

## **6.1 GENERAL REQUIREMENTS**

## **A. GENERAL REQUIREMENTS**

### **A1.1 LOCATION AND SCOPE OF WORK**

#### **A1.1.1 Location of Work**

Pipelines and structures will be located substantially as indicated on the Drawings. The Engineer reserves the right to modify locations to avoid interference with existing structures and utilities or for other reasons.

#### **A1.1.2 Scope of Work**

This Contract, No..... for the National Water Supply and Drainage Board comprises the Supply of Goods and Services as indicated below.

(Provide detailed description of the scope of work)

#### **A1.1.3 Notice of other Contracts**

Specify other contracts in the project and provide locations etc.

#### **A1.1.4 Intent of Contract Documents**

It is the intent of the Contract Documents to provide for the execution and completion of all details of the work described in the Contract Documents, and it is to be understood that the Contractor, will supply goods, furnish all labour, material, equipment, tools, transportation and necessary services required to execute the Contract in a satisfactory manner and in accordance with the Contract Documents.

#### **A1.1.5 Programme**

The Contractor's construction programme shall comply with the requirements of the specification and the Contractor shall also accommodate the following particular requirements in the preparation of his programme.

- (a). Entry into roads for the purpose of the contract will depend on permission from the Roads Authorities. This will in the first place depend on the submission and approval of the Contractor's programme for work in each section of road from first cutting through to pressure testing, completion of backfill to approval of Road Authority, temporary reinstatement and hand over to the Roads Authorities on completion.

#### **A1.1.6 Inter-changeability of Standards**

Whenever reference standards appear in these specifications, they are intended to be the latest available. However, in case of materials do not conform to the specified standards, they should conform to one of the relevant British standards, European Standards, American

Standards or Japanese Standards must ensure an equal or higher quality than the reference standards, the Contractor shall provide and prove that the substituted materials and standards are better than or equal to those specified in the Specification. The Engineer has the right to accept or reject the Contractor's proposal. The Contractor shall provide English Version of all relevant standards to the Engineer for reference and approval at no additional cost to NWSDB and the English version will be prevail as correct.

#### **A1.1.7 Minimum Standard**

The specifications and Contract Drawings define a minimum standard for materials, manufacture and workmanship. The Contractor shall include in his tender 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 work in conformity with the Contract. All such proposals shall be given in the form of an annex but there is no obligation on the part of the Employer to accept any of the Tenderer's proposals.

#### **A1.1.8 Workmanship**

The quality of the workmanship and materials shall be compatible with BS/ BSEN ISO 9000 Series Quality Assurance Standards.

#### **A1.1.9 Specifications to be kept on Site**

The Contractor shall have a copy of these specifications and all other standard specifications or parts of specifications referred to herein on the site at all times. All specifications shall be producible upon demand by the Engineer. Failure to have copies of all specifications on site will be considered an infraction to the Contract and delays caused to the works as a result will be the Contractor's responsibility.

#### **A1.1.10 Pre-construction Conference**

Prior to the start of Work at site, a pre-construction meeting will be held at a mutually agreed time and place, attended by representatives of:

- The Contractor, the Engineer or the Employer and/or his representatives and the Consultant.
- Representatives of other Agency or Authority as appropriate, and
- Others as requested by the Contractor, the Employer or the Engineer.

Seven days before the meeting, the Contractor shall submit to the Engineer his tentative proposals for each of the following:

- Administrative and Technical Organisation, Key Post and Curriculum Vitae of the key staff to be employed for this project on full time basis locally and overseas
- Overall Construction Programme
- List of Contractor's equipment including category, number, type and capacity
- Proposal for location and size of the camps, offices, workshops and stores etc.
- Computer system and software to be used in producing detail programmes and sub programmes and for monitoring and updating the progress, and resources throughout the project,

- Details of nominal hours of working (as per Clause 6.5 of the Particular Conditions of Contract),
- Details of procurement of imported materials
- Details of procurement of local materials such as Ready Mix Concrete, Steel, Cement, PVC Pipes & Fittings etc,
- Cash flow forecast
- Draft format of monthly interim statement.

The purpose of the meeting is to designate responsible personnel and establish a working relationship. Matters requiring co-ordination will be discussed and procedures for handling such matters will be established. The agenda will include:

- Contractor's tentative overall programme and sub programmes
- Contractor's proposed method of work and site organisation
- Transmittal, review and distribution of Contractor's submittals
- Processing applications for payment & payment procedures
- Maintaining record documents
- Critical work sequencing
- Field decisions and variations
- Use of office and storage areas, security, and the Employer's needs
- Major procured items, deliveries and priorities
- Contractor's assignments for safety and first aid
- Co-ordinate with outside agencies
- Any other relevant matters.

#### **A1.1.11 Progress Meetings**

The Engineer shall schedule and hold regular progress meetings at least monthly and at other times as required by the progress of the work, to review the progress of the work, maintain co-ordination of efforts, discuss programme changes, and resolve other problems which may develop. Further, regular site meetings shall be conducted at each sub project at dates and intervals agreed with the Engineer.

The Contractor and the Engineer shall be represented at each meeting. The Contractor may at his discretion request the attendance of representatives of his Contractors and manufacturers. The Engineer shall preside at the meetings and the Engineer shall provide for keeping and distribution of the minutes.

#### **A1.1.12 Site Administration**

The Contractor shall be responsible for all areas of the site used by him in the performance of the work. He will 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 exclude from the site all persons who have no purpose related to the Work or its inspection or to operations related to dominant rights to the site, with the approval of the Engineer.

The Contractor shall provide a sufficient number of interpreters at sites to facilitate effective communication, to the satisfaction of the Engineer.

