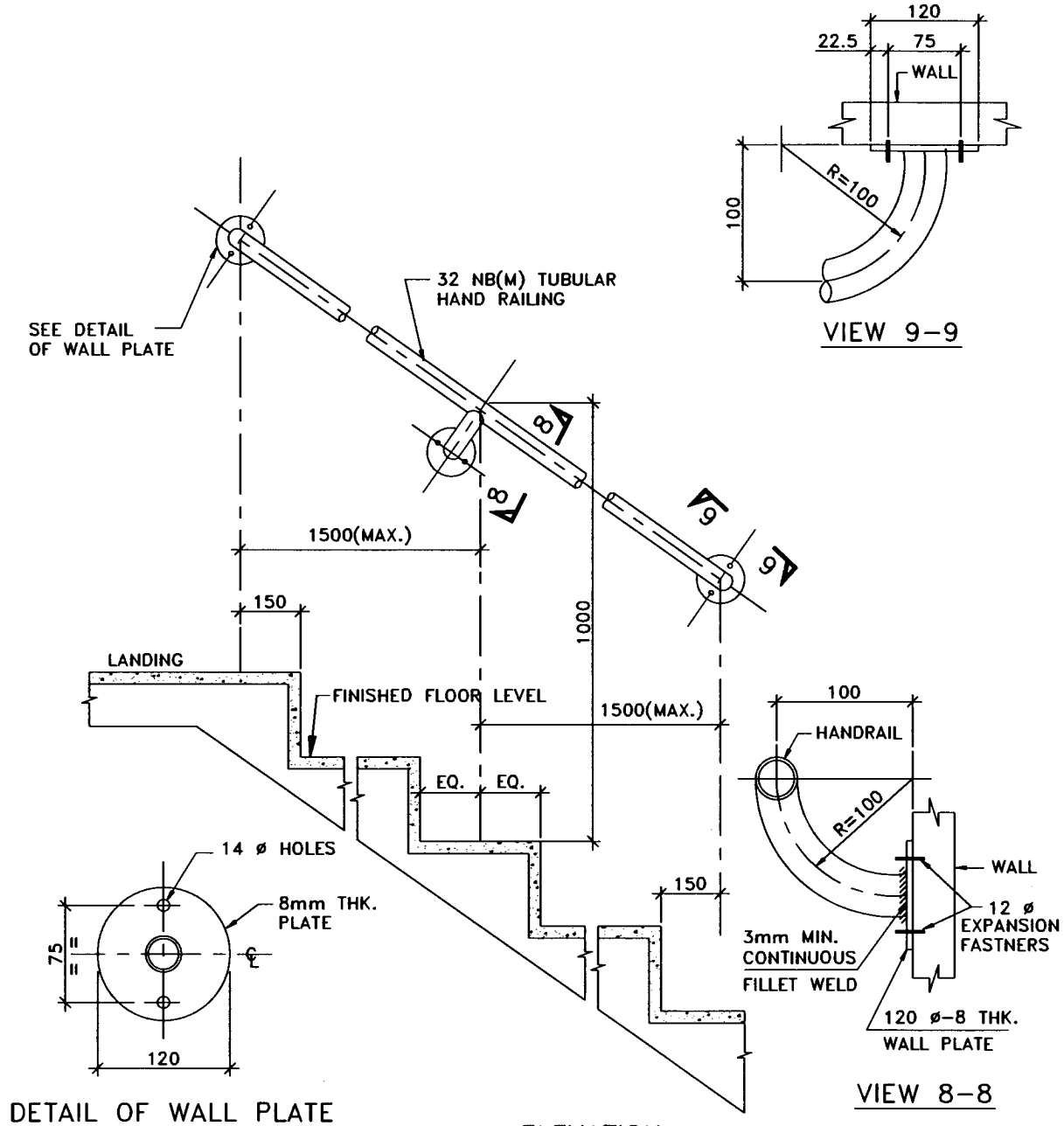
TYPE – III



HANDRAIL FIXED TO WALL DIRECT

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
8	28.09.2020	REAFFIRMED & ISSUED AS STANDARD	JG	AVM	AS	SM
7	16.12.2014	REVISED & ISSUED AS STANDARD	V.P.SINGH	V GOEL	PK MITTAL	S CHANDA

