

Corrigendum - 03 dated 03/02/2026 to CPC Tender No. BHEL/CPC/PAT/ELE/26/078

Corrigendum - 03 to Tender for the work of

“Erection, Testing & Commissioning of Electrical Pkg of main plant area including ACC systems For Unit#3 of 3x800 MW Patratu Super Thermal Power Project Patratu, Jharkhand.”

A) Some of the Bidders had asked queries in the published tender specification. The clarifications issued by BHEL are furnished below

Sl. No.	Reference clause of Tender	Bidder's Query	BHEL's Response
1.	Clause 7.1 & 7.2 of Chapter VII of TCC	We request you to keep 10% as milestone payment and balance 90% against RA bills We request permission to revise the price break-up in line with the 95% and 5% payment terms, to enable us to submit the bid strictly in compliance with the commercial requirements of the tender	Please refer revised Clause 7.1 & 7.2 at Sl. no. B.13 of this Corrigendum
2.	BOQ at Chapter XII of TCC	Please keep LT cable termination as separate line item, presently it is included in the laying of the cable	Tender condition shall prevail.
3.	BOQ Sl.No. E7C at Chapter XII of TCC	Please look into the quantity of NGR [BOQ Sl.No. E7C]	Tender condition shall prevail.
4.	BOQ Sl.No. E7D at Chapter XII of TCC	The quantity of the BUS DUCTS (IPBD) is mentioned in SET. The scope also includes the support structure steel. Request you to kindly segregate bus duct from structural activities and provide UOM as meter and MT respectively. [BOQ Sl.No. E7D] . Also request you to create line items for SPVT Cubicle, NG Cubicle, Air pressurization unit	Please refer revised BOQ at Sl. no. B.21 of this Corrigendum
5.	BOQ Sl.No. E2C.3 at Chapter XII of TCC	Please look into the quantity and Weightage of Trefoil Clamps [BOQ Sl.No. E2C.3]	Please refer revised BOQ at Sl. no. B.21 of this Corrigendum

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Sl. No.	Reference clause of Tender	Bidder's Query	BHEL's Response
6.	Clause no. 9.23.1 of Chapter IX of TCC	Defined qualification for different staffs shall be extremely challenging and, in some cases, it becomes difficult. Hence, request you to reconsider it. "H.T cable jointer-01 No should be available for 24x7 basis". Whereas it is required only during H.T jointing and will remain idle in all other time.	Please refer revised Clause 9.23.1 at Sl. no. B.15 of this Corrigendum
7.	Clause no. 9.23.2 of Chapter IX of TCC	There shall be separate erection In-charge for H.T Electrical works. Two In-charge in same project may lead to administrative issues.	Please refer revised Clause 9.23.2 at Sl. no. B.16 of this Corrigendum
8.	Clause no. 9.23.3 of Chapter IX of TCC	Specifically 3 erection engineer under In-charge is mentioned in 9.23.3 of TCC. Please consider to provide Engineer or Supervisor for the same	Please refer revised Clause 9.23.3 at Sl. no. B.17 of this Corrigendum
9.	Clause no. 9.23.4 of Chapter IX of TCC	Clause 9.23.4 of TCC may lead to the confusion of number of Supervisors/Technicians to be provided.	Please refer revised Clause 9.23.4 at Sl. no. B.18 of this Corrigendum
10.	BOQ Sl. No. E5E.01 at Chapter XII of TCC	Please confirm the Distance from stores/ storage yards to Unit-2	Please refer revised BOQ at Sl. no. B.21 of this Corrigendum Distance from BHEL Stores to Patratu Unit-3 will be around 3-4 Km. However, vendor should necessarily visit the site and get acquainted with the location of Plants, Stores and other site constraints.
11.	Clause No. 2.14.3 of Chapter II of TCC	Please confirm the Tentative Qty for each size of LT cables termination.	Bidder's query is not relevant w.r.t. Clause No. 2.14.3. However, LT Cable Laying price shall be inclusive of LT Cable Termination. No separate payment shall be made for LT Cable termination
12.	Clause no. 2.14.5(i) of Chapter II of TCC	Light fixture mounting details drawings missing section - E. The type of mounting	Lighting fixtures of appropriate type as per the lighting layout drawings shall be installed by the contractor. The type of mounting arrangement of fixtures shall be selected from the typical arrangements shown in enclosed fixture mounting details

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Sl. No.	Reference clause of Tender	Bidder's Query	BHEL's Response
			drawings attached as Annexure 3 with this corrigendum. The type of mounting will generally be indicated on the layout drawings. The exact mounting will, however, be decided at site depending upon the actual space/ other facilities available at site.
13.	Clause No.2.14.14 (i) of Chapter II of TCC	<p>1. Please confirm the Supply scope of Pole in vendor or BHEL</p> <p>2. Please confirm Pole Foundation work in Vendor scope or BHEL</p>	Clause 2.14.14 stands deleted.
14.	Clause No. 2.43 of Chapter II of TCC	Please confirm the foundation work of PSS in vendor scope or BHEL scope	Clause 2.43 stands deleted.
15.	Clause No 11.1.2 (C) of Chapter XI of TCC	Please confirm the Tentative Qty for each size of LT cables	Bidder is expected to quote prices for LT Cable Laying inclusive of tentative quantity in a Power Plant of LT Cable Joints.
16.	TCC Clause No 2.5 of Chapter II of TCC	With reference to Patratu Unit-3, TCC-2.5, we request your kind consideration regarding the clause covering supply and erection of all consumables and incidental materials being included in the installation rates. We would like to submit that the cost of these items has a significant impact on the overall installation cost, as quantities and site-specific requirements vary considerably. Inclusion of all such consumables within installation rates may lead to higher quoted prices. We therefore humbly request BHEL to kindly review the clause and consider revoking or minimizing its scope, or allowing suitable commercial relief, to ensure fair and realistic pricing.	Tender Conditions shall prevail.

B) Following Clauses of TCC are being amended

Sl.No	Reference clause of Tender Document	Existing provision	Amended As
1	TCC Clause No. 2.6.18 of Chapter II of TCC	Perforated cable trays shall be used in higher elevations in Boiler and TG area.	Perforated cable trays shall be preferred to be used in higher elevations in Boiler and TG area.
2	TCC Clause No 2.9.13 of Chapter II of TCC	The erection contractor shall supply consumables like aluminium tags, lugs and ferrules.	The erection contractor shall supply consumables like aluminium tags, lugs and ferrules as per Clause No 11.1.2 of Chapter-XI .
3	TCC Clause No 2.9.19 of Chapter II of TCC	Copper tinned lugs of various types (pin, ring, fork, snap-on) up to 4 sq. mm conforming to IS: 694 for cables, PVC cable ties, PVC ferrules, PVC button and tapes, cable identification tag of PVC/ metal as per site requirement, clamping and dressing material such as suitable cable ties/ clamps etc. with hardware, PVC sleeves etc. shall be supplied by the contractor within the quoted rates for cable laying. However, trefoil clamps with hardware for single core power cable shall be supplied by BHEL. No separate payment for erection of this trefoil clamp will be entertained and is included in the cable laying. The quality of material shall be got approved from BHEL Engineer prior to their use on job.	Copper tinned lugs of various types (pin, ring, fork, snap-on) up to 4 sq. mm conforming to IS: 694 for cables, PVC cable ties, SS316 cable ties, PVC ferrules, PVC button and tapes, cable identification tag of PVC/ metal as per site requirement, clamping and dressing material such as suitable cable ties/ clamps etc. with hardware, PVC sleeves etc. shall be supplied by the contractor within the quoted rates for cable laying. However, trefoil clamps with hardware for single core power cable shall be supplied by BHEL. The quality of material shall be got approved from BHEL Engineer prior to their use on job.
4	TCC Clause No. 2.9.46 of Chapter II of TCC	The rate of laying for LT power, control and signal cable is inclusive of glanding, trefoil clamps and termination at both ends. Glands & Lugs above 4 sq. mm shall be supplied by BHEL & lugs up to 4 sq. mm shall be in vendor's scope. The LT Power Cable straight through Jointing Kit (if required) shall be in vendor's scope of supply. The rate for erection for all these items will be part of laying rates. No separate rate is applicable on this account.	The rate of laying for LT power, control and signal cable is inclusive of glanding and termination at both ends. Glands & Lugs above 4 sq. mm shall be supplied by BHEL & lugs up to 4 sq. mm shall be in vendor's scope. The LT Power Cable straight through Jointing Kit (if required) shall be in vendor's scope of supply. The rate for erection for all these items will be part of laying rates. No separate rate is applicable on this account.

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Sl.No	Reference clause of Tender Document	Existing provision	Amended As
5	TCC Clause No 2.14.1 of Chapter II of TCC	Station lighting covers the complete FGD area with handling, transportation from BHEL stores / yard to work place. Erection & Commissioning of lighting material like LDB (Including Lighting transformer for AC /DC) Type, LP, lighting luminaires (with Complete accessories), Switch Boxes, Junction Boxes, Receptacles, Ceiling Fan, Emergency lighting, Poles, Conduits, Rigid/Flexible PVC coated conduit, Wires, structural Steel, Hume Pipe, High Mast, cabling in Tray and Underground excavated trench, earthing above and below ground, earth pit for poles and high mast as per the drawing, etc.	Station lighting covers the complete TG, Boiler, ESP, ACC, Street light & FGD area with handling, transportation from BHEL stores / yard to work place. Erection & Commissioning of lighting material like LDB (Including Lighting transformer for AC /DC) Type, LP, lighting luminaires (with Complete accessories), Switch Boxes, Junction Boxes, Receptacles, Ceiling Fan, Emergency lighting, Poles, Conduits, Rigid/Flexible PVC coated conduit, Wires, structural Steel, Hume Pipe, High Mast, cabling in Tray and Underground excavated trench, earthing above and below ground, earth pit for poles and high mast as per the drawing, etc.
6	TCC Clause No 2.14.14 along with sub-clauses of Chapter II of TCC	Foundation & Civil Works	This Clause stands deleted
7	TCC Clause No 2.19.22 of Chapter II of TCC	Contractor shall conduct 20 % radiography and 100% NDT test on welded joints.	Contractor shall conduct 20 % radiography and 100% DP test on side welded joints of Busbar and enclosure.

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Sl.No	Reference clause of Tender Document	Existing provision	Amended As
8	TCC Clause No 2.20.2 of Chapter II of TCC	Single Phase 265MVA, 420/ 21kV, OFAF cooled YNd11, Generator Transformer (GT), 130/65/65 MVA, 3-phase 400/11.5/11.5kV Station Transformer, 40MVA 21/11.5kV Unit Transformer , 25MVA, 34.5/11kV Common Service Aux. Transformer ,FGD Auxiliary, Miscellaneous Transformer shall be made available to the contractor 80 to 120meters (approximately) away from the respective foundation, further unloading, transport and shifting of power transformers to the foundation shall be in the scope of this work. The shifting operation may require dragging either on ground with suitable arrangement or dragging after fixing of wheels on rail track. It may also require turning of transformer at suitable locations en-route to foundation. The contractor shall arrange wooden sleepers, winches, jacks, rails, crane, plates etc. at his cost for this operation. However, all loose accessories shall have to be shifted from stores/ storage yard.	Single Phase 315MVA, 420/27kV, YNd11, Generator Transformer (GT), 144/72/72 MVA, 3-phase, 400/11.5/11.5kV Station Transformer, 65MVA, 27/11.5kV Unit Transformer (UT), 12.5 MVA, 11/3.45 kV UAT, 10MVA, 11/3.45 kV FGD Auxiliary and Miscellaneous Transformer shall be made available to the contractor 80 to 120meters (approximately) away from the respective foundation, further unloading, transport and shifting of power transformers to the foundation shall be in the scope of this work. The shifting operation may require dragging either on ground with suitable arrangement or dragging after fixing of wheels on rail track. It may also require turning of transformer at suitable locations en-route to foundation. The contractor shall arrange wooden sleepers, winches, jacks, rails, crane, plates etc. at his cost for this operation. However, all loose accessories shall have to be shifted from stores/ storage yard.
9	TCC Clause No 2.26 of Chapter II of TCC	ELECTRICAL HOIST	ELECTRICAL CRANE / HOIST
10	TCC Clause No 2.26.5 of Chapter II of TCC	Commissioning & testing of electrical hoists shall include panel wiring check, IR measurement, functional check, over load relay testing, trial run, providing assistance during load test, replacement of component if required etc. However, preparatory work for load test and arrangement of load etc. shall be done by another agency.	Commissioning & testing of electrical hoists shall include panel wiring check, IR measurement, functional check, over load relay testing, trial run, providing assistance during load test, replacement of component if required etc. shall be done by electrical agency . However, preparatory work for load test and arrangement of load etc. shall be done by another agency.
11	TCC Clause No 2.42.18 of Chapter II of TCC	The scope covers the erection, testing and commissioning of 1750 kVA and 1010 KVA DG system including control cable laying and termination between the DG AMF Panel, Battery Charger, and distribution board and battery. Installation of battery and connection to engine starter. DG Control Panels and CT erection are under the contractor's scope.	The scope covers the erection, testing and commissioning of 2 Sets of 1750/2000kVA, 3-Phase, 415V Diesel Generator system including control cable laying and termination between the DG AMF Panel, Battery Charger, and distribution board and battery. Installation of battery

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Sl.No	Reference clause of Tender Document	Existing provision	Amended As
			and connection to engine starter. DG Control Panels and CT erection are under the contractor's scope.
12	TCC Clause No 2.43 along with sub-clauses of Chapter II of TCC	FOUNDATION, ERECTION, TESTING & COMMISSIONING OF PACKAGE SUB-STATION (PSS):	This Clause stands deleted
13	TCC Clause No 7.1 & 7.2 of Chapter VII of TCC	Payment Terms	Revised Terms of Payment attached as Annexure 1 to this Corrigendum.
14	TCC Clause No 9.20.1 of Chapter IX of TCC	To meet the need of construction management at site, Contractor shall comply Clause No. 5.7 in Chapter-V within their accepted rates.	To meet the need of construction management at site, Contractor shall comply Clause No. 6.7 in Chapter-VI within their accepted rates.
15	TCC Clause No 9.23.1 of Chapter IX of TCC	<p>Manpower requirement for Erection and Commissioning shall as follows:</p> <p>a. There shall be a Resident manager as Site In Charge at site, under whom there shall be sufficient area engineers who shall take care of the erection activities.</p> <p>b. Resident Engineer should have a minimum qualification of Electrical Engineering Degree with minimum 5 years' experience or Diploma in Electrical /Electronic engineering with minimum 10 years of experience in Thermal Power Station.</p> <p>c. Supervisor should have a minimum qualification of Diploma in electrical engineering or any graduate with minimum 5 years of experience in Thermal Power Station.</p> <p>d. Lab Technicians should have experience in Thermal Power Stations.</p> <p>e. Contractor should have one Store Keeper, one Transport Supervisor for the safe transportation of materials.</p> <p>f. Planning / safety Engineers should be available and they should have experience in construction field especially in power plant.</p>	<p>Manpower requirement for Erection and Commissioning shall as follows:</p> <p>a. There shall be a Resident Manager as Site In Charge at site, under whom there shall be sufficient Area Engineers who shall take care of the erection activities.</p> <p>b. Resident Manager should have a minimum qualification of Electrical Engineering Degree with minimum 5 years' experience or Diploma in Electrical /Electronic engineering with minimum 10 years of experience in Thermal Power Station.</p> <p>c. Area Engineers should have a minimum qualification of Degree/Diploma in electrical engineering or any graduate with minimum 5 years of Industrial experience.</p> <p>d. Lab Technicians should have Industrial experience.</p> <p>e. Contractor should have one Store Keeper, one Transport Supervisor for the safe transportation of materials.</p> <p>f. Planning / safety Engineers should be available and they should have experience in construction field especially in power plant.</p>

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Sl.No	Reference clause of Tender Document	Existing provision	Amended As
		<p>g. Licensed supervisor-01 No. with valid HT electrical license</p> <p>h. HT cable jointer-01 No. should be available on 24x7 basis</p> <p>Dedicated commissioning engineer should be deployed for commissioning of the equipment.</p>	<p>g. Licensed supervisor-01 No. with valid HT electrical license</p> <p>h. HT cable jointer-01 No. should be available as and when required.</p> <p>Dedicated commissioning engineer should be deployed for commissioning of the equipment.</p>
16	TCC Clause No 9.23.2 of Chapter IX of TCC	There shall be separate Erection In-charge for HT electrical work. He shall work with required manpower, T&P etc., including storage facilities.	There shall be separate Area Engineers for HT, LT Electrical & Illumination work . They shall report to Resident Manager . They shall work with required manpower, T&P etc., including storage facilities.
17	TCC Clause No 9.23.3 of Chapter IX of TCC	Each Erection In-charge shall have minimum 3 erection engineers who shall be in charge of TRANSFORMERS, BUS DUCT, SWITCHGEAR & CONTROL PANELS AND CABLES &TRAYS.	Each Area Engineer shall have required no. of erection supervisor /technician who shall be package wise in-charge like TRANSFORMERS, BUS DUCT, SWITCHGEAR & CONTROL PANELS, CABLES & TRAYS AND LIGHTING PANEL & FIXTURES.
18	TCC Clause No 9.23.4 of Chapter IX of TCC	Each area engineer shall be provided with minimum four supervisors and adequate number of Technicians/ electricians and other erection staff and T&P etc. The testing Engineers / supervisors / electricians shall be identified separately for the each Unit and the minimum requirement shall be as indicated in previous Clause. Besides, there shall be separate engineers for Planning, Safety and Quality.	Each Area Engineer shall be provided with minimum 2 (Two) supervisors and adequate number of Technicians / electricians and other erection staff and T&P etc. The testing Engineers / supervisors / electricians shall be identified separately for each Unit and the minimum requirement shall be as indicated in previous Clauses. Besides, there shall be separate engineers for Planning, Safety and Quality.
19	TCC Clause No 10 of Chapter X of TCC		Fixture Mounting Drg. Attached with this Corrigendum
20	TCC Clause No 11.1.2 of Chapter XI of TCC	All Consumables/ items to be arranged by Bidder at his/ her own cost, broad items are mentioned below (except mentioned in Clause 9.1.1 a) to e) of TCC)	All Consumables/ items to be arranged by Bidder at his/ her own cost, broad items are mentioned below (except mentioned in Clause 11.1.1 a) to e) of TCC)
21	BOQ as per Chapter XII of TCC	Existing BOQ with Weightages	Revised BOQ along with comparison sheet is attached as Annexure 2 with this corrigendum

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Sl.No	Reference clause of Tender Document	Existing provision	Amended As
23	NIT	Annexure 6 of NIT (Integrity Pact)	Revised Annexure 6 (Integrity Pact) to NIT is attached with this Corrigendum

Note:

- 1) All other terms and conditions against this Tender shall remain unchanged.
- 2) This corrigendum is to be submitted duly signed and stamped along with the Techno-commercial bid (Part- I).

