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14 WORKS IN RELATION TO SERVICES

14.1 GENERAL

14.1.1 Scope

- 1 This Part includes the provision of new services and the seeking, protection, diversion and relocation of the existing services for the following service authorities:

Qatar General Electricity & Water Corporation (QGEWC)
Licensed Telecom Service Provider
Qatar Petroleum (QP) and Qatar Gas (QatarEnergy)
Public Works Authority (PWA)
Urban Planning and Development Authority (UPDA) (Ministry of Municipality)
Local Municipality

- 2 Related Sections and Parts:

This Section

Part 1 General

Part 3 Earthworks

Part 17 Road Drainage

Section 1 General

Section 5 Concrete

Section 20 Drainage Works For Buildings

14.1.2 References

- 1 The following standards and reference documents are referred to in this Part:

BS 1377Methods of tests for soils for civil engineering purposes

BS 2484Straight concrete clayware cable covers

BS 2782Methods of testing plastics

Circulars, memos and instructions published by Communication Regulatory Authority (CRA)

14.1.3 Submittals

- 1 The Contractor shall prepare and submit records and sketches showing position, levels and types of each existing service including manholes, joint boxes, inspection chambers and connections. These records shall be maintained in the form of a daily diary.
- 2 The Contractor shall prepare and submit shop drawings for utility protection work and obtain the approval of the appropriate Authority before beginning construction.
- 3 Samples of proposed ducts shall be submitted to the Engineer for his approval beforehand.
- 4 The Contractor shall prepare and maintain up-to-date drawings for each service authority giving details of each duct laid including precise location, level, number and type, and these drawings are to be submitted to the Engineer.
- 5 The Contractor shall keep accurate records of the arrangement, positions and details of all works constructed by him as Record Drawings. The details, format, extent and procedures for the preparation and submission of the record drawings shall be in accordance with Section 1.

14.1.4 Notification to Service Authorities & Statutory Bodies

- 1 All works in relation to services shall be carried out by a contractor or subcontractor prequalified and approved by the concerned service authority. Proof of such approval shall be required in writing before the start of Works on the Site. The name of any subcontractor to be used shall be as designated.
- 2 No work concerning services will be started without having first informed and obtained approval of the concerned service authorities. Before opening the ground for any purpose, the Contractor must notify all concerned parties by issue of formal "Notice of Intent" and must obtain information by formal notice regarding the location of all services. The complete responsibility for obtaining this information rests with the Contractor. "Notices of Intent" shall be circulated to all concerned parties including those listed in Clause 11.1.1

Qatar General Electricity & Water Corporation (QGEWC)
Licensed Telecom Service Provider
Qatar Petroleum (QP) and Qatar Gas (**QatarEnergy**)
Public Works Authority (PWA)
Urban Planning and Development Authority (UPDA) (**Ministry of Municipality**)
Local Municipality
Communication Regulatory Authority (CRA)
- 3 Prior to commencing any work on excavation in a roadway the Contractor shall obtain the approval of the Traffic Police. All excavations in a roadway shall be carried out in accordance with PWA road opening procedures.
- 4 Drawings and notices shall be sent in duplicate one of which shall be retained by the addressee and the other returned to the sender duly marked to show underground services. "Notice of Intent" will be given 14 days in advance of starting the proposed Works. In the event that the work is not started within eight weeks of the date of the "Notice of Intent", it will be deemed to have lapsed. A further Notice of Intent will then be submitted. The Contractor shall furnish copies of the above Notices of Intent to the Engineer.
- 5 The Contractor's attention is particularly drawn to the procedures to be followed concerning existing services and service diversions laid down in all current administrative orders of the service authorities.