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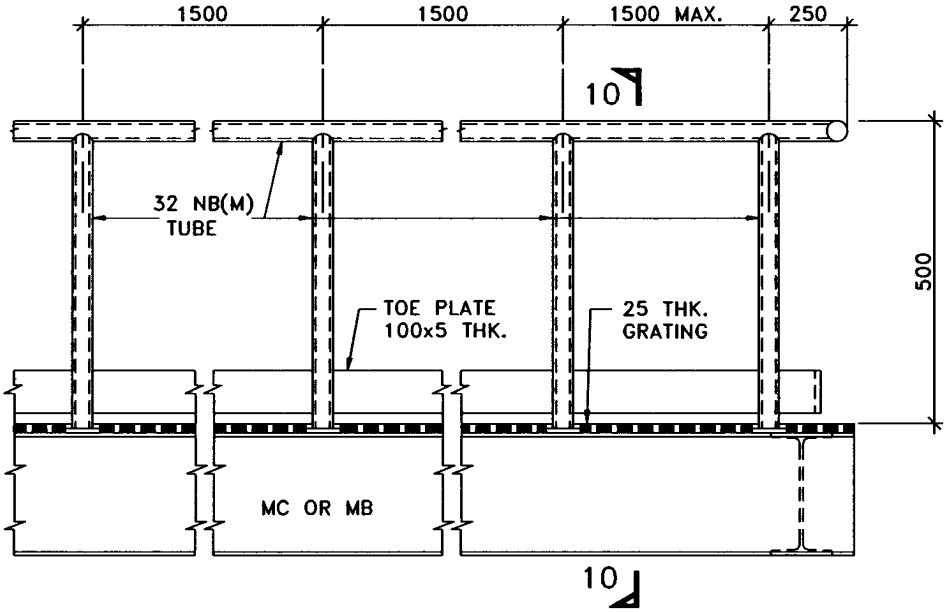
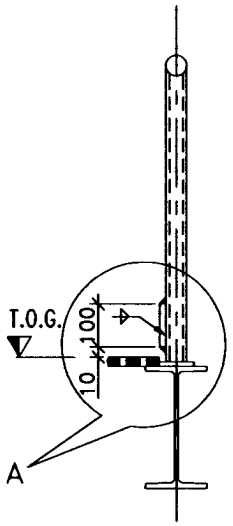
TYPE – IV



HANDRAIL ON HORIZONTAL PLATFORM (STEEL)



SEC. 10–10

NOTE : HANDRAIL TYPE–IV SHALL BE USED OVER PIPE CROSS OVER AND LOW LEVEL PLATFORMS SUCH AS FOR VALVE OPERATION ETC. AS MENTIONED IN STD 7–68–0562 & 0563.

(FOR DETAILS Ⓐ REFER PAGE 8 OF 8)

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
8	28.09.2020	REAFFIRMED & ISSUED AS STANDARD	JG	AVM	AS	SM
7	16.12.2014	REVISED & ISSUED AS STANDARD	V.P.SINGH	V.P.SINGH	PK MITTAL	S CHANDA

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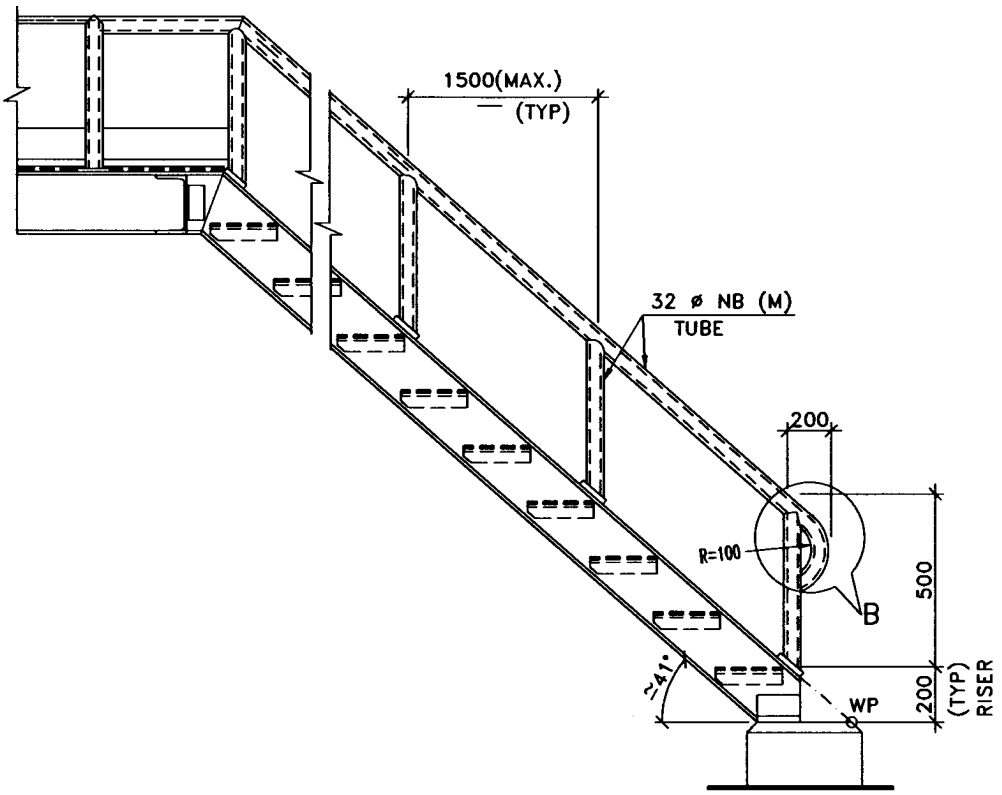
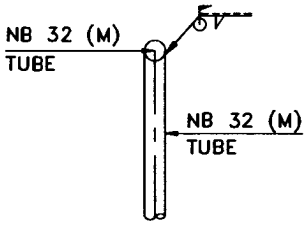
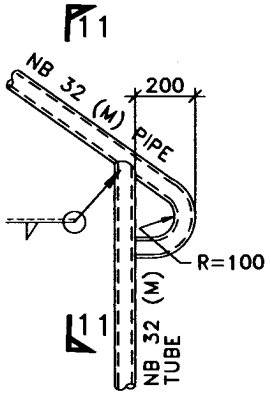
TYPE – IV



