Indian Standard

CODE OF PRACTICE FOR USE AND LAYING OF DUCTILE IRON PIPES

0. FOREWORD

0.1 This Indian Standard was adopted by the Bureau of Indian Standards on 30 December 1987, after the draft finalized by the Water Supply and Sanitation in Buildings Sectional Committee had beed approved by the Civil Engineering Division Council.

0.2 The laying of pipelines for water supply and drainage has been generally governed by the guidelines laid down by various municipalities and local authorities. However, at present there are no guidelines for laying of ductile iron pipes which have been used in India recently at some places. This code is intended to give guidelines for proper laying of ductile iron pipes.

0.3 For the purpose of deciding whether a particular requirment of this standard is complied with, the final values, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This code covers the methods of laying centrifugally cast (spun) ductile iron pressure pipes of diameters 80 mm and above, laid either above ground or below ground for water supply and drainage. It also includes handling and jointing of pipes, hydrostatic testing, commissioning of laid pipes, back filling, restoration and maintenance of surfaces.

1.2 For the purpose of this code, ductile iron pressure pipes and the fittings shall conform to IS : 8329-1977*.

2. ROUTING

2.1 General — The choice of route for a pipeline is governed by economic considerations and other factors such as overhead and underground cables, existing pipelines and traffic flow.

2.2 For cross country terrain before carrying out final field survey, the pipe alignment shall be marked on Survey of India maps and reconnaisance should be undertaken along the pipe route selected. Any change called for should be made before the final survey is undertaken.

2.3 Final Field Survey Plans — Field surveys for strip width representing about 500 m along the proposed alignments should be carried out. Any vertical section or profile along the pipeline route should be shown to a scale appropriate to the variations in ground elevation. Special crossings which require permission from authority should be detailed on separate drawings and cross referenced to the appropriate strip plan; the scale should be between 1 : 100 and 1 : 125 depending on the complexity of the work. In built up areas, consideration should be given to the use of plans of 1 : 1250 scale. In urban areas, trail trenches at suitable intervals will be necessary to locate the utilities which may affect the laying of pipes.

*Specification for centrifugally cast (spun) ductile iron pressure pipes for water, gas and sewage.

3. SITE PREPARATION

3.1 Preliminary work required to be done before laying of pipelines includes pegging out, clearing and disposal of all shrubs, grasses, large and small bushes, trees, hedges, fences, gates, portions of old masonry, boulders, and debris from the route.

3.2 Where trees have been felled, the resulting timber shall be stacked properly and disposed of as directed by the authority. Tree roots within a distance of about 0·5 metre from either side of the pipeline should be completely removed before laying pipelines.

3.3 All other serviceable materials, such as wood, bricks and stones, recovered during the operation of clearing the site, shall be separately stacked and disposed of as directed by the authority.

4. FORMATION

4.1 General — Before pipeline is laid, proper formation shall be prepared for pipeline.

4.2 Excavation and Preparation of Trenches for Laying Underground Pipeline

4.2.1 The width of the trench at bottom between the faces of sheeting shall be such as to provide not less than 200 mm clearance on either side of the pipe except where rock excavation is involved. Trenches shall be of such extra width, when required, as will permit the convenient placing of timber supports, strutting and planking, and handling of specials.

4.2.2 Special consideration should be given to the depth of the trench. In agricultural land, the depth should be sufficient to provide a cover of not less than 900 mm so that the pipeline will not interfere with the cultivation of the land. In rocky ground, rough grazing or swamps, the cover may be reduced provided the water in the pipeline is not likely to freeze due to frost.

4.2.3 It may be necessary to increase the depth of pipeline to avoid land drains or in the vicinity of roads, railways or other crossings.

4.2.4 Care should be taken to avoid the spoil bank causing an accumulation of rainwater.

4.2.5 Where pipes are to be bedded directly on the bottom of the trench (*See* Fig. 1A), it should be trimmed and levelled to permit even bedding of the pipeline and should be free from all extraneous matter which may damage the pipe or the pipe coating. Additional excavation should be made at the joints of the pipes so that the water main is supported along its entire length.

4.2.6 Where excavation is through rocks or boulders, the pipeline should be bedded on concrete bedding (*see* Fig. 1B) or on at least 150 mm of fine grained material (*see* Fig. 1C), or other means are used to protect the pipe and its coating. Material harmful to the pipeline should not be used.

4.2.7 Temporary underpining, supports and other protective measures for building structures or apparatus in or adjacent to the trench should be of proper design and sound construction.

4.3 Rock Excavation — The term 'rock' wherever used in this standard, shall have the same meaning as given in terminology in IS : 1200 (Part 1)-1974*.

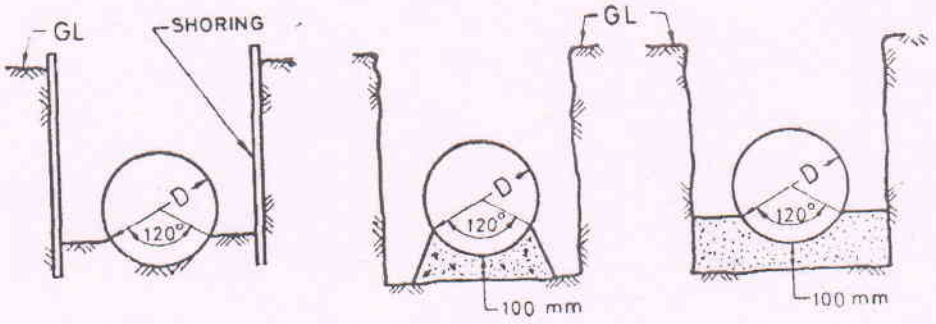
4.3.1 Blasting — Blasting for excavation shall be permitted only after securing the approval of the authority and only when proper precautions are taken for the protection of persons and property. The hours of blasting shall be fixed by the authority. The procedure of blasting shall conform to the requirements of the authority.

4.4 Braced and Sheeted Trenches — Open-cut trenches shall be sheeted and braced as required by any governing state laws and municipal regulations and as may be necessary to protect life, property and the work. When close sheeting is required, it shall be so driven as to prevent adjacent soil from entering the trench either below or through such sheeting.

4.4.1 The authority shall have the right to order the sheeting to be driven to the full depth of the trench or to such additional depths as may be required. Where the soil in the lower reaches of a trench has the necessary stability, the authority at its discretion may permit stopping of the driving of sheeting at some designated elevation above the trench bottom.

4.4.2 Sheeting and bracing which is to be left in place should be removed for a depth of 900 mm below the established street level or the existing surface of the street, whichever is lower. Sheeting except that which has been left in place, may be removed after the backfilling has been completed or has been brought up to such an elevation as to permit its safe removal. Sheeting and bracing may be removed before filling the trench, but only in such a manner as will ensure the adequate protection of the complete work and adjacent structures.

*Method of measurement of building and civil engineering works : Part 1 Earth work (*third revision*).



1A Trench in Earth or Murum

1B Trench in Hard Rock with Cement Concrete Bedding

1C Trench in Hard Rock with Sand Bedding.

FIG. 1 TRENCHING OF DUCTILE IRON PIPES