 321.2	100x80mm dia.	nr	3								
		Total of Page BOQ - 83 to Page BOQ - 91 Summary							-	-	-	

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 9 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Suppy and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES										
		Valve Chambers										
		Rate to include extra over above items for pipelaying, for supply and installation of Valves, Flange Adaptor, couplings, flanged straight specials, pipe cutting, RC chamber, 600mm dia. heavy duty DI Class D-400 hinged type manhole cover, and all other items to complete as shown in the drawings.										
		Ref dwg no: ANP2/LC1/STD/TD/C/033										
9.33	K 232.1	80mm dia. PN10 Gate Valve Chamber	nr	2					-	-	-	-
9.34	K 232.2	150mm dia. PN10 Gate Valve Chamber	nr	1					-	-	-	-
		Total of Page BOQ - 84 to Page BOQ - 91 Summary							-	-	-	-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 9 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Suppy and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Air Valve Chambers (exclusive of above-ground bridge air valves)										
		Rate to include for supply and installation of isolation Gate valve, Air Valve as specified, flanged straight specials, blank flanges, tappings, RC chamber, ventilation pipes, ventilated type heavy duty DI Class D-400 hinged type DI access cover, and all appurtenances to complete as shown in the drawings. The tee is included under the item for tees.										
		Ref drawing No: ANP2/LC1/STD/TD/C/031										
9.35	K 232.3	50mm dia. single orifice air valve (Type A)	nr	7								
		Washout Valve Arrangements										
		Rate to include for supply and installation of Gate valve, Flange Adaptor, flanged straight specials, HDPE fittings, RC chamber, ventilated type heavy duty DI Class D-400 hinged type access cover, or DI Surface Box and concrete surround as detailed, washout outlet pipe, and all appurtencances to complete as shown in the drawings (excluding washout tee, which is covered under tees)										
		Ref drawing No: ANP2/LC1/STD/TD/C/034										
9.36	K 232.4	80 mm dia. washout	nr	5								
		Outlet Arrangements										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/23										
9.37	K 232.5	Type 'A'	nr	5	n/a	n/a	n/a		n/a	n/a	n/a	
		Total of Page BOQ - 85 to Page BOQ - 91 Summary										

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 9 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Suppy and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Gate Valve and Surface Boxes, as detailed										
		Rate to include extra over the above items for pipelaying, for supply and installation of Gate valve, spindle cap, Flange Adaptor, flanged straight specials, 150x150mm DI Surface Box, concrete surface surround, riser pipe, foundation for riser, and all items to complete as shown in the drawings.										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/038										
9.38	K 272.1	80mm dia. flanged gate valve	nr	7					-	-	-	-
		CULVERT CROSSINGS										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction for all necessary pipes, fittings, couplings, concrete or steel sleeve protection, and all other items to complete as shown in the drawings.										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037										
		Culvert Crossing Type 'D', only for culvert pipes or box culverts greater than 450mm width or diameter and 450mm height, as specified and shown on the Drawings, for:										
		For pipelines crossing Box culverts or culvert pipes over 450mm width/dia. but less than 900mm width, for:										
9.39	K 671.1	160mm dia. PN10 HDPE pipe	nr	3					-	-	-	-
9.40	K 671.2	110mm dia. PN10 HDPE pipe	nr	6					-	-	-	-
9.41	K 671.3	90mm dia. PN10 HDPE pipe	nr	14					-	-	-	-
		Total of Page BOQ - 86 to Page BOQ - 91 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 9 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Suppy and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		For pipelines crossing Box culverts or culvert pipes over 900mm width/dia. but less than 1500mm width, for:										
9.42	K 671.4	90mm dia. PN10 HDPE pipe	nr	1					-	-		-
		For pipelines crossing Box culverts or culvert pipes over 2000mm width/dia. (measure total length), for:										
9.43	K 671.5	90mm dia. PN10 HDPE pipe	m	4					-	-		-
		Extra over to HDPE pipelaying, for reinstatement of:										
		Breaking up Temporary Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
9.44	K 711.1	HDPE up to and including 160mm dia.	m	40	n/a	n/a	n/a		n/a	n/a	n/a	
		Permanent Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
9.45	K 791.1	HDPE up to and including 160mm dia.	m	40	n/a	n/a	n/a		n/a	n/a	n/a	
		Permanent Reinstatement of Local Gravel Roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
9.46	K 731.1	HDPE up to and including 160mm dia.	m	60	n/a	n/a	n/a		n/a	n/a	n/a	
		Reinstatement of Concrete Surfaces										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
9.47	K 731.2	HDPE up to and including 160mm dia.	m	10	n/a	n/a	n/a		n/a	n/a	n/a	
9.48	K 731.3	Reinstatement of Pavings Surfaces (Provisional Quantity)	m^2	10	n/a	n/a	n/a		n/a	n/a	n/a	
		Total of Page BOQ - 87 to Page BOQ - 91 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 9 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Suppy and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Other Pipework Ancillaries										
9.49	K 820	Supply and fixing marker posts as per Dwg.No. ANP2/LC1/STD/TD/C/001	nr	22	n/a	n/a	n/a		n/a	n/a	n/a	
9.50	K 900.1	Supply and laying of marker tape Ref. drawing no. ANP2/LC1/STD/TD/C/002	m	18275								
		Testing										
		Pressure Testing of pipelines of										
9.51	K 900.2	160mm dia. PN10	m	1670	n/a	n/a	n/a		n/a	n/a	n/a	
9.52	K 900.3	110mm dia. PN10	m	2430	n/a	n/a	n/a		n/a	n/a	n/a	
9.53	K 900.4	90mm dia. PN10	m	14145	n/a	n/a	n/a		n/a	n/a	n/a	
9.54	K 900.5	63mm dia. PN10	m	30	n/a	n/a	n/a		n/a	n/a	n/a	
		Cleaning and Flushing for pipelines of:										
9.55	K 900.6	160mm dia. PN10	m	1670	n/a	n/a	n/a		n/a	n/a	n/a	
9.56	K 900.7	110mm dia. PN10	m	2430	n/a	n/a	n/a		n/a	n/a	n/a	
9.57	K 900.8	90mm dia. PN10	m	14145	n/a	n/a	n/a		n/a	n/a	n/a	
9.58	K 900.9	63mm dia. PN10	m	30	n/a	n/a	n/a		n/a	n/a	n/a	
		Disinfection for pipelines of:										
9.59	K 900.10	160mm dia. PN10	m	1670	n/a	n/a	n/a		n/a	n/a	n/a	
9.60	K 900.11	110mm dia. PN10	m	2430	n/a	n/a	n/a		n/a	n/a	n/a	
9.61	K 900.12	90mm dia. PN10	m	14145	n/a	n/a	n/a		n/a	n/a	n/a	
9.62	K 900.13	63mm dia. PN10	m	30	n/a	n/a	n/a		n/a	n/a	n/a	
		Total of Page BOQ - 88 to Page BOQ - 91 Summary							-	-	-	

