SITE COORDINATION & COMMUNICATION PROCEEDURE

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0	18-10-2019	ISSUED FOR INFORMATION	NVK	PKP	LA	JMC
REV.	**DATE**	**DESCRIPTION**	**PREPARED**	**CHECKED**	**APPROVED**	**AUTHORIZED**

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1. INTRODUCTION:

INDIAN OIL CORPORATION LIMITED (IOCL) has awarded Fax of Acceptance (FOA) dated 29th August 2019 to M/s. Technip India Limited (TPIL) for Consultancy services (PMC/EPCM services) for overall project management, FEED Review / FEED, Detailed Engineering, Procurement & expediting services, Tendering & award, Construction Management & Supervision, Assistance in start-up, Commissioning & performance test runs for installation of a Standby SRU of 525 TPD capacity and execution of Additional tanks for Paradip Refinery, Odisha, India.

2. DEFINITIONS & ABBREVIATIONS:

Abbreviation	Definition /Expanded form
IOCL/ CLIENT	Indian Oil Corporation Limited
PMC/ CONSULTANT	Technip India Limited
LICENSOR	Party selected by IOCL for process technology ownership for any UNIT
CONTRACTOR	Party whose services are obtained for performing the works specified as part of LSTK / packages.
EPCM	Engineering, Procurement & Construction Management Services.
LSTK	Lump Sum Turn Key portion of the work to be executed by CONTRACTOR
FEED	Front End Engineering Design
AUTHORISED REPRESENTATIVE	IOCL's/ CONSULTANT's representative authorized to act for and on behalf of them.
VENDOR	Any third party supplying the equipment/materials for setting up the Plant
PROJECT	Indicates Standby SRU and Additional tanks Project, Paradip Refinery
UNIT	Indicates any particular portion of the project to be built which can be Process related or Utilities/Offsites related
SRU	Sulphur Recovery Unit

3. SCOPE

3.1 This Site Coordination Procedure establishes the guidelines to be followed by the LSTK/ CONTRACTOR for communicating with PMC relating to the construction activities for Standby SRU & Additional Tanks IOCL Paradip Refinery. This procedure is intended to establish methods of communication, and to define the areas of responsibility and authority within PMC's and the LSTK / CONTRACTOR's organization, thereby developing efficient and effective coordination between the parties.

4. PROJECT IDENTIFICATION

The Project Name is to be referred to as Standby SRU & Additional Tanks IOCL Paradip Refinery .

5. SITE COMMUNICATION

The principle language on the project is English. Correspondence between all parties shall be in the English language.

Due to the number of participants on the project site, extensive from/to communication streams will be involved. In order to monitor and track such communications, systematic approach shall be implemented by each project participant.

6. SITE ORGANIZATION

6.1 PMC's SITE ORGANIZATION

"PMC SITE Organization" (to be submitted later)

"Basic Roles and Functions of PMC's SITE Office -Departments" is to be referred to, which summarizes the respective roles and functions of PMCs SITE Organization department.

6.2 LSTK CONTRACTOR SITE ORGANIZATION

The LSTK CONTRACTOR shall furnish a list of key personnel by function, which shall be shown in the LSTK CONTRACTOR's organization chart, who shall be directly involved in the WORKS. Such personnel being subject to approval by the OWNER/PMC.

"LSTK CONTRACTOR SITE Organization" (to be submitted by LSTK Contractor).

7. CORRESPONDENCE ON SITE

7.1 GENERAL

7.1.1 All correspondence from LSTK CONTRACTOR on SITE shall be duly signed by SITE representative of LSTK CONTRACTOR and it shall be required to be sent to PMC's SITE.

7.1.2 **All correspondence shall indicate the following information:**

7.1.2.1 Job Number:

7.1.2.2 Subject:

7.1.2.3 Correspondence Identification Number:

7.1.2.4 LSTK CONTRACTOR's Name:

7.1.3 Correspondence shall deal only with a single subject whenever feasible. Separate subjects shall be covered by separate correspondence.

7.1.4 All correspondences, drawings, instructions, data sheets, computer print-outs, and other technical and. commercial documentation of the LSTK CONTRACTOR's shall be written in the English language.

7.2 CORRESPONDENCE ADDRESSES

7.2.1 OWNER

7.2.1.1 Head Office Address (Delhi)

M/s. Indian Oil Corporation Ltd. (Refinery Division)
Scope Complex, Core-2 7, Institutional Area Lodhi Road,
New Delhi-110003
Representative Name Designation- Shall be informed during KOM
E-mail-do-
FAX number-do-
Telephone Number -do-

7.2.1.2 Owner Site Office (Paradip)

M/s. Indian Oil Corporation Ltd.
Xxxxxxxxxxxxxxxxx
Xxxxxxxxxxxxxxxxxxx
Representative Name Designation - Shall be informed during KOM
E-mail -do-

FAX number -do- Telephone Number- do-

7.2.2 CONSULTANT

7.2.2.1 Head Office Address M/s. Technip India Ltd

Xxxxxxxxxx
xxxxxxxxxxxx
Project Manager's Name Shall be informed during KOM

Project Manager's e-mail-do-

Project Manager's FAX -do-

Project Manager's Phone -do-

Project Coordinator -do-

7.2.2.2 Site Office Address

Resident Construction Manager (RCM)	**Shall be informed during KOM**
Name -do-	
Address -do-	
E-Mail -do-	
Telefax No-do-	
Telephone No-do-	

7.2.3 **LSTK CONTRACTOR**

7.2.3.1 **Head Office Address**

Representative's Name & Designation	**To be filled by the LSTK Contractor.**
Address	
E-Mail	
Fax no	
Telephone no	

7.2.3.2 Site Office Address

Representative's Name & Designation	**To be filled by the LSTK Contractor.**
Address E-Mail Fax no	
Telephone no	

7.2.4 **CORRESPONDENCE IDENTIFICATION SYSTEM**

For Correspondence Identification system refers "Project Document Numbering Procedure"

8. MEETINGS

8.1 GENERAL

8.1.1 **The following meetings shall be held on the project site.**

8.1.1.1 Weekly Coordination Meeting at the involved LSTK contractors, with participation of the PMC resident manager and IOCL representative.

8.1.1.2 Monthly review meetings at the involved LSTK contractors, with participation of the PMC resident manager and IOCL representative.

8.1.1.3 Quarterly review meetings with the involved LSTK contractor, with participation of the PMC and IOCL Management.

8.1.1.4 Special Meeting.

8.1.1.5 Other meetings with the PMC and/or IOCL

8.1.1.6 Schedule and Work Progress Meeting.

8.1.1.7 HSE Meeting.

8.1.1.8 Discipline Meetings.

8.2 WEEKLY MEETING

Owner/PMC may hold weekly progress review meetings at the work site and during the initial phase of the work at LSTK Contractor's engineering or other work centre, with LSTK Contractor in order to evaluate progress, identify problems and discuss other matters relevant to the work and to review LSTK Contractor's weekly report.

8.3 MONTHLY MEETING

8.3.1 Owner/PMC may hold monthly progress review meetings with LSTK Contractor to review and evaluate the overall status and progress of the work and other matters relating to the work and to review LSTK Contractor's monthly report.

8.3.2 Regular attendees shall be as agreed between Owner / PMC and LSTK Contractor.

8.3.3 The agenda for the monthly meeting shall as far as possible shall be settled by mutual agreement five working days before the meeting. Indicative agenda items for the meeting are as below:

8.3.3.1 Presentation by LSTK Contractor on Project status and major problems

8.3.3.2 Monthly plan vs progress status / statistics (Physical and Financial)

8.3.3.3 Major hold ups / slippage

8.3.3.4 Engineering / Design

8.3.3.5 Procurement

8.3.3.6 Construction contracting

8.3.3.7 Project interfaces

8.3.3.8 Completion outlook

8.3.3.9 Area of concern and critical issues

8.3.3.10 Recovery action plan

8.3.3.11 Contractual staffing plan

8.3.3.12 Status of Long Lead / Critical items

8.4 MANAGEMENT REVIEW MEETING

8.4.1 Owner / PMC shall hold Quarterly Management Review meetings with LSTK Contractor Management Team to review and evaluate the overall status, progress, HSE, project risks and critical issues requiring management attention.

8.4.2 List of attendees shall be agreed between Owner / PMC and LSTK Contractor. In addition, the LSTK Contractor shall upon request provide appropriate representation covering the relevant items of the meeting.

8.4.3 The agenda for the monthly meeting shall as far as possible shall be settled by mutual agreement seven working days before the meeting. Indicative agenda items for the meeting are as below:

8.4.3.1 Presentation by LSTK Contractor on Project status and Critical Issues.

8.4.3.2 Status of Commitments of Monthly reviews.

8.4.3.3 Project schedule and possible recovery plans

8.4.3.4 Contractual staffing plan

8.4.3.5 Completion outlook.

8.4.3.6 Status of critical items.

8.4.3.7 HSE review.

8.4.4 The venue of such meetings shall be at the work site for Construction phase.

8.5 SPECIAL MEETING

8.5.1 Owner / PMC or contractor may from time to time request a meeting to be held in order to discuss a matter of an urgent nature and which cannot be left until the weekly or monthly meeting, covering a specific matter, requiring a dedicated meeting.

8.5.2 In such circumstances, the party requesting the meeting shall contact the other party and agree upon the agenda, attendees and timing of such meeting. Such arrangements are subject to approval.

8.6 OTHER MEETINGS

8.6.1 PRE-INSPECTION MEETING

LSTK Contractor shall hold a Pre-Inspection Meeting with each Vendor / Subcontractors prior to commencement of fabrication to discuss items including:

8.6.1.1 Contract requirements to ensure vendor /Sub-Contractor understands of its responsibilities

8.6.1.2 Code requirements

8.6.1.3 Owner's special requirements

8.6.1.4 Independent third party inspection agency for code and / or statutory requirements

8.6.1.5 WPS and PQR, including reference to pre-heat and post weld heat treatment requirements and impact valves as may be applicable.

8.6.1.6 Special weld procedure requirements, where applicable

8.6.1.7 Requirements for production test plates, where applicable

8.6.1.8 Project schedule

8.6.1.9 Quality control program check & Inspection hold points

8.6.1.10 Witness tests

8.6.1.11 Dimensional tolerances

8.6.2 MECHANICAL COMPLETION /COMMISSIONING MEETING

Brief daily meeting shall be held during the mechanical completion and commissioning period with an agenda covering:

8.6.2.1 Work in progress for the past 24 hours

8.6.2.2 Scheduled progress for the next 24 hours

8.6.2.3 Review of resources

8.6.2.4 Safety, work permits

8.6.2.5 Technical queries or problems

8.7 SCHEDULE AND WORK PROGRESS MEETING.

The requirements for this meeting is referred in Project Control Procedure

HSE MEETINGS

Owner / PMC and LSTK Contractor shall have weekly meetings on HSE matters. LSTK Contractor shall also conduct HSE meeting with his sub-contractors.

8.8 DISCIPLINE MEETINGS

Owner / PMC and LSTK Contractor shall have weekly meetings with various disciplines such as QA/QC, Civil, Electrical, Instrument, etc.

JOB SPECIFICATION FOR MATERIAL RECEIVING, INSPECTION, HANDLING, STORAGE & PRESERVATION

REV.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED	AUTHORIZED
			NAVNEET KUMAR	Signed By	Alakappan L 2019.10.19 17:09:34 +05'30'	Morischristopher Jesumarian 2019.10.21 14:17:13 +05'30'
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3. SCOPE

This procedure is to apply to all aspects of MATERIALS handling and Control carried out by the respective CONTRACTOR. This MATERIAL RECEVING, INSPECTION HANDLING AND STORAGE SPECIFICATION is intended to define the requirements, storing, care and custody etc., from receipt through to issue of the MATERIALS supplied by the CONTRACTOR / OWNER (Long lead Items if any), and to set forth the respective CONTRACTOR's responsibilities and obligations in this respect.

4. KEY PERSONNEL

The following key personnel of the CONTRACTOR's may be assigned in respect of materials handling and storing

4.1 MATERIAL CONTROLLER

A person employed and assigned who shall be responsible to the DY. HEAD OF CONSTRUCTION DIVISION, for overall control of MATERIALS, which includes receiving, Inspection, storing, issuing, stocktaking and disposal of MATERIALS and also includes forecasting of MATERIALS availability and arranging of replacement for shortage, damaged or shortfall MATERIALS.

4.2 STORE OFFICER

A person employed and assigned, who shall be reporting to the MATERIAL CONTROLLER, for the receiving, storing, issuing and stocktaking of MATERIALS at the WAREHOUSE and OPEN STORAGE AREA

4.3 STOREKEEPER

A person employed and assigned, who shall be responsible to the STORE OFFICER, for the receiving, storing and issuing of MATERIALS at the WAREHOUSE and OPEN STORAGE AREA.

4.4 DISCIPLINE CO-ORDINTATOR

A person employed and assigned, who shall be reporting to the Head of Construction Co-ordination Department of the CONTRACTOR's for the supervision and co-ordination of the construction work assigned to him, and carried out by the CONTRACTOR

5. SCOPE OF CONTRACTOR

5.1 Receipt of Project materials from IOCL entry gate including owner supplied items if any.

5.2 Identify the crane movement roads for materials shifting (Including Long Lead Items) from IOCL entry gate to location at site where to be erected / Warehouse for storing.

5.3 Road Survey, Road Strengthening, Repair, Road laying, making proper access, demolition of compound wall (if required) & rebuilding of wall for materials shifting from IOCL gate to the location at site where to be erected/Ware House for storing.

5.4 Construction of hard stands for crane movement, assembly & testing of equipment's at site, shifting & erection of equipment.

5.5 Unloading the materials supplied by Contractor and Owner supplied materials if any.

5.6 Unloading / Shifting the materials from Owner's warehouse if any.

5.7 Unpacking & Inspection of incoming materials and acceptance/ rejection of materials.

5.8 Preparing the Material receipt report.

5.9 Marking & ensuring the material traceability.

5.10 Report on excess, short, damage & reject (ESDR) against each consignment on receipt at warehouse

5.11 Storing and preservation of materials.

5.12 Protection of materials

5.13 Replacing /rectification of defective materials.

5.14 Reconciliation, codification of materials (Surplus & Spares) as per SAP & Handing over of all surplus materials & Spares to Owner's warehouse without any cost implication to Owner.

5.15 All such materials shall be got codified by Contractors as per SAP code along with cost of materials etc. before handing over the same to the OWNER.

5.16 Implementation of good material software package for materials.

5.17 Color coding of materials for material traceability as per specification.

5.18 Issuing the materials to site for pre-fabrication and erection.

5.19 Storing of hazardous materials as per applicable laws and regulations.

5.20 Supply and application of anticorrosive compound.

6. MATERIAL HANDLING ACTIVITIES

6.1 Prior to receiving of Materials at the SITE, the following planning and preparatory works shall be carried out by the respective CONTRACTOR's.

6.2 Preparation / ensure the receipt of the following reference documents for planning

6.2.1 Overall Shipping Schedule,

6.2.2 Over Dimension Cargo List and drawings,

6.2.3 Storage Area General Drawing

6.2.4 Material Handling Procedure

6.2.5 Receiving the Detail Packing Lists

6.2.6 Planning for required manpower and construction equipment for unloading.

6.2.7 Planning of unloading place and designation of storing areas

7. MATERIAL RECEIVING, UNLOADING AND INSPECTION

7.1 RECEIVING OF MATERIALS

The Materials received at the site shall be delivered to one of the following areas as designated by the store officer

- At the WAREHOUSE
- At the OPEN STORAGE AREA
- At any given place in the SITE (DIRECT DELIVERY MATERIALS)

7.2 UNLOADING OF MATERIALS

7.2.1 Delivery schedules for all types of materials shall be reviewed by Contractor as and when required and updated by the material controller in order to allow the pre-arrangement of supervision, manpower and suitable equipment to unload the project materials.

7.2.2 Utmost care shall be taken by material controller in the unloading to ensure that no damage occurs to materials.

7.2.3 Prior to any unloading, packing cases or crates material controller shall inspect for signs of damage during transportation, and where evident, this shall be recorded on the cargo receiving record, and as necessary, photographs of the damage shall be taken.

7.2.4 On unloading, cargo weigh bill, which shall be issued by transportation company, shall be received, checked and filed as record by the store officer

7.3 UNPACKING AND INSPECTION

7.3.1 UNPACKING INSPECTION SCHEDULE

Unpacking Inspection schedule for respective packages shall be prepared by the store officer and submitted to the material controller for his review.

Packed Materials procured overseas shall not be opened without the appropriate customs clearance, which, at the discretion of the customs officials, may be carried out at the site.

7.3.2 NON-SCHEDULED UNPACKING INSPECTION

In case any damage to the packing is found, Unpacking Inspection shall be carried out by store officer and put to the notice to the PMC.

Contractor shall take immediate action for damaged items.

7.3.3 **PREPARATION OF UNPACKING INSPECTION**

The store officer shall make the necessary preparations prior to unpacking inspection and which are:

Establishing the inspection procedure according to the kind of packing

Provision of, as necessary, the area for the unpacking inspection

Making available all necessary manpower, equipment, tools, materials, etc., for unpacking and re-packing the materials

Designation of the place for storing of the MATERIALS after Unpacking Inspection.

7.3.4 **UNPACKING INSPECTION**

All Unpacking Inspection shall be carried out by the store officer or storekeepers & inspection engineers

If any damage to packing is found prior to Unpacking Inspection, the store officer or storekeepers shall notify it to the material controller and seek for his instruction and bring in notice to PMC.

All Unpacking inspection shall be carried out with the utmost care, to ensure that no damage occurs to the MATERIALS.

7.3.4.1 UNPACKING INSPECTION SHALL BE CARRIED OUT FOR THE FOLLOWING CHECKS.

Visual appearance inspection for

Damage to, and/or deformation of the MATERIALS

Rust or stains,

Evidence of water soaking

Peeling of, and/or damage to, paint, coatings or linings, and/or blistering thereof due to underlying rust.

Verification of Tag Nos., Valve Nos., ID Stamps, ID Markings. Etc.

Quantity verification.

Damaged materials shall be stored separately by store officer

The store officer shall prepare unpacking inspection report and submit it to the material controller for recording.

7.3.5 **Material Excess, Shortage or Damage**

Where excess, shortage, or damage of the MATERIALS shall be discovered, the storekeepers shall prepare the Excess, Shortage or Damage Report (ESD), and present it to the store officer together with the relevant Unpacking Inspection Report.

The Store officer shall submit both reports to the Material controller for review and confirmation.

The Material controller shall arrange for distribution of copies of the ESD to the OWNER / PMC and the appropriate departments of Site Office and, as necessary, shall request a subsequent inspection

by the Quality Control Department to determine whether repairs are possible and what methods are to be adopted.

The Material controller shall take any necessary steps for the replacement of irreparable Materials, or to make up any deficiency in quantities, through one of the following actions:

- Requesting Supplier to take action if the ESD is pertaining to them
- Requesting local procurement and necessary approval by PMC.
- Preparing Request for Urgent Procurement (RUP)

8. STORAGE AND PRESERVATION

8.1 Contractor is responsible for preparing, maintaining and implementing the material control and preservation procedures, which specify the material receiving, handling, storage, preservation and issuing on the construction site.

8.2 Contractor shall have software for material management & ware house management.

8.3 During storage, all materials shall be protected from damage, loss and ingress of foreign matter. Carbon and low alloy steels shall be segregated to prevent mix-up. Stainless steel materials shall be segregated from carbon and low-alloy steels materials to avoid contamination. Also, stainless steel materials shall be protected from falling debris like CS particles from nearby by grinding activities.

8.4 The classification of storage shall be as follows:

8.4.1 Outdoor storage

8.4.2 Weatherproof storage

8.4.3 Indoor storage

8.4.4 Temperature/humidity controlled storage

8.4.5 Special storage like N2 purging & other inert gas. If inert gas is lost during storage re-filling action to be done till installation

8.5 Contractor shall furnish the area requirements for optimum storage and handling of the materials and equipment's including requirement of their vendors.

8.6 For a safe handling of material and equipment and to protect materials and equipment from damages, special handling tools and equipment shall be provided and maintained in good condition. All instructions for material handling requiring special care shall be established and maintained by contractor and shall be implemented by all staff members.

8.7 Contractor shall review and audit the receipt of materials at site, ensuring proper receipt inspection, stock records, handling. and storage, and that materials are appropriately segregated to avoid inter-mixing.

8.8 Contractor shall store, protect and maintain materials and equipment at the construction site in accordance with manufacturer's recommendations and as per the contractor's procedure for

preservation and maintenance. Anticorrosive compound specified in the specification or Owner approved material is to be applied on the material during preservation to avoid atmospheric corrosion. All the piping and fitting are to be blanked off using end caps. Sufficient quantities of end caps of different sizes are to be kept in the store for the same.

8.9 Preservation and maintenance activities for equipment shall continue until acceptance of the work, with formal records of such activities maintained by the contractor, and made available for Owner /PMC review, and ultimately for handing over to Owner.

8.10 All MATERIALS stored in the OPEN STORAGE AREA shall be landed on pallets or sleepers with height sufficient enough to clear stagnant water and mud during rain and shall be tagged or marked for easy identification by the STORE KEEPER

8.11 All MATERIALS stored in the WAREHOUSE shall be landed on pallets, on shelves, on racks, or in bins, and shall be tagged or marked for easy identification by the STORE KEEPER under the direction by STORE OFFICER

8.12 Pallets, racks, shelves, and bins must be designed to carry the materials envisaged, in respect of size, weight and quantity.

9. DETAILED METHOD FOR STORING

9.1 STRAIGHT PIPES

All pipes shall be stored outside except for special steel tubing. Pipes shall be stacked on sleepers in a stepped formation, with the bottom layer of pipe sat on timber sleepers, and subsequent layers separated by chocks & wedges to facilitate safe handling.

Pipe shall be segregated by size, schedule and material specifications.

Pipes shall be fitted with secure end caps to avoid ingress of rainwater or mud.

Do not store in contact with the ground

For large diameter pipes, check and if necessary renew the internal cross beam for end concentricity protection

9.2 FLANGES

Flanges up to and including DN 100 shall be stored inside the warehouse; flanges with greater diameter shall be stored outside, except for RFS and RJ flanges which shall be stored inside.

9.2.1 FLANGES STORED INSIDE WAREHOUSE

Check anti-rust protection on seal surface.

Renew any damaged protection by applying a coat of protection product.

9.2.2 FLANGES STORED OUTSIDE WAREHOUSE

Check anti-rust protection on seal surface provided.

Renew any damaged protection by applying a coat of protection product. Flanges shall not be stored in direct contact with the ground.

Flange faces shall be protected from damage.

Storage area must be fully drained, concrete paved or decked Check every 3 months and renew protection as required.

Special care must be taken in handling. Flange surface and grooves must be carefully inspected at flange arrival at site for surface integrity checking; scratches rust or other damages must be immediately shown to QC Supervisor/Inspector for action

9.2.3 RFS AND RJ FLANGES

These flanges shall be stored inside warehouse and protected with individual rigid covers after renewing the protection coat.

9.3 FITTINGS

9.3.1 FITTINGS INSIDE WAREHOUSE

Special steel fittings of any diameter;

Carbon steel fittings up to and including DN 100 (DIA 4”).

Carbon steel fittings with diameters of DN 150 (DIA 6”) and over shall be stored outside the warehouse.

9.3.2 FITTINGS OUTSIDE WAREHOUSE

Fittings over 6" shall be stored on pallets with special care to avoid any damage to bevel ends.

Protection cover for bevel end to be furnished

9.4 VALVES

Valves up to and including DN 100 (DIA 4”) shall be stored inside the warehouse.

Valves of DN 150 (DIA 6”) and over, of whatever type of material, shall be stored outside, except for RFS and RJ valves which shall be stored inside.

9.4.1 VALVES INSIDE WAREHOUSE

Check the mechanical protection of flanges, on reception, and repair any damage.

Repeat operations as, for flanged valves and for RFS and RJ.

Apply grease or brush or spray protection products to valve pins and screws.

Manual, automatic, and relief valves shall be stored on shelves, or on pallets, in one layer, and segregated by Tag No. and size

9.4.2 VALVES OUTSIDE WAREHOUSE

Carry out all operations as for valves inside warehouse, protecting the stem with grease and

oiled paper.

Do not store in contact with the ground and cover with plastic sheeting. Check every 3 months and replace protection as required.

Manually operated valves larger than 12" shall be stored on pallets in a single layer with caps fitted to both ends to prevent the ingress of rainwater, mud, etc.

9.4.3 VALVES WITH REDUCER

Inspect the gear combination, remove any rust, and clean the gear casing, the gears, rod and other mechanical parts.

Protect the reducing mechanism with a plastic cover, after greasing appropriately or spraying protection product.

Repeat operations as for valves outside/inside warehouse.

9.5 NUTS AND BOLTS

All nuts and bolts shall be stored inside the warehouse.

Protection products shall be applied to all nuts and bolts by immersion.

Bolts, with nuts, shall be stored separately in bins, bags or boxes by type, diameter, length and material.

Washers shall be stored separately in bags or boxes by type, diameter and material.

In case rusting appears, they shall be soaked in rustproofing oil and greased.

9.6 GASKET & PACKING

Gasket & Packing shall be stored inside the warehouse. Flat packing shall be stored on flat surfaces to avoid deformation due to stress and protected against any mechanical damage.

Ring-joints shall be stored as for flat packing above, and shall be protected with grease and covered with oiled paper, or sprayed/brush coated with protection products.

Check every 3 months.

Sheets and non-metallic shall be stored on shelves, stacked and segregated by rating & size.

Metallic gaskets shall be stored, on shelves, stacked in greaseproof wrappings, and segregated by rating and diameters.

9.7 SPECIAL ACCESSORIES

For special accessories, follow manufacturer's instructions.

9.8 NON-FERROUS PIPING MATERIALS

These shall be stored without special protection inside the warehouse.

If, by reason of dimensions or quantity, outside storage is necessary, means of suitable protection shall be selected, case-by-case, together with Project Team.

9.9 PREFABRICATED PIPING

The end of prefabricated piping shall be protected in the workshop, as follows:

Flanges of all diameters: protective layer and mechanical protection for seal surfaces;

Coupling, nipples and similar: greased and protected with plastic caps;

Piping up to and including DN 500: coat of anti-rust on the chamfering and ends closed with plastic caps;

Piping over DN 500: coat of anti-rust on the chamfering and ends closed with suitable materials.

On reception, check state of mechanical protection and renew if necessary.

Repeat checking after sandblasting/painting and storing in painted-piping yard, renewing where required the anti-rust protection of the flange seal surfaces, proceeding as for flanges.

9.10 SPRING HANGERS

Spring hangers less than 10 kg shall be stored inside the warehouse on pallets, in one layer, according to the order of the support number. Care must be taken at the time of unpacking not to cause any confusion on hanger and component parts

Spring hangers greater than 10 kg shall be stored outside the warehouse on pallets or sleepers, the spring barrel to be wrapped with a waterproof material.

9.11 STEEL SECTION

Steel sections shall be stacked outside warehouse on sleepers, flanges down to avoid the collection of rainwater.

Separating timbers shall be provided to allow safe handling and to prevent any deformation

9.12 STEEL PLATE

Steel plate shall be stored outside warehouse flat on sleepers with separating timbers to allow safe handling.

Steel plate shall be stored in such a way as not to cause deformation.

9.13 TOWERS, VESSELS, DRUMS, AND HEAT-EXCHANGERS

On reception, check mechanical protection on joint provided by Supplier and replace if damaged. Repeat operations as for flanged couplings and in particular protect, or renew the protection, for RFS and RJ flanges with individual rigid covers after renewing the protection coat

These items shall be stored free from ground contact.

These items shall be placed with sufficient space between packings to enable easy identification of each individual item without double handling.

Some items will be transported directly to the PLANT area. (DIRECT, DELIVERY MATERIALS)

Accessories and spare parts for these items shall be correctly identified, tagged and stored inside the WAREHOUSE after unpacking. If they are to be stored in the OPEN STORAGE AREA, tarpaulins or similar protective coverings must be used to prevent deterioration by water ingress.

All Heat exchangers shall be filled with Nitrogen purging & other inert gas during storage and maintained till Installation.

9.14 EQUIPMENT INTERNALS

Plates for Columns and supporting beams

Store outside, not in direct contact with ground, and protect with plastic sheeting.

9.14.1 NUTS AND BOLTS, PLATES AND SMALL FITTINGS

Store inside the warehouse without removing from their packing case. Repeat operations as for nuts and bolts and for oxidable material.

9.14.2 DEMISTER

Store outside warehouse, not in direct contact with the ground, and cover with plastic sheeting.

9.15 CENTRIFUGAL PUMPS – TURBINES – AGITATORS – VENTILATORS – GEAR BOXES

All accessories mounted on the before-mentioned machinery which may be damaged during the work shall be removed, marked and stored in the warehouse.

Upon arrival, all the temporary protective devices previously applied by the Manufacturer on the flange faces and on the apertures communicating with the interior of the machinery shall be checked. If any are missing they shall be replaced and if any are damaged they shall be repaired. In these cases, check that water or extraneous matter has not penetrated into the machinery. If necessary, the interior of the machinery shall be cleaned again and the damaged rust-proofing shall be restored.

All machined surfaces which are uncovered and exposed to outside agents (e.g. wheelworks, flange surfaces, motor coupling joints, rods, pistons, cams, etc.) shall be cleaned, if necessary, with solvents and coated with protective product.

Twice a week, centrifugal pumps shall be rotated by hand for a few revolutions so that the rust-proofing oil is uniformly distributed over all surfaces. Never keep the shaft in the same position.

Pumps, compressors, turbines and ventilators, after being mounted and during erection of the piping, shall be separated from the piping by inserting blind plates with gaskets on both sides

between the coupling flanges, to prevent the entry of foreign bodies into the machinery. These blind plates shall be removed only after the testing and washing of the piping.

9.16 RECIPROCATING PUMPS AND COMPRESSORS

For these machines, the same operations as described in previous points for piping material shall also be carried out.

The steam liquid cylinders, as well as the valve housing, shall be filled with protective oil or coated with grease or protective product.

Twice a week the forced lubrication circuits of the compressors shall be operated by hand, operating the oilers and squirts (if any) and allowing the oil to drip from the respective nozzles for at least one minute. At the same time, the transmission shaft shall be rotated a couple of times. Finally, if necessary, the oil level shall be topped up.

9.17 HAZARDOUS MATERIALS

Hazardous MATERIALS shall be stored independently from other MATERIALS, and shall be sheltered from direct sunlight. Their handling shall be carried out in a safe manner, taking all necessary precautions.

The storage of these MATERIALS should be grouped as follows:

- Oil based products
- Gaseous products
- Chemicals
- Catalyst

9.18 ELECTRICAL MATERIALS

9.18.1 ELECTRIC MOTORS

These shall be stored inside the warehouse.

Motors shall be stored on pallets in a well-ventilated area. All accessories and spare parts shall be correctly identified, tagged and stored on shelves

Check anti-rust protection on the coupling extremities.

Check that the bearings are lubricated and if necessary, lubricate according to Supplier's instructions.

Rotate the shaft a few times every two weeks.

Motors equipped with "space-heaters", in case of expected long storage, shall be connected to a provisional supply.

9.18.2 **ELECTRIC PANEL BOARDS**

Switchgears, MCC, electric switchboards or control boards shall be stored inside the warehouse, or directly in the electrical substation.

In case of expected long storage, “space-heaters” shall be connected to a provisional supply.

9.18.3 **BULK ELECTRICAL MATERIAL**

Bulk electrical material, such as lighting fixtures, control stations with or without ammeters junction boxes, etc. shall be stored inside the warehouse.

Material shall be wrapped in plastic bags, with drying agent inside for delicate material. Check silica-gel every 3 months.

Electrical wire shall be stored inside the warehouse in a well-ventilated area, and segregated by type and size.

Distribution and control panels shall be stored inside the warehouse on timbers or pallets, off the floor, in a well ventilated or air-conditioned area, when climatic condition requires.

Transformers, current transformers, and disconnect switches designed for indoor service shall be stored inside the warehouse on pallets in a well-ventilated area.

9.19 INSTRUMENTATION MATERIALS

All instruments shall be stored indoor.

Control panels and DCS shall be stored on timbers or pallets without unpacking in a well ventilated or air-conditioned area in accordance with the VENDOR's instruction.

Meters, switches, and relays shall be stored on shelves in a dry, well ventilated area to avoid damage by heat or humidity, and must be handled carefully to avoid damage.

Potentiometers shall not be exposed to temperatures below 0°C and above 500°C.

Analysers shall be stored on pallets in a well-ventilated area. If special conditions of storage - are required, the Vendor's instructions shall be followed.

Orifice Plates less than 4" in diameter shall be stored on shelves. Larger than 4" in diameter shall be stored on pallets in one layer. Care is to be taken to avoid damage to their protective wrappings.

Capillary tube shall be stored on shelves after unpacking

9.20 PAINTING MATERIALS

Products for painting operations shall be stored in their original sealed containers in covered warehouse.