SLOPING HALF HANDRAIL ON STEEL STAIR



SEC. 11–11



DETAIL – (B)

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
8	28.09.2020	REAFFIRMED & ISSUED AS STANDARD	JG	AVM	AS	SM
7	16.12.2014	REVISED & ISSUED AS STANDARD	V.P.SINGH	V GOEL	PK MITTAL	S CHANDA

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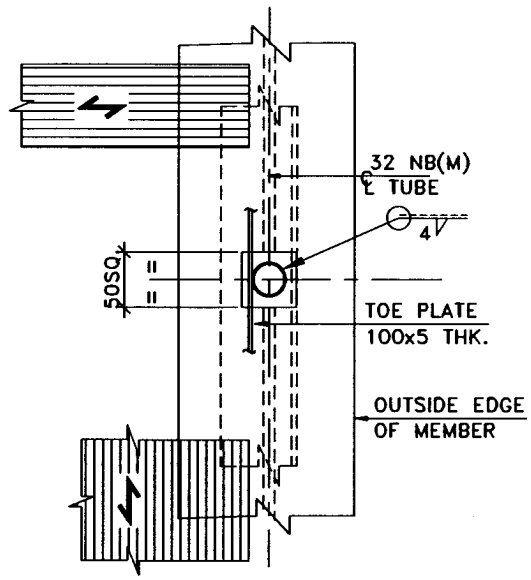
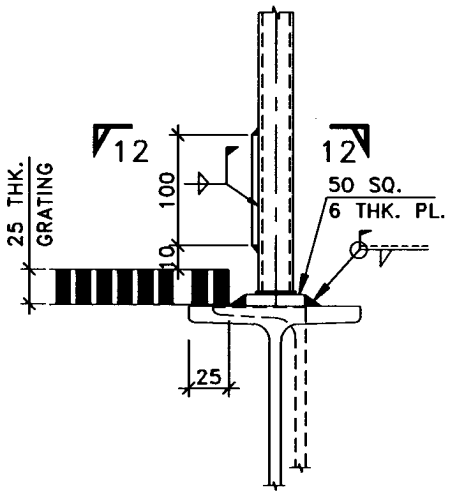


VIEW 12–12



DETAIL – (A)

CONNECTION DETAILS
(FOR TYPE II & IV)

NOTE : CHEQUERED PLATES / GRATINGS SHALL BE SUITABLY NOTCHED TO ACCOMMODATE THE TUBE IN CASE OF BEAM MC100 OR MC125.

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8	28.09.2020	REAFFIRMED & ISSUED AS STANDARD	JG	AVM	AS	SM
7	16.12.2014	REVISED & ISSUED AS STANDARD	V.P.SINGH	V GOEL	PK MITTAL	S CHANDA

