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| DOCUMENT NO    | TPWODL/ENGG/SPEC/085/2022                                                          | REVISION NO: R1              |

# STANDARAD TECHNICAL SPECIFICATION For F BRACKET 11KV & 33KV FOR PSC POLE

|                        |                    |                        |
|------------------------|--------------------|------------------------|
| <b>PREPARED BY</b>     | <b>REVIEWED BY</b> | <b>APPROVED BY</b>     |
| <b>SANTOSH K PATRA</b> | <b>A JAWASE</b>    | <b>VARUN BHATNAGAR</b> |

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### 1. SCOPE:

This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing and forwarding, supply, unloading at TPWODL stores/sites. Following equipment's / materials covered under the scope with all fittings, accessories and associated auxiliary equipment, mandatory spares which are required for efficient and trouble-free operation.

- a) F Bracket

### 2. APPLICABLE STANDARDS:

The Material covered by this specification shall unless otherwise stated, be designed, constructed and tested in accordance with the latest revisions of relevant Indian Standards /IEC/ International Standards and shall conform to the regulations of local statutory authorities.

|         |                                                                                                       |
|---------|-------------------------------------------------------------------------------------------------------|
| IS 2062 | Specification for Hot Rolled Medium and High Tensile Structural Steel                                 |
| IS 800  | General Construction in Steel – Code of Practice                                                      |
| IS 228  | Method for Chemical Analysis of Steels                                                                |
| IS 808  | Dimensions for Hot Rolled Steel, Beam, Column, Channel and Angle Sections                             |
| IS 1852 | Specification for Rolling and Cutting Tolerances for Hot-Rolled Steel Products                        |
| IS 4759 | Hot-Dip Zinc Coatings on Structural steel and other Allied Products- Specifications                   |
| IS 209  | Specification of Zinc Ingot                                                                           |
| IS 2629 | Recommended Practice for Hot-Dip Galvanizing for Iron and Steel                                       |
| IS 1387 | General Requirements for the Supply of Metallurgical Materials                                        |
| IS 814  | Covered Electrodes for Manual Metal Arc Welding of Carbon and Carbon Manganese Steel                  |
| IS 1730 | Dimensions for Steel Plates, Sheets, Strips and Flats for Structural and general engineering purposes |
| IS 9595 | Metal arc welding of carbon and carbon manganese steels — Recommendations                             |
| IS 8910 | General Technical Delivery Requirements for Steel and Steel Products                                  |

### 3. CLIMATIC CONDITIONS OF THE INSTALLATION:

The service shall be as follow:

- |                                                               |        |
|---------------------------------------------------------------|--------|
| 1. Maximum altitude above sea level                           | 1,000m |
| 2. Maximum ambient air temperature                            | 50°C   |
| 3. Maximum daily average ambient air temperature              | 35°C   |
| 4. Minimum ambient air temperature                            | 0°C    |
| 5. Maximum temperature attainable by an object exposed to sun | 60°C   |
| 6. Maximum relative humidity                                  | 95%    |
| 7. Average number of thunderstorms per annum                  | 70     |

|                        |                    |                        |
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- |                                                                                                                                         |                 |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 8. Average number of rainy days per annum                                                                                               | 120             |
| 9. Rainy months                                                                                                                         | June to October |
| 10. Average annual rainfall                                                                                                             | 150cm           |
| 11. Maximum Wind velocity                                                                                                               | 200 km/hr.      |
| 12. Earthquakes of an intensity in horizontal direction - equivalent to seismic acceleration of 0.3g                                    |                 |
| 13. Earthquakes of an intensity in vertical direction - equivalent to seismic acceleration of 0.15g (being acceleration due to gravity) |                 |

Environmentally, some of the regions, where the work will take place includes hilly areas, subject to high relative humidity, which can give rise to condensation. Atmosphere is generally laden with mild acid and dust due to industrial activities. Some places are in heavily industrial polluted areas. On occasions, the combination of humid, acidic and dust condensation may create pollution conditions for outdoor equipment's. Therefore, outdoor materials and equipment's shall be designed and protected for use exposed, heavily polluted, acidic, corrosive, tropical and humid atmosphere.