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 9 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Suppy and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION										
		Extra over to pipelaying, for construction of pipelines across RDA and PRDA road Crossings, including special backfilling material and disposal of excavated material, (except for those crossings where RCP conduit has already been provided for installation of pipes), for:										
9.63	L 240.1	HDPE pipes of 90mm dia. and less	m	40					-	-		-
		Extra over to pipelaying, bedding, backfilling and surface reinstatement, for Type F construction across Causeway Crossings, as shown, for:										
		Ref : ANP2/LC1/STD/TD/C/011										
9.64	L 260.1	HDPE pipes of 160mm dia. and less	m	60	n/a	n/a	n/a		n/a	n/a	n/a	-
9.65	L 260.2	HDPE pipes of 90mm dia. and less	m	30	n/a	n/a	n/a		n/a	n/a	n/a	-
		Pipe Bedding										
		Ref : ANP2/LC1/STD/TD/C/003										
		Extra over to pipelaying for the supply and placement of 100mm Sand bedding, as shown, for DI / HDPE pipes in trench, for:										
9.66	L 310.1	HDPE pipes not exceeding 160mm dia.	m	18275	n/a	n/a	n/a		n/a	n/a	n/a	-
9.67	L 331	Extra over to pipelaying and normal bedding, for granular bedding as specified, for pipelines requiring Type G construction (in paddy field) (provisional quantity)	m^3	90	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 89 to Page BOQ - 91 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES

BILL NO. 9 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Suppy and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION (CONTD.)										
		Pipe Surround Backfilling										
		Placement of Pipe Surround backfilling, as shown, with suitable selected excavated material for DI / HDPE pipes in trench:										
9.68	L 520	HDPE pipes not exceeding 160mm dia.	m	18275	n/a	n/a	n/a		n/a	n/a	n/a	-
9.69	L 540	Extra over pipe surround backfilling, for supply and placement of concrete slab covers protection for HDPE pipes, where shown	m^2	10	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 90 to Page BOQ - 91 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO.: AN/PH II/JICA/DM/LOT C1
SUMMARY OF BILL NO.9

BILL NO. 9 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA — ANURADHAPURA NWSP - PHASE II

BOQ BILL NO.	PAGE TOTAL	TOTAL AMOUNT			
		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
		(e)	(f)	(g)	(h)
		CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
		Yen	LKR	LKR	LKR
Bill No. 9	Page BOQ - 81 of Bill No. 9	-	-	-	-
	Page BOQ - 82 of Bill No. 9	-	-	-	-
	Page BOQ - 83 of Bill No. 9	-	-	-	-
	Page BOQ - 84 of Bill No. 9	-	-	-	-
	Page BOQ - 85 of Bill No. 9	-	-	-	-
	Page BOQ - 86 of Bill No. 9	-	-	-	-
	Page BOQ - 87 of Bill No. 9		-	-	-
	Page BOQ - 88 of Bill No. 9	-	-	-	-
	Page BOQ - 89 of Bill No. 9	-	-	-	-
	Page BOQ - 90 of Bill No. 9	-	-	-	-
	TOTAL OF BILL NO. 9 CARRIED TO GRAND SUMMARY	-	-	-	-

"For References ONLY"
(Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		NOTE: Rates and Prices entered against BOQ items given hereunder shall be made in conjunction with Specifications, Drawings, General Requirements, Preamble to BOQ and Contractual requirements, not limited to the descriptions given in the captions. *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Outside the Employer's Country", his Rates & Prices shall be quoted only in Column No. (a), (b), (d), (e), (f) & (h) *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Within the Employer's Country", his Rates & Prices shall be quoted only in Column No. (c), (d), (g) & (h) CLASS I : PIPE WORK - PIPES PIPE WORK IN RDA / PRDA ROAD RESERVE HDPE PE100 - SDR 17 - PN10 welded pipes as specified 63mm HDPE pipes										
10.1	I 712.1	pipe in trench, depth not exceeding 1.5m	m	3328					-	-	-	-
		90mm HDPE pipes										
10.2	I 712.2	pipe in trench, depth not exceeding 1.5m	m	34600					-	-	-	-
10.3	I 713.1	pipe in trench, depth over 1.5m to 2.0m	m	2200					-	-	-	-
		Total of Page BOQ - 92 to Page BOQ - 109 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS I : PIPE WORK - PIPES (CONTD.)										
		110mm HDPE pipes										
10.4	I 712.3	pipe in trench, depth not exceeding 1.5m	m	10250								
10.5	I 713.2	pipe in trench, depth over 1.5m to 2.0m	m	610								
		160mm HDPE pipes										
10.6	I 712.4	pipe in trench, depth not exceeding 1.5m	m	16800								
10.7	I 713.3	pipe in trench, depth over 1.5m to 2.0m	m	1410								
		225mm HDPE pipes										
10.8	I 722.1	pipe in trench, depth not exceeding 1.5m	m	9920								
10.9	I 723.1	pipe in trench, depth over 1.5m to 2.0m	m	980								
		PIPE WORK IN LOCAL ROAD RESERVE										
		HDPE PE100 - SDR 17 - PN10 welded pipes as specified										
		63mm HDPE pipes										
10.1	I 712.5	pipe in trench, depth not exceeding 1.5m	m	13172								
		90mm HDPE pipes										
10.11	I 712.6	pipe in trench, depth not exceeding 1.5m	m	15640								
10.12	I 713.4	pipe in trench, depth over 1.5m to 2.0m	m	150								
		110mm HDPE pipes										
10.13	I 712.7	pipe in trench, depth not exceeding 1.5m	m	7810								
10.14	I 713.5	pipe in trench, depth over 1.5m to 2.0m	m	170								
		Total of Page BOQ - 93 to Page BOQ - 109 Summary										

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS I : PIPE WORK - PIPES (CONTD.)										
		160mm HDPE pipes										
10.15	I 712.8	pipe in trench, depth not exceeding 1.5m	m	4250								
10.16	I 713.6	pipe in trench, depth over 1.5m to 2.0m	m	200								
		CLASS J : PIPE WORK - FITTINGS AND VALVES										
		Extra over the above items for pipes for installation of fittings and valves										
		All HDPE Fittings shall be PE 100 - SDR 17 - for PN 10 pipes										
		HDPE PE100 PN10 Bends										
		90mm dia.										
10.17	J 611.1	22 ^{0}	nr	20								
10.18	J 611.2	45 ^{0}	nr	30								
		110mm dia.										
10.19	J 611.3	22 ^{0}	nr	5								
10.2	J 611.4	45 ^{0}	nr	5								
		160mm dia.										
10.21	J 611.5	22 ^{0}	nr	10								
10.22	J 611.6	45 ^{0}	nr	10								
		225mm dia.										
10.23	J612.1	22 ^{0}	nr	4								
10.24	J612.2	45 ^{0}	nr	2								
		Total of Page BOQ - 94 to Page BOQ - 109 Summary										

