

TECHNICAL QUALIFYING REQUIREMENT & EXPERIENCE

The bidder should have manufactured & supplied GI Flat, MS Flat at least 300MT cumulatively and 50MT GI Flat/MS Flat in any one year during the last 5 years from the date of original scheduled bid opening.

(The bidder shall submit the relevant documents pertaining to Proof of Supply.)


02/11/18


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Bill of Quantities/ Price Schedule

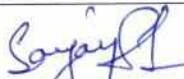
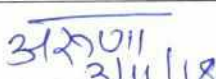
Sl. no.	Description	Unit	Quantity
A.	Galvanized MS Flat		
1	75x12mm	MT	700
2	75x10mm	MT	6
3	75x8mm	MT	5
4	65x10mm	MT	5
5	65x8mm	MT	4
6	50x8mm	MT	3
7	50x6mm	MT	190
B.	MS Flat		
1	75x12mm	MT	989
2	75x10mm	MT	6
3	50x8mm	MT	60
4	50x6mm	MT	9
C	Pipe electrode		
1	GI pipe electrode	No.	300
2	CI pipe electrode	No.	50

TECHNICAL SPECIFICATION
for
EARTHING MATERIALS

SPECIFICATION NO: TB-XXX-316-020
REVISION: 06
DATE: 30.10.2018



BHARAT HEAVY ELECTRICALS LIMITED
TRANSMISSION BUSINESS GROUP
NOIDA, UP (INDIA) – 201305

	Prepared by	Checked by	Approved by
Name	Dileep Shukla	SK Shukla	Aruna Gulati
Signature			
Date	30.10.2018	30.10.2018	30.10.2018



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4.	TOTAL NO. OF SHEETS (INCLUDING COVER/ SEPARATOR SHEETS)	13



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SECTION - I

SPECIFIC TECHNICAL REQUIREMENTS



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ANNEXURE-A
COMPLIANCE CERTIFICATE OF TECHNICAL SPECIFICATION

The bidder shall confirm compliance to the following by signing and/or sealing/ stamping this compliance certificate and furnishing same with the offer.

1. The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusion/ deviation with regard to same.
2. There are no deviation(s) with respect to specification other than those furnished in the 'schedule of deviations'.
3. Only those technical submittals which are specifically asked for in Notice Inviting Tender (NIT) to be submitted at tender stage shall be considered as part of offer. Any other submission, even if made, shall not be considered as a part of offer.
4. Any comments/ clarifications on technical/ inspection requirements furnished as part of bidder's covering letter shall not be considered by BHEL, and bidder's offer shall be construed to be in conformance with the specification.
5. Any changes made by the bidder in the price schedule with respect to the description/ quantities from those given in 'BOQ' of the specification shall not be considered (i.e., technical description & quantities as per the specification shall prevail).

Date:

Bidder's Stamp & Signature



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ANNEXURE-B
SCHEDULE OF DEVIATION/ CONCESSION/ CHANGE REQUEST

Bidder shall list out all technical potential deviation (s)/ concession(s)/change request(s) along with clause with respect to technical specifications.

Sl. no.	Page no.	Contract requirement with clause no.	Potential deviation (s)/concession(s)/ change request(s)	Reason(s) / Justification(s)

Any deviation not specifically brought out in this section shall not be admissible for any commercial implication at later stage. Except to the technical deviations listed in this schedule, bidder's offer shall be considered in full compliance to the tender specifications irrespective of any such deviation indicated / taken elsewhere in the submitted offer.

Date:

Bidder's Stamp & Signature



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SECTION - I

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1.0 PURPOSE

This specification is intended for finalization of rate contract between BHEL TBG and Bidder. Standard technical detail as indicated in the specification shall be agreed upon between BHEL TBG and bidder. Project specific technical details shall be made available to the bidder along with project specific material requirement.

