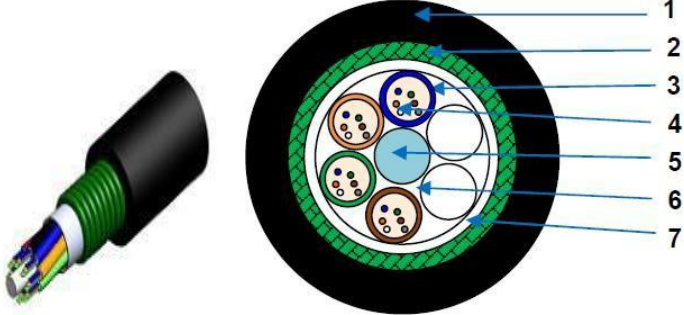
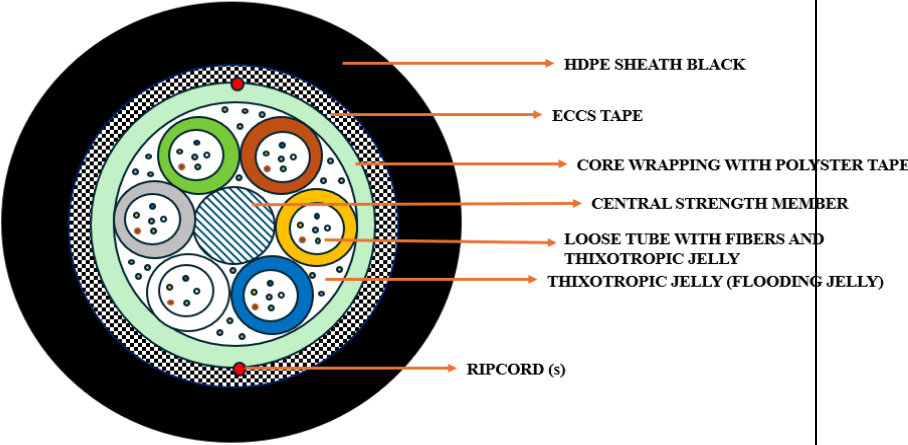


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Sl. No.	Clause Ref. No.	Existing provision	Amended as
1.	Volume-II, Technical Specification, Appendix-I	<p><u>APPROACH CABLE INSTALLATION AND HANDLING DOCUMENT</u></p> <p>Introduction: - A fiber optic approach cable is defined as the Armored Underground fiber Where suitable existing cable trenches are not available, suitable alternatives shall be provided after Employer approval. The approach cable shall be laid in the PLB HDPE duct in all conditions.</p> <p>Overview: - Optical ensure proper operation</p> <p><u>Approach Cable Structure</u></p>	<p><u>APPROACH CABLE INSTALLATION AND HANDLING DOCUMENT</u></p> <p>Introduction: - A fiber optic approach cable is defined as the Armored Underground fiber..... Where suitable existing cable trenches are not available, suitable alternatives shall be provided after Employer approval. <i>The approach cable shall be laid in the GI pipe in all conditions</i></p> <p>Overview: - Optical ensure proper operation</p> <p><u>Approach Cable Structure</u></p>

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		 <p>Construction :</p> <ol style="list-style-type: none"> 1. Outer sheath (PE, Anti-rodent) 2. Armor tape 3. Loose tube 4. Fiber and jelly 5. Center strength member (FRP) 6. Cable jelly 7. Water blocking tape <p>Technical Characteristics The unique extruding technology provides the fibers in the tube with good flexibility and bending endurance. The unique fiber excess length control method provides the cable with excellent mechanical and environmental properties multiple water blocking material filling provides dual water blocking function provides good crush resistance.</p>	<p>Typical Construction:</p>  <p>Technical Characteristics Dimensions and Properties</p> <table border="1" data-bbox="1272 1034 2114 1412"> <thead> <tr> <th rowspan="8" style="writing-mode: vertical-rl; transform: rotate(180deg);">Physical</th> <th><i>Fibre Count</i></th> <th>24 G652D</th> <th>48 G652D</th> <th>96 G652D</th> </tr> </thead> <tbody> <tr> <td><i>No. of loose tubes</i></td> <td>6</td> <td>6</td> <td>8</td> </tr> <tr> <td><i>No. of Fibre Per Tube</i></td> <td>4</td> <td>8</td> <td>12</td> </tr> <tr> <td><i>Cable OD</i></td> <td colspan="2">11.5 ± 0.5 mm</td> <td>13 ± 0.5 mm</td> </tr> <tr> <td><i>Nominal Cable Weight</i></td> <td colspan="2">130 kg/Km ± 10%</td> <td>170 kg/Km ± 10%</td> </tr> <tr> <td><i>Operation Temperature Range</i></td> <td colspan="2">-30° C to + 70° C</td> <td>-30° C to + 70° C</td> </tr> <tr> <td><i>Installation Temperature Range</i></td> <td colspan="2">-30° C to + 70° C</td> <td>-30° C to + 70° C</td> </tr> </tbody> </table>	Physical	<i>Fibre Count</i>	24 G652D	48 G652D	96 G652D	<i>No. of loose tubes</i>	6	6	8	<i>No. of Fibre Per Tube</i>	4	8	12	<i>Cable OD</i>	11.5 ± 0.5 mm		13 ± 0.5 mm	<i>Nominal Cable Weight</i>	130 kg/Km ± 10%		170 kg/Km ± 10%	<i>Operation Temperature Range</i>	-30° C to + 70° C		-30° C to + 70° C	<i>Installation Temperature Range</i>	-30° C to + 70° C		-30° C to + 70° C
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		<p>the coils, if required for unloading.</p> <p>2. The coil shall normally be unrolled at the same place and the PLB HDPE duct carried by workmen near the trench. The coils shall not be dragged in any case. But where the drums/coils of duct have to be moved should always be rolled in the direction of the arrow, otherwise the coils tend to unwind and the same may get battered. In case no such direction of arrow is given see the direction of winding of the coil and the coil should be rolled pointing in the opposite direction in which the upper end is coiled.</p> <p>3. All care should be taken in handling the coils with a view to ensure safety of the coils but also of the working party handling them. The coil should not be broken by standing in front of the coil but only from side.</p> <p>4.</p> <p><u>INSTALLATION PROCEDURE OF PLB HDPE DUCT LAYING :</u></p> <p>It is advisable to employ the people before commencement of the laying, inspection of the trench and inspection of protection works should be carried out so as to ensure their conformity with the specification. The trench bottom should be clean, smooth and free of small stone. When the soil contains stone or pieces or rock and therefore cannot be raddled, sieved earth about 10 cm. thick should be used both for the bedding on which the duct is being laid. The duct coil should be brought as close to the</p>	<p>3. <i>All necessary precautions shall be taken during handling to ensure the safety of both the material and the personnel. GI pipes shall be handled carefully to prevent slipping, rolling, or accidental impact. At all stages of handling and transportation, due care shall be taken to avoid damage to the pipe surface, ensuring its suitability for cable installation.</i></p> <p><u>INSTALLATION PROCEDURE OF GI PIPE LAYING:</u></p> <p>1. <i>The trench shall be inspected prior to laying, and its bottom shall be smooth, clean, and free from stones or sharp objects. Where required, a 100 mm thick layer of sieved soil shall be provided as bedding, and the GI pipes shall be brought close to the trench and handled carefully to avoid damage.</i></p> <p>2. <i>GI pipes shall be placed carefully with proper alignment, avoiding bending, impact, or deformation. Adequate manpower shall be deployed, and dragging of pipes shall not be permitted.</i></p> <p>3. <i>Continuous inspection shall be carried out during laying to identify any damage or defects, and any damaged portion shall be replaced before completion of installation. The joints shall be executed using suitable threaded couplers & elbows, ensuring proper sealing, and necessary corrosion protection shall be provided at joints. GI flexible conduits shall also be securely connected to maintain continuity and protection of the</i></p>

