

1.3 Polyvinylchloride(PVC)

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POLYVINYLCHLORIDE (PVC)
DUCTS

A *min* *4* *17*

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APPENDIX 1

1. GENERAL

1.1. SCOPE

1.1.1 This specification covers the minimum standards and requirements for the construction, properties, testing and packing of PVC ducts.

1.1.2 Tenderers shall provide with their bids their proposed material under this Specification, stating manufacturer, model number, technical specification, country of origin, and such other required information as noted herein. References to submissions by "supplier", "manufacturer" and the like shall mean the "Tenderers" (during tender stage) or the "Contractor" (during the contract period), the Tenderer/Contractor being required to provide same under actual submission from the respective supplier/manufacturer.

1.1.3 The purpose of the tender for The OFT is for supply / install as set out in the Contract. References to "Supply-only" in this specification shall be disregarded, and shall only apply to special supply purchase orders as may be requested by MoT under the provision of Contract, if applicable.

1.1.4 Packing and marking sections of this Specification are generally intended for imported materials. The Contractor shall be responsible to provide all necessary requirements to suit his approved sourcing, in order to ensure that materials are delivered to site in the specified condition.

1.2. INTENDED USE

1.2.1 PVC ducts are used directly buried at a depth of approximately 800 mm in the outside plant network. The ducts may also be concrete encased.

1.3. TYPE APPROVAL

1.3.1 Contractors who have not previously supplied under this specification (or who have made changes to prior supplied products) shall submit a product sample for approval. An interim Type Approval may be granted on the basis of a compliance statement and other information from the manufacturer. Approval of a sample shall not be construed as waiving any requirements of this specification.

1.4. RESERVED RIGHTS

1.4.1 The MoT guarantee that any of the requirements, standards, regulations and conditions of this specification is not covered or protected by copyright or patent of a third party.

The MoT reserves the right to make changes to the specification without notice.

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2. ASSOCIATED SPECIFICATIONS

The following unattached international and/or national standards shall be applied, and deemed to be an integral part of this specification:

- | | |
|------------|--|
| ASTM D 883 | Standard Definitions of terms relating to plastics... |
| ISO 9002 | Quality systems - Model. For quality assurance in production and installation. |

3. DEFINITIONS

Refer to the general definitions of the Contract.

4. DESIGN REQUIREMENTS

4.1. GENERAL

This section describes straight PVC duct for direct burial (DB) or encased in concrete as per installation standards.

4.2. LONG TERM PERFORMANCE REQUIREMENTS

4.2.1. The PVC duct supplied in compliance with this specification shall be capable of withstanding the typical service conditions of Lebanon for a period of thirty years without detriment to the operation and maintenance characteristics.

4.2.2. PVC duct shall be designed, manufactured and packaged so that exposure to the environmental conditions of Lebanon during storage, transport, installation and operation and the environmental conditions to be expected during storage and transport outside Lebanon shall not degrade the physical or operation and maintenance characteristics of the PVC duct.

The environmental conditions of Lebanon may include ambient air temperature variations from -15° to +37°C. In addition direct solar radiation is known to increase the temperature of some outside plant to 52°C.

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4.3. MANUFACTURING STANDARD

4.3.1. The PVC duct sections shall be as shown in Appendix 1:

Outside diameter.....100 mm
Effective length.....6000 mm \pm 25 mm
Wall thickness 3.2 \pm 0.2 mm.

Outside diameter50 mm
Effective length.....6000 mm \pm 25 mm
Wall thickness the wall thickness of the 50mm duct shall be such that it has the same strength characteristics as the 100mm duct. The Contractor shall supply all dimensions for the 50mm duct.

4.3.2. Each 6 m section of duct shall be provided with bell and spigot ends, as shown in Appendix 1. The spigot end shall be chamfered to produce a 15° leveled edge along the outer circumference, the bell end shall be preformed into a plain bell socket suitable for coupling with the chamfered spigot end of an adjacent duct. There shall be a mark on the spigot 70mm from the end of the pipe.

4.3.3 The joining of two ducts shall provide a water tight joint.

5. MATERIAL PROPERTIES AND TEST REQUIREMENTS

5.1. GENERAL

5.1.1. This section specifies the PVC duct material, physical, chemical environmental and mechanical requirements and the tests to be applied for the determination of these requirements.

5.1.2. The requirements of this section refer to completed PVC duct, or material removed from completed PVC duct unless identified otherwise-

5.1.3. All materials used in the PVC duct shall be non-toxic and dermatologically safe.

5.1.4. Certificate.

5.1.5. Testing at laboratory.

5.2 TEST AND REPORT REQUIREMENTS

5.2.1. In order to assure the quality of purchased PVC duct, tenderers are required to supply Type Approval and routine Quality Control test results and reports.

5.2.2. TYPE APPROVAL TESTING

5.2.2.1. Type Approval test results, sample and reports are required for acceptance of new designs and materials and following-modifications to existing designs and materials. These test results are intended to assure the MoT that products have been designed to provide fault free service for the required life of the PVC duct.

5.2.2.2. Type Approval shall not be granted until a Type Approval sample has been evaluated by the MoT at the factory. In the event that appropriate samples are not available from the manufacture an interim Type Approval may be granted on the basis of a compliance statement and other information from the manufacturer. However a sample must be approved by the MoT for Type Approval prior to delivery.

5.2.2.3. Further to the contract requirements in respect of material approvals by the Engineer, Contractors are advised not to proceed with manufacture until written Type Approval or interim Type Approval has been given by the Engineer for all Type Approval requirements of this specification.