Where warehousing is not possible, paint shall in all cases be stored in a shaded area, not exposed to the sun at any time of day.

The containers shall not come into contact with heat sources or naked flame.

The containers shall be stored subdivided according to the quality of the product and in such a way as to be able to use, as required, those containers stored longest.

Particular attention shall be paid to the shelf-life specified in the contractual documents and/or on the packing itself, in order to identify special items requiring specific storage precautions which may deviate from the above general requirements.

9.21 INSULATION MATERIALS

Insulation materials shall be stored inside the warehouse.

Insulation materials shall be segregated by size, Thickness and material specifications

Insulation accessories materials shall be stored as per manufactures instructions.

9.22 WELDING RODS

Welding rods shall be stored in a well ventilated, dry, secure place. Drying facilities may become necessary due to local climatic conditions.

9.23 MATERIAL SUBJECT TO EXPIRING DATE

For such kind of product (e.g.: refractory, resins, chemicals, calibration of valves) the following actions are required:

Maintain a record showing expire dates;

Strictly follow Vendor recommendations for storage (i.e.: cooled zone. Covered areas etc);

Strictly follow Vendor HSE recommendations for handling and storage (i.e.: paved and curbed areas, specific PPI etc) as per MSDS (material safety data sheet) requirements;

Maintain a log for material repurchasing (i.e.: resin for RTR pipes).

9.24 PRECIOUS METALS

These items shall be stored in a closed, fully secure area within the facility with access restricted to nominated responsible person(s).

10. MATERIAL REQUISITION AND ISSUING

Materials shall only be issued from the storage facilities i.e. warehouse and/or open storage area against requisitions.

While preparation of requisition, approval is required from the discipline co-ordinator responsible for the construction work on which the materials are to be used, and then from the Material controller.

11. STOCKTAKING

11.1 The storekeepers shall carry out monthly stocktaking of all materials being in the storage facilities, both within the warehouse and open storage area.

11.2 The purpose of the exercise is to compare actual quantities of materials held in stock with the quantities indicated on the stock book, bin cards and/or materials issued control report.

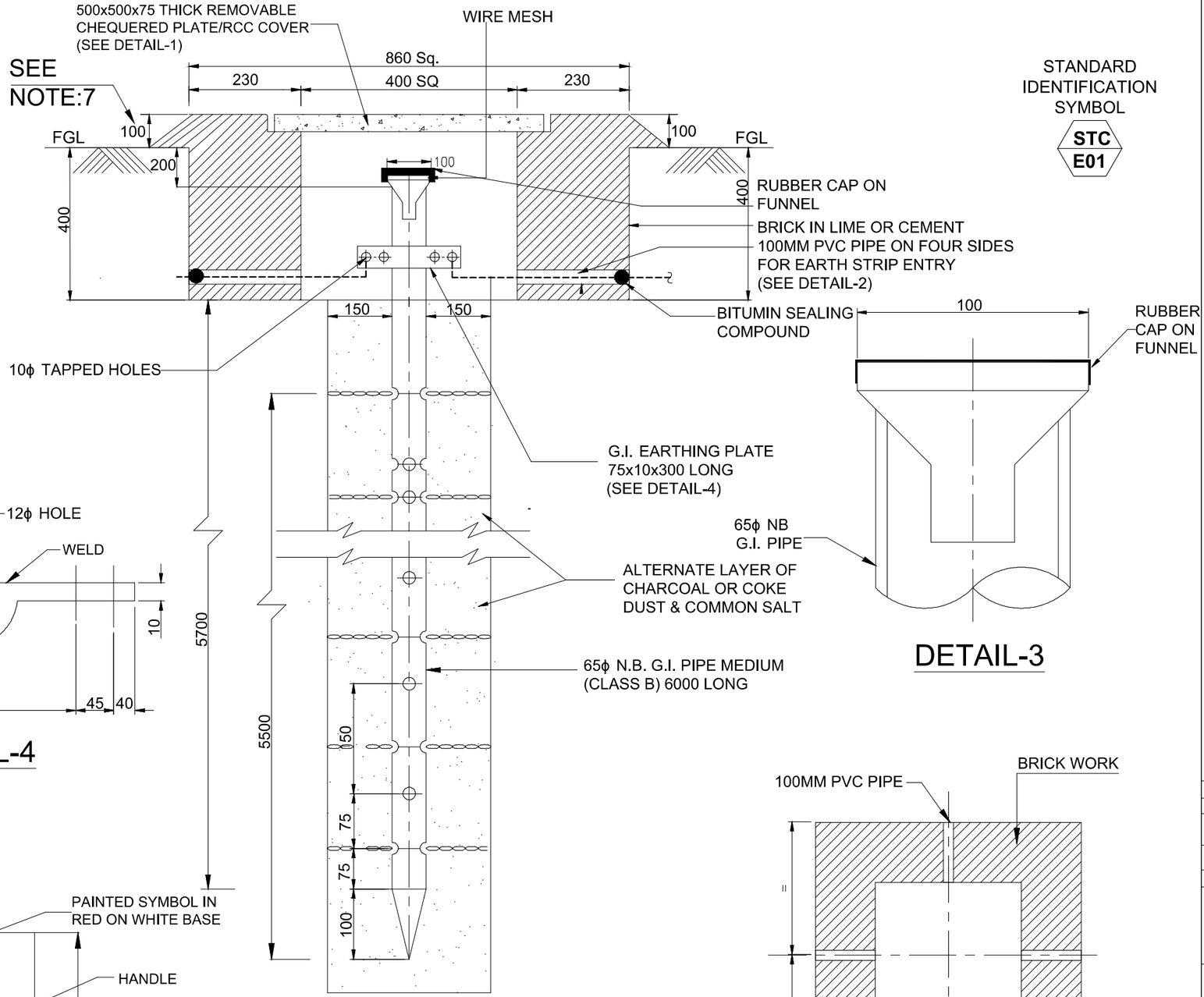
11.3 The results of the exercise, i.e., surplus or shortfall of materials shall be recorded by the store officer on stock book, and reported to the material controller.

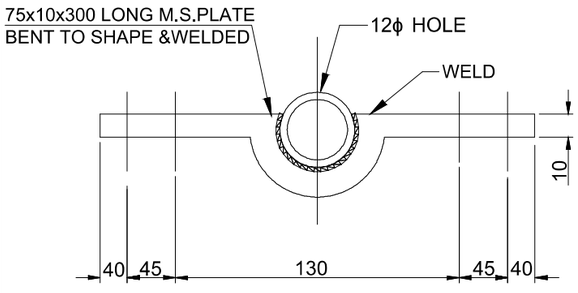
11.4 Additional stocktaking may be requested by the material controller from time to time and the results will be recorded and reported in the same manner as the regular stocktaking

12. DOCUMENTATION

Contractor shall prepare the following documents but limited to

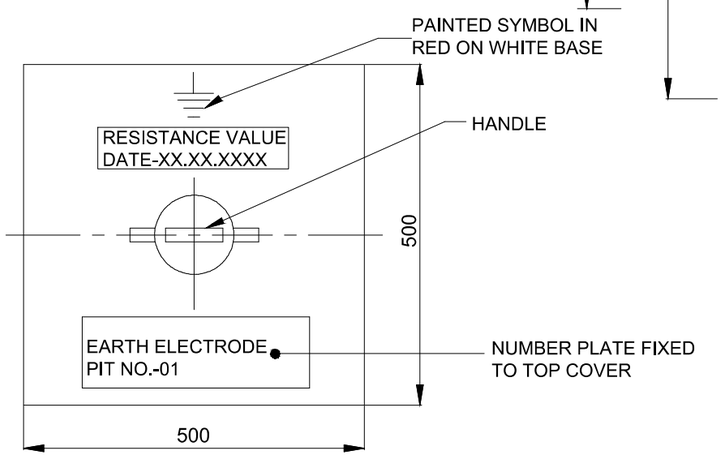
- Material receipt report
- Daily material reception report
- Detail packing list.
- Material/equipment inspection deficiency report
- Excess shortage /damage report.
- Request for urgent summary report
- Material receipt status and inventory status with respect to material delivery schedule
- Report on excess, short, damage & reject (ESDR) against each consignment on receipt at warehouse
- Weekly status of consignments, material receipt report (MRRs)
- Log Register of rotating equipment's maintenance
- Log register of N2 protection by periodic recording of the pressure gauge reading.





DETAIL-4

DETAIL-3



DETAIL-1

DETAIL-2

NOTES:

1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.
2. BRICK WORK SHALL BE DONE AFTER COMPACTING THE SOIL.
3. AFTER REMOVAL OF CAP, OWNER SHALL BE ABLE TO POUR WATER THROUGH THE FUNNEL WITH STEEL WIRE MESH.
4. COLOR CODING & PAINTING OF COVER SHALL BE AS PER OISD NORMS.
5. ALL DAMAGE TO GALVANIZED SURFACES SHALL BE MADE GOOD WITH ZINC RICH PAINT.
6. IN CASE OF PAVED AREA, TOP OF PIT SHALL BE FLUSHED WITH F.F.L., WHEREAS IN UNPAVED AREA, TOP OF PIT SHALL BE PROJECTED 100MM ABOVE F.G.L.
7. ALL EARTH PITS SHALL BE MARKED WITH EARTH PIT NUMBER FOR EASY IDENTIFICATION. IN ADDITION, METALLIC TAG IS ALSO TO BE FASTENED WITH THE EARTH ELECTRODE INSIDE THE PIT AS A PERMANENT INDENTIFICATION.
8. PIPE ASSEMBLY SHALL BE HOT DIP GALVANISED AFTER FABRICATION.

STANDARD IDENTIFICATION SYMBOL

STC
E01

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
0	29.05.2020	ISSUED FOR CONSTRUCTION	GP	CG	SV	JMC

DOCUMENT CATEGORY (USE " X " MARK)

- ☐ APPROVAL
- ☐ REVIEW
- ☒ INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT: STANDBY SRU & ADDITIONAL TANKS
IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER: INDIAN OIL CORPORATION LTD.

PMC: TechnipFMC

TITLE: TYPICAL INSTALLATION OF EARTH PIT

DRAWING NO.						PAGE	REV.
SCALE	080557C001	000	STC	1691	001	06 OF 30	0
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1691-001-06.DWG

SHEET SIZE : A3

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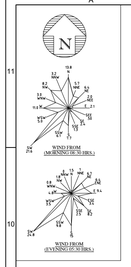

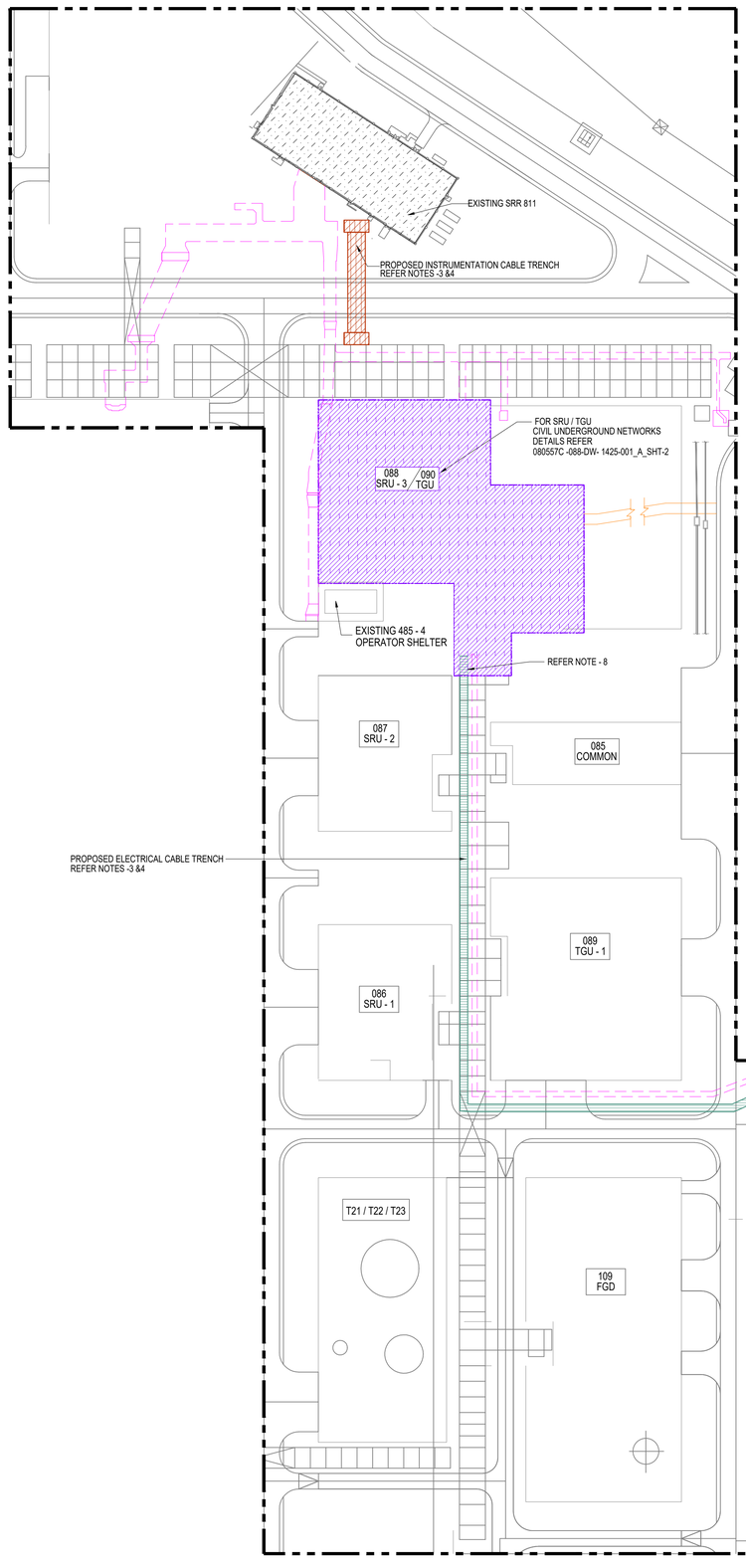

GENERAL NOTES:

1. UNLESS OTHERWISE STATED, ALL DIMENSIONS ARE IN MILLIMETERS, ELEVATIONS ARE IN METERS.
2. HIGH POINT OF PAVING EL.100.300M IS EQUAL TO 4.360M ABOVE I.M.S.L. (INDIAN MEAN SEA LEVEL).
3. FOR ROUTING AND DETAILED DIMENSIONS OF CABLE TRENCH ,REFER RESPECTIVE SCOPE DRAWING FOR ELECTRICAL / INSTRUMENT DISCIPLINE.
4. DUCT BANK WITH PULLING PIT SHALL BE PROVIDED FOR ERC / IRC.
5. THIS DRAWING SHALL BE REFERRED ONLY FOR PROPOSED TRENCH LAYOUT FROM EXISTING SRR & SUBSTATION TO PROPOSED SRU & INCINERATOR PACKAGE.
6. READ THIS DRAWING IN CONJUCTION WITH SCOPE OF WORK DOCUMENT NO 080557C-SOW-LSTK1-003.
7. EXISTING OSBL DRAINS AND OTHER SERVICES IF DAMAGED DURING CONSTRUCTION SHALL BE RECONSTRUCTED BY LSTK CONTRACTOR.
8. SUITABLE PROTECTIONS SHALL BE PROVIDED FOR ALL EXISTING UG FACILITIES BY LSTK CONTRACTORS DURING EXCAVTION AND CONSTRUCTION FOR NEW CABLE TRENCHES.
9. EXISTING MANHOLE ,STORM WATER DRAIN, CABLE TRENCH SHOWN ARE INDICATIVE ONLY.LSTK CONTRACTOR TO VALIDATE AND UPDATE THE SAME DURING DETAIL ENGINEERING.ANY MODIFICATION REQUIRED SHALL ALSO IN THE LSTK CONTRACTOR SCOPE.

LEGENDS :

- EXISTING SUBSTATION / SRR
- PROPOSED INSTRUMENT TRENCH
- EXISTING CABLE TRENCHES (ELECT / INST)
- PROPOSED ELECTRICAL TRENCH
- PROPOSED ACCESSWAY

KEYPLAN

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E	12/06/2020	ISSUED FOR INFORMATION	TUN	ND	JPKC	JMC
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C	12/03/2020	ISSUED FOR INFORMATION	MD	ND	JPKC	JMC
B	07/02/2020	ISSUED FOR INFORMATION	MD	ND	JPKC	JMC
A	09/12/2019	ISSUED FOR INFORMATION	MD	ND	JPKC	JMC

DOCUMENT CATEGORY (USE " X " MARK)

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- ☐ REVIEW
- ☒ INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

TechnipFMC

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TITLE

SCOPE DRAWING FOR CIVIL NETWORK
ROADS AND PAVING
SRU -3,WHB & INCINERATOR AREA
(UNIT -088 & 090) SOUTH OF CREEK

DRAWING NO.						PAGE	REV.
SCALE	080557C	088	DW	1425	001	1/3	E
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : - 080557C-088-DW-1425-001_E_SHT -1.DWG

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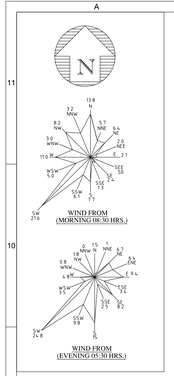

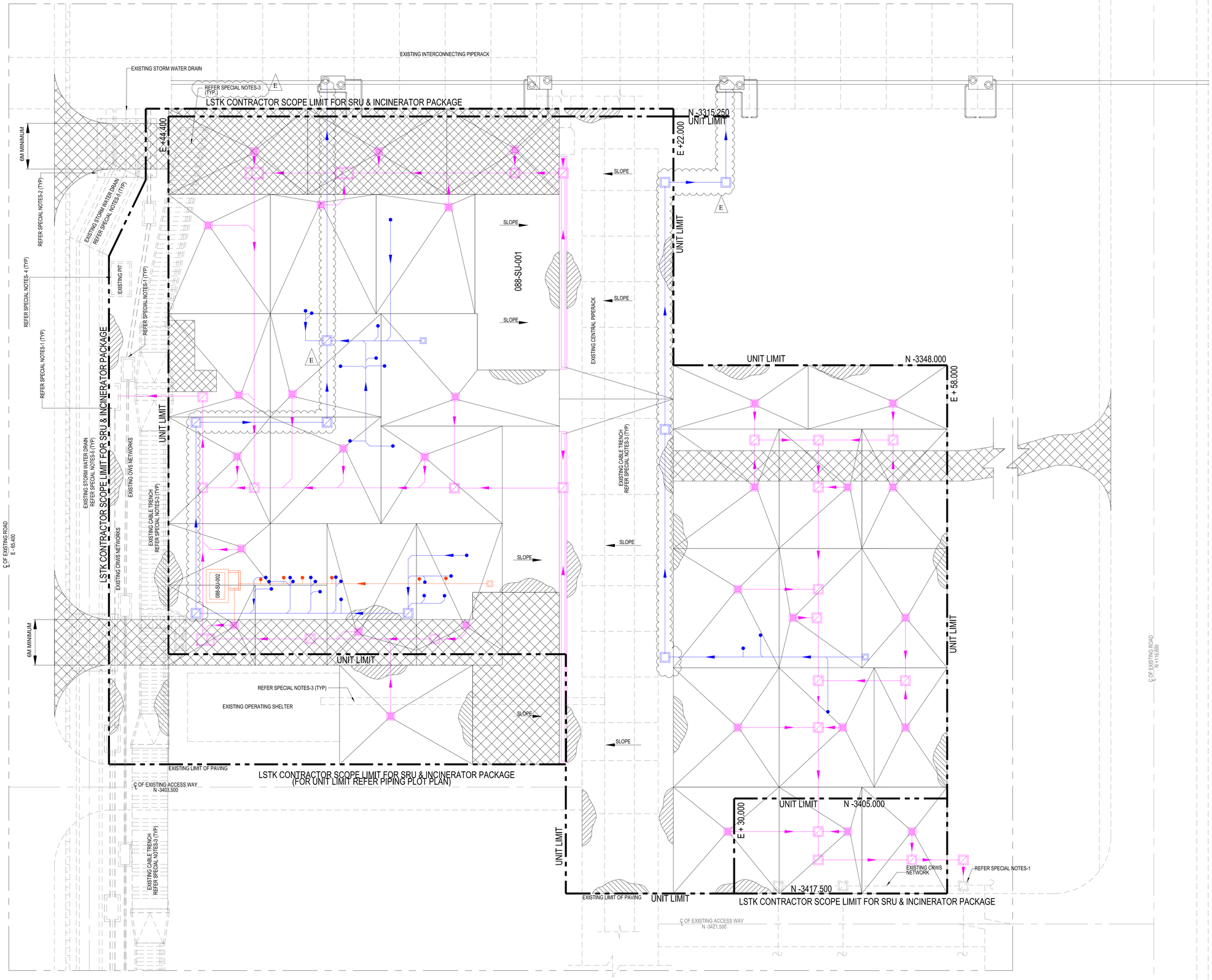

REFERENCE DOCUMENTS / DRAWINGS	
DRAWING NO	DRAWING TITLE
080557C-088-DW-0051-001	UNIT PLOT PLAN
PDRP4200-8230-03-600-0002-A12	OVERALL SITE PLAN

GENERAL NOTES:

1.UNLESS OTHERWISE STATED, ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS ARE IN METERS.

2. HIGH POINT OF PAVING EL.100.300M IS EQUAL TO 4.360M ABOVE I.M.S.L. (INDIAN MEAN SEA LEVEL).

3. REFER PLOT PLAN OF SRU FOR MORE DETAILS OF UNIT BATTERY LIMIT CONDITIONS AND PLOT DETAILS.

4. ENTIRE AREA WITHIN LSTK CONTRACTOR SCOPE SHALL BE PAVED, SUITABLE ISOLATION JOINT TO BE PROVIDED BETWEEN EXISTING & NEW PAVING.

5. THIS DRAWING SHALL BE REFERRED AS THE SCHEMATIC LAYOUT TO UNDERSTAND THE SCOPE OF WORK FOR PAVING AND UG NETWORKS. LSTK CONTRACTOR TO DEVELOPE DETAIL CONSTRUCTION DRAWING.

6. ENTIRE WORK SHALL BE EXECUTED AS PER BID DOCUMENT. NO DEVIATION IS ACCEPTABLE.

7. FOR PAVING DETAILS REFER CONSTRUCTION STANDARD 080557C-000-LD-1490-001.

8. EXISTING OSBL DRAINS AND OTHER SERVICES IF DAMAGED DURING CONSTRUCTION SHALL BE RECONSTRUCTED BY LSTK CONTRACTOR.

SPECIAL NOTES:

1.CRWS / OWS NETWORK SHOWN IS INDICATIVE ONLY. LSTK CONTRACTOR HAS TO DESIGN THE SEWER NETWORKS DURING DETAIL ENGINEERING .THE SEWER NETWORK SHALL BE CONNECTED TO THE EXISTING MANHOLE.

2. HEAVY DUTY CONCRETE SLABS SHALL BE PROVIDED OVER STORM WATER DRAIN AT ROAD CROSSING FOR CRANE ACCESS.

3. EXISTING TRENCH COVER SLAB LEVEL SHALL BE MODIFIED TO MATCH WITH PROPOSED PAVING ELEVATION.ALSO TRENCH COVER SHALL BE DESIGNED FOR TRAFFIC LOAD IN CRANE ACCESS WAY. (E)

4. EXISTING PIT TOP SHALL BE MIN 150MM ABOVE THE PAVING LEVEL. IF REQUIRED WALL HEIGHT SHALL BE RAISED.HANDRAIL TO USING CHEMICAL BOLTS BE PROVIDED ALL AROUND THE PITS.

5. EXISTING STORM WATER DRAIN WALL SHALL BE MIN 300MM ABOVE PAVING LEVEL IN SRU SIDE.IF REQUIRED WALL HEIGHT SHALL BE RAISED.ALSO HANDRAIL SHALL BE PROVIDED ALONG THE EXISTING STORM WATER DRAIN.

LEGENDS:

- 200 THK CONCRETE PAVING (HEAVY DUTY)
- 150 THK CONCRETE PAVING (MEDIUM DUTY)
- CRWS / AOC NETWORKS
- OWS / COC NETWORKS
- EXISTING FACILITIES
- CHEMICAL SEWER NETWORKS
- CRWS MANHOLE
- CRWS CATCHBASIN
- OWS MANHOLE

KEYPLAN

THIS IS TENTATIVE DWG.BIDDER IS TO ACQUIANT THEMSELVES WITH THE ACTUAL SITE CONDITIONS,EQ.LAYOUT BEFORE GOING AHEAD WITH ENGINEER AND EXECUTION.

THE WORD "LSTK" CONTRACTOR MEANS "SRU" CONTRACTOR.

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C	12/03/2020	ISSUED FOR INFORMATION	MD	ND	JP/KC	JMC
B	07/02/2020	ISSUED FOR INFORMATION	MD	ND	JP/KC	JMC
A	09/12/2019	ISSUED FOR INFORMATION	MD	ND	JP/KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)	DOCUMENT REVIEW STATUS (BY CLIENT)
☐ APPROVAL	
☐ REVIEW	
☒ INFORMATION	

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

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TITLE

SCOPE DRAWING FOR CIVIL NETWORK
ROADS AND PAVING
SRU -3,WHB & INCINERATOR AREA
(UNIT -088 & 090) SOUTH OF CREEK

DRAWING NO.					PAGE	REV.
SCALE	080557C	088	DW	1425	001	2/3	E
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : _ 080557C-088-DW-1425-001_E_SHT -2.DWG

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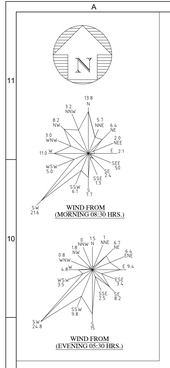

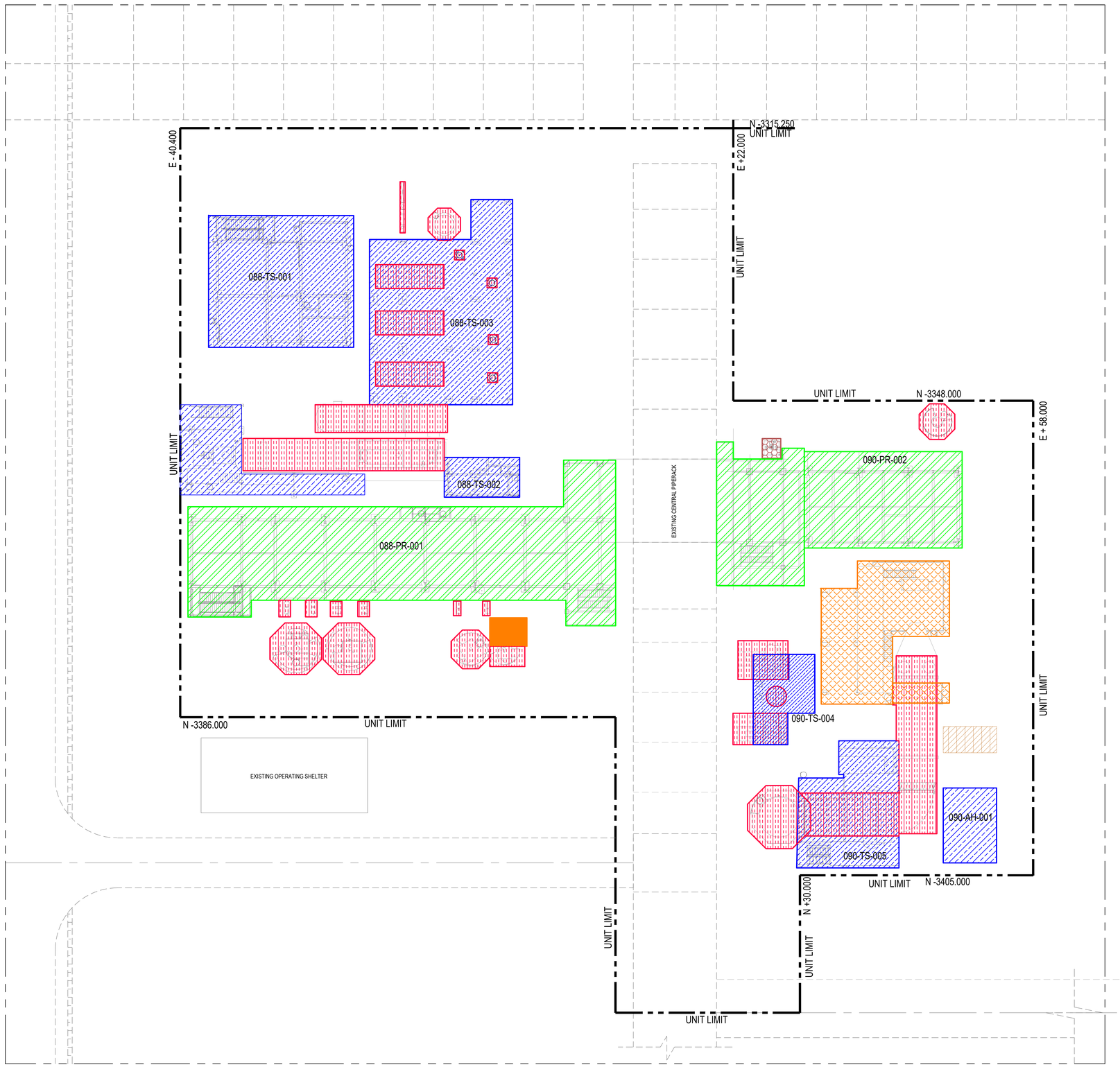

GENERAL NOTES:

1. REQUIREMENTS SPECIFIED IN THIS DRAWING ARE MINIMUM THE SAME SHALL BE FURTHER DEVELOPED BY CONTRACTOR DURING DETAIL ENGINEERING.ANY FACILITIES NOT SHOWN SPECIFICALLY OR FULLY BUT REQUIRED FOR COMPLETION OF THE JOB SHALL BE PROVIDED BY CONTRACTOR.
2. ALL EQUIPMENT FOUNDATIONS, STRUCTURES FOUNDATIONS AND SUPERSTRUCTURE WITHIN BATTERY LIMIT (AS PER UNIT PLOT PLAN 080557C-088-DW-0051-001) SHALL BE BY LSTK CONTRACTOR.
3. FOR UNDER GROUND FACILITIES ,REFER DWG 080557C-088-DW-1425-001 SHEET 2 OF 3.