#### 4. GENERAL TECHNICAL REQUIREMENTS:

| SI. NO. | PARAMETERS                                   | STANDARD VALUES                                                         |          |
|---------|----------------------------------------------|-------------------------------------------------------------------------|----------|
|         |                                              | 11 kV                                                                   | 33 kV    |
| 1       | Material Description                         | F Bracket                                                               |          |
| 2       | Material                                     | MS Flat                                                                 |          |
| 3       | Galvanization process                        | Hot-Dip Galvanized                                                      |          |
| 4       | Relevant Standard                            | IS: 2062, IS: 2633, IS: 2629,                                           |          |
| 5       | Dimension of section                         | 50x8 mm                                                                 | 75x10 mm |
| 6       | Weight of F Bracket (minimum)                | 1.5 kg                                                                  | 2.8 kg   |
| 7       | Grade of Steel                               | E 250A                                                                  |          |
| 8       | Minimum Tensile Strength                     | 410 N/mm <sup>2</sup>                                                   |          |
| 9       | Yield Stress                                 | 250 N/mm <sup>2</sup>                                                   |          |
| 10      | Percentage Elongation (Min.) at Gauge Length | 23%                                                                     |          |
| 11      | Bend Test (Internal Dia)                     | Min-2t                                                                  |          |
| 12      | Mass of Zinc coating                         | 705 gm/m <sup>2</sup>                                                   |          |
| 13      | Zinc coating thickness                       | 100 micron (6 Dip)                                                      |          |
| 14      | Chemical composition                         | Grade E 250A (As per IS: 2062)                                          |          |
| 15      | General Tolerance                            | As per IS: 1852                                                         |          |
| 16      | Marking                                      | TPWODL, Manufacture's name or trademark, Month & Year of Manufacturing. |          |

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## 5. GENERAL CONSTRUCTIONS:

### 5.1. GENERAL MANUFACTURING REQUIREMENTS:

5.1.1 All finished steel shall be well and cleanly rolled to the dimensions, sections and masses specified. The finished material shall be reasonably free from surface flaws; laminations; rough/jagged and imperfect edges and all other harmful defects.

5.1.2. Minor surface defects may be removed by the manufacturer/supplier by grinding provided.

5.1.3. Welding shall carry out by approved procedure by competent operators with approved

5.1.4. electrodes and that the welding is ground smooth to the correct nominal thickness; and

5.1.5. Zinc Coating shall be applied by hot-dip galvanizing on steel products fabricated or assembled as specified in IS 4759-1996.

5.1.6. Zinc coating shall be uniform, adherent, reasonably smooth and free from such imperfections as flux, ash bare patches, black spots, pimples, lumpiness, runs, rust stains, bulky white deposits and blisters.

### 5.2. APPROVED MAKES:

TATA Steel, SAIL, Jindal, RINL. In addition, these makes, bidder may also supply material of other makes (having ISI Certification) subject to successful testing for tests specified in Clause 7.0. Sampling in this regard shall be done jointly along with TPWODL representative and testing shall be got done from govt. approved laboratories

**Zinc for Galvanization:** Hindustan Zinc, Vedanta.

## 6. NAME PLATE AND MARKING:

Not Applicable

## 7. TESTS:

All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC.

All routine/acceptance tests shall be witnessed by the purchaser/his authorized representative. All components shall also be type tested as per the relevant standards.

| Tests               | IS to be referred  |
|---------------------|--------------------|
| Visual test         | As a routine test  |
| Dimensional tests   | As per the drawing |
| Tensile strength    | IS 2062            |
| Bend test           | IS 2062            |
| Impact test         | IS 2062            |
| Hot dip galvanizing | IS 4759: 1996      |

|                        |                    |                        |
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## 8. TYPE TEST CERTIFICATES:

1. The bidder shall furnish the type test certificates as mentioned above as per the corresponding standards.
2. All the tests shall be conducted at CPRI / ERDA as per the relevant standards.
3. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid.
4. In the event of any discrepancy in the test reports, i.e., any test report not acceptable same shall be carried out without any cost implication to TPWODL.
5. Bidder shall submit the Test Reports for the Tree Retardant properties of the insulation.

## 9. PRE-DISPATCH INSPECTION:

1. Material shall be subject to inspection by a duly authorized representative of TPWODL.
2. Inspection may be made at any stage of manufacture at the option of the purchaser and the equipment if found unsatisfactory as to workmanship or material, the same is liable to rejection.
3. Bidder shall grant free access to the places of manufacture to TPWODL's representatives at all times when the work is in progress.
4. Inspection by TPWODL or authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications.
5. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by TPWODL.
6. Following documents shall be sent along with material:
  - a) Test report
  - b) MDCC issued by TPWODL
  - c) Invoice in duplicate
  - d) Packing list
  - e) Drawings & catalogue
  - f) Guarantee / Warrantee card
  - g) Brought out (raw) material test certificates
  - h) Delivery Challan
  - i) Other Documents (as applicable)

## 10. INSPECTION AFTER RECEIPT AT STORES:

The material received at TPWODL store will be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to "Engineering & Quality" department.

