TECHNICAL SPECIFICATION FOR MINI SECTION PILLAR (MSP)

1.1 SCOPE

This specification covers the design, manufacturing and testing of MSP with anti-corrosive, dust proof, rust proof, shock proof, self-extinguishing property, resistant to heat, vermin & water proof, Ultra Violet Stabilized and pilfer resistant made from Thermosetting Plastic i.e. Glass Reinforced Polyester Sheet Moulding Compound (SMC) Confirming to IS: 13410 -1992 and attached technical specification, and IS: 14772-2000 with SMC HRC fuse base confirming to IS:13703/1993 (Pt.I & II amended up to date)and other relevant IS.

The equipment offered shall be complete with all parts necessary for their effective and trouble-free outdoor operation. Such parts will be deemed to be within the scope of the supply irrespective of whether they are specifically indicated in the commercial order or not.

It is not the intent to specify herein complete details of design and construction. The equipment offered shall conform to the relevant standards and be of high quality, sturdy, robust and of good design and workmanship complete in all respects and capable to perform continuous and satisfactory operations in the actual service conditions at site and shall have sufficiently long life in service as per statutory requirements.

In these specifications, the design and constructional aspects, including materials and dimensions, will be subject to good engineering practice in conformity with the required quality of the product, and to such tolerances, allowances and requirements for clearances etc. as are necessary by virtue of various stipulations in that respect in the relevant ISO, IEC, BS, IS standards and other statutory provisions.

1.2 SERVICE CONDITIONS

Equipment to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions.

a) Maximum ambient temperature of air: 50˚C
b) Maximum temperature of air in shade: 4˚C
c) Maximum daily average ambient temperature: 40˚C
d) Maximum yearly average ambient temperature: 30˚C
e) Relative Humidity: up to 95%
f) Average number of thunder storm days per annum: 15
g) Maximum annual Rainfall: 150cm

h) Maximum Altitude above mean sea level: 1000Meter

i) Maximum Wind Pressure: 150 Kg/cm2 (As per IS 802 latest code)

j) Maximum soil temperature at cable depth: 30˚C

k) Maximum soil thermal resistively: 150˚C cm/watt

1.3 TECHNICAL PARAMETERS

The L.T Feeder Pillar panel shall be designed as following: -

Sl. No	Parameter	Value
1	Rated Supply Voltage	433 volts +/-10%
2	Number of Phases & Frequency	3 phase 4W 50 Hz
3	Rated Current	as per Single line diagram/BOQ
4	Neutral	Solidly Grounded
5	Location of panel	Outdoor on M.S Channels fixed on RCC Plinth
6	Thickness of SMC Sheet for cabinet mm	3.15MM
7	Bus bar material	Tinned Cu / Al bus bar

1.4 APPLICABLE STANDARDS

All equipment and material shall be designed manufactured and tested in accordance with the latest applicable IEC standard or IS standard except where modified and / or supplemented this specification.

Title	IEC Standard	IS /Other Standard
Low-voltage switchgear and control gear	IEC:60947 (Part-1,2,3)	IS: 13947
Low-voltage switchgear and control gear assemblies	IEC:60439 (Part-2)	-do-
General Requirements for Enclosures for Accessories for Household and Similar Fixed Electrical Installations		IS 14772
Glass reinforced polyester sheet moulding compounds (SMC)		IS 13410

LV Fuses for voltages not exceeding 1000 V ac or 1500 V dc		IS 13703
MCBs	IEC 60898	IS: 8828

1.5 GENERAL TECHNICAL REQUIREMENTS

a) The minimum size of box without rain hood shall be 820(H)x 525(W)x400(D) mm. and with rain hood shall be 1370(H) x 735 (W) x 516 (D)mm. The thickness of SMC sheet for enclosure and door is minimum 3.15 mm.

b) MSP shall be of Grade S-3 SMC material MSP shall be moulded in a single piece forming the body of the MSP with a cover fitted with base by minimum three nos. concealed stainless steel hinges. The lid/cover shall rest on the collar of the MSP base in such a way that any access from outside is not possible. The stainless steel hinges shall be fitted with the MSP body base and covers rigidly, thereby making the MSP pilfer resistant.

c) The door in closed position should be overlapped in such a manner that no direct entry or access is possible. The MSP shall be closed by minimum two nos hings per door. Minimum 50 mm length of strip having thickness not less than 1.2 mm for holding and locking of the door with body base.

d) The door shall open at 90 degrees (Min.). The top surface of box shall have little tapering shape towards both sides of the distribution box for easy flow of rainwater.

e) Earth bolt of 12 mm diameter X 20 mm. length with 2 nos. nuts, 2 nos. washers and 1 no. spring washer shall be provided. The earthing arrangement shall be of M.S. with Zinc passivation. All corners of the MSP should be round & not pointed ones. All metal parts shall be zinc passivated.

f) The MSP should have one no of 400 / 250 Amp three phase and neutral incoming circuit HRC SMC fuse base and appropriate size of lugs filled with 50X6 mm copper or 50x10 mm Aluminum bus bar and six (6) nos of outgoing circuit.

g) Anodized aluminum operating instructions in GUJARATI shall be fixed inside the door. The letter should be cleared legible and readable. The letters of the instructions should be of sufficient size to read with normal eye.

h) The MSP should have Bus bar of EC grade tinned copper / aluminum bus bar duly insulated for all phase and neutral.