2.0 SCOPE

- 2.1 This specification entails the Design, Manufacture, Inspection and Testing at Manufacturer's works, proper packing and delivery to site of **EARTHING MATERIALS** confirming to this specification.
- 2.2 It is not the intent to specify herein all the details of design & manufacture of material. However, the material shall conform in all respect to high standard of design, engineering & workmanship and shall be capable of performing in continuous commercial operation at site condition.
- 2.3 Technical requirements of **EARTHING MATERIALS** are indicated in Section-II & Technical Data Sheet.
- 2.4 Bidder shall furnish list of conflict (s)/ ambiguity(ies)/ deviation(s), if any, along with their technical offer and also furnish the basis(s)/ reason(s)/ justification(s) that is considered for submitting technical offer. BHEL/Owner will resolve listed conflicts prior to award. In case of ambiguity, bidder shall inform BHEL/Owner of their interpretation. In case bidder fails to convey the same prior to award, decision of BHEL/Owner decision on interpretation shall be considered final and binding if need arises during the execution. No additional commercial implication on account of conflict(s)/ ambiguity(ies)/ deviation(s) shall be admissible.

3.0 BILL OF QUANTITIES

- 3.1 The bidder shall quote for items as per **BOQ/ PRICE SCHEDULE** attached with Notice Inviting Tender (NIT). **The quantity as mentioned in the BOQ is only for evaluation purpose.** However actual ordered quantity may vary from project to project throughout the contract.
- 3.2 The **BOQ/ PRICE SCHEDULE** is as per **ANNEXURE-BOQ**.

4.0 DOCUMENTS & DRAWINGS TO BE SUBMITTED

- 4.1 Bidders shall submit following documents duly signed and sealed as the part of their technical offer for evaluation,
- (i) **ANNEXURE-A: COMPLIANCE CERTIFICATE OF TECHNICAL SPECIFICATION.**
- (ii) ANNEXURE-B: SCHEDULE OF DEVIATION/ CONCESSION/ CHANGE REQUEST.
- (iii) UNPRICED BOQ mentioning "QUOTED" against each item.
- (iv) Documents for meeting the requirement PRE-QUALIFYING REQUIREMENTS (TECHNICAL).
- 4.2 After finalization of rate contract; against specific project requirement following information shall be provided by BHEL,
1. BOQ of required materials
 2. Project site information
- 4.3 Following documents shall be submitted for specific project requirement after placement of order for the approval of BHEL/Customer,

Sl. no.	Drawing / Document Description	Document no.	Document Type	First Submission	Resubmission
1	GA Drawings with Technical Data Sheet	TB-XXX-316-E121	Primary	Within 2 week of PO	Within 1 week of comments
2	Quality Plan	TB-XXX-316-E123	Primary	Within 2 week of PO	Within 1 week of comments



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3	Routine & Acceptance Test Reports	TB-XXX-316-E124	Secondary	Within 1 week of test conduction	--
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Notes

1. Approval on Primary documents is essential for providing manufacturing clearance.
2. The bidder/ manufacturer may note that all re-submissions must incorporate all comments given in the prior submission by the Purchaser. Adequate justification for not incorporating the same must be submitted, failing which the submitted documents may be returned.

4.4 Drawings/ Documents – Distribution of copies

Sl. no.	Stages	Set of copies	Submission schedule
1	First submission	6	Within 2 weeks of award of contract
2	Re-submission, if required	6	Within 1 week of comments
3	Distribution copies of drawings in bound volume	6	Within 1 week of final approval
4	Distribution copies of routine test reports in bound volume	6	Within 1 week of final approval
5	Compact disc/ Pen drive	1	Within 1 week of final approval

5.0 TECHNICAL PRE-QUALIFYING REQUIREMENT & EXPERIENCE

The technical qualifying requirement & experience shall be as per attached **Annexure-TQR**.

6.0 QUALITY ASSURANCE, TESTING & INSPECTION

- 6.1 At contract stage, the successful bidder shall submit the same Quality Plan (QP) for approval of BHEL/ customer at contract stage. In case bidder has reference Quality Plan agreed with customer, same can be submitted for specific project after award of contract for approval/ extension from BHEL/customer. There shall not be any commercial implication to BHEL on account of changes in Quality Plan (QP) during contract stage.
- 6.2 All materials shall be procured, manufactured, inspected and tested by vendor/ sub-vendor as per approved Quality Plan (QP). The supplier shall perform all tests necessary to ensure that the material and workmanship conform to the relevant standards and comply with the requirements of the specification.
- 6.3 The supplier shall perform all routine and acceptance tests during manufacturing as per requirement of the specification. The material shall be offered for inspection by BHEL/customer in accordance with agreed Quality Plan (QP) with 1 Week advance information. Commercial implications, if any for all these tests shall be deemed to be included in the bid price.