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES (CONTD.)										
		HDPE PE100 PN10 plain ended Level Invert Tees										
10.25	J 621.1	90mm x 90mm dia.	nr	20								
10.26	J 621.2	110mm x 90mm dia.	nr	15								
10.27	J 621.3	160mm x90mm dia.	nr	15								
10.28	J 622.1	225mm x90mm dia.	nr	15								
		HDPE PE100 PN10 plain ended Tees										
10.29	J 621.4	63x63mm dia.	nr	2								
10.30	J 621.5	90x63mm dia.	nr	45								
10.31	J 621.6	90x90mm dia.	nr	50								
10.32	J 621.7	110x63mm dia.	nr	22								
10.33	J 621.8	110x90mm dia.	nr	9								
10.34	J 621.9	110x110mm dia.	nr	3								
10.35	J 621.10	160x63mm dia.	nr	15								
10.36	J 621.11	160x90mm dia.	nr	11								
10.37	J 621.12	160x110mm dia.	nr	2								
10.38	J 621.13	160x160mm dia.	nr	5								
10.39	J 622.2	225x63mm dia.	nr	4								
10.4	J 622.3	225x90mm dia.	nr	9								
10.41	J 622.4	225x160mm dia.	nr	3								
10.42	J 622.5	225x225mm dia.	nr	5								
		Total of Page BOQ - 95 to Page BOQ - 109 Summary										

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES (CONTD.)										
		HDPE PE100 PN10 plain ended Reducers										
10.43	J 631.1	90-63mm dia.	nr	15								
10.44	J 631.2	110-90mm dia.	nr	15								
10.45	J 631.3	160-90mm dia.	nr	4								
10.46	J 631.4	160-110mm dia.	nr	6								
10.47	J 632.1	225-90mm dia.	nr	3								
10.48	J 632.2	225-110mm dia.	nr	2								
10.49	J 632.3	225-160mm dia.	nr	3								
		HDPE PE100 PN10 End Caps										
10.50	J 691.1	63mm dia.	nr	130								
10.51	J 691.2	90mm dia.	nr	80								
10.52	J 691.3	110mm dia.	nr	5								
10.53	J 691.4	160mm dia.	nr	5								
		DI double socket Tees, with flanged branch PN10/16										
10.54	J 321.1	80x80mm dia.	nr	20								
10.55	J 321.2	100x80mm dia.	nr	13								
10.56	J 321.3	150x80mm dia.	nr	14								
10.57	J 321.4	200x80mm dia.	nr	7								
		Total of Page BOQ - 96 to Page BOQ - 109 Summary										

