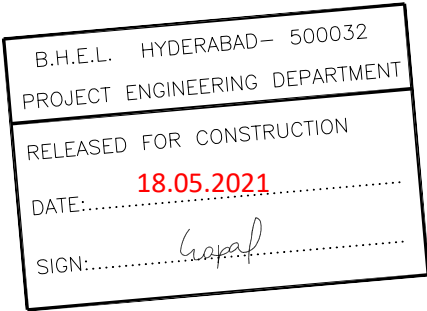






DOCUMENT CATEGORY		DOCUMENT REVIEW STATUS (BY CLIENT)			
(USE "X" MARK)\ <input type="checkbox"/> APPROVAL <input checked="" type="checkbox"/> REVIEW <input type="checkbox"/> INFORMATION					
<div style="text-align: center;">  </div>					
1	18.05.21	PMC COMMENTS INCORPORATED & ISSUED FOR CONSTRUCTION	CSS	RDS	AS
0	12.04.21	ISSUED FOR COMMENTS	CSS	RDS	AS
REV	DATE	DETAILS OF REVISION	PREPARED	CHECKED	APPROVED
CLIENT	 IndianOil	INDIAN OIL CORPORATION LIMITED PARADIP REFINERY PROJECT PARADIP ODISHA			
CONSULTANT			TECHNIP ENERGIES		
PROJECT	525 TPD STANDBY SRU PROJECT IOCL PARADIP REFINERY, ODISHA, INDIA				
ESC	 ENGINEERS INDIA LIMITED NEW DELHI				
	BHEL Hyderabad	NAME DRN CHD	EIL GPP	SIGN EIL [Signature]	DATE 18.05.21 18.05.21
DEPT. PE&SD.	CODE 450	APPD	EC	[Signature]	18.05.21
The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED, It must not be used directly or indirectly in any way detrimental to the interest of the company		TITLE: GENERAL NOTES FOR STRUCTURAL STEEL WORKS			
		BHTEL/EIL DRG/DOC NO. B366-088-81-41-46052			REV
		CUST. DRG/ DOC NO. : 080557C-26899053-CIV-A2011-002			1
		SHT NO. 01	NO. OF SHT. 09		

GENERAL NOTES, STANDARDS, SYMBOLS & ABBREVIATIONS STRUCTURAL STEEL WORKS

सामान्य टिप्पणियाँ, मानक,
प्रतीक एवं संक्षिप्तियाँ
संरचनात्मक इस्पात कार्य

परियोजना : स्टैंड बाइ एसआरयू परियोजना , पारादीप रिफ़ाइनरी
PROJECT : **STANDBY SRU PROJECT, PARADIP REFINERY**

मालिक : मे. इंडियन ऑइल कॉर्पोरेशन लिमिटेड
OWNER : **M/S INDIAN OIL CORPORATION LIMITED**

पीएमसी : मे. टेक्निप एनेर्जीस
PMC : **M/s TECHNIP ENERGIES**

ग्राहक : मे. भारत हेवि एलेक्ट्रिकल्स लिमिटेड
CLIENT : **M/s BHARAT HEAVY ELECTRICALS LTD.**

1	18.05.2021	PMC COMMENTS INCORPORATED & ISSUED FOR CONSTRUCTION	CSS	RDS	AS
0	12.04.2021	ISSUED FOR CONSTRUCTION	CSS	RDS	AS
A	07.04.2021	ISSUED FOR COMMENTS	CSS	RDS	AS
Rev. No	Date	Purpose	Prepared	Checked	Approved

A. GENERAL NOTES

1. THESE NOTES FORM PART OF ALL APPROVED FOR CONSTRUCTION (AFC) DRAWINGS THAT BEAR REFERENCE TO THIS DOCUMENT FOR STRUCTURAL STEEL CONSTRUCTION. THIS DOCUMENT IS NOT APPLICABLE FOR PRE-ENGINEERED BUILDINGS/ STRUCTURES.
2. THESE NOTES SHALL BE READ IN CONJUNCTION WITH THE FOLLOWING SPECIFICATIONS OF CIVIL & STRUCTUAL WORKS.

a)	080557C-000-JSS-1800-001	:	STRUCTURAL STEEL WORKS
b)	080557C-000-JSS-1700-004	:	GROUTING
c)	080557C-000-JSS-1800-002	:	MS GRATINGS
d)	080557C-000-JSS-1800-003	:	FIRE PROOFING OF STEEL STRUCTURES
e)	080557C-000-JSS-1800-004	:	ROOFING & CLADDING
f)	080557C-000-PP-802_0	:	BARRICADING WORKS
g)	080557C-000-JSD-2300-001	:	PAINTING

3. THE AFC DRAWING SHALL BE READ IN CONJUNCTION WITH THIS DOCUMENT AND IN CASE OF ANY CONFLICT BETWEEN THIS DOCUMENT AND THE AFC DRAWING, THE LATER SHALL GOVERN.
4. ALL DIMENSIONS ARE IN **mm** AND LEVELS/ ELEVATIONS IN **M** UNLESS NOTED OTHERWISE (UNO). DRAWINGS SHALL NOT BE SCALED AND ONLY FIGURED DIMENSIONS SHALL BE FOLLOWED.
5. ALL STRUCTURAL STEEL MATERIAL FOR ANCHOR BOLTS SHALL BE OF WELDABLE QUALITY MILD STEEL OF GRADE **E250 (Fe410W)** QUALITY **A** (UNO) CONFORMING TO IS:2062.
6. ALL STRUCTURAL STEEL MATERIAL OTHER THAN ANCHOR BOLTS SHALL BE OF WELDABLE QUALITY MILD STEEL OF MINIMUM GRADE **E250 QUALITY B0/BR** CONFORMING TO IS:2062 UNLESS NOTED OTHERWISE (UNO) & SHAPES SHALL BE AS PER SP6 OF IS:800/ IS:12778 (WIDE FLANGE/NARROW FLANGE SECTIONS) OR UNIVERSAL BEAMS AND COLUMNS AS PER BSEN 10025 S275JR / S275J0 / S355J0
7. TUBULAR/ HOLLOW STEEL SECTIONS SHALL BE OF GRADE **YSt 310** CONFORMING TO IS:1161 (FOR CIRCULAR HOLLOW SECTIONS (CHS)) & CONFORMING TO IS:4923 (FOR RECTANGULAR HOLLOW SECTIONS (RHS)/ SQUARE HOLLOW SECTIONS (SHS)).
8. ALL HOLLOW SECTIONS AND TUBES SHALL BE FULLY SEALED AT THE END WITH 6 mm PLATES WELDED ALL ROUND, UNLESS NOTED OTHERWISE ON THE DESIGN DRAWINGS.

9. STEEL STAIRS, LADDERS & HAND RAILS SHALL BE AS PER STANDARD DRAWINGS. ALL HANDRAIL WELD AND EXPOSED CUT EDGES AND CORNERS SHALL BE ROUNDED AND GROUND SMOOTH.
10. BEVEL WASHERS SHALL BE USED TO PROVIDE PROPER BOLTING CONNECTIONS FOR EQUIPMENTS & MONORAIL SUPPORTS.
11. GRATINGS SHALL BE 25mm THICK AS PER SPECIFICATION NO. 080557C-000-JSS-1800-002.
12. ALL GRATING (ELECTRO FORGED TYPE) PANELS, CHEQUERED PLATES, STAIR TREADS SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH IS:4759. THE MINIMUM THICKNESS OF GALVANIZING SHALL BE 120 MICRON.
13. THE DETAILS OF STAIRCASE, LADDER, HANDRAIL, LACING, GRATING AND CHEQUERED PLATE FLOORING SHALL BE AS PER CONSTRUCTION STANDARD FOR STEEL : 080557C-000-LD-1890-001.
14. THE HANDRAIL APPROACH TO AND FROM EXIT AREAS SHALL BE SMOOTH AND CONTINUOUS KNEE RAILS AND KICK PLATE SHALL ALSO BE CONTINUOUS WITH THOSE OF ADJACENT WALKWAYS, PLATFORMS AND STAIRS.
15. ALL CHEQUERED PLATE SHALL BE 6mm THK. (ON PLAIN), UNO.
16. CHEQUERED PLATE & GRATING SHALL HAVE A MINIMUM BEARING OF 30 mm AT EACH SUPPORTS.
17. CHEQUERED PLATE SHALL BE TACK WELDED TO FLOOR BEAM.
18. A 10mm DIA DRAINAGE HOLE SHALL BE PROVIDED FOR EVERY 1.5M OF FLOOR PLATE WITH A MINIMUM OF ONE HOLE PER PANEL, SHOWN OTHERWISE ON DESIGN DRAWING.
19. WORKING POINTS 'WP' FOR BRACINGS SHALL BE ON CENTERLINES OF BEAMS/COLUMNS, UNLESS NOTED OTHERWISE.
20. FOR PIPING AND OTHER PENETRATIONS THROUGH FLOORING, OPENINGS SMALLER THAN THAT LISTED IN THE FOLLOWING SHALL BE LOCATED AND CUT BY THE FIELD. 200 mm DIA. FOR CHEQUERED PLATE FLOORING, 300 mm DIA. FOR GRATING FLOORING. FIELD SHALL PROVIDE "GRATING PENETRATION COLLARS". WHEN FOR ANY REASON THE CLEAR SPACE BETWEEN THE PIPE / INSULATION AND THE EDGE OF FLOORING EXCEEDS 50 mm ON ANY SIDE, FIELD SHALL SUPPLY AND INSTALL A PENETRATION COVER PLATE IN ACCORDANCE WITH SPECIFICATION. IT MAY BE NECESSARY TO REMOVE TOE PLATE WHERE PROVIDED.

21. CONNECTION DETAILS:

UNLESS NOTED OTHERWISE, ALL SHOP CONNECTIONS SHALL BE WELDED AND FIELD CONNECTION SHALL BE BOLTED AND SHALL BE DESIGNED FOR FULL STRENGTH OF CONNECTED MEMBERS. ALL CONNECTION SHALL BE DESIGNED AS PER IS:800

ALL COLUMN ENDS SHALL BE GROUND SMOOTH BEFORE WELDING TO THE BASE PLATE.

a) WELDED CONNECTIONS

- i) ALL WELDING SHALL CONFORM TO IS:816, IS:819, IS:1024, IS:1261, IS:1323, IS:9595 AS APPLICABLE.
- ii) ALL WELDING SHALL BE DONE AS PER SPECIFICATIONS USING ELECTRODES OF APPROVED MANUFACTURER & CONFORMING TO IS:814 & IS:7280 AND ALL OTHER CONSUMABLES SHALL BE AS PER SPECIFICATION 080557C-000-JSS-1800-001.
- iii) ALL WELDS SHALL BE MINIMUM 6 mm FILLET WELD ALL-ROUND, UNO. ALL BUTT WELDS SHALL BE FULL STRENGTH BUTT WELDS WITH REQUISITE EDGE PREPARATION FOR MEMBERS WITH THICKNESS MORE THAN 8mm.
- iv) ALL BATTENS, LACINGS & BOX SECTIONS SHALL HAVE CONTINUOUS WELDING, UNO.
- v) PROPER SEATING CLEATS AND/ OR ERECTION/ LOCATION BOLTS SHALL BE PROVIDED WHEREVER FIELD WELDING IS ENVISAGED.
- vi) UNLESS NOTED OTHERWISE TYPICAL JOINT/ CONNECTION DETAILS SHALL BE AS PER EIL STANDARD NOS. 7-68-0207, 7-68-0208, 7-68-0210, 7-68-0689 AND 7-68-0696.