7.0 PACKING AND MARKING

- 7.1 The material shall be packed to ensure protection against damage during transit, storage for prolonged periods and handling, however, identified materials can be supplied in open condition with proper stacking of materials ensuring that similar items are grouped and tied with steel wires/ strips for proper handling so that any damaged could be avoided during transit.
- 7.2 The packing material shall be properly marked as per following details,
 1. Name & Address of Consignee



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2. Purchase Order Number with Date
3. Name of Supplier
4. Description of Materials along with size/ length etc.

8.0 ABBREVIATIONS USED

NIT: Notice Inviting Tender

QP: Quality Plan

BOQ: Bill of Quantities

IS: Indian Standard

EN: European Standard

CI: Cast Iron

GI: Galvanized Iron

MS: Mild Steel



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SECTION II

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SECTION - II

STANDARD TECHNICAL REQUIREMENTS



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SPECIFICATION NO. TB-XXX-316-020

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SECTION II

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1.0 CODES AND STANDARDS

- 1.1 The materials for **EARTHING MATERIALS** shall comply with all currently applicable safety codes and statutory regulations of India as well as of the locality where it is to be installed.
- 1.2 The design, material, construction, manufacture, inspection, and testing of **EARTHING MATERIALS** shall conform to the latest revision of relevant standards and codes of practices. However, in case of conflict between the applicable reference standard and this specification, this specification shall govern.
- 1.3 The materials shall strictly conform to the following but not limited to relevant latest Indian and International standards and codes of practices, as appropriate,
 1. IS 2062 Hot Rolled Medium and High Tensile Structural Steel
 2. IS 280 Mild Steel Wire for general engineering purposes
 3. IS 2629 Recommended practice for hot dip galvanizing of iron and steel.
 4. IS 4826 Hot dip galvanized coatings on round steel wires
 5. IS 2633 Method for testing uniformity of coating on zinc-coated articles.
 6. IS 6745 Methods for determination of mass of zinc coating on zinc coated iron and steel articles
 7. IS 1852 Rolling & cutting tolerances for hot rolled steel products
 8. IS 4759 Hot dip zinc coatings on structural steel & other allied products
 9. IS 1239 Part1 Steel tubes, tubulars and other wrought steel fittings (Steel tubes)
 10. IS 1239 Part2 Steel tubes, tubulars and other wrought steel fittings (Steel pipe fittings)
 11. IS 1536 Centrifugally cast (spun) iron pressure pipes for water, gas and sewage
 12. IS 1730 Dimensions for steel plate, sheets, strips and flats for general engineering purposes
 13. IS 1731 Dimensions for steel flats for structural and general engineering purposes
 14. IS 3043 Code of practice for earthing

2.0 CONSTRUCTIONAL REQUIREMENTS

- 2.1 Technical particulars of **EARTHING MATERIALS** are specified in Technical Datasheet.
- 2.2 Straight lengths of hot dip galvanised MS materials as per project specific requirement shall be supplied in standard lengths.
- 2.3 All metal surfaces shall be treated to provide anti-corrosion protection. All ferrous surfaces for external use shall be hot-dip galvanized after fabrication. High Tensile steel nuts and bolts and spring washers shall be electro-galvanized to service condition.
- 2.4 Necessary fixing hardware, if applicable shall be provided along with each accessory as specified in drawings enclosed.
- 2.5 The galvanised surfaces shall consist of a continuous and uniformly thick coating of zinc, firmly adhering to the surfaces of steel. The finished surface shall be clean and smooth and shall be free from defects like discoloured patches, bare spots, unevenness of coating, spelter which is loosely attached to the steel globules, spiky deposits, blistered surfaces, flaking or peeling off etc. The presence of any of these defects noticed on visual or microscopic inspection shall render the material liable to rejection.
- 2.6 Materials and Workmanship
 - 2.6.1 Equipment materials and components shall be new, of high grade and good quality and be to the latest engineering practice. The material and workmanship throughout shall be in accordance with the purpose for which they are intended. Each component shall be designed to be consistent with its duty.
 - 2.6.2 All the welding shall be done by qualified welder.