14.2 SERVICES GENERALLY

14.2.1 General

- 1 The Contractor shall acquaint himself with the position of all existing services and shall obtain clearance from the concerned service authority before commencing any work in a particular area. Written evidence of such clearance shall be provided to the Engineer by the Contractor.
- 2 The position, types of ducts, pipes, cables, manholes and related structures are designated, but the final location will be determined on site by the Contractor and submitted to the Engineer for approval after having consulted with the concerned service authorities.
- 3 All concrete works shall conform to the requirements of Section 5.
- 4 The Contractor will be fully responsible for ensuring observance of the requirements of this clause by his subcontractors.
- 5 Where any utility or service works are to be constructed under a separate contract by the Engineer within the Site and concurrent with the execution of the Works, the Contractor shall co-operate with the other contractor and shall co-ordinate his construction operations to avoid interference with the other contractor's operations.

- 6 Any public or private service for water, electricity, drainage, or other utility, affected by the Works shall not be interrupted without the written permission of the Engineer. Such permission will be withheld until suitable approved permanent or temporary alternative services have been provided by the Contractor or by the owner of the utility or his agents.
- 7 For temporary traffic diversions as may be required for the construction of road crossings, full liaison with the Municipality and Police shall be required as well as compliance with the requirements of the PWA road opening procedures.
- 8 The Contractor shall be responsible for following each service authorities inspection and testing procedures.
- 9 The Contractor shall be responsible for liaison with each service authority to obtain their approval for the completion of the works.

14.2.2 Safety

- 1 The Contractor shall be responsible for public safety during execution of work. He shall take all measures, including, where necessary, the provision of ropes, picket fences, and other temporary barriers on the sides of trenches and excavations with warning lights.
- 2 The Contractor shall arrange for night watchman and any other measures required to ensure the safety of the public.
- 3 The Contractor will be held responsible for any damage to property or injury to persons due to his negligence. Any instruction from the Engineer concerning the safety aspects of the work must be carried out immediately, but the Contractor shall remain responsible for the adequacy of the safety measures.
- 4 The Contractor shall take into account the current laws regarding the safety of service lines, together with any amendment or additions thereto. The Contractor shall be responsible for locating or verifying the location of existing services, liaison with the various service authorities and complying with the above.

14.2.3 Marking Services

- 1 All services shall be provided with continuous warning tapes with the requirements of the following paragraphs.
- 2 The Contractor shall install approved warning tapes during backfilling work over buried pipes, cables, conduits and ducts, as required. Warning tapes shall be coloured and inscribed for identification according to the requirements of the concerned service authority.
- 3 Warning tape shall be approved high quality, acid and alkali-resistant polyethylene film 250 mm wide, and with a minimum thickness of 150 microns. Tape shall have a minimum tensile strength of 125 kg/cm² longitudinally and 105 kg/cm² laterally with an elongation factor of 350 %.
- 4 Tape shall be printed with 50 mm high black lettering, alternatively in Arabic and English. The complete wordings shall be repeated every 2 m along the tape. The colours shall be vivid, glossy and permanent with a life expectancy of 40 years.
- 5 Warning tapes shall be placed with the inscriptions facing upwards. The level of the tape relating to the top of service shall be in accordance with the requirements of the concerned service authority.
- 6 Warning tapes over non-metallic services shall be backed with aluminium foil to facilitate detection.

14.2.4 Location of Existing Services

- 1 The positions of all designated public and privately owned services have been based on the records of various service authorities and must be regarded as approximate.
- 2 The positions designated for existing services are for informational purposes only and do not necessarily show exact locations, depths, spacings, or the presence and location of smaller services such as house connections which are not normally designated.
- 3 The Contractor shall verify this information and satisfy himself as to the exact nature and position of all such apparatus. The Engineer does not guarantee the accuracy of the designated information, and no warranty is given or implied.
- 4 The Contractor shall verify the position of services by digging trial trenches and pits. If ducts, pipes, cables and manholes which are not designated are found, the Engineer and the concerned service authority shall be informed as soon as possible. The concerned service authority will then instruct on the action to be taken, if any.
- 5 The Contractor shall excavate by hand, take trial pits at regular distances and also at all road intersections to locate existing services, their number, depth and route direction. As these services are located the Contractor shall prepare record drawings indicating the aforementioned information which shall be submitted to the Engineer.