### **A1.1.13 Requirements of Authorities and Agencies**

The Contractor shall be responsible for full compliance with the requirements of all duly constituted Authorities and Agencies including PRDA, RDA, CEA, CEB, LECO, Archaeological Department, Local Authorities, Irrigation Department, UDA, Department of Town & Country Planning, Mineral & Mining Department, Sri Lanka Telecom, Mahaweli Authority, National Aquatic Resources Fisheries, Survey Department & Land Reclamation 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 the Road Authorities and with Authorities concerned with 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 this authority as regards their requirements and procedures and seek the assistance of the Engineer where necessary to arrange such discussions.

## **A1.2 CONTROL OF WORK**

### **A1.2.1 Land for Construction Purposes**

#### (1). Public Property

Permits or approval for work to proceed shall be obtained by the Contractor from relevant agencies with the assistance of the Employer. 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 Employer) of such agencies owning or having jurisdiction over and control of the right-of-way in each case.

Those relevant agencies include but not limited to the following:

- Road Development Authority
- Provincial Road Development Authority
- Department of Irrigation
- Relevant Pradeshiya Sabha
- Survey Department
- Ceylon Electricity Board (CEB) and/or Lanka Electricity Company (LECO),
- Sri Lanka Telecom
- Relevant Divisional and District Secretariats
- Mahaweli Authority of Sri Lanka
- Sri Lanka Land Reclamation Development Corporation
- National Aquatic Resources Fisheries
- National Water Supply & Drainage Board and its Regional Support Centres.
- Central Environmental Authority
- Department of Town & Country Planning

*Specify any other agency which are required.*

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.

Utilities and other concerned agencies shall be contacted and permission shall be obtained prior to cutting or closing roads, streets or other traffic areas or excavating near underground utilities or above ground utilities or pipe laying on the lagoon bed.

(2). Private Property

The Contractor shall not enter for any deliveries or occupy for any other purpose with men, 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 removed before excavation or trenching is started. The Contractor shall be responsible for all damage outside of the way-leave, and shall make satisfactory settlement at his own cost for the damage directly with the property owner and/or tenant involved. The Contractor shall prepare 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

When it is necessary to temporarily deny access to owners or tenants to their property, or when any utility service connection must 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 will include appropriate information concerning the interruption and instructions on how to limit their inconvenience.

### **A1.2.2 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 will be established by the Contractor from the points designated by the Engineer on the drawings. These points shall be checked by the Contractor for accuracy and shall be used as datum for the work. 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, layout and measurement work. In addition, the Contractor shall furnish, without charge, competent men from his force and such tools, stakes, and other materials as the Engineer may require in establishing or designating control points, in establishing construction easement boundaries, or in checking survey, layout, and measurement work performed by the Contractor.

The Contractor shall keep the Engineer informed, with a reasonable time in advance, of the times and places at which he wishes to do work, so that horizontal and vertical control points may be checked by the Engineer with minimum inconvenience to him and minimum delay.

The Contractor shall remove and reconstruct work, which is improperly located, at his own cost and to the satisfaction of the Engineer.

### **A1.2.3 Construction Plant & Equipment**

The Contractor shall furnish construction plant and equipment which will be appropriate type and capacity to secure a satisfactory quality of work and rate of progress to ensure completion of the work within the time stipulated in the Contract. The Contractor shall also furnish to the Engineer list of all construction plant and equipment that he intends to deploy at site before commencement of work. All these plants and equipments shall be equivalent or higher in capacities and numbers as specified in the Appendix 16 of the contract document.

### **A1.2.4 Personnel**

Contractor shall provide all personnel for the successful completion of contract as stated in clause 2.5 Section 3.

### **A1.2.5 Open Trench Safety**

The length of open trench will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer, which may include overnight closure.

### **A1.2.6 Uncovering Work for Inspection & Correction of Defective Works**

Contractor shall perform all cutting, removal, patching and repairs required for the work as may be necessary in connection with uncovering work for inspection or for the correction of defective works for the installation of improperly timed work, to remove samples of installed materials for testing, and to provide for alteration of existing facilities or the installation of new work in existing construction at his own cost.

Except when the cutting or removal of existing construction is specified or indicated, the contractor shall not undertake any cutting or removal, which may affect the structural stability of the Work or existing facilities without Engineer's concurrence.

The Contractor shall provide all shoring, bracing, supports, and protective devices necessary to safeguard all works and existing facilities during cutting, removal, patching and repair operations.

Materials shall be cut and removed to the extent indicated on the Drawings or as required to complete the work. Materials shall be removed in a careful manner with no damage to adjacent facilities or materials. Materials, which are not salvageable, shall be removed from the site by the Contractor.

All works and existing facilities affected by cutting & patching operations shall be restored with new materials, or with salvaged materials acceptable to Engineer, to obtain a finished

installation with the strength, appearance, and functional capacity required. If necessary, entire surfaces shall be redone and refinished.

#### **A1.2.7 Protection of Existing Structures and Utilities**

The Contractor shall assume full responsibility at no additional cost to the Employer for the protection of all buildings, structures, natural embankment and utilities, public or private including poles, signs, services to buildings, utilities in the street, water pipes, hydrants, drains and 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 injury of any kind.

The Contractor shall bear full responsibility for obtaining all locations of underground structures and utilities, and all such services shall be maintained uninterrupted during construction. Prior commencement of work in the vicinity of structures likely to be affected by the works, the Contractor shall prepare a condition report of such structures to be agreed with owner and the Engineer.

Details of existing utility services shall be detected by the contractor. It is the responsibility of the contractor to detect all utility services and the contractor shall indemnify the Employer for any claims or payments to the utility agencies in case of damages by the contractor. The Employer accept no responsibility whatsoever for any omissions or for the correct representation on the drawings of these services.