b) BOLTED CONNECTIONS

- i) ALL BOLTS HOLES SHALL BE DRILLED.
- ii) ORDINARY BOLTS (GRADE 4.6) SHALL BE OF 16mm DIAMETER (MAXIMUM) & MINIMUM 2 NOS. OF 16 mm DIAMETER TO BE USED FOR ERECTION PURPOSE.
- iii) FOR SHEAR & MOMENT CONNECTIONS, HIGH STRENGTH BOLTS OF GRADE 8.8 & 10.9 CONFORMING TO IS:3757 & IS:1367 SHALL BE USED, UNO. ALL MAIN BOLTED CONNECTIONS SHALL BE PROVIDED WITH MINIMUM OF 2 NUMBERS OF 20mm DIAMETER BOLTS.
- iv) ALL BOLT HOLES SHALL BE 2 mm LARGER THAN THE BOLT DIAMETER FOR STEEL TO STEEL CONNECTION, UNO.
- v) CONNECTION BOLTS SHALL BE HIGH STRENGTH STRUCTURAL STEEL BOLTS OF PROPERTY CLASS 8.8 (MINIMUM) CONFORMING TO IS:3757 & IS:4000. HEXAGONAL NUTS SHALL CONFORM TO IS:6623. WASHERS SHALL CONFORM TO IS:6649.
- vi) BOLTS AND NUTS SHALL BE AS PER IS: 1367 AND TESTED AS PER IS:1608. BOLTS SHALL BE THREADED IN ACCORDANCE WITH IS:4218. WASHERS SHALL BE AS PER IS:2016.
- vii) ALL BOLTS OF GRADE 10.9 & BOLTS OF SEISMIC RESISTING FRAMES SHALL BE PRETENSIONED AS SPECIFIED IN IS:4000. ALL OTHER BOLTS CAN BE SNUG TIGHT. STEEL LAYOUT AND SHOP ERECTION DRAWING SHOULD CLEARLY SHOW THE BOLTS WHICH NEED TO BE PRETENSIONED.

viii) ALL BOLTS OF GRADE 4.6 & 8.8 WITH CORRESPONDING NUTS & WASHERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH IS:1367 (PART 13) NUT SHALL BE HEXAGONAL HEADED.

ix) FOR ANCHOR BOLTS THE DIAMETER OF HOLES IN THE BASE PLATES SHALL BE 2 mm LARGER THAN THE BOLT DIAMETER UPTO 24 mm DIAMETER BOLTS & 3 mm LARGER FOR BOLTS ABOVE 24 mm DIAMETER.

c) GUSSETS FOR CONNECTION

i) ALL GUSSETS FOR THE WELDED AND/ OR BOLTED CONNECTIONS SHALL BE MINIMUM 10 mm THICK, UNO. ALL END PLATES, STIFFENERS AND CLEATS FOR THE BOLTED AND WELDED CONNECTIONS SHALL BE MINIMUM 8 mm THICK UNLESS NOTED OTHERWISE. MINIMUM GUSSET PLATE THICKNESS FOR TRUSSES & GIRDERS IS 8 MM FOR SPAN UPTO & INCLUDING 12 M ABOVE WHICH THICKNESS IS 10 mm.

ii) SPACER PLATES SHALL BE PROVIDED IN ALL BACK-TO-BACK ANGLES/ CHANNELS OR STARRED ANGLES AS PER IS:800. THESE SHALL BE OF THE SAME THICKNESS AS THE GUSSET PLATES AND THE MAXIMUM SPACING SHALL BE 40 TIMES THE MINIMUM RADIUS OF GYRATION OF SINGLE ANGLE/ CHANNEL.

22. PROTECTIVE COATING:

(SURFACE PREPARATION/ PRIMING/ PAINTING/ GALVINIZING) SHALL BE AS PER SPECIFICATION NO. 080557C-000-JSD-2300-001 CONSIDERING “**COASTAL / MARINE**” ENVIRONMENT FOR SELECTION OF COATING SYSTEM FOR OFFSITE & UNITS AND DESIGN TEMPERATURE AS -14° C TO 100° C:

- a) SURFACE PREPARATION SHALL BE **SSPC-SP-10** AS PER SL. NO. 4.2 OF SURFACE PREPARATION TABLE.
- b) PRE-ERECTION/ SHOP PRIMER SHALL BE ONE COAT EACH OF **FP-6, FP-3A & FP-1** AS PER SL. NO. 1.2 OF TABLE - 01 FOR UNITS & OFFSITES.
- c) REPAIR OF SHOP PRIMER IF REQUIRED SHALL BE BY ONE COAT OF **FP-6** AS PER SL. 10.1 OF TABLE- 10. AFTER SURFACE PREPARATION **SSPC-SP-3**, AFTER INSPECTION OF FABRICATION AND BEFORE DELIVERY TO SITE, U.N.O.
- d) FINAL FINISH PAINT SHALL BE ONE COAT OF **FP-1**, AS PER SL. NO. 1.2 OF TABLE- 01 FOR UNITS & OFFSITES.
- e) FINAL PAINTING SHALL NOT BE DONE ON STEEL MEMBERS TO BE FIRE PROOFED OR TO BE ENCASED IN CONCRETE. FIREPROOFING SHALL BE DONE AS PER FIREPROOFING SPECIFICATION NO : 080557C-000-JSS-1800-003.
- f) WHERE STEEL HAS BEEN DELIVERED PAINTED, THE PAINT SHALL BE REMOVED FOR A DISTANCE OF 50 mm ON EITHER SIDE OF THE JOINTS BEFORE ANY WELDING IS CARRIED OUT. THE WELDED AREA SHALL BE THOROUGHLY CLEANED USING WIRE BRUSH ETC. AND TOUCH UP/ REPAIR PRIMER APPLIED ON THE UNCOATED AREA.

- g) PROTECTIVE COATING (INCLUDING GALVANISING) FOR GRATINGS, ROLLING & STATIONERY LADDERS, SPIRAL STAIRWAYS AND HAND RAILS SHALL BE DONE IN ACCORDANCE WITH SL. NO. 9.1 OF TABLE - 09.
- h) TABLE NOS. MENTIONED ABOVE ARE AS PER SPECIFICATION NO. 080557C-000-JSD-2300-001.

23. FABRICATION DRAWINGS:

- a) ALL FABRICATION SHALL BE AS PER IS:800-2007 & IS:816.
- b) DETAILED FABRICATION AND ERECTION DRAWINGS SHALL BE PREPARED BY THE CONTRACTOR (OR AN AGENCY APPROVED BY THE ENGINEER-IN-CHARGE), ON THE BASIS OF AFC DESIGN DRAWINGS IN CONFORMITY TO THE PROVISIONS OF SPECIFICATIONS NO. 080557C-000-JSS-1800-001 FOR ALL STRUCTURES AND SUBMITTED TO ENGINEER-IN-CHARGE FOR APPROVAL. WHEREVER SPECIFICALLY MENTIONED ON THE AFC DRAWINGS, FABRICATION DRAWINGS SHALL BE SUBMITTED TO BHEL / EIL DESIGN OFFICE FOR REVIEW/ APPROVAL.
- c) FOR ROOF TRUSSES OR OPEN WEB GIRDERS OF SPAN >12 m, A UNIFORM CAMBER OF 0.5% SHALL BE PROVIDED FROM EITHER SUPPORT TO THE CENTER OF SPAN, UNO. ALL GUSSET PLATES SHALL BE SUITABLY ADJUSTED FOR THIS CAMBER.

24. ERECTION:

- a) ERECTION OF STRUCTURE SHALL BE STARTED WITH THE BRACED BAYS AND NOT MORE THAN ONE STOREY TO BE LEFT UNBRACED AT ANY STAGE OF ERECTION.
- b) ERECTION SCHEME SHALL BE CLEARLY MENTIONED ON FABRICATION DRAWINGS WHERE SO REQUIRED, AND APPROVAL OF ENGINEER-IN-CHARGE SHALL BE TAKEN BEFORE STARTING ERECTION.
- c) SAFETY DURING ERECTION SHALL BE ENSURED BY THE CONTRACTOR BY PROVIDING ADEQUATE TEMPORARY BRACINGS/ SUPPORTS OR OTHERWISE AS APPROVED BY THE ENGINEER-IN-CHARGE. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE SAFETY DURING ERECTION.
- d) NO PART OF ANY STRUCTURE SHALL BE USED FOR ERECTION PURPOSE WITHOUT PRIOR APPROVAL OF ENGINEER-IN-CHARGE.
- e) STABILITY AGAINST WIND, AT INTERMEDIATE STAGES OF ERECTION, SHALL BE ENSURED BY PROVIDING TEMPORARY GUYS AND TIES WHEREVER REQUIRED.
- f) MINOR HANDRAIL ADJUSTMENTS TO TOP RAIL, MID RAIL OR TOE PLATE AT LOCATIONS WHERE PIPING & SUPPORTS ARE REQUIRED SHALL BE MADE IN THE FIELD IF NECESSARY. HANDRAIL POST SHALL BE ADJUSTED OR ADDED FOR SUPPORTS AT DISCONTINUOUS RAIL THAT HAVE BEEN FIELD CUT.

STANDARDS:

THE FOLLOWING STANDARDS/ DRAWINGS SHALL BE REFERRED FOR THE RESPECTIVE DETAILS AS GIVEN BELOW:

SL. NO	STANDARD NO.	TITLE
1.	080557C-000-LD-1890-001	CONSTRUCTION STANDARD FOR STEEL WORKS
2.	7-68-0251	WELDING SYMBOLS
3.	7-68-0355	INSTRUMENTATION CABLE DUCT/ TRAY SUPPORTING ARRANGEMENT
4.	7-68-0691	DETAIL OF SLIDING T-SUPPORT
5.	7-68-0695	ELECTRICAL CABLE TRAY SUPPORTING STRUCTURE
6.	7-68-0696	DETAIL OF LACING CONNECTIONS
7.	7-68-0699	SADDLE SUPPORTS FOR EQUIPMENTS ON TECH. STRUCTURES
8.	7-68-0207	WELDED COLUMN SPLICE
9.	7-68-0208	SPLICING DETAIL FOR ROLLED SECTIONS
10.	7-68-0210	CRANE BRACKET DETAILS.
11.	7-68-0689	SHEAR CONNECTIONS WELDED TYPE - BEAM TO BEAM
12.	7-68-0696	DETAIL OF LACING CONNECTION

B. SYMBOLS:

HANDRAIL

HALF HANDRAIL

-----H-H-----H-H-----

TOE PLATE ONLY

-----I-P-----T-P-----

REMOVABLE HANDRAIL

-----R-H-----R-H-----

SAFETY CHAINS

0-0-0-0-0 S-C 0-0-0-0 S-C 0-0-0-0 S-C 0-0-0-0-0

SAFETY BAR

===== S-B =====

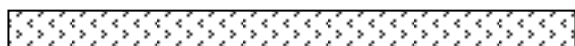
AUTOMATIC BARRIER

----- A-B -----

GRATING



CHEQUERED PLATE



OPEN HOLE



HOLE COUNTERSUNK NEAR SIDE



HOLE COUNTERSUNK FAR SIDE



BLACK BOLT



TURNED BOLT



GROUND FLUSH



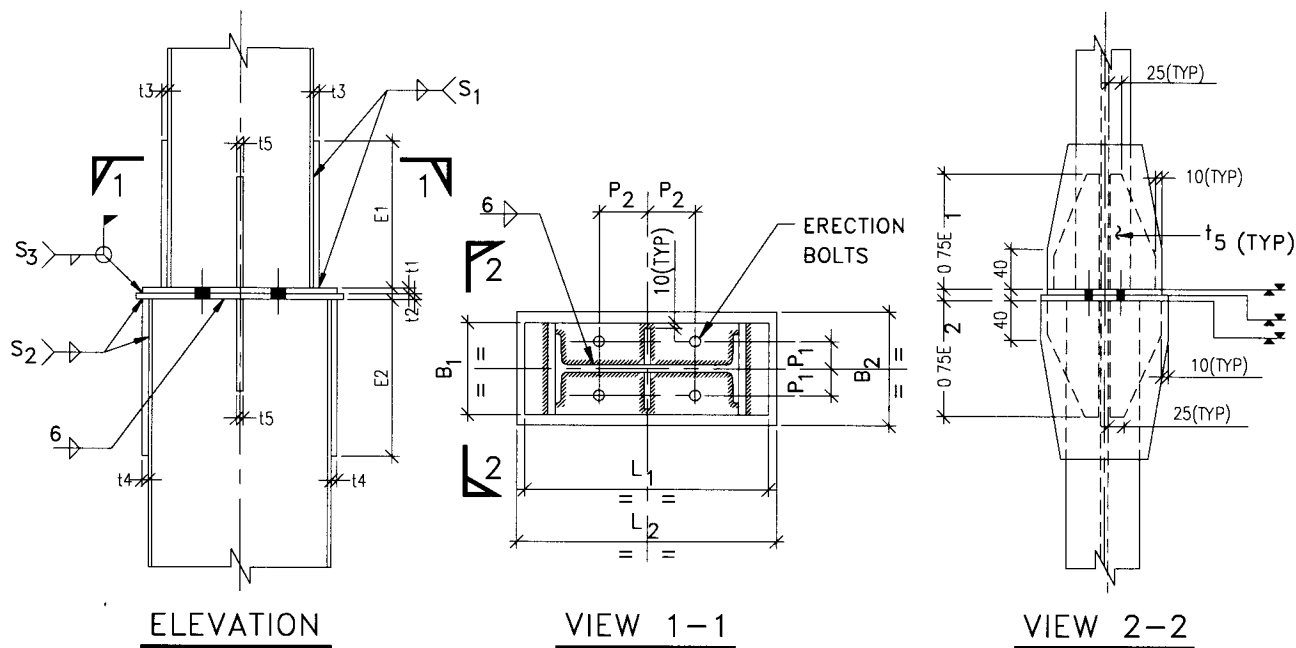
C. ABBREVIATIONS:

α	:	ANGLE	AFC	:	APPROVED FOR CONSTRUCTION
@	:	AT THE RATE OF	B/B	:	BACK TO BACK
BCD	:	BOLT CIRCLE DIAMETER	CL/CL	:	CENTRE LINE
C/C	:	CENTRE TO CENTRE	COL	:	COLUMN
DIA/D/Ø	:	DIAMETER	****	:	DIMENSION NOT TO SCALE
DWG/DRG	:	DRAWING	EL	:	ELEVATION
EQ	:	EQUAL	NB	:	NOMINAL BORE
FFL	:	FINISHED FLOOR LEVEL	FGL	:	FINISHED GROUND LEVEL
LVL	:	LEVEL	NGL	:	NATURAL GROUND LEVEL
FLG.PL.	:	FLANGE PLATE	HPP	:	HIGH POINT OF PAVEMENT
IP	:	INSERT PLATE	kN	:	KILONEWTON
m	:	METRE	MT/T	:	METRIC TON
MS	:	MILD STEEL	mm.	:	MILLIMETRE
NF	:	NEAR FACE	FF	:	FAR FACE
PL	:	PLATE	PCD	:	PITCH CIRCLE DIAMETER
QTY.	:	QUANTITY	R	:	RADIUS
RECT	:	RECTANGULAR	SQ	:	SQUARE
STD	:	STANDARD	∠	:	STRUCTURAL ANGLE
TH/THK	:	THICK	SYM	:	SYMMETRICAL
TOG	:	TOP OF GROUT	TOR	:	TOP OF ROAD
TOS	:	TOP OF STEEL	TYP	:	TYPICAL
U/S	:	UNDERSIDE	UNO	:	UNLESS NOTED OTHERWISE
B/PL.	:	BASE PLATE	WT	:	WEIGHT
ID	:	INSIDE DIAMETER	OD	:	OUTSIDE DIAMETER
GST. PL.	:	GUSSET PLATE	MC	:	MOMENT CONNECTION
T & B	:	TOP AND BOTTOM	ALT	:	ALTERNATE
B/W	:	BOTH WAYS	RL	:	REDUCED LEVEL
NTS	:	NOT TO SCALE	STGD.	:	STAGGERED
EF	:	EACH FACE	PG	:	PLATE GIRDER
CHQ. PL.	:	CHEQUERED PLATE	HOR	:	HORIZONTAL
BTN. PL.	:	BATTEN PLATE	VER	:	VERTICAL
BR	:	BRACING	WP	:	WORKING POINT

NOTES:-

1. SPLICE IS DESIGNED FOR FULL STRENGTH OF SMALLER JOIST SECTION.
2. ENDS OF JOISTS SHALL BE GROUND FLUSH, BEFORE WELDING TO THE BASE / CAP PLATES.
3. BASE AND CAP PLATE SURFACES SHALL BE GROUND FLUSH
4. ERECTION BOLTS ARE DESIGNED FOR 5% MOMENT AND 5% AXIAL LOAD CAPACITY OF THE SMALLER SECTION.
5. JOISTS SHALL BE SUITABLY HELD IN POSITION WITH THE HELP OF GUY-ROPES / TIES TILL THE BASE AND CAP PLATES ARE WELDED IN POSITION.
6. ERECTION BOLTS SHALL BE LEFT PERMANENTLY IN POSITION.
7. BASE PLATE OF SMALLER JOIST SHALL BE OMITTED IN CASE OF SHOP SPlicing AND THE SMALLER JOIST ALONG WITH ALL GUSSETS AS SHOWN SHALL BE WELDED WITH THE CAP PLATE OF THE LARGER JOIST.

5	01 08 19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R.K TRIVEDI
4	21 01.14	REAFFIRMED AND ISSUED AS STANDARD	VPS	AJS	P K.MITTAL	S CHANDA
Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
						Approved by



COLUMN SECTIONS SPLICED		BASE AND FLANGE PLATE DETAILS (SMALLER JOIST)						CAP AND FLANGE PLATE DETAILS (LARGER JOIST)						WELD SIZE	ERECTION BOLT			
ISMB	ISMB	L ₁	B ₁	E ₁	t ₁	t ₃	S ₁	L ₂	B ₂	E ₂	t ₂	t ₄	S ₂	S ₃	Ø	P ₁	P ₂	t ₅
100	125 150	140	100	150	12	08	06	165 190	120 125	150 160	12 12	08 08	06 06	06	12	30	25	OMIT
125	150 175	165	105	160	12	08	06	190 215	125 130	160 165	12 12	08 08	06 06	06	12	30	35	OMIT
150	175 200	190	110	165	16	10	06	215 240	130 170	165 220	16 16	08 08	06 06	06	12	35	50	OMIT
175	200 225	215	145	220	16	10	06	240 280	170 180	220 225	16 20	08 10	06 08	08	12	50	60	OMIT
200	225 250	250	150	225	20	12	08	280 305	180 180	225 225	20 20	10 10	08 08	10	16	45	65	10
225	250 300	275	150	225	20	12	10	305 350	180 205	225 265	20 20	10 10	08 10	10	16	45	75	10
250	300 350	300	175	265	20	12	10	350 400	205 220	265 285	20 20	10 10	10 10	10	16	55	85	10
300	350 400	350	190	285	20	12	10	400 450	220 220	285 285	20 25	10 12	10 10	12	16	65	110	12
350	400 450	415	190	285	25	16	12	450 500	220 245	285 310	25 25	12 12	10 10	12	20	60	130	12
400	450 500	465	205	310	25	16	12	500 560	245 285	310 360	25 25	12 12	10 10	12	20	70	150	12
450	500	525	240	360	25	18	12	560	285	360	25	12	10	12	20	85	175	12
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NOTES :-

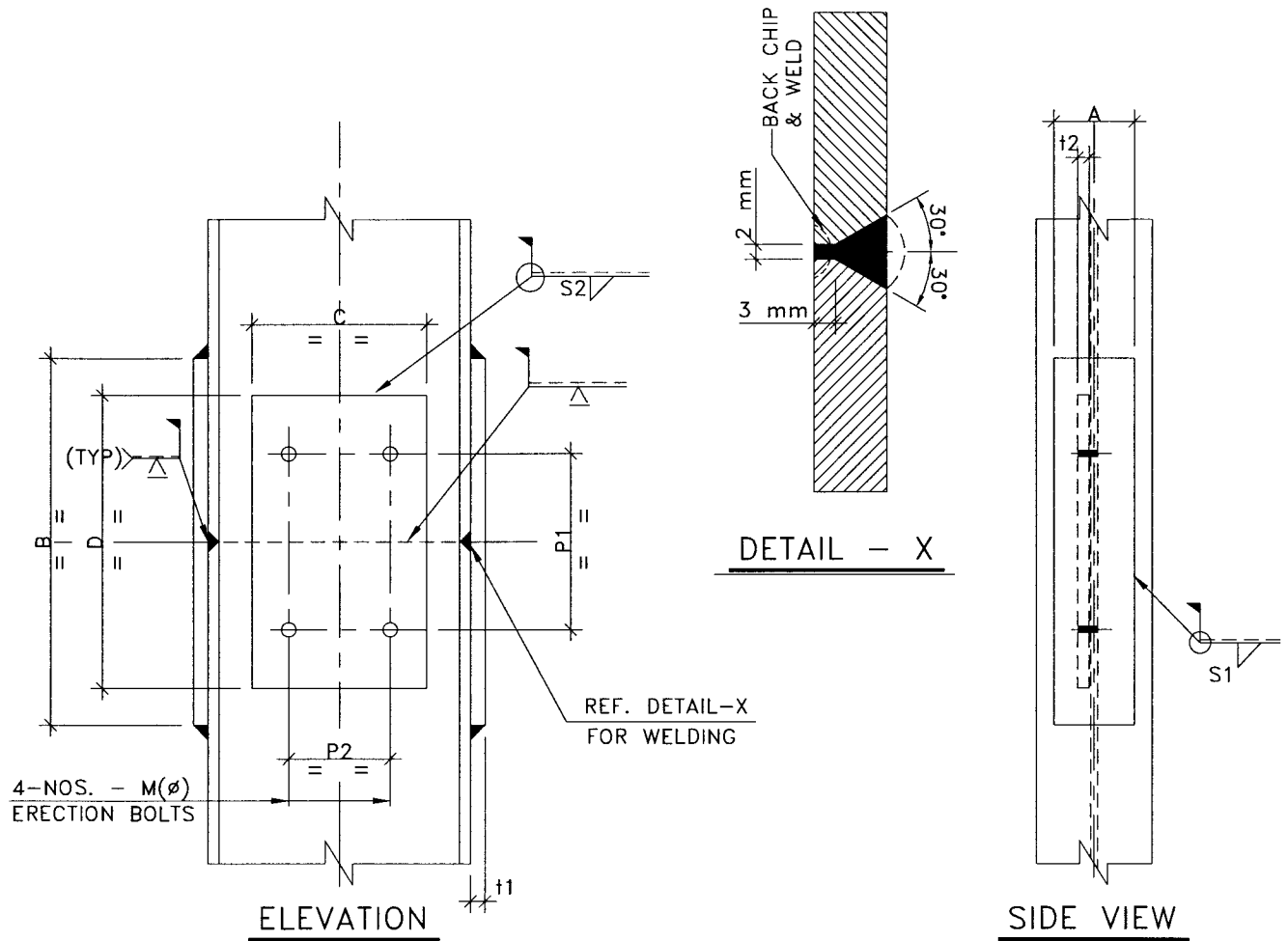
- ALL DIMENSIONS ARE IN mm.
- WELD SIZE FOR WEB LENGTH OF JOISTS AND WEB STIFFENER IS 6 mm (TYP)

5	01 08 19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R K TRIVEDI
4	21 01 14	REAFFIRMED AND ISSUED AS STANDARD	VPS	AJS	P K MITTAL	S CHANDA
Rev No	Date	Purpose	Prepared by	Checked by	Sds Committee Convenor	Sds Bureau Chairman

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 STRENGTH OF THE MEMBER.
5. SPLICE SHALL NOT BE LOCATED AT THE POINT OF MAXIMUM BENDING MOMENT AND / OR MAXIMUM SHEAR FORCE.
6. SPLICE PLATES MAY BE OMITTED FOR PURLINS & SIDE GIRTS FOR MEMBER SIZES UPTO 150 mm DEPTH.