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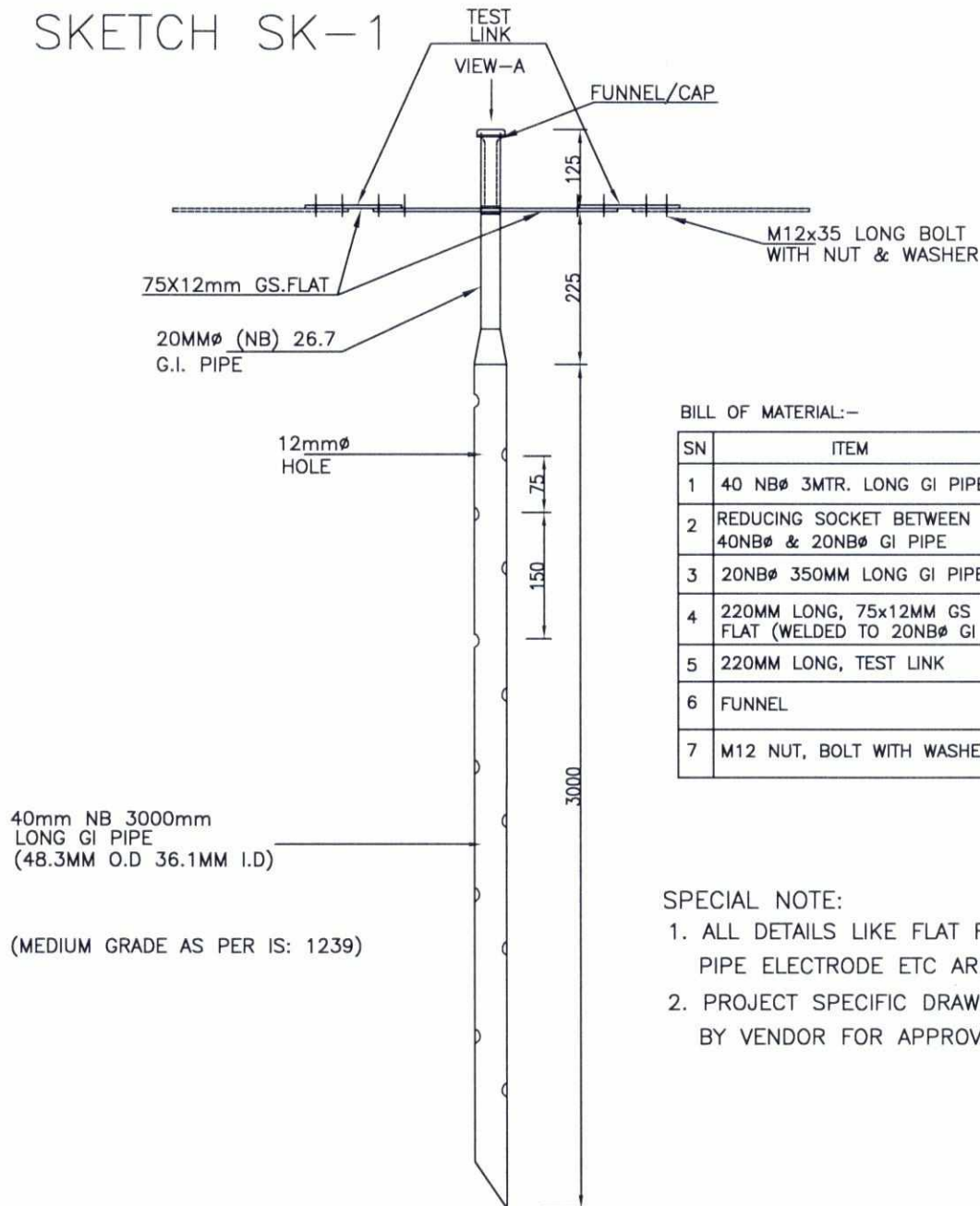
DATE: 30.10.2018