In collaboration with the Engineer, the Contractor shall contact the local officials of each of the Statutory Authorities responsible for underground services and shall maintain close liaison with them throughout the construction. Under the co-ordination of the Engineer the positions of all main services liable to interference by the construction shall be established prior to commencement of work, trial holes being made at the Contractor's expense where the information cannot be derived from records or surface indications. Apart from verifying positions to avoid damage, scrutiny is needed to clarify those main services, which might conflict with the drawings. Where conflicts arise the Engineer will consider if an amendment to the design can be made or if a diversion of the existing main service is needed.

Early scrutiny of these services is essential to enable any such diversions to be made 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 services and connections to buildings.

The Engineer may be able to extend assistance by writing only to the various authorities and requesting them to give information to the Contractor.

Where service connections conflict with the Permanent Works their diversions will be agreed in detail by the Engineer when the connections are encountered. Drain and sewer diversions shall be made by the Contractor and other diversions by the Statutory Authority unless prior agreement is obtained from them for the work to be done and will issue detailed instructions for each diversion.



Contractor shall deal all materials in relations with objections for land disputes arising out of the contract, public awareness, social issues & all compensation in relation to those shall be borne by the Contractor.

Crossings under service connections to individual premises or properties, for water services and for sewerage and drains, shall be deemed to be included in the Contractor's rates for excavation.

Note : When prepare the Employers requirements, of the area is high risks, we have define them give available details as a basic data.

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, and should any damage occur shall immediately notify the Engineer and Statutory Authority and afford every facility for the repair of the affected service. Such repairs shall be at the expense of the Contractor.

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 or any overhead electricity or telephone cables. He shall also take all precautions to prevent his plant from operating too closely to overhead high tension cables, and he shall in conjunction with the Engineer and Electricity Authority, establish all necessary precautions for crossings under such cables. No mechanical excavation will be permitted within 2 metres of the established positions of high voltage cables. If 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. Engineer shall take precautionary actions is advance.

#### **A1.2.8 Obstruction of Utility Services**

The Contractor shall ensure that all existing hydrants, valves, or other utility controls including sewerage & storm water shall remain unobstructed and accessible during the construction of the work.

#### **A1.2.9 Operation of Utility Services**

The Contractor shall obtain written approval from the Authorities concerned before operating any valve, switch, or other control on existing utility services.

All consumers affected by such operation shall be notified by the Contractor, before the operation of the 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 from bowsers) to the affected consumers at his own cost.

#### **A1.2.10 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 offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the Engineer well in advance of the interference of any flow.

### **A1.2.11 Provisions for Traffic and Detours**

The Contractor shall conduct his construction so that interference with the flow of traffic is kept to a minimum. He shall construct temporary bridging across his trenches where necessary for traffic including access to private property and to pedestrians. Road 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.

### **A1.2.12 Co-operation with other Contractors**

The Contractor shall plan, schedule, and co-ordinate his operations in a manner which will facilitate simultaneous progress of the work of other Contractors of roads, electricity, telecom etc., implemented by other agencies.

### **A1.2.13 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 work to the Employer.

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. The Contractor shall observe the following particular requirements, which shall be recognised as setting the standard for the final condition of the work.

- (1). Construction Sites  
Remove all surplus material; leave the site in a clean neat and satisfactory condition to the approval of the Engineer.
- (2). All Exposed Concrete, Masonry and Sheet Metal  
Thoroughly clean all exposed concrete masonry and sheet metal to eliminate mortar droppings.
- (3). Floor Surfaces  
Remove all temporary protective coverings and shall leave all surfaces clean, unmarked and free from stains, and where specified, properly waxed and polished.
- (4). Duct Work  
Remove dust and debris from all ductwork.
- (5). Plumbing and Plumbing Fixtures  
Free all pipes and fittings from dirt and debris clean and polish all fixtures and ensure that facilities are in proper working order.

- (6). Pipe Work  
Check all piping works for sufficient supports, water tightness, and cleanliness.
- (7). Control and Safety Equipment  
Ensure that all such equipment is properly operating, calibrated and maintained for the service intended and left in a clean condition.

#### **A1.2.14 Flotation**

The Contractor shall take all-necessary precautions against the flotation of any structures or pipelines. The Contractor shall be responsible for any damage caused by flotation and for making good such damage at his own cost.

#### **A1.2.15 Inconvenience and Right of Access**

The construction of the works shall be carried out avoiding inconvenience as far as possible to the owners and occupants of properties adjacent to the works.

#### **A1.2.16 Preventive Measures for Water Interruption**

The Contractor shall also ensure that he has stocks of repair fittings and pipes at each pipe laying gang location to be able immediately to effect repairs and minimise interruption of supplies in event of accidental pipe damages.

#### **A1.2.17 Excess Fill Material**

The Contractor shall be responsible for making all arrangements for the disposal of all excess fill material from any excavation not considered for use in the grading and other purposes and for handling of this excess material over whole distance from the point of excavation to the point of disposal.

#### **A1.2.18 Pumping & 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.

#### **A1.2.19 Overhead Construction**

No machinery shall be employed which, in the opinion of the Engineer, will unduly interfere with wires and other overhead construction.

#### **A1.2.20 Unfavourable Construction Conditions**

During unfavourable weather, wet ground, or other unsuitable construction conditions, the Contractor shall confine his operations to work, which will not be affected adversely by such conditions. No portion of the work shall be constructed under conditions, which would adversely affect the quality or efficiency thereof, unless special means or precautions are

taken by the Contractor to perform the work in a proper and satisfactory manner to the approval of the Engineer.