5.2.2.4. Tenderers are required to ensure that supplied PVC duct complies fully with the Type Approval requirements. Although the MoT may designate tests as Type Approval the tenderer may find it necessary to perform some of the tests on a regular Quality Control basis.

5.2.2.5. Type Approval tests and measurements are identified by (TA).

5.2.2.6. Type Approval Samples

Type Approval samples shall include, unless agreed otherwise:

- One length of the PVC duct.

5.2.3. ROUTINE QUALITY CONTROL

Routine Quality Control tests are the tests used on a regular basis to assure items conform to specification and that the MoT process is under control. Routine Quality Control tests are identified by (QC). Testing frequencies are detailed in Section 8.

5.3. RAW MATERIAL

The PVC duct shall be made of virgin unplasticized, polyvinylchloride (PVC).

5.4. TESTS

5.4.1. BENDS TESTS

The PVC Duct shall be capable of performing a Bend of Radius 12m and still be able to pass a standard test.

There shall be no apparent abnormalities.

5.4.2 COMPRESSION TEST

A one meter section should be cut from the random sample and offered for test.

A 40 kg load should be applied to one end of the sample for a period of one minute. The diameter deformation shall not exceed 5%. The pipe should restore to normal when within the 40 kg load is removed.

6. ELECTRICAL AND TRANSMISSION REQUIREMENTS

Not required in this specification.

7. QUALITY ASSURANCE

7.1. QUALITY SYSTEM ACCREDITATION

7.1.1. Manufacturers of PVC ducts conforming to this specification may be required to show evidence that the product has been manufacture according to a Quality System preferably conforming to ISO 9002 or a national equivalent which has been approved by MoT.

7.1.2. Manufacturers may be required to supply a copy of the Quality Manual at the time of tender, which shall be utilized for the manufacture and delivery of PVC ducts complying to this specification.

7.1.3. The MoT may require the manufacturer to be accredited to the above standards either by MoT personnel or assessors acting on behalf of the MoT.

7.2. INSPECTION

- 7.2.1. The MoT or its authorized representatives(s) may inspect the Tenderer's facilities for the purpose of Quality Assurance surveillance, at any time during the term of the contract
- 7.2.2. If requested by MoT the tenderer shall supply evidence of the quality of raw materials and components used in the manufacturing process.
- 7.2.3. All PVC ducts manufactured to this specification may be inspected and tested by MoT to check compliance.
- 7.2.4. The inspector reserves the right to request proof of compliance with specification, either by witnessing actual performance of this specification's prescribed tests and/or the provisioning of documented test results at the discretion of the inspector.
- 7.2.5. In the case of a dispute, testing shall be performed by an independent authority at the expense of the tenderer.

8. SUMMARY OF REPORTS AND TESTING FREQUENCY

8.1. GENERAL

- 8.1.1. The two categories of test reports required, i.e. Type Approval and Quality Control, are detailed in clause 5.2.

8.1.2. REPORT FORMAT

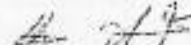
- 8.1.2.1. All reports submitted shall include the following details:

Manufacturer's name
Project number

Quality Control reports shall also include
Date of delivery
Identification of PVC ducts included in report

- 8.1.2.2. The report shall detail all results in the same order and shall refer to the relevant clause of Section 8.

8.2. TYPE APPROVAL TESTS, SAMPLES AND REPORT REQUIREMENTS



8.2.1. Type Approval test results and samples shall be submitted follows:-

1. At the time of tender for each type and size of PVC duct which has not been given Type Approval or
2. Prior to delivery of any PVC duct which does not have Type Approval.

8.2.2. COMPLIANCE STATEMENT

- 8.2.2.1 Tenderers shall supply a clause by clause compliance statement, with the complete specification.

8.3. ROUTINE QUALITY CONTROL TEST REPORTS

Results of tests to confirm compliance must be submitted with each delivery, unless agreed otherwise.

9. PACKING AND MARKING

9.1. PACKING

- 9.1.1. The PVC duct shall be crated. There shall be 24 duct sections per crate in a 4 by 6 configuration. The crating shall be suitable to protect the ducts from damage during shipping by land or sea, and during storage.

- 9.1.2. Each crate shall be marked with the following information in Arabic and English:

Ministry of Telecommunications Lebanon
PVC Duct (Size in mm)
Manufacturer's Name or Trademark
Month and year of manufacture

9.2. MARKING

- 9.2.1. All 6 m. sections of PVC duct shall be clearly marked at 1.5 m intervals with the following information:

PVC duct - RL -MoT
Manufacturer's name or Trademark
Month and year manufacture

- 9.2.2. ⇒ To be placed 70 mm from spigot end.

- 9.2.3. The marking shall be in an easily readable color with 3 mm. high lettering.

- 9.2.4. The marking shall not decrease the thickness of the materials.

10. COMPLIANCE STATEMENT

The Contractor must indicate his compliance or non-compliance with all clauses of this specification in a side by side format there are three statements to describe compliance or non-compliance with each clause, as detailed in clauses 10. 1, 10.2 and 10.3.

10.1. COMPLIANCE

The Contractor agrees to the stated requirements without any reservation.

10.2. NON-COMPLIANCE

The Contractor does not meet the respective item or clause. The reason for the non-compliance shag be stated.

10.3. NON-COMPLIANCE WITH ALTERNATIVE PROPOSAL

The Contractor does not meet the provisions of the clause but offers an equivalent alternative wish shall be fully documented with supporting evidence.

Appendix 1

LIST OF ATTACHED DRAWINGS

L 960/2000