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK										
		Valve Chambers										
		Rate to include extra over above items for pipelaying, for supply and installation of Valves, Flange Adaptor, couplings, flanged straight specials, pipe cutting, RC chamber, 600mm dia. heavy duty DI Class D-400 hinged type manhole cover, and all other items to complete as shown in the drawings.										
		Ref dwg no: ANP2/LC1/STD/TD/C/033										
10.58	K 232.1	80mm dia. PN10 Gate Valve Chamber	nr	16					-	-		-
10.59	K 232.2	100mm dia. PN10 Gate Valve Chamber	nr	15					-	-		-
10.60	K 232.3	150mm dia. PN10 Gate Valve Chamber	nr	19					-	-		-
10.61	K 232.4	200mm dia. PN10 Gate Valve Chamber	nr	8					-	-		-
		Air Valve Chambers (exclusive of above-ground bridge air valves)										
		Rate to include for supply and installation of isolation Gate valve, Air Valve as specified, flanged straight specials, blank flanges, tappings, RC chamber, ventilation pipes, ventilated type heavy duty DI Class D-400 hinged type DI access cover, and all appurtenances to complete as shown in the drawings. The tee is included under the item for tees.										
		Ref drawing No: ANP2/LC1/STD/TD/C/031										
10.62	K 232.5	50mm dia. single orifice air valve (Type A)	nr	53					-	-		-
		Total of Page BOQ - 97 to Page BOQ - 109 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Washout Valve Arrangements										
		Rate to include for supply and installation of Gate valve, Flange Adaptor, flanged straight specials, HDPE fittings, RC chamber, ventilated type heavy duty DI Class D-400 hinged type access cover, or DI Surface Box and concrete surround as detailed, washout outlet pipe, and all appurtencances to complete as shown in the drawings (excluding washout tee, which is covered under tees)										
		Ref drawing No: ANP2/LC1/STD/TD/C/034										
10.63	K 232.6	80 mm dia. washout	nr	60					-	-		-
		Outlet Arrangements										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/034										
10.64	K 232.7	Type 'A'	nr	60	n/a	n/a	n/a		n/a	n/a	n/a	-
10.64.1	K 232.8	Manholes for Washouts (Provisional Quantity)	nr	5					-	-		-
		Total of Page BOQ - 98 to Page BOQ - 109 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Gate Valve and Surface Boxes, as detailed										
		Rate to include extra over the above items for pipelaying, for supply and installation of Gate valve, spindle cap, Flange Adaptor, flanged straight specials, 150x150mm DI Surface Box, concrete surface surround, riser pipe, foundation for riser, and all items to complete as shown in the drawings.										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/038										
10.65	K 272.1	80mm dia. flanged gate valve	nr	10					-	-		-
10.66	K 272.2	50mm dia. flanged gate valve	nr	2					-	-		-
		Total of Page BOQ - 99 to Page BOQ - 109 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		CULVERT CROSSINGS										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction for all necessary pipes, fittings, couplings, concrete or steel sleeve protection, and all other items to complete as shown in the drawings.										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037										
		Culvert Crossing Type 'D', only for culvert pipes or box culverts greater than 450mm width or diameter and 450mm height, as specified and shown on the Drawings, for:										
		For pipelines crossing Box culverts or culvert pipes over 450mm width/dia. but less than 900mm width, for:										
10.67	K 671.1	225mm dia. PN10 HDPE pipe	nr	23						-		-
10.68	K 671.2	160mm dia. PN10 HDPE pipe	nr	49						-		-
10.69	K 671.3	110mm dia. PN10 HDPE pipe	nr	29						-		-
10.70	K 671.4	90mm dia. PN10 HDPE pipe	nr	101						-		-
		Total of Page BOQ - 100 to Page BOQ - 109 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		For pipelines crossing Box culverts or culvert pipes over 900mm width/dia. but less than 1500mm width, for:										
10.71	K 671.5	225mm dia. PN10 HDPE pipe	nr	8								
10.72	K 671.6	160mm dia. PN10 HDPE pipe	nr	16								
10.73	K 671.7	110mm dia. PN10 HDPE pipe	nr	18								
10.74	K 671.8	90mm dia. PN10 HDPE pipe	nr	24								
		For pipelines crossing Box culverts or culvert pipes over 1500mm width/dia. but less than 2000mm width, for:										
10.75	K 671.9	225mm dia. PN10 HDPE pipe	nr	9								
10.76	K 671.10	160mm dia. PN10 HDPE pipe	nr	6								
10.77	K 671.11	110mm dia. PN10 HDPE pipe	nr	8								
10.78	K 671.12	90mm dia. PN10 HDPE pipe	nr	15								
		For pipelines crossing Box culverts or culvert pipes over 2000mm width/dia. (measure total length), for:										
10.79	K 671.13	225mm dia. PN10 HDPE pipe	m	18								
10.80	K 671.14	160mm dia. PN10 HDPE pipe	m	11								
10.81	K 671.15	110mm dia. PN10 HDPE pipe	m	11								
10.82	K 671.16	90mm dia. PN10 HDPE pipe	nr	21								
		Total of Page BOQ - 101 to Page BOQ - 109 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Culvert Crossing Type 'B', only for culvert pipes or box culverts greater than 450mm width or diameter and 450mm height, as specified and shown on the Drawings, for:										
		For pipelines crossing Box culverts or culvert pipes over 450mm width/dia. but less than 900mm width, for:										
10.83	K 671.17	90mm dia. PN10 HDPE pipe	nr	1								
		For pipelines crossing Box culverts or culvert pipes over 900mm width/dia. but less than 1500mm width, for:										
10.84	K 671.18	110mm dia. PN10 HDPE pipe	nr	2								
		Culvert Crossing Type 'C'										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction of culvert crossings, including all necessary pipes, fittings, flange-stub connectors, HDPE welds, flanged pipe specials,steel backing rings, and all other items to complete as shown in the drawings, for:										
10.85	K 671.19	DN100 dia DI pipe	nr	1								
		Total of Page BOQ - 102 to Page BOQ - 109 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Culvert Crossing Type 'E'										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037 & ANP2/LC1/STD/TD/C/012										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction of bridge crossings, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, couplings, flange-stub connectors, HDPE welds, flanged pipe specials, concrete supports and foundations, piles, steel brackets, and all other items to complete the self-supporting pipe-bridges as shown in the drawings, for:										
10.86	K 631.1	DN80 PN10 DI pipes, 12 to 14m pipe-bridge at Ch.7385	nr	1					-	-		-
10.87	K 631.2	DN100 PN10 DI pipes, 10 to 12m pipe-bridge at Ch.3310	nr	1					-	-		-
10.88	K 631.3	DN100 PN10 DI pipes, 8 to 10m pipe-bridge at Ch.2610	nr	2					-	-		-
10.89	K 621.1	DN150 PN10 DI pipes, 3 to 5m pipe-bridge at Ch.4025	nr	1					-	-		-
10.90	K 621.2	DN150 PN10 DI pipes, 4 to 6m pipe-bridge at Ch.6475	nr	2					-	-		-
10.91	K 621.3	DN150 PN10 DI pipes, 4 to 6m pipe-bridge at Ch.7600	nr	1					-	-		-
10.92	K 621.4	DN200 PN10 DI pipes, 4 to 6m pipe-bridge at Ch.255	nr	1					-	-		-
10.93	K 621.5	DN200 PN10 DI pipes, 5 to 7m pipe-bridge at Ch.6580	nr	1					-	-		-
		Total of Page BOQ - 103 to Page BOQ - 109 Summary							-	-	-	-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Bridge Crossings										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction of bridge crossings, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, dismantling joints, couplings, all other flanged pipe specials, flange-stub connectors, HDPE welds, concrete foundations, piles and column supports, steel trusses, steel brackets, and all other items to complete as shown in the drawings, for:										
10.94	K 631.4	200mm dia. PN10 DI pipes on bridge crossing Ch.5104 (Ref Drawing No. ANP2/LC1/51/BC4/C/001)	LS	Item					-	-	-	-
10.95	K 631.5	200mm dia. PN10 DI pipes on bridge crossing Ch.4930 (Ref Drawing No. ANP2/LC1/51/BC3/C/001)	LS	Item					-	-	-	-
10.96	K 631.6	200mm dia. PN10 DI pipes on bridge crossing Ch.5282 (Ref Drawing No. ANP2/LC1/51/BC2/C/001)	LS	Item					-	-	-	-
10.97	K 631.7	80mm dia. PN10 DI pipes on bridge crossing Ch.750 (Ref Drawing No. ANP2/LC1/51/BC1/C/001)	LS	Item					-	-	-	-
		Extra over to HDPE pipelaying, for reinstatement of:										
		Breaking up Temporary Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
10.98	K 711.1	HDPE up to and including 225mm dia.	m	310	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 104 to Page BOQ - 109 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Permanent Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
10.99	K 791.1	HDPE up to and including 225mm dia.	m	310	n/a	n/a	n/a		n/a	n/a	n/a	-
		Breaking up,Temporary Reinstatement of Asphalt paved local roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
10.100	K 711.2	HDPE up to and including 225mm dia.	m	40	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of Asphalt paved local roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
10.101	K 791.2	HDPE up to and including 225mm dia.	m	40	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of Gravel Roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
10.102	K 731.1	HDPE up to and including 225mm dia.	m	420	n/a	n/a	n/a		n/a	n/a	n/a	-
		Reinstatement of Concrete Surfaces										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
10.103	K 731.2	HDPE up to and including 225mm dia. (Provisional Quantity)	m	20	n/a	n/a	n/a		n/a	n/a	n/a	-
10.104	K 731.3	Reinstatement of Pavings Surfaces	m^2	15	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 105 to Page BOQ - 109 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA — ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Other Pipework Ancillaries										
10.105	K 820	Supply and fixing marker posts as per Dwg.No. ANP2/LC1/STD/TD/C/001	nr	183	n/a	n/a	n/a		n/a	n/a	n/a	
10.106	K 900.1	Supply and laying of marker tape Ref. drawing no. ANP2/LC1/STD/TD/C/002	m	121500					-	-		
		Testing										
		Pressure Testing of pipelines of										
10.107	K 900.2	225mm dia. PN10	m	10910	n/a	n/a	n/a		n/a	n/a	n/a	
10.108	K 900.3	160mm dia. PN10	m	22660	n/a	n/a	n/a		n/a	n/a	n/a	
10.109	K 900.4	110mm dia. PN10	m	18840	n/a	n/a	n/a		n/a	n/a	n/a	
10.110	K 900.5	90mm dia. PN10	m	52590	n/a	n/a	n/a		n/a	n/a	n/a	
10.111	K 900.6	63mm dia. PN10	m	16500	n/a	n/a	n/a		n/a	n/a	n/a	
		Cleaning and Flushing for pipelines of:										
10.112	K 900.7	225mm dia. PN10	m	10910	n/a	n/a	n/a		n/a	n/a	n/a	
10.113	K 900.8	160mm dia. PN10	m	22660	n/a	n/a	n/a		n/a	n/a	n/a	
10.114	K 900.9	110mm dia. PN10	m	18840	n/a	n/a	n/a		n/a	n/a	n/a	
10.115	K 900.10	90mm dia. PN10	m	52590	n/a	n/a	n/a		n/a	n/a	n/a	
10.116	K 900.11	63mm dia. PN10	m	16500	n/a	n/a	n/a		n/a	n/a	n/a	
		Total of Page BOQ - 106 to Page BOQ - 109 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Disinfection for pipelines of:										
10.117	K 900.12	225mm dia. PN10	m	10910	n/a	n/a	n/a		n/a	n/a	n/a	-
10.118	K 900.13	160mm dia. PN10	m	22660	n/a	n/a	n/a		n/a	n/a	n/a	-
10.119	K 900.14	110mm dia. PN10	m	18840	n/a	n/a	n/a		n/a	n/a	n/a	-
10.120	K 900.15	90mm dia. PN10	m	52590	n/a	n/a	n/a		n/a	n/a	n/a	-
10.121	K 900.16	63mm dia. PN10	m	16500	n/a	n/a	n/a		n/a	n/a	n/a	-
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION										
		Extra over to pipelaying, for construction of pipelines across RDA and PRDA road Crossings, including special backfilling material and disposal of excavated material, (except for those crossings where RCP conduit has already been provided for installation of pipes), for:										
10.122	L 240.1	HDPE pipes of 160mm dia. and less	m	310						-		-
10.123	L 240.2	HDPE pipes of 225mm dia.	m	15						-		-
		Extra over to pipelaying, bedding, backfilling and surface reinstatement, for Type F construction across Causeway Crossings, as shown, for:										
		Ref : ANP2/LC1/STD/TD/C/011										
10.124	L 260.1	HDPE pipes of 160mm dia. and less	m	135	n/a	n/a	n/a		n/a	n/a	n/a	-
10.125	L 260.2	HDPE pipes of 225mm dia.	m	10	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 107 to Page BOQ - 109 Summary								-		-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION (CONTD.)										
		Pipe Bedding										
		Ref : ANP2/LC1/STD/TD/C/003										
		Extra over to pipelaying for the supply and placement of 100mm Sand bedding, as shown, for DI / HDPE pipes in trench, for:										
10.126	L 311	HDPE pipes not exceeding 160mm dia.	m	110590	n/a	n/a	n/a		n/a	n/a	n/a	-
10.127	L 312	HDPE pipes 225mm dia.	m	10910	n/a	n/a	n/a		n/a	n/a	n/a	-
10.128	L 310	Extra over to pipelaying and normal bedding construction, for the provision of 200mm thick sand bedding for pipelines requiring Type B construction (in rock)	m^3	25	n/a	n/a	n/a		n/a	n/a	n/a	-
10.129	L 331	Extra over to pipelaying and normal bedding, for granular bedding as specified, for pipelines requiring Type G construction (in paddy field) (provisional quantity)	m^3	710	n/a	n/a	n/a		n/a	n/a	n/a	-
		Pipe Surround Backfilling										
		Placement of Pipe Surround backfilling, as shown, with suitable selected excavated material for DI / HDPE pipes in trench:										
10.130	L 521	HDPE pipes not exceeding 160mm dia.	m	110590	n/a	n/a	n/a		n/a	n/a	n/a	-
10.131	L 522	HDPE pipes 225mm dia.	m	10910	n/a	n/a	n/a		n/a	n/a	n/a	-
10.132	L 540	Extra over pipe surround backfilling, for supply and placement of concrete slab covers protection for HDPE pipes, where shown	m^2	60	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 108 to Page BOQ - 109 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