LEGENDS:

- UNIT LIMIT
- PIPE RACK
- STRUCTURE
- EQUIPMENT AT GRADE LEVEL
- MISC PLATFORM
- PACKAGE
- MISC PLATFORM CUM SUPPORT STRUCTURE

KEYPLAN

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A	09/12/2019	ISSUED FOR INFORMATION	MD	ND	JP/KC	JMC

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PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

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TITLE

SCOPE DRAWING FOR CIVIL
STRUCTURAL AND ARCHITECTURAL WORKS
SRU -3,WHB & INCINERATOR AREA
(UNIT -088 & 090) SOUTH OF CREEK

DRAWING NO.						PAGE	REV.
SCALE	080557C	088	DW	1425	001	3/3	E
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME: - 080557C-088-DW-1425-001_E_SHT -3.DWG

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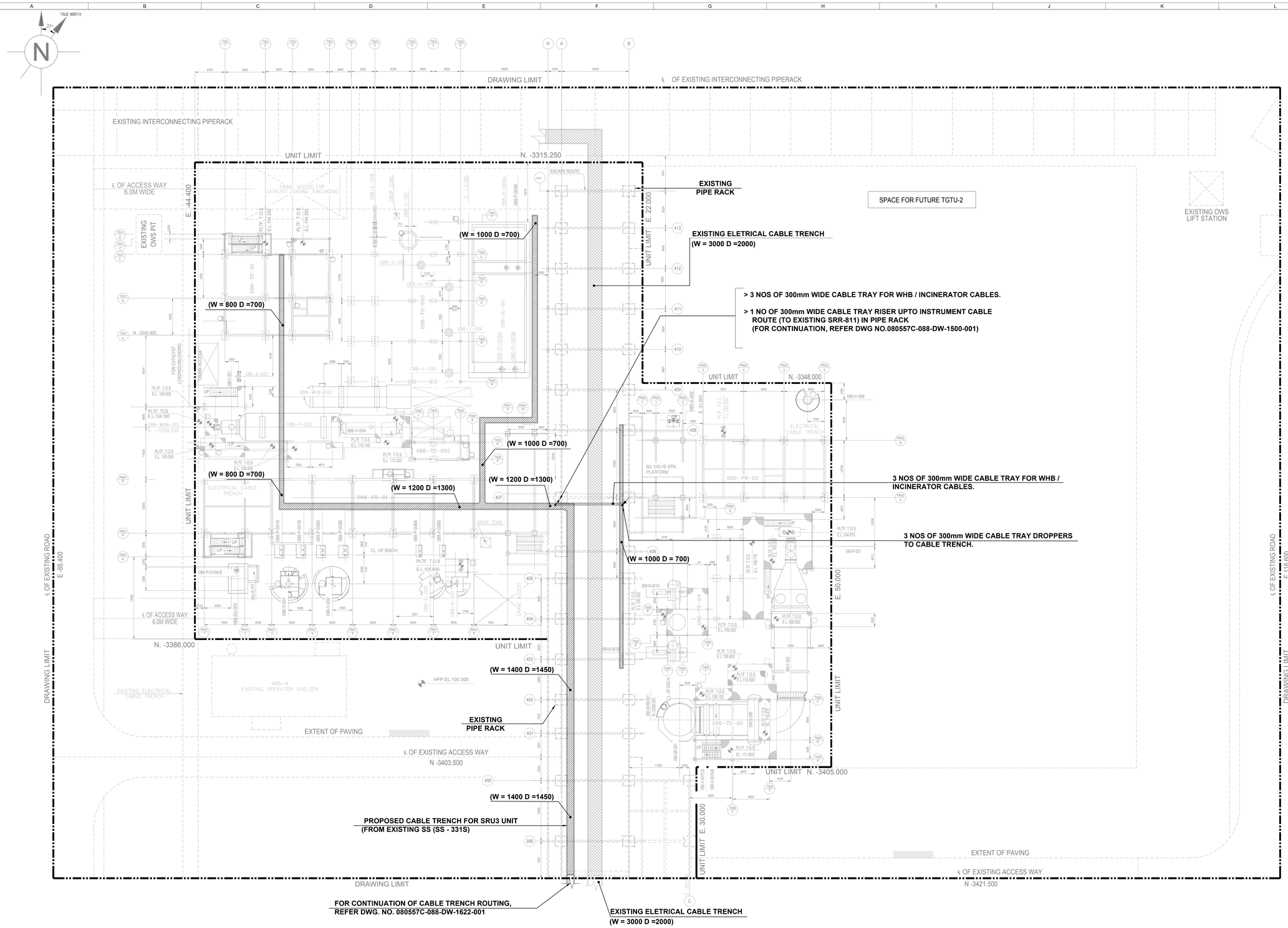


PLAN VIEW FOR UNIT- 088 & 090

NOTES:

1. ALL DIMENSIONS ARE IN MM & ELEVATIONS ARE IN M, UNLESS OTHERWISE SPECIFIED.
2. THE ELECTRICAL MAIN CABLE ROUTING SHOWN IN THIS DRAWING IS INDICATIVE & FOR GUIDANCE PURPOSE ONLY.
3. THE CABLE TRENCH / TRAY LOCATIONS & SIZES SHOWN IN THIS DRAWING ARE INDICATIVE & FOR GUIDANCE PURPOSE ONLY AND THE SAME SHALL BE REVALIDATED / MODIFIED BY LSTK CONTRACTOR ACCORDING TO THE ACTUAL REQUIREMENT AND SITE CONDITIONS DURING DETAIL ENGINEERING.
4. AT ROAD CROSSING, CULVERT SHALL BE CONSIDERED FOR UNDERGROUND CABLES AND OVERHEAD CABLE BRIDGE SHALL BE CONSIDERED FOR ABOVE GROUND CABLES.
5. CABLE INSTALLATION SHALL BE IN ACCORDANCE WITH JOB SPECIFICATION FOR FIELD ELECTRICAL INSTALLATION (DOC.NO.080557C-000-JSD-1600-003) AND RESPECTIVE POWER INSTALLATION STANDARDS (DWG.NO. 080557C-000-STD-1682-001).

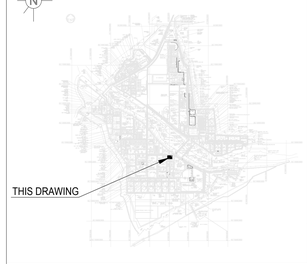
LEGEND :

- PROPOSED ELECTRICAL CONCRETE CABLE TRENCH
- EXISTING DIRECT BURIED ELECTRICAL CABLE TRENCH
- PROPOSED ABOVE GROUND CABLE TRAY

REFERENCE DRAWINGS / DOCUMENTS

080557C-088-JSD-1600-001	ELECTRICAL DESIGN BASIS
080557C-088-DW-0051-001	UNIT PLOT PLAN SRU - 3, WHB & INCINERATOR AREA (UNIT - 088 & 090)
080557C-000-STD-1682-001	POWER INSTALLATION STANDARDS FOR DESIGN
080557C-088-DW-1622-001	CONCEPTUAL ELECTRICAL INTERFACE CABLE ROUTING GUIDE DRAWING. [SRU - 3, WHB & INCINERATOR OF TGTU - 2] (UNIT - 088 & 090)

KEYPLAN



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A	02.12.2019	ISSUED FOR DESIGN	BR	CG	SV	JMC

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DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT: STANDBY SRU & ADDITIONAL TANKS
IOCL PARADIP REFINERY,ODISHA, INDIA

OWNER: INDIAN OIL CORPORATION LTD.

PMC: TechnipFMC

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TITLE: CONCEPTUAL ELECTRICAL MAIN CABLE ROUTING GUIDE DRAWING [SRU - 3, WHB & INCINERATOR OF TGTU - 2] (UNIT -088 & 090)

DRAWING NO.						PAGE	REV.
SCALE	080557C	088	DW	1622	002	1 OF 1	A
1:300	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME :- 080557C-088-DW-1622-002_A.DWG

SHEET SIZE : A0

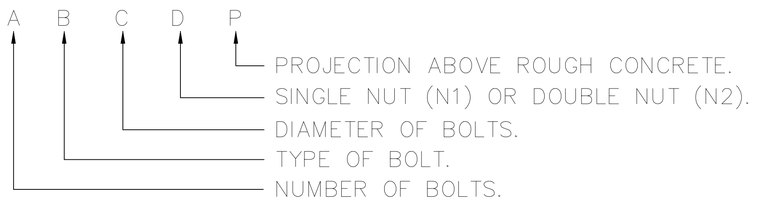
CONSTRUCTION STANDARD
FOR
CONCRETE WORKS

			Written By T.Ulaganathan 2019.10.16 12:08:28 +05'30'	Checked By Rameshkumar Kalyanasundaram 2019.10.16 13:02:50 +05'30'	Approved By Jayaprakash Jayaraman 2019.10.16 14:51:11 +05'30'	Authorized By Morischristopher Jesumarian 2019.10.16 22:32:08 +05'30'
A	16.10.2019	ISSUED FOR DESIGN	TUN	KRK	JP / KC	JMC
REV.	**DATE**	**DESCRIPTION**	**PREPARED**	**CHECKED**	**APPROVED**	**AUTHORIZED**

SL. NO.	DRAWING NO.	DESCRIPTION	REV.	DATE	REMARKS
01	080557C-000-STC-1790-001 SHT. 1/2 TO 2/2	STANDARD M.S ANCHOR BOLT	A	16.10.2019	2 SHEETS
02	080557C-000-STC-1790-002	STANDARD INSERT PLATE	A	16.10.2019	1 SHEET
03	080557C-000-STC-1790-003 SHT. 1/5 TO 5/5	FIRE PROOFING OF STEEL STRUCTURES	A	16.10.2019	5 SHEETS
04	080557C-000-STC-1790-004	STANDARD EDGE PROTECTION	A	16.10.2019	1 SHEET
05	080557C-000-STC-1790-005 SHT. 1/2 TO 2/2	STANDARD DETAIL OF PEDESTAL FOR STAIR & LADDER	A	16.10.2019	2 SHEETS
06	080557C-000-STC-1790-006	STANDARD PRECAST SLEEPERS	A	16.10.2019	1 SHEET
07	080557C-000-STC-1790-007	STANDARD FOR LIGHTING POLE FOUNDATION	A	16.10.2019	1 SHEET

STANDARD MS ANCHOR BOLTS
GENERAL NOTES

1. BOLTS SHALL BE MARKED ON DRAWING AS UNDER:



e.g. 7–B–M27–N1–200

2. BOLTS SHALL BE TURNED FROM MILD STEEL BARS CONFORMING TO IS: 2062 GRADE–A.
3. HEXAGONAL NUTS AND WASHERS SHALL CONFORM TO IS: 1363 AND 3138.
4. THREADING SHALL BE COARSE AND CONFORM TO IS: 1367 AND IS: 4218.
5. PIPE SLEEVES USED SHALL BE MEDIUM TUBES CONFORMING TO IS: 1239.
6. IF THE ANCHOR BOLTS ARE MADE BY FORGING, THEY SHALL BE TEMPERED BEFORE MACHINING. THE FORGING TEMPERATURE SHALL BE ABOVE 900°C BUT IN ANY CASE SHALL BE LOWER THAN SUPER HEATING TEMPERATURE.
7. ANCHOR BOLTS SHALL BE SET ACCURATELY AND HELD IN POSITION BY TEMPLATES BEFORE CONCRETING.
8. LOCKNUTS SHALL BE PROVIDED TO ANCHOR BOLTS FOR CRITICAL AND VIBRATING STRUCTURES / EQUIPMENTS.
9. FOR PROJECTION (P) OF BOLT ABOVE TOP OF ROUGH CONCRETE & NUMBER OF BOLTS,RELEVANT DESIGN DRAWINGS SHALL BE REFERED.
10. 6 THK. SQUARE PLATE AT THE BOTTOM OF SLEEVE SHALL BE TACK WELDED WITH BOLT AND SLEEVE FOR TYPE I,II&III.
11. TOLERANCES ALLOWED FOR ANCHOR BOLT POSITIONING SHALL BE 1/20TH OF THE BOLT NOMINAL DIA.
12. BOLT TYPE PREFERENCE FOR DIFFERENT EQUIPMENTS/STRUCTURES SHALL BE AS FOLLOWS (FOR GUIDANCE ONLY)

1. STEEL PIPE RACKS/LIGHT STANCHIONS	–	TYPE–I,III
2. EXCHANGERS/HORIZONTAL DRUMS	–	TYPE–I,III
3. VERTICAL VESSELS ON STAGING/PEDESTALS	–	TYPE–I,II
4. EQUIPMENT ON SLABS	–	TYPE–I,III
5. HEAVY STEEL STANCHIONS	–	TYPE–II
6. FLARE STACK/GUIDE STRUCTURE	–	TYPE–I,II&III
7. SPHERE	–	TYPE–II
8. STORAGE TANK	–	TYPE–I,III

STANDARD MS ANCHOR BOLTS
CORRESPONDING MS ROUNDS

BOLTS SHALL BE TURNED FROM THE CORRESPONDING MS ROUNDS BARS CONFORMING TO IS: 2062 GRADE–A

S.NO.	BOLT DIA (ø) IN mm	CORRESPONDING MS ROUND DIA
1.	10	10
2.	12	12
3.	16	16
4.	(18)	18
5.	20	20
6.	(22)	22
7.	24	25
8.	(27)	28
9.	30	32
10.	(33)	36
11.	36	36
12.	(39)	40
13.	42	45
14.	(45)	47
15.	48	50
16.	(52)	56
17.	56	63
18.	(60)	63
19.	64	71
20.	(68)	71
21.	72	80

NOTES:

1. BOLTS ø SHOWN IN BRACKETS SHALL HAVE SECOND PREFERENCE AS PER IS: 1363 & IS: 3138

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)	DOCUMENT REVIEW STATUS (BY CLIENT)
☐ APPROVAL ☐ REVIEW ☒ INFORMATION	

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

IndianOil — INDIAN OIL CORPORATION LTD.

PMC

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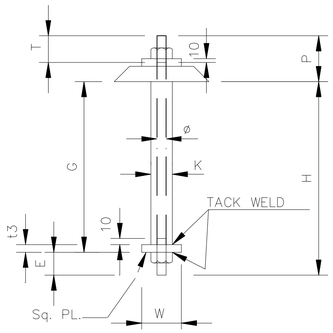
TITLE

STANDARD M.S ANCHOR BOLT

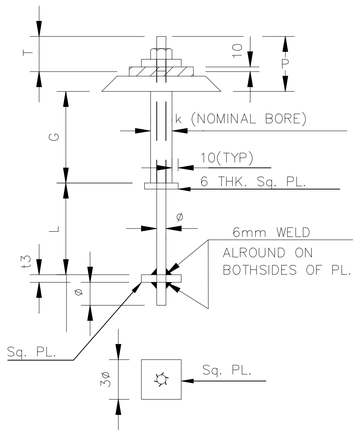
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	001	1 OF 2	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1790-001_001_A.DXF

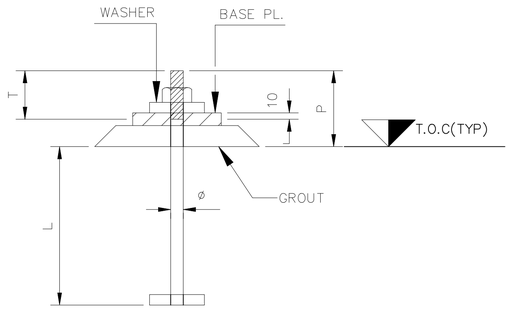
SHEET SIZE : A3



TYPE–I



TYPE–II



TYPE–III

CONCRETE MIX	TYPE	DIMENSIONS MM	BOLT DIA (ø) IN MM																					
			10	12	16	18	20	22	24	27	30	33	36	39	42	45	48	52	56	60	64	68	72
M20	I	G	150	150	150	200	300	300	300	450	450	450	450	550	600	650	700	750	800	900	900	1000	1050
		H	210	222	234	291	398	410	417	580	585	598	608	722	786	841	905	975	1035	1150	1171	1281	1350
		W	80	80	90	100	100	130	130	140	150	170	180	200	210	220	230	260	270	290	320	330	350
		t3	10	12	14	16	18	20	22	25	25	28	32	36	36	36	40	45	45	50	56	56	63
	II	L					350	400	400	500	550	600	750	950	1050	1200	1100	1350	1500	1750	1900	2100	2300
M25, M30 & M35	I	G	150	150	150	200	300	300	300	450	450	450	450	550	600	650	700	750	800	900	900	1000	1050
		H	210	222	234	291	398	410	417	580	585	598	608	722	786	841	905	975	1035	1150	1171	1281	1350
		W	80	80	90	100	100	130	130	140	150	170	180	200	210	220	230	260	270	290	320	330	350
		t3	10	12	14	16	18	20	22	25	25	28	32	36	36	36	40	45	45	50	56	56	63
	II	L					295	340	360	420	465	540	670	815	930	1070	980	1185	1340	1520	1680	1860	2035
M20 M25, M30 & M35	I	E	50	60	70	75	80	90	95	105	110	120	130	140	150	155	165	180	190	200	215	225	240
		k	50	50	50	50	50	80	80	80	80	80	80	100	100	100	100	125	125	125	150	150	150
	II	THREAD-ED(T) LENGTH SINGLE NUT	40	45	55	60	60	65	70	75	80	90	95	100	105	110	120	125	135	140	150	160	165
		THREAD-ED(T) LENGTH DOUBLE NUT	50	60	70	75	80	90	95	105	110	120	130	140	150	155	165	180	190	200	215	225	240
	II	t3					16	16	16	16	16	16	16	16	16	16	20	20	20	20	20	20	20
	II	G	150	150	150	150	300	300	300	450	450	450	450	450	450	450	450	450	450	450	600	600	600
FULL TENSION CAPACITY (Kg.)			680	985	1845	2255	2875	3560	4145	5395	6590	8155	9600	11465	13160	15275	17270	20680	23850	27730	31490	35955	40655
FULL SHEAR CAPACITY (Kg.)			455	660	1230	1505	1920	2375	2770	3600	4400	5445	6410	7660	8790	10205	11540	13815	15935	18525	21035	24020	27160

CONCRETE MIX	TYPE	DIMENSIONS MM	BOLT DIA (ø) IN MM										
			10	12	16	18	20	22	24	27	30	33	36
M20 & M25	III	L	185	220	310	335	385	435	460	535	590	660	720
M30		L	150	150	200	225	250	275	300	350	375	425	450
M35		L	150	150	175	200	225	250	275	300	350	375	400

CONCRETE MIX	TYPE	DIMENSIONS MM	BOLT DIA (ø) IN MM											
			10	12	16	18	20	22	24	27	30	33	36	39
M20, M25 M30 & M35	III	THREAD-ED(T) LENGTH SINGLE NUT	40	45	55	60	60	65	70	75	80	90	95	100
		THREAD-ED(T) LENGTH DOUBLE NUT	50	60	70	75	80	90	95	105	110	120	130	140

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY

(USE " X " MARK)

- ☐ APPROVAL
- ☐ REVIEW
- ☒ INFORMATION

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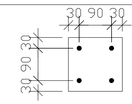
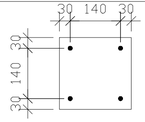
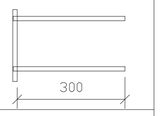
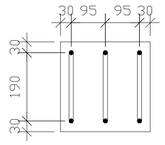
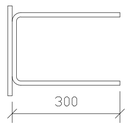
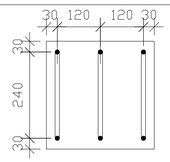
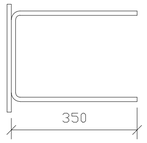
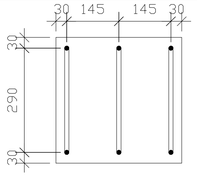
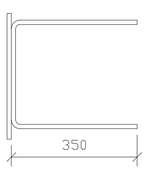
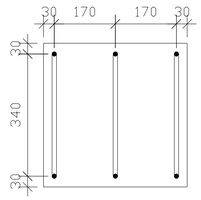
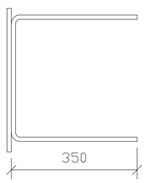
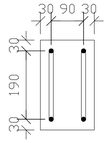
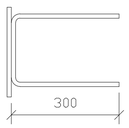
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	001	2 OF 2	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

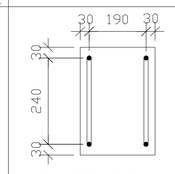
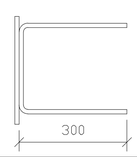
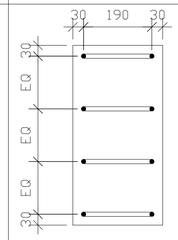
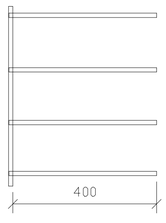
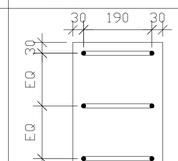
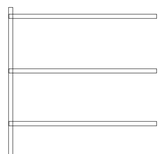
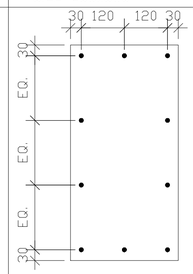
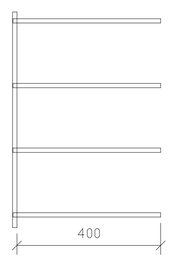
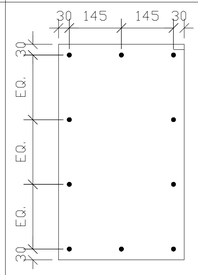
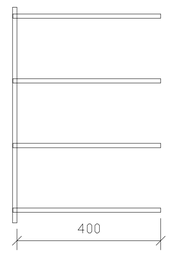
CAD FILE NAME : 080557C-000-STC-1790-001_002_A.DXF

SHEET SIZE : A3

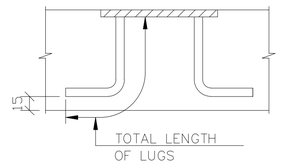
SQUARE/RECTANGULAR METAL INSERT PLATES

S.NO.	TYPE OF INSERT PLATE	DIA. OF LUGS (mm)ø	THK. OF INSERT PLATE	DETAILS OF INSERT PLATE	
				PLAN	CROSS SECTION
1	IP-1	12	12	 SIZE 150x150	
2	IP-2	12	12	 SIZE 200x200	
3	IP-3	12	12	 SIZE 250x250	
4	IP-4	12	12	 SIZE 300x300	
5	IP-5	12	12	 SIZE 350x350	
6	IP-6	16	16	 SIZE 400x400	
7	IP-7	12	12	 SIZE 150x250	

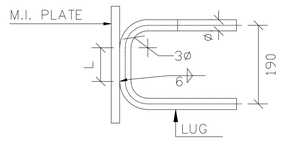
SQUARE/RECTANGULAR METAL INSERT PLATES

S.NO.	TYPE OF INSERT PLATE	DIA. OF LUGS (mm)ø	THK. OF INSERT PLATE	DETAILS OF INSERT PLATE	
				PLAN	CROSS SECTION
8	IP-8	12	12	 SIZE 250x300	
9	IP-9	12	12	 SIZE 250x500	
10	IP-10	16	16	 SIZE 250x500	
11	IP-11	16	16	 SIZE 300x600	
12	IP-12	16	16	 SIZE 350x600	

STANDARD INSERT PLATE DETAILS



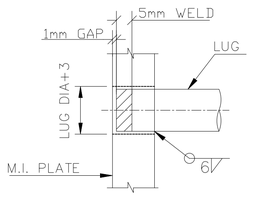
TYP METAL INSERT DETAIL ON TOP OF SLAB



ø = DIA OF LUG
L = WELD LENGTH AVAILABLE
L = (190−7ø)

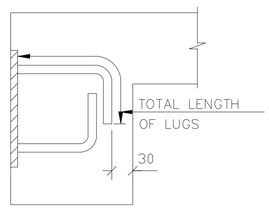
BENDING DIMENSION FOR 12ø&16ø LUGS

(FOR SPACING OF LUGS > 190)

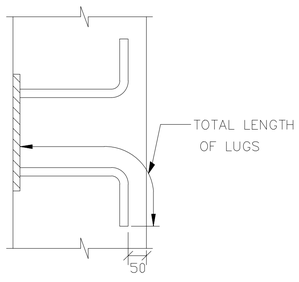


WELD DETAIL OF 12ø&16ø LUGS WITH METAL INSERT PLATE

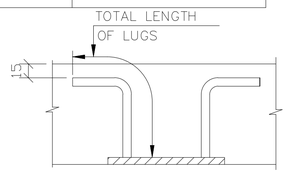
(FOR SPACING OF LUGS < 190)



TYP METAL INSERT DETAIL ON SIDE OF BEAM



TYP METAL INSERT DETAIL ON SIDE OF COLUMNS



TYP METAL INSERT DETAIL ON BOTTOM OF SLAB

NOTES: −

1. FOR GENERAL NOTES ON CONCRETE WORK REFER DRG. NO. 080557C−000−DW−1702−001.
2. METAL INSERT PLATES SHALL BE MARKED ON DRAWING AS UNDER:
   IP−(A) @ (C)
   IP = INSERT PLATE
   A = TYPE OF INSERT PLATE
   C = ELEVATION OF INSERT PLATE (TOP OF PLATE)
3. METAL INSERT PLATES SHALL BE KEPT FLUSH WITH CONCRETE SURFACE.
4. THE LONGER SIDE OF THE METAL INSERT PLATE SHALL BE KEPT VERTICAL UNLESS SHOWN OTHERWISE.
5. METAL INSERT PLATE ON COLUMN OR BEAM SHALL BE KEPT SYMMETRICAL ABOUT ℄ OF COLUMN OR BEAM, UNLESS SHOWN OTHERWISE.
6. METAL INSERT PLATE SHALL BE 12 MM OR 16 MM
7. ALL LUGS SHALL BE OF 12ø OR 16ø MS BARS CONFORMING TO IS:432 AND SHALL ATTACH TO METAL INSERT PLATE BY 6MM.
   FILLET WELDS AS SHOWN IN SKETCHES U.N.O.

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)	DOCUMENT REVIEW STATUS (BY CLIENT)
☐ APPROVAL ☐ REVIEW ☒ INFORMATION	

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

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TITLE

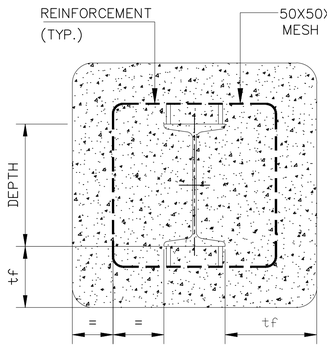
STANDARD INSERT PLATE

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	002	1 OF 1	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

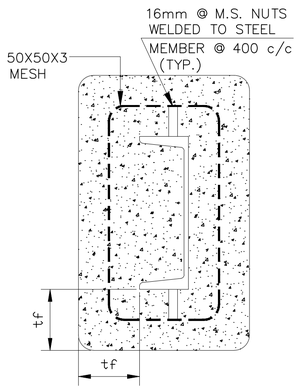
CAD FILE NAME : 080557C-000-STC-1790-002_001_A.DXF

SHEET SIZE : A3

FIRE PROOFING TO STEEL BEAMS

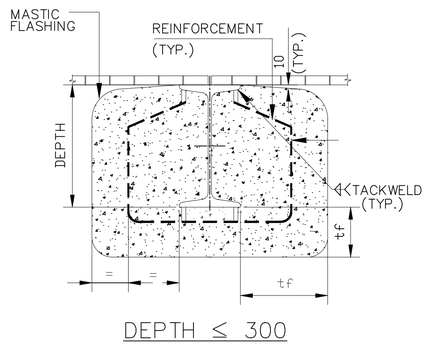


DEPTH ≤ 300
(FOR ISMB)

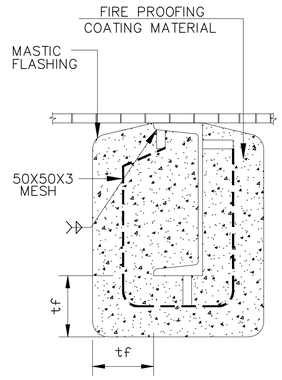


DEPTH ≤ 300
(FOR ISMC)

FOR TIE BEAMS



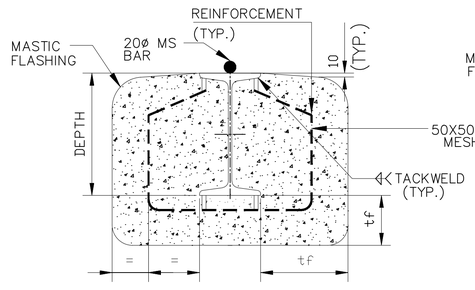
DEPTH ≤ 300



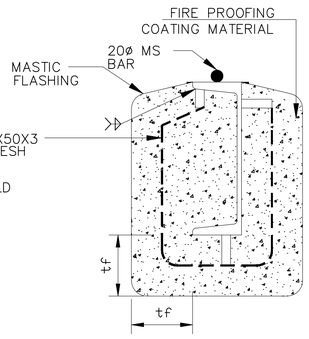
DEPTH ≤ 300

BEAMS SUPPORTING GRATING

STEEL SECTION UP TO 300mm DEEP

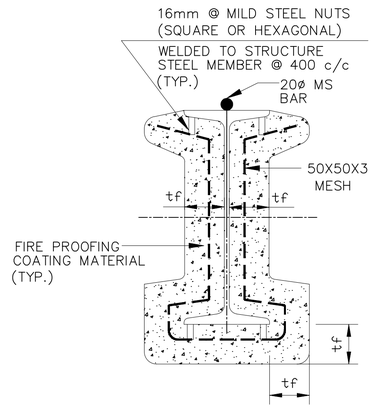


DEPTH ≤ 300

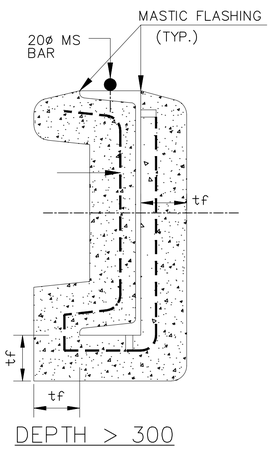


DEPTH ≤ 300

BEAMS SUPPORTING PIPES

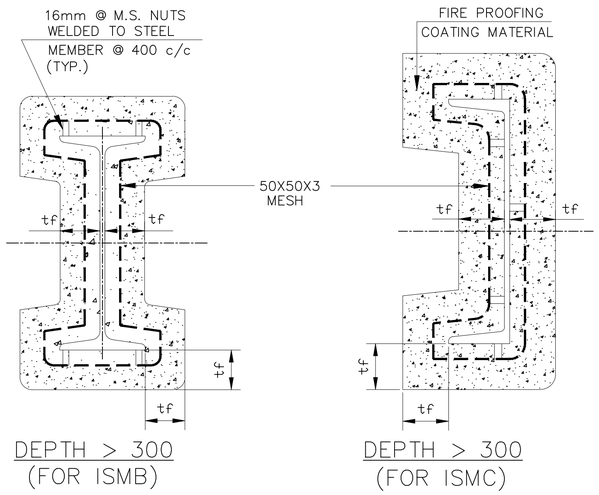


DEPTH > 300



DEPTH > 300

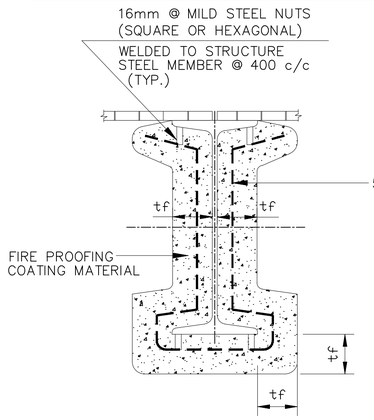
BEAMS SUPPORTING PIPES



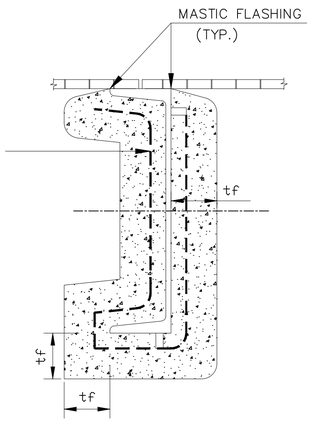
DEPTH > 300
(FOR ISMB)

DEPTH > 300
(FOR ISMC)

SECTION WITHOUT FLANGE PLATE



DEPTH > 300



DEPTH > 300

BEAMS SUPPORTING GRATING

STEEL SECTION > 300mm DEEP

NOTES: –

1. FIRE PROOFING SHALL BE AVERAGE. 30 MM THICK VERMICULITE CEMENTITIOUS COATING AS PER MANUFACTURER'S SPECIFICATION.
2. FOR DETAILS OF FIRE PROOFING, REFER DOC. NO. 080557C–000–JSS–1800–003.
   ENGINEERING SPECIFICATION FOR FIRE PROOFING OF STEEL STRUCTURES.
3. tf = THICKNESS OF FIREPROOFING ≈AVERAGE 38mm

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DOCUMENT CATEGORY (USE " X " MARK)	DOCUMENT REVIEW STATUS (BY CLIENT)
☐ APPROVAL ☐ REVIEW ☒ INFORMATION	

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

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TITLE

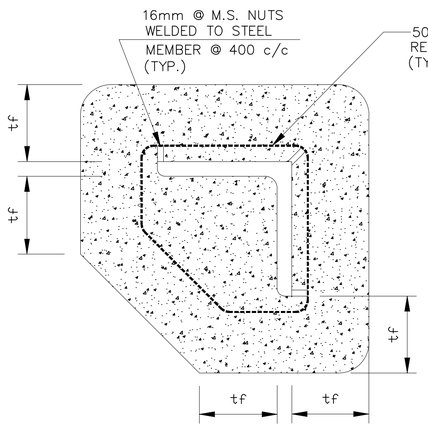
FIRE PROOFING OF STEEL STRUCTURES

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	003	1 OF 5	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

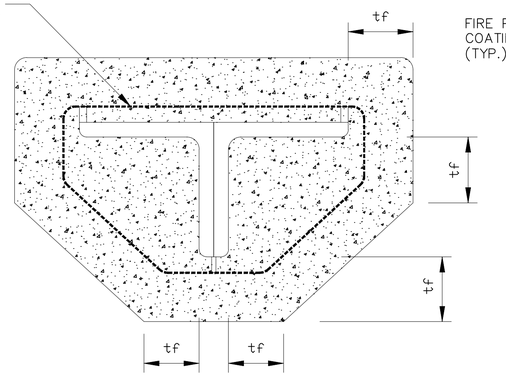
CAD FILE NAME : 080557C-000-STC-1790-003_001_A.DXF

SHEET SIZE : A3

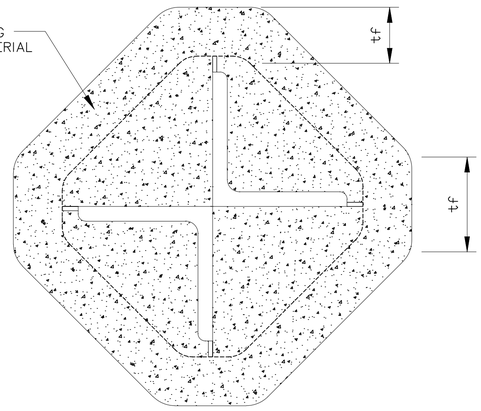
FIRE PROOFING TO VERTICAL & HORIZONTAL BRACINGS



FIREPROOFING
DETAIL FOR SINGLE ANGLE

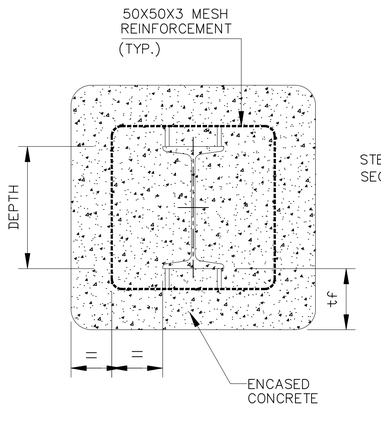


FIREPROOFING
DETAIL FOR DOUBLE ANGLE

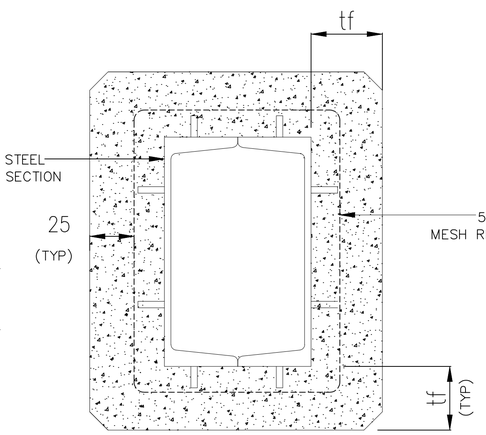


FIREPROOFING
DETAIL FOR STAR SECTION

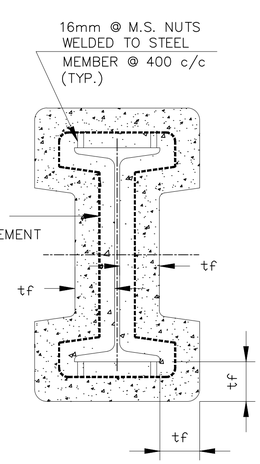
FIRE PROOFING TO COLUMNS



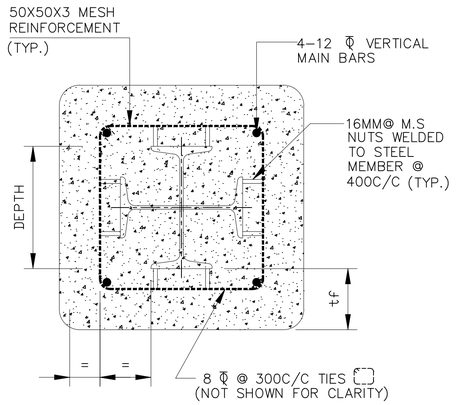
DEPTH ≤ 300
(FOR ISMB)



SECTION WITH
CHANNEL BOX



DEPTH > 300
(FOR ISMB)



FOR STAR COLUMNS

STEEL SECTION OVER 300MM DEEP

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A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)
- ☐ APPROVAL
- ☐ REVIEW
- ☒ INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT
STANDBY SRU & ADDITIONAL TANKS
IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER
INDIAN OIL CORPORATION LTD.