## 11. GUARANTEE:

1. Bidder shall stand guarantee towards design, materials, workmanship & quality of process/ manufacturing of items under the contract for due and intended performance of the same, as an

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integrated product delivered under this contract.

2. In the event any defect is found by the TPWODL, up to a period of 36 months from the date of commissioning or 42 months from the date of last supplies made under the contract, whichever is earlier, (the time scale of 36/42 months could be enhanced subject to mutual agreements). Bidder shall be liable to undertake to replace/rectify such defects at his own costs. within mutually agreed timeframe, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at supplier's risks and costs and recover all such expenses plus the Company's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum Performance Deposit" as the case may be. Bidder shall further be responsible for '**free replacement**' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.

## **12. PACKING:**

For packing of F Bracket double gunny bags (or wooden cases, if deemed necessary) shall be employed. The heads and threaded portions of pins shall be properly protected against damage. The gross weight of each packing shall not normally exceed 50 Kg. All nuts shall be hand-tightened over the bolts and screwed up to the farthest point. Bidder shall ensure that all equipment covered by this specification shall be prepared for rail / road transport (local equipment) and be packed in such a manner as to protect it from damage in transit.

**NOTE:** Single use plastic not be used for packing of the material.

## **13. TENEDR SAMPLE:**

To be submitted as per the request of tender enquiry.

## **14. TRAINING:**

Not Applicable

## **15. QUALITY CONTROL:**

The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. TPWODL's engineer or its nominated representative shall have free access to the bidder's works to carry out inspections.

## **16. MINIMUM TESTING FACILITIES:**

Bidder shall have adequate inhouse testing facilities for carrying out all routine tests & acceptance tests as per relevant International / Indian standards.

|                        |                    |                        |
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### 17. MANUFACTURING ACTIVITIES:

The successful Bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order. Manufacturing mass quantity to start only after getting approved drawings or as per intimation from TPWODL.

### 18. SPARES, ACCESSORIES AND TOOLS:

Not applicable.

### 19. DRAWINGS AND DOCUMENTS:

Following drawings and documents shall be prepared based on TPWODL specifications and statutory requirements and shall be submitted with the bid:

- Completely filled in Technical Particulars
- General drawing arrangements
- Bill of material
- Type Test certificates.
- Brought out (raw material) test certificates
- Experience List

After the award of the contract four (4) copies of drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval and shall subsequently provide four (4) complete sets of final drawings, one of which shall be auto positive suitable for reproduction, before the dispatch of the equipment. Soft copy of all the drawing, GTP, Test certificates shall be submitted after the final approval of the same to purchaser.

Following drawings / documents shall be submitted by the bidder for Purchaser's approval.

| Sl. No. | Description                                    | For Approval | For Review Information | Final Submission |
|---------|------------------------------------------------|--------------|------------------------|------------------|
| 1       | Technical Particulars                          | √            |                        | √                |
| 2       | General Arrangement drawings                   | √            |                        | √                |
| 3       | Manual / catalogue/drawings                    |              | √                      |                  |
| 4       | Installation /Commissioning Manuals (If any)   |              | √                      | √                |
| 5       | QA & QC Plan                                   | √            | √                      | √                |
| 6       | Routine, Acceptance and Type Test Certificates | √            | √                      | √                |
| 7       | Brought out or Raw material test certificates  |              | √                      | √                |

\*All the documents & drawings shall be in English language.

|                        |                    |                        |
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#### Instruction Manuals:

Bidder shall furnish two softcopies and four (4) hard copies of nicely bound manuals (In English language) covering erection and maintenance instructions and all relevant information and drawings pertaining to the main equipment as well as auxiliary devices.

#### 20.GUARANTEED TECHNICAL PARTICULARS:

| SI. NO. | PARAMETERS                                       | STANDARD VALUES          |       |
|---------|--------------------------------------------------|--------------------------|-------|
|         |                                                  | 11 kV                    | 33 kV |
| 1       | Material Description                             | To be provided by Bidder |       |
| 2       | Material                                         |                          |       |
| 3       | Galvanization process                            |                          |       |
| 4       | Relevant Standard                                |                          |       |
| 5       | Dimension of section                             |                          |       |
| 6       | Weight of F Bracket (minimum)                    |                          |       |
| 7       | Grade of Steel                                   |                          |       |
| 8       | Minimum Tensile Strength                         |                          |       |
| 9       | Yield Stress                                     |                          |       |
| 10      | Percentage Elongation (Min.) at Gauge Length     |                          |       |
| 11      | Bend Test (Internal Dia)                         |                          |       |
| 12      | Mass of Zinc coating                             |                          |       |
| 13      | Zinc coating thickness                           |                          |       |
| 14      | Chemical composition                             |                          |       |
| 15      | Dimensional Tolerance                            |                          |       |
| 16      | Engraved Marking (Punching before galvanization) |                          |       |