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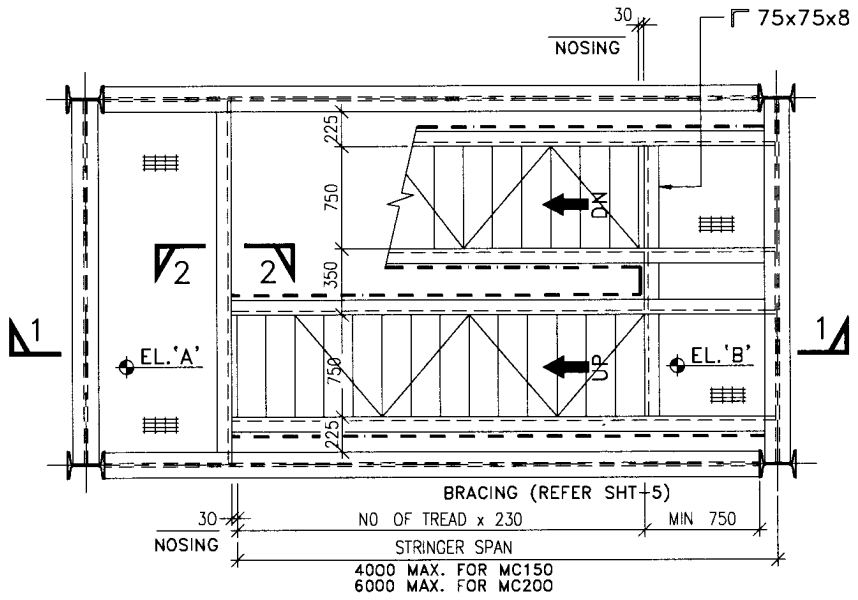
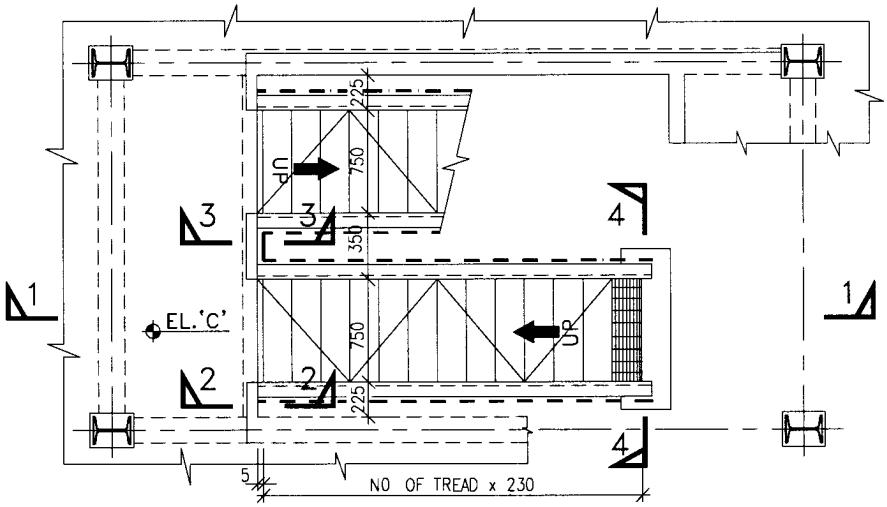
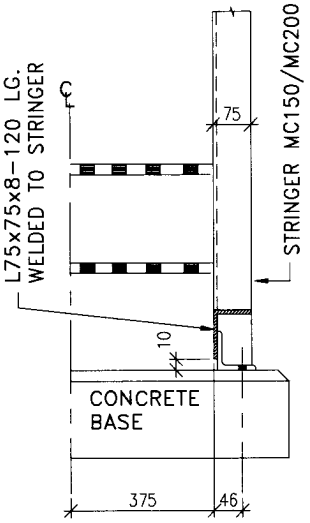


PLAN AT EL. 'A'



PLAN AT EL. 'C'



SECTION 4-4

NOTES :-

1. FOR STAIRWAY/TREAD USE ELECTROFORGED GRATING TYPE-II AS PER EIL STD NO 7-68-0697.
2. FOR CONNECTION DETAILS REFER SHEETS 3, 4, 5 AND 6.
3. STRINGER SHALL BE SUITABLY DESIGNED FOR OFFICE BUILDING, WARE HOUSES AND WORKSHOP.
4. FOR DETAIL OF INSERT PLATE 'R1a' REFER EIL STD. NO. 7-68-0056.

Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
					Approved by	
7	01 08 19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R K TRIVEDI
6	18 09 13	REVISED AND ISSUED AS STANDARD	VPS	PJ SINGH	PK MITTAL	D MALHOTRA