14.2.5 Protection of Services

- 1 The Contractor shall take any and all measures reasonably required by any public or concerned service authority for the support and full protection of all mains, pipes, cables and other apparatus during the progress of the Works, and shall construct and provide to the satisfaction of the concerned service authority, all works necessary for the prevention of damage or interruption of services.
- 2 The protection of the existing services shall be carried out before the earth work starts in the vicinity of the services to be protected.
- 3 If some services have already been protected by the various Departments, no protection will be carried out under this Contract, but such protection can be extended or upgraded as instructed by the Engineer on Site after having consulted with the concerned service authority.
- 4 If in the execution of the Works, by reason of any subsidence caused by, or any act of neglect or default of the Contractor, any damage to any apparatus or any interruption of, or delay to, the provision of any service is caused, the Contractor shall report it to the Engineer immediately and bear and pay the cost reasonably incurred by the service authority concerned in making good such damage and shall make full compensation to the authority for any loss, sustained by reason of such interruption or delay.
- 5 All protected services, existing ducts found or newly laid ducts shall be marked with markers of approved of size and type as designated. The location of markers shall be as designated. No asphalt course will be laid unless the ends of the ducts or protected services have been exposed and marked with markers.
- 6 The Contractor shall, at all times during the progress of the works, afford facilities to properly accredited agents of any concerned service authority for access to all or any of their apparatus situated in or under the site, as may be necessary for inspecting, reporting, maintaining, removing, renewing or altering such apparatus in connection with the construction of the Works or any other purpose whatsoever.

14.2.6 Relocation of Services

- 1 The Contractor shall relocate certain utilities to service reservation areas as designated. This work may only include constructing necessary protective housing such as box culverts, slabs, and concrete encased sleeves in the service reservation areas for utility lines to be relocated. Or this work may include necessary protective housing as described above and, in addition, the relocation of specific utility lines to the service reservation areas.
- 2 In both cases the Contractor shall complete the necessary survey to establish the lines and levels, prepare shop drawings and submit them to the Engineer for his review. The Contractor shall obtain approval from the concerned service authority before commencing this work.
- 3 After existing services, according to the Engineer's instruction, have been exposed and if according to the opinion of the Engineer and after approval of the concerned service authorities it is found necessary to proceed with the lowering or diversion thereof, the Contractor shall proceed with the relevant excavation in co-ordination with the said authorities.
- 4 The Contractor shall maintain records of such excavation in a form acceptable to the Engineer. Two copies of such records shall be submitted to the Engineer on a weekly basis or as agreed with by the Engineer.
- 5 All materials removed shall be disposed of by the Contractor as designated.
- 6 When directed by the Engineer, all such excavations shall be backfilled with suitable material, placed and compacted as designated.
- 7 The Contractor shall place fill material and compact with care to avoid damage to the existing services. The Contractor shall be responsible for any and all damages caused by his construction operations.
- 8 The works relevant to the lowering of existing services will be started as soon as, according to the Engineer, all the necessary precautions have been taken to prevent any injury to person or damage to property or services.
- 9 The excavation for lowering existing services shall be performed by hand down to the elevation indicated by the Engineer and the concerned service authority.
- 10 At all times the Contractor shall provide and maintain access to the adjoining properties to the satisfaction of the Engineer.

14.2.7 Services Ducts

- 1 Service ducts shall be provided as designated so that future services can pass through them without disturbing road construction.
- 2 The Contractor shall supply, unless otherwise designated, and install all the necessary service ducts required for the project. The duct material shall be as designated.
- 3 Road crossing ducts shall extend beyond the road or shoulder line at each side of the road as designated.
- 4 To prevent earth blocking the ducts, the openings at both ends are to be protected with appropriate blanking caps.
- 5 In general, all duct laying work is subject to the approval of the Engineer and any particular requirements of the concerned service authority.
- 6 The Contractor shall after completing each duct, make the necessary arrangements with the service authority for testing and acceptance of the work. As a minimum this shall involve the verification of the duct by rodding or pulling through a mandrel.