SUMMARY OF BILL NO.10

BILL NO. 10 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA

ANURADHAPURA NWSP - PHASE II

BOQ BILL NO.	PAGE TOTAL	TOTAL AMOUNT			
		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
		(e)	(f)	(g)	(h)
		CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
		Yen	LKR	LKR	LKR
Bill No. 10	Page BOQ - 92 of Bill No. 10	-	-	-	-
	Page BOQ - 93 of Bill No. 10	-	-	-	-
	Page BOQ - 94 of Bill No. 10	-	-	-	-
	Page BOQ - 95 of Bill No. 10	-	-	-	-
	Page BOQ - 96 of Bill No. 10	-	-	-	-
	Page BOQ - 97 of Bill No. 10	-	-	-	-
	Page BOQ - 98 of Bill No. 10	-	-	-	-
	Page BOQ - 99 of Bill No. 10	-	-	-	-
	Page BOQ - 100 of Bill No. 10	-	-	-	-
	Page BOQ - 101 of Bill No. 10	-	-	-	-
	Page BOQ - 102 of Bill No. 10	-	-	-	-
	Page BOQ - 103 of Bill No. 10	-	-	-	-
	Page BOQ - 104 of Bill No. 10	-	-	-	-
	Page BOQ - 105 of Bill No. 10	-	-	-	-
	Page BOQ - 106 of Bill No. 10	-	-	-	-
	Page BOQ - 107 of Bill No. 10	-	-	-	-
	Page BOQ - 108 of Bill No. 10	-	-	-	-
	TOTAL OF BILL NO. 10 CARRIED TO GRAND SUMMARY	-	-	-	-

"For References ONLY" (Not for Bidding)

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		NOTE: Rates and Prices entered against BOQ items given hereunder shall be made in conjunction with Specifications, Drawings, General Requirements, Preamble to BOQ and Contractual requirements, not limited to the descriptions given in the captions. *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Outside the Employer's Country", his Rates & Prices shall be quoted only in Column No. (a), (b), (d), (e), (f) & (h) *If the Bidder intends to supply the Pipeline Materials (HDPE/DI Pipes & Fittings, Valves & Accessories etc.) on the basis of "Within the Employer's Country", his Rates & Prices shall be quoted only in Column No. (c), (d), (g) & (h) CLASS I : PIPE WORK - PIPES PIPE LAYING IN RDA / PRDA ROAD RESERVE HDPE PE100 - SDR 17 - PN10 welded pipes as specified 63mm HDPE pipes											
11.1	I 712.1	pipe in trench, depth not exceeding 1.5m	m	25					-	-		-
		Total of Page BOQ - 110 to Page BOQ - 125 Summary							-	-	-	-

"For References ONLY"
(Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS I : PIPE WORK - PIPES (CONTD.)										
		90mm HDPE pipes										
11.2	I 712.2	pipe in trench, depth not exceeding 1.5m	m	9595								
11.3	I 713.1	pipe in trench, depth over 1.5m to 2.0m	m	850								
		110mm HDPE pipes										
11.4	I 712.3	pipe in trench, depth not exceeding 1.5m	m	4550								
11.5	I 713.2	pipe in trench, depth over 1.5m to 2.0m	m	510								
		160mm HDPE pipes										
11.6	I 712.4	pipe in trench, depth not exceeding 1.5m	m	13050								
11.7	I 713.3	pipe in trench, depth over 1.5m to 2.0m	m	1500								
		225mm HDPE pipes										
11.8	I 722.1	pipe in trench, depth not exceeding 1.5m	m	1310								
11.9	I 723.1	pipe in trench, depth over 1.5m to 2.0m	m	130								
		63mm HDPE pipes										
11.1	I 712.5	pipe in trench, depth not exceeding 1.5m	m	250								
		Total of Page BOQ - 111 to Page BOQ - 125 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS I : PIPE WORK - PIPES (CONTD.)										
		PIPE LAYING IN LOCAL ROAD RESERVE										
		HDPE PE100 - SDR 17 - PN10 welded pipes as specified										
		90mm HDPE pipes										
11.11	I 712.6	pipe in trench, depth not exceeding 1.5m	m	15910								
11.12	I 713.4	pipe in trench, depth over 1.5m to 2.0m	m	210								
		110mm HDPE pipes										
11.13	I 712.7	pipe in trench, depth not exceeding 1.5m	m	7950								
11.14	I 713.5	pipe in trench, depth over 1.5m to 2.0m	m	180								
		CLASS J : PIPE WORK - FITTINGS AND VALVES										
		Extra over the above items for pipes for installation of fittings and valves										
		All HDPE Fittings shall be PE 100 - SDR 17 - for PN 10 pipes										
		HDPE PE100 PN10 Bends										
		90mm dia.										
11.15	J 611.1	22 ^{0}	nr	20								
11.16	J 611.2	45 ^{0}	nr	40								
		110mm dia.										
11.17	J 611.3	22 ^{0}	nr	10								
11.18	J 611.4	45 ^{0}	nr	5								
		160mm dia.										
11.19	J 611.5	22 ^{0}	nr	12								
11.20	J 611.6	45 ^{0}	nr	8								
		Total of Page BOQ - 112 to Page BOQ - 125 Summary										