PMC
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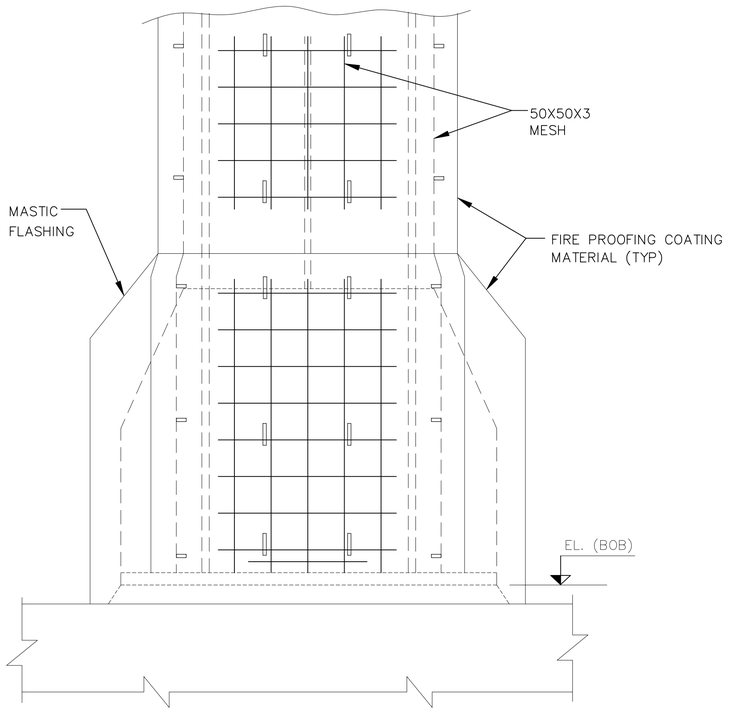
TITLE
FIRE PROOFING OF STEEL STRUCTURES

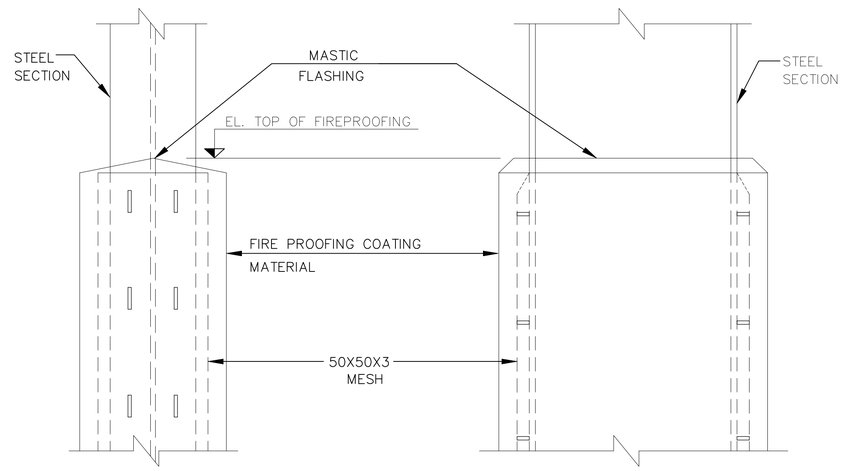
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	003	2 OF 5	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1790-003_002_A.DXF

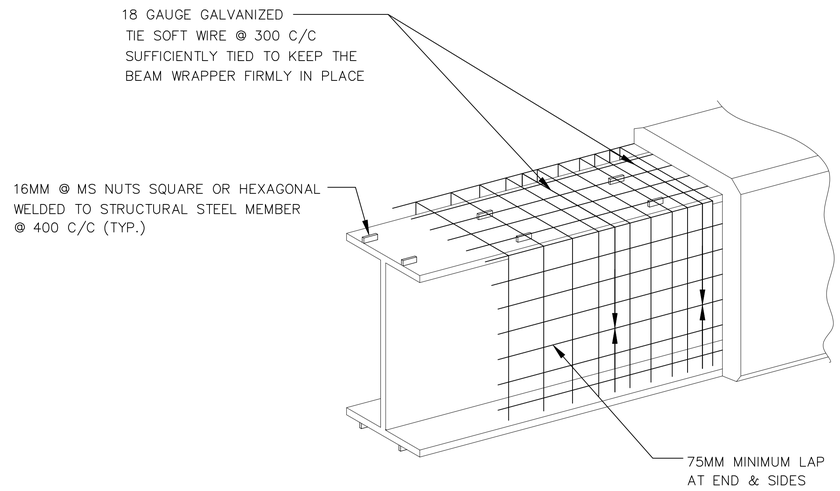
SHEET SIZE : A3



FIREPROOFING TO BASE PLATE AREA



FIREPROOFING AT TOP OF COLUMNS



TYPICAL METHOD OF APPLYING BEAM WRAPPER

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

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☐ APPROVAL ☐ REVIEW ☒ INFORMATION	

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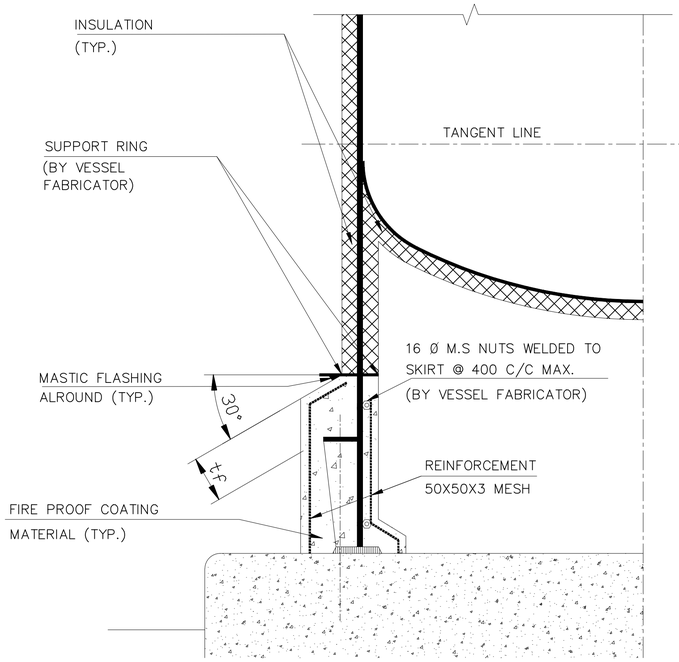
TITLE

FIRE PROOFING OF STEEL STRUCTURES

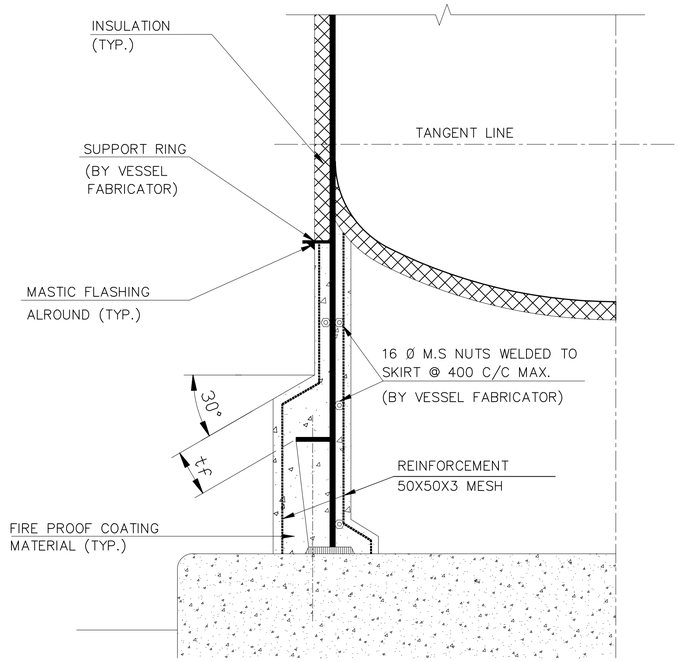
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	003	3 OF 5	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1790-003_003_A.DXF

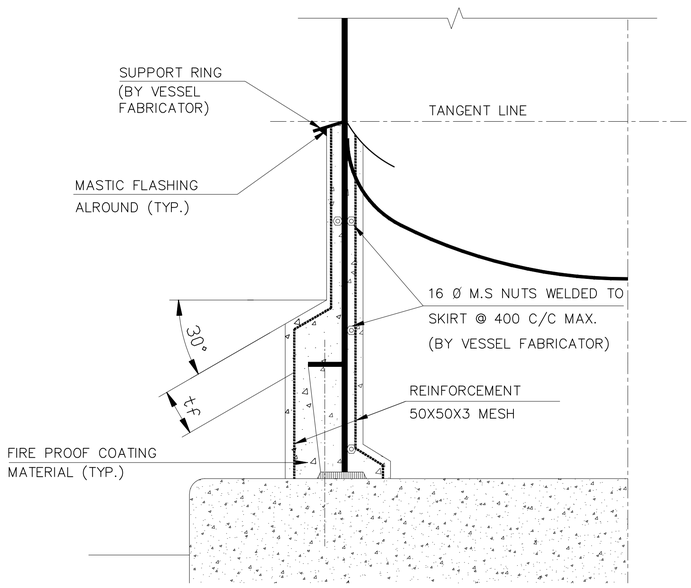
SHEET SIZE : A3



TYPE–A (INSULATED VESSEL)



TYPE–B (INSULATED VESSEL)



TYPE–C (UNINSULATED VESSEL)

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY

(USE " X " MARK)

- ☐ APPROVAL
- ☐ REVIEW
- ☒ INFORMATION

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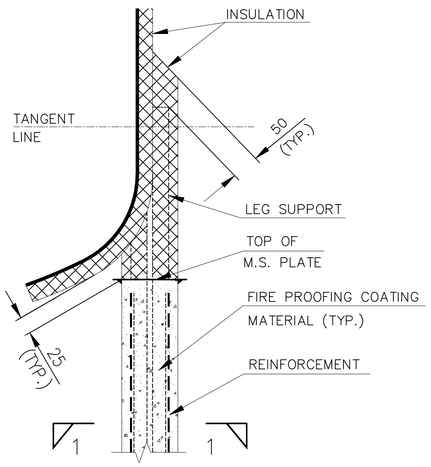
TITLE

FIRE PROOFING OF STEEL STRUCTURES

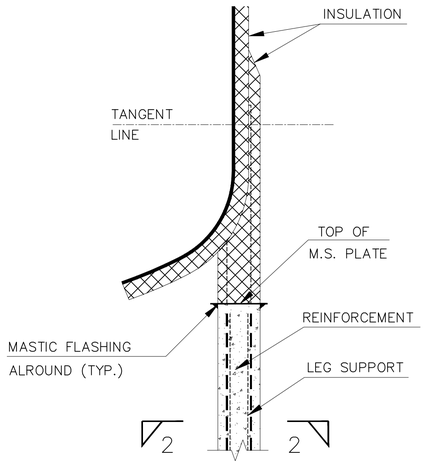
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	003	4 OF 5	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1790-003_004_A.DXF

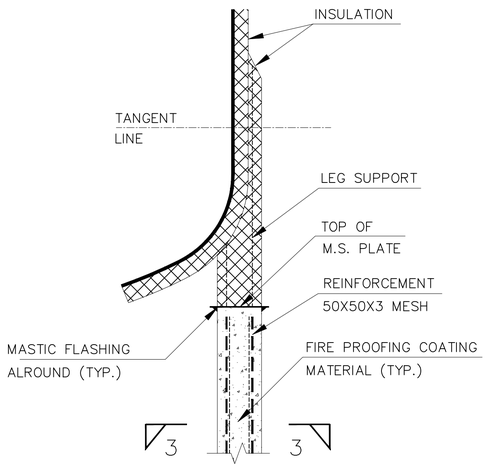
SHEET SIZE : A3



R.S.JOIST (ISMB) LEG



ANGLE (ISA) LEG



PIPE LEG

INSULATED VESSEL WITH LEG SUPPORT

R.S.JOIST (ISMB) LEG

ANGLE (ISA) LEG

PIPE LEG

UNINSULATED VESSEL WITH LEG SUPPORT

SECTION 1–1

SECTION 2–2

SECTION 3–3

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
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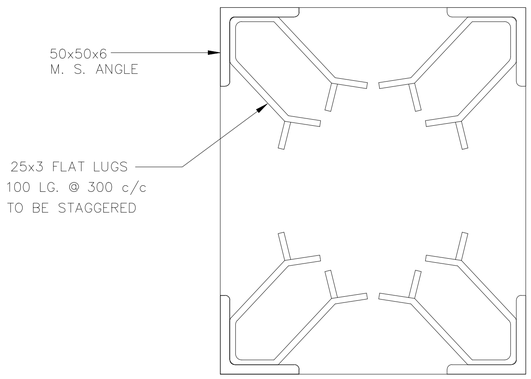
FIRE PROOFING OF STEEL STRUCTURES

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	003	5 OF 5	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

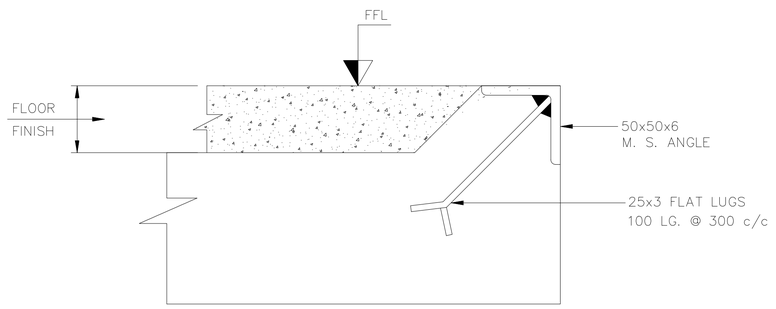
CAD FILE NAME : 080557C-000-STC-1790-003_005_A.DXF

SHEET SIZE : A3



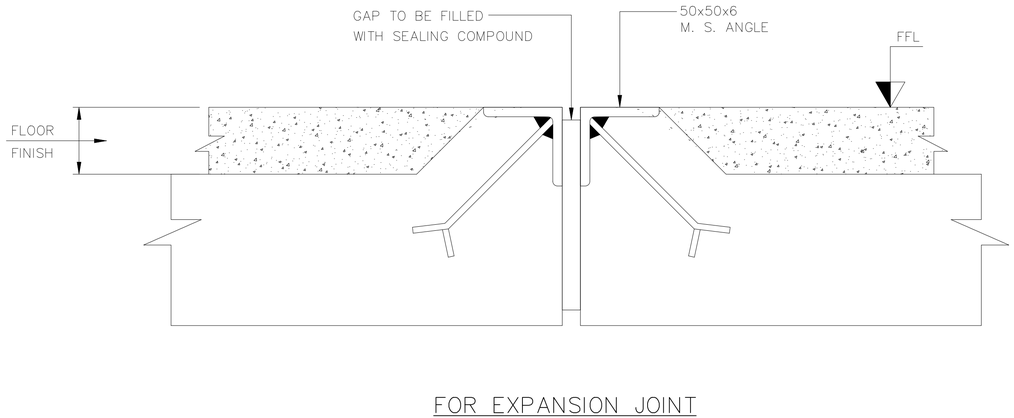
TYPE–I

FOR COLUMN

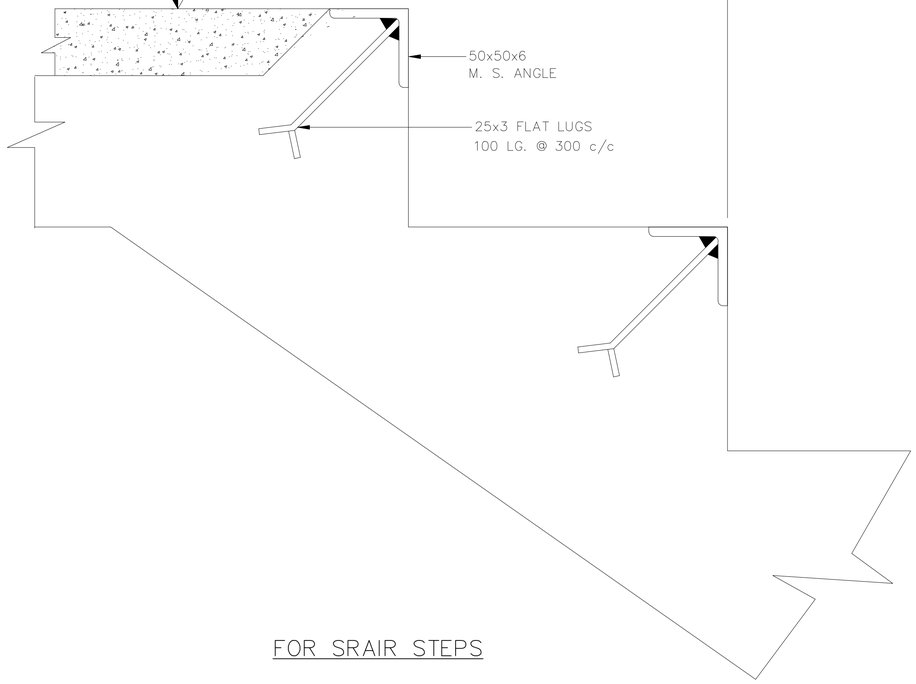


TYPE–II

FOR SLAB



FOR EXPANSION JOINT



FOR SRAIR STEPS

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)

- [ ] APPROVAL
- [ ] REVIEW
- [x] INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT

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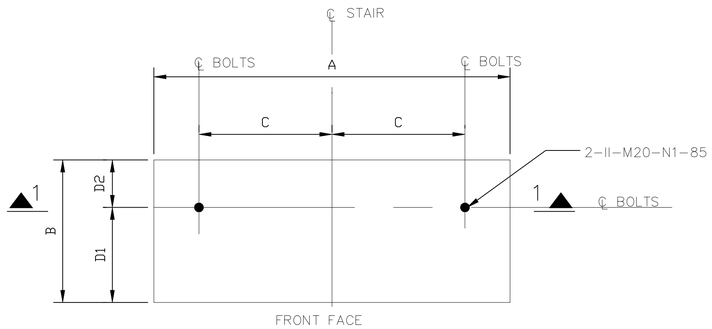
TITLE

STANDARD EDGE PROTECTION

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	004	1 OF 1	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1790-004_001_A.DXF

SHEET SIZE : A3



PLAN

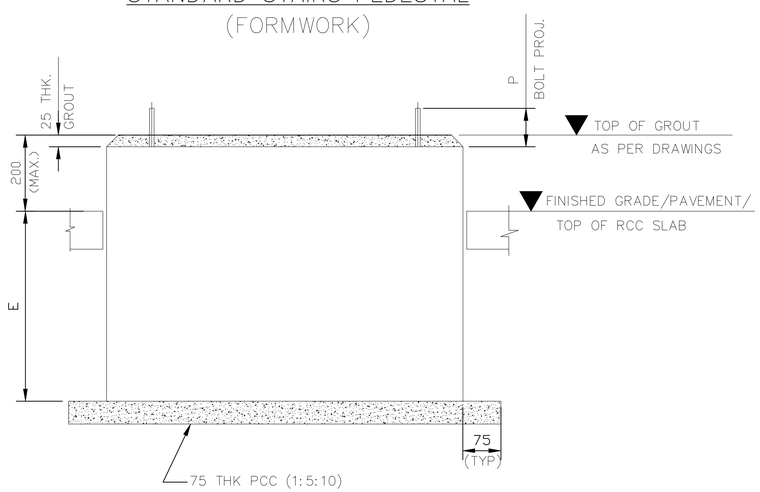
STANDARD STAIRS PEDESTAL

(FORMWORK)

SL. No.	ITEM	WIDTH	A	B	C	D1	D2	E	BOLT DIA	NUT	CONCRETE GRADE
1.	STAIR	750	1150	400	440	275	125	500 MIN	20	SINGLE	M30
2.	STAIR	900	1300	400	515	275	125	500 MIN	20	SINGLE	M30

TABLE–1

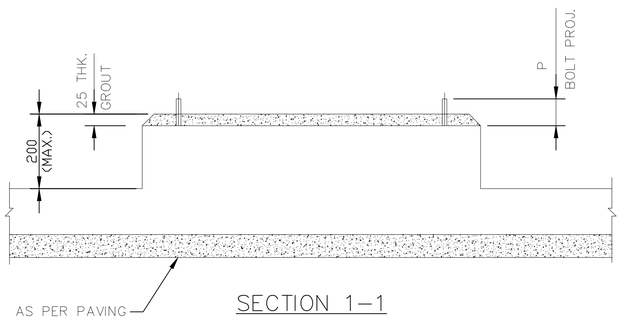
PEDESTAL FOR STAIR



SECTION 1–1

(UNPAVED AREAS)

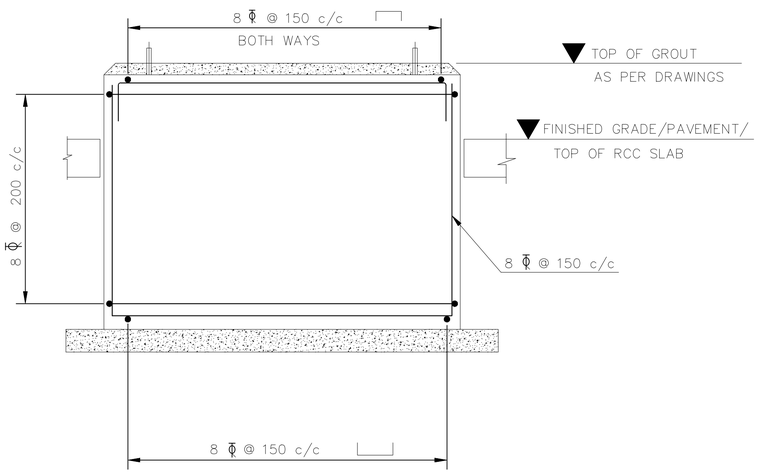
(FORMWORK)



SECTION 1–1

(PAVED AREAS)

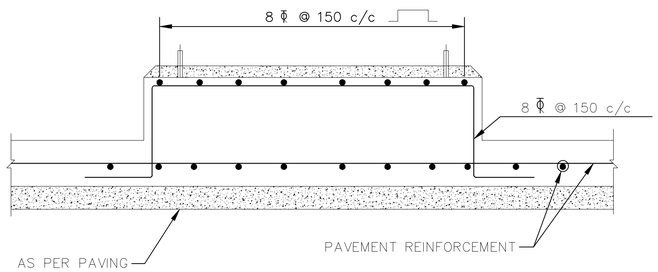
(FORMWORK)



SECTION 1–1

(UNPAVED AREAS)

(REINFORCEMENT)



SECTION 1–1

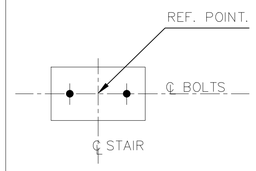
(PAVED AREAS)

(REINFORCEMENT)

NOTES:

1. ALL DIMENSIONS ARE IN mm & LEVELS IN METRES
2. DETAILS SHOWN IN THIS DRAWING SHALL BE FOLLOWED UNLESS OTHERWISE SPECIFICALLY SHOWN IN CONSTRUCTION DRAWING
3. ALL CONRETE WORK SHALL CONFORM TO IS:456, M30 GRADE OF CONCRETE SHALL BE USED.(U.N.O.)
4. Φ DENOTES HIGH YIELD DEFORMED BARS CONFORMING TO IS:1786.

REPRESENTATION ON AREA DRAWING



Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)	DOCUMENT REVIEW STATUS (BY CLIENT)
☐ APPROVAL ☐ REVIEW ☒ INFORMATION	

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

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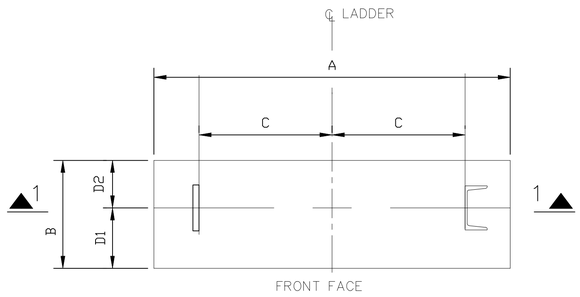
TITLE

STANDARD DETAIL OF PEDESTAL FOR STAIR

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	005	1 OF 2	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1790-005_001_A.DXF

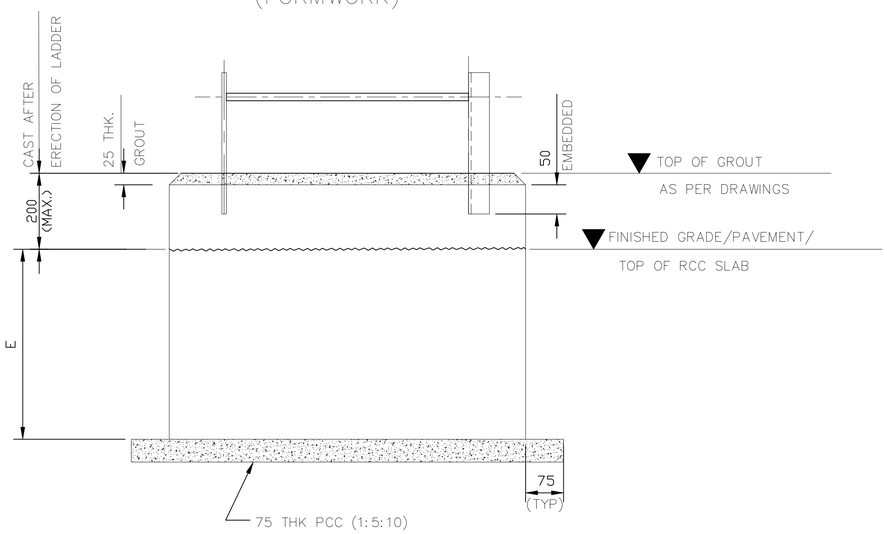
SHEET SIZE : A3



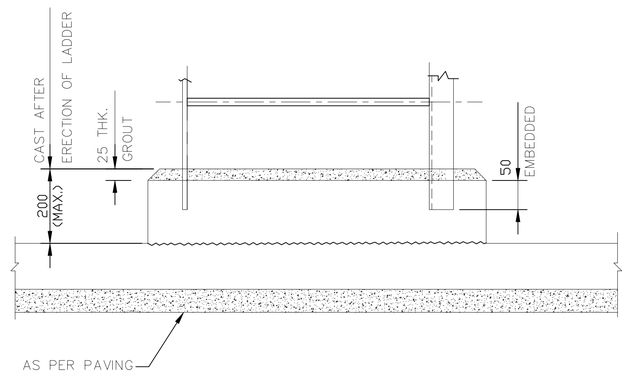
PLAN
STANDARD LADDER PEDESTAL
(FORMWORK)

SL. No.	ITEM	WIDTH	A	B	C	D1	D2	E	CONCRETE GRADE
1.	LADDER	450	700	200	225	100	100	300 MIN	M30

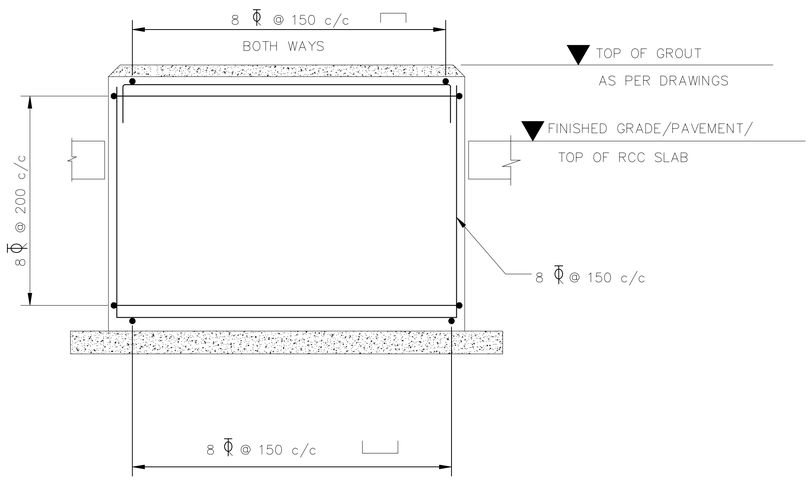
TABLE–1
PEDESTAL FOR LADDER



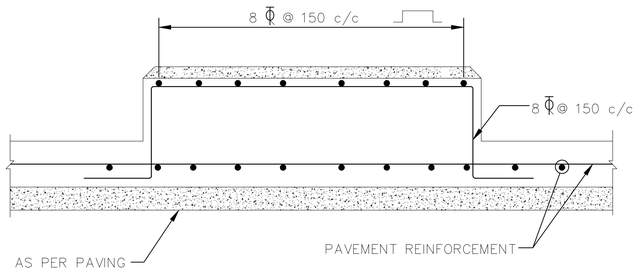
SECTION 1–1
(UNPAVED AREAS)
(FORMWORK)



SECTION 1–1
(PAVED AREAS)
(FORMWORK)



SECTION 1–1
(UNPAVED AREAS)
(REINFORCEMENT)

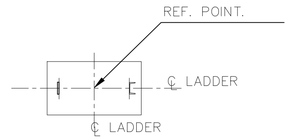


SECTION 1–1
(PAVED AREAS)
(REINFORCEMENT)

NOTES:

1. ALL DIMENSIONS ARE IN mm & LEVELS IN METRES
2. DETAILS SHOWN IN THIS DRAWING SHALL BE FOLLOWED UNLESS OTHERWISE SPECIFICALLY SHOWN IN CONSTRUCTION DRAWING
3. ALL CONCRETE WORK SHALL CONFORM TO IS:456, M30 GRADE OF CONCRETE SHALL BE USED.(U.N.O.)
4. Φ DENOTES HIGH YIELD DEFORMED BARS CONFORMING TO IS:1786.

REPRESENTATION ON AREA DRAWING



Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
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DOCUMENT CATEGORY (USE " X " MARK)	DOCUMENT REVIEW STATUS (BY CLIENT)
☐ APPROVAL ☐ REVIEW ☒ INFORMATION	

PROJECT
STANDBY SRU & ADDITIONAL TANKS
IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER
INDIAN OIL CORPORATION LTD.