14.2.8 Excavation for Ducts

- 1 The trench shall be excavated to the designated width and depth.
- 2 When appropriate, the excavation for the road crossing and laying of ducts, concreting and related work shall only be carried out on half the width of the road at one time, the other half being left available for traffic. In this case the necessary traffic warning signs on self-supporting tripods or cones shall be provided well ahead of the duct crossing work and all care and attention exercised to avoid risk of traffic accidents during preparation and execution of the work.
- 3 All trenches and other excavation shall be maintained in a dry condition and the Contractor shall arrange a suitable dewatering system for any dewatering involved, in agreement with the Engineer, to keep the working place clean and dry.
- 4 The sides of pits and trenches shall be vertical and adequately supported at all times. Excavations may if considered necessary be battered with a safe slope, but only with the Engineer's written permission.
- 5 Where ducts are laid under any area of the road construction, the bottom of the excavation shall be completed to a density of 95 % of the maximum dry density, as determined by BS 1377 Test 13 or as otherwise approved by the Engineer.
- 6 Excavated material shall, if found unsuitable as defined in Part 3 of this Section, be disposed of to an approved tip and replaced with suitable material. All surplus suitable excavated material shall be used in road construction or disposed of in an approved manner.
- 7 Where split ducts are required for existing services crossing the Works, hand excavation shall be carefully undertaken until the position of the service to be protected is fully exposed.

14.2.9 Bedding and Laying of Ducts

- 1 As soon as possible after trench excavation, ducts of the required diameter shall be laid and jointed as designated and in accordance with the manufacturer's instructions.
- 2 Ducts shall be laid to the designated lines and levels with the required depth of cover. Where the designated minimum cover cannot be achieved, or as otherwise directed by the Engineer, they shall be bedded and surrounded with 150 mm of grade 20 concrete.
- 3 Unless surrounded in concrete, ducts shall be bedded on a 150 mm thick layer of well graded sand of maximum particle size 5mm and fully surrounded with sand to a depth of 150 mm above the duct barrel, well packed and tamped. Filling with suitable material above this level shall be free from large stones. For multiple ducts, the spaces between ducts are to be filled with compacted sand and the ducts surrounded to a depth of 150 mm above the uppermost layer. Trench backfill shall be compacted to the designated requirements.
- 4 Ducts shall be cut by the Contractor as necessary only at right angles to their length using a saw in a simple cutting guide. The inside cut edges shall be thoroughly rounded off or dressed before installation to prevent damage to cables drawn through the ducts.
- 5 In kerbed areas of new roadway duct markers shall be used. Duct marker shall be of concrete construction, in-situ or precast depending on the location, as per the designated details complete with approved abbreviation cast thereon. The finished product shall be solid in appearance, free of segregation, honeycombing broken edges and other defects.