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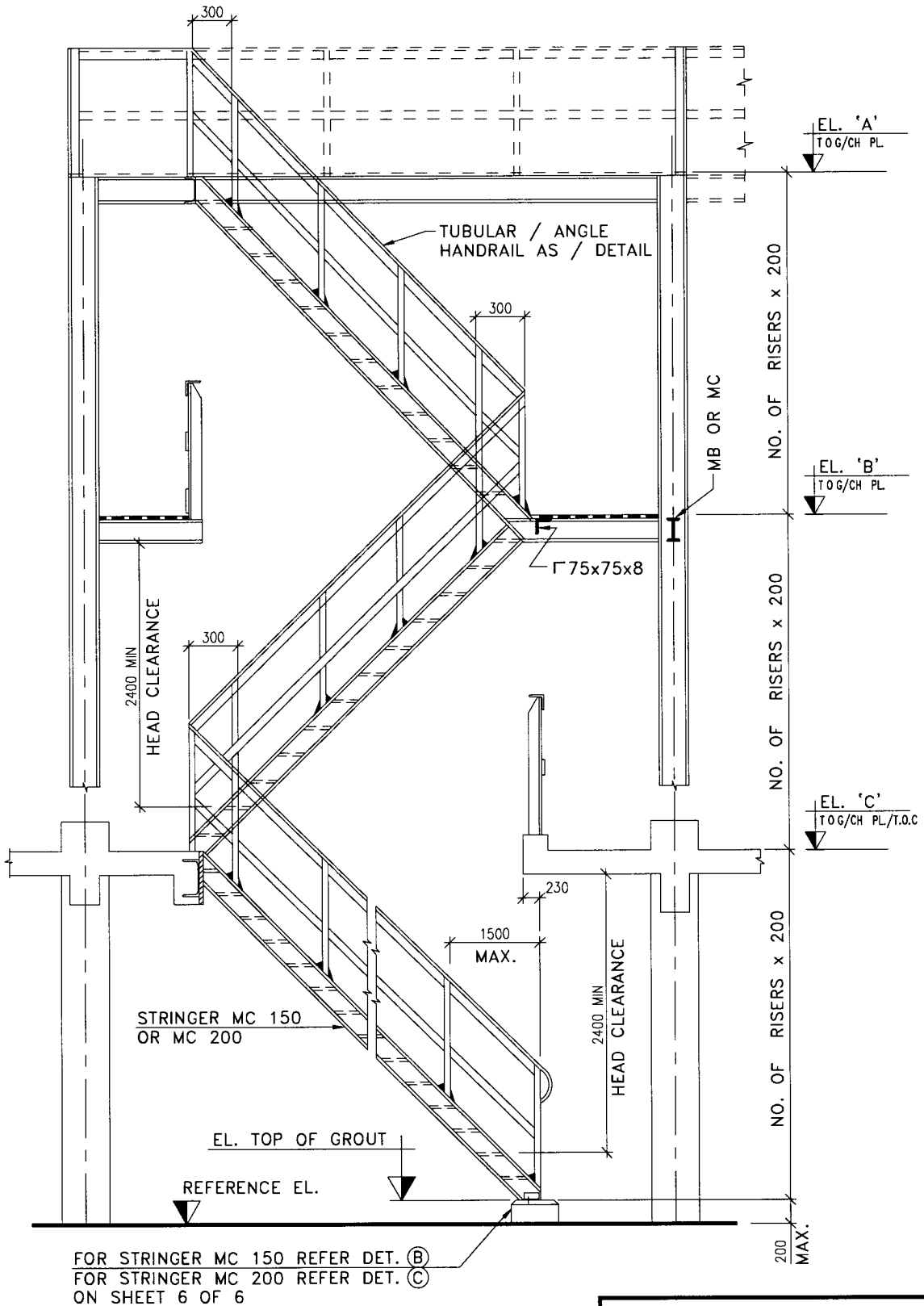

FOR STRINGER MC 150 REFER DET. (B)
FOR STRINGER MC 200 REFER DET. (C)
ON SHEET 6 OF 6

SECTION 1–1

MAXIMUM RISER IS 200 HOWEVER IT MAY BE REDUCED AND ADJUSTED AS REQUIRED.

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7	01 08 19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	RK TRIVEDI
6	18 09.13	REVISED AND ISSUED AS STANDARD	VPS	PJ SINGH	PK MITTAL	D MALHOTRA

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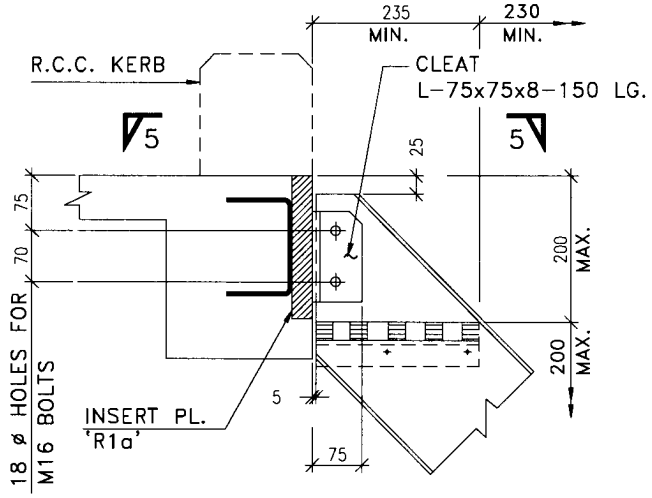
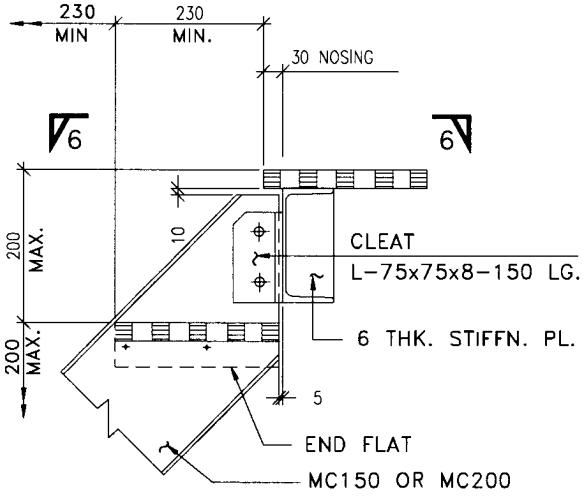