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES (CONTD.)										
		HDPE PE100 PN10 plain ended Level Invert Tees										
11.21	J 621.1	90mm x 90mm dia.	nr	6					-	-	-	-
11.22	J 621.2	110mm x 90mm dia.	nr	10					-	-	-	-
11.23	J 621.3	160mm x90mm dia.	nr	12					-	-	-	-
		HDPE PE100 PN10 plain ended Tees										
11.24	J 621.4	63x63mm dia.	nr	2					-	-	-	-
11.25	J 621.5	90x63mm dia.	nr	35					-	-	-	-
11.26	J 621.6	90x90mm dia.	nr	25					-	-	-	-
11.27	J 621.7	110x63mm dia.	nr	18					-	-	-	-
11.28	J 621.8	110x90mm dia.	nr	7					-	-	-	-
11.29	J 621.9	110x110mm dia.	nr	4					-	-	-	-
11.30	J 621.10	160x63mm dia.	nr	8					-	-	-	-
11.31	J 621.11	160x90mm dia.	nr	19					-	-	-	-
11.32	J 621.12	160x160mm dia.	nr	1					-	-	-	-
11.33	J 622.1	225x160mm dia.	nr	2					-	-	-	-
		HDPE PE100 PN10 plain ended Reducers										
11.34	J 631.1	90-63mm dia.	nr	15					-	-	-	-
11.35	J 631.2	110-63mm dia.	nr	5					-	-	-	-
11.36	J 631.3	110-90mm dia.	nr	5					-	-	-	-
11.37	J 631.4	160-90mm dia.	nr	2					-	-	-	-
11.38	J 631.5	160-110mm dia.	nr	5					-	-	-	-
11.39	J 632.1	225-160mm dia.	nr	2					-	-	-	-
		Total of Page BOQ - 113 to Page BOQ - 125 Summary							-	-	-	-

"For References ONLY"
(Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS J : PIPE WORK - FITTINGS AND VALVES (CONTD.)										
		HDPE PE100 PN10 End Caps										
11.40	J 691.1	63mm dia.	nr	75								
11.41	J 691.2	90mm dia.	nr	47								
11.42	J 691.3	110mm dia.	nr	2								
11.43	J 691.4	160mm dia.	nr	2								
		DI double socket Tees, with flanged branch PN10/16										
11.44	J 321.1	80x80mm dia.	nr	7								
11.45	J 321.2	100x80mm dia.	nr	5								
11.46	J 321.3	150x80mm dia.	nr	11								
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES										
		Valve Chambers										
		Rate to include extra over above items for pipelaying, for supply and installation of Valves, Flange Adaptor, couplings, flanged straight specials, pipe cutting, RC chamber, 600mm dia. heavy duty DI Class D-400 hinged type manhole cover, and all other items to complete as shown in the drawings.										
		Ref dwg no: ANP2/LC1/STD/TD/C/033										
11.47	K 232.1	80mm dia. PN10 Gate Valve Chamber	nr	6								
11.48	K 232.2	100mm dia. PN10 Gate Valve Chamber	nr	4								
11.49	K 232.3	150mm dia. PN10 Gate Valve Chamber	nr	11								
		Total of Page BOQ - 114 to Page BOQ - 125 Summary							-	-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Air Valve Chambers (exclusive of above-ground bridge air valves)										
		Rate to include for supply and installation of isolation Gate valve, Air Valve as specified, flanged straight specials, blank flanges, tappings, RC chamber, ventilation pipes, ventilated type heavy duty DI Class D-400 hinged type DI access cover, and all appurtenances to complete as shown in the drawings. The tee is included under the item for tees.										
		Ref drawing No: ANP2/LC1/STD/TD/C/031										
11.50	K 232.4	50mm dia. single orifice air valve (Type A)	nr	21					-	-		-
		Type C , offset to the side of te main pipeline air valves which are offset to the side of the main pipeline (Provisional										
11.51	K 232.5	50mm dia. single orifice air valve	nr	1					-	-		-
		Washout Valve Arrangements										
		Rate to include for supply and installation of Gate valve, Flange Adaptor, flanged straight specials, HDPE fittings, RC chamber, ventilated type heavy duty DI Class D-400 hinged type access cover, or DI Surface Box and concrete surround as detailed, washout outlet pipe, and all appurtencances to complete as shown in the drawings (excluding washout tee, which is covered under tees)										
		Ref drawing No: ANP2/LC1/STD/TD/C/034										
11.52	K 232.6	80 mm dia. washout	nr	26					-	-		-
		Total of Page BOQ - 115 to Page BOQ - 125 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Outlet Chambers										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/034										
11.53	K 232.7	Type 'A'	nr	26	n/a	n/a	n/a		n/a	n/a	n/a	-
		Gate Valve and Surface Boxes, as detailed										
		Rate to include extra over the above items for pipelaying, for supply and installation of Gate valve, spindle cap, Flange Adaptor, flanged straight specials, 150x150mm DI Surface Box, concrete surface surround, riser pipe, foundation for riser, and all items to complete as shown in the drawings.										
		Complete as shown in drawing No: ANP2/LC1/STD/TD/C/038										
11.54	K 272.1	100mm dia. flanged gate valve	nr	4					-	-		-
11.55	K 272.2	80mm dia. flanged gate valve	nr	11					-	-		-
11.56	K 272.3	50mm dia. flanged gate valve	nr	2					-	-		-
		Total of Page BOQ - 116 to Page BOQ - 125 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		CULVERT CROSSINGS										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction for all necessary pipes, fittings, couplings, concrete or steel sleeve protection, and all other items to complete as shown in the drawings.										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037										
		Culvert Crossing Type 'D', only for culvert pipes or box culverts greater than 450mm width or diameter and 450mm height, as specified and shown on the Drawings, for:										
		For pipelines crossing Box culverts or culvert pipes over 450mm width/dia. but less than 900mm width, for:										
11.57	K 671.1	225mm dia. PN10 HDPE pipe	nr	6					-	-	-	-
11.58	K 671.2	160mm dia. PN10 HDPE pipe	nr	30					-	-	-	-
11.59	K 671.3	110mm dia. PN10 HDPE pipe	nr	37					-	-	-	-
11.60	K 671.4	90mm dia. PN10 HDPE pipe	nr	38					-	-	-	-
		Total of Page BOQ - 117 to Page BOQ - 125 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		For pipelines crossing Box culverts or culvert pipes over 900mm width/dia. but less than 1500mm width, for:										
11.61	K 671.5	160mm dia. PN10 HDPE pipe	nr	14								
11.62	K 671.6	110mm dia. PN10 HDPE pipe	nr	3								
11.63	K 671.7	90mm dia. PN10 HDPE pipe	nr	5								
		For pipelines crossing Box culverts or culvert pipes over 1500mm width/dia. but less than 2000mm width, for:										
11.64	K 671.8	160mm dia. PN10 HDPE pipe	nr	14								
11.65	K 671.9	110mm dia. PN10 HDPE pipe	nr	4								
11.66	K 671.10	90mm dia. PN10 HDPE pipe	nr	6								
		For pipelines crossing Box culverts or culvert pipes over 2000mm width/dia. (measure total length), for:										
11.67	K 671.11	160mm dia. PN10 HDPE pipe	m	3								
11.68	K 671.12	110mm dia. PN10 HDPE pipe	m	3								
11.69	K 671.13	90mm dia. PN10 HDPE pipe	nr	3								
		Culvert Crossing Type 'B', only for culvert pipes or box culverts greater than 450mm width or diameter and 450mm height, as specified and shown on the Drawings, for:										
		For pipelines crossing Box culverts or culvert pipes over 450mm width/dia. but less than 900mm width, for:										
11.70	K 671.14	110mm dia. PN10 HDPE pipe	nr	1								
		Total of Page BOQ - 118 to Page BOQ - 125 Summary										