6	27-03-19	REAFFIRMED AND ISSUED AS STANDARD	JG	AJS	RAJANJI SRIVASTAVA	R K TRIVEDI
5	27-12-12	REAFFIRMED AND ISSUED AS STANDARD	VPS	AJS	P K MITTAL	D MALHOTRA
Rev. No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
				Approved by		



BEAMS

SIZE OF JOIST	FLANGE SPLICE PLATE				WEB SPLICE PLATES						
	A	B	t1	WELD SIZE	C	D	t2	WELD SIZE	ERECTION BOLTS		
				S1				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	100	260	8	6	120	120	6	6	16	60	60
MB300	120	300	8	6	150	120	6	6	16	60	80
MB350	120	300	8	6	150	160	8	6	16	60	80
MB400	120	300	10	8	180	190	8	6	16	60	100
MB450	160	300	10	8	215	225	8	6	16	60	135
MB500	160	400	10	8	260	275	8	6	16	60	150
MB600	180	400	12	10	300	280	10	8	16	60	160

6 27-03-19 REAFFIRMED AND ISSUED AS STANDARD

JG

AJS

RAJANJI SRIVASTAVA

R K TRIVED

5 27-12-12 REAFFIRMED AND ISSUED AS STANDARD

VPS

AJS

P K MITTAL

D MALHOTRA

Rev
No

Date

Purpose

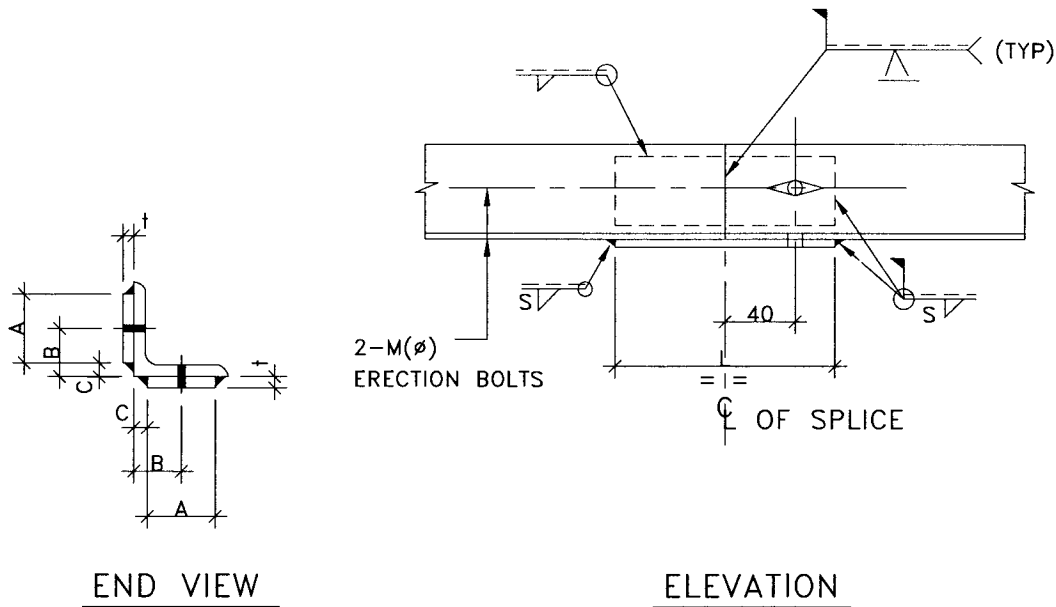
Prepared
by

Checked
by

Stds Committee
Convenor

Stds Bureau
Chairman

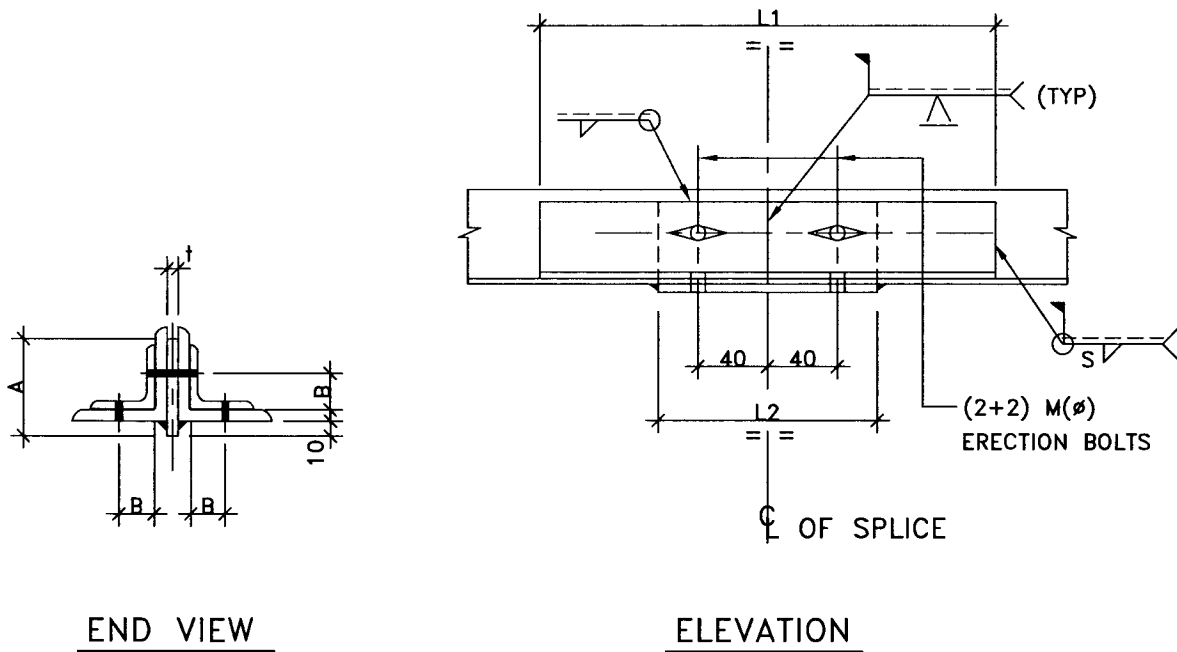
Approved by



EQUAL ANGLE (SINGLE)

SIZE OF ANGLE	SPLICE PLATE			B	C	BOLT DIA M(φ)	SIZE OF WELD (S)
	A	t	L				
L 50x50x6	40	6	130	28	10	12	5
L 65x65x6	45	6	130	35	10	12	5
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
L 100x100x8	60	6	150	60	20	16	8
L 130x130x10	70	8	200	80	30	16	8
L 150x150x10	80	8	200	90	35	16	8

6	27-03-19	REAFFIRMED AND ISSUED AS STANDARD	JG	AJS	RAJANJI SRIVASTAVA	R K SRIVEDI
5	27-12-12	REAFFIRMED AND ISSUED AS STANDARD	VPS	AJS	P K MITTAL	D MALHOTRA
Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
Approved by						

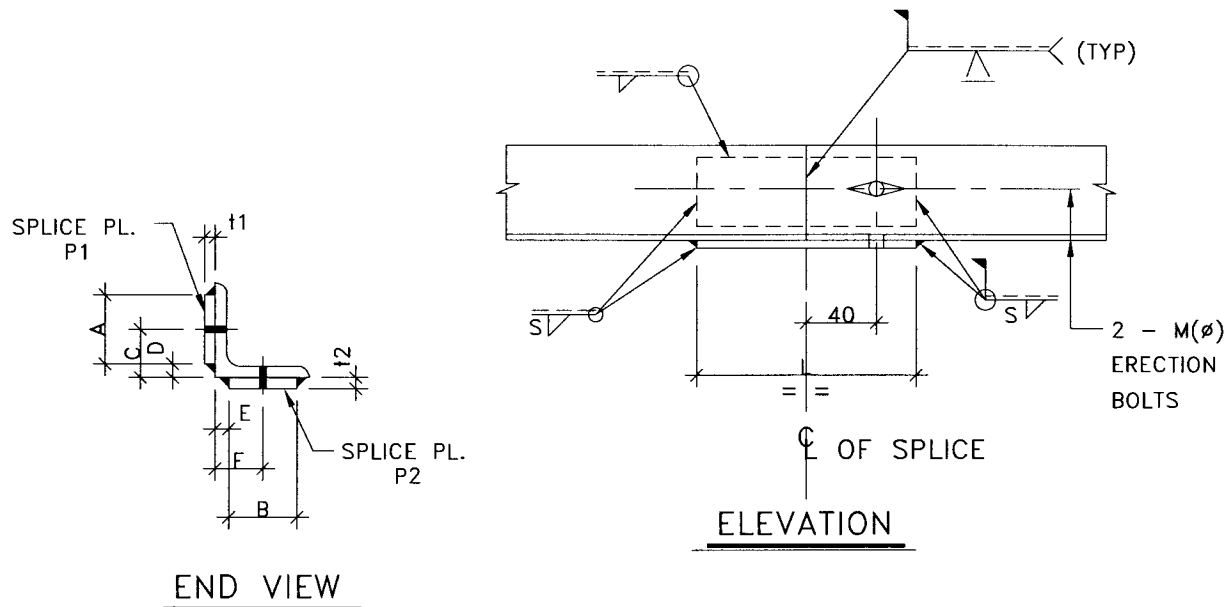


EQUAL ANGLES (DOUBLE)

SIZE OF ANGLE	SPLICE ANGLE	L1	SPLICE PLATE			B	ERECTION BOLT DIA M(φ)	SIZE OF WELD (S)
			A	t	L2			
JL 50x50x6	JL 35x35x6	150	50	t	130	19	12	5
JL 65x65x6	JL 35x35x6	150	65	t	130	19	12	5
JL 65x65x8	JL 50x50x6	200	65	t	130	28	12	6
JL 75x75x6	JL 50x50x6	200	75	t	130	28	12	6
JL 75x75x8	JL 50x50x6	230	75	t	130	28	12	6
JL 90x90x6	JL 50x50x6	240	90	t	130	28	12	6
JL 90x90x8	JL 65x65x6	270	90	t	130	35	12	6
JL 100x100x8	JL 65x65x6	300	100	t	130	35	12	6
JL 130x130x10	JL 75x75x8	400	130	t	130	40	16	6
JL 150x150x10	JL 90x90x8	480	150	t	130	50	16	6

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

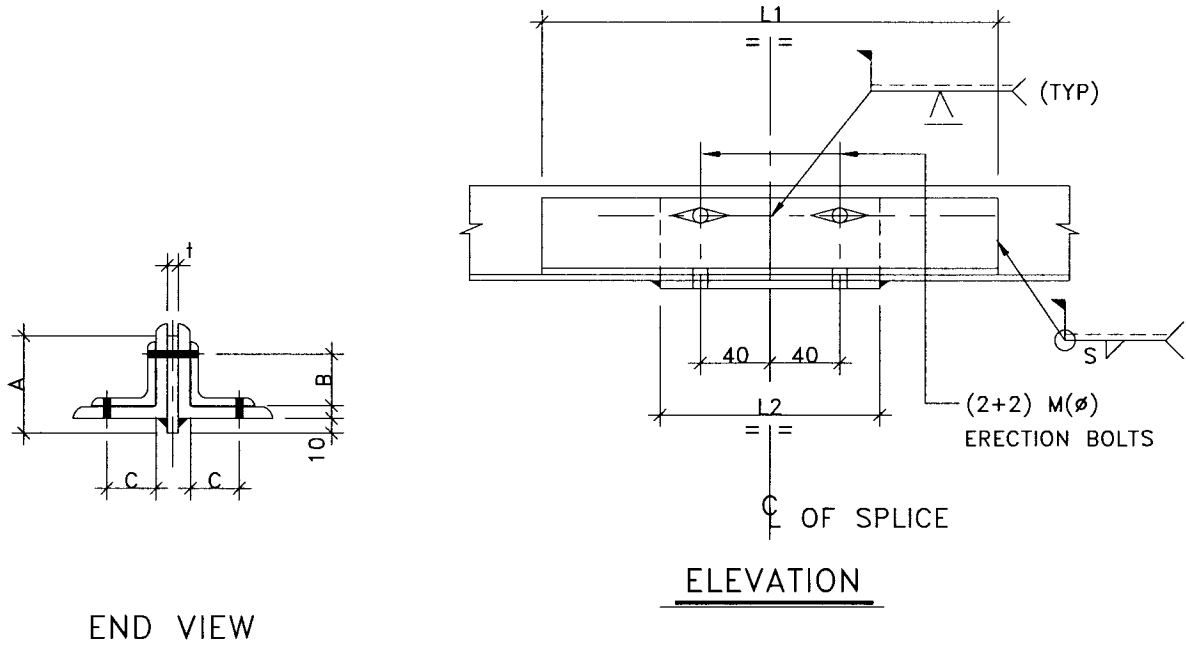
6	27-03-19	REAFFIRMED AND ISSUED AS STANDARD	JG	AJS	RAJANJI SRIVASTAVA	R.K. TRIVEDI
5	27-12-12	REAFFIRMED AND ISSUED AS STANDARD	VPS	AJS	P K.MITTAL	D MALHOTRA
Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman



UNEQUAL ANGLE (SINGLE)

SIZE OF ANGLE	SPlice PLATE P1		SPlice PLATE P2		L	C	D	E	F	EREC- TION BOLT DIA M(φ)	SIZE OF WELD (S)
	A	t1	B	t2							
L 75x50x6	35	6	40	6	130	40	20	10	28	12	6
L 100x75x6	40	6	45	6	130	60	40	15	40	12	6
L 100x75x8	60	6	50	6	130	60	30	15	40	12	6
L 125x75x8	80	6	50	6	150	75	40	15	40	12	6
L 125x75x10	80	6	50	6	200	75	40	15	40	12	6
L 150x75x10	100	6	50	6	250	90	40	15	40	12	6
L 150x115x10	100	6	80	6	250	90	40	30	70	16	6

6	27-03-19	REAFFIRMED AND ISSUED AS STANDARD	JG	AJS	RAJANJI SRIVASTAVA	R K TRIVEDI
5	27-12-12	REAFFIRMED AND ISSUED AS STANDARD	VPS	AJS	P K MITTAL	D MALHOTRA
Rev No	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds Bureau Chairman
Approved by						

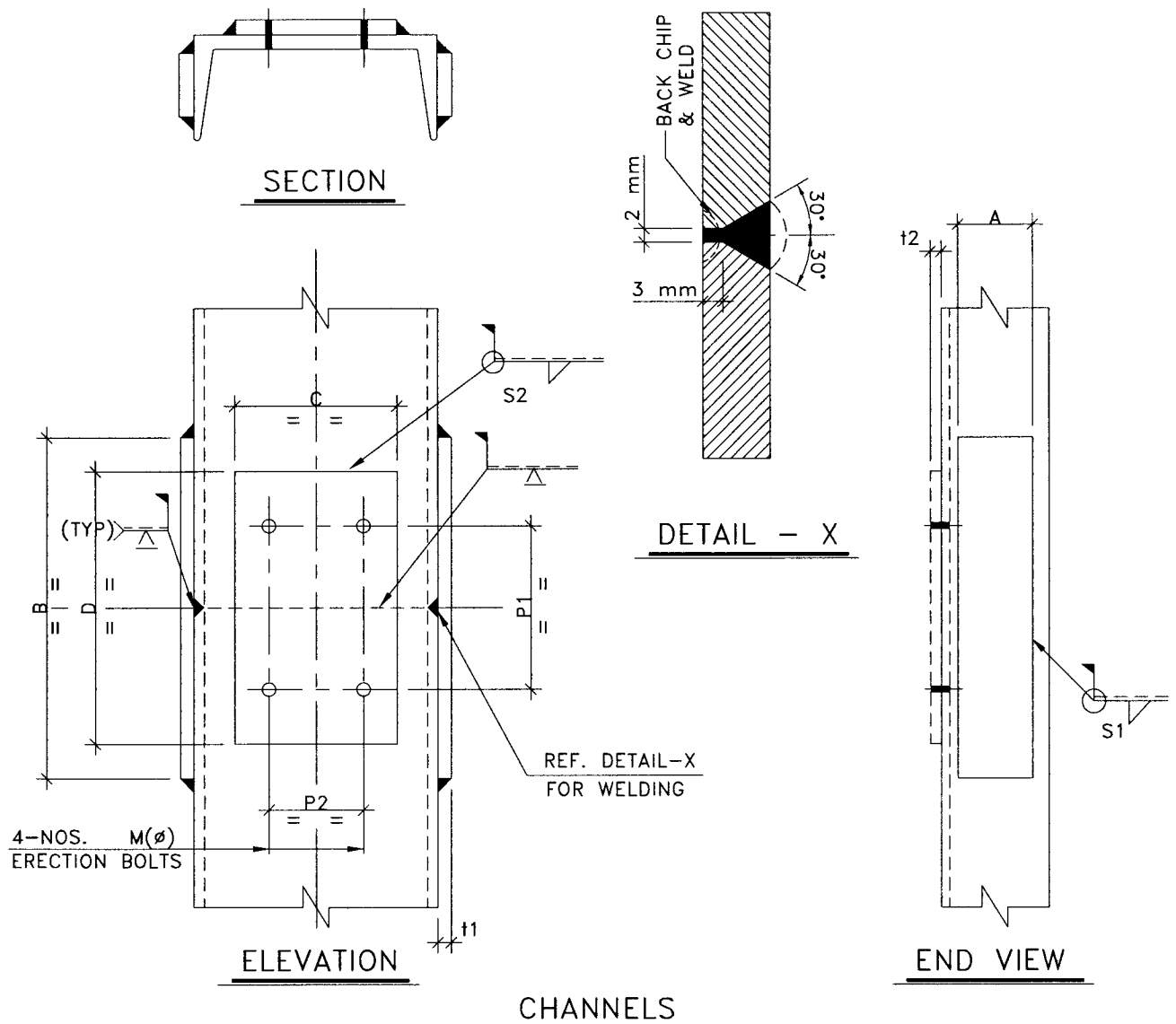


UNEQUAL ANGLES (DOUBLE)

SIZE OF ANGLE	SPLICE ANGLE	L1	SPLICE PLATE			B	C	ERECTION BOLT DIA M(ϕ)	SIZE OF WELD (S)
			A	t	L2				
JL 75x50x6	JL 35x35x6	150	75	t	130	19	19	12	6
JL 100x75x6	JL 50x50x6	200	100	t	130	28	28	12	6
JL 100x75x8	JL 50x50x6	270	100	t	130	28	28	12	6
JL 125x75x8	JL 75x50x6	300	125	t	130	40	28	12	6
JL 125x75x10	JL 75x50x8	320	125	t	130	40	28	12	6
JL 150x75x10	JL 75x50x8	350	150	t	130	40	28	12	6
JL 150x115x10	JL 100x75x8	420	150	t	130	60	40	12	6

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

6	27-03-19	REAFFIRMED AND ISSUED AS STANDARD	JG	AJS	RAJANJI SRIVASTAVA	R K TRIVEDI
5	27-12-12	REAFFIRMED AND ISSUED AS STANDARD	VPS	AJS	P K MITTAL	D MALHOTRA
Rev. No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
						Approved by



SIZE OF CHANNEL	FLANGE SPLICE PLATE				WEB SPLICE PLATES							REMARKS
	A	B	t1	WELD SIZE	C	D	t2	WELD SIZE	ERECTION BOLTS			
				S1				S2	M(ø)	P1	P2	
MC100	35	120	8	6	40	90	6	6	12	50	–	TWO BOLTS
MC125	45	120	8	6	50	90	6	6	12	50	–	TWO BOLTS
MC150	55	150	8	6	60	120	6	6	16	60	–	TWO BOLTS
MC175	55	150	10	8	120	120	6	6	16	60	60	
MC200	55	150	12	10	120	120	6	6	16	60	60	
MC225	60	160	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	

6 27-03-19 REAFFIRMED AND ISSUED AS STANDARD

JG

AJS

RAJANJI SRIVASTAVA

R K TRIVEDI

5 27-12-12 REAFFIRMED AND ISSUED AS STANDARD

VPS

AJS

P K MITTAL

D MALHOTRA

Rev
No

Date

Purpose

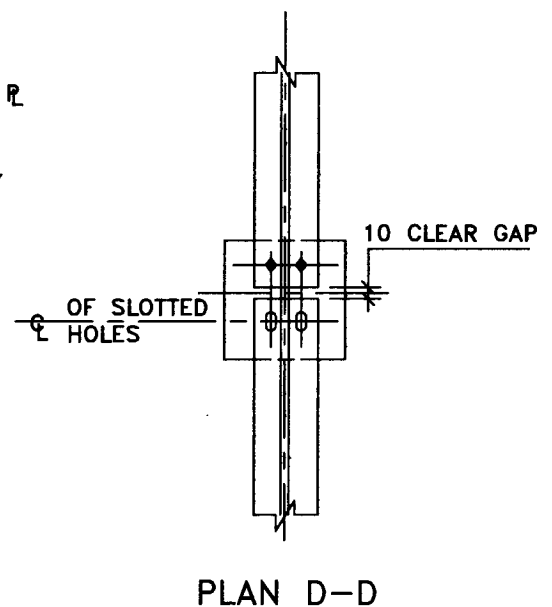
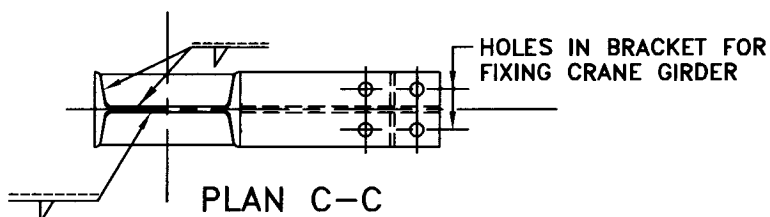
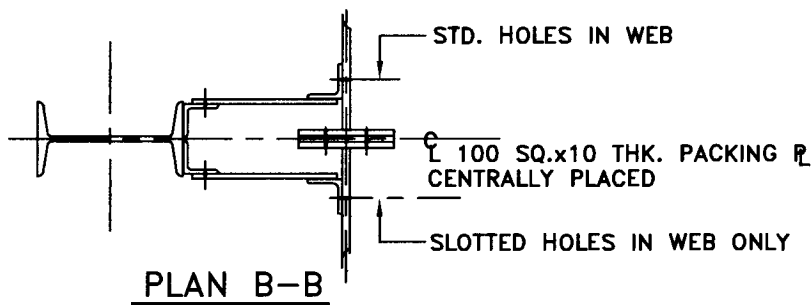
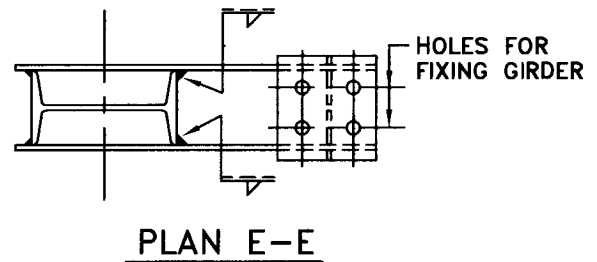
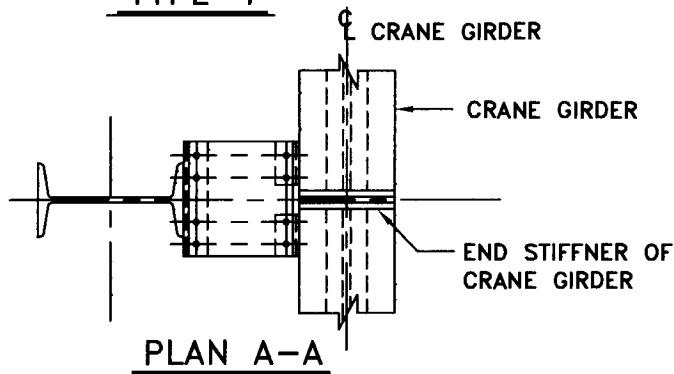
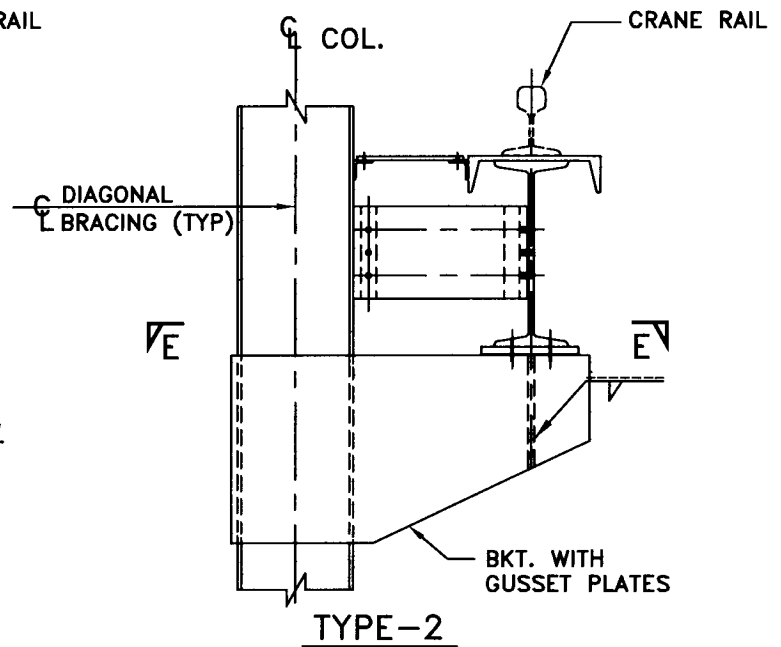
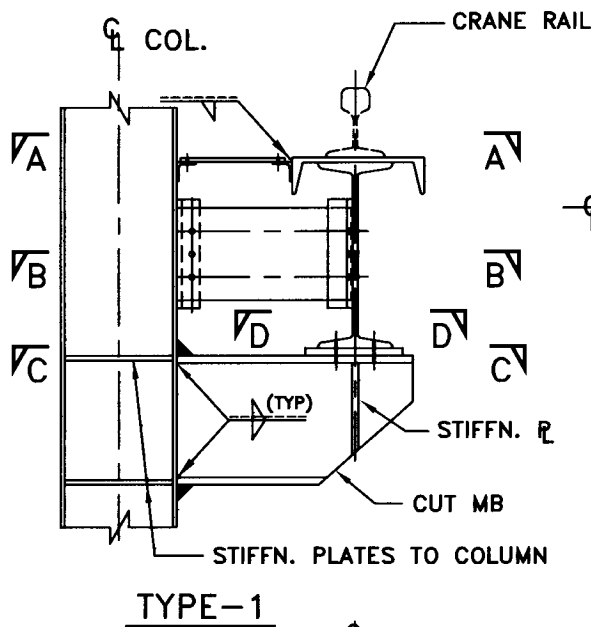
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by