**for BHARAT HEAVY ELECTRICALS LTD
Sr MANAGER / SCT- CPC**

Annexure 1 (Revised Terms of Payment)

7.0	Existing Terms of Payment		Revised Terms of Payment	
The progressive payment for erection, testing and commissioning on accepted price of contract value for Electrical Package rates will be released as per the break up given hereinafter:			The progressive payment for erection, testing and commissioning on accepted price of contract value for Electrical Package rates will be released as per the break up given hereinafter:	
S. No.	Activity/ Work Description	Existing %age of Unit Rate	Activity/ Work Description	Revised % of Unit Rate
7.1	PRO RATA PAYMENTS (85%)		PRO RATA PAYMENTS (90%)	
7.1.1	Cable tray and accessories		Cable tray and accessories	
A)	Fabrication and fixing/ welding/ bolting in position	60%	Fabrication and fixing/ welding/ bolting in position	75%
B)	Earthing of cable trays	10%	Earthing of cable trays	5%
C)	Numbering of cable trays	8%	Numbering of cable trays	5%
D)	Covering of trays where ever envisaged	7%	Covering of trays where ever envisaged	5%
	Total =	85%	Total =	90%
7.1.2	Cable laying including Earth wires		Cable laying including Earth wires	
A)	Laying of cables/ wires	45%	Laying of cables/ wires	65%
B)	Glanding & Termination (Except HT Termination) & Testing	15%	Glanding & Termination (Except HT Termination) & Testing	15%
C)	Charging of cables	10%	Charging of cables	5%
D)	Dressing and clamping of cables	15%	Dressing and clamping of cables	5%
	Total =	85%	Total =	90%
7.1.3	Junction box/ Push button station (local)		Junction box/ Push Button Station (local)	

Annexure 1 (Revised Terms of Payment)

A)	Erection including fixing of terminal blocks where ever applicable	75%	Erection including fixing of terminal blocks where ever applicable	80%
B)	Name plate fixing where ever applicable, Labelling (both inside and outside) and Commissioning of connected equipment	10%	Name plate fixing where ever applicable, Labelling (both inside and outside) and Commissioning of connected equipment	10%
	Total =	85%	Total =	90%
7.1.4	Miscellaneous Structural steel including frames for Panels/ Racks/ Instruments, supports for cable tray/ pipes/ tubes, Canopies etc.		Miscellaneous Structural steel including frames for Panels/ Racks/ Instruments, supports for cable tray/ pipes/ tubes, Canopies etc.	
A)	Fabrication/Pre assembly/Erection, Alignment, welding/bolting and if applicable chipping/grouting/painting	85%	Fabrication/Pre assembly/Erection, welding/bolting and if applicable chipping/grouting/painting	90%
	Total =	85%	Total =	90%
7.1.5	DG sets/ Switch Gears/ MCC/ PCC/ Distribution Boards/ Marshalling Box/ Starter Units/ Dry Transformers/ Electrical Hoists/ Panels/ Cubicles/ Desks/ UPS/ Batteries/ Chargers/ VFD/ LA assy/ NGT/ NGR/ SP/ Miscellaneous Equipment/ Station lighting etc.		DG sets/ Switch Gears/ MCC/ PCC/ Distribution Boards/ Marshalling Box/ Starter Units/ Electrical Hoists/ Panels/ Cubicles/ Desks/ UPS/ Batteries/ Chargers/ VFD/ LA Assy/ NGT/ NGR/ SP/ Miscellaneous Equipment/ Station lighting etc.	
A)	Placement, Alignment and coupling/interconnection where ever applicable, erection of associated accessories etc.	50%	Placement, Alignment and coupling/interconnection where ever applicable, erection of associated accessories etc.	50%
B)	Pre-commissioning checks and tests	10%	Pre-commissioning checks and tests	25%
C)	Charging, Loop testing and commissioning	15%	Charging, Loop testing and commissioning	5%
D)	Nomenclature/Name-plate/Painting etc	5%	Nomenclature/Name-plate/Painting etc	5%
E)	System commissioning	5%	System commissioning	5%
	Total =	85%	Total =	90%
7.1.6	Earthing/ Lightning protection strips, Earthing pits/Rubber mat etc		Earthing/ Lightning protection strips, Earthing pits/Rubber mat etc	

Annexure 1 (Revised Terms of Payment)

A)	Fabrication, erection, alignment, welding/ bolting of earthing/ lightning protection strips; earth pits completion/insulation	60%	Fabrication, erection, alignment, welding/ bolting of earthing/ lightning protection strips; earth pits completion/insulation	80%
B)	Testing/commissioning/Connection to equipment	25%	Testing/commissioning/Connection to equipment	10%
	Total =	85%	Total =	90%
7.1.7	LT/ HT Bus Ducts		LT/ HT Bus Ducts	
A)	Pre assembly of Bus Ducts and accessories, erection, alignment, bolting/ welding etc. complete with supporting structure	50%	Pre assembly of Bus Ducts and accessories, erection, alignment, bolting/ welding etc. complete with supporting structure	70%
B)	Pre commissioning checks	20%	Pre commissioning checks	10%
C)	Testing, Charging and Painting (as applicable)	15%	Testing, Charging and Painting (as applicable)	10%
	Total =	85%	Total =	90%
7.1.8	Oil Filled Transformers (Generator, Station, UAT, Station Service etc.)		Oil Filled Transformers (Generator, Station, UAT, Station Service etc.)	
A)	Placement on foundation and alignment	25%	Placement on foundation and alignment	25%
B)	Erection of associated auxiliaries/ assemblies, oil filling, etc.	25%	Erection of associated auxiliaries/ assemblies, oil filling, etc.	30%
C)	Dry out including oil filtration	15%	Dry out including oil filtration	20%
D)	Pre-commissioning checks/Testing	10%	Pre-commissioning checks/Testing	10%
E)	Charging and Painting (as applicable)	10%	Charging and Painting (as applicable)	5%
	Total =	85%	Total =	90%
7.1.9	Testing/ Commissioning of Equipment (like motors, actuators, ESP transformer, misc. equipment, etc.) erected by other agencies		Testing/ Commissioning of Equipment (like motors, actuators, ESP transformer, misc. equipment, etc.) erected by other agencies	
A)	Testing & pre-commissioning checks	65%	Testing & pre-commissioning checks	70%

Annexure 1 (Revised Terms of Payment)

B)	System commissioning	20%	System commissioning	20%
	Total =	85%	Total =	90%
7.1.10	HT Termination/Straight through Jointing Kits/Trefoil Clamps		HT Termination/Straight through Jointing Kits/Trefoil Clamps	
A)	Kit termination/Jointing/Clamping	50%	Kit termination/Jointing/Clamping	65%
B)	Testing	20%	Testing	15%
C)	Charging/checking	15%	Charging/checking	10%
	Total =	85%	Total =	90%
	Total =	85%		

Annexure 1 (Revised Terms of Payment)

7.2	STAGE/ MILESTONE PAYMENTS	Existing %age of Unit Rate	STAGE/ MILESTONE PAYMENTS	Revised % of Unit Rate proposed
a)	Boiler Light Up	1%	Boiler Light Up	1%
b)	Chemical Cleaning	1%	Chemical Cleaning	
c)	Steam Blowing	1%	Steam Blowing	
d)	Safety Valve Floating	1%	Safety Valve Floating	
e)	Oil Flushing (TG)	1%	Oil Flushing (TG)	
f)	Barring Gear (TG)	1%	Barring Gear (TG)	
g)	Rolling and Synchronisation (STG)	1%	Rolling and Synchronisation (STG)	1%
h)	Coal Firing	1%	Coal Firing	1%
i)	Full Load	1%	Full Load	1%
j)	COD	1%	COD	1%
k)	Trial Operation	1%	Trial Operation	1%
l)	Punch List points/ pending points liquidation	1%	Punch List points/ pending points liquidation	1%
m)	Area cleaning, temporary structures cutting/ removal and return of scrap	1%	Area cleaning, temporary structures cutting/ removal and return of scrap	1%
n)	Submission of 'As Built Drawings'	1%	Submission of 'As Built Drawings'	1%
o)	Material Reconciliation	1%	Material Reconciliation	1%
	Total for Stage/ Milestone Payments (15%)	15%	Total for Stage/ Milestone Payments (10%)	10%

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2 Consists of Following

- 1. Annexure 2_1 (Comparison of existing and revised Line items in BOQ)**
- 2. Annexure 2_2 (Revised BOQ)**

Annexure 2_1 (Comparison of existing and revised Line items in BOQ)									
Items in Existing BOQ					Items in Revised BOQ				
S. No.	DESCRIPTION	UO M	TOTAL QUANTITY	Weightage	S. No.	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E2C.3.1	Trefoil Clamp	No	52704	0.0413606491	E2C.3.1	Trefoil Clamp	No	44800	0.0413606491
E5E.01	Transportation from stores/ storage yards to erection site, erection, assembly, testing & commissioning of Variable Frequency Drive System consisting of IGBT based VFD Panel and accessories including transformer for CEP-A, B, C (Complete for Unit-2)	Set	1	0.0056054749	E5E.01	Transportation from stores/ storage yards to erection site, erection, assembly, testing & commissioning of Variable Frequency Drive System consisting of IGBT based VFD Panel and accessories including transformer for CEP-A, B, C (Complete for Unit-3)	Set	1	0.0056054749
E5G.1.02	100kVA transformer for housing in E5F.1.01 above.	No	11	0.0005131816	E5G.1.02	100kVA transformer for housing in E5G.1.01 above.	No	11	0.0005131816
E5G.1.04	100kVA transformer for housing in E5F.1.03 above.	No	6	0.0003058441	E5G.1.04	100kVA transformer for housing in E5G.1.03 above.	No	6	0.0003058441

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_1 (Comparison of existing and revised Line items in BOQ)									
Items in Existing BOQ					Items in Revised BOQ				
S. No.	DESCRIPTION	UO M	TOTAL QUANTITY	Weightage	S. No.	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E5G.1.06	100kVA transformer for housing in E5F.1.05 above.	No	1	0.0000593082	E5G.1.06	100kVA transformer for housing in E5G.1.05 above.	No	1	0.0000593082
E5G.1.09	100kVA transformer for housing in E5F.1.08 above.	No	5	0.0003166618	E5G.1.09	100kVA transformer for housing in E5G.1.08 above.	No	5	0.0003166618
E7D.01	Isolated Phase Bus Duct main run (27kV: 22250A- approx length 210 mtrs), Isolated Phase Bus Duct Delta Run (27kV: 13000A- approx length 135 mtrs), Isolated Phase Bus tap off run (24kV: 2800A- approx length 110 mtrs)	Set	1	0.0202951989	E7D.01	Isolated Phase Bus Duct main run (27kV: 22250A- approx length 210 mtrs), Isolated Phase Bus Duct Delta Run (27kV: 13000A- approx length 135 mtrs), Isolated Phase Bus tap off run (24kV: 2800A- approx length 110 mtrs)	Meter	455	0.0145401072

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_1 (Comparison of existing and revised Line items in BOQ)									
Items in Existing BOQ					Items in Revised BOQ				
S. No.	DESCRIPTION	UO M	TOTAL QUANTITY	Weightage	S. No.	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
	(Including SPVT Cubicle (1 set), NG Cubicle (1 set), Air pressurisation equipment (23 KW load consist of compressor and receiver -1 set, Drier and pressuring panel- 1 set, Control panel- 1 set) , Support structure for IPBD - 50 Tons etc)				E7D.02	SPVT Cubicle (1 set), NG Cubicle (1 set), Air pressurisation equipment (23 KW load consist of compressor and receiver -1 set, Drier and pressuring panel- 1 set, Control panel- 1 set) , Support structure for IPBD - 50 Tons etc)	MT	50	0.0057550917
E8.04	10/12.5/16/20MVA, 11/11.5kV / 11/3.5kV UAT, FGD Auxiliary, Miscellaneous Transformer including all accessories, piping, cabling etc.	Set	4	0.0085677924	E8.04	12.5 MVA, 11/3.45 kV UAT, 10MVA, 11/3.45 kV FGD Auxiliary, Miscellaneous Transformer including all accessories, piping, cabling etc.	Set	4	0.0085677924

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E1A	CABLE TRAYS AND ACCESSORIES			
E1A.01	Ladder type Cable Tray 150mm	Meter	8737	0.0053847138
E1A.02	Ladder type Cable Tray 300mm	Meter	11541	0.0085602467
E1A.03	Ladder type Cable Tray 600mm	Meter	20462	0.0182680099
E1A.04	Perforated type Cable Tray 50mm	Meter	1375	0.0005802175
E1A.05	Perforated type Cable Tray 100mm	Meter	4345	0.0021680245
E1A.06	Perforated type Cable Tray 150mm	Meter	3951	0.0028141953
E1A.07	Perforated type Cable Tray 300mm	Meter	4206	0.0036695520
E1A.08	Perforated type Cable Tray 600mm	Meter	5184	0.0062666340
E1B	CABLE TRAY SUPPORT AND ACCESSORIES		0	0.0000000000
E1B.01	Single Channel (in standard length of 6meter per piece)	Meter	9017	0.0059575624
E1B.02	Double Channel (in standard length of 6meter per piece)	Meter	8144	0.0072197799
E1C	CANTILEVER ARM (EACH COMPLETE WITH, 2 NOS.-M12 HEX. BOLT & WASHER, 2 NOS.-M12 SPRING NUTS, 2 NOS.-M6 PAN HEAD SCREWS & WASHER, 2 NOS.-M6 SPRING NUTS)			
E1C.01	For 750mm trays	No	100	0.0000642792
E1C.02	For 600mm trays	No	21136	0.0194649532
E1C.03	For 300mm trays	No	8622	0.0051804575
E1C.04	For 150mm trays	No	6426	0.0034520272
E1C.05	For 100mm trays	No	100	0.0000155596
E1D	CLAMPS & FITTINGS (COMPLETE WITH REQUIRED HARDWARE I.E. SPRING NUTS / WASHERS, TRESTLE BRACKET, ETC. AS REQUIRED FOR COMPLETE INSTALLATION)			
E1D.01	Base plate for single channel.	No	5573	0.0014213066
E1D.02	Base plate for double channel.	No	3011	0.0008472548
E1E	FABRICATION OF IRREGULAR BEND TO BE DONE FROM THE EXISTING CABLE TRAY AS PER SITE REQUIREMENT (cable tray material will be issued by BHEL free of cost) (CONSUMABLES etc. TO BE PROVIDED BY VENDOR) (Applicable for BEND TYPE 'E', 'F' & 'G')			
E1E.1	IRREGULAR BEND FOR LADDER/PERFORATED 600 MM TRAYS (Site Fabricated/Readymade)	No	3200	0.0066705877
E1E.2	IRREGULAR BEND FOR LADDER 450 MM TRAYS	No	100	0.0001896789
E1E.3	IRREGULAR BEND FOR LADDER/PERFORATED 300 MM TRAYS (Site Fabricated/Readymade)	No	1500	0.0024469275
E1E.4	IRREGULAR BEND FOR LADDER 150 MM TRAYS	No	100	0.0001365763

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E2A	LT XLPE/ PVC ARMOURED/ UNARMOURED ALUMINIUM/ COPPER CONDUCTOR POWER/ FRLS CABLE			
E2A.01	1Cx35sqmm Al Cable	Meter	13500	0.0016849542
E2A.02	1Cx70sqmm Cable	Meter	500	0.0000671470
E2A.03	1Cx120sqmm Al Cable	Meter	16800	0.0030104072
E2A.04	1Cx300sqmm Al Cable	Meter	101200	0.0196613128
E2A.05	1Cx630sqmm Al Cable	Meter	28200	0.0076437257
E2A.06	2Cx10sqmm Al Cable	Meter	12000	0.0010056237
E2A.07	2Cx16sqmm Al Cable	Meter	600	0.0000554456
E2A.08	2Cx25sqmm Al Cable	Meter	400	0.0000416889
E2A.09	2Cx35sqmm Al Cable	Meter	8700	0.0009341884
E2A.10	2Cx70sqmm Al Cable	Meter	14400	0.0016894907
E2A.11	2Cx95sqmm Al Cable	Meter	16200	0.0024154920
E2A.12	2Cx120sqmm Al Cable	Meter	500	0.0001022360
E2A.13	3Cx10sqmm Al Cable	Meter	39600	0.0035380961
E2A.14	3Cx16sqmm Al Cable	Meter	31200	0.0029927935
E2A.15	3Cx25sqmm Al Cable	Meter	27600	0.0035637301
E2A.16	3Cx35sqmm Al Cable	Meter	500	0.0000656043
E2A.17	3Cx50sqmm Al Cable	Meter	13800	0.0022705232
E2A.18	3Cx70sqmm Al Cable	Meter	2400	0.0004375832
E2A.19	3Cx95 sqmm Al Cable	Meter	10320	0.0023819387
E2A.20	3Cx150 sqmm Al Cable	Meter	4480	0.0012967417
E2A.21	3Cx240sqmm Al Cable	Meter	500	0.0001839347
E2A.22	3.5Cx25sqmm Al Cable	Meter	19200	0.0030100583
E2A.23	3.5Cx50sqmm Al Cable	Meter	40400	0.0079638128
E2A.24	3.5Cx95sqmm Al Cable	Meter	5100	0.0010223034
E2A.25	2Cx1.5sqmm Cu Control Cable	Meter	51700	0.0040119547
E2A.26	2Cx2.5sqmm Cu Power Cable	Meter	116400	0.0091510304
E2A.27	3Cx1.5sqmm Cu Control Cable	Meter	43700	0.0034858586
E2A.28	3Cx2.5sqmm Cu Power Cable	Meter	238300	0.0202356164
E2A.29	4Cx1.5sqmm Cu Screened Cable for ESP	Meter	61000	0.0056910330
E2A.30	4Cx2.5sqmm Cu Screened Cable for ESP	Meter	400	0.0000373182
E2A.31	4CX16 SQMM ARMOURED/UNARMOURED CABLE	Meter	2500	0.0002528599
E2A.32	4CX70 SQMM ARMOURED/UNARMOURED CABLE	Meter	1000	0.0001645209
E2A.33	5Cx1.5 sqmm Cu Control Cable	Meter	4160	0.0003218554
E2A.34	5Cx2.5sqmm Cu Control Cable	Meter	3240	0.0002662521
E2A.35	7Cx1.5sqmm Cu Control Cable	Meter	8700	0.0007239451
E2A.36	7CX2.5 SQMM ARMOURED/UNARMOURED CABLE	Meter	5000	0.0004468383
E2A.37	10CX2.5 SQMM ARMOURED/UNARMOURED CABLE	Meter	20000	0.0019221385