**A1.2.21 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 printed notice in Sinhalese, Tamil and English full page size with wording similar to that shown in the next page.

**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 them away.
3. Please report all inconvenience to the Site Engineer or call the office at the numbers given below.

Telephone Nos.: .....

.....

The work is being performed for the National Water Supply and Drainage Board,  
by:

*(Insert Firm Name, Address, and Telephone Number of the Contractor in this space)*

In case of complaint 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 : .....

## **A1.3 SUBMITTALS**

### **A1.3.1 Construction Programme**

The Contractor shall submit six (06) copies of his overall construction programme within twenty-eight (28) days of Contract Award. The Contractor shall comply with the following 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, procurement and cash-flow requirements, and during the course of the contract be capable of clearly showing progress compared to the programme.
- (b). The overall construction programme submitted shall be in bar chart form and 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 imported materials and equipment, construction and installation, testing commissioning and hand-over.
- (c). A graph showing the build-up of staff and labour resources related to the tasks and work identified in the Construction Programme.
- (d). A schedule of major plant and their time on site related to the Construction Programme.
- (e). 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.
- (f). Programming shall take into account.
  - The Notice to Commence Work
  - The periods for approval of the programme or subsequent revisions thereto
  - The periods for approvals procurement and delivery to site of Materials and equipment required for incorporation in the permanent works.

Approval of the programme, materials and shop drawings shall not relieve the Contractor of any of his responsibilities under the contract.

- (g). Six copies of programme revisions that become necessary during the course of the work shall be submitted to the Engineer for approval of the details at least seven days before the proposed revision is to be implemented. Six copies of the revised programme as approved shall be supplied to the Engineer within three (03) days of approval being given.
- (h). The overall programme shall be based on sub-programmes for each sub-project. The sub-programmes shall include all the principal tasks envisaged to be required for the proper execution of the sub-project.

In the case of pipe-laying in roads the periods required to obtain 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 will be required to discuss the sub-programmes for each section of road with the Engineer and the relevant roads authorities prior to start work, and will be expected to make such changes to the order of work as the authorities may impose.

### **A1.3.2 Progress of Works**

(i). Contractors Progress Reports

The Contractor shall submit Monthly and Quarterly Progress Reports to the Engineer in quadruplicate at least 7 days prior to the date of monthly and quarterly progress meeting. The actual work done shall be superimposed upon the copies of the programme. He shall furnish an explanation of any deviation from the programme, and shall state proposals for improving progress, should this be lacking in any respect.

(ii). Photographic Record

The Engineer will maintain the photographic record every month during the construction work. The Contractor shall submit a report in quadruplicate to the Engineer with Photo Prints using a digital camera.

(iii). Progress Meetings (as per Clause A1.1.11) herein.

### **A1.3.3 Survey Data**

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 work. Where measurement for preparation of monthly invoices is required, the survey shall be done in the presence of the Engineer.

### **A1.3.4 “As-Built” Drawings and GIS maps**

As each portion of work is completed the Contractor shall submit one copy of the draft “As Built” drawings for Engineer's approval. The “As-Built” Drawings are required as a record of all work carried out. Final “As-Built” drawings shall be furnished in A1 size sheets with one original set and three sets of photocopy prints. 4 nos. Electronic files too of “As-Built” drawings shall be submitted in CD's. In the drawings it is necessary to indicate "As-Built" conditions, including field modifications, and furnish additional copies for insertion in equipment instruction books or operation and maintenance manuals as required. All such copies shall be clearly marked "AS-BUILT". Production of “As-Built” Drawings shall proceed with the construction work and will be considered as part of the completed product.

In the case of the Distribution System and Transmission Mains, the “As-Built” Drawings shall indicate at least three (3) tie measurements for each and every tee junction, sluice valve, washout valve, air valve, non-return valve, fire hydrants and bends 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.

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.

#### Arc GIS Maps

*(Required GIS format shall be given. Ex:- Coordinate System, Accuracy level)*

### **A1.3.5 Layout Data**

The Contractor shall keep neat and legible notes of measurements and calculations made by him in connection with the layout of the work. Copies of such data shall be furnished to the Engineer for use in checking the Contractor's layout as provided under Lines and Grades. All such data considered of value to the Employer will be transmitted to the Employer by the Engineer with other records upon completion of the work.

### **A1.3.6 Standards & 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.

## **A1.4 CONTROL OF MATERIALS**

### **A1.4.1 Approval of Materials and Equipment**

Only new materials and equipment shall be incorporated in the work. All materials and equipment furnished by the Contractor shall be subject to the inspection and approval of the Engineer. No material shall be incorporated into the work without approval of the Engineer.

The Contractor shall submit to the Engineer data relating to materials and equipment proposed to be furnished for the work. 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.

Facilities and labour for the handling and inspection of all materials and equipment shall be furnished by the Contractor. If the Engineer requires, either prior to beginning or during the progress of the work, the Contractor shall submit samples of materials for such special tests to demonstrate that they conform to the specifications. Such samples shall be furnished, stored and tested as directed at the Contractor's expense.

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 of a claim 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.



#### **A1.4.2 Packing**

- (a) The Contractor shall provide such packing of the DI/HDPE Pipes, Fittings, Specials and DI Valves as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the final destination of DI /HDPE Pipes, Fittings, Specials and DI Valves and the absence of heavy handling facilities at all points in transit.
- (b) The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract and, subject to Clause A1.4.10 hereof in any subsequent instructions ordered by the Employer.
- (c) The Contractor will be required to make separate packages for each. Each package shall be marked on three sides with proper indelible paint as follows:
  - i) National Water Supply & Drainage Board, Sri Lanka
  - ii) Contract Number
  - iii) Description of Goods
  - iv) Country of Origin of Goods
  - v) Suppliers' Name
  - vi) Packing List Reference Number

#### **A1.4.3 Transport**

The Contractor shall be required to meet all transport and storage expenses until delivery to the destination as specified in the Contract.