SECTION II

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Sl. No.	Description	Specific Technical Requirement (s)
	EARTHING MATERIALS	
A.	Galvanised Mild Steel (MS) Flat	
1.0	Material Description	
	(i) Material	Mild steel
	(ii) Chemical composition & mechanical properties	Grade A (Item Designation Fe410W) of IS 2062
	(iii) Type	Hot-dip galvanized
2.0	Surface Treatment-Galvanising	
	(i) Pre-treatment	As per IS 2629 prior to galvanization
	(ii) Type	Hot dip galvanization
	(iii) Applicable standard	IS 2629
3.0	Mass of minimum protective zinc coating	
	(i) MS Flat 6mm thickness and over	85microns (min) with 610gm/sqmm
	(ii) MS Flat under 6mm thickness	Thickness shall be as per Table-1 of IS 4759
4.0	Sizes and respective Weight	
	(i) Galvanised MS Flat 75x12mm	7.0650 kg/meter
	(ii) Galvanised MS Flat 75x10mm	5.8880 kg/meter
	(iii) Galvanised MS Flat 75x8mm	4.7100 kg/meter
	(iv) Galvanised MS Flat 65x10mm	5.1000 kg/meter
	(v) Galvanised MS Flat 65x8mm	4.0820 kg/meter
	(vi) Galvanised MS Flat 50x8mm	3.1400 kg/meter
	(vii) Galvanised MS Flat 50x6mm	2.4000 kg/meter
	(viii) Galvanised MS Flat 25x3mm	0.5890 kg/meter
	(ix) MS Flat 75x12mm	7.0650 kg/meter
	(x) MS Flat 75x10mm	5.7843 kg/meter
	(xi) MS Flat 50x8mm	3.1400 kg/meter
	(xii) MS Flat 50x6mm	2.3316 kg/meter
5.0	Length	4-6 meters
B.1	Earth Electrode (Galvanized Iron)	
1.0	Material	Fabricated from Mild steel pipes
2.0	Applicable standard	IS 1239 Part I, IS 3043
3.0	Type	Perforated
4.0	Sizes of pipe	40 NB
5.0	Grade	Medium
6.0	Mass of minimum protective zinc coating	460gm/sqmm
7.0	Length	4-6 meters
8.0	Reference Drawing	Sketch SK-1 (Typical) attached
B.2	Earth Electrode (Cast Iron)	
1.0	Material	Fabricated from Cast Iron pipes
2.0	Applicable standard	IS 1239 Part I, IS 3043
3.0	Sizes of pipe ID	100/150 mm
4.0	Thickness	12/10/13 mm
5.0	Reference Drawing	Sketch SK-2 (Typical) attached

SKETCH SK-1



BILL OF MATERIAL:-

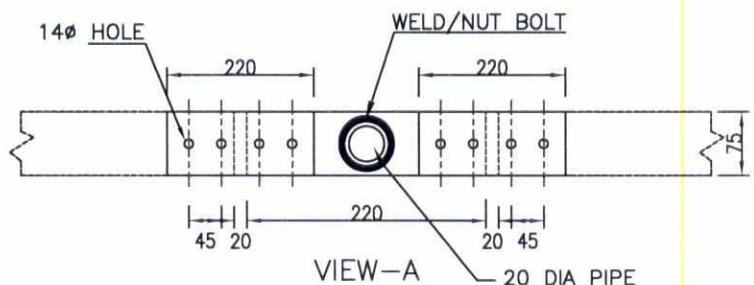
SN	ITEM	UNIT	QTY.
1	40 NB ϕ 3MTR. LONG GI PIPE	NOS.	01
2	REDUCING SOCKET BETWEEN 40NB ϕ & 20NB ϕ GI PIPE	NOS.	01
3	20NB ϕ 350MM LONG GI PIPE	NOS.	01
4	220MM LONG, 75x12MM GS FLAT (WELDED TO 20NB ϕ GI PIPE)	NOS.	01
5	220MM LONG, TEST LINK	NOS.	02
6	FUNNEL	NOS.	01
7	M12 NUT, BOLT WITH WASHERS	SETS	08

SPECIAL NOTE:

1. ALL DETAILS LIKE FLAT FIXING TO GI PIPE ELECTRODE ETC ARE TYPICAL.
2. PROJECT SPECIFIC DRAWING TO BE SUBMITTED BY VENDOR FOR APPROVAL.

NOTE:

1. ALL DIMENSIONS ARE IN MM.
2. STEEL TO CONFORM TO IS:2062, GRADE-A
3. ALL ITEMS TO BE HOT DIP GALVANISED.
4. SUPPLY OF FIXING BOLTS, NUTS, WASHERS FOR GI FLT EARTHING CONDUCTOR IS ALSO PART OF THE SCOPE
5. WASHER TO BE ELECTRO GALVANISED.