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Pipe Installation "On Supports"										
		Ref Drawing No. ANP2/LC1/STD/TD/C/10										
		Extra over the above items for the installation of pipelines, for the Supply, installation and construction of pipes on column supports, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, dismantling joints, couplings, flanged pipe specials, flange-stub connectors, HDPE welds, steel brackets, and all other items to complete as shown in the drawings (the column supports are included under Item K688), for:										
11.71	K 680	DN150 PN10 DI pipes, on supports Ch.3805 to 3908 (WEE 1 - WEE - 2)	m	103					-	-		-
		Extra over the above items for the installation of pipelines and for pipelines "on-supports" for the Supply and construction of the column supports, including all necessary foundation measures, reinforced concrete columns and/or pile lengths, and all other items to complete as shown in the drawings, for column and/or pile supports of combined above-ground and embedded underground depth from foundation level to invert, of:										
11.72	K 688	Upto but not exceeding 1.50m, for, 150mm dia. DI pipeline	nr	16	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 119 to Page BOQ - 125 Summary							-	-	-	-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Culvert Crossing Type 'E'										
		Ref Drawing No. ANP2/LC1/STD/TD/C/037 & ANP2/LC1/STD/TD/C/012										
		Extra over the above items for the installation of pipelines for the Supply, installation and construction of bridge crossings, including all necessary pipes, fittings, flanged bends, tees, air valve and isolation valve, couplings, flange-stub connectors, HDPE welds, flanged pipe specials, concrete supports and foundations, piles, steel brackets, and all other items to complete the self-supporting pipe-bridges as shown in the drawings, for:										
11.73	K 621.1	DN150 PN10 DI pipes, 6 to 8m pipe-bridge at Ch.11050 (WEE 19-WEE 20)	nr	2					-	-	-	-
11.74	K 631.1	DN100 PN10 DI pipes, 8 to 10m pipe-bridge at Ch.4400 (WEE 13-WEE 14)	nr	2					-	-	-	-
		Extra over to HDPE pipelaying, for reinstatement of:										
		Breaking up Temporary Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
11.75	K 711.1	HDPE up to and including 225mm dia.	m	140	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 120 to Page BOQ - 125 Summary							-	-	-	-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

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ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Permanent Reinstatement of RDA/ PRDA Carriageway, for pipes of:										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
11.76	K 791.1	HDPE up to and including 225mm dia.	m	140	n/a	n/a	n/a		n/a	n/a	n/a	-
		Temporary Reinstatement of Asphalt paved local roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
11.77	K 711.2	HDPE up to and including 225mm dia.	m	20	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of Asphalt paved local roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
11.78	K 791.2	HDPE up to and including 225mm dia.	m	20	n/a	n/a	n/a		n/a	n/a	n/a	-
		Permanent Reinstatement of Gravel Roads										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
11.79	K 731.1	HDPE up to and including 225mm dia.	m	240	n/a	n/a	n/a		n/a	n/a	n/a	-
		Reinstatement of Concrete Surfaces										
		Ref Drawing No. ANP2/LC1/STD/TD/C/002										
11.80	K 731.2	HDPE up to and including 225mm dia. (Provisional Quantity)	m	10	n/a	n/a	n/a		n/a	n/a	n/a	-
11.81	K 731.3	Reinstatement of Pavings Surfaces	m^2	10	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 121 to Page BOQ - 125 Summary							-	-	-	-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS K : PIPE WORK - MANHOLES AND PIPE WORK ANCILLARIES (CONTD.)										
		Other Pipework Ancillaries										
11.82	K 820	Supply and fixing marker posts as per Dwg.No. ANP2/LC1/STD/TD/C/001	nr	86	n/a	n/a	n/a		n/a	n/a	n/a	
11.83	K 900.1	Supply and laying of marker tape Ref. drawing no. ANP2/LC1/STD/TD/C/002	m	56020								
		Testing										
		Pressure Testing of HDPE pipelines, of										
11.84	K 900.2	225mm dia. PN10	m	1440	n/a	n/a	n/a		n/a	n/a	n/a	
11.85	K 900.3	160mm dia. PN10	m	14550	n/a	n/a	n/a		n/a	n/a	n/a	
11.86	K 900.4	110mm dia. PN10	m	13190	n/a	n/a	n/a		n/a	n/a	n/a	
11.87	K 900.5	90mm dia. PN10	m	26565	n/a	n/a	n/a		n/a	n/a	n/a	
11.88	K 900.6	63mm dia. PN10	m	275	n/a	n/a	n/a		n/a	n/a	n/a	
		Cleaning and Flushing for pipelines of:										
11.89	K 900.7	225mm dia. PN10	m	1440	n/a	n/a	n/a		n/a	n/a	n/a	
11.90	K 900.8	160mm dia. PN10	m	14550	n/a	n/a	n/a		n/a	n/a	n/a	
11.91	K 900.9	110mm dia. PN10	m	13190	n/a	n/a	n/a		n/a	n/a	n/a	
11.92	K 900.10	90mm dia. PN10	m	26565	n/a	n/a	n/a		n/a	n/a	n/a	
11.93	K 900.11	63mm dia. PN10	m	275	n/a	n/a	n/a		n/a	n/a	n/a	
		Disinfection for pipelines, of:										
11.94	K 900.12	225mm dia. PN10	m	1440	n/a	n/a	n/a		n/a	n/a	n/a	
11.95	K 900.13	160mm dia. PN10	m	14550	n/a	n/a	n/a		n/a	n/a	n/a	
11.96	K 900.14	110mm dia. PN10	m	13190	n/a	n/a	n/a		n/a	n/a	n/a	
11.97	K 900.15	90mm dia. PN10	m	26565	n/a	n/a	n/a		n/a	n/a	n/a	
11.98	K 900.16	63mm dia. PN10	m	275	n/a	n/a	n/a		n/a	n/a	n/a	
		Total of Page BOQ - 122 to Page BOQ - 125 Summary							-	-	-	-

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE — **ANURADHAPURA NWSP- PHASE II**