1.6 TESTS

a) The bidder shall submit type test report for complete FSP as per BS 214/1959 or IS 8623/93 and for box as per IS-14772-2000 & IS: 13410- 1992 from CIPET, Ahmedabad/ERDA, Baroda or NABL accredited lab. for the box as well as TPN switch disconnector fuse & SMC fuse base along with the offer. Type Test Certificate should not be older than 7 years as on the date of tender opening.

b) **ROUTINE TEST**: Manufacturer has to carryout routine test during production to check the essential requirements that are likely to vary during production. Manufacturer has to keep records of the same and to be produced for verification of inspector when asked at the time of inspection of lot.

c) **TYPE TEST (For SMC box):**

From the offered lot sample may be picked up at discretion of purchaser for type test at CIPET, Ahmedabad/ERDA, Baroda or NABL accredited lab for each lot offer. The charges for the type test shall be borne by bidder. On passing the type test successfully, the lot shall be accepted. In case, the boxes are not confirmed to type test, another sample form the lot shall be selected and the tested again. On receipt of unsatisfactory results, the lot shall be rejected and new lot shall be offered for inspection keeping aside old lot offered and rejected earlier by the Company. However, Company reserves the right to accept the boxes by levying penalty as per description of the company.

d) **TYPE TEST (For Isolator/box):**

Type test reports not more than 7 years old from the date of tender from Government approved and NABL accredited lab.

1) Type Test for complete FSP as per BS214/1959 or IS8623/93.

e) **ACCEPTANCE TESTS:**

The bidder should have all the testing facilities at their works & shall offer testing as under. Following acceptance tests shall be carried out, on 2% of the offered quantity on sample boxes selected at random, while inspecting the lot of materials offered.

- Visual examination
- Verification of dimensions as per approved drawings.
- Verification of fittings
- HV test at 5.2 (3.5*1.5) KV for Bus bar, 11KV for SMC material of Box.
- Insulation resistance test with 2.5KV DC megger of each box.

- Temperature rise test in accordance with relevant IS for the rated capacity of Switch disconnector fuse.
- Earth continuity checking test.
- 10 Operations test on SMC HRC fuse base & fuse link.

Note: MGVCL reserve the right to select one sample from whole tender quantity and will send Govt. approved/ NABL accredited lab. For complete acceptance test of all material. Cost of the same is to be paid by contractor.

1.7 DRAWING & CALIBRATION OF INSTRUMENT

The tenderer shall submit detailed constructional and dimensional drawing of complete FSP details of Units and TPN switch Disconnector fuse, incoming and outgoing circuit, Louvers details, clearance details along with the offer.

(a) The firm has to submit list of testing equipment's instruments, stating Sr. No., Make, Capacity, date of last calibration along with test certificate of each instrument along with the offer, same is also required to be provided to inspecting officer at the time of prototype inspection as well as regular lots. The calibration shall be either from original manufacturer of the equipment's / instruments or from Government approved laboratory.

1.8 PROTO TYPE

The successful tenderer shall have to offer 1 No. Prototype FSP for carrying out tests mentioned at specification clause No. e (acceptance test) at their works or at Government approved Laboratory, where no adequate testing facility is available at firm's work in presence of MGVCL's representative. In case of brought out items like SMC **HRC** Fuse Units, Disconnector switch the same have to be either tested at firm's work or at the works of original manufacturer or at Government approved / recognized laboratory in case of non-availability of adequate testing facility either at firm's works of original manufacturer. However, all the testing expenditures of prototype sample testing. Acceptance tests for routine inspection of lots will be borne by the firm only after successful passing of the prototype unit in all the tests and after obtaining the written approved from the competent authority of MGVCL for prototype box and drawing approval, the firm can commence bulk manufacturing of the ordered boxes. The expenses towards prototype test including visit of our Engineers (2 Nos.) other than your works shall be borne by the bidder.

1.9 RAW MATERIALS

Test certificate for the material used in the lot offered and document for purchase of raw material should be maintained by manufacturer and produced to inspector as and when required.

1.10 FACILITY

The bidder shall have facility to test the box for routine tests and acceptance as per IS – 14772: 2000 and IS – 13410 & MGVCL's specifications at their works. The bidder has to submit list of Machinery & Equipment / Testing instruments etc. along with the offer.