EQUIPMENT EARTHING DETAILS
DETAILS OF PIPE ELECTRODE
IN TREATED EARTH PIT

COMPUTERREF.NO.

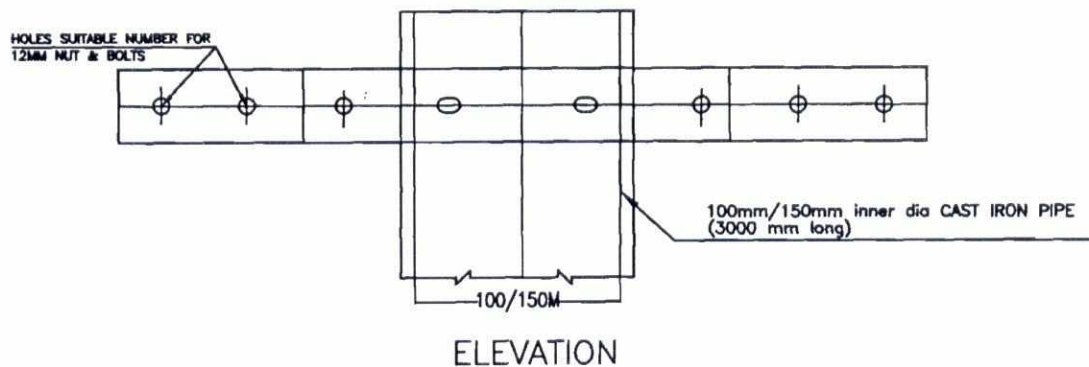
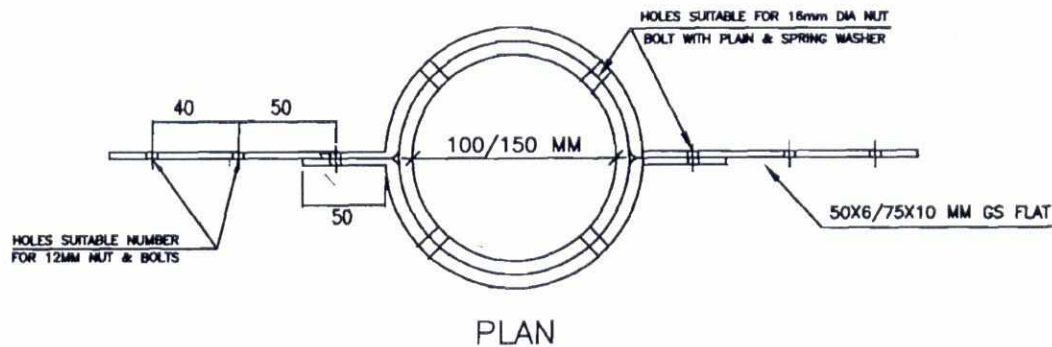
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SKETCH SK-1

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BILL OF MATERIAL:-

SN	ITEM	UNIT	QTY.
1	100/150MM INNER DIA CI PIPE CONFORMING TO IS :1536-1960	NO.	01
2	16MM NUT, BOLT INCLUDING 1 NO. PLAN WASHERS AND 1 NO. SPRING WASHER	SETS.	06
3	12MM NUT, BOLT INCLUDING 1 NO. PLAN WASHERS AND 1 NO. SPRING WASHER	SETS.	04
4	50X6 OR 75X10 MM GS FLAT (HALF RING)	PAIR	01

SPECIAL NOTE:

1. ALL DETAILS ARE TYPICAL.
2. PROJECT SPECIFIC DRAWING TO BE SUBMITTED BY VENDOR FOR APPROVAL.

NOTE:-

1. ALL DIMENSIONS ARE IN MM
2. ALL NUT AND BOLTS ARE HOT DIP GALVANIZED.
3. WASHERS SHALL BE ELECTRO-GALVANIZED.
4. Cast iron pipe shall be supplied with GS flat suitably wrapped and connected through welding/bolting to minimize contact resistance.



COMPUTERREF.NO.

DRG. No.

SKETCH SK-2

REV. 03

SHEET No.