Signature of Bidder:

Date:

Name of the Company:

Office Seal:

|                        |                    |                        |
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## 21. SCHEDULE OF DEVIATIONS:

### (TO BE ENCLOSED WITH TECHNICAL BID)

All deviations from this specification shall be set out by the Bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:

| S. No | Clause No. | Details of deviation with justifications |
|-------|------------|------------------------------------------|
|       |            |                                          |

We confirm that there are no deviations apart from those detailed above. Seal of the Company:

Signature of Bidder:

Name of the Company:

Date:

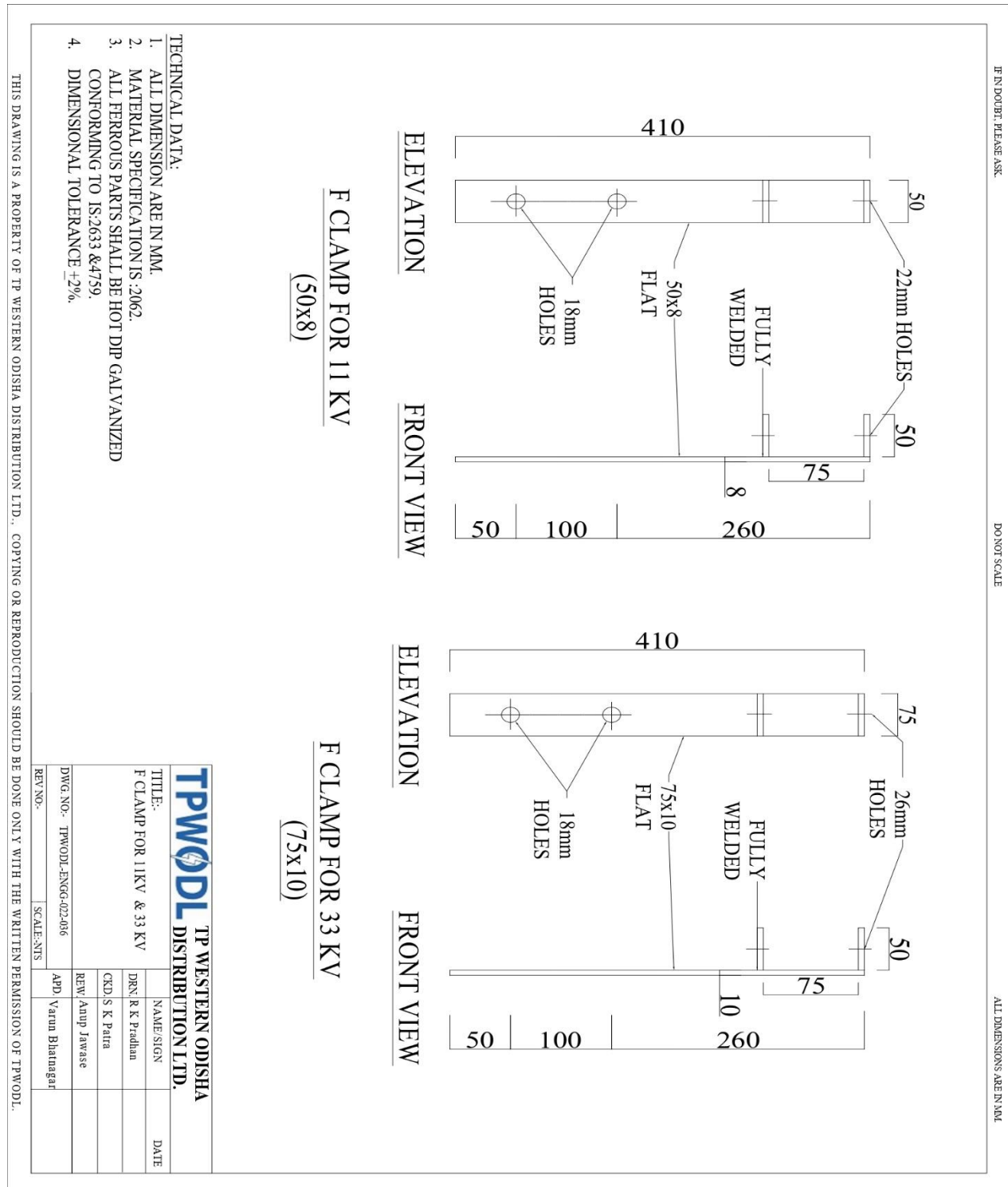
Office Seal:

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### A. 11KV & 33KV F Bracket For PSC Pole:



|                        |                    |                        |
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