

SUB-SECTION – B-15

**FIRE PROOF CABLE
PENETRATION SEALING
SYSTEM**

CLAUSE NO.	TECHNICAL REQUIREMENTS		
1.00.00	CODES AND STANDARDS		
1.01.00	The fire proof cable penetration (FPCP) sealing system shall conform to the requirement of latest edition including amendments of BS:476 Part-20 Fire tests on Building materials and structures.		
1.02.00	Fire penetration seal complying with any other international standards will also be considered if it ensures performance equivalent or superior to standard listed above.		
1.03.00	The Bidder shall clearly indicate the standards adopted and furnish a copy of the English version of the latest editions of standards alongwith the bid, and shall clearly bring out the salient features for comparison.		
2.00.00	SYSTEM DESCRIPTION		
2.01.00	The fire proof cable penetration sealing system shall be of the following types; i) Type - A Type A fire sealing system is either Silicone foam or equivalent foam system or using individual blocks for each cable along with suitable frame work rated for one hour. Type A is to be implemented at floor openings below C&I panels, control panels/Boards etc. in CER & CCR. ii) Type-B Type B fire sealing system is any proven fire sealing system rated for one hour. This will comprise of rest of wall and floor crossings of cables/cable trays, opening below HT/LT Switchgears/board other than those covered under Type A.		
2.02.00	The penetration system, shall be installed immediately after the completion of cable termination in a particular switchboard/control panel/area after clearance from the Project Manager.		
3.00.00	GENERAL INFORMATION		
3.01.00	The cables shall generally be laid in cable trays/racks, conduits, ducts. The fire proof cable penetration system shall be designed in such a way that the existing supporting structure/cable is not disturbed.		
3.02.00	The penetration system shall be suitable for site condition at 50 ⁰ C ambient temperature and relative humidity of 100%.		
3.03.00	The penetration system of each wall/floor crossing shall be adequately designed/sized such that 20% addition of cables is possible at any later date without disturbance/wastage of material in the penetration system.		
3.04.00	Contractor shall plan the schedule of supply of the materials in consultation with Project Manager and use the material within stipulated shelf life of material. After		
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	award of work, drawings for each penetration seal shall be prepared by the contractor after verifying the actual installation of cables at site and approval shall be taken from the Project Manager's representative before proceeding with the actual work. The requirement of fire sealing material shall be quantified accordingly. Fire sealing material to be supplied shall be based on the net area to be sealed, wastage, thickness, density and other parameters as per the type test report approved under this contract.			
4.00.00	TECHNICAL REQUIREMENTS			
4.01.00	The fire proof cable penetration system shall fully comply with the requirements of BS:476 Part-20 and also to the requirements specified in this specification.			
4.02.00	The penetration system shall prevent spreading of fire in cable beyond the seal system in case of fire and shall have minimum 1 hour fire resistance rating.			
4.03.00	The penetration system shall be physically, chemically, thermally stable and shall be mechanically secure to the masonry/concrete/structural members. The system shall be mechanically robust and capable of giving satisfactory performance under vibrations encountered in power stations.			
4.04.00	The penetration system shall be capable of withstanding mechanical loads, foot traffic drop loads, vibrations, wind pressure, etc.			
4.05.00	The penetration system shall be completely gas and smoke tight.			
4.06.00	The penetration system shall retain integrity and perform satisfactorily even after remaining in water for long period.			
4.07.00	The materials used in FPCP sealing system shall be non-toxic and harmless to the working personnel.			
4.08.00	The penetration materials shall have no reaction with cable sheath/galvanising/painting of structural steel.			
4.09.00	The penetration materials shall have anti-rodent and anti-termite properties.			
4.10.00	The penetration materials shall have no shrinkage or cracking after the setting for the complete life of the power Plant.			
4.11.00	Under normal load, short circuit and fire conditions, cables may be subjected to movement and vibration. The FPCP sealing system shall be designed to withstand and perform satisfactorily under these conditions.			
4.12.00	The penetration system shall not affect the current carrying capacity of cables passing through it.			
4.13.00	Asbestos shall not be used in the construction of fire penetration seal system.			
4.14.00	The penetration system shall have life expectancy of 40 years.			
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4.15.00	The penetration system shall not emit any corrosive or toxic fumes or smoke on the unexposed face of the barrier.			
4.16.00	Any wastage of the compound during the process of mixing for preparing the FPCP sealing compound shall be to Contractor's account.			
4.17.00	For foam type of systems, only the foam shall form the penetration seal of specified rating, having the damming board removed after curing of the foam.			
5.00.00	PACKING AND STORAGE			
5.01.00	All materials and components of penetration system shall be supplied in packing to avoid contamination of materials due to dust/moisture and temperature during transit and storage. All packing shall be of durable quality and the date of expiry and the date of manufacture shall be printed on it.			
6.00.00	INSTALLATION			
6.01.00	The contractor shall take adequate care to ensure that cables are not damaged in any manner during penetration system installation.			
6.02.00	Wherever the floor/wall opening provided in the vicinity of penetration seals larger or smaller than that required for the cable fire penetration, these opening size can be reduced or increased in an approved manner by the contractor using the same materials as provided around the opening and of the same thickness. Generally the walls in the power station comprises of brickwork and the floors are made of RCC/steel work. The Contractor shall be paid for this work at the unit rates for the respective brickwork/ R.C.C.			
6.03.00	The work to be carried out under this specification shall be done under the supervision of Project Manager's representative.			
6.04.00	All work shall be carried out in accordance with the agreed "field quality plan" and approved drawings. The "field quality plan" shall additionally specify the fire sealing material thickness, minimum cured density and other related parameters achieved in the approved type tests for the contract. The work shall be done to the satisfaction of the Project Manager and the same shall be subject to Project Manager's approval for acceptance.			
6.05.00	The installation shall be carried out in a neat workmen like manner by the skilled, experienced and competent workmen.			
6.06.00	Installation work at site shall be properly coordinated with other services.			
6.07.00	All materials being supplied or consumed during installation by the Contractor in the process of installation shall be of the best quality and according to relevant standards. All materials shall be inspected and approved by the Project Manager before the same is used for installation work. Also regarding inspection of work, the engineer shall have the right to inspect at any stage during installation, testing and commissioning.			
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