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E2A.38	12Cx1.5 sqmm Cu Control Cable	Meter	10880	0.0010708528
E2A.39	12Cx2.5 sqmm Cu Control Cable	Meter	77920	0.0076691957
E2A.40	14Cx1.5sqmm Cu Control Cable	Meter	21000	0.0023912436
E2A.41	14CX2.5 SQMM ARMOURED/UNARMOURED CABLE	Meter	15000	0.0017080311
E2A.42	19CX2.5 SQMM ARMOURED/UNARMOURED CABLE	Meter	4000	0.0004574468
E2A.43	Laying & Termination of UTP cable	Meter	6000	0.0002383889
E2B	HT ALUMINIUM CONDUCTOR, ARMOURED/ UNARMOURED XLPE POWER CABLE			
E2B.01	11/11kV, 1Cx240sqmm Power Cable	Meter	9900	0.0028561995
E2B.02	11/11kV, 1Cx400sqmm Power Cable	Meter	19500	0.0093033613
E2B.03	11/11kV, 1Cx630sqmm Power Cable	Meter	5400	0.0028519819
E2B.04	11/11kV, 3Cx185sqmm Power Cable	Meter	17775	0.0139670221
E2B.05	3.3/3.3kV, 1Cx150sqmm Power Cable	Meter	2400	0.0010405984
E2B.06	3.3/3.3kV, 3Cx150sqmm Power Cable	Meter	13920	0.0078888596
E2B.07	3.3/3.3kV, 3Cx185sqmm Power Cable	Meter	30	0.0000170019
E2C	CABLE TERMINATION KITS & JOINING KITS			
E2C.1	HT END TERMINATION JOINTING KITS, XLPE INSULATED, UNARMOURED/ ARMOURED, ALUMINIUM CABLE WITH LUGS			
E2C.1.01	11/11kV, 1Cx630 Sqmm End Jointing Kit	Nos	40	0.0008926046
E2C.1.02	11/11kV, 1Cx240sqmm Power Cable	No	54	0.0014869734
E2C.1.03	11/11kV, 1Cx400sqmm Power Cable	No	120	0.0033071290
E2C.1.04	11/11kV, 3Cx185sqmm Power Cable	No	3	0.0000949497
E2C.1.05	3.3/3.3kV, 1Cx150sqmm Power Cable	No	12	0.0002950888
E2C.1.06	3.3/3.3kV, 1Cx240sqmm Power Cable	No	3	0.0000795381
E2C.1.07	3.3/3.3kV, 3Cx150sqmm Power Cable	No	3	0.0000958277
E2C.1.08	3.3/3.3kV, 3Cx185sqmm Power Cable	No	8	0.0002627197
E2C.2	HT STRAIGHT THROUGH JOINTING KITS, XLPE INSULATED, UNARMOURED/ ARMOURED, ALUMINIUM CABLE WITH LUGS			
E2C.2.01	11/11kV, 1Cx240sqmm Power Cable	No	60	0.0014754438
E2C.2.02	11/11kV, 1Cx630sqmm Power Cable	No	36	0.0009921387
E2C.2.03	11/11kV, 1Cx400sqmm Power Cable	No	27	0.0006661162
E2C.2.04	11/11kV, 3Cx185sqmm Power Cable	No	21	0.0005180904
E2C.2.05	3.3/3.3kV, 1Cx240sqmm Power Cable	No	3	0.0000839561
E2C.2.06	3.3/3.3kV, 3Cx185sqmm Power Cable	No	3	0.0000896257
E2C.2.07	3.3/3.3kV, 3Cx150sqmm Power Cable	No	3	0.0000826083

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E2C.3	TREFOIL CLAMPS (COMPLETE WITH FIXING HARDWARES) 11/11kV,3.3/3.3kV GRADE ALUMINIUM CONDUCTOR,XLPE INSULATED, ARMoured/ UNARMoured CABLES AS PER CABLE OD.			
E2C.3.1	Trefoil Clamp	No	44800	0.0413606491
E3	JUNCTION BOXES AND PUSH BUTTON			
E3.01	Start Stop Push Button Station (Local push button station Type A/ B/ C/ D)	No	974	0.0038015852
E3.02	Local Motor Starter	No	447	0.0018090830
E3.02	Junction Box 12/ 24/ 26/ 48/ 96 way.	No	102	0.0004546319
E3.03	Local Control box for panel type hopper heater.	No	120	0.0022262208
E3.04	AC/ DC Fuse DB	No	30	0.0008011248
E3.05	Junction Boxes for ACC Tube Cleaning System	No	60	0.0002849993
E4	STRUCTURAL STEEL			
E4.01	Structural Steel fabrication & Installation (MS angle, Channel, Plate etc)/ Cable tray structural steel fabrication & installation.	MT	253	0.0291207639
E5	SWITCHGEARS/ MCC/ PCC			
E5A	HT SWITCHGEAR (3.3 kV)			
E5A.1	3.3kV FGD Auxiliary Switchboard #3GA. Each Board shall have 20 panels. Approx. overall dimension of each panel is 820x2692x1831 to 2651 mm. Each shipping section weight is approximately 3MT.	Set	1	0.0013215307
E5B	LT SWITCHGEAR (415/220V)			
E5B.1	415V ACC PMCC PANEL (3000A). Approx overall dimensions 3000x1700x2450mm.	Set	8	0.0074004006
E5B.2	415V ACC STANDBY PANEL (3000A). Approx overall dimensions 3000x1700x2450mm.	Set	3	0.0030880817
E5B.3	AC & Ventilation MCC for ACC-3 (Approx overall dimension 1000X5000MM)	Set	1	0.0009874009
E5B.4	415V Service building MCC (3000A). Approx overall dimension 16350x1700x2400mm	Set	1	0.0009980326
E5B.5	415V Hydrogen plant MCC (1600A). Approx overall dimension 7150x1500x2400mm	Set	1	0.0005148182
E5C	STARTER PANEL/BOXES/POWER DISTRIBUTION BOX/MARSHALLING BOXES			
E5C.01	Electronic Control Panel, overall approx. dimensions are 600mm (L)x550mmx2300mm. Approx. overall weight of each panel is 0.25MT.	No	120	0.0064351793

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E5C.02	IOS PANEL with approx overall dimension 1000x650x2050; approx. weight of panel 0.3MT along with loose accessories such as IOS PC, Computer Furniture, Data Logger PC, Printer, PC termination box, peripheral cables etc.	Set	1	0.0000633127
E5C.03	SAS-2 Panel in Plant Control Room; approx dimensions 2200x800x800.	No	1	0.0000492145
E5C.04	3D Acoustic level transmitter for first field ESP along with probe head assembly, electronic unit, JB, etc.	No	12	0.0006426375
E5C.05	DC motor starter panels, etc (DC JOP, DC EOP, Seal oil panel, DC Scanner fan), including resistance boxes. Approx weight 0.5 MT and approx. dimension 1000x800x2200 mm each.	No	7	0.0005682222
E5C.06	Local Motor Starter Panels Suitable for (0.37KW/0.55KW/0.75KW, 1.1kW/1.5kW/2.2kW/3.7kW/5.5kW)	No	306	0.0024627753
E5C.07	Ground Brush Monitoring System	Set	1	0.0000535521
E5C.08	Rotor Flux Monitoring System	Set	1	0.0000811740
E5D	220V DC BATTERY & BATTERY CHARGER SYSTEM			
E5D.01	220Volt DC Battery Charging System with battery (2x170cells) with DC Battery Charger. Approx total weight of battery system -23MT, approx total weight of battery charger - 2MT)	Set	2	0.0031313450
E5E	VARIABLE FREQUENCY DRIVE SYSTEM FOR CEP			
E5E.01	Transportation from stores/ storage yards to erection site, erection, assembly, testing & commissioning of Variable Frequency Drive System consisting of IGBT based VFD Panel and accessories including transformer for CEP-A, B, C (Complete for Unit-3)	Set	1	0.0056054749
E5F	MISCELLANEOUS EQUIPMENT			
E5F.01	Ash Level Indicator comprising of level probe with extension lagging pipe, Electronic Unit, Interconnecting PTFE Cabling, Conduit, etc.	Set	120	0.0007342483
E5F.02	Opacity Monitor consisting of Transmitter & Receiver, Electronic Unit, Air Blower unit, Weather Proof housings, Junction boxes, flexible hoses, mounting flanges with pipe for Transmitter, Receiver & Air blower, interconnected cables etc. for mounting on ESP outlet duct.	Set	6	0.0003942658
E5G	PLANT ILLUMINATION PACKAGE (LIGHTING SYSTEM)			
E5G.1	LIGHTING DISTRIBUTION BOARD (LDB)			

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E5G.1.01	AC LDB Type LDB-H (12) without transformer (including cubicles suitable for 1 No 100kVA transformer)	No	11	0.0009480617
E5G.1.02	100kVA transformer for housing in E5G.1.01 above.	No	11	0.0005131816
E5G.1.03	AC LDB Type LDB-H (12) without transformer (including cubicles suitable for 2 No 100kVA transformer)	No	3	0.0003479320
E5G.1.04	100kVA transformer for housing in E5G.1.03 above.	No	6	0.0003058441
E5G.1.05	AC LDB Type LDB-H (18) without transformer (including cubicles suitable for 1 No 100kVA transformer)	No	1	0.0000771768
E5G.1.06	100kVA transformer for housing in E5G.1.05 above.	No	1	0.0000593082
E5G.1.07	DCLDB Type LDB-D (12)	No	2	0.0001102939
E5G.1.08	AC LDB Type WDB-H (18) without transformer (including cubicles suitable for 1 No 100kVA transformer)	No	5	0.0005485068
E5G.1.09	100kVA transformer for housing in E5G.1.08 above.	No	5	0.0003166618
E5G.1.10	AC LDB Type LDB-F (8) without transformer (including cubicles suitable for 2 No 50kVA transformer)	No	1	0.0000760284
E5G.1.11	50kVA transformer for housing in E5G.1.10 above.	No	2	0.0001182232
E5G.2	LIGHTING PANELS (LP)			
E5G.2.01	AC Normal /Emergency indoor Type LP - A (12)	No	20	0.0004432321
E5G.2.02	AC Normal /Emergency outdoor Type LP - A (12) [with timer]	No	20	0.0003198507
E5G.2.03	AC Normal (Decorative) Type LP - A (12)	No	5	0.0001099538
E5G.2.04	AC Normal (Decorative) Type LP-A (18)	No	3	0.0000473446
E5G.2.05	AC Normal /Emergency indoor Type LP - A (18)	No	17	0.0003011380
E5G.2.06	AC Normal /Emergency outdoor Type LP - A (18) [with timer]	No	29	0.0005231233
E5G.2.07	DC indoor Type LP - D (6)	No	6	0.0001015640
E5G.2.08	DC outdoor Type LP - D (6)	No	9	0.0001776507
E5G.2.09	Street Lighting Type LP - S (6)	No	4	0.0000654823
E5G.2.10	LP Outdoor type (LP-E24) with 3kVA TRF	No	5	0.0000766247
E5G.3	LIGHTING LUMINAIRES (COMPLETE WITH ACCESSORIES)			
E5G.3.01	Luminaire Type FC02/ FC06/ FC07-DC/ FC30/ FC30 with dimmable ballast/ FC32/ FC33-DC/ FC34-DC/ FC81	No	3029	0.0114141140
E5G.3.02	Luminaire Type SF64/ SF66	No	183	0.0012030382
E5G.3.03	Luminaire Type SB02/ SB11	No	393	0.0017598680
E5G.3.04	Luminaire Type SS62/ SS63	No	601	0.0025975693
E5G.3.05	Luminaire Type SW41/ SW42	No	8205	0.0326806903

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E5G.3.06	Luminaire Type MW96/ MW98	No	157	0.0008607652
E5G.3.07	Downlighter (18W= 6x3W) / (18W= 6x3W) Dimmable	No	529	0.0032439837
E5G.4	SWITCH BOXES			
E5G.4.01	Type SWB1	No	274	0.0007574904
E5G.4.02	Type SWB2	No	138	0.0003963781
E5G.4.03	Type SWB3	No	18	0.0000541770
E5G.4.04	Type SWB4	No	2	0.0000078493
E5G.4.05	Type SWB5	No	51	0.0002785173
E5G.5	JUNCTION BOXES			
E5G.5.01	Type JB-F	No	10000	0.0401220875
E5G.5.02	Type JB-FE	No	108	0.0004342743
E5G.5.03	Type JB-S	No	524	0.0018371018
E5G.6	RECEPTACLES			
E5G.6.01	Type RA	No	339	0.0011151629
E5G.6.02	Type RA (Flame proof)	No	8	0.0000316516
E5G.6.03	Type RB	No	201	0.0008000957
E5G.6.04	Type RC	No	200	0.0008771042
E5G.6.05	Type RC (Flame proof)	No	1	0.0000076004
E5G.7	CEILING FANS WITH ELECTRONIC REGULATORS			
E5G.7.01	1200 mm sweep	No	30	0.0000994391
E5G.7.02	Pedestal Fans	No	3	0.0000127984
E5J.8	EMERGENCY LIGHTING UNITS INSTALLATION		0	0.0000000000
E5G.8.01	With Ni-Cd battery and 2x9W fluorescent lamp	No	11	0.0000582796
E5G.9	POLES INSTALLATION INCLUDING ALL ACCESSORIES. (SWAGED, STEEL TUBULAR, GALVANIZED)			
E5G.9.01	Type PS1	No	101	0.0039286084
E5G.9.02	Type PS2	No	152	0.0058118955
E5G.9.03	Type PS4/ PF1	No	5	0.0001583852
E5G.9.04	Type PF2	No	14	0.0005254392
E5G.9.05	Fabrication of J poles	No	3000	0.0118573961
E5G.10	WIRES			
E5G.10.01	1x1.5sqmm Cu PVC	Meter	180000	0.0031646902
E5G.10.02	1x2.5sqmm Cu PVC	Meter	330000	0.0092770196
E5G.10.03	1x4sqmm Cu PVC	Meter	68000	0.0025048327
E5G.11	HOT DIP GALVANISED RIGID STEEL CONDUITS (HEAVY DUTY)			
E5G.11.01	20 mm dia GI conduit, 1.6 mm thick	Meter	195000	0.0814138396
E5G.11.02	25 mm dia GI conduit, 1.6 mm thick	Meter	28800	0.0134093816

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E5G.11.03	40 mm dia GI conduit, 2 mm thick	Meter	13000	0.0099385679
E5G.11.04	50 mm dia GI conduit, 2 mm thick	Meter	1500	0.0010328120
E5G.11.05	20 mm dia GI conduit with epoxy coating, 1.6 mm thick	Meter	2000	0.0007569513
E5G.11.06	20mm dia TERENE conduit, 1.6mm thick	Meter	16037	0.0043177700
E5G.12	HUME PIPE			
E5G.12.01	Hume pipe 100 mm dia	Meter	1000	0.0009239418
E5G.13	24V SUPPLY MODULE & LAMP UNIT COMPLETE WITH ALL ACCESSORIES			
E5G.13.01	Portable type 24V supply modules	No	10	0.0000337089
E5G.13.02	Portable halogen lamp unit	No	10	0.0000269239
E5G.13.03	5A, 24V industrial type sockets	No	69	0.0001692997
E5G.13.04	Exit Sign	No	32	0.0004657411
E5G.14	LAYING & TERMINATION OF CABLES (ARMOURED CABLES TO BE BURIED UNDERGROUND)			
E5G.14.01	3.5Cx25sqmm Al	Meter	15000	0.0067283923
E5G.14.02	3.5Cx95sqmm Al	Meter	10000	0.0077853339
E5G.14.03	3.5Cx50sqmm Al	Meter	6000	0.0059059386
E5G.14.04	3Cx2.5sqmm Cu	Meter	10000	0.0100107353
E5G.15	LAYING & TERMINATION OF CABLES			
E5G.15.01	3.5Cx95sqmm Al	Meter	10000	0.0021060455
E5G.15.02	3.5Cx50sqmm Al	Meter	20000	0.0038502856
E5G.15.03	3Cx2.5sqmm Cu	Meter	10000	0.0008898846
E5G.15.04	2Cx95sqmm Al	Meter	2000	0.0003277074
E5G.16	GREEN BUILDING ECBC COMPLIANCE			
E5G.16.01	Occupancy Sensor	Nos	56	0.0000643250
E5G.16.02	Control System	Set	2	0.0001109202
E5G.16.03	Lighting Sensor System	Nos	1	0.0000443681
E5G.16.04	Lighting Dimmer System	Nos	1	0.0000601165
E6	ABOVE GROUNG EARTHING & LIGHTNING PROTECTION MATERIALS for ACC work area			
E6.01	8 SWG GI wire	Meter	3872	0.0001570029
E6.02	14SWG GI wire	Meter	220000	0.0102749627
E6.03	25x3mm GI flat	Meter	4797	0.0015564587
E6.04	25x6mm GI flat	Meter	13352	0.0045488716
E6.05	50x6mm GI flat	Meter	4776	0.0025730720
E6.06	65x8mm GI flat	Meter	11681	0.0119381168
E6.07	40mm dia MS Rod	Meter	1620	0.0011940821