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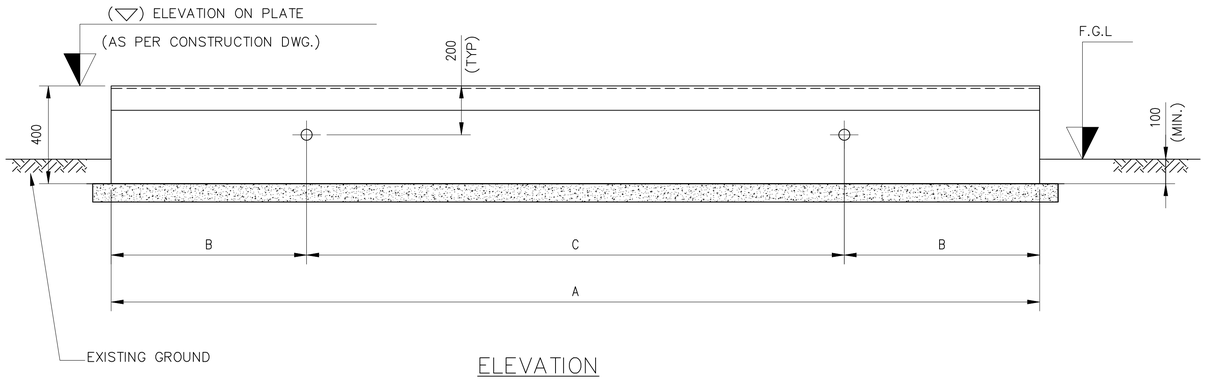
TITLE
STANDARD DETAIL OF PEDESTAL FOR LADDER

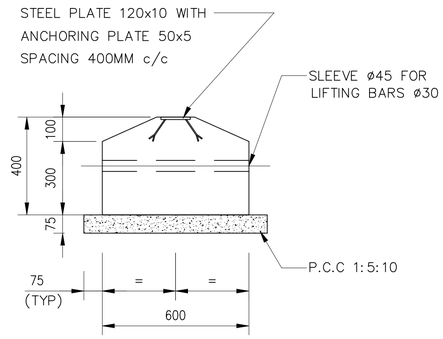
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	005	2 OF 2	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1790-005_002_A.DXF

SHEET SIZE : A3

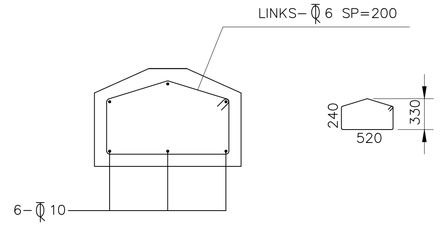


ELEVATION

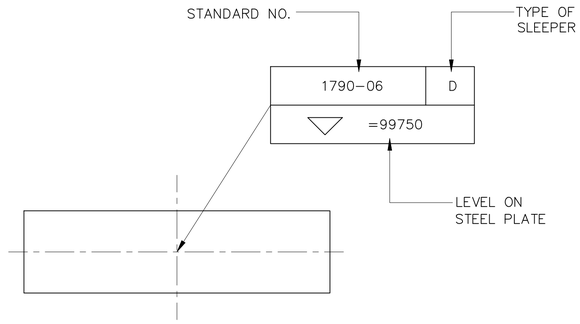


SECTION

TYPE	DIMENSIONS				TAKE–OFF	
	A	B	C	WEIGHT	CONCRETE	RE–BARS
A	500	150	200	267 kg	0.107 m^3	1.5 kg
B	1000	200	600	535 kg	0.214 m^3	3.1 kg
C	1500	300	900	803 kg	0.321 m^3	4.7 kg
D	2000	450	1100	1070 kg	0.428 m^3	6.2 kg
E	3000	650	1700	1605 kg	0.642 m^3	9.3 kg
F	4000	800	2400	2140 kg	0.856 m^3	12.4 kg
G	5000	1000	3000	2675 kg	1.070 m^3	15.5 kg
H	5500	1250	3000	2942 kg	1.177 m^3	17.0 kg
J	6000	1250	3500	3210 kg	1.284 m^3	18.5 kg
K	2500	500	1500	1337 kg	0.535 m^3	7.7 kg



REINFORCEMENT



REPRESENTATION ON SITE DWG.

NOTES:

1. ALL DIMENSIONS ARE IN mm
2. DETAILS SHOWN IN THIS DRAWING SHALL BE FOLLOWED UNLESS OTHERWISE SPECIFICALLY SHOWN IN CONSTRUCTION DRAWING
3. ALL CONRETE WORK SHALL CONFORM TO IS:456, M30 GRADE OF CONCRETE SHALL BE USED.(U.N.O.)
4. Ø DENOTES HIGH YIELD DEFORMED BARS CONFORMING TO IS:1786.

LEGEND

H.P.P – HIGHEST PAVEMENT POINT

SP – SPACING

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)

- [ ] APPROVAL
- [ ] REVIEW
- [x] INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

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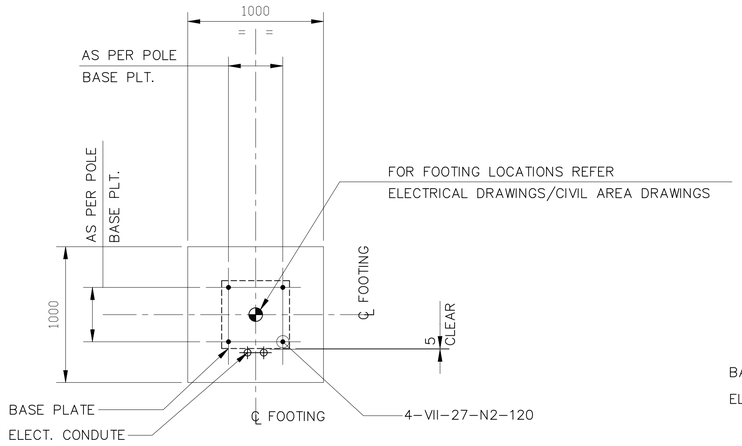
TITLE

STANDARD PRECAST SLEEPERS

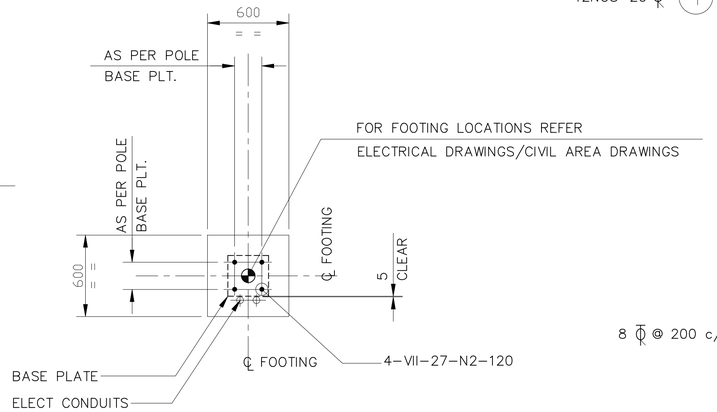
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	006	1 OF 1	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1790-006_001_A.DXF

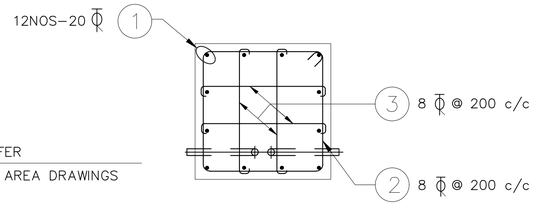
SHEET SIZE : A3



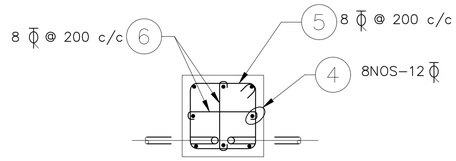
VIEW A–A



VIEW C–C



SECTION B–B



SECTION D–D

LIGHTPOLE FOUNDATION TYPE–1

FOUNDATION FOR 15m HIGH LIGHT POLE

LIGHTPOLE FOUNDATION TYPE–2

FOUNDATION FOR 8m HIGH LIGHT POLE

NOTES:

1. ALL DIMENSIONS ARE IN mm
2. DETAILS SHOWN IN THIS DRAWING SHALL BE FOLLOWED UNLESS OTHERWISE SPECIFICALLY SHOWN IN CONSTRUCTION DRAWING
3. ALL CONRETE WORK SHALL CONFORM TO IS: 456, M30 GRADE OF CONCRETE SHALL BE USED.(U.N.O.)
4. ϕ DENOTES HIGH YIELD DEFORMED BARS CONFORMING TO IS: 1786.

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY	DOCUMENT REVIEW STATUS (BY CLIENT)
(USE " X " MARK) ☐ APPROVAL ☐ REVIEW ☒ INFORMATION	

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

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TITLE

STANDARD FOR LIGHTING POLE FOUNDATION

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1790	007	1 OF 1	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

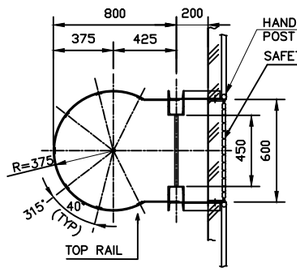
CAD FILE NAME : 080557C-000-STC-1790-007_001_A.DXF

SHEET SIZE : A3

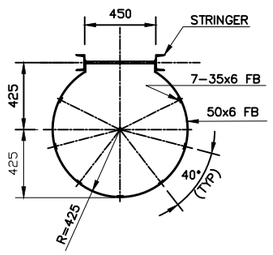
CONSTRUCTION STANDARD FOR STEEL WORKS

			Written By	Checked By	Approved By	Authorized By
B	10.06.2020	ISSUED FOR DESIGN	TUN	KRK	JP / KC	JMC
A	16.10.2019	ISSUED FOR DESIGN	TUN	KRK	JP / KC	JMC
REV.	**DATE**	**DESCRIPTION**	**PREPARED**	**CHECKED**	**APPROVED**	**AUTHORIZED**

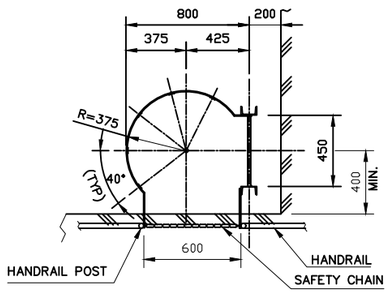
SL. NO.	DRAWING NO.	DESCRIPTION	REV.	DATE	REMARKS
01	080557C -000-STC-1890-001 SHT. 1/2 TO 2/2	STANDARD LADDER DETAILS	A	16.10.2019	2 SHEETS
02	080557C -000-STC-1890-002 SHT. 1/3 TO 3/3	STANDARD HANDRAIL DETAILS	A	16.10.2019	3 SHEETS
03	080557C -000-STC-1890-003 SHT. 1/2 TO 2/2	STANDARD STAIRCASE DETAILS	A	16.10.2019	2 SHEETS
04	080557C -000-STC-1890-004 SHT. 1/3 TO 3/3	STANDARD GRATING & CHEQUERED PLATE FLOORING DETAILS	A	16.10.2019	3 SHEETS
05	080557C -000-STC-1890-005 SHT. 1/6	TYPICAL DETAIL OF MOMENT CONNECTION WITH COLUMN TO BEAM	B	10.06.2020	1 SHEET
06	080557C -000-STC-1890-005 SHT. 2/6	TYPICAL DETAIL OF MOMENT CONNECTION WITH COLUMN TO BEAM	B	10.06.2020	1 SHEET
07	080557C -000-STC-1890-005 SHT. 3/6	TYPICAL DETAIL OF MOMENT CONNECTION WITH BOX COLUMN TO BEAM	B	10.06.2020	1 SHEET
08	080557C -000-STC-1890-005 SHT. 4/6	TYPICAL DETAIL OF MOMENT CONNECTION WITH BOX COLUMN TO BEAM	B	10.06.2020	1 SHEET
09	080557C -000-STC-1890-005 SHT. 5/6	TYPICAL DETAIL OF MOMENT CONNECTION WITH BOX COLUMN TO BOX BEAM	B	10.06.2020	1 SHEET
10	080557C -000-STC-1890-005 SHT. 6/6	TYPICAL DETAIL OF MOMENT CONNECTION WITH BOX COLUMN TO BOX BEAM	B	10.06.2020	1 SHEET
11	080557C -000-STC-1890-006 SHT. 1/3	TYPICAL DETAIL OF SHEAR CONNECTION BEAM TO BEAM AND BEAM TO COLUMN	B	10.06.2020	1 SHEET
12	080557C -000-STC-1890-006 SHT. 2/3	TYPICAL DETAIL OF SHEAR CONNECTION BEAM TO BEAM	B	10.06.2020	1 SHEET
13	080557C -000-STC-1890-006 SHT. 3/3	TYPICAL DETAIL OF SHEAR CONNECTION BEAM TO BEAM AND BEAM TO COLUMN	A	16.10.2019	1 SHEET
14	080557C -000-STC-1890-007	TYPICAL SPLICE DETAIL OF COLUMNS / BEAMS	B	10.06.2020	1 SHEET
15	080557C -000-STC-1890-008 SHT. 1/2 TO 2/2	TYPICAL SPLICE DETAIL OF ANGLES	B	10.06.2020	2 SHEETS
16	080557C -000-STC-1890-009	TYPICAL SPLICE DETAIL OF CHANNELS	B	10.06.2020	1 SHEET
17	080557C -000-STC-1890-010	TYPICAL DETAIL OF WELD LENGTH FOR ANGLE MEMBERS	A	16.10.2019	1 SHEET



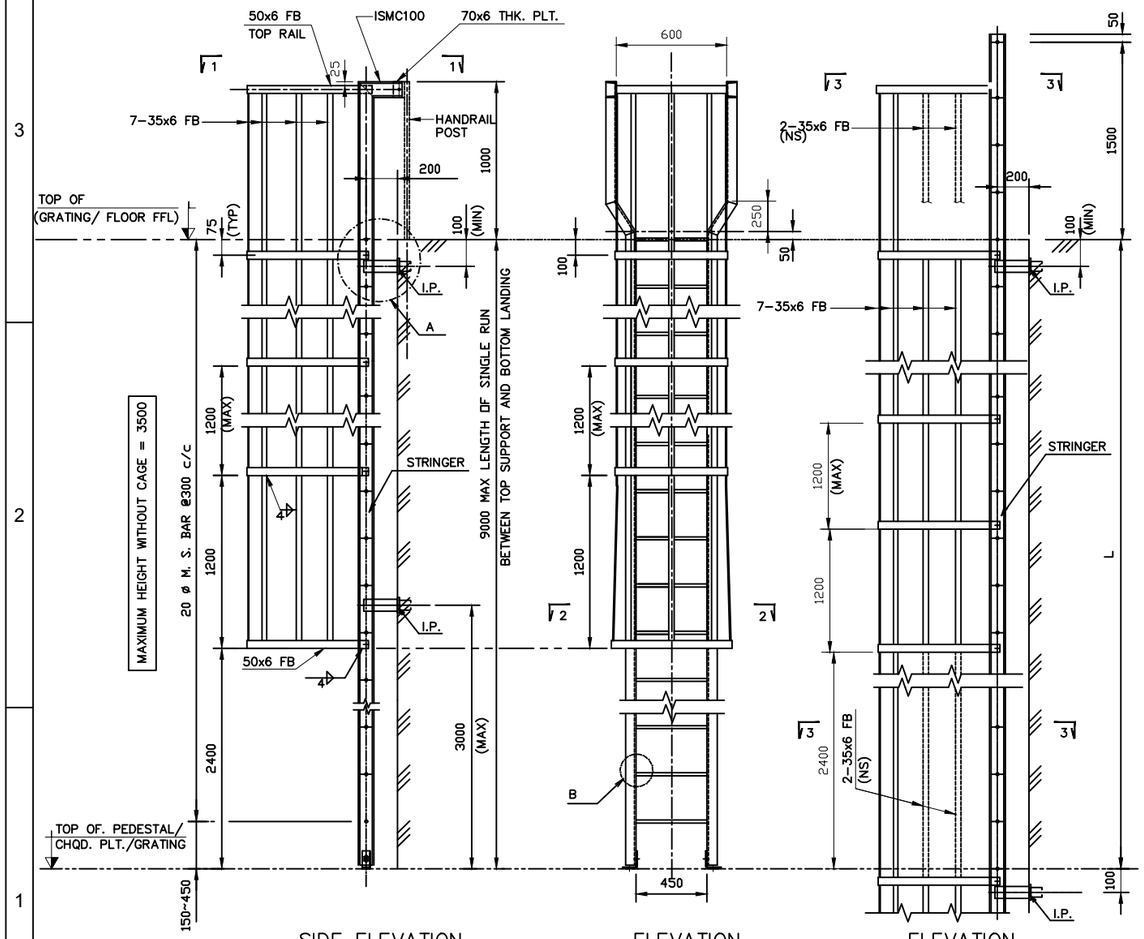
SECTION 1–1



SECTION 2–2



SECTION 3–3

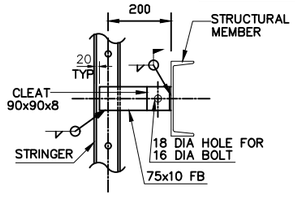


SIDE ELEVATION
FRONT ENTRANCE

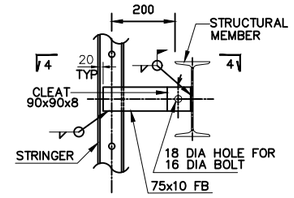
ELEVATION

ELEVATION
SIDE ENTRANCE

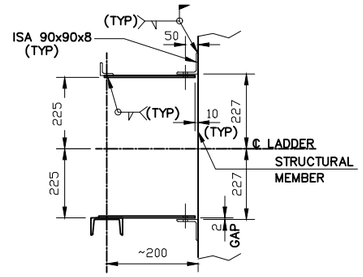
STRINGER	HEIGHT
L65x65x6	L= 5000 MAX
MC 100	L= 9000 MAX



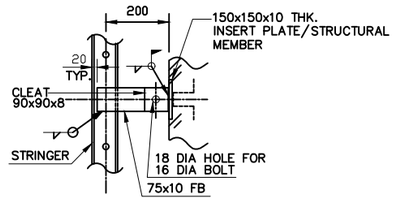
DETAIL–A
(FOR ISMC)



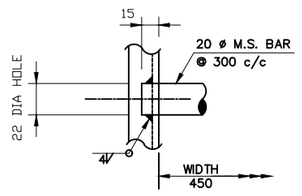
DETAIL–A
(FOR ISMB)



SECTION 4–4



DETAIL–A



DETAIL–B

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. ALL PROJECTING CUT EDGES ON LADDER AND CAGES SHALL BE ROUNDED TO SMOOTH FINISH.
3. WHERE REQUIREMENT IN AN ENGINEERING DRAWING ARE IN CONTRADICTION TO REQUIREMENTS IN STANDARD DRAWING, THE ENGINEERING DRAWING SHALL GOVERN.
4. LADDER SHALL BE GIVEN A SUITABLE SLOPE IF NECESSARY, TO AVOID FOULING WITH ANCHOR CHAIRS.

LEGEND

TOG ----- TOP OF GRATING
TOC ----- TOP OF CONCRETE
TOS ----- TOP OF STEEL
FFL ----- FINISHED FLOOR LEVEL
FB ----- FLAT BAR

Rev	DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)
- ☐ APPROVAL
- ☐ REVIEW
- ☒ INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT
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IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER
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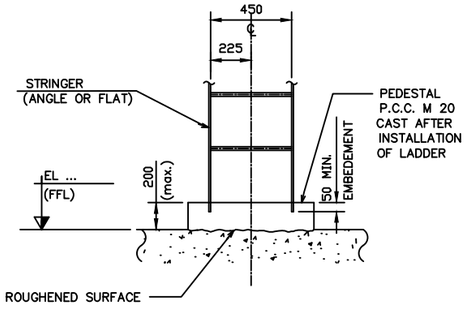
TITLE
STANDARD LADDER DETAILS

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	001	1 OF 2	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

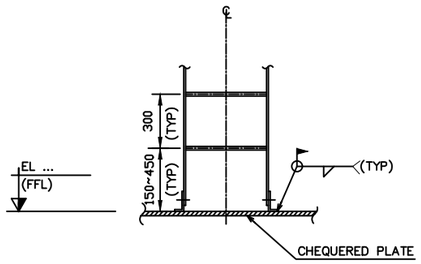
CAD FILE NAME : 080557C-000-STC-1890-001_1_A.DWG

SHEET SIZE : A3

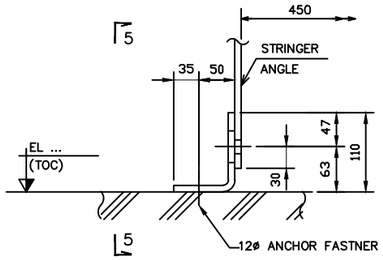
FIXING DETAIL OF LADDER BOTTOM



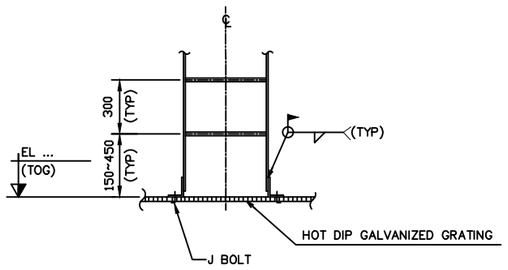
TYPE–I
FOR PEDESTAL



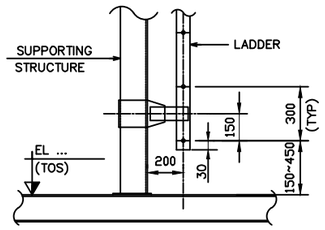
TYPE–II
CHEQUERED PLT. FLOOR



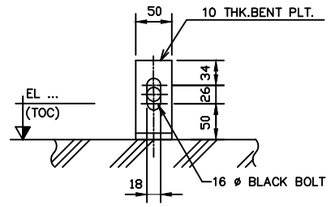
TYPE–III
FOR R.C. FLOOR



TYPE–IV
FOR GRATING FLOOR

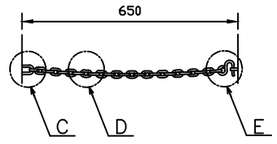


TYPE–V
FOR SUPER STRUCTURE WITH MEMBER

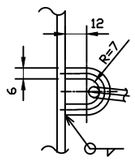


VIEW 5–5

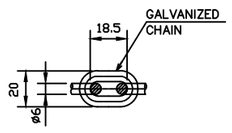
DETAIL OF SAFETY CHAIN



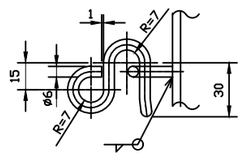
SAFETY CHAIN



DETAIL–C



DETAIL–D



DETAIL–E

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)	DOCUMENT REVIEW STATUS (BY CLIENT)
☐ APPROVAL ☐ REVIEW ☒ INFORMATION	

PROJECT
STANDBY SRU & ADDITIONAL TANKS
IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER
INDIAN OIL CORPORATION LTD.

PMC
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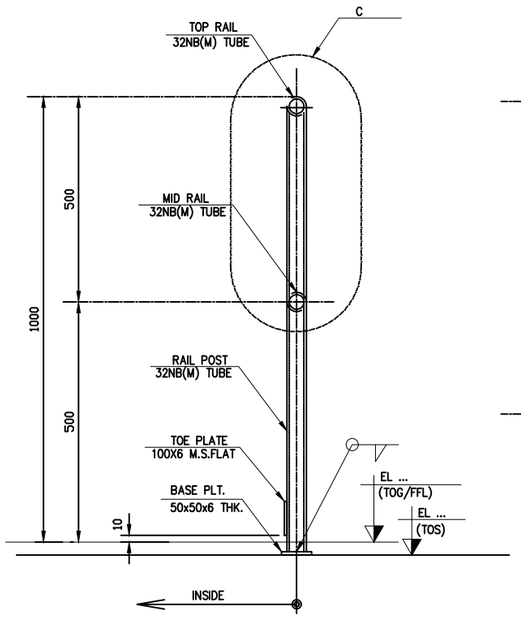
TITLE
STANDARD LADDER DETAILS

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	001	2 OF 2	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1890-001_2_A.DWG

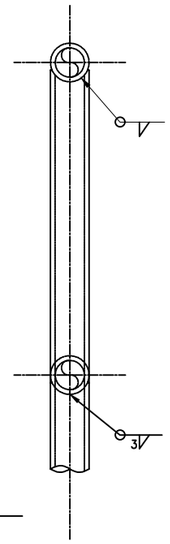
SHEET SIZE : A3

TYPICAL HANDRAIL DETAIL

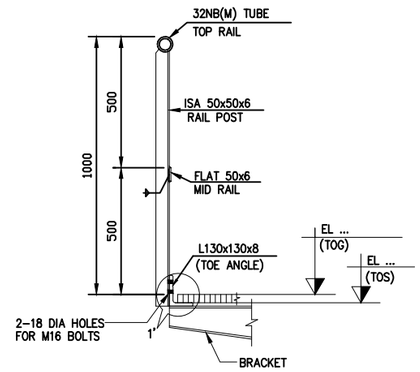


(TYPE-I)

(FOR WALKWAYS,PLATFORMS,STAIRS)

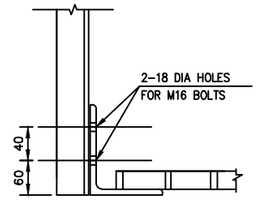


DETAIL-C



(TYPE-2)

(FOR PLATFORM AROUND CIRCULAR VESSELS)



DETAIL -1'

SCHEDULE OF MEMBERS	
SECTION	REMARKS
ISA 50X50X6	RAIL POST
32 NB(M) TUBE	TOP RAIL
FLAT 50X6	MID RAIL

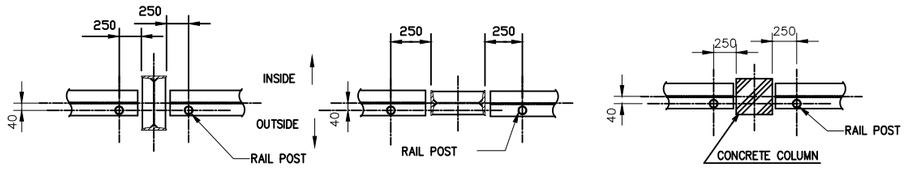
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS & LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
2. HANDRAIL SHALL BE PAINTED WITH APPROVED PAINT TYPE.
3. HANDRAIL SHALL BE PROVIDED FOR STAIRWAYS, PLATFORMS AND WALKWAYS ABOVE 1.00 M. FROM FGL OR FFL
4. HANDRAIL SHALL BE PROVIDED ALL AROUND FLOOR OPENINGS WHEN THE POSSIBILITY OF PERSONNEL FALLING THROUGH OPENING EXISTS.
5. MS TUBES FOR HANDRAIL SHALL BE USED, CONFORMING TO IS:1239
6. REMOVABLE HANDRAIL SHALL BE CLEARLY INDICATED ON DESIGN DRAWING
8. GRATING SHALL BE SUITABLY NOTCHED TO ACCOMMODATE THE TUBE IN CASE OF BEAM ISMC 100/125
9. ALL FILLET WELDS OF 3mm(MIN) THICKNESS SHALL BE CONTINUOUS UNLESS NOTED OTHERWISE
10. JOINTS IN HANDRAIL SHALL BE PROVIDED AT SUITABLE LOCATIONS, WELDED AND GROUND FLUSH.
11. ALL M.S. TUBES AND FITTINGS SHALL CONFORM TO IS:1239
12. BOTTOM 150 MM OF ALL UPRIGHT MEMBERS EMBEDDED IN CONCRETE SHALL BE CUT AND ENDS SPLAYED OUT.
13. FABRICATION OF TOP RAIL, INTERMEDIATE FLAT AND TOE PLATE SHALL ONLY BE STARTING AFTER TAKING ACTUAL DIMENSIONS AT SITE.
14. WHERE REQUIREMENT IN AN ENGINEERING DRAWING ARE IN CONTRADICTION TO REQUIREMENT IN STANDARD DRAWINGS, THE ENGINEERING DRAWING SHALL GOVERN.

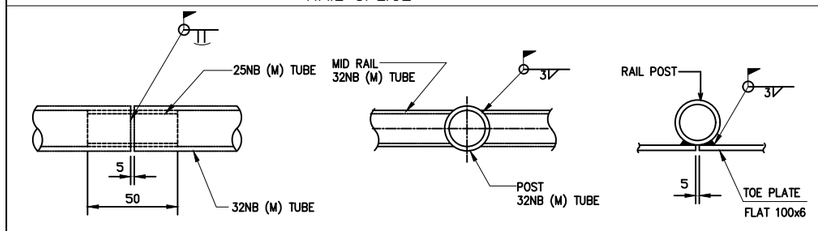
LEGEND

TOG ----- TOP OF GRATING
TOC ----- TOP OF CONCRETE
TOS ----- TOP OF STEEL
FFL ----- FINISHED FLOOR LEVEL

POST LOCATION NEAR STEEL/CONCRETE COLUMN

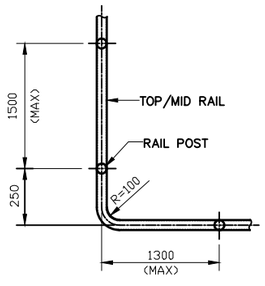


RAIL SPLICE

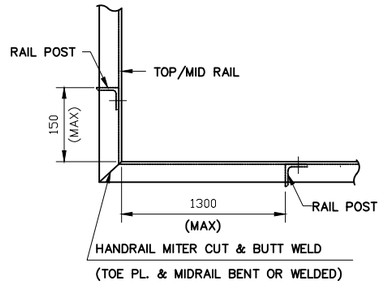


TOP RAIL (TUBE) | MID RAIL | TOE PLATE

CONNECTIONS AT CORNERS



PIPE RAILING



ANGLE RAILING

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)
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PROJECT
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IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER
INDIAN OIL CORPORATION LTD.