Checked
by

Stds Committee
Convenor

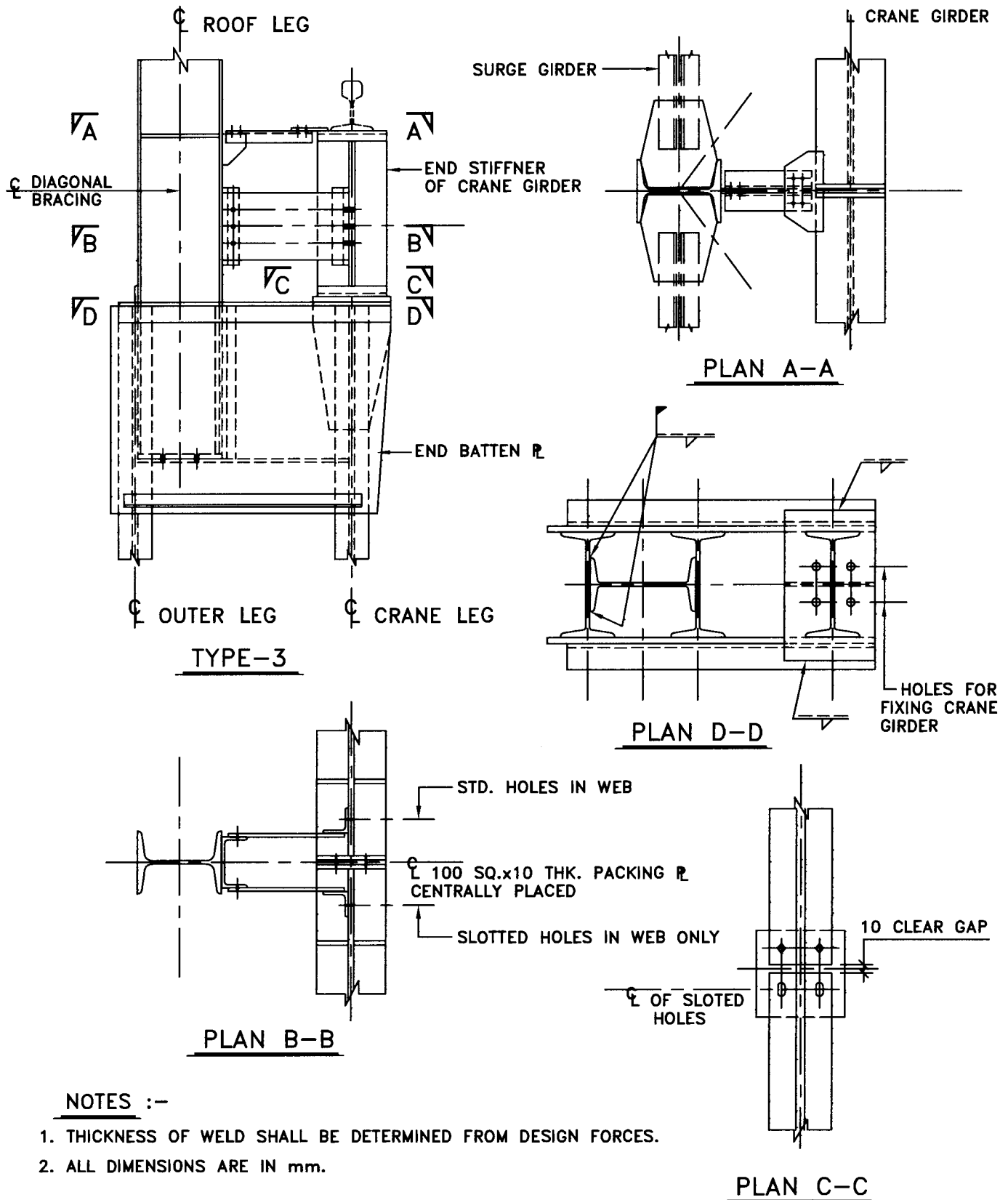
Stds. Bureau
Chairman

Approved by







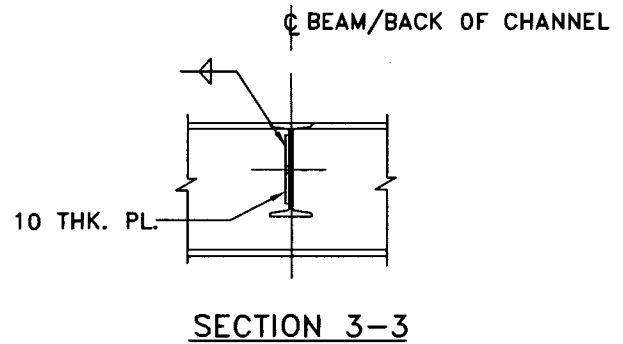
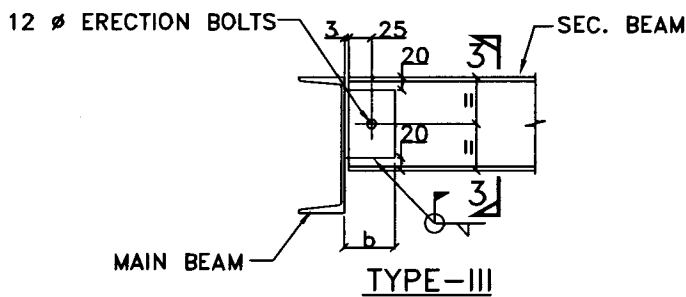
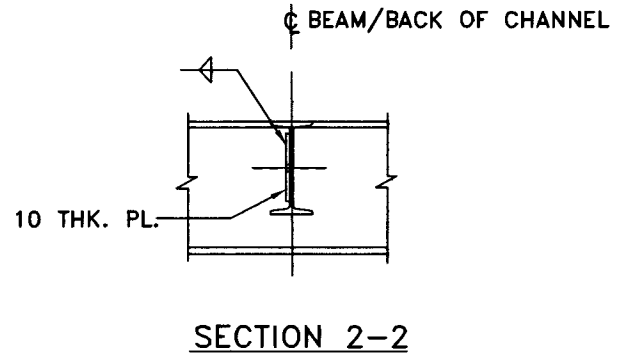
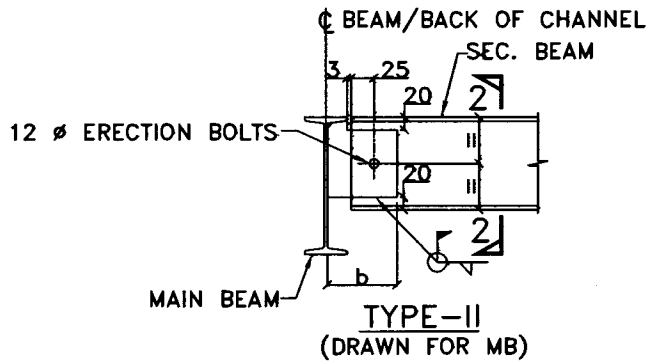
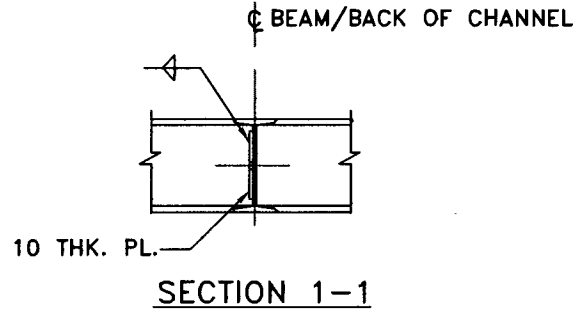
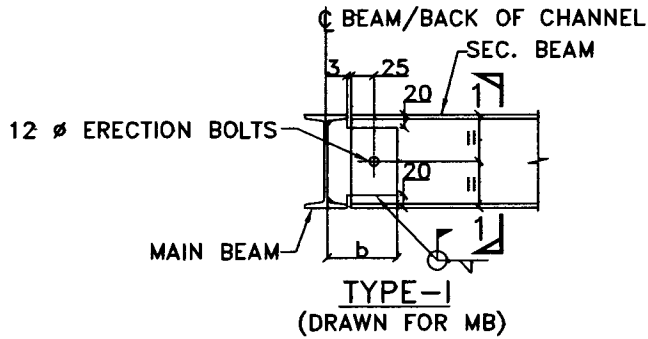
DETAILS OF CRANE BRACKET FOR SINGLE SHAFT COLUMNS

5	07-08-14	REAFFIRMED AND ISSUED AS STANDARD	SUSHMA	V. GOEL	P.K. MITTAL	S. CHANDA
4	20-07-09	REAFFIRMED AND ISSUED AS STANDARD	N VENU KUMAR	P.K. MITTAL	VINAY KUMAR	N DUARI
Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
Approved by						



DETAILS OF CRANE GRIDER CONNECTION WITH DOUBLE SHAFT COLUMN

5	07-08-14	REAFFIRMED AND ISSUED AS STANDARD	 SUSHMA	 VGOEL	 P.K.MITTAL	 S.CHANDA	
4	20-07-09	REAFFIRMED AND ISSUED AS STANDARD	N VENU KUMAR	P.K.MITTAL	VINAY KUMAR	N DUARI	
Rev. No.	Date	Purpose	Prepared by	Checked by	Std. Committee Convenor	GM	Std. Bureau Chairman
Approved by							