14.3 PARTICULAR REQUIREMENTS

14.3.1 Qatar General Electricity and Water Corporation, Electricity Networks Affairs, QGEWC (ENA)

- 1 All of the works associated with electricity supply shall be carried out in accordance with the latest specifications for materials, excavation and backfill, cable laying and jointing, as issued by the QGEWC (ENA). Contractors are deemed to be in possession of the latest QGEWC (ENA) specifications.
- 2 All QGEWC (ENA) MV, HV and EHV works shall be carried out by a Contractor or subcontractor prequalified and approved by the QGEWC (ENA). Proof of such approval shall be required in writing before the start of Works on the Site, and the name of any subcontractor to be used shall be as designated. All cable jointers to be used on the Contract shall be required to undertake and pass a trade test conducted by QGEWC (ENA).
- 3 Providing material for the Electrical and Communication (ect) shall be based on mutual agreement between the client / Engineer and the Telecom Infrastructure owner whether it is the government, represented by CRA or the Telecom Service Providers (Ooredoo, QNBN, or Vodafone Qatar)
- 4 Where carriageway works and road crossings are performed the Contractor shall provide steel plates of sufficient size and quality to permit the safe passage of traffic and the plates shall be so placed (and if necessary fixed) to permit reasonable traffic flow.
- 5 All doorways, gates and entrances shall be kept clear with full access. Where excavations impede pedestrian access crossing boards shall be provided. Crossing boards shall be 1250 mm wide with a handrail on both sides 1 m in height and guard-rails on both sides at vehicular and pedestrian access to premises. Ducts will not be installed at entrances to premises except on the express instruction of the Engineer.
- 6 Materials excavated shall be placed so as to prevent nuisance or damage. Where this is not possible, the material shall be removed from site and returned for backfilling on completion of cable laying. In cases where the excavated material is not to be used for backfilling trenches it must be removed from site on the same day as it is excavated.
- 7 QGEWC (ENA) will require to carry out inspections at the following stages:
 - (a) Completion of excavations.
 - (b) Completion of bedding of trench before cable installation.
 - (c) Cable installation.
 - (d) Completion of surround over cables and installation of cable tiles.
 - (e) Upon completion of reinstatement.
- 8 The Contractor must not progress from one stage to the next of the above without the approval of QGEWC (ENA) and the Engineer. The Contractor shall be responsible for arranging inspections by QGEWC (ENA) to suit his programme of works.
- 9 Ashghal Road Opening Approval System (Q-PRO) shall be utilized where CRA, Ooredoo, Vodafone Qatar & QNBN are involved
- 10 The timeframe for the project shall be based on mutual agreement between the client / Engineer and the Telecom Infrastructure owner whether it is the government, represented by CRA or the Telecom Service Providers (Ooredoo, QNBN, or Vodafone Qatar)
- 11 For works involving the use of high voltage overhead cables Contractors shall comply with the requirements of QGEWC circular no 6.

- 12 Specifications and the details of the proposed supplier shall be submitted to QGEWC (ENA) for approval before a firm order being placed.
- 13 On delivery of materials to Qatar, QGEWC (ENA) inspectors shall be given the opportunity to inspect the materials before their use.
- 14 The Contractor shall supply all cables and jointing materials for the works unless expressed stated to the contrary in the contract documentation. Cleaning materials, protection tiles, warning tape, and other materials shall be supplied by the Contractor.
- 15 The Contractor is responsible for all liaison with QGEWC (ENA) in respect of programming the installation and commissioning of the complete electrical system. He shall ensure that QGEWC (ENA) are at all times kept informed of the current progress of the civil works on the Site and that his approved electricity supply subcontractor programs the cable laying works in the designated sequence in accordance with the approved programme.
- 16 The Contractor shall provide and install concrete cable tiles over all 66 kV cables. The cable tiles shall be of the designated size and form. Samples must be provided for approval by QGEWC (ENA) and the Engineer, and satisfy a test of impact strength in accordance with BS 2484.
- 17 For cables of 132KV and above the measures for protection of the cable shall be as per the requirements of QGEWC.
- 18 Cable tiles shall be installed over all 11,000 volt cables. Cable tiles shall be manufactured from recycled polyethylene or similar with a minimum thickness of 12 mm, length 1 m, width (minimum) 24 mm, tensile strength 8.40 N/mm² as per BS 2782, Method 320 C.
- 19 The tiles shall be marked as designated. The cable tiles must be supplied complete with any pins, pegs or other devices for jointing tiles together. Samples must be supplied to QGEWC (ENA) and the Engineer for approval before use.
- 20 The Contractor shall liaise directly with QGEWC (ENA) regarding the removal of existing cables and shall not, under any circumstance, commence removal of cables until QGEWC (ENA) have verified such apparatus as being redundant.
- 21 Removal of cable shall only be carried out in the presence of a QGEWC (ENA) engineer.
- 22 The Contractor shall arrange uplift of empty cable drums from QGEWC (ENA) Stores and shall return all recovered cables neatly coiled on the drums provided.
- 23 Ducts are to be supplied by the Contractor. They shall be of high impact resistant PVC of internal diameter 150 mm or 100 mm as designated, minimum wall thickness 3.6 mm (for 150 mm) or 2.4 mm (for 100 mm). Samples must be provided for approval by the Engineer before use.