PMC
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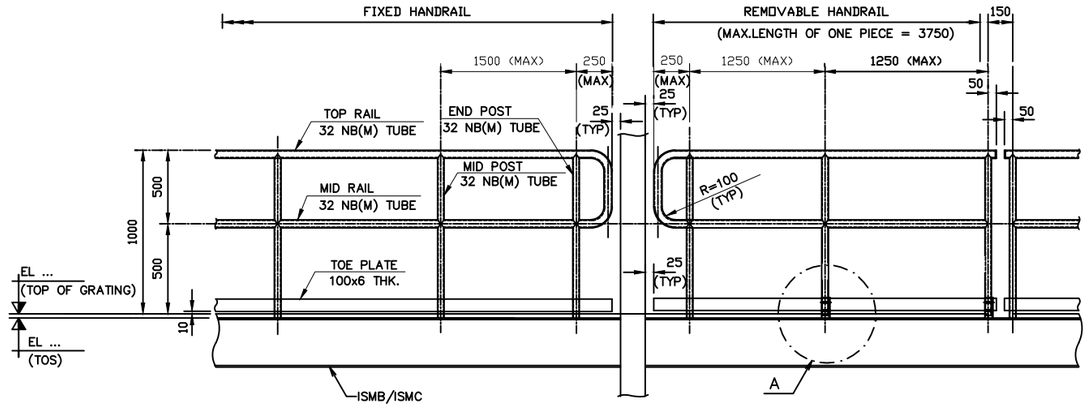
TITLE
STANDARD HANDRAIL DETAILS

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	002	1 OF 3	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

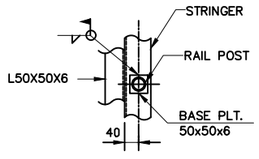
CAD FILE NAME : 080557C-000-STC-1890-002_1_A.DWG

SHEET SIZE : A3

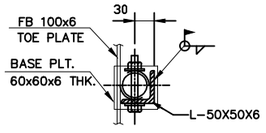
FIXED/REMOVABLE HANDRAIL ON STEEL FLOOR/WALKWAY



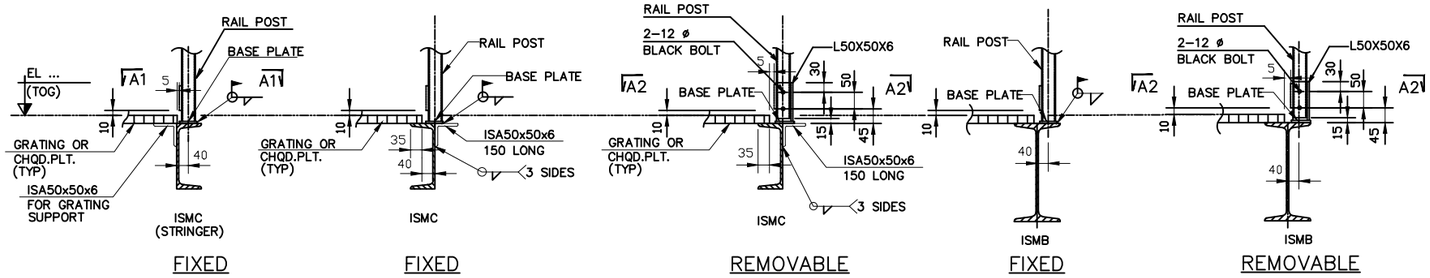
DETAIL–A



SECTION A1–A1



SECTION A2–A2



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DRAWING NO.						PAGE	REV.
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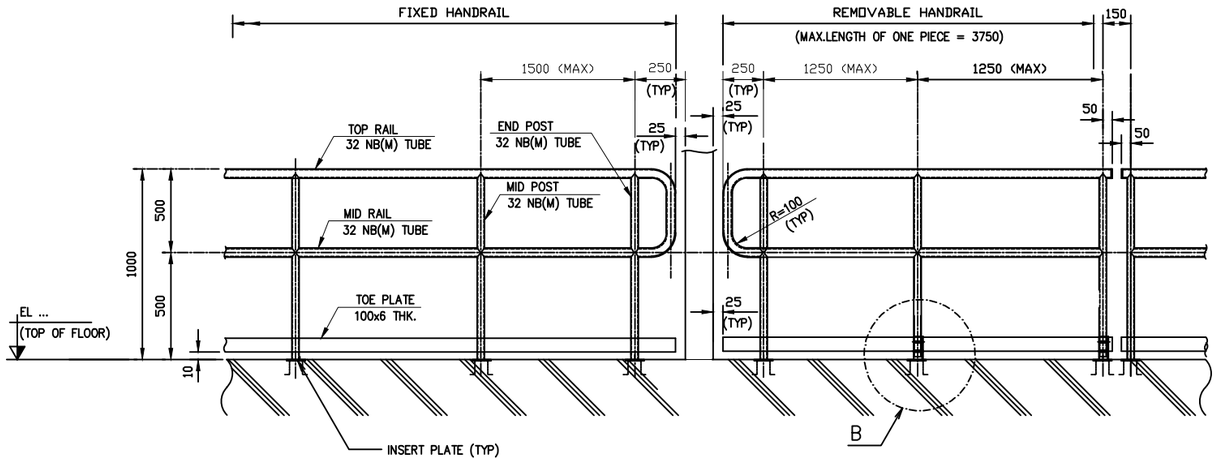
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

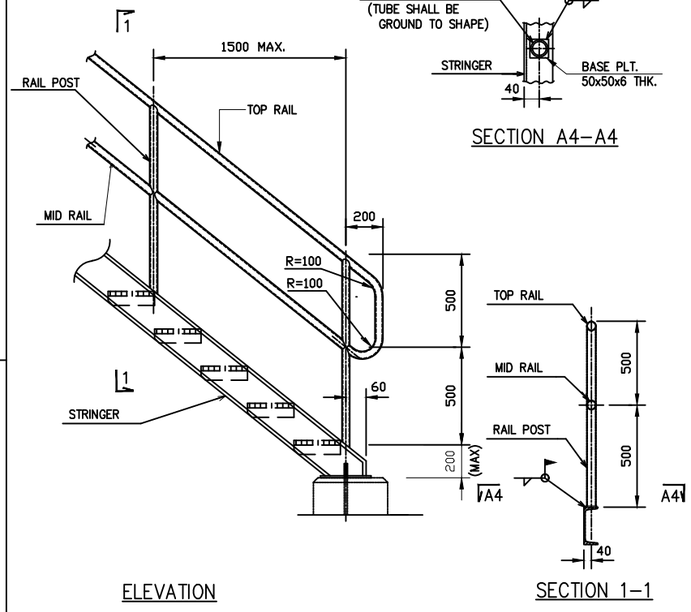
CAD FILE NAME : 080557C-000-STC-1890-002_2_A.DWG

SHEET SIZE : A3

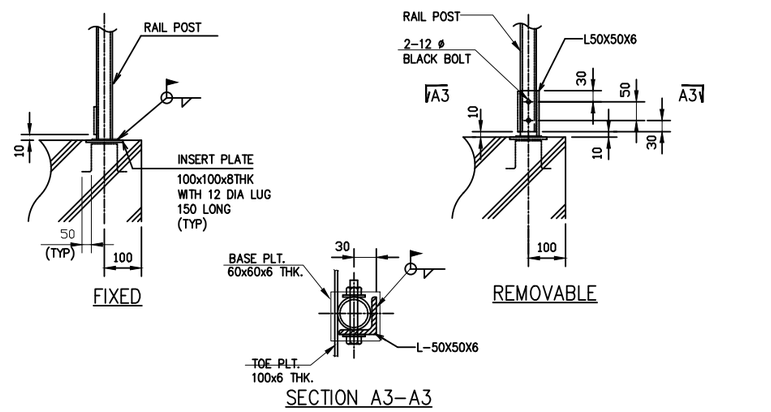
FIXED/REMOVABLE HANDRAIL ON CONCRETE FLOOR



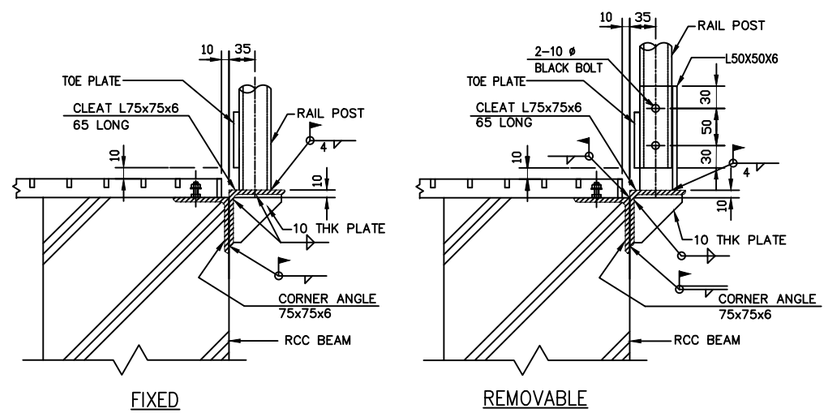
HANDRAIL ON STAIRWAY(STEEL STAIR)



DETAIL–B



TYPE–2



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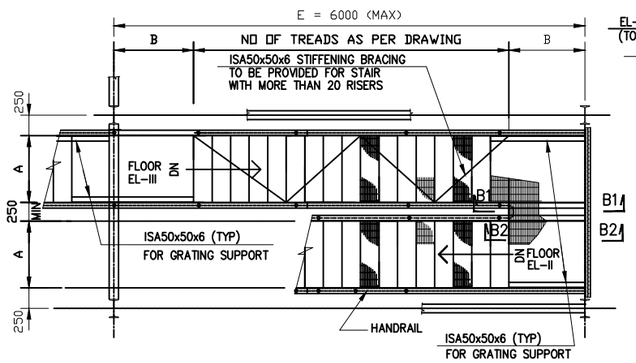
STANDARD HANDRAIL DETAILS

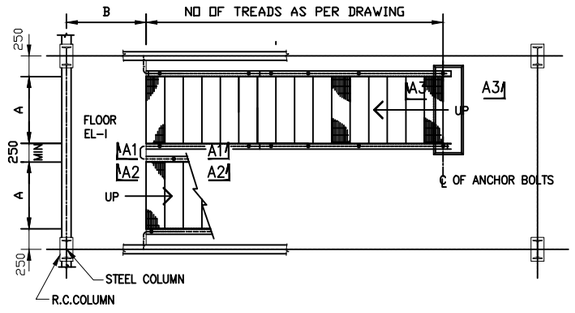
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	002	3 OF 3	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1890-002 3 A.DWG

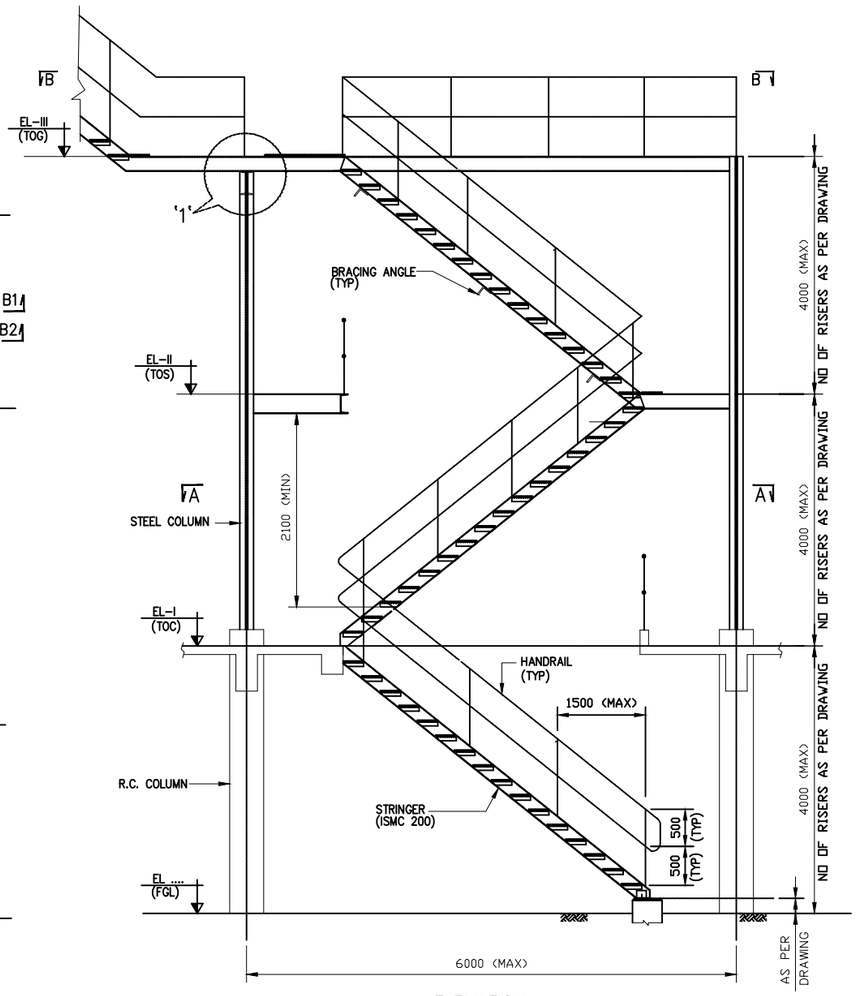
SHEET SIZE : A3



PLAN B–B



PLAN A–A



ELEVATION

TYPE	A	B (MIN)	TREAD	RISER	E (MAX)	STRINGER
1	900	800	250	185 ~200	6000	ISMC 200

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. ALL SHOP CONNECTIONS SHALL BE WELDED.
3. WHERE REQUIREMENT IN AN ENGINEERING DRAWING ARE IN CONTRADICTION TO REQUIREMENT IN STANDARD DRAWINGS, THE ENGINEERING DRAWING SHALL GOVERN.
4. a) BLACK BOLTS SHALL BE AS PER IS : 1367, GRADE 4.6
   b) HIGH TENSION BOLTS (H.T.BOLTS) SHALL BE AS PER IS : 1367, GRADE 8.8
5. TREAD TO BE PRESS WELDED CONSTRUCTION ANTI SKID TYPE.

LEGEND

TOC ----- TOP OF CONCRETE
TOS ----- TOP OF STEEL
FGL ----- FINISHED GROUND LEVEL
TOG ----- TOP OF GRATING

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PMC

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TITLE

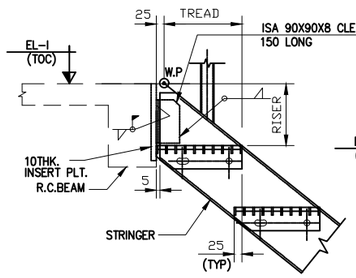
STANDARD STAIRCASE DETAILS

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	003	1 OF 2	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

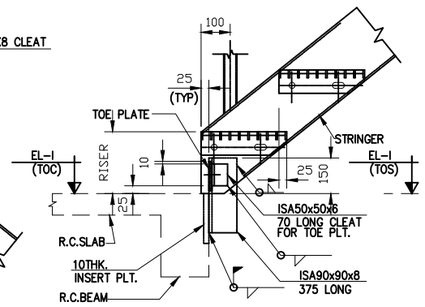
CAD FILE NAME : 080557C-000-STC-1890-003_1_A.DWG

SHEET SIZE : A3

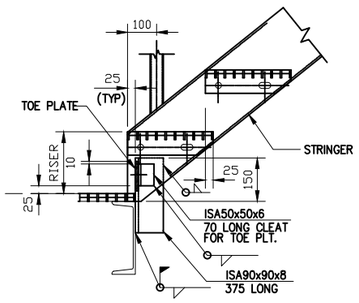
TYPICAL CONNECTION DETAILS



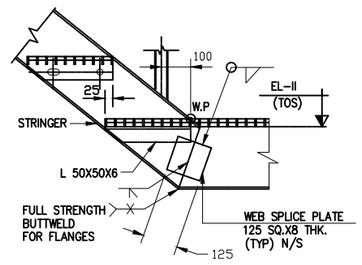
SECTION A1–A1
(CONNECTION WITH R.C. BEAM)



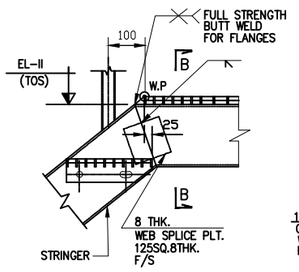
SECTION A2–A2
(CONNECTION WITH R.C. BEAM)



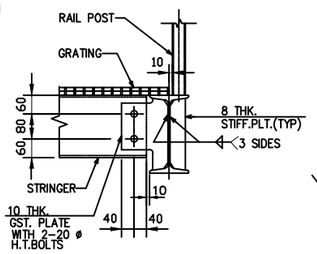
SECTION A2–A2
(CONNECTION WITH CHANNEL SECTION)



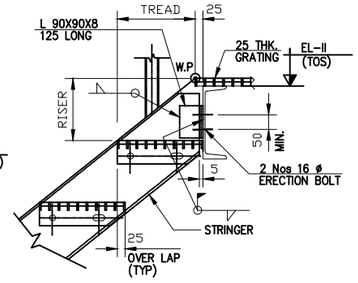
SECTION B1–B1



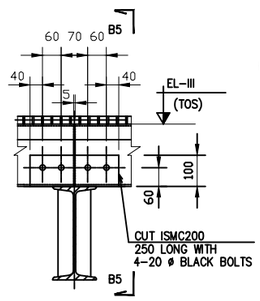
SECTION B2–B2



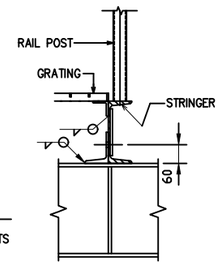
SECTION B–B



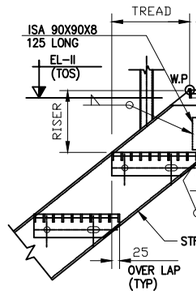
SECTION B2–B2
(CONNECTION WITH CHANNEL SECTION)



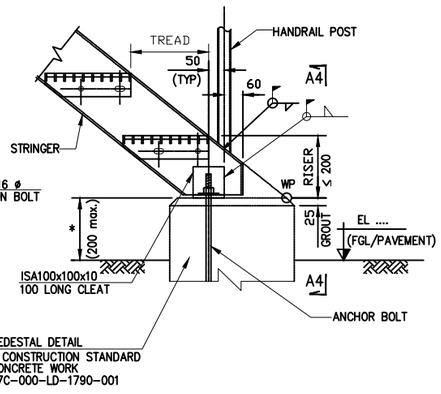
DETAIL – 1



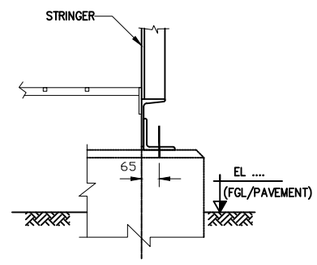
SECTION B5–B5



SECTION B2–B2
(CONNECTION WITH BEAM SECTION)

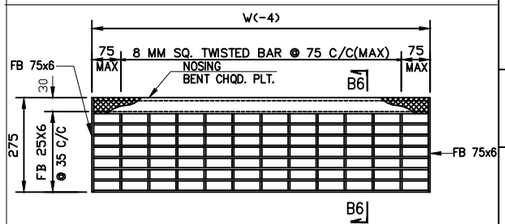


SECTION A3–A3
(*=AS SPECIFIED IN DRAWING)

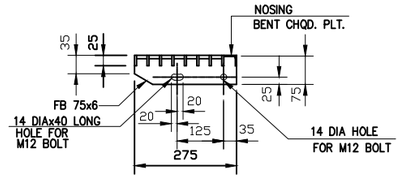


SECTION A4–A4

TYPICAL DETAIL OF STAIR TREAD (GRATING)



TYP. DETAIL OF STAIR TREAD(GRATING)



SECTION B6–B6

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A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

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- ☐ APPROVAL
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DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT
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IOCL PARADIP REFINERY, ODISHA, INDIA

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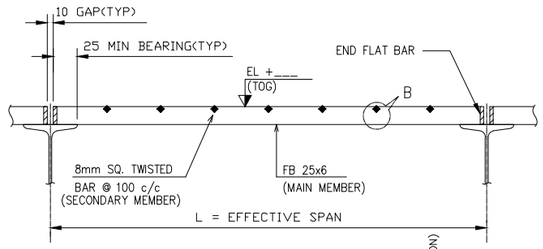
TITLE
STANDARD STAIRCASE DETAILS

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	003	2 OF 2	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

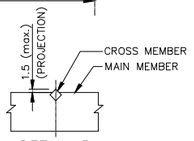
CAD FILE NAME : 080557C-000-STC-1890-003_2_A.DWG

SHEET SIZE : A3

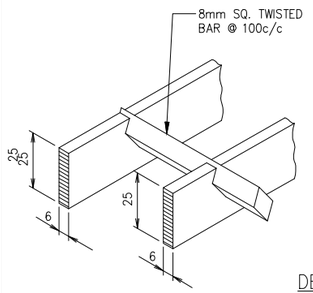
GALVANIZED GRATING FLOORING DETAIL



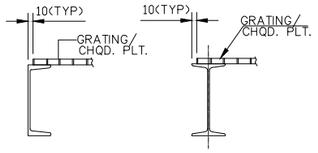
SECTION 1–1



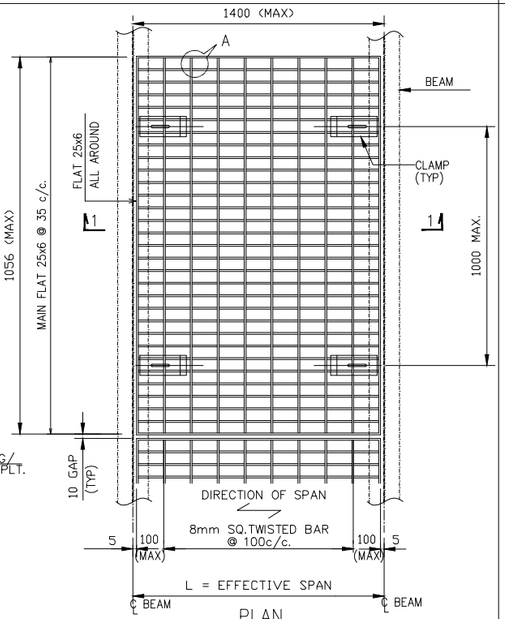
DETAIL–B



DETAIL–A

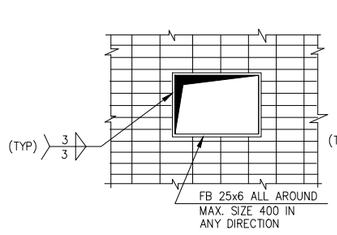


DETAIL SHOWING GRATING/CHQD. PLATE AT END SUPPORT

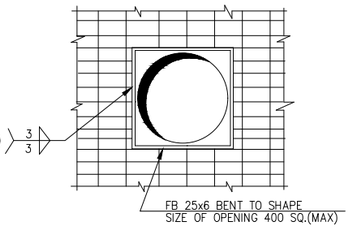


PLAN
(TYPICAL PANEL)

NOTE:–
1. M.S. FLAT & ROD SHALL CONFIRM TO IS: 2026 GR–A
2. PANEL SIZE SHALL BE SUCH THAT A PANEL WEIGHT SHALL NOT EXCEED 70 kg.

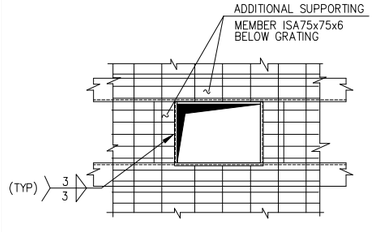


RECTANGULAR



CIRCULAR

(MAXIMUM SIZE OF OPENING 400 mm)



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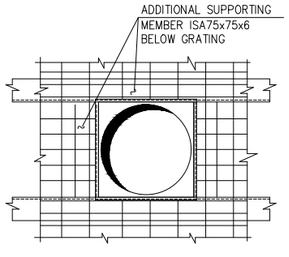
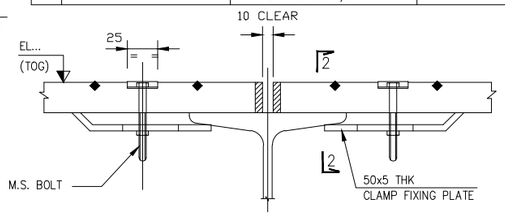
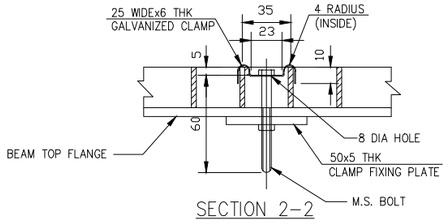


CIRCULAR

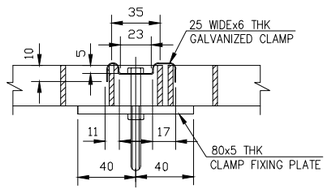
SIZE OF OPENING GREATER THAN 400 mm
TYP DETAIL OF GRATING STRENGTHENING AT OPENINGS



CLAMP DETAIL WITH SUPPORTING BEAM

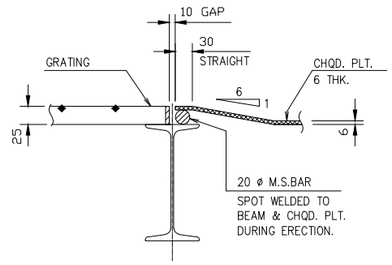


SECTION 2–2

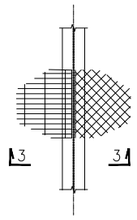


CLAMP DETAIL AT UNSUPPORTED EDGES

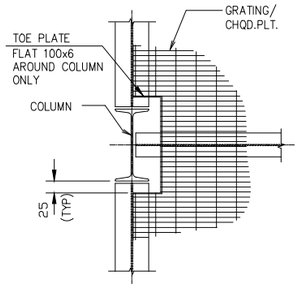
DETAIL AT JUNCTION OF GRATING AND CHEQUERED PLATE



SECTION 3–3



PLAN



TYPICAL ARRANGEMENT AROUND COLUMN

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. WHERE REQUIREMENTS IN AN ENGINEERING DRAWING ARE IN CONTRADICTION TO REQUIREMENTS IN STANDARD DRAWING, THE ENGINEERING DRAWING SHALL GOVERN.
3. PIPE OPENINGS LESS THAN 200 mm DIA. IN FLOOR SHALL BE IN THE SCOPE OF PIPING CONTRACTOR.
4. DRIP HOLES HAVING 10mm ø SHALL BE PROVIDED AT LOW SPOTS OF CHQD. PLATE FLOOR AS REQUIRED.
5. ALL GRATINGS SHALL BE MADE BY ELECTROFORGING PROCESS.
6. ALL GRATINGS SHALL BE HOT DIP GALVANIZED. (MINIMUM UNIFORM THICKNESS SHOULD BE 120 MICRONS)
7. GRATING TO BE CLAMPED (TYP)
8. ALL GRATINGS SHALL BE ANTISKID TYPE.
9. FABRICATOR SHALL PREPARE HIS OWN DRAWING SHOWING PANEL SIZES, CUT OUTS, NOTCHES ETC. BASED ON THE DESIGN DRAWING, FABRICATOR SHALL START ONLY AFTER THE APPROVAL OF DRAWING.
10. MAIN/SECONDARY MEMBERS OF THE GRATING SHALL BE PLACED AS PER SPACING, HOWEVER IF THE SIZE OF THE GRATING IS NOT IN MULTIPLES OF THE SPACING, ADJUSTMENT SHALL BE MADE AT ENDS ONLY
11. GRATING SHALL BE FIXED TO THE SUPPORTING MEMBERS ONLY BY CLAMPS
12. UNSUPPORTED EDGES OF ADJACENT GRATING PANEL SHALL BE CONNECTED BY GALVANIZED U–CLAMPS MADE OUT 25x6 THK. M.S. FLATS WITH M6 BOLTS AT BOTTOM, MINIMUM TWO CLAMPS PER PANEL SHALL BE PROVIDED
13 DESPATCH PACKAGES OF GRATING/ CHQD. PLATE PANELS SHALL BE GROUPED , BASED ON FLOOR ELEVATIONS AND NOT BASED ON GRATING PANEL SIZES.

LEGEND

TOG ----- TOP OF GRATING
TOP ----- TOP OF CHEQUERED PLATE

TYPE	BEARING BAR (CONFORMING TO IS:1977)	CROSS BAR (CONFORMING TO IS:1977)	CLOSING BAR (CONFORMING TO IS:1977)	WT. APPROX. kg/m2	UDL kg/m2	MAX. SPAN MM	DEFLECTION MM
A	FB 25x6 @35mm c/c	8mm SQ. TWISTED BAR @ 100 c/c	FB 25x6	42.3	500	1400	6.0

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A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)
☐ APPROVAL
☐ REVIEW
☒ INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT
STANDBY SRU & ADDITIONAL TANKS
IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER
INDIAN OIL CORPORATION LTD.

PMC
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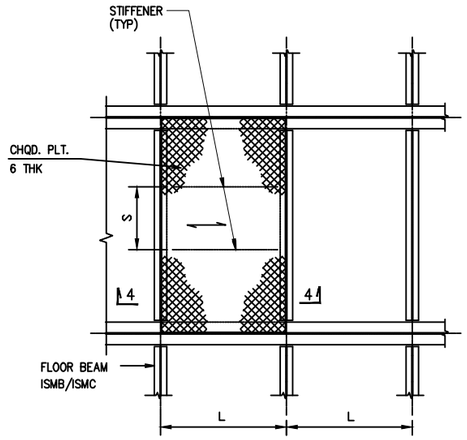
TITLE
STANDARD GRATING & CHEQUERED PLATE FLOORING DETAILS

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	004	1 OF 3	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

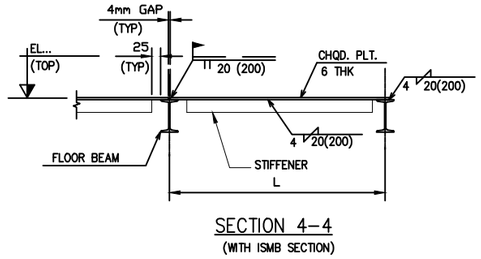
CAD FILE NAME : 080557C-000-STC-1890-004_1_A.DXF

SHEET SIZE : A3

CHEQUERED PLATE FLOORING DETAIL



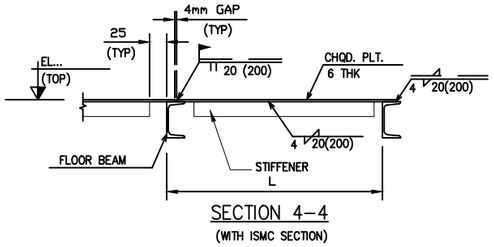
PLAN



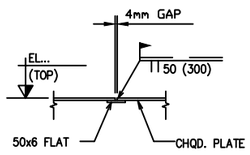
SECTION 4–4
(WITH ISMB SECTION)

SPAN	STIFFENER	SPACING
L	SIZE	S
UPTO 600	–	–
600 TO 900	25 x 5 FLAT	500
900 TO 1500	50 x 6 FLAT	500

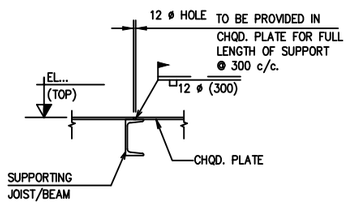
NOTE: 1. LIVE LOAD = 500 kg/m^2
2. DRIP HOLES HAVING 30mm DIA SHALL BE PROVIDED AT EVERY 1.5 M^2 OF FLOOR PLATE



SECTION 4–4
(WITH ISMC SECTION)



DETAIL SHOWING CONNECTION BETWEEN TWO CHQD. PLATES ACROSS THE SPAN



DETAIL SHOWING CHQD. PLATE CONTINUOUS OVER SUPPORT

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

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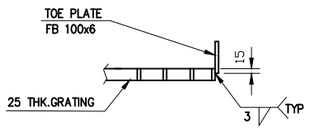
TITLE
STANDARD GRATING & CHEQUERED PLATE FLOORING DETAILS

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	004	2 OF 3	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

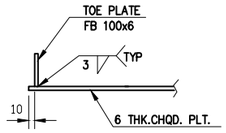
CAD FILE NAME : 080557C-000-STC-1890-004_2_A.DWG

SHEET SIZE : A3

GRATING/CHEQUERED PLATE FLOORING AT EQUIPMENT SUPPORTS



DETAIL–1



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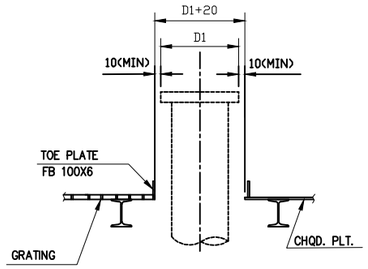
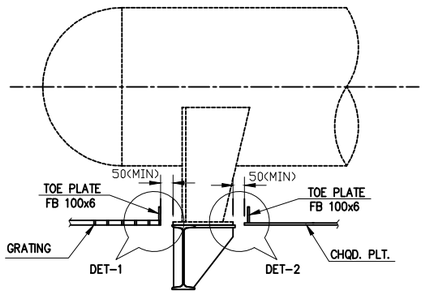


SECTION



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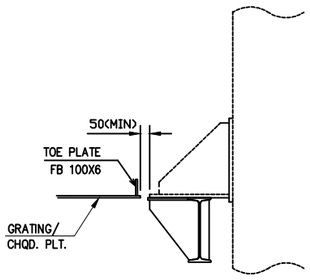

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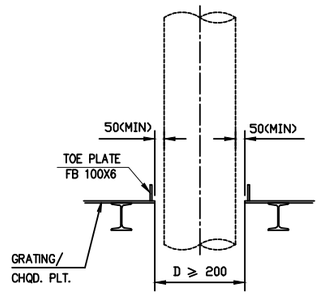

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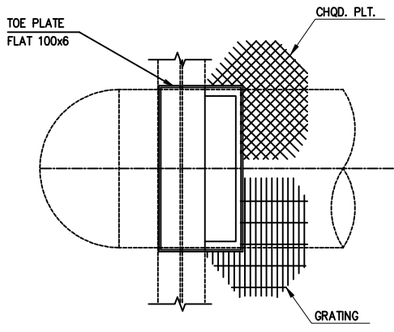
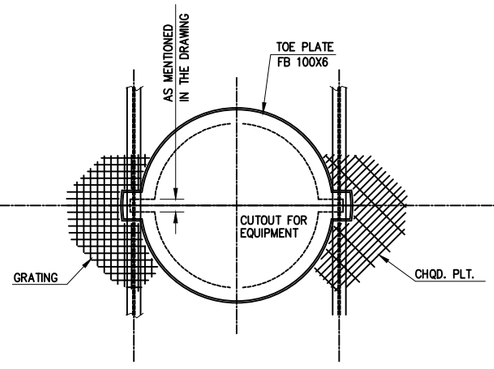
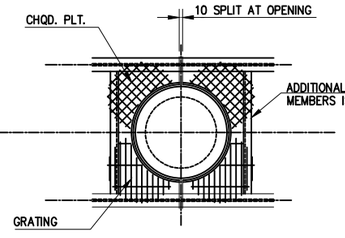


PLAN
FOR HORIZONTAL VESSEL



PLAN
FOR VERTICAL VESSEL



NOTE:–
PROVIDE ADDITIONAL SUPPORTING MEMBERS
BELOW OPENING/ CUTOUTS AROUND GRATING
PANEL WITH OPENING MORE THAN 400 DIA

PLAN
FOR PIPE DUCT
(TOE PLATE NOT REQUIRED FOR D < 400)

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)	DOCUMENT REVIEW STATUS (BY CLIENT)
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PROJECT
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DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	004	3 OF 3	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1890-004_3_A.DWG

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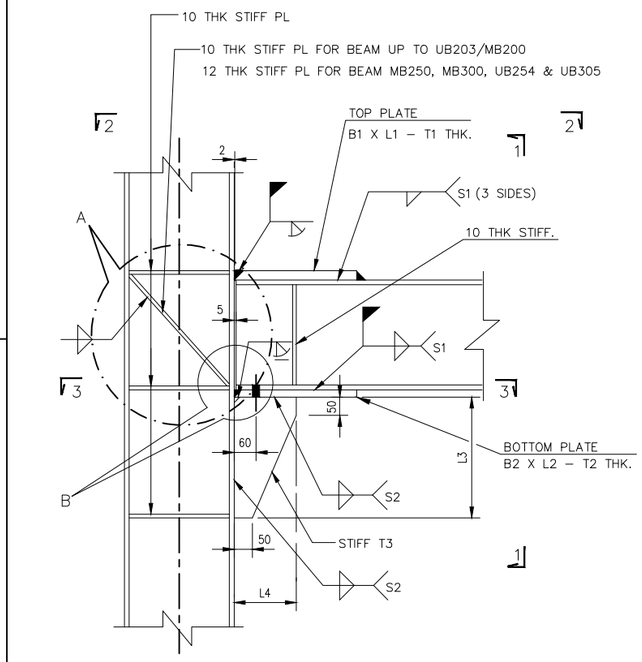
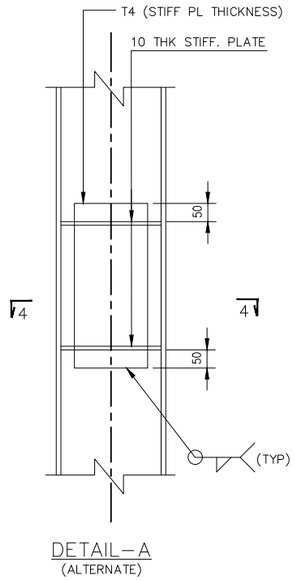
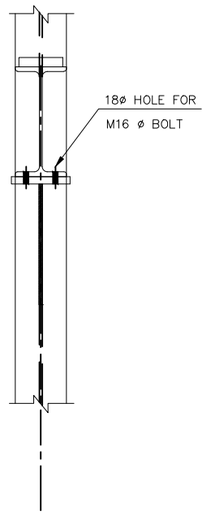


TYPICAL DETAIL OF MOMENT CONNECTION.