SEC. BEAM	CONN TYPE	DIMENSION	MAIN BEAM																	
			MB100	MB125	MB150	MB200	MB250	MB300	MB350	MB400	MB450	MB500	MB600	MC100	MC125	MC150	MC200	MC250	MC300	MC400
MB100/ MC100	I	b	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	II	b	-	90	95	105	115	125	125	125	130	145	160	-	-	-	-	-	-	-
	III	b	-	-	-	-	-	-	-	-	-	-	-	55	55	55	55	55	55	55
MB125/ MC125	I	b	-	105	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	II	b	-	-	110	120	130	140	140	140	145	160	175	-	-	-	-	-	-	-
	III	b	-	-	-	-	-	-	-	-	-	-	-	-	70	70	70	70	70	70

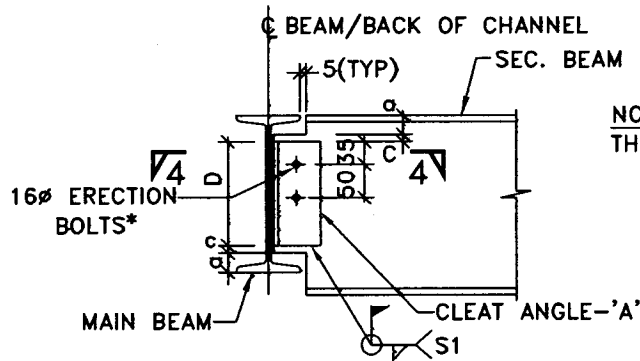
NOTES:-

1 CONNECTION HAS BEEN DESIGNED TO CATER FOR FOLLOWING SHEAR STRENGTH.

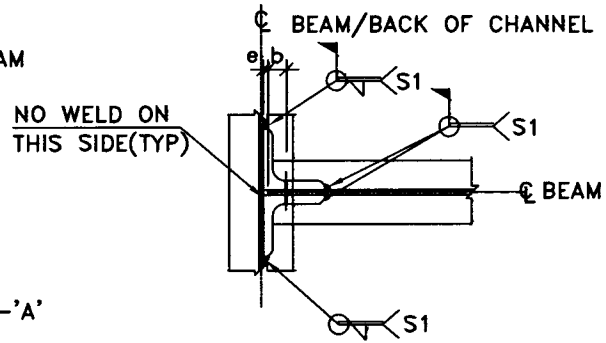
MB100/MC100 = 2.5 T.

MB125/MC125 = 3.5 T.

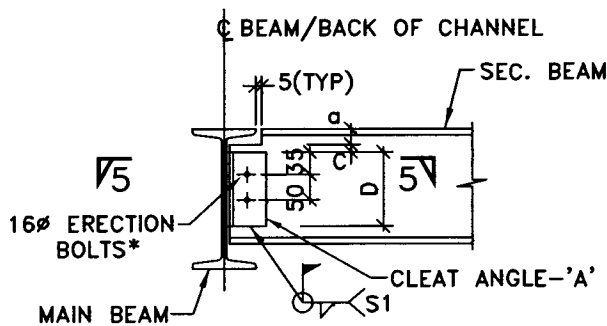
3	02.12.15	REVISED AND ISSUED AS STANDARD	JITENDER GUPTA	AMARJEET SINGH	RAJANJI SRIVASTAVA	S. CHANDA
2	08.08.14	REVISED AND ISSUED AS STANDARD	K K SHARMA	V. GOEL	P. K. MITTAL	S. CHANDA
Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
						Approved by



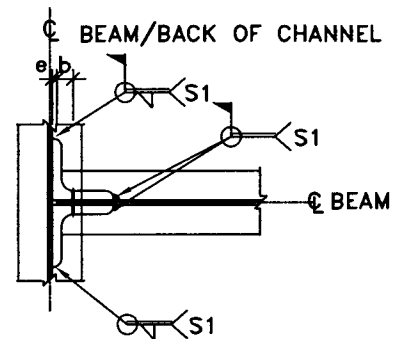
TYPE-IV



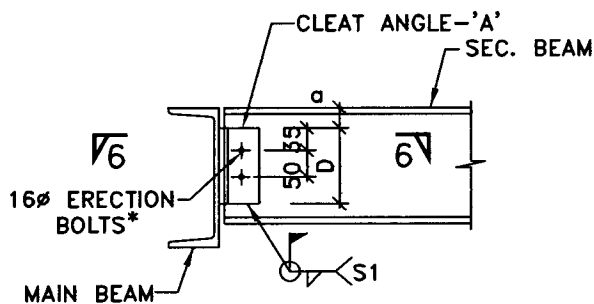
SECTION 4-4
(DRAWN FOR SEC. BEAM AS MB)



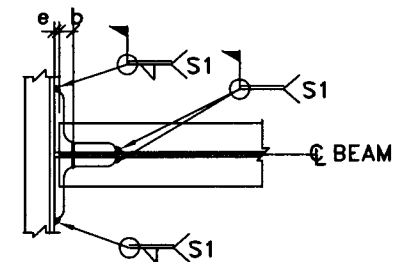
TYPE-V



SECTION 5-5
(DRAWN FOR SEC. BEAM AS MB)



TYPE-VI



SECTION 6-6
(DRAWN FOR SEC. BEAM AS MB)

$c = 15$ FOR SEC. BEAM MB600

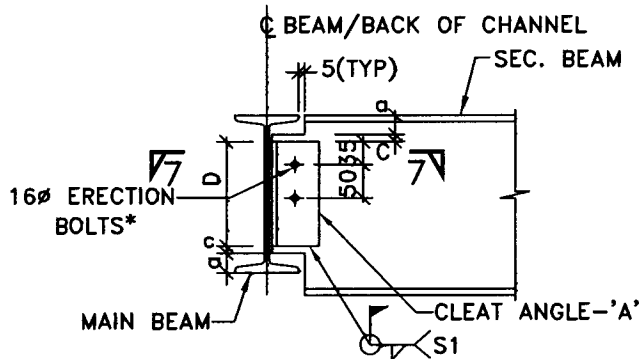
$c = 10$ FOR OTHERS

$e = 2$ mm CLEAR GAP

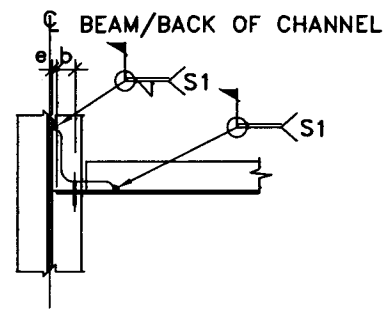
* 2 NOS. ERECTION BOLTS SHALL BE PROVIDED FOR SEC. BEAM \geq MB250 / MC250

CLEAT ANGLE SIZE	b
L 65x65x6	35
L 75x75x8	40
L 90x90x10	45
L 100x100x12	45

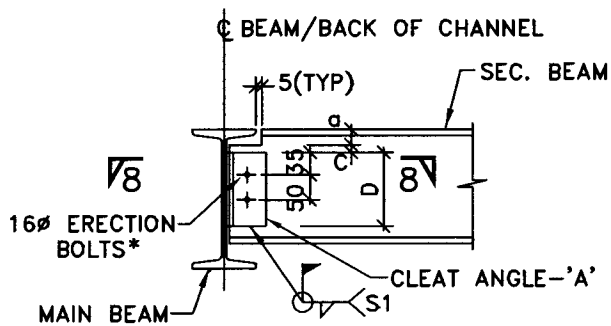
3	02.12.15	REVISED AND ISSUED AS STANDARD	JITENDER GUPTA	AMARJEET SINGH	RAJANJEE SRIVASTAVA	S. CHANDA
2	08.08.14	REVISED AND ISSUED AS STANDARD	K K SHARMA	V. GOEL	P. K. MITTAL	S. CHANDA
Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
						Approved by



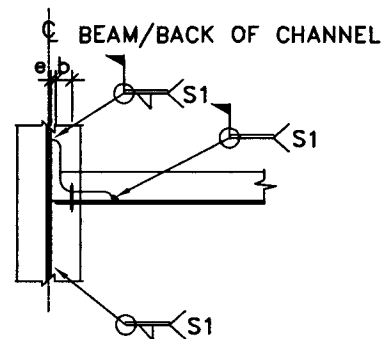
TYPE-VII



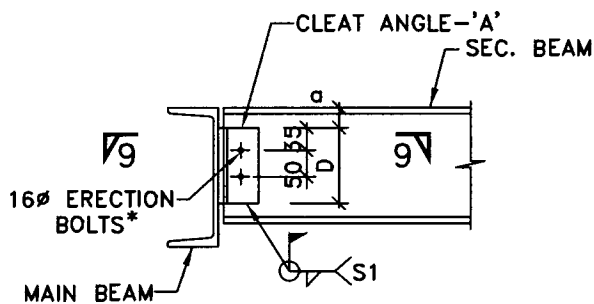
SECTION 7-7



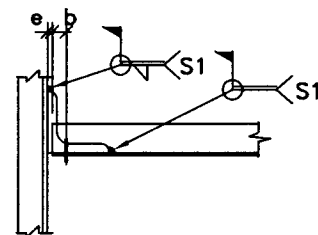
TYPE-VIII



SECTION 8-8



TYPE-IX



SECTION 9-9

e= 2 mm CLEAR GAP

* 2 NOS. ERECTION BOLTS SHALL BE PROVIDED FOR SEC. BEAM \geq MB250 / MC250

CLEAT ANGLE SIZE	b
L 65x65x6	35
L 75x75x8	40
L 90x90x10	45
L 100x100x12	45

VALID FOR SEC. BEAM AS CHANNELS ONLY

3	02.12.15	REVISED AND ISSUED AS STANDARD	JITENDER GUPTA	AMARJEET SINGH	RAJANJEE SRIVASTAVA	S. CHANDA
2	08.08.14	REVISED AND ISSUED AS STANDARD	K K SHARMA	V. GOEL	P. K. MITTAL	S. CHANDA
Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
						Approved by