14.3.2 Qatar General Electricity and Water Corporation, Water Networks Affairs, QGEWC (WNA)

- 1 All of the works associated with water supply shall be carried out in accordance with the latest General Specifications for Main Laying Contracts and Main Laying Materials, as issued by the QGEWC (WNA) except as modified in this Part. Contractors are deemed to be in possession of the latest specifications.
- 2 All QGEWC (WNA) Works shall be carried out by a Contractor or subcontractor prequalified and approved by the QGEWC (WNA). Proof of such approval shall be required in writing before the start of Works on the Site and the name of any subcontractor to be used shall be as designated.

- 3 The supply of the materials required to carry out the Works shall be as designated in the contract documents. The Contractor will be responsible for the conveyance of all materials to the site of the works.

14.3.3 Telecom Service Provider

- 1 All Licensed Telecom Service Providers' works shall be carried out strictly in accordance with the Licensed Telecom Service Provider Standard Specifications. Contractors are deemed to be in possession of the latest version of the specifications.
- 2 All Licensed Telecom Providers works shall be carried out by licensed Contractor or subcontractor approved by CRA . Proof of such approval shall be required in writing before the start of Works on the Site and the name of any subcontractor to be used shall be as designated.
- 3 Licensed Telecom Service Providers will supply as 'free issue' all ducts for Road Crossings projects only. Other projects will be charged for the ducts. All other materials required for any type of project shall be supplied by the approved Contractor.
- 4 Trenches for Telecom Provider ducts through rock fill shall be lined with geotextile, complying with the requirements of Part 16, Geosynthetics.
- 5 The Telecom Provider Specification S. 006 shall be modified as described in the following paragraphs.
- 6 The Supervising Officer shall mean the Civil/Cable Engineer from Telecom Provider, for the purpose of superintending the work, or, where the context permits, the representative of such officers.
- 7 The concrete quality classes specified in Clause 202 of the Telecom Provider specifications shall be of the comparable classes in Section 5 as designated by the Engineer.
- 8 Clause 105 of Telecom Provider Standard Specifications Telecom Provider WRK 4001 'Underground Duct Laying And Associated Works' should be read as:
- 105 (a) "Backfill materials" means earth free from stone or loose earth, compacted in two equal layers above the protection dune sand, and shall not leave voids to form a water course.
- 105 (b) "Sand bed and surround" means dune sand, 75 mm below, above and around the duct.
- 9 The approved Contractor shall apply on the on-line system (QPRO system) and get approval from Licensed Telecom Service Providers to to ascertain whether any underground installations will be affected by the proposed works before the commence of their works.
- 10 The approved Contractor shall give at least one week's notice in writing to Licensed Telecom Service Providers of the dates upon which it is intended to operate plant or equipment or carry out any work for which permission has been given in writing by Licensed Telecom Service Provider. Such operations of work shall only be carried out in the presence at Telecom Provider unless notice shall be obtained in writing from Telecom Provider that they do not require to be present.
- 11 Telecom Provider may require work to be executed on their installations during the period of the Contract. The Contractor shall allow access to Telecom Provider's Contractor or workmen until their diversion work is complete. The Contractor shall co-ordinate the work of Telecom Provider and his own activities and when necessary shall amend his programme of working to suit all requirements of Telecom Provider in connection with their diversion work and shall keep the Engineer informed in writing of all arrangements made.