The pipe Materials and pipe appurtenance shall be stored in Contractor's stores within reasonable distances from Work sites and only the quantities that can be laid in excavated trenches for the daily work shall be kept along the road. Left-overs shall not be kept at the roadsides and it shall be returned to the Contractor's stores.

#### **A1.4.4 Incidental Services**

- (A) The Contractor shall provide any or all of the following services, if required, without any extra cost to the Employer.
  - (a) Furnishing of tools required for assembly and/or maintenance.
  - (b) Furnishing of a detailed installation, operations and maintenance manual for each appropriate unit.
  - (c) Conduct training of the Employer's personnel, at the Manufacturer's Plant and/or on-Site, in assembly, operation, maintenance and/or repair as appropriate.
  - (d) Demonstration of pipe laying prior to commencement.
- (B) Prices charged by the Contractor for the preceding incidental services, shall be included in the Contract Price.

#### **A1.4.5 Spare Parts**

The Contractor shall be required to provide the following materials and notifications pertaining to spare parts manufactured or distributed by the Contractor:

- (a) Such spare parts as the Employer may elect to purchase from the Contractor, provided that this election shall not relieve the Contractor of any warranty obligations under the Contract;
- (b) The Contractor shall carry sufficient inventories to assure ex-stock supply of consumable spares such as Gaskets, Plugs, Bolts, Nuts and Washers etc.
- (c) In the event of termination of production of the spare parts:
  - (i) advance notification to the Employer of the pending termination, in sufficient time to permit the Employer to procure needed requirements; and
  - (ii) following such termination, furnishing at no cost to the Employer, the blue-prints, drawings and specifications of the spare parts, if and when requested.

#### **A1.4.6 Warranty**

- (a) The Employer warrants that the Materials supplied under the Contract are new, unused, of the most recent or current models and incorporate all recent improvements in design and materials unless otherwise provided in the Contract. The Contractor further warrants that Materials supplied under the Contract shall have no defect arising from design, Materials or workmanship (except insofar as the design or Material is required by the Employer's Specifications) or from any act or omission of the Contractor, that may develop under normal use of the supplied Materials in the conditions prevailing in the country of final destination.
- (b) This warranty shall remain valid for twelve (12) months after Materials, or any portion thereof as the case may be, have been delivered and commissioned to the final destination indicated in the Contract.
- (c) The Employer shall promptly notify the Contractor in writing of any claims arising under this warranty.
- (d) Upon receipt of such notice, the Contractor shall, with all reasonable speed, repair or replace the defective Materials or parts thereof, without costs to the Employer other than, where applicable, the cost of inland delivery of the repaired or replaced Materials or parts from the port of entry to the final destination.

#### **A1.4.7 Payments**

Measurements of works and payments shall be made in-accordance with Clause 12 and 14 of the General Conditions of Contract.

Payments shall be in accordance with Clause 12 of General Conditions of Contract. Payment scheme shall be as per Clause 14, contract price & payments of General Conditions of Contract and Contract Data.

#### **A1.4.8 Change Orders**

- (a) The Employer may at any time, by a written order given to the Contractor pursuant to Clause 13 of General Conditions of Contract, make changes within the general scope of the Contract in any one or more of the following:
  - (a) drawings, designs or specifications, where DI Pipes, Fittings, Specials and DI Valves to be furnished under the Contract are to be specifically manufactured for the Employer;

- (b) the method of shipment or packing;
  - (c) the place of delivery; and/or
  - (d) the Services to be provided by the Contractor.
- (b) If any such change causes an increase or decrease in the cost of, or the time required for, the Contractor's performance of any part of the Works under the Contract, whether changed or not changed by the order, an equitable adjustment shall be made in the Contract Price and the Contract shall accordingly be amended. Any claims by the Contractor for adjustment under this clause must be assessed within thirty (30) days from the date of the Contractor's receipt of the Employer's change order.

#### **A1.4.9 Contract Amendments**

Subject to Clause A1.4.12 hereof, no variation or modification of the terms of the Contract shall be made except by written amendment signed by the parties.

#### **A1.4.10 Assignment**

The Contractor shall not assign, in whole or in part, his obligations to perform under the Contract, except with the Employer's prior written consent.

#### **A1.4.11 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 in Section A1.5 of this Specification to allow the Engineer to determine that the materials proposed are equivalent to or better than those named. Such items shall be submitted before 21 days prior to the expected date of approval by the Engineer for review by the procedure set forth in Section A1.3 of this Specification "Submittals".

#### **A1.4.12 Handling and Storage of Materials**

All materials to be incorporated in the work shall be handled and stored by the manufacturer, Contractor, and the Contractor before, during, and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft or damage of any kind whatsoever to the material.

Pipes and fittings shall be stored & handled as per the relevant Clauses in the Section A1.5 of this Specification.

Cement and lime shall be stored, covered and off the ground, and shall be 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 and 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.

All equipment subject to corrosive damage by the atmosphere if stored outdoors (even though covered) shall be stored in a building to prevent damage. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the Engineer.

Any materials which, in the opinion of the Engineer, have become so damaged as to be unfit for the use intended or specified shall be promptly removed from the site of the work, and the Contractor shall receive no compensation for the replacement of the damaged material or its removal.

Manufactured materials shall be delivered and stored in their original containers, plainly marked, with identification of material and manufacturer, provided that original containers are fit for storage under local conditions.