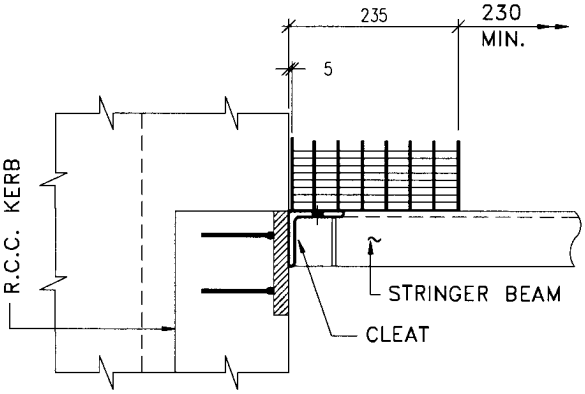
SECTION 2-2

(CONNECTION WITH CONCRETE BEAM)

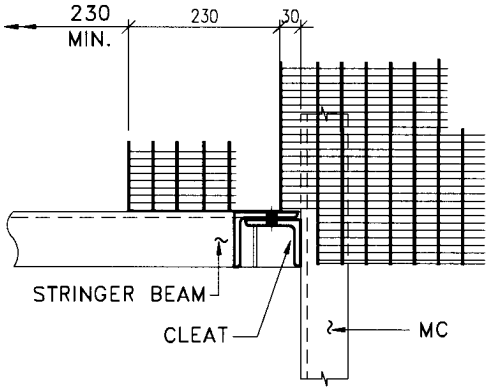


SECTION 2-2

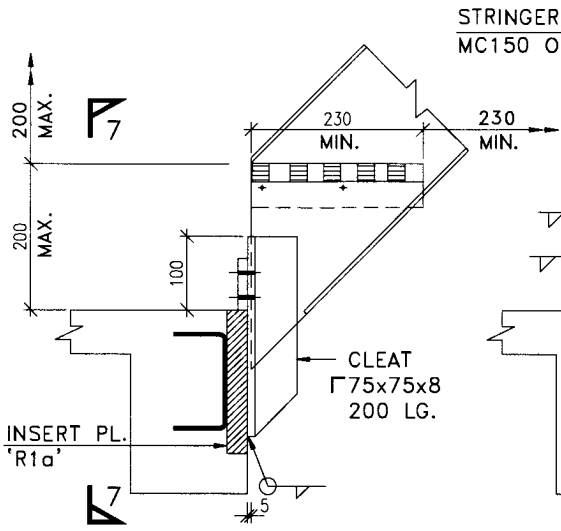
(CONNECTION WITH STEEL BEAM MC)



VIEW 5-5

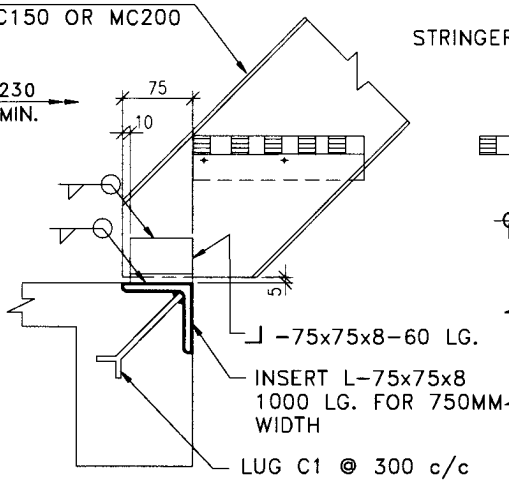


VIEW 6-6



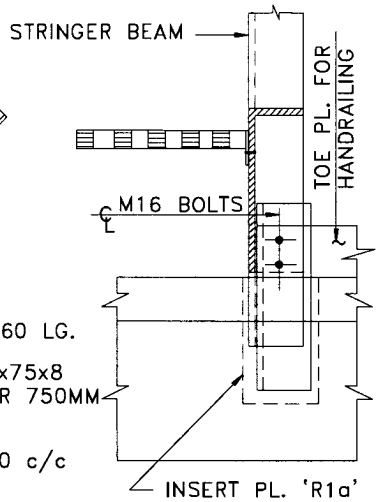
SECTION 3-3

(CONNECTION WITH CONCRETE BEAM)
(R.C.C. KERB NOT SHOWN FOR CLARITY)



SECTION 3-3 (ALT.)