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E6.08	Ground Electrode with 40mm Dia rod (One end Sharpened) 3000mm long located along the periphery of Earthing Grid (Without Treated Pit Other than Earth Test Pit)	No	176	0.0020302019
E6.09	GS Rod 20mm dia Vertical Air Termination	No	176	0.0019249223
E6.10	Test Links with 150x150x3mm GS flat	No	20	0.0000487752
E6.11	Flexible braided Copper conductor of 600mm with tinned Cu, clamp connected by U-bolt for fence gate earthing.	No	18	0.0000031794
E6.12	50NB gal MS pipe(PERF) (for neutral earthing along with salt, sand, charcol & chamber with cover)	No	100	0.0018288629
E7	BUS DUCTS			
E7A	LT BUS DUCTS			
E7A.01	415V, 1000A/ 1600A/ 2500A/ 3200A/ 4000A, LT Bus Duct(For MCC/Emergency MCC/ PMCC/ FGD PMCC/ ESP/DG Boards etc). Loose items like silicagel Breather pipe, GI Channel Supports and associated accessories.	Meter	542	0.0102611354
E7A.02	Sandwich Bus Duct for Emergency Board	Meter	300	0.0042460887
E7B	BUS DUCT (SPBD)			
E7B.01	11kV, 1000A/ 2500A/3150A/ 4000A, SPBD (Including erection of Support structure, duct earthing, support insulator, space heater etc. supplied by manufacturing unit)	Meter	566	0.0121270898
E7B.02	3.3kV, 600/1000A/ 2500A , SPBD including CHP/AHP area (Including erection of Support structure, duct earthing, support insulator, space heater etc. supplied by manufacturing unit)	Meter	103	0.0016627152
E7B.03	Shifting of 11kV SPBD (Without inside conductor to site)	No	30	0.0003768135
E7B.04	Shifting of 11 KV loose conductors from BHEL store (works include loading, shifting & unloading)	No	200	0.0005273340
E7B.05	Assembly of 11kV SPBD conductors in its SPBD for readiness	No	50	0.0002140783
E7B.06	Space heater fixing, including wiring in SPBD Ducts	No	48	0.0004249635
E7C	NEUTRAL GROUNDING RESISTOR			
E7C.1	Neutral Grounding Resistor including NGR support structure 11kV (approx dimensions: NGR-1510x1110x1855, weight-1MT; support structure-1400x1000x2500, weight-0.3MT) & 3.3kV (approx dimensions: NGR-1510x635x1405, weight-0.4MT; support structure-1400x525x2400, weight-0.25MT)	Set	16	0.0249039877
E7D	BUS DUCTS (IPBD)			

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E7D.01	Isolated Phase Bus Duct main run (27kV: 22250A- approx length 210 mtrs), Isolated Phase Bus Duct Delta Run (27kV: 13000A- approx length 135 mtrs), Isolated Phase Bus tap off run (24kV: 2800A- approx length 110 mtrs)	Meter	455	0.0145401072
E7D.02	SPVT Cubicle (1 set), NG Cubicle (1 set), Air pressurisation equipment (23 KW load consist of compressor and receiver -1 set, Drier and pressuring panel- 1 set, Control panel- 1 set) , Support structure for IPBD - 50 Tons etc)	MT	50	0.0057550917
E8	OIL FILLED TRANSFORMERS (GT, UT, UAT & ST)			
E8.01	Single Phase 315MVA, 420/27kV, YNd11 (after 3-ph bank formation), Generator Transformer (GT) including all accessories, piping, cabling etc.	Set	3	0.0286780103
E8.02	Re-erection, testing and commissioning of 144/72/72 MVA, 3-phase, 400/11.5/11.5kV Station Transformer (ST), OLTC, ONAN/ ONAF (60%/100%) including all accessories, piping, cabling etc.	Set	1	0.0067811270
E8.03	65MVA, 27/11.5kV Unit Transformer (UT) including all accessories, piping, cabling etc.	Set	2	0.0077805737
E8.04	12.5 MVA, 11/3.45 kV UAT, 10MVA, 11/3.45 kV FGD Auxiliary, Miscellaneous Transformer including all accessories, piping, cabling etc.	Set	4	0.0085677924
E8.07	630/ 1000/ 1600/ 2000/ 2500/ 5000 kVA, 11/0.433kV Auxiliary Transformers including ACC area transformers	No	27	0.0345895327
E8.08	Complete dismantling of 144/72/72 MVA, 3-phase, 400/11.5/11.5kV Station Transformer (ST), OLTC, ONAN/ ONAF (60%/100%), required portion busduct including all accessories, piping, cabling etc and Cable Tray and Cabling Upto 500 meters	Set	1	0.0067811270
E9	ONLY TESTING & COMMISSIONING			
E9.01	Heating elements for Hopper Heater of ESP.	No	4320	0.0105956659
E9.02	Heating elements for Support Insulator Heater, Shaft Insulator Heaters of ESP.	No	600	0.0015014823
E9.03	High Voltage Rectifier Transformers (95kV peak, 1000 mA) including oil filtration.	No	120	0.0057027159
E9.04	Testing & Commissioning of Collecting, Emitting, GD Screen Motor	No	252	0.0020902645
E9.05	Testing and commissioning of 3.3kV, 6.6kV &11kV HT motors including dryout.	No	20	0.0014990232
E9.06	Testing and commissioning of 415V LT motors including dry out.	No	200	0.0074240858
E9.07	Generator System Testing	No	1	0.0009100939

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
E9.09	Testing & Commissioning of Wall, Long Retractable, Air Heater Soot Blower	No	250	0.0090288163
E9.10	Testing & Commissioning of Furnace Temperature Probe (including Solenoids, Thermocouples, JB etc)	No	2	0.0000148666
E9.11	Thermostats including Calibration	No	132	0.0003235290
E9.12	Electrically (LT) Operated Valves, Dampers and Gates with Actuators, Limit Switches, etc. (Regulating & ON/OFF Type).	No	466	0.0038359894
E9.13	Electrical Operated Hoist at various area like ESP, Mill, IDF, PAF, FDF, Vacum Pumps, BFP, CW & ACW area	No	24	0.0004798723
E9.14	Testing and Commissioning of H2 Drier Panels.	No	2	0.0000507659
E9.15	1750/2000kVA, 3-Phase, 415V Diesel Generator set. approx. overall weight 43MT.	Set	2	0.0000781324
E10	OTHER ITEMS			
E10.1	Interconnection of each Hopper Heater Cables to Hopper Heater Junction Box for total 06 passes, with detialed works as per below section. 36 Nos Heaters each with 2X16 Sqmm AWG Heat Resistant Cable of 2.5 Sqmm Core approx. Length 6.0 meter. (Will be electrically tested and erected by BHEL other agencies) Each Hopper heater cables of 6 meter lenght to be pass through separate flexible metallic conduit (12-15 mm) supplied by BHEL and conduit with cables to be dressed in Hopper Surface with conduit and clamp supplied by BHEL. To be issued. Each Hopper is having 36 Nos Heaters.	Nos	120	0.0073366153
E10.2	Laying and Testing, etc of Optical Fibre Cable on cable trays, conduits etc with minor civil works	Mtr	40000	0.0049232112
E10.3	Termination & OTDR Testing etc. of Optical Fibre Cable including all consumables like Break-out Kits , OFC Markers, etc	Nos	300	0.0021583439
E10.4	Erection ,Testing and Commissioning of Outdoor CMS Panels (03 Nos) and Indoor CMS Panels (01 Nos) for Generator Transformers.	Set	4	0.0006932328
E10.5	Erection,Testing and Commissioning of Online Moisture Removal System for Generator Transformer	Set	1	0.0000684060
E10.6	Laying and Placement of HT and LT Insulation Mats for HT and LT Swgrs.	Mtr	300	0.0001531286
B	ACC Work Area (including man lifter/sky climber etc)			
EB1A.01	Ladder type Cable Tray 150mm	Meter	400	0.0002808165
EB1A.02	Ladder type Cable Tray 300mm	Meter	500	0.0004524386

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
EB1A.03	Ladder type Cable Tray 600mm	Meter	5000	0.0049891709
EB1A.04	Perforated type Cable Tray 50mm	Meter	200	0.0001290142
EB1A.05	Perforated type Cable Tray 100mm	Meter	200	0.0001181411
EB1A.06	Perforated type Cable Tray 150mm	Meter	400	0.0003114449
EB1A.07	Perforated type Cable Tray 300mm	Meter	500	0.0005211783
EB1A.08	Perforated type Cable Tray 600mm	Meter	2000	0.0029536032
EB1B	CABLE TRAY SUPPORT AND ACCESSORIES for ACC work area			
EB1B.01	Single Channel (in standard length of 6meter per piece)	Meter	800	0.0009202518
EB1B.02	Double Channel (in standard length of 6meter per piece)	Meter	1500	0.0018789578
EB1C	CANTILEVER ARM (EACH COMPLETE WITH, 2 NOS.-M12 HEX. BOLT & WASHER, 2 NOS.-M12 SPRING NUTS, 2 NOS.-M6 PAN HEAD SCREWS & WASHER, 2 NOS.-M6 SPRING NUTS) for ACC work area			
EB1C.01	For 600mm trays	No	4000	0.0030748647
EB1C.02	For 300mm trays	No	500	0.0002507109
EB1C.03	For 150mm trays	No	400	0.0002799108
	LT CABLES for ACC work area			0.0000000000
EB2A.1	1Cx300Sqmm	Mtr	500	0.0001356295
EB2A.2	2Cx1.5Sqmm	Mtr	20000	0.0023228132
EB2A.3	2Cx2.5Sqmm	Mtr	1500	0.0001647711
EB2A.4	3Cx2.5Sqmm	Mtr	7000	0.0008062196
EB2A.5	3Cx16Sqmm	Mtr	800	0.0001048225
EB2A.6	3Cx95Sqmm	Mtr	1000	0.0002721882
EB2A.7	3Cx240Sqmm	Mtr	27000	0.0110293607
EB2A.8	4Cx10Sqmm	Mtr	400	0.0000580521
EB2A.9	5Cx1.5Sqmm	Mtr	15000	0.0017409576
EB2A.10	5Cx2.5Sqmm	Mtr	4000	0.0004678535
EB2A.11	3.5Cx25Sqmm	Mtr	1500	0.0003510366
EB2A.12	3.5Cx50Sqmm	Mtr	700	0.0001821205
EB2A.13	3.5Cx95Sqmm	Mtr	500	0.0001370800
EB6	ABOVE GROUNG EARTHING & LIGHTNING PROTECTION MATERIALS for ACC work area			
EB6.1	25x6 Flat	Mtr	1084	0.0006031134
EB6.2	8 SWG GI wire	Meter	700	0.0000323196
EB6.3	65x8mm Flat	Meter	4758	0.0039017477
EB6.4	50x6mm flat	Meter	1184	0.0007890405
EB6.5	25x3mm GI flat	Meter	314	0.0001748771

Annexure 2 (Revised BOQ and Comparison of existing and revised Line items in BOQ)

Annexure 2_2 (Revised BOQ)

S. No	DESCRIPTION	UOM	TOTAL QUANTITY	Weightage
EB6.6	50NB gal MS pipe(PERF) (for neutral earthing along with salt, sand, charcol & chamber with cover)	No	40	0.0037290125
EB6.7	75X12 Flat	Mtr	5000	0.0056844117
EB6.8	Test Links with 150x150x3mm GS flat	No	25	0.0000475517
EB6.9	100NB gal MS pipe	No	35	0.0012994064
				1.0000000000



Annexure 3

एन टी पी सी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)
(Formerly National Thermal Power Corporation Ltd.)
(केंद्रीय कार्यालय नोएडा)
Corporate Center NOIDA

Reference : CC-ENGG-9585-001-215-PVE-E-191A

Date : 01/12/2023

From : R K Niranjan ADDL. GENERAL MANAGER	To : BHEL DELHI SIRIFORT, BHEL HOUSE,P.S.PROJECT MANAGEMENT GRP BHEL NEW DELHI 110049
Cc : NKALITA@BHEL.IN	
Subject : EPC ELECTRICAL EQUIPMENTS SUPPLY AND ERECTION Please find enclosed following drawings/ documents for necessary action at your end.	
Vendor Drg. No. : 9585-001-215-PVE-E-191A	
Orgn. Drg. No. : 9585-001-215-PVE-E-191A	
Revision No. : 01	
Drg. Title : GA Drawing for mounting arrangement.	
App. Category : CAT-I	
Release Date : 01/12/2023	Scan to verify
Comments : no comment	



Engineering Division
ISO 9001:2008 Certified

अधियाविकी कार्यालय परिसर, याट नं.- ए ४८, सेक्टर-२४, नोएडा (उ प) पिन-२०१ ३०७
टेलिफोन नं.- ०१२०-२४१०३३३, २४१०१६ फैक्स-०१२०-२४१०१३६, २४१०१७
पंजीकृत कार्यालय, एनटीपीसी भवन, व्होर कार्पोरेक्स, ७ इन्स्टीट्यूशनल प्लॉय, लोधी रोड, नई दिल्ली-११० ००३
टेलिफोन नं.- ०११-२४३६१०१८ फैक्स-०११-२४३६१०१८, वेबसाइट: www.ntpc.co.in
ENGINEERING OFFICE COMPLEX, Plot No: A-8A, Sector-24, Post Box No: 13, Noida (UP), Pin-201 307
Telephone No: 0120-2410333, 2410116 Fax-0120-2410136, 2410137
Registered Office: NTPC Bhawan, Scope Complex, 7 Institutional Area, Lodhi Road, New Delhi-110 003
Telephone No: 011 21360100 Fax 011 21361018, Website: www.ntpc.co.in

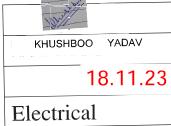
Document shall be as per NTPC QA if any discrepancies occur tech spec shall be prevail

		COMMENT RECORD SHEET	
PROJECT TITLE :		NTPC PATRATU SUPER THERMAL POWER STATION EXPANSION PHASE -I (3 X 800 MW)	
OWNER :		NTPC LIMITED	
EPC :		BHARAT HEAVY ELECTRICALS LIMITED	
REVIEW OF :		GA for mounting arrangement	
S.No		NTPC COMMENT	
DRAWING NUMBER & TITLE		BHEL REPLY	
1	9585-001-215-PVE-E-191A R001 : GA for mounting arrangement	R01	Please ensure mounting of LED fixture as per technical specification.
2			Confirmed, mounting arrangement is in line with technical specification.
2			Confirmed, document is in line with technical specification.