#### **A1.4.13 Materials Stock Control**

The Contractor shall store all goods in a methodical and systematic manner, so that he can control his work efficiently and in particular in the case of materials to be used in the permanent works, the Engineer can physically monitor the amounts in stock.

Each month or at such other times as may be requested by the Engineer the Contractor shall submit his up-to-date stock list of materials required for the permanent works. In any case such list must be submitted with the Contractor's monthly valuation.

#### **A1.4.14 Salvage of Materials and Equipment**

Existing materials and equipment removed, and not reused, as a part of the work shall remain property of the relevant agency.

The Contractor shall carefully remove, in a manner to prevent damage, all materials and equipment specified or indicated to be salvaged and reused or to remain property of the relevant agency. He shall store and protect salvaged items specified or indicated to be reused in the work.

Salvaged items not to be reused in the work, but to remain 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.

Any items damaged in 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 option 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 which case such removed items will become the Contractor's property.

Existing materials and equipment removed by the Contractor shall not be reused in the work except where so specified or indicated.

## **A1.5 GENERAL EQUIPMENT STIPULATIONS**

### **A1.5.1 Scope**

All equipment furnished and installed under this Contract shall conform to the general stipulations set forth in this section except as otherwise specified in other sections of the Specifications.

### **A1.5.2 Manufacturer's Experience**

Manufacturers shall have expressed as specified.

### **A1.5.3 Preparation for Shipment**

All materials shall be suitably packaged, sea-worthy where required, to facilitate handling and protect against damage during transit and storage. All equipment and material shall be boxed, crated, or otherwise completely enclosed and/or protected during shipment, handling, and storage. All equipment shall be protected from exposure to the detrimental elements and shall be kept thoroughly dry at all times.

Painted surfaces shall be protected against impact, abrasion, discoloration, and other damage. All painted surfaces, which are damaged prior to acceptance of equipment, shall be repainted to the satisfaction of Engineer.

Each item shall be tagged or marked as identified in the delivery schedule and/or on the shop drawings. Complete packing lists and bills of material shall be included with each shipment.

### **A1.5.4 Storage**

Upon delivery, all materials shall immediately be stored and protected until installed in the work.

Materials shall not show any pitting, rust, decay, or other deleterious effects of storage when installed in the work.

## **A1.6 TEMPORARY FACILITIES**

### **A1.6.1 Temporary Workshop & Dwellings for 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 be maintained in a clean and sanitary condition. Each dwelling unit shall be provided with lights, water supply and sanitary facilities and properly furnished.

## **A1.6.2 Facilities for the Engineer’s Representative**

The Contractor shall provide facilities the Engineer’s Representative and his staff until the completion of the Works and thereafter as may be required. As such, the use of “Engineer’s Representative” under this sub-clause shall be interpreted as ‘Engineer’s Representative’ nominated by the Engineer.

The layout of all offices and car parking facilities for the Engineer’s Representative shall be arranged to the approval of the Engineer’s Representative.

Before placing any orders or delivering any materials or fittings for the offices the Contractor shall obtain the approval of the Engineer in writing as to the location and type of the structure and the furniture, fittings, and equipment to be supplied.

### **A1.6.2.1 Engineer’s Representative’s Main Office (Project Office)**

*(Can be amended to suit specific requirements when preparing the Bidding Document)*

#### **Project office:**

The office shall be well lighted, lockable and fully weather proof. A covered parking space for one vehicle shall be provided and another additional space for minimum 2 vehicles.

The office shall have two rooms with a total floor area of at least 120m<sup>2</sup>. The office shall have overhanging eaves and be provided with windows with lockable shutters for security. The office shall have two wash room and a pantry space.

Doors shall be fitted with locks at least with two keys and the Contractor shall hand over all keys to the Engineer’s Representative. The office shall be provided with wash basins with cold running water and two ceiling fans. The Contractor shall provide electricity, communication facilities, air condition facilities, toilet facilities, potable drinking water facilities and the following furniture & Equipment to the office until maximum of 6 months in the Defects Notification Period where necessary.

<b>Item</b>	<b>Required No</b>
Table 0.9m x 1.5m with four lockable drawers	.....
Table 0.9m x 1.5m with one lockable drawer	.....
Chairs	.....
Chairs with arm rest	.....
Lockable four drawer steel filing cabinet	.....
Computer with UPS & requires software	.....
Photocopy + Printing machine	.....
Binding machine	.....
Set of shelving 1.2m high by 0.9m long with shelves for keeping the drawings	.....
Domestic water filter	.....
Stand fans	.....
Personal Protection Equipment (PPE)	.....
Partitioned first aid box with the regular prescribed medicines and general medical dressings.	.....
.....	

All office building and fittings in good condition and the equipment and furnishings installed therein shall be provided and well maintained during the above period by the Contractor. Computer with ups & required softwares, photocopy, printing machine and binding machine shall be handover to the Employer in good condition at the end of the project period. The Contractor submits the all the reference details of the Equipment which are provided to employer's representative upon the request done by the Engineer. All other Equipment and furnishing of office shall become the property of the Contractor thereafter.

The Contractor shall be provided provide janitorial services to maintain a good working environment and security of the project office. At the end of the given period, the Contractor shall remove the office building as per the instructions given by the Engineer.

#### **A1.6.2.2 Site Offices for the Officers of Engineer's Representative**

##### **Sub office/s or Site office/s:**

The Contractor shall provide and maintain sub office/s or site office/s for the use of the Engineer's staff in numbers stated in the BOQ. Each office shall be established at the sites as directed by the Engineer maintained by the Contractor until the completion of construction works.

The sub office/s shall be provided with sufficient ventilation, light, weather proofed, insulated and painted internally and externally. Floor to ceiling height shall be at least 2.7 meters with minimum floor area 60m<sup>2</sup>. The office shall have external lockable doors and windows as necessary.