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION										
		Extra over to pipelaying, for construction of pipelines across RDA and PRDA road Crossings, including special backfilling material and disposal of excavated material, (except for those crossings where RCP conduit has already been provided for installation of pipes), for:										
11.99	L 240.1	HDPE pipes of 160mm dia. and less	m	140								-
11.100	L 240.2	HDPE pipes of 225mm dia.	m	10								-
		Extra over to pipelaying, bedding, backfilling and surface reinstatement, for Type F construction across Causeway Crossings, as shown, for:										
		Ref : ANP2/LC1/STD/TD/C/011										
11.101	L 260	HDPE pipes of 160mm dia. and less	m	200	n/a	n/a	n/a		n/a	n/a	n/a	-
		Pipe Bedding										
		Ref : ANP2/LC1/STD/TD/C/003										
		Extra over to pipelaying for the supply and placement of 100mm Sand bedding, as shown, for DI / HDPE pipes in trench, for:										
11.102	L 311	HDPE pipes not exceeding 160mm dia.	m	54580	n/a	n/a	n/a		n/a	n/a	n/a	-
11.103	L 312.1	HDPE pipes 225mm dia.	m	1440	n/a	n/a	n/a		n/a	n/a	n/a	-
11.104	L 310	Extra over to pipelaying and normal bedding construction, for the provision of 200mm thick sand bedding for pipelines requiring Type B construction (in rock)	m^3	30	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 123 to Page BOQ - 125 Summary								-	-	-

"For References ONLY" (Not for Bidding)

* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS

CONTRACT NO: AN/PH II/JICA/DM/LOT C1

BILL OF QUANTITIES

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP- PHASE II

ITEM No.	CESMM3 Code No.	DESCRIPTION	UNIT	QTY	RATE				TOTAL AMOUNT			
					Supplied from Outside the Employer's Country		Supplied from within the Employer's Country		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
					(a)	(b)	(c)		(e)	(f)	(g)	
					CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(d) Installation & all Other Civil Works	CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	(h) Installation & all Other Civil Works
					Yen	LKR	LKR	LKR	Yen	LKR	LKR	LKR
		CLASS L : PIPEWORK - ANCILLARIES TO LAYING AND EXCAVATION (CONTD.)										
11.105	L 331	Extra over to pipelaying and normal bedding, for granular bedding as specified, for pipelines requiring Type G construction (in paddy field) (provisional quantity)	m^3	650	n/a	n/a	n/a		n/a	n/a	n/a	-
		Pipe Surround Backfilling										
		Placement of Pipe Surround backfilling, as shown, with suitable selected excavated material for DI / HDPE pipes in trench:										
11.106	L 521	HDPE pipes not exceeding 160mm dia.	m	54580	n/a	n/a	n/a		n/a	n/a	n/a	-
11.107	L 522	HDPE pipes 225mm dia.	m	1440	n/a	n/a	n/a		n/a	n/a	n/a	-
11.108	L 531	Extra over pipe surround backfilling, for placing imported material for pipe surround (Type C) (provisional quantity)	m^3	220	n/a	n/a	n/a		n/a	n/a	n/a	-
11.109	L 590	Extra over pipe surround backfilling, for supply and placing Geotextile wrapping protection (provisional quantity)	m^2	1700	n/a	n/a	n/a		n/a	n/a	n/a	-
11.110	L 540	Extra over pipe surround backfilling, for supply and placement of concrete slab covers protection for HDPE pipes, where shown	m^2	40	n/a	n/a	n/a		n/a	n/a	n/a	-
		Total of Page BOQ - 124 to Page BOQ - 125 Summary							-	-	-	-

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* 'n/a' - not applicable

ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II

SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO.: AN/PH II/JICA/DM/LOT C1

SUMMARY OF BILL NO.11

BILL NO. 11 : SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE

ANURADHAPURA NWSP - PHASE II

BOQ BILL NO.	PAGE TOTAL	TOTAL AMOUNT			
		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
		(e)	(f)	(g)	(h)
		CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
		Yen	LKR	LKR	LKR
Bill No. 11	Page BOQ - 110 of Bill No. 11	-	-	-	-
	Page BOQ - 111 of Bill No. 11	-	-	-	-
	Page BOQ - 112 of Bill No. 11	-	-	-	-
	Page BOQ - 113 of Bill No. 11	-	-	-	-
	Page BOQ - 114 of Bill No. 11	-	-	-	-
	Page BOQ - 115 of Bill No. 11	-	-	-	-
	Page BOQ - 116 of Bill No. 11	-	-	-	-
	Page BOQ - 117 of Bill No. 11	-	-	-	-
	Page BOQ - 118 of Bill No. 11	-	-	-	-
	Page BOQ - 119 of Bill No. 11	-	-	-	-
	Page BOQ - 120 of Bill No. 11	-	-	-	-
	Page BOQ - 121 of Bill No. 11	-	-	-	-
	Page BOQ - 122 of Bill No. 11	-	-	-	-
	Page BOQ - 123 of Bill No. 11	-	-	-	-
	Page BOQ - 124 of Bill No. 11	-	-	-	-
	TOTAL OF BILL NO. 11 CARRIED TO GRAND SUMMARY	-	-	-	-

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GRAND SUMMARY

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ANURADHAPURA NORTH WATER SUPPLY PROJECT - PHASE II
SUPPLY & LAYING OF HDPE, DI DISTRIBUTION MAINS AND PROVIDING SERVICE CONNECTIONS FOR PADAVIYA AND KEBITHIGOLLEWA DS DIVISIONS
CONTRACT NO.: AN/PH II/JICA/DM/LOT C1
BILL OF QUANTITIES
GRAND SUMMARY

ANURADHAPURA NWSP - PHASE II

BOQ BILL NO.	DESCRIPTION	TOTAL AMOUNT			
		Supplied from Outside the Employer's Country		Supplied from within the Employer's Country	
		(e)	(f)	(g)	(h)
		CIF	Port Charges (Except Customs Duties), Handling, Double Handling, Clearance and Transportation including Transit Insurances etc., to Anuradhapura Phase II Site.	Supply and Delivery to Anuradhapura Phase II Site	Installation & all Other Civil Works
		Yen	LKR	LKR	LKR
1	GENERAL REQUIREMENTS				
2	PROVISIONAL SUMS	-	-	-	260,723,000.00
3	MISCELLANEOUS WORK ITEMS				
4	SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KANUGAHAWEWA				
5	SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAMBILIWEWA				
6	SUPPLY AND LAYING OF DISTRIBUTION MAINS AT PADAVIYA				
7	SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WAHALKADA				
8	SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KAHATAGOLLEWA				
9	SUPPLY AND LAYING OF DISTRIBUTION MAINS AT GALAWEWA				
10	SUPPLY AND LAYING OF DISTRIBUTION MAINS AT KEBITHIGOLLEWA				
11	SUPPLY AND LAYING OF DISTRIBUTION MAINS AT WEERASOLE				
A	**Total of (1 to 11)**				
B	Total Provisional Sum				260,723,000.00
C	Total of (A - B)				
D	Contingencies (10% of C)				
E	**Grand Total (B + C + D) excluding VAT Carried to Letter of Bid**				

	Foreign Currency Component	Yen	-
	Converted based on rates 28 days prior to the bid closure (1 Yen = ... LKR)	LKR	-
	Local Currency Component	LKR	-
	TOTAL ESTIMATED COST IN LOCAL CURRENCY	**LKR**	**-**
	TOTAL ESTIMATED COST IN FOREIGN CURRENCY	**Yen**	**-**
	VAT Amount (.....%)*	LKR	**-**
	VAT Registration No.		
	Name and Signature of Bidder		
	Address		

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