Mr. Jitendra Singh
30/11/2022

MOUNTING ARRANGEMENT DRAWING FOR STATION LIGHTING (TYPICAL)

 BHARAT HEAVY ELECTRICALS LIMITED PROJECT ENGINEERING MANAGEMENT	
<p>This is to certify that this document has been reviewed in PEM for confirming to the technical requirements for the project.</p>	
<i>SIGNATURE</i> <i>INITIALS OF DEALING ENGINEER</i> <i>DATE</i> <i>DEPARTMENT</i>	 <p> KHUSHBOO YADAV 18.11.23 Electrical </p>

NTPC DOC NO: 9585-001-215-PVE-E-191A					
CUSTOMER					
 NTPC Limited (A GOVERNMENT OF INDIA ENTERPRISE)					
PROJECT					
NTPC PATRATU SUPER THERMAL POWER STATION EXPANSION PHASE - I (3 X 800 MW)					
	BHARAT HEAVY ELECTRICAL LTD POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA	DEPT CODE			
			DSGN	RS	02.08.23
			E	CHKD	RS
TITLE	MOUNTING ARRANGEMENTS OF LED LIGHTING FIXTURE	DOC. NO.			
			APPD	ULG	02.08.23
		SHEET	21 SHEETS	REV. 01	



Sl. No.	Mounting Type	Mounting Description	applicable for fixtures	Sheet No.
1	Type-A	False ceiling area decorative fixture	FC-30, FC-33 & DOWNLIGHTER	3
2	Type-B	Industrial fixture mounted on ceiling	FC-06, FC-07, FC-32 & FC-81	4
3	Type-C	Industrial fixture with suspended type mounting	FC-06, FC-07, FC-32 & FC-81	5
4	Type-D	Industrial fixture mounted on wall	FC-06, FC-07, FC-32 & FC-81	5
5	Type-E	Supported from wall (highbay/well glass fixtures)	FC-34, SB-11, SB-02, SB-03, SW-41 & SW-42	6
6	Type-F	Supported from ceiling (highbay/well glass fixtures)	SB-02 & SB-03	7
7	Type-G	Supported from Channel/Structural steel on top (highbay/well glass fixtures)	FC-34, SB-02, SB-03, SW-41 & SW-42	7
8	Type-I	Supported from vertical Channel/Structural steel (highbay/well glass fixtures)	FC-34, SB-11, SB-02, SB-03, SW-41 & SW-42	8
9	Type-J	Handrail mounted (well glass fixtures)	SW-41 & SW-42	9
10	Type-J	Wall mounted (flameproof fixtures)	MW-96	10
11	Type-O	Ceiling mounted (highbay/flameproof fixtures)	SB-11, SB-02, SB-03 & MW-96	11
12	Type-P	Roof mounted (flood light fixtures)	SF-63, SF-64 & SF-66	12
13	Type-Q	Column mounted flood light	SF-63, SF-64 & SF-66	12
14	Type-R	Wall mounted (flood light fixtures)	SF-63, SF-64 & SF-66	13
15	Type-S	Column/wall mounted (street light fixtures)	SS-61, SS-62 & SS-63	14
16		Typical buried cable laying for street light cables	SS-61, SS-62 & SS-63	15
16		Typical J/B/Switch-Box/Receptacles mounting details	SS-61, SS-62 & SS-63	16-21
17		Typical conduit fixing Arrangement of Wall		

NTPC DOC NO: 9585 001 215 PVE E 191A

CUSTOMER

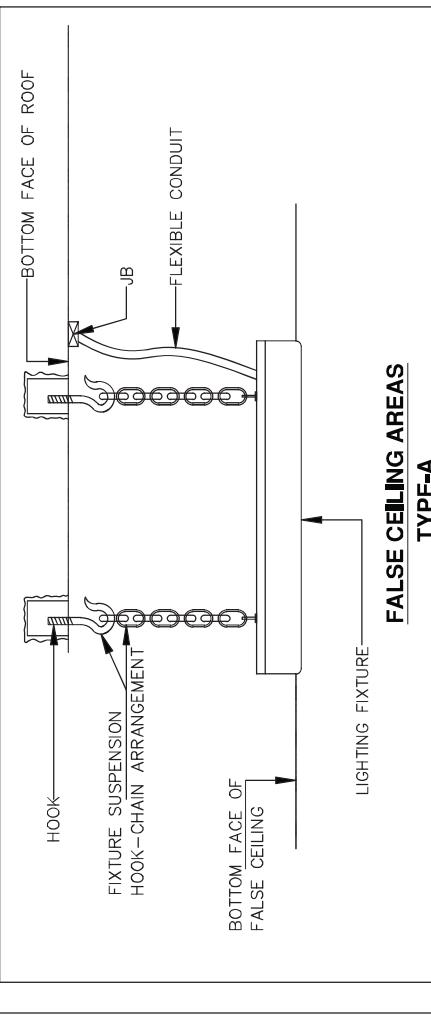


NTPC Limited
(A GOVERNMENT OF INDIA ENTERPRISE)

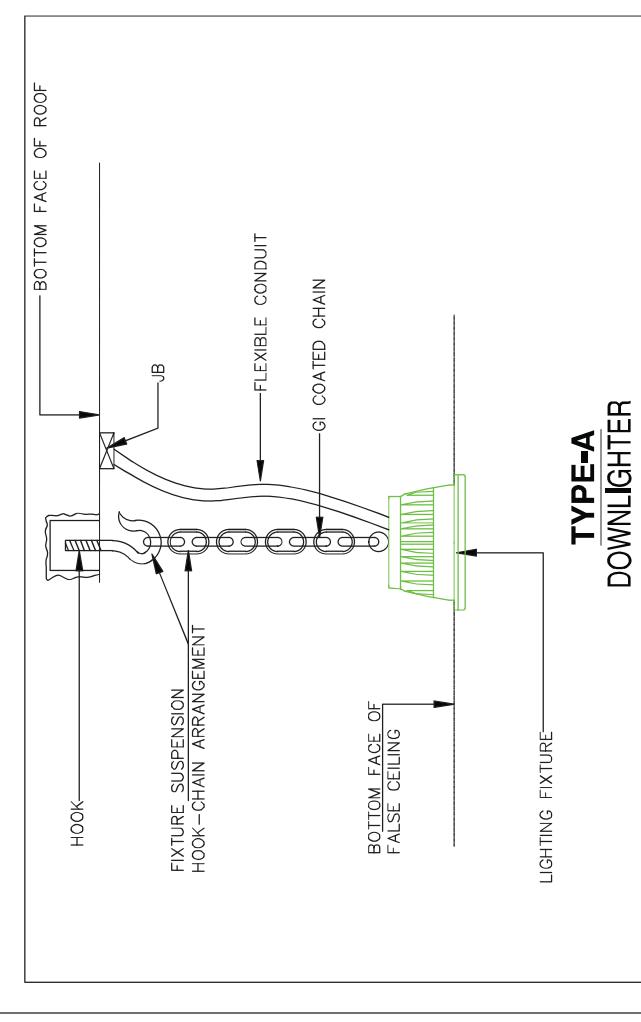
Notes:- Mounting details showns is typical & can vary as per site condition.

PROJECT
NTPC PATRATU SUPER THERMAL POWER STATION
EXPANSION PHASE - I (3 X 800 MW)

BRARAT HEAVY ELECTRICAL LTD	DER	NAMF	NAFF
PROVIN SECTION	200E	RCN	03.08.23
PROJECT ENGINEERING MANAGEMENT	CRND	RS	03.08.23
NOIDA	E	APPD	JLG
			03.08.23
TITLE	MOUNTING ARRANGEMENTS OF LED LIGHTING FIXTURE	DOC. NO.	-
		SHEET	REV. 01 22 SHEETS



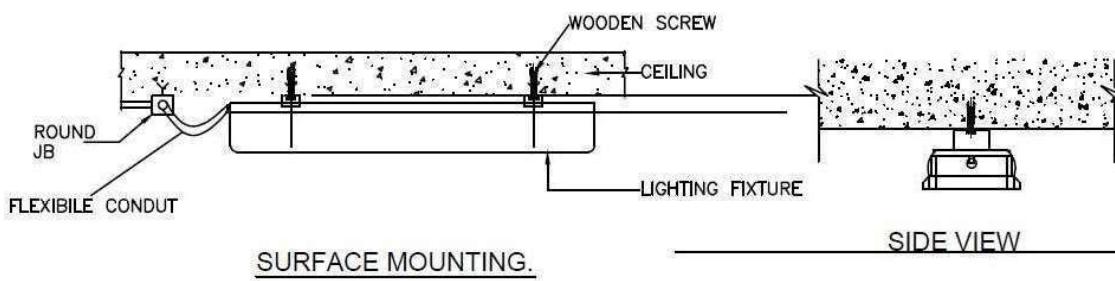
FC-33
MOUNTING ARRANGEMENT FOR FC-30,
& DOWNLIGHTER TYPE LIGHTING FIXTURE



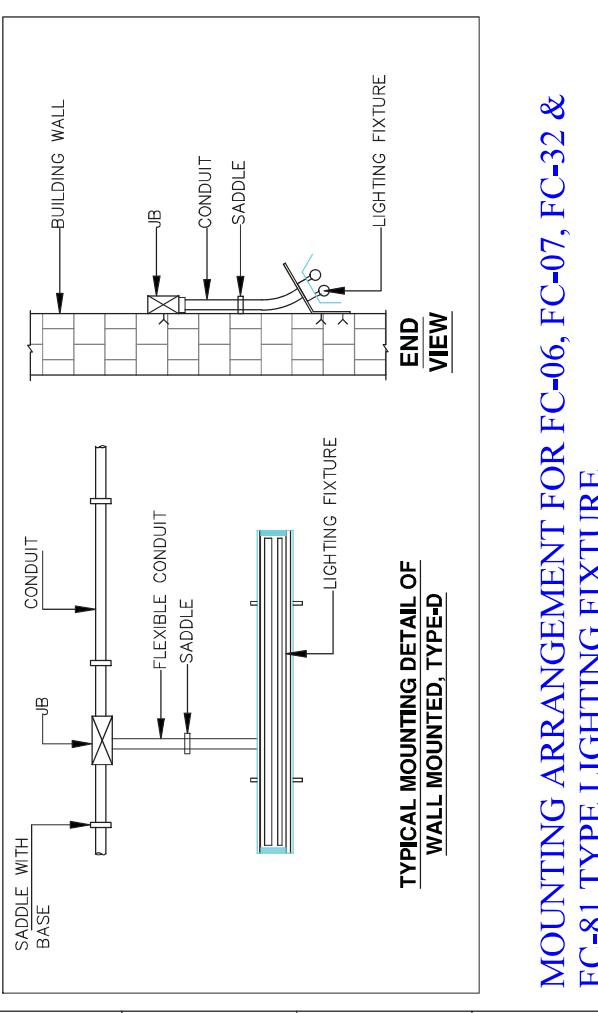
Note—

1. Pyrotech scopes includes Provision of mounting arrangement in the Lighting Fixtures as per the typical mounting drawings shown
2. Necessary accessories like chain, hooks and clamps will be provided along with the Fixtures.
3. 20mm GI Conduit Dia and Structural Steel shall be provided by BHEL.

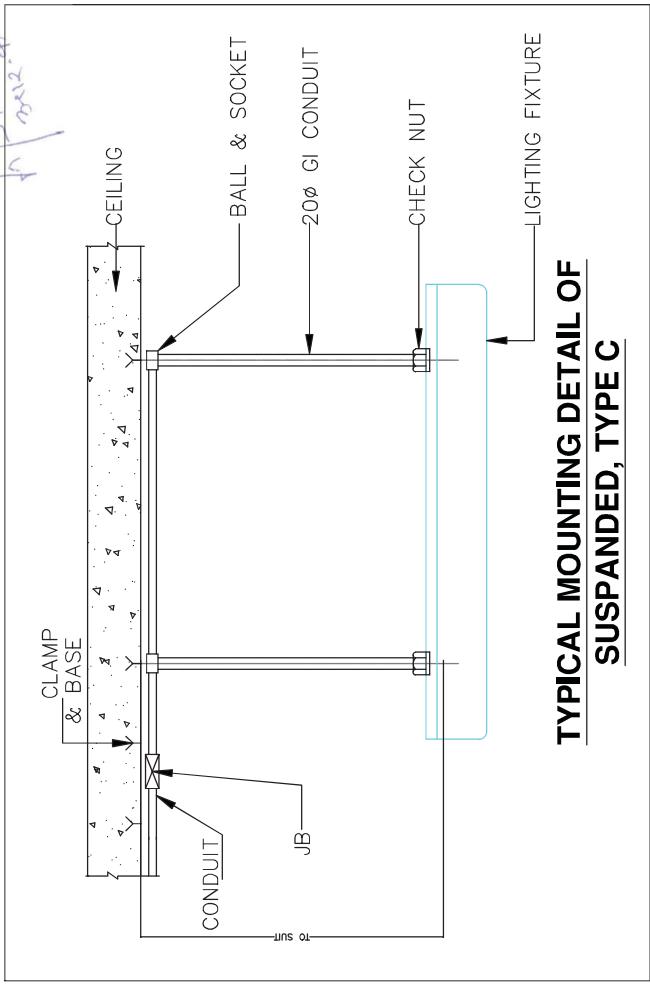
01	02	03	04	05	06	07	08
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HJM
2012-2013**TYPE-B****MOUNTING ARRANGEMENT FOR FC-06, FC-07, FC-32
& FC-81 TYPE LIGHTING FIXTURE****Note—**

1. Pyrotech scopes includes Provision of mounting arrangement in the Lighting Fixtures as per the typical mounting drawings shown
2. Necessary accessories like chain, hooks and clamps will be provided along with the Fixtures .
3. 20mm GI Conduit Dia and Structural steel shall be provided by BHEL.



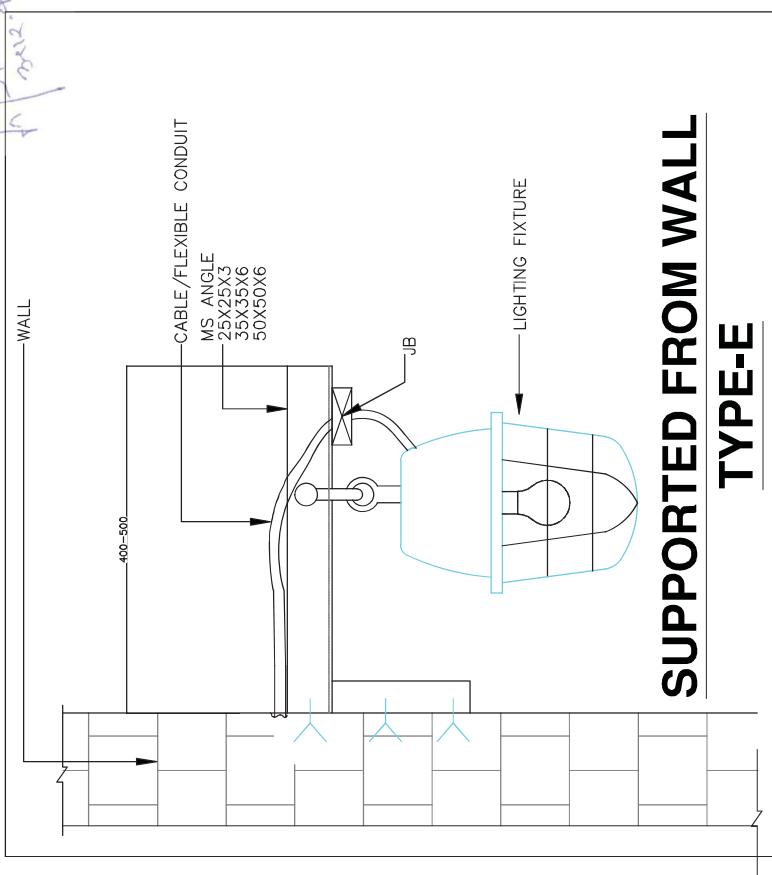
MOUNTING ARRANGEMENT FOR FC-06, FC-07, FC-32 & FC-81 TYPE LIGHTING FIXTURE



MOUNTING ARRANGEMENT FOR FC-06, FC-07, FC-32 & FC-81 TYPE LIGHTING FIXTURE

Note—

1. Pyrotech scopes includes Provision of mounting arrangement in the Lighting Fixtures as per the typical mounting drawings shown
2. Necessary accessories like chain, hooks and clamps if required will be provided along with the Fixtures
3. 20mm GI Conduit Dia and Structural Steel shall be provided by BHEL.



SUPPORTED FROM WALL
TYPE-E

**Mounting Arrangement For
SW-41, SW-42, SB-02, SB-03, SB-11 &
FC-34 Type Lighting Fixture**

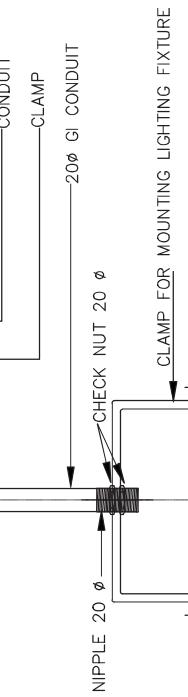
Note—

1. Pyrotech scopes includes Provision of mounting arrangement in the Lighting Fixtures as per the typical mounting drawings shown
2. Necessary accessories like chain, hooks and clamps if required will be provided along with the Fixtures
3. 20mm GI Conduit Dia and Structural Steel shall be provided by BHEL.

A	01	02	03	04	05	06	07	08
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BALL & SOCKET

CEILING

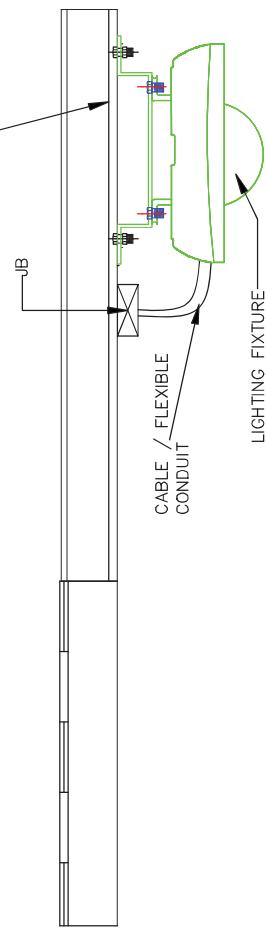


SUPPORTED FROM CEILING
TYPE-F

MOUNTING ARRANGEMENT FOR
SB02 & SB03 TYPE
LIGHTING FIXTURE

Note-

1. Pyrotech scopes includes Provision of mounting arrangement in the Lighting Fixtures as per the typical mounting drawings shown
2. Necessary accessories like chain, hooks and clamps will be provided along with the Fixtures
3. 20mm GI Conduit Dia and Structural steel shall be provided by BHEL.