Water Supply, electricity supply, Air condition facility, sanitation facility and telephone shall be provided and maintained throughout the Contract period.

All necessary facilities & Equipment such as stationeries, consumables and office utilities shall also be provided by the Contractor.

Each sub office/site office shall be supplied with the following new furniture, Equipment and services:

<b>Item</b>	<b>Quantity</b>
Steel tables 1.2m x 0.75m with two lockable drawers	.....
Steel four drawer lockable filing cabinet	.....
Arm chairs	.....
Water filters	.....
Stand fans	.....
File Trays	.....
Leveling instrument	.....
Computers with UPS & required software	.....
Binding machine	.....
Personal Protection Equipment (PPE)	.....
Partitioned first aid box with the regular prescribed medicines and general medical dressings.	.....

All office building and fittings in good condition and the Equipment and furnishings installed therein shall be provided and well maintained during the above period by the Contractor. Computer with ups & required softwares, binding machine and leveling instruments shall be handover to the Employer in good condition at the end of the project period. The Contractor submits the all the reference details of the Equipment which are provided to employer's representative upon the request done by the Engineer. All other Equipment and furnishing of office shall become the property of the Contractor thereafter.

The Contractor shall be provided janitorial services to maintain a good working environment and security of the project office. At the end of the given period, the Contractor shall remove the office building as per the instructions given by the Engineer.

### **Mobile Office/s**

The Contractor shall provide and maintain mobile office/s for the use of the Engineer's staff in numbers stated in the BOQ. Each office shall be established at locations as directed by the Engineer and shall be maintained by the Contractor until the completion of construction works.

The mobile office/s shall be provided with sufficient ventilation, weather proofed, insulated and painted internally and externally. Floor to ceiling height shall be at least 2.7 meters with minimum floor area 15m<sup>2</sup>. The office shall have external lockable doors and windows as necessary. The office shall be well lighted and ventilated.

Water Supply, electricity supply, air condition facility, sanitation facility and telephone shall be provided and maintained by the Contractor throughout the contract period.

Each mobile Office shall be supplied with the following new furniture, Equipment and services:

<b>Item</b>	<b>Quantity</b>
Steel tables 1.2m x 0.75m with two lockable drawers	.....
Steel four drawer lockable filing cabinet	.....
Arm chairs	.....
Computers with UPS & required software	.....
Water filters	.....
Stand fans	.....
File Trays	.....
Leveling instrument	.....
Personal Protection Equipment (PPE)	.....
Partitioned first aid box with the regular prescribed medicines and general medical dressings.	.....



All office building and fittings in good condition and the Equipment and furnishings installed therein shall be provided and well maintained during the above period by the Contractor. Computer with ups & required softwares and leveling instruments shall be handover to the Employer in good condition at the end of the project period. The Contractor submits the all the reference details of the Equipment which are provided to employer's representative upon the request done by the Engineer. All other Equipment and furnishing of office shall become the property of the Contractor thereafter.

The Contractor shall be provided janitorial services to maintain a good working environment and security of each office. At the end of the given period, the Contractor shall remove each office building as per the instructions given by the Engineer.

[Insert the no of mobile offices and their locations required for the project when preparing the bidding document]

### **A1.6.3 Transport**

Deleted.

### **A1.6.4 Survey and Measuring Instruments**

The Contractor shall provide all survey and measuring instruments of every kind necessary for his own use in the execution of the Works and others as required by and for the exclusive use of the Engineer. Each item shall be approved in writing by the Engineer before being accepted and shall be new at the start of the Contract these instruments shall remain the property of the Contractor. The Contractor shall attach a list of survey instruments he is proposing for the execution of the project in his tender.

The Contractor shall provide for the Engineer's Representative and his staff such waterproof clothing, safety helmets, rubber boots, torches, and the like as may reasonably be required by them.

### **A1.6.5 Water**

The responsibility shall be upon the Contractor to provide and maintain at his own expense an adequate supply of potable water for the use of Engineer and his staff, Contractor or his subcontractor's work for construction and domestic consumption and to install and maintain necessary supply connections and piping for the same, but only at such locations and in such a manner as may be approved by the Engineer. Before final acceptance, temporary connections and piping, installed by the Contractor, shall be removed to the satisfaction of the Engineer, unless requested by the Engineer to be left, upon agreement on price.

Testing & commissioning shall be done by the Contractor and requirement of water for the same shall be arranged by the contractor at his cost. Whenever available, water for testing & commissioning shall be supplied by NWSDB at production cost.

### **A1.6.6 Electricity**

All electrical power required by the Contractor and for the use of Engineer and his staff shall be furnished by the Contractor at his own expense. All temporary connections for electricity shall be

subject to the approval of the Engineer. All temporary lines shall be furnished, installed, connected and maintained by the Contractor in a workmanlike manner and in accordance to the acceptable safety standards and to the satisfaction of the Engineer, and shall be removed by the Contractor in like manner, at his expense, prior to final acceptance of the works, unless requested by the Engineer.

#### **A1.6.7 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.

#### **A1.6.8 First Aid**

The Contractor shall provide all necessary first aid facilities, attendants and supplies for his labour force, all sub-contractors and Contractors, in accordance with all government rules and regulations and all other statutory requirements and/or to the satisfaction of the appropriate government departments, the Employer and the Engineer. First aid boxes with adequate supplies shall be maintained at the Engineer's Project Office and Mobile Field Offices.

#### **A1.6.9 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 light and acceptable warning signs shall be placed. Barricades shall be located at the nearest intersecting public highway or street on each 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 the minimum obstruction and inconvenience to the travelling 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.