(CONNECTION WITH CONCRETE BEAM)
(R.C.C. KERB NOT SHOWN FOR CLARITY)



VIEW 7-7

Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
7	01 08 19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R K TRIVEDI
6	18 09 13	REVISED AND ISSUED AS STANDARD	VPS	PJ SINGH	PK MITTAL	D MALHDTRA

Approved by

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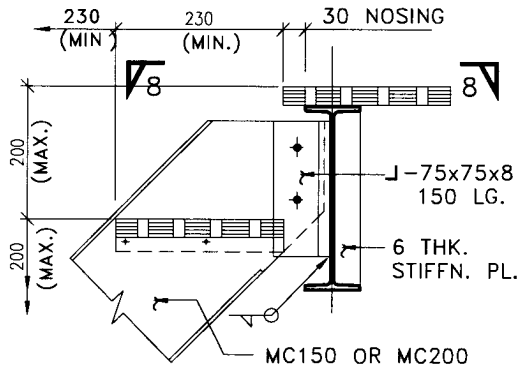
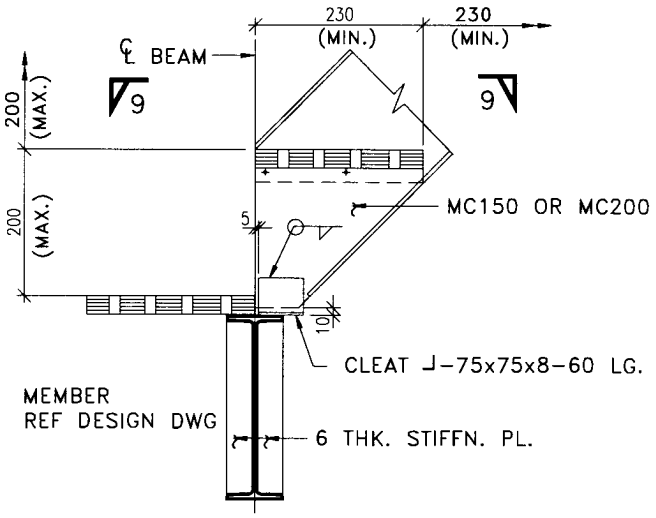
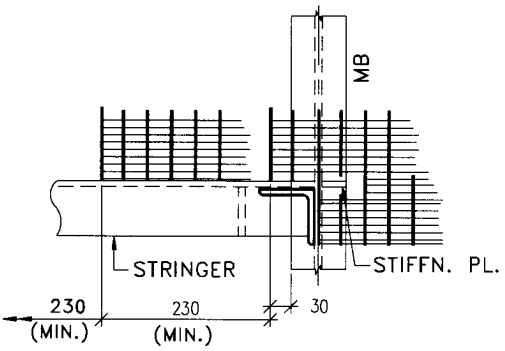


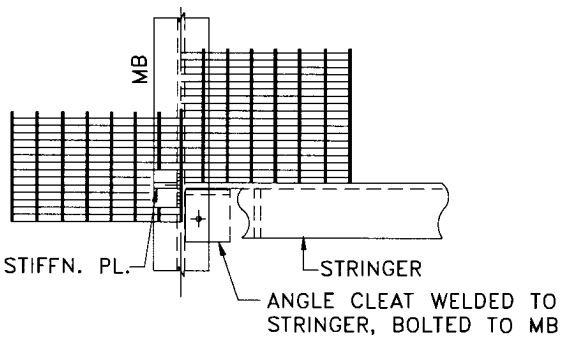
SECTION 2-2
(CONNECTION WITH STEEL BEAM ISMB)



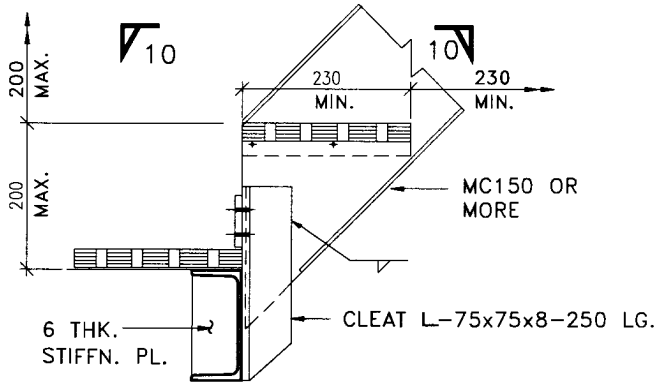
SECTION 3-3
(CONNECTION WITH STEEL BEAM ISMB)