MS ANGLE
25X25X3
35X35X6
50X50X6

SUPPORTED FROM CHANNEL/
STRUCTURAL STEEL
TYPE-G

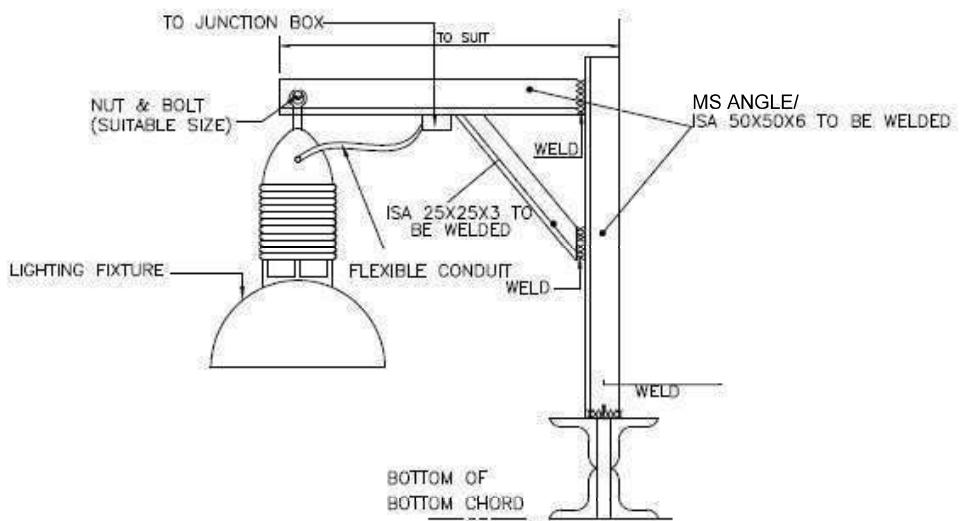
MOUNTING ARRANGEMENT FOR SW-41
SW-42, FC-34,
SB02 & SB03 TYPE
LIGHTING FIXTURE

A	08
B	07
C	06
D	05
E	04
F	03
G	02
H	01

HJM
2012-2012

71/178

257087/2021/PS-PEM-EL

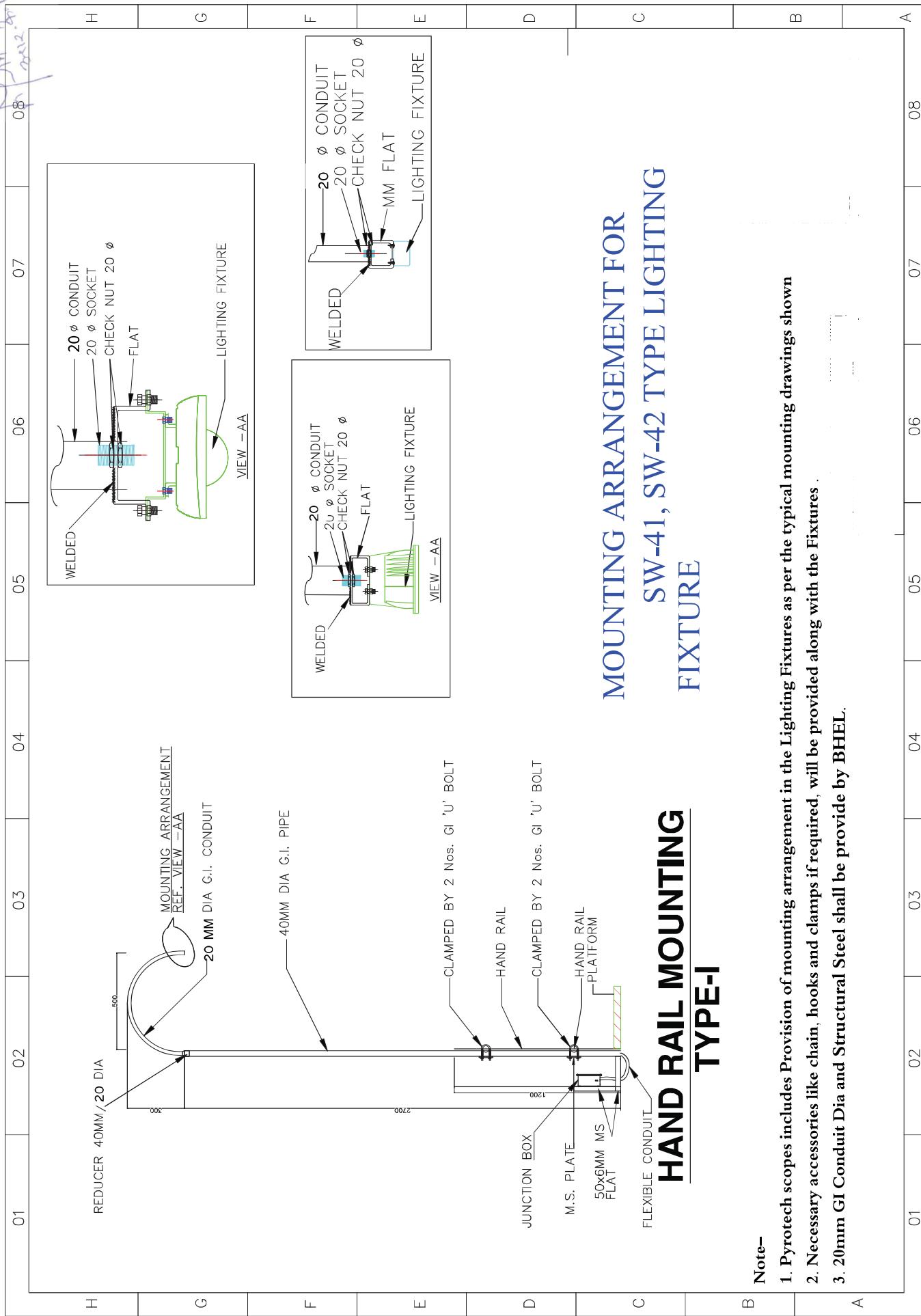


STRUCTURE MOUNTING
TYPE-L

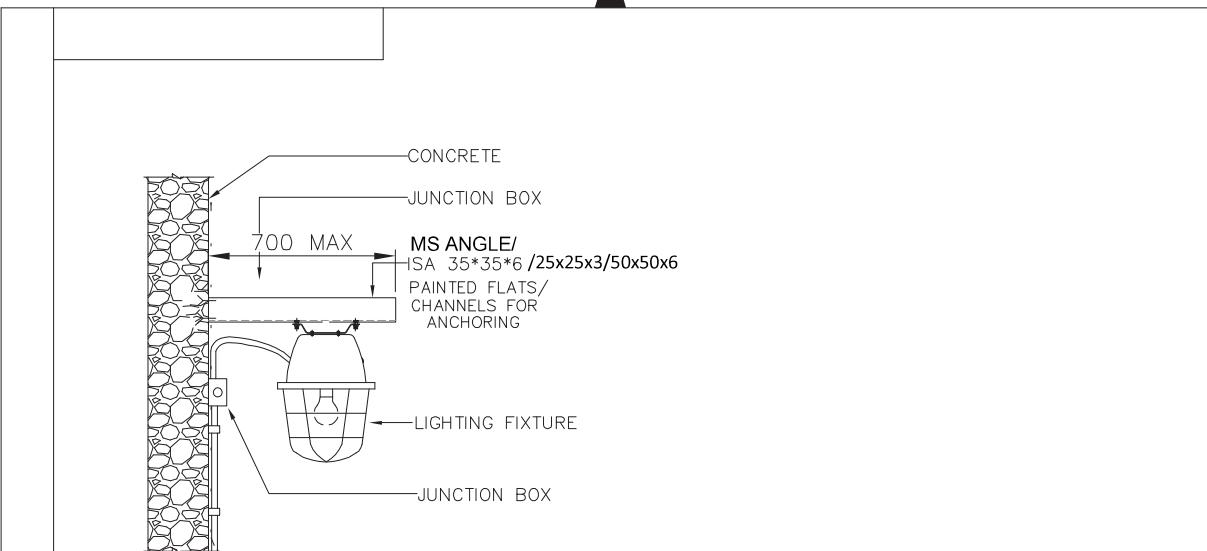
**MOUNTING ARRANGEMENT FOR FC-34, SB-11, SB-02,
SB-03, SW-41, SW-42 TYPE LIGHTING FIXTURE**

Note—

1. Pyrotech scopes includes Provision of mounting arrangement in the Lighting Fixtures as per the typical mounting drawings shown
2. Necessary accessories like chain, hooks and clamps will be provided along with the Fixtures
3. 20mm GI Conduit Dia and Structural Steel shall be provided by BHEL.



Tj-12.3.12/2012

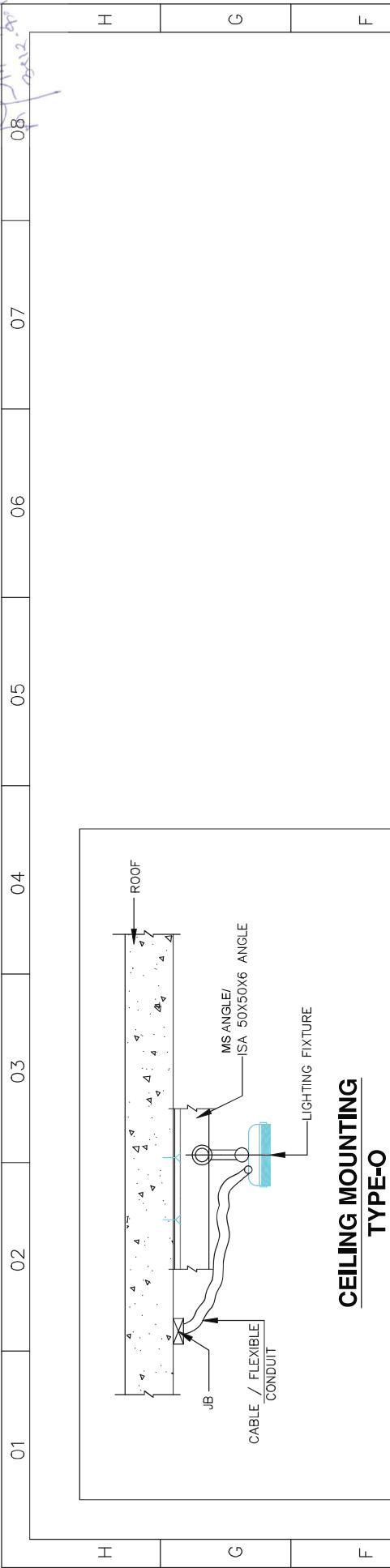


SUPPORTED FROM WALL
TYPE-J

**MOUNTING ARRANGEMENT FOR MW-96
& MW-98, SB02, SB03 , SW42**

Note—

1. Pyrotech scopes includes Provision of mounting arrangement in the Lighting Fixtures as per the typical mounting drawings shown
2. Necessary accessories like chain, hooks and clamps will be provided along with the Fixtures
3. 20mm GI Conduit Dia and Structural Steel shall be provided by BHEL.

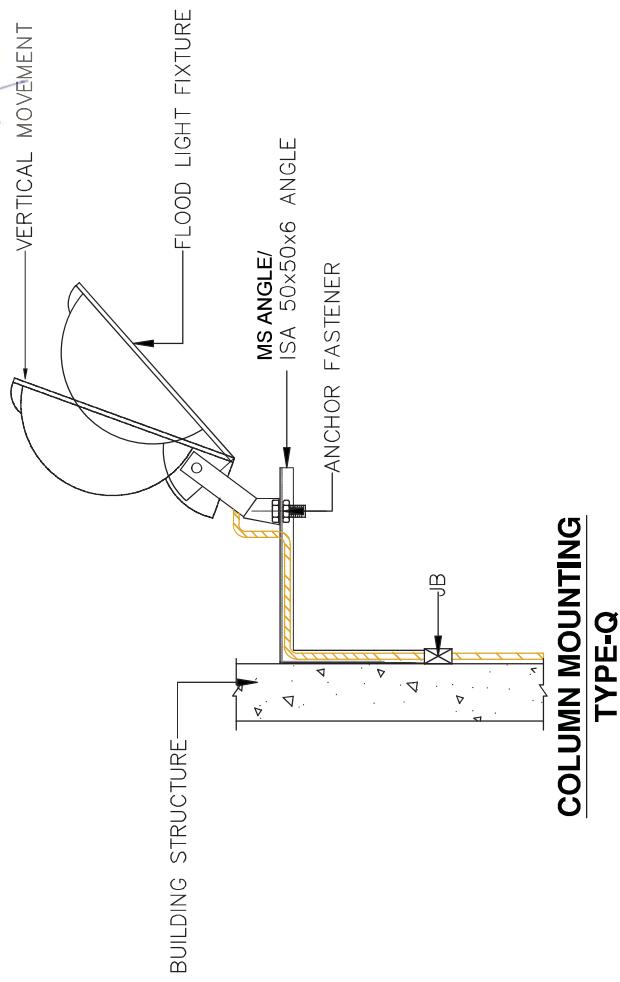


**MOUNTING ARRANGEMENT FOR SB-02, SB-03,
SB-11 & MW-96 TYPE LIGHTING FIXTURE**

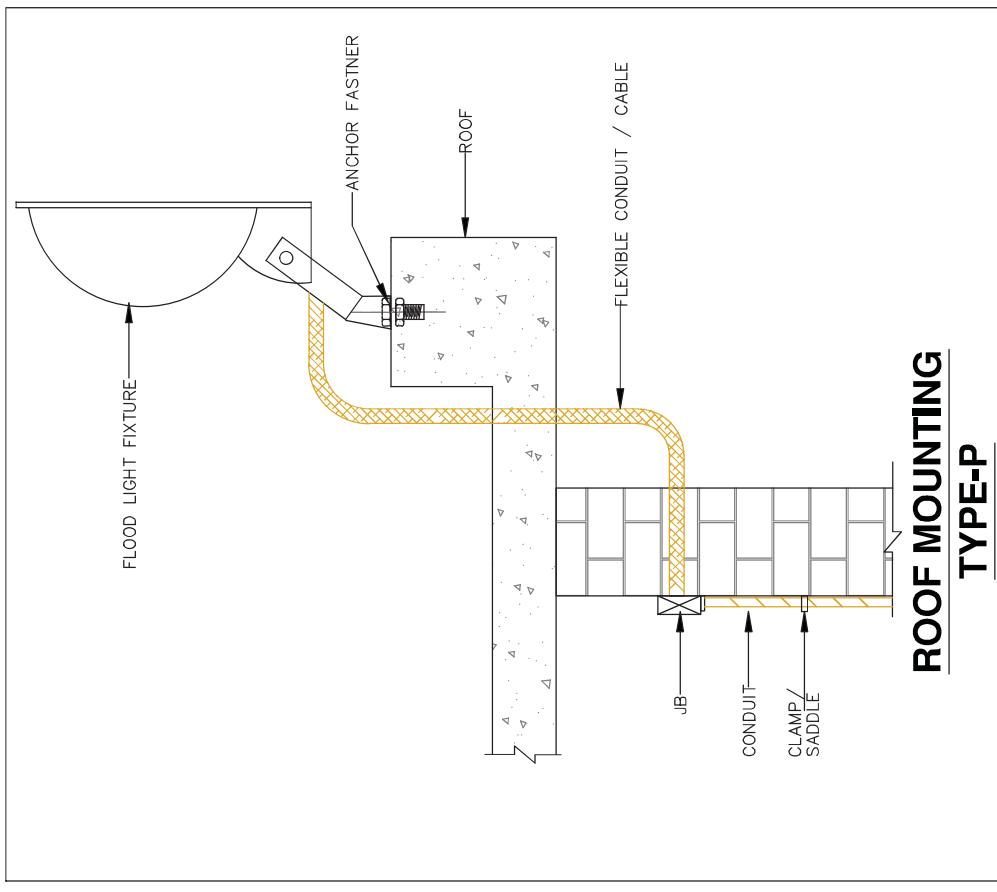
Note—

B 1. Pyrotech scopes includes Provision of mounting arrangement in the Lighting Fixtures as per the typical mounting drawings shown
 2. Necessary accessories like chain, hooks and clamps if required, will be provided along with the Fixtures
 3. 20mm GI Conduit Dia and Structural Steel shall be provided by BHEL.





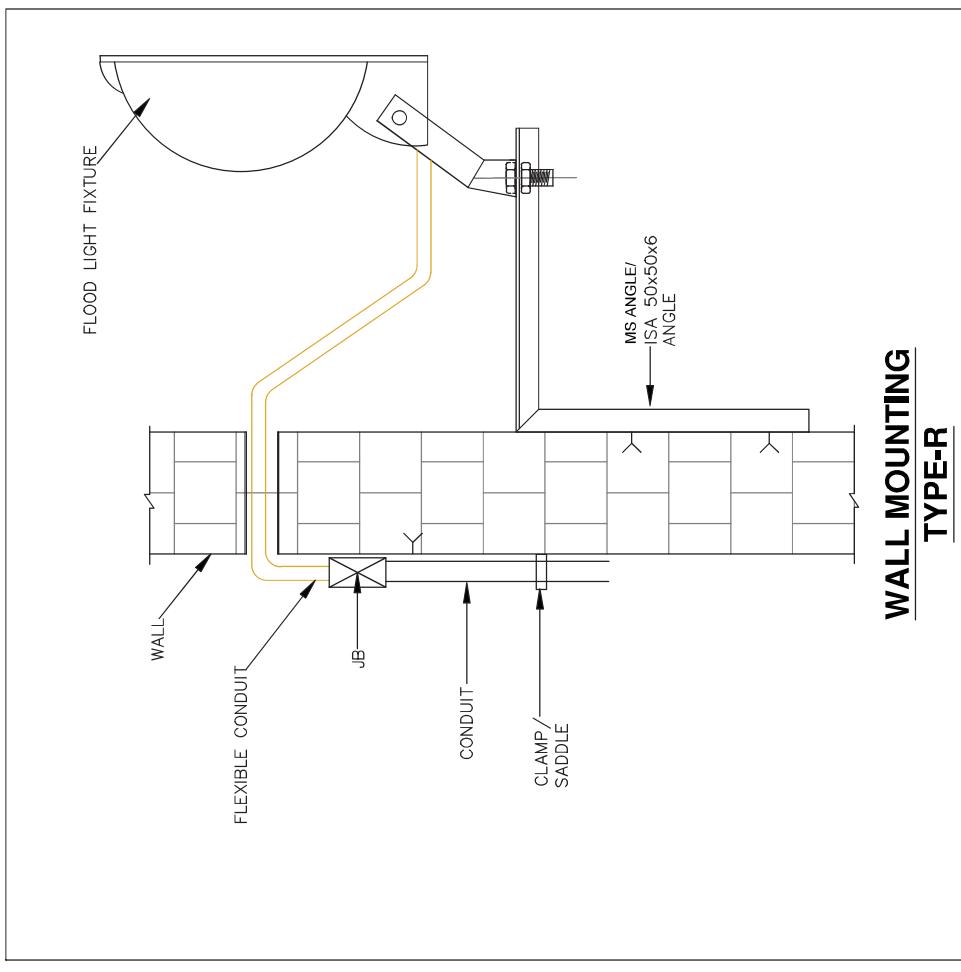
MOUNTING ARRANGEMENT FOR SB-02, SF-64, SF-66, SF-63 TYPE LIGHTING FIXTURE



B Note—

1. Pyrotech scopes includes Provision of mounting arrangement in the Lighting Fixtures as per the typical mounting drawings shown
2. Necessary accessories like chain, hooks and clamps if required will be provided along with the Fixtures
3. 20mm GI Conduit Dia and Structural Steel shall be provided by BHEL.