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		<p>trench as possible. It should be lifted carefully with the aid of jacks.</p> <ol style="list-style-type: none"> 1. Supervisor in charge should stand in a commanding position where he can view the entire trenches and shout evenly and call his men to pull. If there is proper synchronization between the mates call in the pulling by the men the duct will leave the coil without difficulty. It is important that the duct shall be pulled with steady and even pulls and there should not be unnecessary twists. Care should be taken to avoid twist as this is likely to damage the PLB HDPE duct. When pulling around bends one or two men should be stationed to give the duct the correct bent when it passes. 2. While laying the duct employ adequate number of men so that the duct can be conveniently carried by them in both hands without stretched arms. The distance between any two persons carrying the duct shall be two to ten meters depending upon the weight such that the maximum sag of the PLB HDPE duct between any two persons is not more than 0.5 meters. 3. While laying work is in progress one man has to continuously observe the PLB HDPE duct along its line 	<p><i>cable.</i></p> <ol style="list-style-type: none"> 4. <i>After completion of laying, the continuity and integrity of the pipe shall be verified, and a suitable arrangement shall be made to facilitate subsequent cable installation.</i>

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		<p>in order to determine indentations poles or other damaged parts are apparent. Such damaged parts have to be protected immediately.</p> <p>4. The conditions of the PLB HDPE duct shall be visually inspected throughout its line and in case damage or defect is noticed, the trench shall be filled up only after ensuring that the damage is not likely to affect the cable. The end of the duct should be sealed with flex to prevent entry of soil before filling back. Adjoining ducts shall be joined by couplers. Duct integrity testing shall be carried out when laying is completed in a block section (1 kms). In case the continuity is not achieved the fault shall be localized and rectified by providing PLB HDPE DUCT couplers/Compression couplers.</p> <p>5. Tools necessary for laying PLB HDPE Duct is to be checked as physically available before starting the Duct laying. For efficient and safe laying, communication may be provided between following points using portable VHF Walkie talkie sets.</p> <p>6. The Supervisor In charge of the duct laying. During PLB HDPE duct laying care must be taken not to twist duct in any direction. For this purpose, the survival (rotating hook) shall be attached between pulling line and pulling eye at the end of duct so as to avoid any possible twist during pulling and laying of the cable.</p>	

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		<p>7. During duct laying care must be taken not to twist duct in any direction. For this purpose, the rotating hook shall be attached between pulling line and pulling eye at the end of duct so as to avoid any possible twist during pulling and laying of the cable. In case it is planned to lay the cable in duct by pulling the cable by using a winch; the duct should be provided with a nylon rope for pulling</p> <p><u>PREPARATION FOR CABLE PULLING GRIP</u></p> <p>Methods used for placing fiber optic cables in ducts are essentially. However,.....8 and takes it out on the other, preventing twists.</p> <p><u>PROCEDURE FOR PULLING OF OPTICAL FIBER CABLE:</u></p> <p>Use pulling grip designed.....</p>	<p><u>PREPARATION FOR CABLE PULLING GRIP</u></p> <p>Methods used for placing fiber optic cables in <i>GI pipe</i> are essentially. However, However,.....8 and takes it out on the other, preventing twists.</p> <p><u>PROCEDURE FOR PULLING OF OPTICAL FIBER CABLE:</u></p> <p>Use pulling grip designed.....</p>
2.	Appendix- I, Technical Specification	“Appendix I_ Guidelines for Approach cable installation REVISED” enclosed herewith.	