SCHEDULE OF CONNECTION

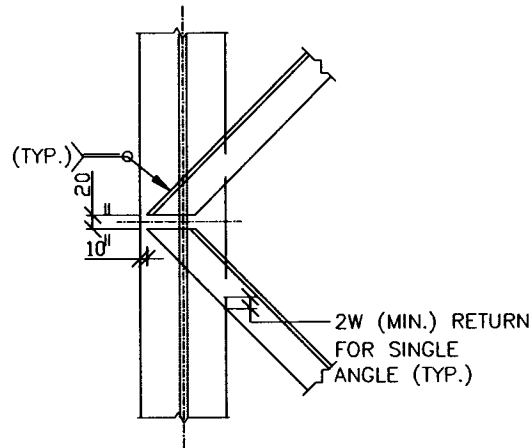
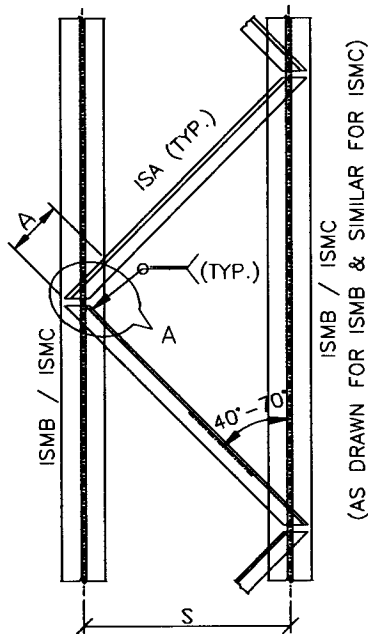
SEC. BEAM	CONN. TYPE	DIMENSION	MAIN BEAM														CLEAT ANGLE 'A'		WELD SIZE	MIN. SHEAR CAPACITY IN MT
			MB150	MB200	MB250	MB300	MB350	MB400	MB450	MB500	MB600	MC150	MC200	MC250	MC300	MC400	D	SIZE	S1	
MB150	IV	a	25	—	—	—	—	—	—	—	—	25	—	—	—	—	80	L65x65x6	6	4.0
	V	a	—	25	30	30	35	35	35	40	45	—	25	30	30	35	60			3.0
	VI	a	—	—	—	—	—	—	—	—	—	25	25	25	25	25	80			4.0
MB200	IV	a	25	25	—	—	—	—	—	—	—	25	25	—	—	—	80	L65x65x6	6	4.0
	V	a	—	—	30	30	35	35	35	40	45	—	—	30	30	35	100			6.5
	VI	a	—	—	—	—	—	—	—	—	—	25	25	25	25	25	100			6.5
MB250	IV	a	—	30	30	—	—	—	—	—	—	—	30	30	—	—	120	L75x75x8	6	7.5
	V	a	—	—	—	30	35	35	35	40	45	—	—	—	30	35	150			10.0
	VI	a	—	—	—	—	—	—	—	—	—	—	30	30	30	30	150			10.0
MB300	IV	a	—	—	30	30	—	—	—	—	—	—	—	30	30	—	170	L75x75x8	6	11.0
	V	a	—	—	—	—	35	35	35	40	45	—	—	—	—	35	200			13.5
	VI	a	—	—	—	—	—	—	—	—	—	—	—	30	30	30	200			13.5
MB350	IV	a	—	—	—	35	35	—	—	—	—	—	—	—	35	—	210	L75x75x8	6	14.0
	V	a	—	—	—	—	—	35	35	40	45	—	—	—	—	35	250			16.5
	VI	a	—	—	—	—	—	—	—	—	—	—	—	—	35	35	250			16.5
MB400	IV	a	—	—	—	35	35	35	—	—	—	—	—	—	35	35	210	L90x90x10	6	14.0
	V	a	—	—	—	—	—	—	35	40	45	—	—	—	—	—	300		8	25.0
	VI	a	—	—	—	—	—	—	—	—	—	—	—	—	35	35	250		6	16.5
MB450	IV	a	—	—	—	—	35	35	35	—	—	—	—	—	—	35	260	L90x90x10	8	21.0
	V	a	—	—	—	—	—	—	—	40	45	—	—	—	—	—	350			30.0
	VI	a	—	—	—	—	—	—	—	—	—	—	—	—	—	35	350			30.0
MB500	IV	a	—	—	—	—	—	40	40	40	—	—	—	—	—	40	300	L90x90x10	8	26.0
	V	a	—	—	—	—	—	—	—	—	45	—	—	—	—	—	390			36.0
	VI	a	—	—	—	—	—	—	—	—	—	—	—	—	—	40	300			26.0
MB600	IV	a	—	—	—	—	—	—	—	45	—	—	—	—	—	—	380	L100x100x12	10	40.0
	IV	a	—	—	—	—	—	—	—	—	45	—	—	—	—	—	480			50.0
MC150	IV/VII	a	25	—	—	—	—	—	—	—	—	25	—	—	—	—	80	L65x65x6	6	4.0
	V/VIII	a	—	25	30	30	35	35	35	40	45	—	25	30	30	35	60			3.0
	VI/IX	a	—	—	—	—	—	—	—	—	—	25	25	25	25	25	80			4.0
MC200	IV/VII	a	25	25	—	—	—	—	—	—	—	25	25	—	—	—	80	L65x65x6	6	4.0
	V/VIII	a	—	—	30	30	35	35	35	40	45	—	—	30	30	35	100			6.5
	VI/IX	a	—	—	—	—	—	—	—	—	—	25	25	25	25	25	100			6.5
MC250	IV/VII	a	—	30	30	—	—	—	—	—	—	—	30	30	—	—	120	L75x75x8	6	7.5
	V/VIII	a	—	—	—	30	35	35	35	40	45	—	—	—	30	35	150			10.0
	VI/IX	a	—	—	—	—	—	—	—	—	—	—	30	30	30	30	150			10.0
MC300	IV/VII	a	—	—	30	30	—	—	—	—	—	—	—	30	30	—	170	L75x75x8	6	11.0
	V/VIII	a	—	—	—	—	35	35	35	40	45	—	—	—	—	35	200			13.5
	VI/IX	a	—	—	—	—	—	—	—	—	—	—	—	30	30	30	200			13.5
MC400	IV/VII	a	—	—	—	35	35	35	—	—	—	—	—	—	30	35	210	L90x90x10	6	13.5
	V/VIII	a	—	—	—	—	—	—	35	40	45	—	—	—	—	—	300		8	25.0
	VI/IX	a	—	—	—	—	—	—	—	—	—	—	—	—	35	35	210		6	13.5

NOTES:

- 1 ALL WELDS SHALL BE 6 mm. THK. UNLESS NOTED OTHERWISE.
- 2 NO AXIAL FORCES ARE INCLUDED AND SHALL BE CHECKED AS PER ACTUAL DESIGN.
- 3 THIS STANDARD IS NOT APPLICABLE FOR COMBINATION OF BEAM MKD. ☐
- 4 SHEAR CAPACITY GIVEN IN THE TABLE IS FOR CONNECTION- TYPE IV, V & VI.

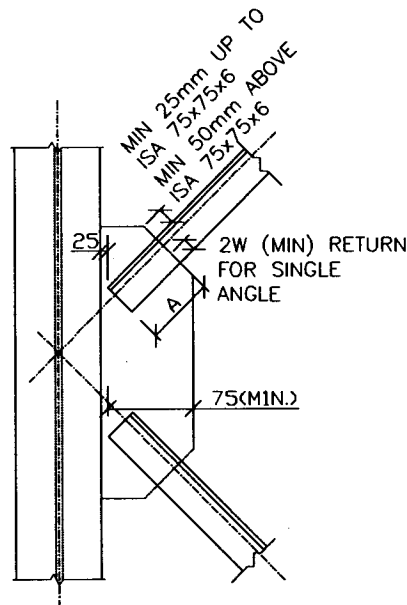
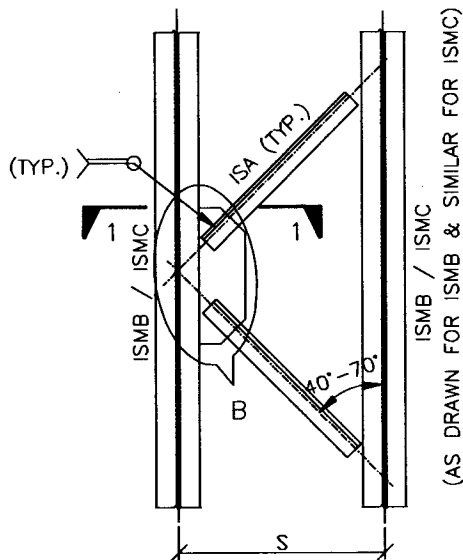
5 CONNECTION TYPE I, II, III, VII, VIII & IX SHALL NOT BE USED FOR EQUIPMENT SUPPORTING MEMBERS.

3	02.12.15	REVISED AND ISSUED AS STANDARD	JITENDER GUPTA	AMARJEET SINGH	RAJANJJI SRIVASTAVA	S. CHANDA
2	08.08.14	REVISED AND ISSUED AS STANDARD	K K SHARMA	V. GOEL	P. K. MITTAL	S. CHANDA
Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
						Approved by

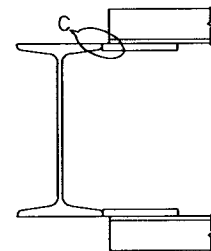


DET.-A

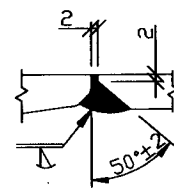
OPTION I-LACINGS LAPPED ON COLUMN FLANGE



DET.-B



SEC. 1-1



DET.-C

OPTION II-LACINGS CONNECTED WITH GUSSET PLATES

(IN CASE OPTION-1 IS NOT FEASIBLE)

3	29.09.20	REAFFIRMED AND ISSUED AS STANDARD	JITENDER GUPTA	AMARJEET	ANURAG SINHA	S.MAZUMDAR
2	11.08.14	REVISED AND ISSUED AS STANDARD	K K SHARMA	V. GOEL	P K MITTAL	S. CHANDA
Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman

TABLE-I : FOR OPTION-I($S \leq 600$)

S. NO.	COLUMN SIZE ISMB / ISMC	MAXIMUM SIZE OF LACING ANGLE *
1	MB 150	50x50x6
2	MB 200	65x65x6
3	MB 250	75x75x6
4	MC 150	50x50x6
5	MC 200	50x50x6
6	MC 250	50x50x6

NOTE: * BASED ON 80% OF FULL STRENGTH OF MEMBER

LEGEND: W = WELD SIZE
S = C/C OF C.G. OF ISMB OR
B/B OF ISMC SPACING

NOTES:

- 1 ALL DIMENSIONS ARE IN mm
- 2 SHOP WELDING SHALL BE USED IN CONNECTIONS.
- 3 LACING SHOWN IN OPTION II CAN BE PROVIDED ON
INSIDE FACE OF GUSSET PLATE, FOR ISMB/ ISMC SIZES
>300 MM AND SPACING >600MM.
- 4 SPACING 'S' BETWEEN COLUMNS IS TO BE SELECTED AS PER FOLLOWING BROAD
GUIDELINES:
 - a) FOR COLUMNS UP TO 5M HEIGHT / CRANE CAPACITIES UP TO 5MT. - ($S \leq 600$)
 - b) FOR COLUMNS >5M HEIGHT / CRANE CAPACITIES >5MT. - ($S > 600$)


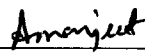

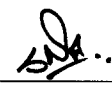
3	29.09.20	REAFFIRMED AND ISSUED AS STANDARD	 JITENDER GUPTA	 AMARJEET	 ANURAG SINHA	 S. MAZUMDAR
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TABLE-II : FOR OPTION-I ($S > 600$)

S. NO.	ANGLE SIZE AND SPACING	WELD LENGTH 'A' mm	WELD SIZE	GUSSET PLATE THK. 't' mm (OPTION II ONLY)
1	ISA 65x65x6 *S ≤ 700mm FOR SINGLE ANGLE S ≤ 1100mm FOR DOUBLE ANGLE	150	6	10
	S > 700mm FOR SINGLE ANGLE S > 1100mm FOR DOUBLE ANGLE	75	6	10
2	ISA 65x65x8 S ≤ 700mm FOR SINGLE ANGLE S ≤ 1100mm FOR DOUBLE ANGLE	200	6	10
	S > 700mm FOR SINGLE ANGLE S > 1100mm FOR DOUBLE ANGLE	100	6	10
3	ISA 75x75x6 S ≤ 900mm FOR SINGLE ANGLE S ≤ 1300mm FOR DOUBLE ANGLE	200	6	10
	S > 900mm FOR SINGLE ANGLE S > 1300mm FOR DOUBLE ANGLE	100	6	10
4	ISA 75x75x8 S ≤ 900mm FOR SINGLE ANGLE S ≤ 1300mm FOR DOUBLE ANGLE	250	6	10
	S > 900mm FOR SINGLE ANGLE S > 1300mm FOR DOUBLE ANGLE	125	6	10
5	ISA 90x90x6 S ≤ 1000mm FOR SINGLE ANGLE S ≤ 1600mm FOR DOUBLE ANGLE	225	6	10
	S > 1000mm FOR SINGLE ANGLE S > 1600mm FOR DOUBLE ANGLE	125	6	10

CONTD...

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Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman

TABLE II (CONTD...)

S. NO.	ANGLE SIZE AND SPACING	WELD LENGTH 'A' mm	WELD SIZE	GUSSET PLATE THK. 't' mm (OPTION II ONLY)
6	ISA 90x90x8	275	8	10
		150	8	10
7	ISA 100x100x10	300	8	10
		300	8	12
8	ISA 110x110x10	325	8	10
		325	8	12
9	ISA 130x130x10	375	8	10
		375	8	16
10	ISA 150x150x12	425	10	12
		425	10	16
	ISA 150x150x12	200	10	12
		200	10	12

NOTE: *S(c/c OF C.G. OF ISMB OR B/B OF ISMC SPACING) SHOWN
 THUS 'S <' ARE SIZED FOR FULL STRENGTH OF MEMBER
 SPACING SHOWN THUS 'S >' ARE SIZED FOR 50% OF
 FULL STRENGTH OF MEMBER

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