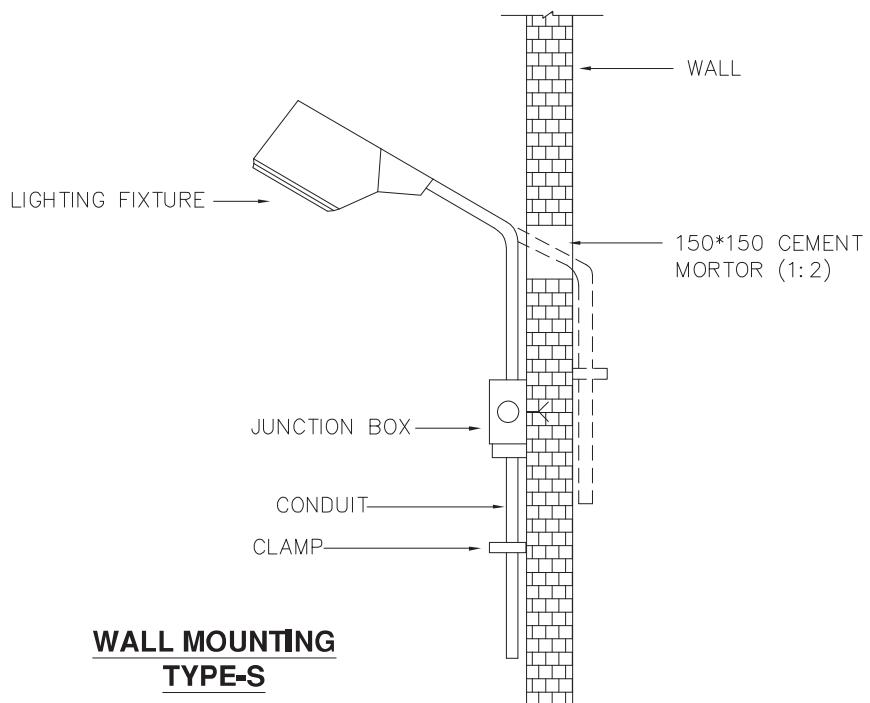
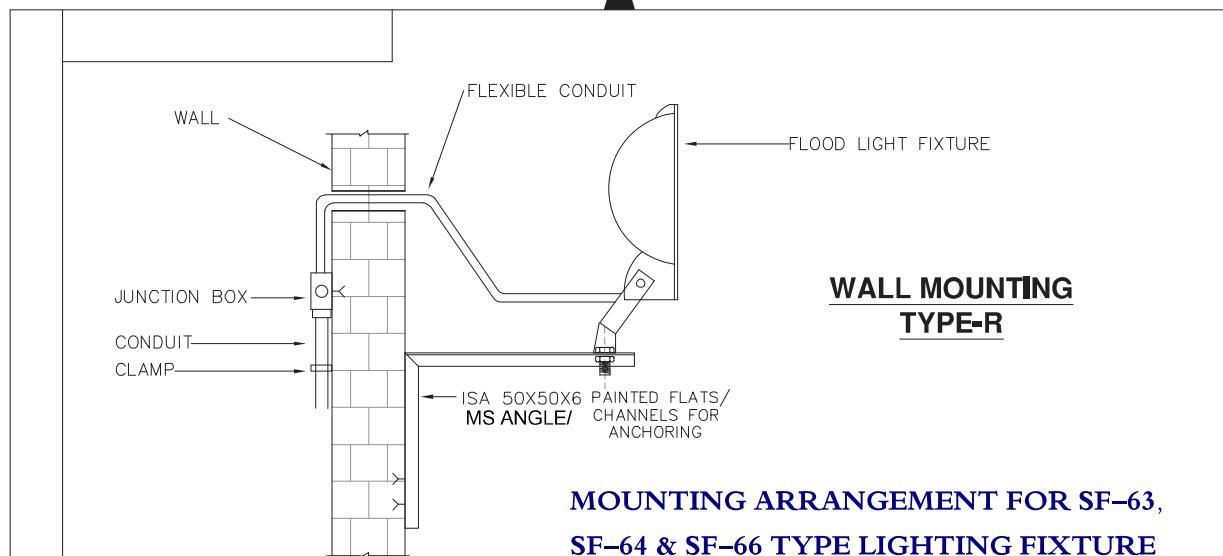
MOUNTING ARRANGEMENT FOR SF-63, SF-64 & SF-66 TYPE LIGHTING FIXTURE



WALL MOUNTING TYPE-R

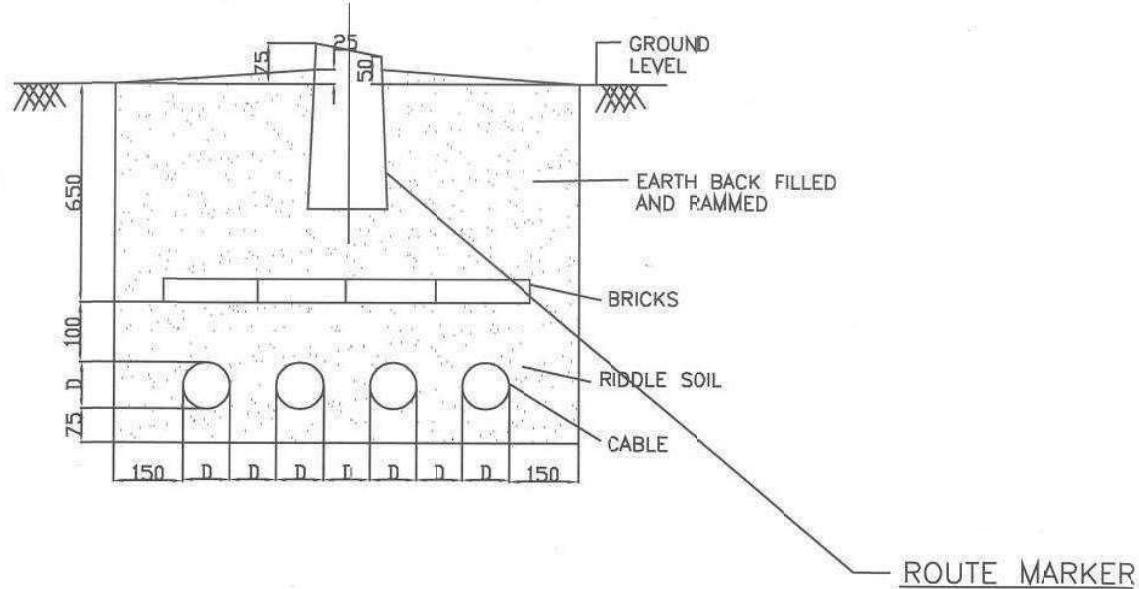
Note—

1. Pyrotech scopes includes Provision of mounting arrangement in the Lighting Fixtures as per the typical mounting drawings shown
2. Necessary accessories like chain, hooks and clamps will be provided along with the Fixtures.
3. 20mm GI Conduit Dia and Structural steel shall be provided by BHEL. >



Note-

1. Pyrotech scopes includes Provision of mounting arrangement in the Lighting Fixtures as per the typical mounting drawings shown
2. Necessary accessories like chain, hooks and clamps will be provided along with the Fixtures
3. 20mm GI Conduit Dia and **Structural Steel shall be provided by BHEL.**

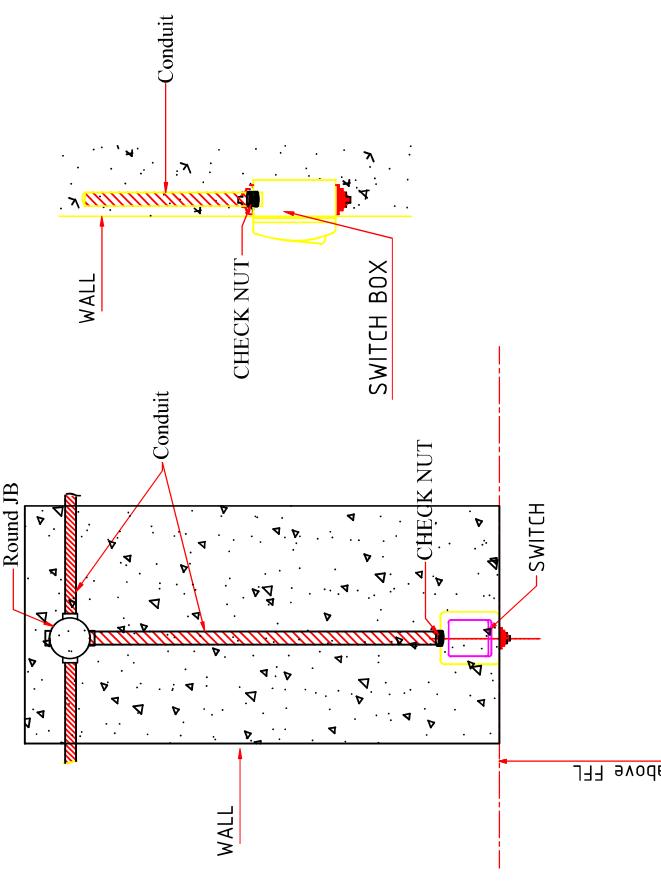
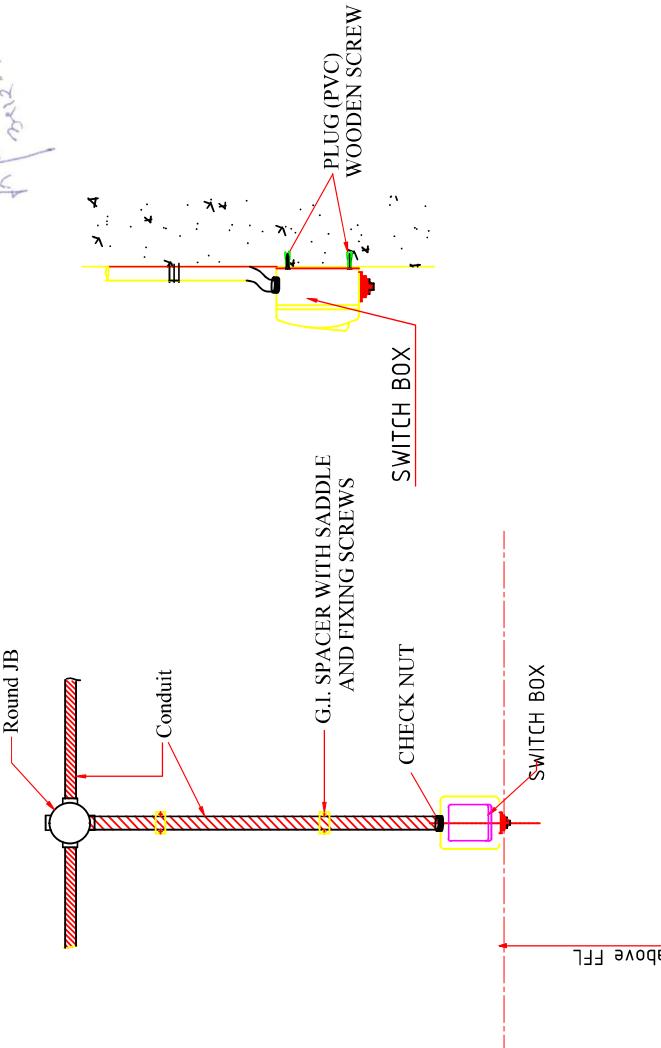


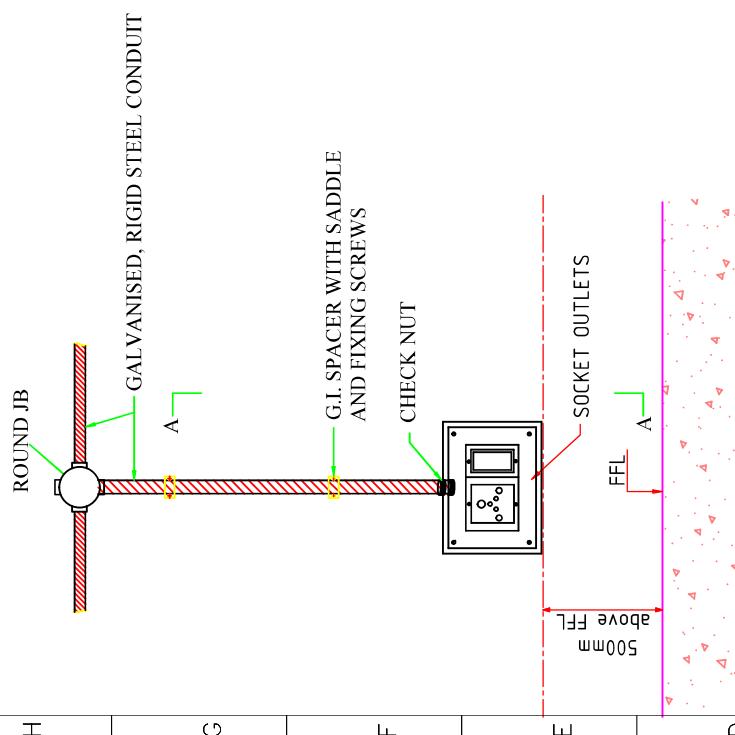
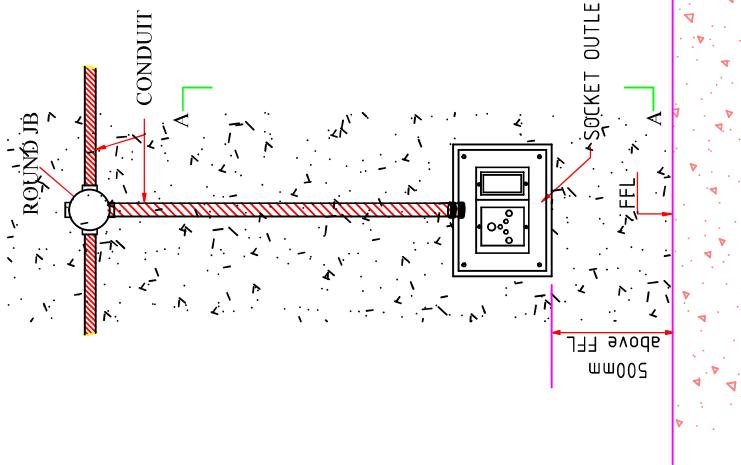
Burried cable laying detail

NOTES:

1. ALL DIMENSIONS ARE IN mm.
2. Brick size to be decided by contractor, however, thickness shall be in range of 75-100 & width in range of 90-125mm.

01	02	03	04	05	06	07	08
H	G	F	E	D	C	B	A
Round JB	Conduit	G.I. SPACER WITH SADDLE AND FIXING SCREWS	PLUG (PVC) WOODEN SCREW	SWITCH BOX	SWITCH BOX	SWITCH BOX SURFACE MOUNTED ON WALL	
WALL	Conduit	CHECK NUT	SWITCH BOX	FFL	1500mm above FFL		
WALL	Conduit	CHECK NUT	SWITCH BOX	FFL	1500mm above FFL	SWITCH BOX FLUSH MOUNTED ON WALL	

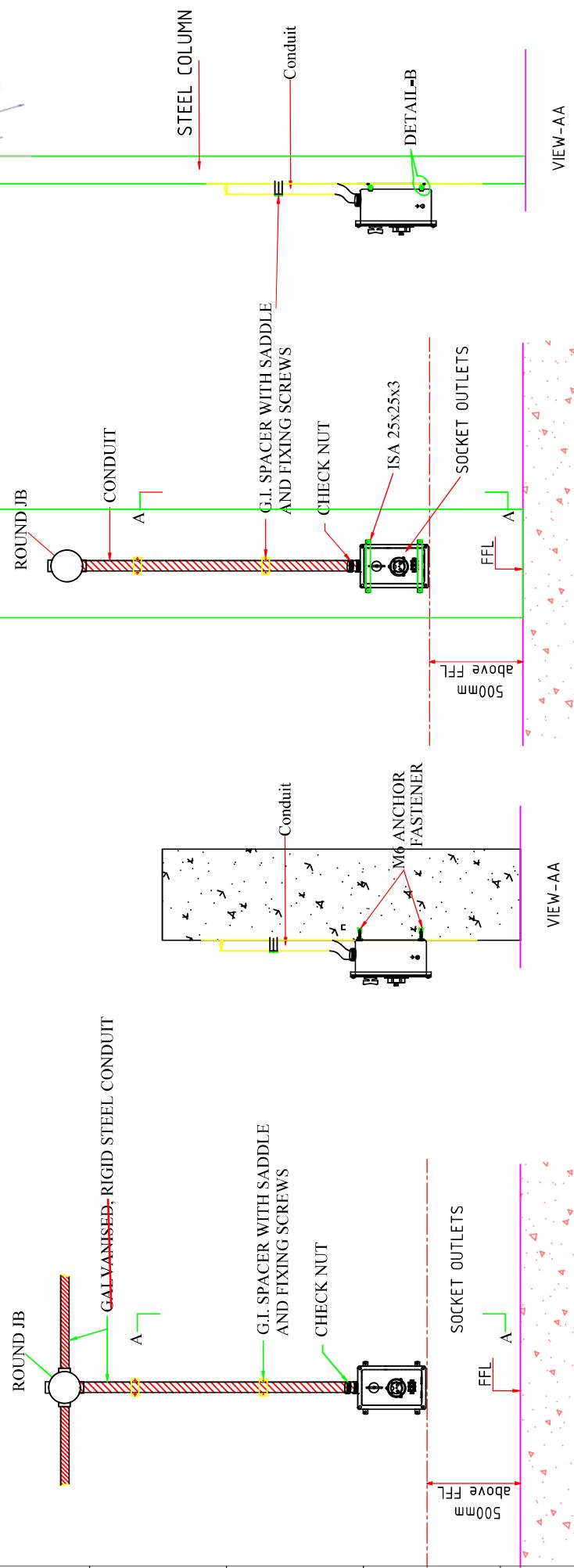




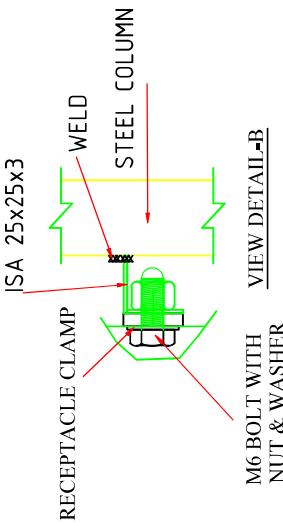
5/15A RECEPTACLE SURFACE MOUNTED ON WALL