1.11 INSPECTION AND TESTING

During the inspection manufacturer will offer all facilities to inspector without any charge.

1.12 DISPATCH

The FSP shall be dispatched duly packed so as to ensure that no damage occurs during transport.

1.13 GUARANTEE

If the goods, stores and equipments found defective due to bad design or workmanship the same should be repaired or replaced free of charge if reported within **24** months from the date of commissioning of equipments. Supplier will be responsible for the proper performance of the equipments materials for the respective guarantee period.

1.14 GTP

The vendor shall furnish all necessary guaranteed technical particulars in the prescribed Performa enclosed hereinafter.

Sr. No	Particulars	Particulars to be offered by Bidders
1	Name of Trade mark of Manufacturer	
2	Type of L.T. piller	
3	Rated normal Voltage	3 phase, 440 Volt, 50Hz
4	Material of construction of L.T. Pillar enclosure and doors	Grade S-3 SMC material
5	Thickness of SMC sheet for enclosure	3.15 mm
6	Thickness of SMC sheet for door	3.15 mm
7	Colour of L.T.Piller of enclosure	
8	Dimension of cubical without rain hood-width x depth x height mm.	820(H)x 525(W)x400(D) mm minimum
9	Dimension of cubical with Rain hood-width x depth x height of (in mm).	1370(H) x 735 (W) x 516 (D)mm.
10	Fibre glass reinforce Plastic sheet moulding compound	
a	Material	Grade S-3 SMC material (Thermostatic Plastic)
b	Grade of Material	SMC as per IS -13410-1992
c	Grade of material for frame	FRP pultruded section as per IS 6746
d	Heat deflection temperature	(as per IS 13411) min 150o C
e	Exposure to flame	(ref. std. IS 4249) Self-extinguishing
f	Melting point	(ref std IS 13360) Does not melt
g	Fibre glass reinforcement	(Min 20%)
h	Density of fibre glass material	(450 gm/sq mtr)
i	Maximum permissible temperature	(≥ 90°C)
j	Door material (UV resistance and salty and humid atmosphere)	Grade S-3 SMC material
k	Insulation Resistance	(As per ASTM D257)
l	Specific Gravity	as per IS:10192 of SMC material (1:8)
m	Dielectric Strength	
n	Tensile Strength	70MPa
o	Cross Breaking Strength	as per ASTM D790 (1723 Kg/sq.cm)

p	Shear strength	as per ASTM D732 (879 Kg/sq.cm)
q	Ball pressure Test	as per IS:335
r	Water Absorption	as per IS:14772
s	Mechanical strength	as per IS:14772
11	Hinges	
a	Hinges: Type	stainless steel hinges
b	Hinges: Length	50mm
c	Hinges: Thickness of material	not less than 1.2 mm
d	Hinges: Pin diameter	Min 4mm
e	Number of hinges per door	two
12	Type of locking arrangements	"Godrej" type triple position locking arrangement and shall be operational with a common handle from outside the door
13	Number of padlocking arrangements	2 Nos.
14	Size of ventilating louvers with wire mesh	Four Louvers (two on each side)
15	Details of painting	anti-corrosive high-quality paint
16	Dimension and details of asbestoses sheets	Asbestos sheet of at least 6mm thick shall be provided for separation between front and rear compartments
17	Dimension and details of Bakelite sheets	at least 50 x 12mm shall be provided to support and take care of weight of cables, jointing etc.
18	Dimension and details of gland plates	Suitable no. of detachable gland plates made up of 10 SWG MS sheets/SMC material shall be provided in the cubicle at the bottom
19	Bus Bar, Fuse Base & fuse Link	
a	Size of bus bar Size of neutral bus bar	
b	Grade and specification of material of Bus bars	IS: 5082/1998
c	Rated normal current of bus bars	
d	Rated safe temperature of bus bars	
e	Make and Type of Fuse base assembly	
f	Grade and specification of material of Fuse base contacts	IS: 13703/1993
g	Thickness and dimensions of contacts of fuse base	
h	Rated normal current of Fuse base	
i	Rated safe temperature of Fuse base	
j	Grade and specification of material of Fuse links	IS/IEC 127-2: 1989

k	Make and Type of Fuse link	
l	Rated normal current of Fuse link	
m	Rated safe temperature of Fuse link	
n	Grade and specification of material of spring steel round	IS: 6005/1998
o	Dimension of steel spring round	spring ring shall be made out of at least 6 mm dia
20	Make & Type of bimetallic lugs	
21	One Minute P.F Withstand voltage	
22	Rated short time current	
23	Rated temperature rise	
24	Size Thickness of Bakelite sheets provided	
25	List of tests conducted on similar equipment	
26	List of copies of test certificate enclosed	