DETAIL–A
(ALTERNATE)

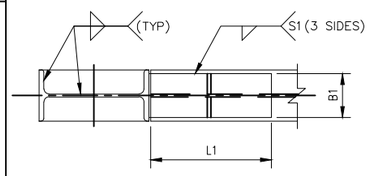


SECTION 1–1

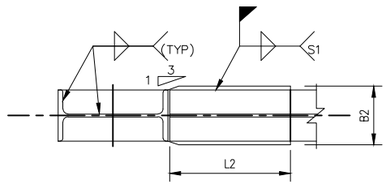
NOTES: –

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNO.
2. ALL CONNECTIONS ARE DESIGNED FOR FULL BENDING AND SHEAR STRENGTH OF BEAM.
3. WHEREVER FILLET WELD SIZE NOT MARKED, IT SHALL BE CONSIDERED AS 6MM.
4. WIDTH OF PLATE SHALL BE NOTCHED IN 1:3 SLOPE AT COLUMN CONNECTION TO MATCH THE COLUMN.
5. ALTERNATE DETAIL 'A' IS TO BE PROVIDED WHEN LONGITUDINAL BEAM FOUL WITH STIFFENER.
6. CONNECTION DESIGN SHOWN IS TENTATIVE AND MINIMUM REQUIREMENT, CONTRACTOR SHALL DESIGN THE CONNECTION FOR ACTUAL DESIGN FORCES AS PER RELEVANT CODE AND JSD / JSS.

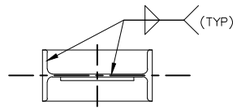
(B)



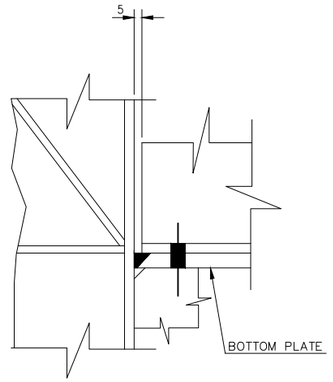
VIEW 2–2



SECTION 3–3



SECTION 4–4



DETAIL–B

EUROPEAN/BRITISH SECTION

BEAM SIZE	COLUMN SIZE	TOP PLATE SIZE			BOTTOM PLATE SIZE			STIFFENER SIZE				WELD SIZE	
		L1	B1	T1	L2	B2	T2	L3	L4	T3	T4	S1	S2
UB203	≥ UB203	260	110	20	260	160	16	250	150	10	8	6	8
UB254	≥ UB254	290	120	25	290	170	20	300	150	10	8	8	8
UB305	≥ UB305	335	140	25	335	190	20	350	170	10	10	8	8
UC152	≥ UC152	250	130	20	250	175	16	250	150	10	8	6	8
UC203	≥ UC203	350	180	25	350	230	20	350	150	10	10	8	8

INDIAN SECTION

BEAM SIZE	COLUMN SIZE	TOP PLATE SIZE			BOTTOM PLATE SIZE			STIFFENER SIZE				WELD SIZE	
		L1	B1	T1	L2	B2	T2	L3	L4	T3	T4	S1	S2
MB100	≥ MB100	150	55	16	150	95	10	175	150	10	10	6	6
MB150	≥ MB150	155	60	16	155	100	10	225	150	10	8	6	6
MB200	≥ MB200	260	80	20	260	120	16	250	150	10	8	6	8
MB250	≥ MB250	290	105	25	290	145	20	300	150	10	8	8	8
MB300	≥ MB300	335	120	25	335	160	20	350	170	10	10	8	8

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A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

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IOCL PARADIP REFINERY, ODISHA, INDIA

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PMC
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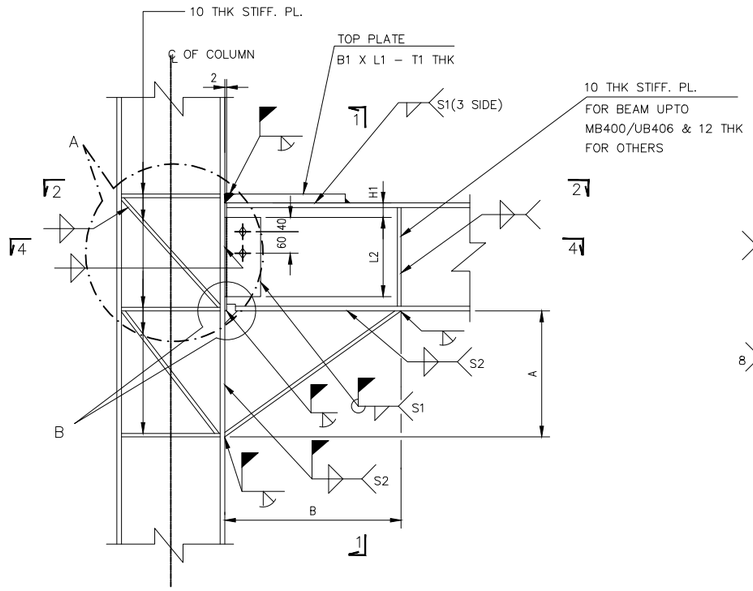
TITLE
TYPICAL DETAIL OF MOMENT CONNECTION WITH COLUMN TO BEAM

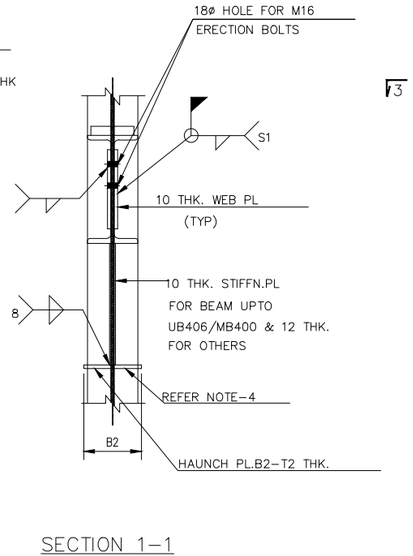
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	005	1 OF 6	B
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1890-005_1_B.DWG

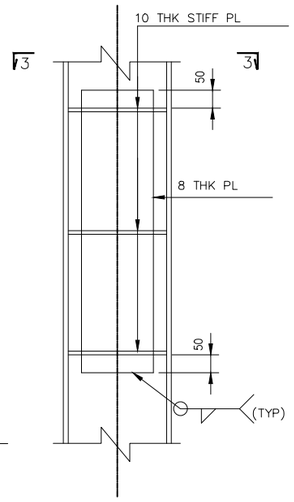
SHEET SIZE : A3



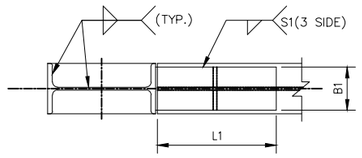
TYPICAL DETAIL OF MOMENT CONNECTION



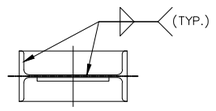
SECTION 1–1



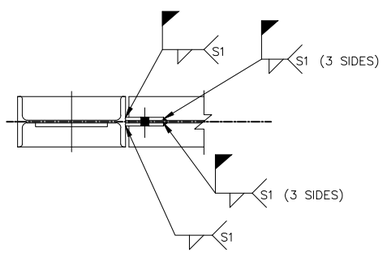
DETAIL–A
(ALTERNATE)



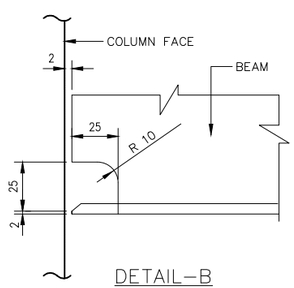
SECTION 2–2



VIEW 3–3



SECTION 4–4



DETAIL–B

EUROPEAN/BRITISH SECTION

BEAM SIZE	COLUMN SIZE	TOP PLATE SIZE			HAUNCH PLATE SIZE				WEB PL. SIZE		WELD. SIZE	
		L1	B1	T1	A	B	B2	T2	H1	L2	S1	S2
UB610	≥ UB610	450	190	25	450	800	230	25	75	450	10	10
IPEA600	≥ IPEA600	450	190	25	450	800	230	25	75	450	10	10
IPEA500	≥ IPEA500	400	170	25	375	650	200	20	60	375	8	10
IPEA450/ NPB450	≥ NPB450	350	160	25	340	600	190	20	55	340	8	10
UB406	≥ UB406	300	150	20	300	550	180	20	50	300	8	8

INDIAN SECTION

BEAM SIZE	COLUMN SIZE	TOP PLATE SIZE			HAUNCH PLATE SIZE				WEB PL. SIZE		WELD. SIZE	
		L1	B1	T1	A	B	B2	T2	H1	L2	S1	S2
MB350	≥ MB250	225	120	20	260	450	140	16	50	250	8	8
MB400	≥ MB300	250	120	20	300	525	140	16	55	290	8	8
MB450	≥ MB300	300	130	25	340	600	150	20	55	340	8	10
MB500	≥ MB400	350	140	25	375	650	180	20	60	380	8	10
MB600	≥ MB500	400	180	25	450	800	210	25	70	460	10	10

NOTES: –

1. ALL CONNECTIONS ARE DESIGNED FOR FULL BENDING AND SHEAR STRENGTH OF BEAM.
2. ALL WELDS ARE 6mm THK. FILLET WELDS UNLESS SHOWN OTHERWISE
3. WIDTH OF PLATE SHALL BE NOTCHED IN 1:3 SLOPE AT COLUMN CONNECTION TO MATCH WITH COLUMN.
4. ALTERNATE DETAIL 'A' IS TO BE PROVIDED WHEN LONGITUDINAL BEAM FOUL WITH STIFFENER.
5. CONNECTION DESIGN SHOWN IS TENTATIVE AND MINIMUM REQUIREMENT, CONTRACTOR SHALL DESIGN THE CONNECTION FOR ACTUAL DESIGN FORCES AS PER RELEVANT CODE AND JSD / JSS.

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
B	10-06-2020	IFD	TUN	KRK	JP / KC	JMC
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DOCUMENT CATEGORY (USE " X " MARK)
- ☐ APPROVAL
- ☐ REVIEW
- ☒ INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT
STANDBY SRU & ADDITIONAL TANKS
IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER
INDIAN OIL CORPORATION LTD.

PMC
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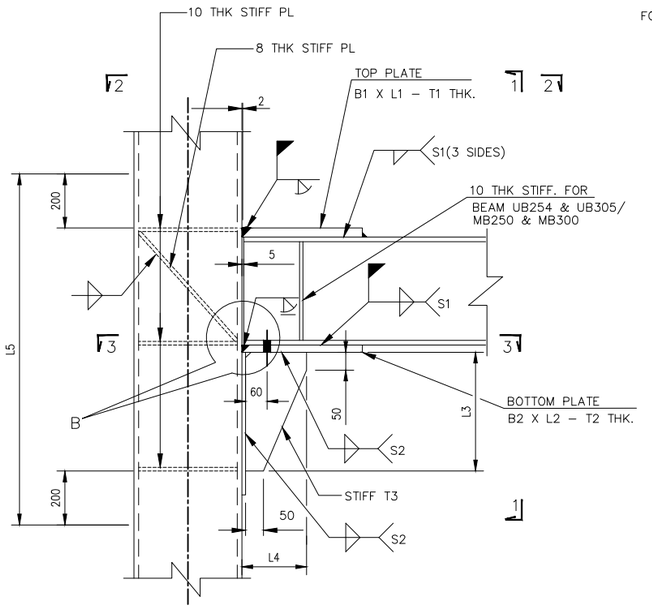
CONFIDENTIAL, NOT TO DISCLOSE WITHOUT AUTHORISATION

TITLE
TYPICAL DETAIL OF MOMENT CONNECTION WITH COLUMN TO BEAM

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	005	2 OF 6	B
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

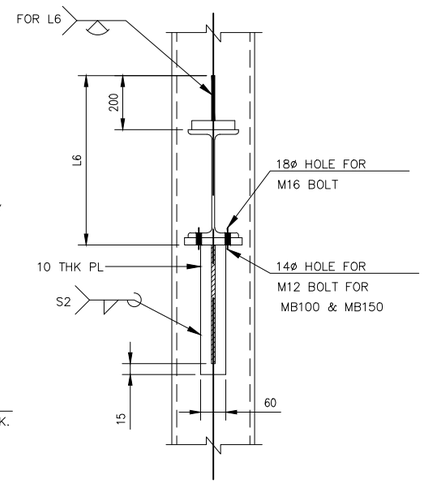
CAD FILE NAME : 080557C-000-STC-1890-005_2_B.DWG

SHEET SIZE : A3

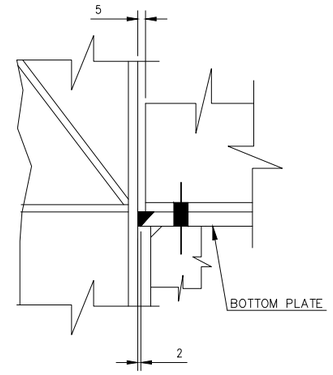


TYPICAL DETAIL OF MOMENT CONNECTION

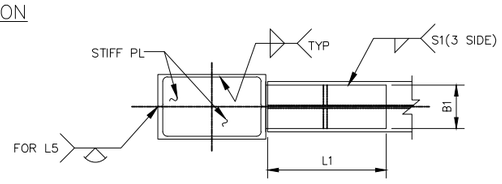
(WITH MC BOX COLUMN TO BEAM)



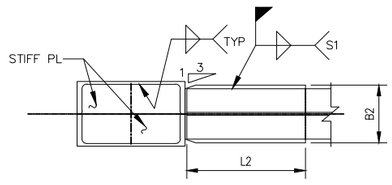
VIEW 1–1



DETAIL–B



VIEW 2–2



SECTION 3–3

EUROPEAN/BRITISH SECTION

BEAM SIZE	COLUMN SIZE	TOP PLATE SIZE			BOTTOM PLATE SIZE			STIFFENER SIZE			WELD SIZE	
		L1	B1	T1	L2	B2	T2	L3	L4	T3	S1	S2
UB203	≥MC150 []	260	110	20	260	160	16	250	150	10	6	8
UB254	≥MC250 []	290	120	25	290	170	20	300	150	10	8	8
UB305	≥MC300 []	335	140	25	335	190	20	350	170	10	8	8
UC152	≥MC250 []	250	130	20	250	175	16	250	150	10	6	8
UC203	≥MC350 []	350	180	25	350	230	20	350	150	10	8	8

INDIAN SECTION

BEAM SIZE	COLUMN SIZE	TOP PLATE SIZE			BOTTOM PLATE SIZE			STIFFENER SIZE			WELD SIZE	
		L1	B1	T1	L2	B2	T2	L3	L4	T3	S1	S2
MB100	≥MC100 []	150	55	16	150	95	10	175	150	10	6	6
MB150	≥MC100 []	155	60	16	155	100	10	230	150	10	6	6
MB200	≥MC150 []	260	80	20	260	120	16	225	150	10	8	8
MB250	≥MC200 []	290	105	25	290	145	20	265	150	10	8	8
MB300	≥MC200 []	335	120	25	335	160	20	330	170	10	8	8

NOTES: –

1. ALL DIMENSIONS ARE IN MILIMETERS, UNO.
2. ALL CONNECTIONS ARE DESIGNED FOR FULL BENDING AND SHEAR STRENGTH OF BEAM.
3. WHEREVER FILLET WELD SIZE NOT MARKED, IT SHALL BE CONSIDERED AS 6MM.
4. WIDTH OF PLATE SHALL BE NOTCHED IN 1:3 SLOPE AT COLUMN CONNECTION TO MATCH WITH COLUMN.
5. CONNECTION DESIGN SHOWN IS TENTATIVE AND MINIMUM REQUIREMENT, CONTRACTOR SHALL DESIGN THE CONNECTION FOR ACTUAL DESIGN FORCES AS PER RELEVANT CODE AND JSD / JSS. (B)

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
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DOCUMENT CATEGORY (USE " X " MARK)

- ☐ APPROVAL
- ☐ REVIEW
- ☒ INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

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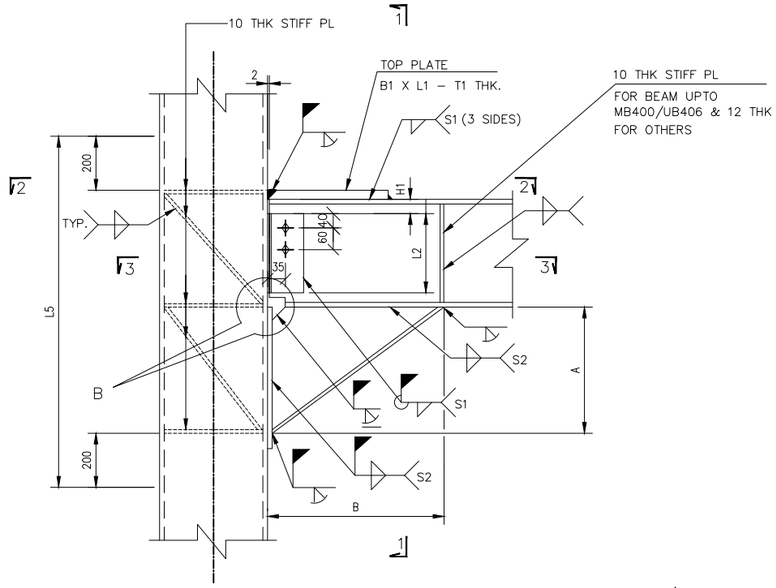
TITLE

TYPICAL DETAIL OF MOMENT CONNECTION WITH BOX COLUMN TO BEAM

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	005	3 OF 6	B
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

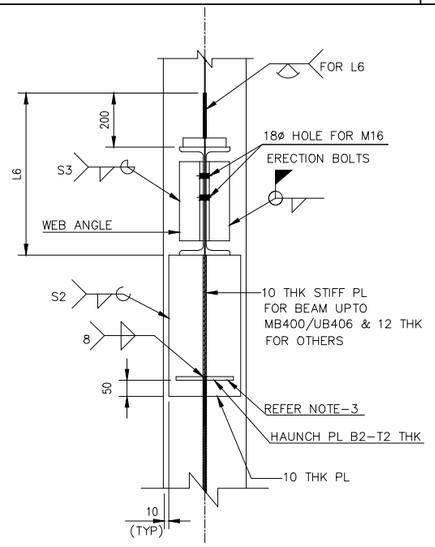
CAD FILE NAME : 080557C-000-STC-1890-005_3_B.DWG

SHEET SIZE : A3

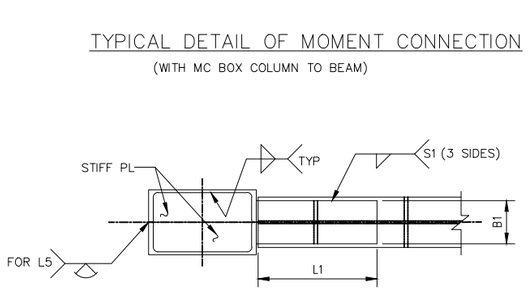


TYPICAL DETAIL OF MOMENT CONNECTION

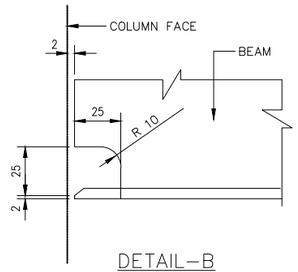
(WITH MC BOX COLUMN TO BEAM)



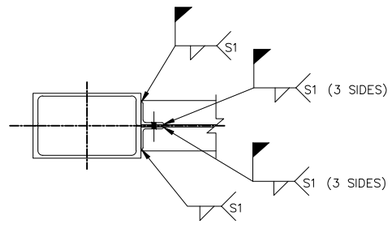
SECTION 1–1



SECTION 2–2



DETAIL–B



SECTION 3–3

NOTES: –

1. ALL CONNECTIONS ARE DESIGNED FOR FULL BENDING AND SHEAR STRENGTH OF BEAM.
2. ALL WELDS ARE 6mm THK. FILLET WELDS UNLESS SHOWN OTHERWISE
3. WIDTH OF PLATE SHALL BE NOTCHED IN 1:3 SLOPE AT COLUMN CONNECTION TO MATCH WITH COLUMN.
4. ALTERNATE DETAIL 'A' IS TO BE PROVIDED WHEN LONGITUDINAL BEAM FOUL WITH STIFFENER.
5. THIS STANDARD IS NOT APPLICABLE FOR BEAM CONNECTING WITH WEB OF MC BOX COLUMN.
6. (B) CONNECTION DESIGN SHOWN IS TENTATIVE AND MINIMUM REQUIREMENT, CONTRACTOR SHALL DESIGN THE CONNECTION FOR ACTUAL DESIGN FORCES AS PER RELEVANT CODE AND JSD / JSS.

INDIAN SECTION

BEAM SIZE	COLUMN SIZE	TOP PLATE SIZE			HAUNCH PLATE SIZE				WEB ANGLE SIZE			WELD SIZE		
		L1	B1	T1	A	B	B2	T2	H1	L2	ANGLE	S1	S2	S3
MB350	≥ MC250 []	225	120	20	260	450	140	16	50	250	L65X65X6	8	8	6
MB400	≥ MC250 []	250	120	20	300	525	140	16	55	290	L65x65x6	8	8	6
MB450	≥ MC300 []	300	130	25	340	600	150	20	55	340	L90X90X6	8	10	8
MB500	≥ MC300 []	350	140	25	375	650	180	20	60	380	L90X90X6	8	10	8
MB600	≥ MC400 []	400	180	25	450	800	210	25	70	460	L90X90X6	10	10	8

EUROPEAN/BRITISH SECTION

BEAM SIZE	COLUMN SIZE	TOP PLATE SIZE			HAUNCH PLATE SIZE				WEB ANGLE SIZE			WELD SIZE		
		L1	B1	T1	A	B	B2	T2	H1	L2	ANGLE	S1	S2	S3
UB406	≥ MC250 []	250	120	20	300	525	140	16	55	290	L65X65X6	8	8	6
IPEA450	≥ MC300 []	300	130	25	340	600	150	20	55	340	L90X90X6	8	10	8
IPEA500	≥ MC300 []	350	140	25	375	650	180	20	60	380	L90X90X6	8	10	8
IPEA600	≥ MC400 []	400	180	25	450	800	210	25	70	460	L90X90X6	10	10	8

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DOCUMENT CATEGORY (USE " X " MARK)

- [ ] APPROVAL
- [ ] REVIEW
- [x] INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

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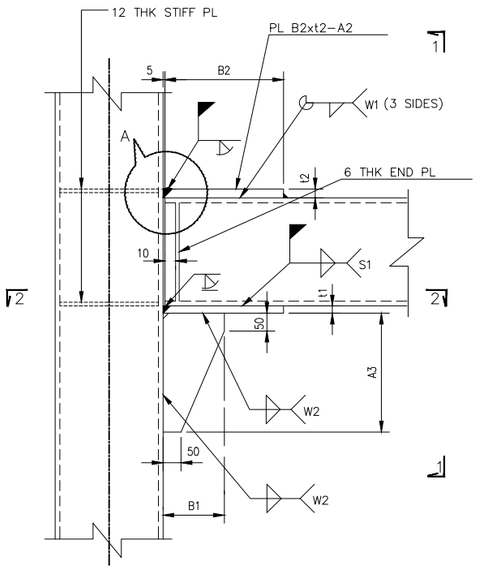
TITLE

TYPICAL DETAIL OF MOMENT CONNECTION
WITH BOX COLUMN TO BEAM

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	005	4 OF 6	B
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

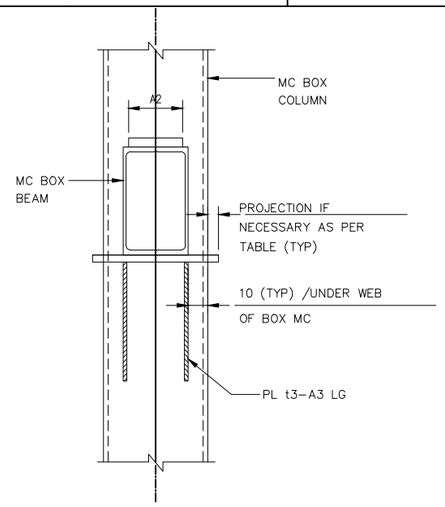
CAD FILE NAME : 080557C-000-STC-1890-005_4_B.DWG

SHEET SIZE : A3

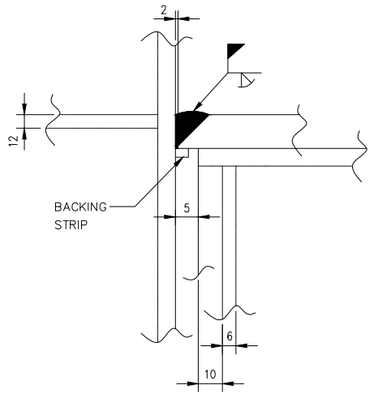


TYPICAL DETAIL OF MOMENT CONNECTION

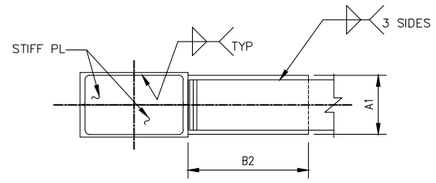
(WITH MC BOX COLUMN TO MC BOX BEAM)



VIEW 1–1



DETAIL A



SECTION 2–2

NOTES: –

1. ALL CONNECTIONS ARE DESIGNED FOR FULL BENDING AND SHEAR STRENGTH OF BEAM.
2. ALL WELDS ARE 6mm THK. FILLET WELDS UNLESS SHOWN OTHERWISE
3. WIDTH OF PLATE SHALL BE NOTCHED IN 1:3 SLOPE AT COLUMN CONNECTION TO MATCH WITH COLUMN.
4. ALTERNATE DETAIL 'A' IS TO BE PROVIDED WHEN LONGITUDINAL BEAM FOUL WITH STIFFENER.
5. THIS STANDARD IS NOT APPLICABLE FOR BEAM CONNECTING WITH WEB OF MC BOX COLUMN.
6. CONNECTION DESIGN SHOWN IS TENTATIVE AND MINIMUM REQUIREMENT, CONTRACTOR SHALL DESIGN THE CONNECTION FOR ACTUAL DESIGN FORCES AS PER RELEVANT CODE AND JSD / JSS. (B)

INDIAN SECTION

COLUMN →	MC 200 [ ]		MC 250 [ ]		MC 300 [ ]			MC 400 [ ]			
BEAM ↓	MC–200 [ ]	MC–150 [ ]	MC–250 [ ]	MC–200 [ ]	MC–300 [ ]	MC–250 [ ]	MC–200 [ ]	MC–400 [ ]	MC–300 [ ]	MC–250 [ ]	MC–200 [ ]
A1	170	170	180	180	200	180	180	220	200	200	200
A2	130	130	140	130	160	140	130	180	160	140	130
A3	200	150	250	200	300	250	200	400	300	250	200
B1	250	200	350	250	400	350	250	500	400	350	250
B2	200	150	275	200	325	275	200	425	325	275	200
t1	12	10	16	12	16	16	12	20	16	16	12
t2	16	12	20	16	20	20	16	25	20	20	16
t3	10	10	10	10	10	10	10	10	10	10	10
W1	8	8	10	8	10	10	8	10	10	10	8
W2	6	6	8	6	8	8	6	8	8	8	6

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PROJECT

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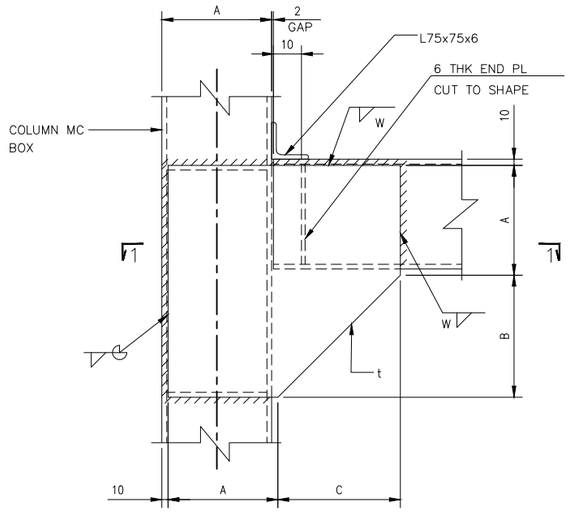
TYPICAL DETAIL OF MOMENT CONNECTION WITH BOX COLUMN TO BOX BEAM

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	005	5 OF 6	B
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

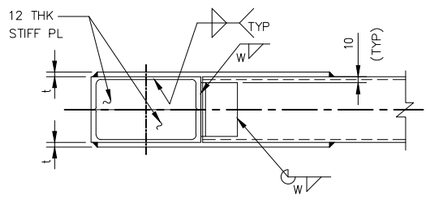
CAD FILE NAME : 080557C-000-STC-1890-005_5_B.DWG

SHEET SIZE : A3



TYPICAL DETAIL OF MOMENT CONNECTION

(WITH MC BOX COLUMN TO MC BOX BEAM)



SECTION 1–1

INDIAN SECTION						
COLUMN SIZE	BEAM SIZE	A	B	C	t	w
MC150 [ ]	MC150 [ ]	150	150	300	10	6
MC200 [ ]	MC200/150 [ ]	150/200	150/200	350	10	6
MC250 [ ]	MC250 [ ]	250	250	400	10	8
MC300 [ ]	MC300 [ ]	300	225	450	10	8
MC400 [ ]	MC400 [ ]	400	300	550	10	8

NOTES: –

1. CONNECTIONS ARE SHOWN FOR FULL MOMENT PLUS 50% SHEAR CAPACITIES.
2. CONNECTION DESIGN SHOWN IS TENTATIVE AND MINIMUM REQUIREMENT, CONTRACTOR SHALL DESIGN THE CONNECTION FOR ACTUAL DESIGN FORCES AS PER RELEVANT CODE AND JSD / JSS.

