

Appendix 4: Representative Nearshore HDVC Cable Specifications

For the nearshore waters being considered in this proposal, each bi-pole will be made up of 2 x single core cable, rated at ± 600 kV DC, with one copper conductor (cross section area of ~ 2500 mm²), insulation, lead sheathing, and single wire armour with galvanized steel wires (Figure 1).

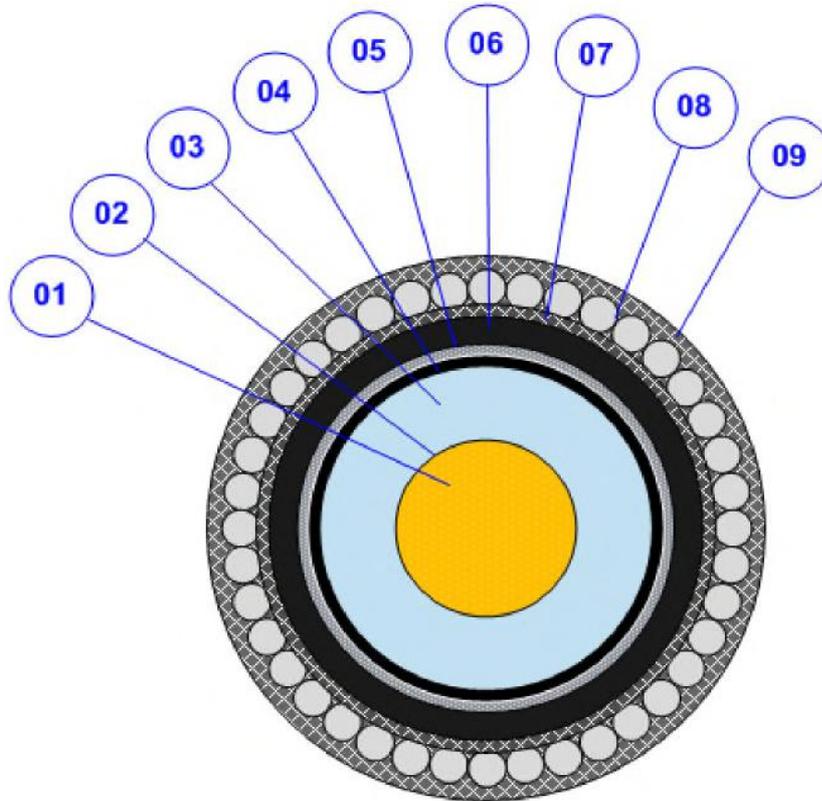


Figure 1: Submarine cable (shallow water section); cable cross sectional drawing – ± 600 kV single core cable.

No.	Description	Details
1	Conductor	Copper circular stranded, compacted
2	Conductor screen	Extruded bonded semi conductive compound
3	Insulation	Cross Linked Polyethylene compound
4	Insulation screen	Extruded bonded semi conductive compound
5	Metal sheath	Lead alloy
6	Anticorrosion sheath	Extruded polyethylene compound
7	Bedding	Polypropylene Yarns
8	Armouring	Galvanized steel wires, filled with Bitumen.
9	Serving	Polypropylene Yarns

The specific cable construction and manufacturing features are detailed below.

1 Conductor

The conductor is of a compacted circular design, constructed from copper wires filled with water blocking compound, or constructed aluminium wires filled with water blocking tapes, in order to limit water propagation in case of cable severance.

The design will meet the requirements laid down by class 2 stranding per IEC 60228.

2 Conductor screen, Insulation and Insulation screen

The insulation system consists of an inner extruded semi-conducting screen layer, the extruded insulation compound and an outer semi-conducting extruded insulation screen. These three layers are extruded in one single process to minimize inter-layer contamination.

The insulation shield is securely bonded to the insulation and requires the application of heat for removal, thus assuring the consistent bond required at the insulation stress interface.

3 Metallic sheath

An extruded lead alloy sheath (alloy E), is provided over the cable core as metallic sheath and radial water barrier.

Phase identification is provided by longitudinal coloured strips, applied under the metallic sheath.

4 Anticorrosion sheath

An extruded layer of polyethylene compound is provided over the metallic sheath, acting as anti-corrosion protection. This effectively prevents any direct contact between the metallic sheath and the surrounding water environment, thus preventing the lead from corrosion as well as the dissolution of lead contaminants into water.

5 Armouring

The “armouring” includes the bedding, the armour and the serving application in one common process.

One layer of polypropylene strings is applied over the anticorrosion sheath layer as bedding for the armour wires.

One layer of galvanized steel armour wires is applied over this bedding.

The application of bitumen is provided over the armour layers as further anti-corrosion protection and to aid the adhesion of the polypropylene strings.

Two layers of polypropylene strings are applied over the armour as cable serving in order to provide a degree of abrasion protection and to reduce cable/skid friction during lay. The polypropylene serving is applied with a black and yellow pattern in order to give high visibility to the cable and enable monitoring of cable horizontal movement by ROV cameras.

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