- 12 The Contractor shall locate and mark with suitable posts all Telecom Provider underground installations that are within the area of the Works and shall ensure that such markers are maintained in their correct positions at all times. The Contractor shall advise Telecom Provider's agent of any installation not found where designated, or found but not shown or found damaged or subsequently damaged.

14.3.4 Qatar Petroleum (QP) and Qatar Gas (QatarEnergy)

- 1 All of the works associated with Qatar Petroleum and Qatar Gas shall be carried out in accordance with their latest specifications except as modified in this Part. Contractors are deemed to be in possession of the latest specifications. Before beginning any work the Contractor shall approach Qatar Petroleum and Qatar Gas and obtain a copy of their latest specification relating to the Works.
- 2 All Qatar Petroleum and Qatar Gas Works shall be carried out by a Contractor or subcontractor prequalified and approved by Qatar Petroleum and Qatar Gas. Proof of such approval shall be required in writing before the start of Works on the Site and the name of any subcontractor to be used shall be as designated.
- 3 When working near existing QP Gas/Oil facilities the following conditions shall be adhered to. All notices to be given to the Contractor shall be in writing and delivered by hand.
- 4 A permit to work must be obtained for all work within fifteen (15) meters distance from all boundaries of existing facilities. These permits can be obtained from QP and twenty four (24) hours notice should be given to prevent delays.
- 5 Mechanical or hydraulic rock breakers shall not be used adjacent to gas, oil or NGL pipelines.
- 6 Should jackhammers be required within two (2) meters of any buried pipelines and between any pipelines running in the same easement all round pipe protection must be provided before commencement.
- 7 Pilot holes to locate existing lines shall be dug by hand tools only, before allowing mechanical equipment to operate within five (5) meters of a QP live gas, oil or NGL pipelines.
- 8 Prior to exposure of any live pipeline the Contractor shall erect a suitable and substantial barrier to prevent any damage to QP pipelines. This is particularly important where there are heavy vehicles in the vicinity and the possibility that removal of the bond for trenching operations opens up an illegal vehicle crossing.
- 9 When backfilling an exposed section of pipeline, naturally occurring soft dune sand shall be used and the pipeline shall be covered and re-bedded all round with 150 mm minimum of sand. The remaining height of the bund will be made up of selected desert fill with particle size not exceeding 150mm from organic material. QP engineer shall witness the backfill work, particularly the soft sand bedding operations.
- 10 When trenching between pipelines in the same easement, vehicle access between the pipelines must be maintained.
- 11 The maximum length of exposed unsupported pipeline must not exceed seven (7) meters. When it exceeds five (5) meters, a central substantial wooden support shall be installed within a minimum 10 mm thick rubber "shoe" contacting the pipe.
- 12 When the bund is removed from any existing line its buried route shall be clearly indicated by pegs and warnings.

- 13 Any damage to the pipe external protecting wrapping caused by the Contractor will be repaired in strict accordance with QP procedures at the Contractor's cost.
- 14 Provision of a permit-to-work by QP does not release the Contractor from obligation of obtaining relevant permits to expose or work near utilities/facilities not under QP area of responsibility. Examples – QGEWC, Telecom Provider etc.

14.3.5 PWA, Storm water and Groundwater

- 1 This sub-clause of the specification covers; storm water and groundwater drainage, foul water drainage and treated sewage effluent systems.
- 2 All of the material submission, inspection & testing, preparation of record sheets, preparation of record drawings for works associated with PWA shall be carried out in accordance with the requirements of this part of the specification.
- 3 Where it is necessary to make a connection to an existing water service this shall be in accordance with Part 14 of this Section.
- 4 Works shall be in accordance with the latest PWA standard details except as modified in this Part. Contractors are deemed to be in possession of the latest standard details. Before beginning any work, the Contractor shall approach PWA and obtain a copy of their latest specification & standard details relating to the Works.
- 5 All work shall be carried out by a contractor or subcontractor prequalified and approved by PWA. Proof of such approval shall be required in writing before the start of Works on the Site and the name of any subcontractor to be used shall be as designated.

END OF PART