#### **A1.6.10 Fences**

All existing fences affected by the work shall be maintained by the Contractor until completion of the work at his own expense. 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, at the contractor's expense.

#### **A1.6.11 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 sod 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 other public or private property, regardless of location or character, which may be caused by transporting equipment, materials, or men to or from the work 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.

All fire hydrants and water control valves shall be kept free from obstruction and 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.

#### **A1.6.12 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.

#### **A1.6.13 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 cost. Such roads shall be available for the use of all others performing work or furnishing services in connection with the Project. Existing public access roads used by the Contractor in connection with the execution of the Contract shall also be maintained by the Contractor.

#### **A1.6.14 Parking**

- (a) The Contractor shall provide such packing as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the final destination and the absence of heavy handling facilities at all points in transit.
- (b) The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract and, any subsequent instructions ordered by the Employer.
- (c) Each package shall be marked on three sides with proper indelible paint as follows:
  - i) National Water Supply & Drainage Board, Sri Lanka
  - ii) Contract Number
  - iii) Description of Materials
  - iv) Country of Origin of Materials
  - v) Suppliers' Name
  - vi) Packing List Reference Number

#### **A1.6.15 Noise Control**

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.

#### **A1.6.16 Dust and Mosquito Control**

The Contractor shall take reasonable measures to control air pollution due to dust from his activities. Earth surfaces causing the 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, which may be affected adversely by dust, shall be adequately protected from dust. 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.

### **A1.6.17 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. 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 work and to direct water to drainage channels or conduits. Stilling Pools shall be provided as necessary to prevent downstream flooding.

### **A1.6.18 Erosion Control**

The Contractor shall prevent erosion of soil on the site and adjacent property resulting from his construction activities. 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, to minimise erosion. Temporary fast growing vegetation or other suitable ground cover shall be provided as necessary to control runoff.

### **A1.6.19 Pollution Control**

The Contractor shall prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris and other substances resulting from construction activities. No sanitary wastes will 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 will be permitted to enter sanitary sewers and reasonable measures will be taken to prevent such materials from entering any drain or watercourses.

## **A1.7 SPECIAL PROVISIONS**

### **A1.7.1 General**

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 deem to be included in the items provided in the Bill of Quantities.

### **A1.7.2 Work in Roads**

#### **(a). General**

Procedures for dealing with Road Authorities 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 pipeline, backfilling 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 at the earliest possible time after award of Contract to show the date of start and completion of excavation laying temporary reinstatement, hydraulic pressure testing, backfilling, compaction and 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 prior approvals, trial pits, ordering, manufacture and supply and delivery of pipes and any special imported fittings. Connection to existing lines shall be programmed for early completion together with the transmission lines to supply the reservoirs.

2. When satisfied with the construction programme, the Engineer will present it to the Road Authority who may propose changes to the sequence according to their own road improvement programme if any. The Contractor shall allow for some disruption to his programme and he shall not be entitled to specific extra cost or extension of time that may arise as a result of the comments of Road Authority.
3. The Contractor shall produce a final programme for action incorporating any changes requested by the Engineer following discussions with the Road Authority.
4. The Engineer shall agree with the Road Authority the estimated permanent reinstatement costs for the roads programmed for entry and execute works within the two months according to the Contractor's agreed programme or such other period as may be found more practical or appropriate similar procedure with monthly or such other suitable period to keep sufficient work in hand thereafter.
5. The Employer shall pay the Road Authority the agreed estimated amount. The Contractor shall apply for permission to enter in to the defined roads following payment to the Road Authority, by the employer.
6. 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.
7. Compaction of the back filling to trenches shall exceed 95% of the maximum dry density or percentage specified in Section 6.6 (Other Specifications) on Modified Proctor Test. The Contractor shall allow all costs for testing facilities and for ensuring correct moisture content to achieve the required minimum compaction. Compaction tests of trench backfill shall be carried out whenever directed and results shall be to the satisfaction of the Engineer.
8. Contractor is expected to use Asphalt Cutters and Pneumatic Tyre Wheeled Excavators for roadwork to minimise damages to the 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 (RA), whose responsible officers are;

- The Director (Engineering Services)  
Roads Development Authority  
Sethsiripaya,  
Sri Jayawardanapura Kotte  
Battaramulla.  
Telephone No: 2865721

RDA Regional Offices in the Project Areas  
PRDA Regional Offices in the Project Areas; and  
Urban Councils and Pradeshiya Sabhas in the Project Areas

(b). Road Crossings

Before commencement of work on any road crossing, the Contractor shall submit through the Engineer to the relevant RA a method statement and obtain Engineer's and relevant RA's prior approval. The method statement should 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 should not be less than 3 metre to permit single lane traffic.

The Contractor shall adequately protect all existing service mains through out 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.

### **A1.7.3 Works within Areas of Private and Public Property**

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 in 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.

Where the work involving pipelines is carried out through, between or under buildings or other structures, the gardens, orchards or cartilage of private houses and 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, Contractor shall be deemed to have made allowance in his tender 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.

#### **A1.7.4 Connections of New Mains to Existing Service Mains**

The Contractor should connect the existing mains to the new mains as shown on the Drawings & Junction Details on completion of the Transmission and Distribution Mains.

- Prior to any connections, the Contractor shall liaise with the Operations and Maintenance Division of NWSDB.
- The Contractor shall prepare a method statement for major connections and shall obtain Engineers' prior approval.
- The Contractor shall carefully plan all pipe work, connections and any associated construction works before interruption to the existing water supply.
- The Contractor shall ensure that all the necessary pipes, fittings, & equipment required for the works including those for an emergency situation are available before commencement of 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.