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WITH BOX COLUMN TO BOX BEAM

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	005	6 OF 6	B
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1890-005_6_B.DWG

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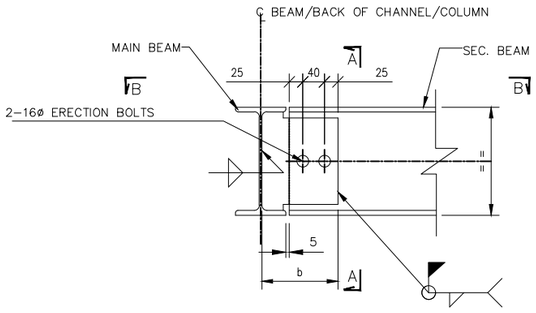
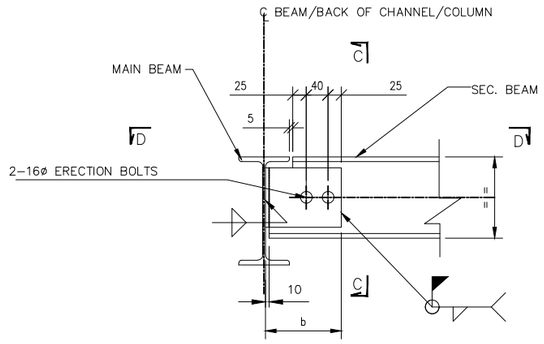


TYPE–I



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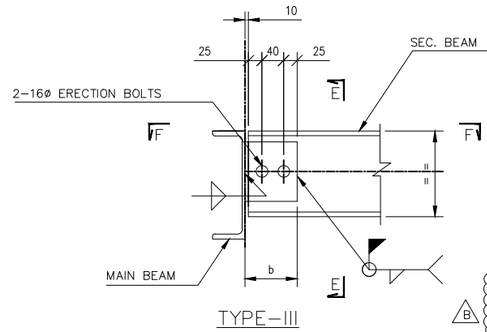

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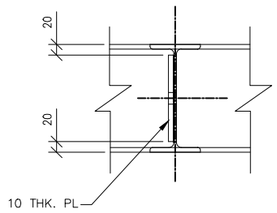
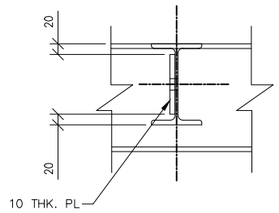
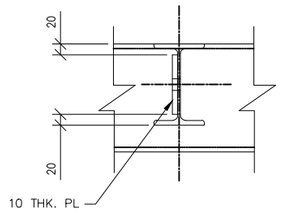


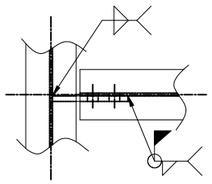
SECTION A–A



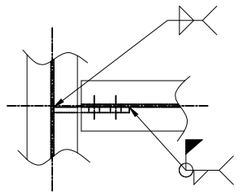
SECTION C–C



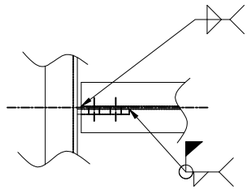
SECTION E–E



VIEW B–B



VIEW D–D



VIEW F–F

NOTES: –

1. ALL DIMENSIONS ARE IN mm AND LEVELS IN METERS
2. ALL WELDS ARE 6mm THK. FILLET WELDS UNO.
3. NO AXIAL FORCES ARE INCLUDED & SHALL BE CHECKED AS PER ACTUAL DESIGN.
4. CONNECTION TYPE I, II, III, IV, V & VI SHALL NOT BE USED FOR EQUIPMENT SUPPORTING MEMBERS.
5. TWO NOS. ERECTION BOLTS SHALL BE PROVIDED.
6. CONNECTION SHALL BE PROVIDED FOR SECONDARY BEAM ≥ ISMB125/ISMC125
7. CONNECTION DESIGN SHOWN IS TENTATIVE AND MINIMUM REQUIREMENT, CONTRACTOR SHALL DESIGN THE CONNECTION FOR ACTUAL DESIGN FORCES AS PER RELEVANT CODE AND JSD / JSS.

INDIAN SECTION

SEC. BEAM	CONN TYP	DIMENSION	MAIN BEAM/MAIN COLUMN																	
			MB100	MB125	MB150	MB200/ UB203	MB250/ UB254	MB300/ UB305	MB350	MB400/ UB406	MB450	MB500/ IPEA500	MB600/ IPEA600	MC100	MC125	MC150	MC200	MC250	MC300	MC400
MB100	I	b	100	–	–	–	–	–	–	–	–	–	–	100	–	–	–	–	–	–
MC100	II	b	–	100	100	125	125	125	125	125	150	200	200	–	150	150	150	150	150	175
	III	b	–	–	–	–	–	–	–	–	–	–	–	75	75	75	75	75	75	75
MB125	I	b	–	125	–	–	–	–	–	–	–	–	–	–	150	–	–	–	–	–
MC125	II	b	–	–	125	125	150	150	150	150	150	175	175	–	–	150	150	150	175	175
	III	b	–	–	–	–	–	–	–	–	–	–	–	–	75	75	75	75	75	75

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
B	10-06-2020	IFD	TUN	KRK	JP / KC	JMC
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DOCUMENT CATEGORY (USE " X " MARK)

- ☐ APPROVAL
- ☐ REVIEW
- ☒ INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

TechnipFMC

TITLE

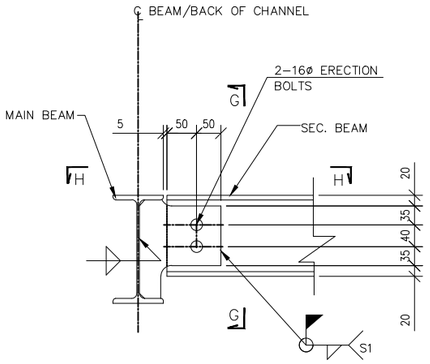
TYPICAL DETAIL OF SHEAR CONNECTION
BEAM TO BEAM
AND BEAM TO COLUMN

DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	006	1 OF 3	B
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

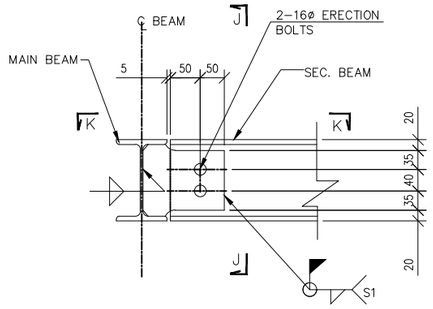
CAD FILE NAME : 080557C-000-STC-1890-006_1_B.DWG

SHEET SIZE : A3

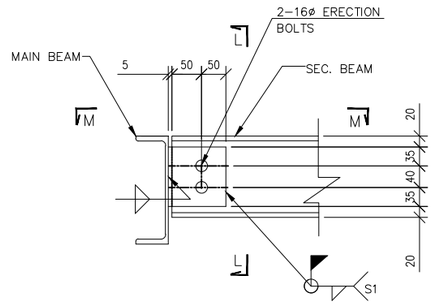
FOR ISMB150 & ISMC150



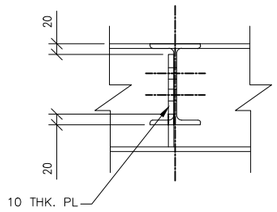
TYPE–IV



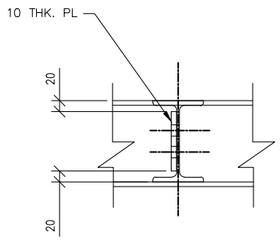
TYPE–V



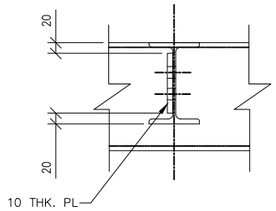
TYPE–VI



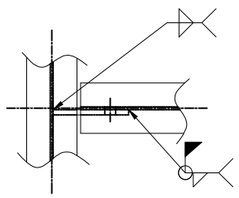
SECTION G–G



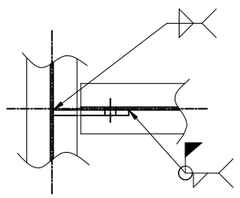
SECTION J–J



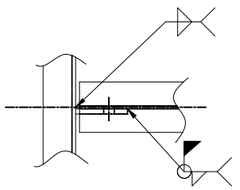
SECTION L–L



VIEW H–H



VIEW K–K



VIEW M–M

NOTES: –

1. ALL DIMENSIONS ARE IN mm AND LEVELS IN METERS
2. ALL WELDS ARE 6mm THK. FILLET WELDS UNO.
3. NO AXIAL FORCES ARE INCLUDED & SHALL BE CHECKED AS PER ACTUAL DESIGN.
4. CONNECTION TYPE I, II, III, IV, V & VI SHALL NOT BE USED FOR EQUIPMENT SUPPORTING MEMBERS.
5. TWO NOS. ERECTION BOLTS SHALL BE PROVIDED.
6. CONNECTION SHALL BE PROVIDED FOR SECONDARY BEAM >ISMB125/ISMC125
7. CONNECTION DESIGN SHOWN IS TENTATIVE AND MINIMUM REQUIREMENT, CONTRACTOR SHALL DESIGN THE CONNECTION FOR ACTUAL DESIGN FORCES AS PER RELEVANT CODE AND JSD / JSS. (B)

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
B	10-06-2020	IFD	TUN	KRK	JP / KC	JMC
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DOCUMENT CATEGORY (USE " X " MARK)
- ☐ APPROVAL
- ☐ REVIEW
- ☒ INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT
STANDBY SRU & ADDITIONAL TANKS
IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER
INDIAN OIL CORPORATION LTD.

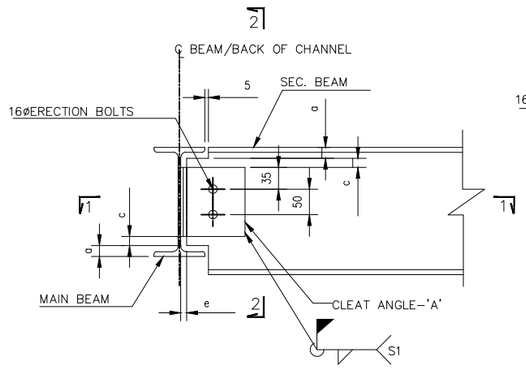
PMC
TechnipFMC

TITLE
TYPICAL DETAIL OF SHEAR CONNECTION WITH BEAM TO BEAM

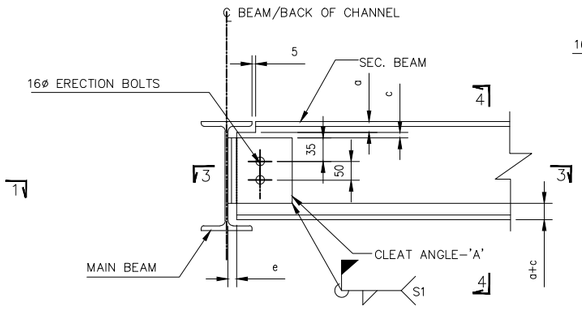
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	006	2 OF 3	B
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1890-006_2_B.DWG

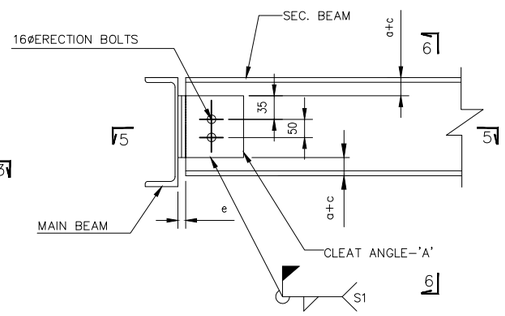
SHEET SIZE : A3



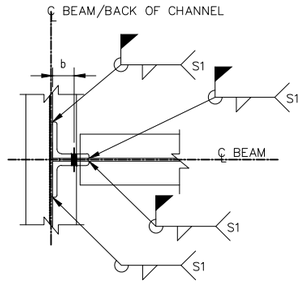
TYPE–VII



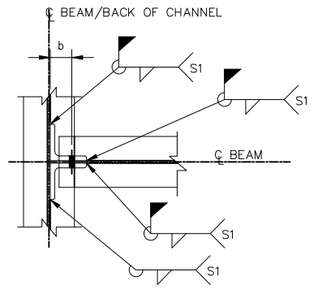
TYPE–VIII



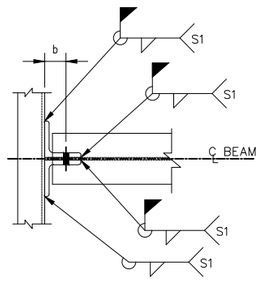
TYPE–IX



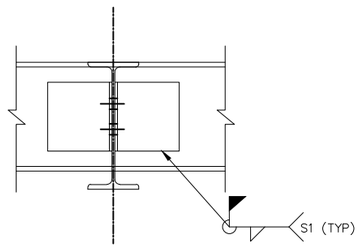
SECTION 1–1



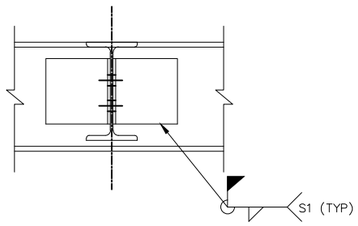
SECTION 3–3



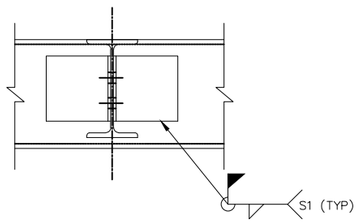
SECTION 5–5



SECTION 2–2



SECTION 4–4



SECTION 6–6

CLEAT ANGLE SIZE	b	FOR SEC. BEAM SIZE	S1
⊥ 65X65X6	35	UB203/UC203	6
⊥ 75X75X6	40	UB254/UB305	6
⊥ 100X100X8	45	UB406/IPEA450/IPEA500	6
⊥ 110X110X10	45	UB610/WPB600/IPEA600	8

CLEAT ANGLE SIZE	b	FOR SEC. BEAM SIZE	S1
⊥ 65X65X6	35	ISMB200/MC200	6
⊥ 75X75X6	40	ISMB250/ISMB300/MC250	6
⊥ 100X100X8	45	ISMB350/ISMB400/ISMB500/ MC300/MC400	6
⊥ 110X110X10	45	ISMB600	8

a=15 + FLANGE OF MAIN BEAM
c=15 FOR SEC.BEAM UB610/MB600
c=10 FOR OTHERS
e=10 mm CLEAR GAP
2 NOS. ERECTION BOLTS SHALL BE PROVIDED FOR ALL SECTIONS.

NOTES: –

1. ALL DIMENSIONS ARE IN mm AND LEVELS IN METERS
2. ALL WELDS ARE 6mm THK. FILLET WELDS UNO.
3. NO AXIAL FORCES ARE INCLUDED & SHALL BE CHECKED AS PER ACTUAL DESIGN.
4. CONNECTION TYPE I, II, III, IV, V & VI SHALL NOT BE USED FOR EQUIPMENT SUPPORTING MEMBERS.
5. TWO NOS. ERECTION BOLTS SHALL BE PROVIDED.
6. CONNECTION SHALL BE PROVIDED FOR SECONDARY BEAM ≥ ISMB125/ISMC125

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)
☐ APPROVAL
☐ REVIEW
☒ INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT
STANDBY SRU & ADDITIONAL TANKS
IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER
INDIAN OIL CORPORATION LTD.

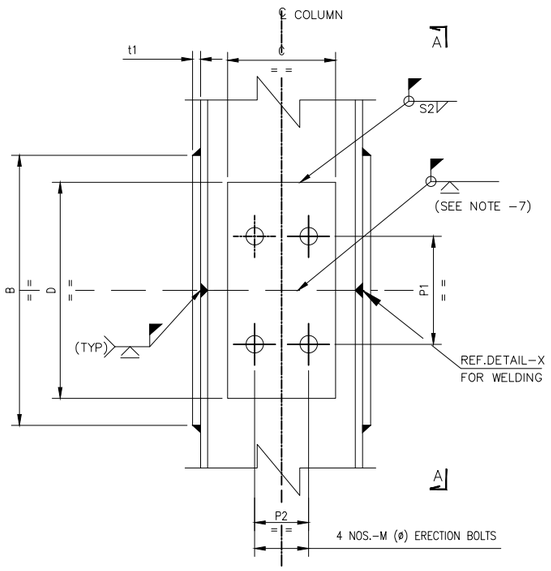
PMC
TechnipFMC
CONFIDENTIAL, NOT TO DISCLOSE WITHOUT AUTHORISATION

TITLE
TYPICAL DETAIL OF SHEAR CONNECTION WITH BEAM TO BEAM AND BEAM TO COLUMN

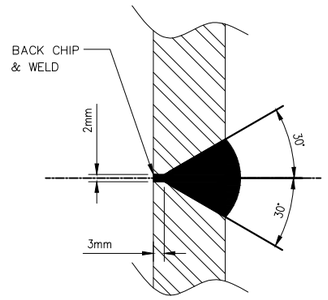
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	006	3 OF 3	A
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1890-006_3_A.DWG

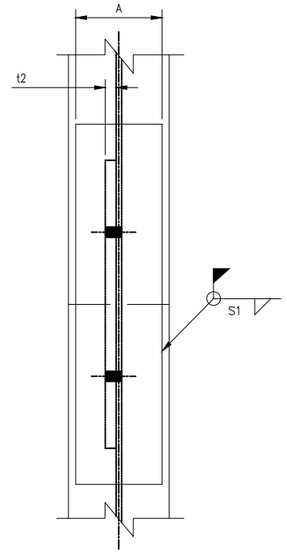
SHEET SIZE : A3



ELEVATION



DETAIL – X



VIEW A–A

NOTES: –

1. ALL DIMENSIONS ARE IN mm.
2. ALL BUTT WELD ARE FULL STRENGTH WELDS.
3. ALL EDGES SHALL BE PREPARED BEFORE BUTT WELDING.
4. SPLICE PLATES ARE DESIGNED FOR 40% OF FULL STRENGH OF THE MEMBER.
5. SPLICE SHALL NOT BE LOCATED AT THE POINT OF MAXIMUM BENDING MOMENT AND/OR MAXIMUM SHEAR FORCE.
6. SPLICE PLATE MAY BE OMITTED FOR PURLINS & SIDE GIRTS FOR MEMBER SIZES UPTO 150mm DEPTH.
7. BUTT WELD SHALL BE SINGLE V BUTT WELD FOR THICKNESS EQUAL TO OR MORE THAN 16 mm.
8. CONNECTION DESIGN SHOWN IS TENTATIVE AND MINIMUM REQUIREMENT, CONTRACTOR SHALL DESIGN THE CONNECTION FOR FULL MEMBER STRENGTH AS PER RELEVANT CODE AND JSD / JSS.

EUROPEAN/BRITISH SECTION

SIZE OF JOIST	FLANGE SPLICE PLATES				WEB SPLICE PLATES				ERECION BOLTS		
	A	B	t1	WELD SIZE S1	C	D	t2	WELD SIZE S2	M(ø)	P1	P2
UC152	130	150	6	6	110	120	6	6	16	60	50
UB203	110	200	6	6	130	120	6	6	16	60	60
UB254	125	275	8	6	175	150	6	6	16	60	60
UB305	145	350	8	6	200	150	6	6	16	60	80
UB406X60	150	400	10	8	300	275	8	6	16	60	135
UB610	200	450	12	10	300	280	10	8	16	60	160
NPB450/ IPEA450	160	450	10	8	300	275	8	6	16	60	135
IPE500	170	450	10	8	300	280	8	6	16	60	150
IPEA500	170	450	10	8	300	280	8	6	16	60	150
IPE600	190	450	12	10	300	280	10	8	16	60	160
IPEA600	190	450	12	10	300	280	10	8	16	60	160

INDIAN SECTIONS

SIZE OF JOIST	FLANGE SPLICE PLATES				WEB SPLICE PLATES				ERECION BOLTS		
	A	B	t1	WELD SIZE S1	C	D	t2	WELD SIZE S2	M(ø)	P1	P2
MB125	55	100	6	6	90	100	6	6	12	50	40
MB150	60	120	6	6	110	120	6	6	16	60	50
MB175	70	120	6	6	120	120	6	6	16	60	60
MB200	80	150	6	6	120	120	6	6	16	60	60
MB225	90	150	6	6	120	120	6	6	16	60	60
MB250	105	260	8	6	120	120	6	6	16	60	60
MB300	120	300	8	6	150	150	6	6	16	60	80
MB350	120	300	8	6	150	160	8	6	16	60	80
MB400	110	300	10	8	180	190	8	6	16	60	100
MB450	120	300	10	8	215	225	8	6	16	60	135
MB500	150	400	10	8	260	275	8	6	16	60	150
MB600	180	400	12	10	300	280	10	8	16	60	160

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
B	10-06-2020	IFD	TUN	KRK	JP / KC	JMC
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DOCUMENT CATEGORY (USE " X " MARK)	DOCUMENT REVIEW STATUS (BY CLIENT)
☐ APPROVAL ☐ REVIEW ☒ INFORMATION	

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

TechnipFMC

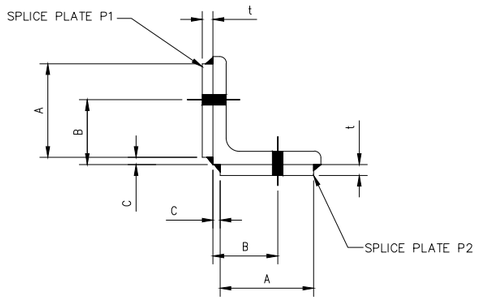
TITLE

TYPICAL SPLICE DETAIL OF COLUMNS / BEAMS

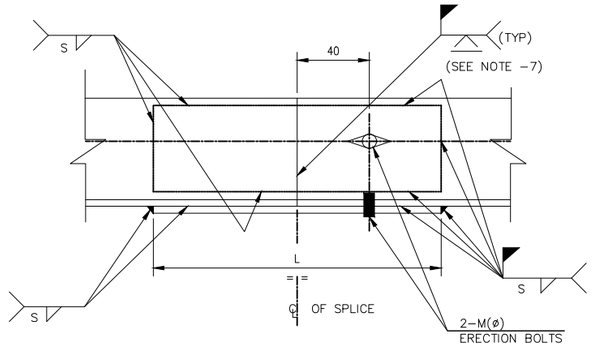
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	007	1 OF 1	B
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1890-007_1_B.DWG

SHEET SIZE : A3



CROSS SECTION



ELEVATION

EQUAL ANGLES (SINGLE)

SIZE OF ANGLE	SPLICE PLATE			B	C	BOLT DIA M(ø)	SIZE OF WELD (S)
	A	t	L				
L 50X50X6	30	6	130	28	10	12	6
L 65X65X6	45	6	130	35	10	12	6
L 65X65X8	45	6	130	35	10	12	6
L 75X75X6	55	6	130	40	10	16	6
L 75X75X8	55	6	130	40	10	16	6
L 90X90X6	60	6	130	50	15	16	6
L 90X90X8	60	6	130	50	15	16	8
L100X100X8	60	6	150	60	20	16	8
L110X110X10	70	6	170	60	20	16	8
L130X130X10	70	8	200	80	30	16	8
L150X150X16	90	8	200	90	30	16	8
L200X200X20	120	10	250	110	40	16	10

NOTES: –

1. ALL DIMENSIONS ARE IN mm.
2. ALL BUTT WELD ARE FULL STRENGTH WELDS.
3. ALL EDGES SHALL BE PREPARED BEFORE BUTT WELDING.
4. SPLICE PLATES ARE DESIGNED FOR 40% OF FULL STRENGH OF THE MEMBER.
5. SPLICE SHALL NOT BE LOCATED AT THE POINT OF MAXIMUM BENDING MOMENT AND/OR MAXIMUM SHEAR FORCE.
6. SPLICE PLATE MAY BE OMITTED FOR PURLINS & SIDE GIRTS FOR MEMBER SIZES UPTO 150mm DEPTH.
7. BUTT WELD SHALL BE SINGLE V BUTT WELD FOR THICKNESS EQUAL TO OR MORE THAN 16 mm.
8. CONNECTION DESIGN SHOWN IS TENTATIVE AND MINIMUM REQUIREMENT, CONTRACTOR SHALL DESIGN THE CONNECTION FOR FULL MEMBER STRENGTH AS PER RELEVANT CODE AND JSD / JSS. (B)

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
B	10-06-2020	IFD	TUN	KRK	JP / KC	JMC
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)

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- ☒ INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

TechnipFMC

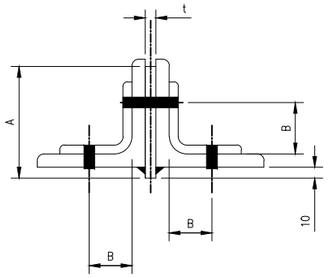
TITLE

TYPICAL SPLICE DETAIL OF ANGLES

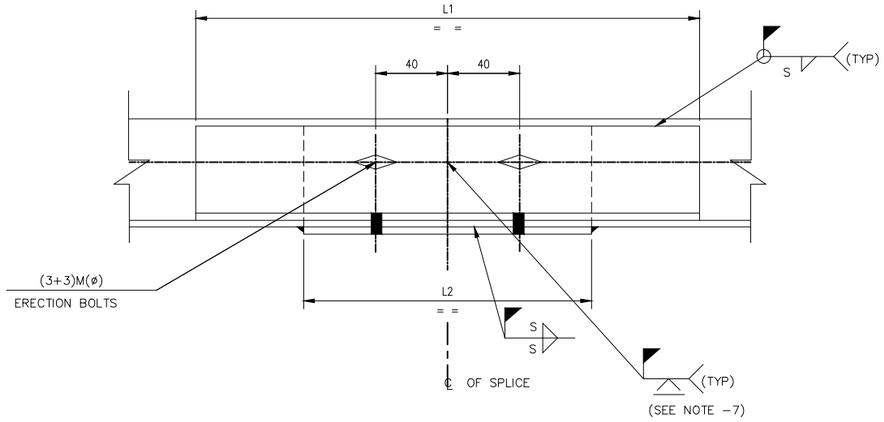
DRAWING NO.						PAGE	REV.
SCALE	080557C	000	STC	1890	008	1 OF 2	B
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1890-008_1_B.DWG

SHEET SIZE : A3



CROSS SECTION



ELEVATION

EQUAL ANGLES (DOUBLE)

SIZE OF ANGLE	SPLICE ANGLE	L1	SPLICE PLATE			B	ERECTION BOLT DIA M(ø)	SIZE OF WELD(S)
			A	t	L2			
2L 50X50X6	2L 35X35X6	150	50	t	130	19	12	6
2L 65X65X6	2L 50X50X6	150	65	t	130	28	12	6
2L 75X75X6	2L 50X50X6	200	75	t	130	28	12	6
2L 75X75X8	2L 50X50X6	230	75	t	130	28	12	6
2L 90X90X6	2L 50X50X6	240	90	t	130	28	12	6
2L 90X90X8	2L 65X65X6	270	90	t	130	35	12	6
2L 100X100X8	2L 65X65X6	300	100	t	130	35	12	6
2L 110X110X10	2L 65X65X6	350	100	t	130	35	16	6
2L 130X130X10	2L 75X75X8	400	130	t	130	40	16	6
2L 150X150X16	2L 90X90X8	480	150	t	130	50	16	6
2L 200X200X20	2L 100X100X8	500	200	t	150	60	16	8

t-THICKNESS OF PLATE AS PER DESIGN DRG. / CONNECTION DESIGN.

NOTES: -

1. ALL DIMENSIONS ARE IN mm.
2. ALL BUTT WELD ARE FULL STRENGTH WELDS.
3. ALL EDGES SHALL BE PREPARED BEFORE BUTT WELDING.
4. SPLICE PLATES ARE DESIGNED FOR 40% OF FULL STRENGH OF THE MEMBER.
5. SPLICE SHALL NOT BE LOCATED AT THE POINT OF MAXIMUM BENDING MOMENT AND/OR MAXIMUM SHEAR FORCE.
6. SPLICE PLATE MAY BE OMITTED FOR PURLINS & SIDE GIRTS FOR MEMBER SIZES UPTO 150mm DEPTH.
7. BUTT WELD SHALL BE SINGLE V BUTT WELD FOR THICKNESS EQUAL TO OR MORE THAN 16 mm.
8. (B) CONNECTION DESIGN SHOWN IS TENTATIVE AND MINIMUM REQUIREMENT, CONTRACTOR SHALL DESIGN THE CONNECTION FOR FULL MEMBER STRENGTH AS PER RELEVANT CODE AND JSD / JSS.

Rev	Date DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
B	10-06-2020	IFD	TUN	KRK	JP / KC	JMC
A	16-10-2019	IFD	TUN	KRK	JP / KC	JMC

DOCUMENT CATEGORY (USE " X " MARK)

- [ ] APPROVAL
- [ ] REVIEW
- [x] INFORMATION

DOCUMENT REVIEW STATUS (BY CLIENT)

PROJECT

STANDBY SRU & ADDITIONAL TANKS

IOCL PARADIP REFINERY, ODISHA, INDIA

OWNER

INDIAN OIL CORPORATION LTD.

PMC

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TITLE

TYPICAL SPLICE DETAIL OF ANGLES

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SCALE	080557C	000	STC	1890	008	2 OF 2	B
NTS	PROJECT	UNIT	DOC. TYPE	MAT. CODE	SER. NO.		

CAD FILE NAME : 080557C-000-STC-1890-008_2_B.DWG

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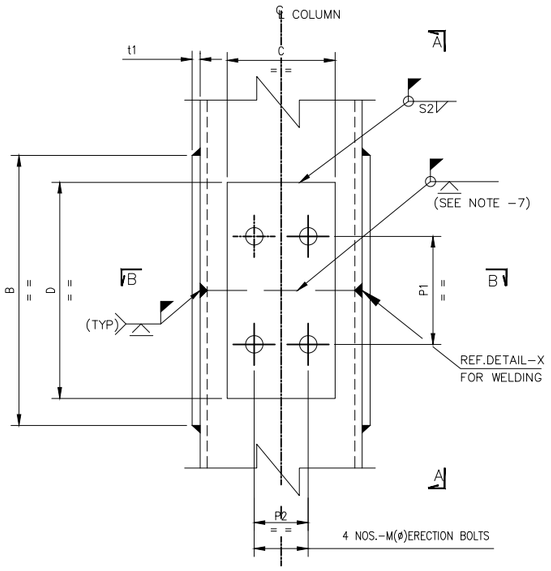
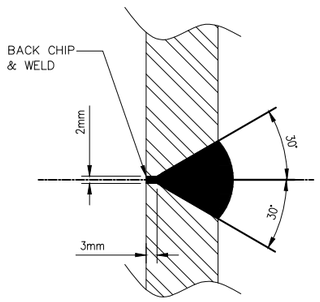
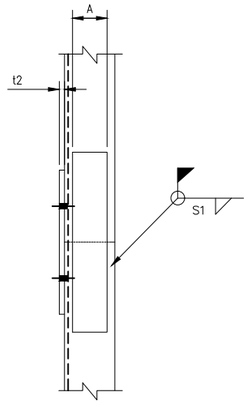


ELEVATION

SECTION B-B



DETAIL - X



VIEW A-A

SIZE OF CHANNEL	FLANGE SPLICE PLATES				WEB SPLICE PLATES							REMARKS
				WELD SIZE				WELD SIZE	ERECTION BOLTS			
	A	B	t1	S1	C	D	t2	S2	M(ø)	P1	P2	
MC75	25	120	8	6	35	90	6	6	12	50	–	TWO BOLTS
MC100	35	120	8	6	40	90	6	6	12	50	–	TWO BOLTS
MC125	45	120	8	6	50	90	6	6	16	50	–	TWO BOLTS
MC150	55	150	8	6	60	120	6	6	16	60	–	TWO BOLTS
MC200	55	150	12	10	120	120	6	6	16	60	60	
MC250	65	160	12	10	120	120	6	6	16	60	60	
MC300	70	160	12	10	150	120	6	6	16	60	60	
MC350	80	190	12	10	200	120	6	6	16	60	60	
MC400	85	190	12	10	240	140	6	6	16	60	60	

NOTES: -

1. ALL DIMENSIONS ARE IN mm.
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3. ALL EDGES SHALL BE PREPARED BEFORE BUTT WELDING.
4. SPLICE PLATES ARE DESIGNED FOR 40% OF FULL STRENGH OF THE MEMBER.
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TYPICAL SPLICE DETAIL OF CHANNELS

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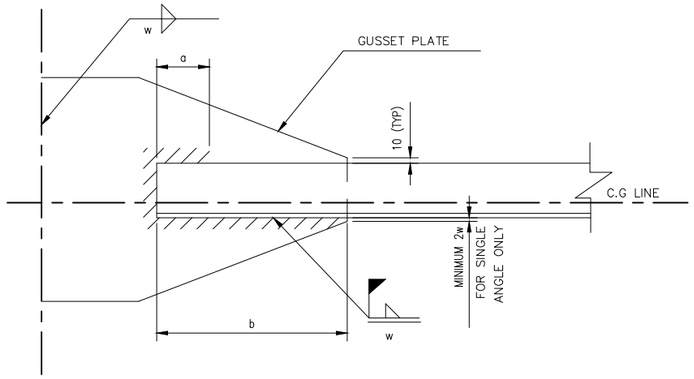

TYP.DET.OF WELD LENGTH FOR ANGLE MEMBERS

ANGLE SIZE	W(mm)	a(mm)	b(mm)	MIN.GUSSET THK.(mm)
L 50x50x6	6	50	150	8
L 65x65x6	6	75	200	8
L 75x75x6	6	75	225	8
L 75x75x8	6	100	300	8
L 90x90x6	6	75	275	8
L 90x90x8	6	100	350	8
L 100x100x8	8	125	350	10
L 110x110x10	8	125	400	10
L 130Xx130x10	8	125	500	10
L 150x150x12	10	150	525	12
L 200x200x20	10	175	550	12
2L 50x50x6 B/B	6	50	150	8
2L 65x65x6 B/B	6	75	200	8
2L 75x75x6 B/B	6	75	225	8
2L 75x75x8 B/B	6	100	300	8
2L 90x90x6 B/B	6	75	275	8
2L 90x90x8 B/B	6	100	350	8
2L 100x100x8 B/B	8	125	350	10
2L 110x110x10 B/B	8	125	400	10
2L 130x130x10 B/B	8	125	500	10
2L 150x150x16 B/B	10	150	525	12
2L 200x200x20 B/B	12	175	550	16

Rev	DD-MM-YYYY	Description of Issue	Written by	Checked by	Approved by	Authorized by
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TYPICAL DETAL OF WELD LENGTH FOR ANGLE MEMBERS

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