5/15A RECEIPT SHEET MOUNTED ON WALL

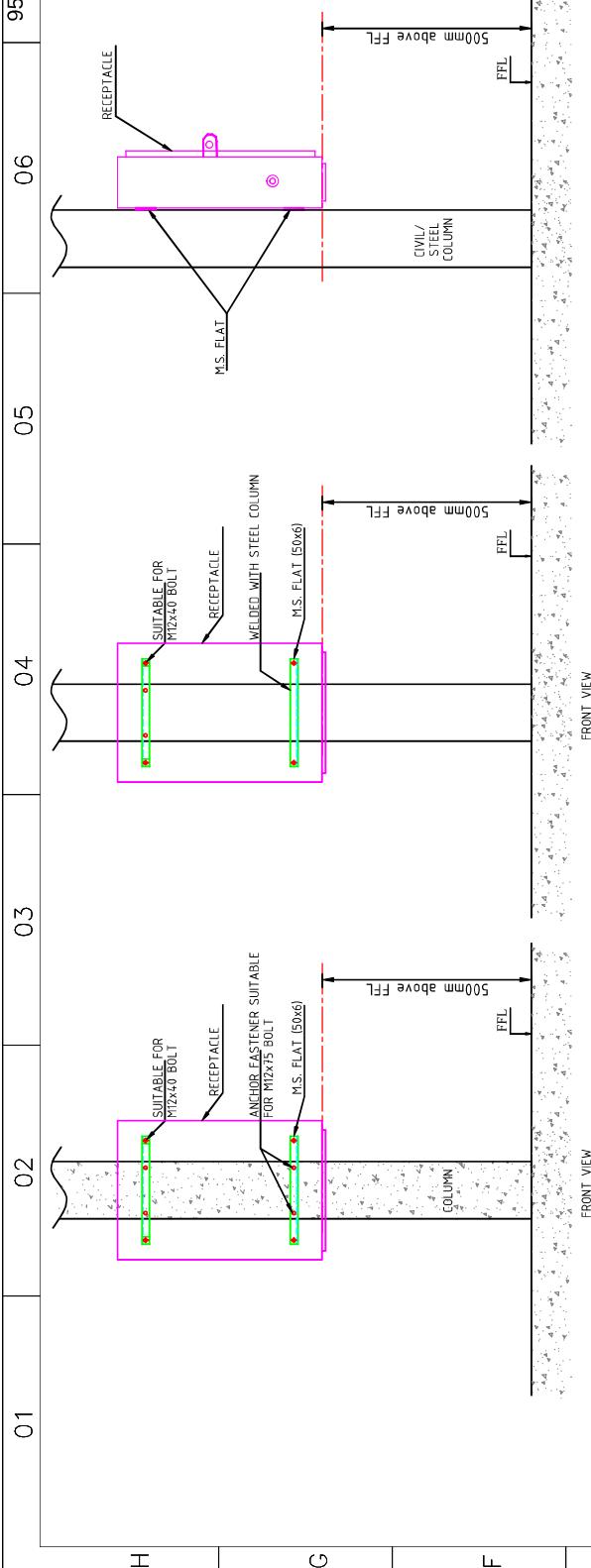
VIEW A



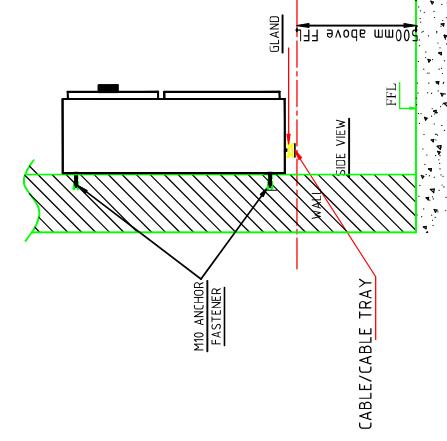
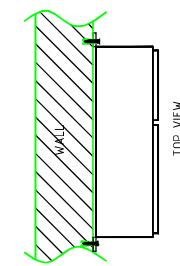
20A RECEPTACLE SURFACE MOUNTED ON WALL/COLUMN



01 02 03 04 05 06 07 08



**CIVIL/STEEL COLUMN MOUNTING ARRANGEMENT
FOR 63/125A RECEPTACLE**



01	02	03	04	05	06	07	08
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A

B

C

D

E

F

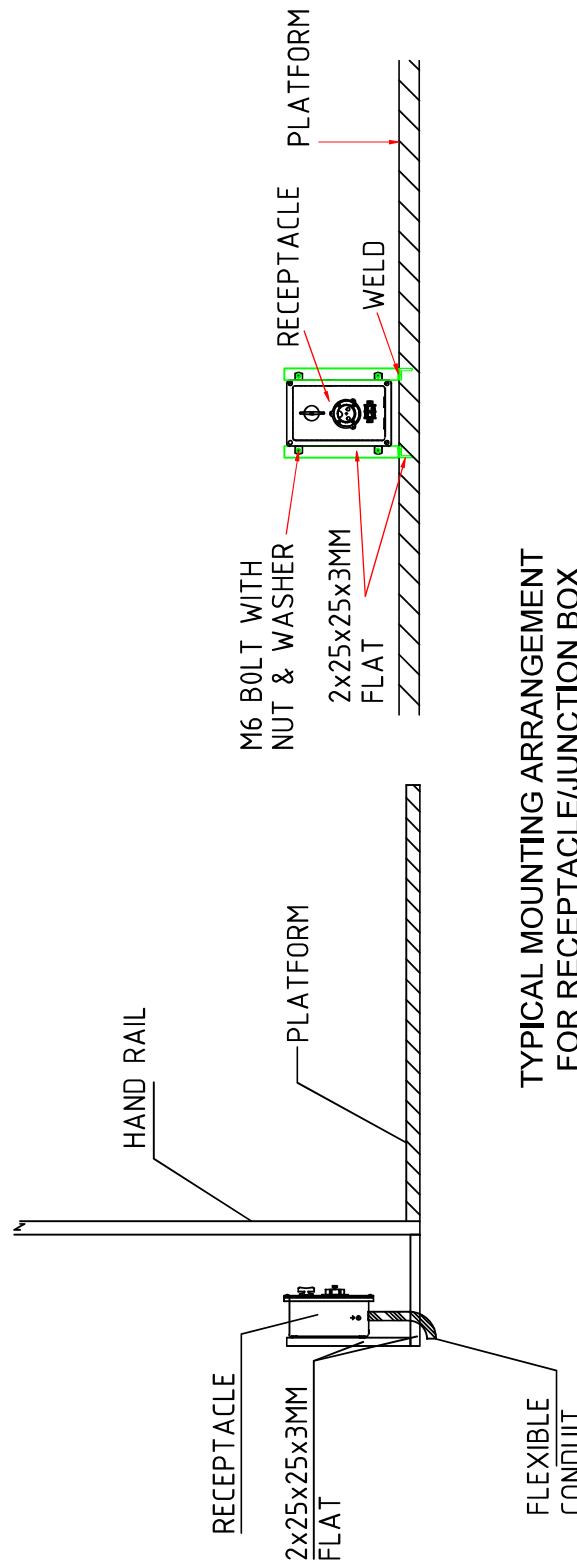
G

H

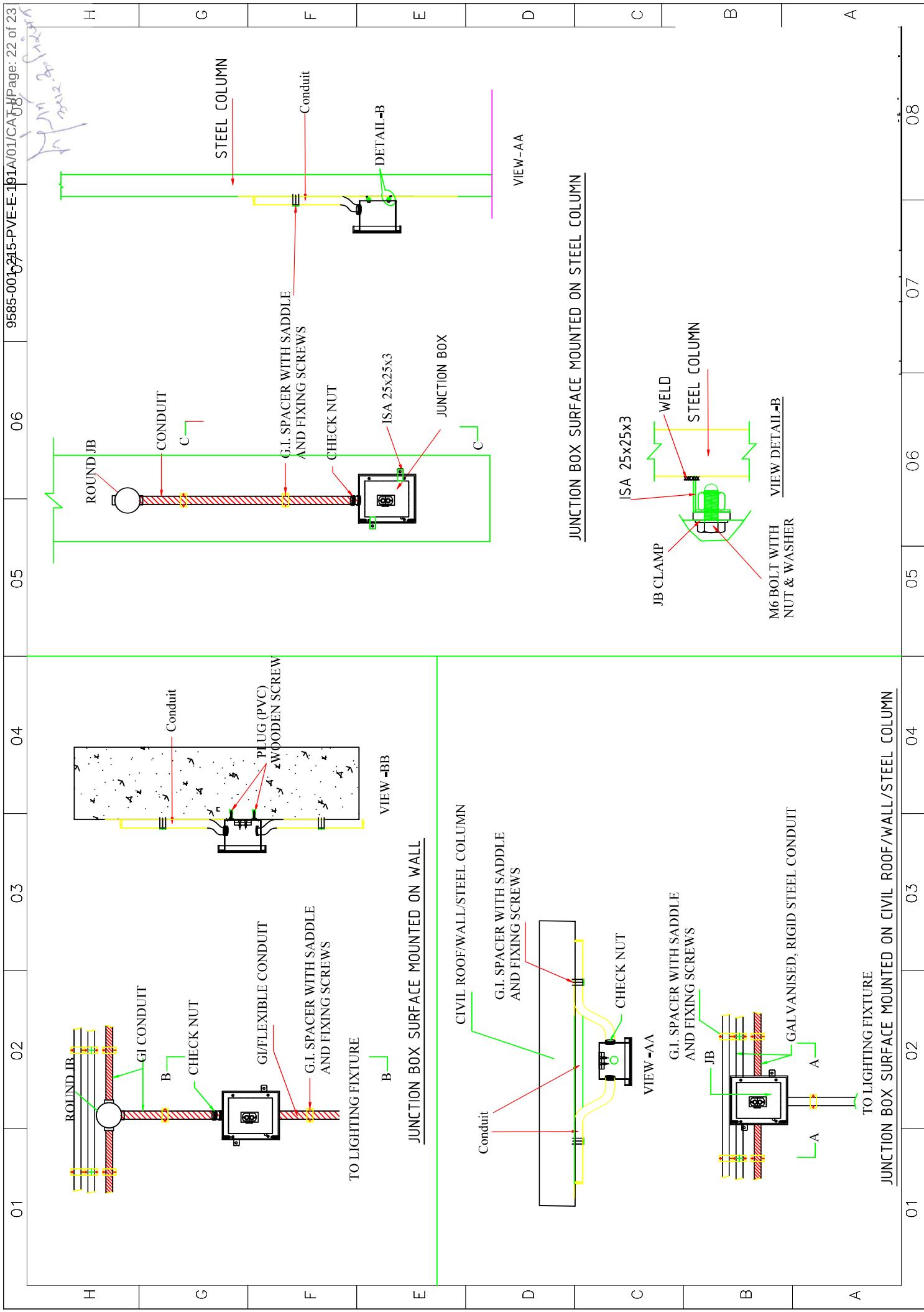
B

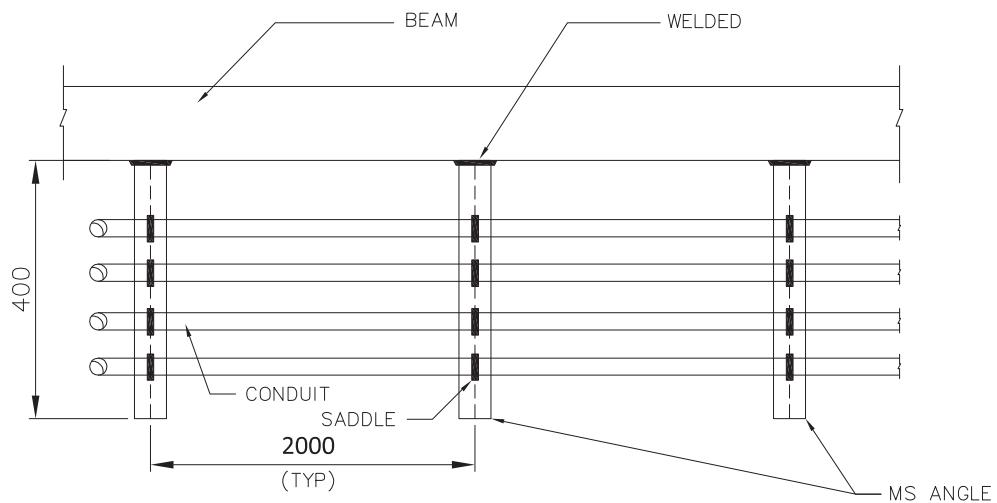
A

01	02	03	04	05	06	07	08
H	G	F	E	D	C	B	A
9585-00407415-PVE-E-191A/01/CAU Page: 21 of 23 11/2012	G	F	E	D	C	B	A
01	02	03	04	05	06	07	08

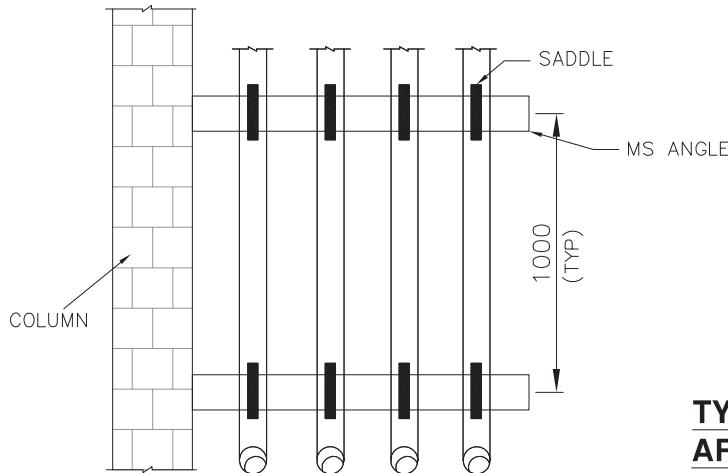


TYPICAL MOUNTING ARRANGEMENT
FOR RECEPTACLE/JUNCTION BOX





TYPICAL CONDUIT FIXING ARRANGEMENT OF STEEL STRUCTURE



TYPICAL CONDUIT FIXING ARRANGEMENT OF WALL

NOTES:

1. THE CONDUIT SUPPORT SHALL BE PROVIDED AT AN INTERVAL OF 2000mm
2. SIZE OF STEEL FOR.
 - b) TWO OR THREE RUNS OF CONDUIT- 25X25X3 MS ANGLE.
 - c) FOUR RUNS OF CONDUIT ONWARD- 35X35X6 MS ANGLE.
3. ALL STEEL FABRICATION SHALL BE PAINTED WITH COATS OF METEL PRIMER FOLLOWED BY TWO COATS OF AL. PAINT.

Revised Annexure 6 (Integrity Pact) to NIT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for Erection, Testing & Commissioning of Electrical Pkg of main plant area including ACC systems For Unit#3 of 3x800 MW Patratu Super Thermal Power Project Patratu, Jharkhand (TS No. BHEL/CPC/PAT/ELE/26/078) (hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -
 - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Bharatiya Nyaya Sanhita (BNS) 2023 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption.-The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.

- 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Bharatiya Nyaya Sanhita (BNS) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process , terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above , the Bidder(s)/ Contractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee , whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years (to be reckoned from date of bid submission) with any other company in any country conforming to the anti-corruption approach in India that could justify his exclusion from the tender process. The date of such transgression, for the purpose of disclosure by the bidders in this regard,

would be the date on which cognizance of the said transgression was taken by the competent authority. The transgression(s), for which cognizance was taken even before the said period of three years, but are pending conclusion, shall also be reported by the bidders.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.

6.2 In case of a joint venture, all the partners of the joint venture should sign the Integrity Pact. In case of Sub-contracting, the Principal Contractor shall be solely responsible for the adherence to the provisions of IP by the sub-contractor(s).

6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 -Independent External Monitor(s)

8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact on receipt of any complaint by them from the bidder(s).

8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as /Top Secret are not to be disclosed.

8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.

8.5 The role of IEM is advisory and the advice of IEM is non- binding on the Organization. However, as IEMs are invariably persons with rich experience who have retired as senior functionaries of the government, their advice would help in proper implementation of the IP.

8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of the tendering process, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an examination, and submit their joint recommendations to the Management. In case the full panel is not available due to some unavoidable reasons, the available IEM(s) will conduct examination of the complaints. Consent of the IEM(s), who may not be available, shall be taken on record.

- 8.7 The IEMs shall examine all the representations/grievances/ complaints received by them from the bidders or their authorized representative related to any discrimination on account of lack of fair play in modes of procurement and bidding systems, tendering method, eligibility conditions, bid evaluation criteria, commercial terms & conditions, choice of technology/specifications etc.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.
- 8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Principal should be looked into by the CVO of the Principal.
- 8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Bharatiya Nyaya Sanhita (BNS)/ Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs.
- 8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.
- 8.13 The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

- 9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.
- 9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

- 10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.
- 10.2 Changes and supplements as well as termination notices need to be made in writing.
- 10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.
- 10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.

10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. If required, the Principal may adopt any mediation rules for this purpose. However, not more than five meetings shall be held for a particular dispute resolution. The fees/expenses on dispute resolution shall be equally shared by both the parties. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract.

For & On behalf of the Principal
Contractor
(Office Seal)

Place _____
Date _____

Witness: _____
(Name & Address) _____

For & On behalf of the Bidder/
(Office Seal)

Witness: _____
(Name & Address) _____