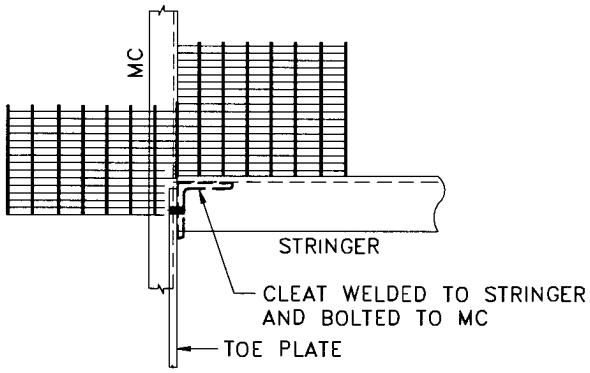
VIEW 8-8



VIEW 9-9



SECTION 3-3
(CONNECTION WITH STEEL BEAM ISMC)



VIEW 10-10

Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
7	01 08.19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R K TRIVEDI
6	18 09 13	REVISED AND ISSUED AS STANDARD	VPS	PJ SINGH	PK MITTAL	D MALHOTRA

Approved by

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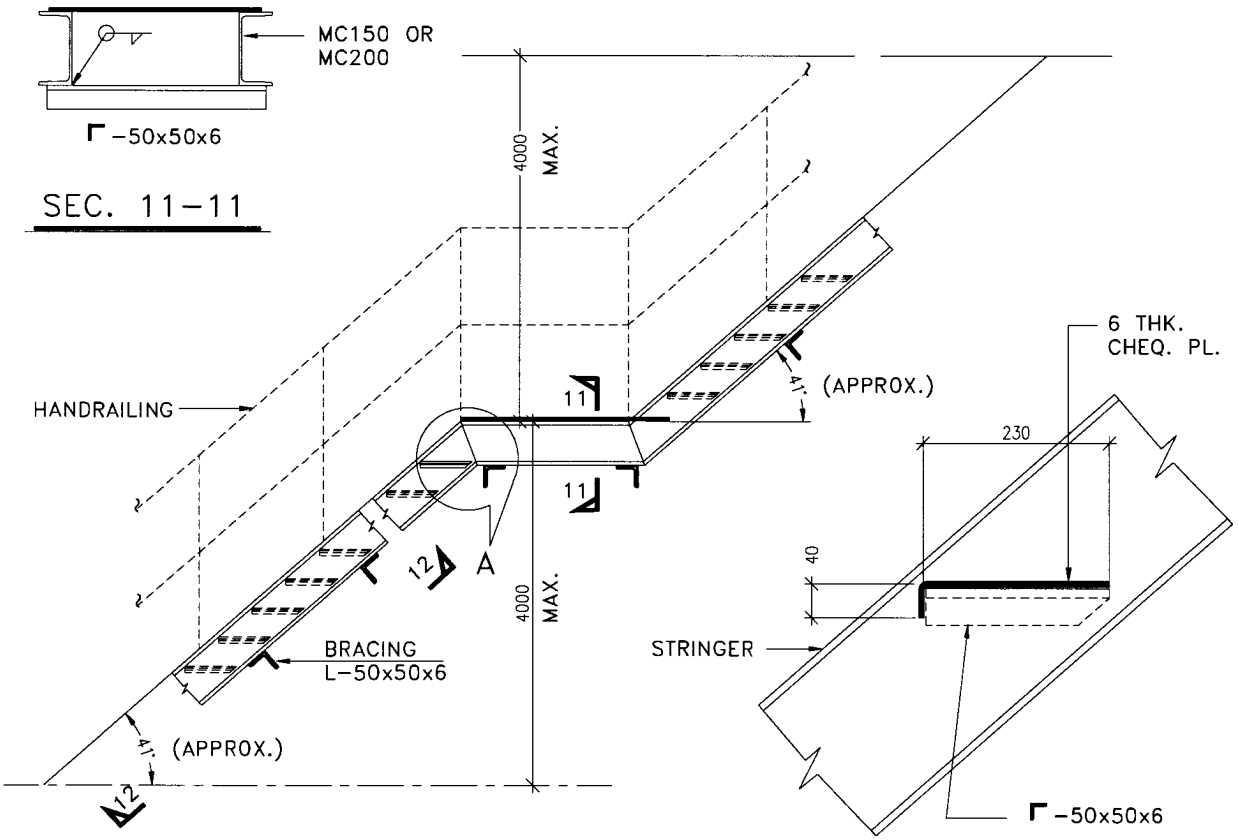
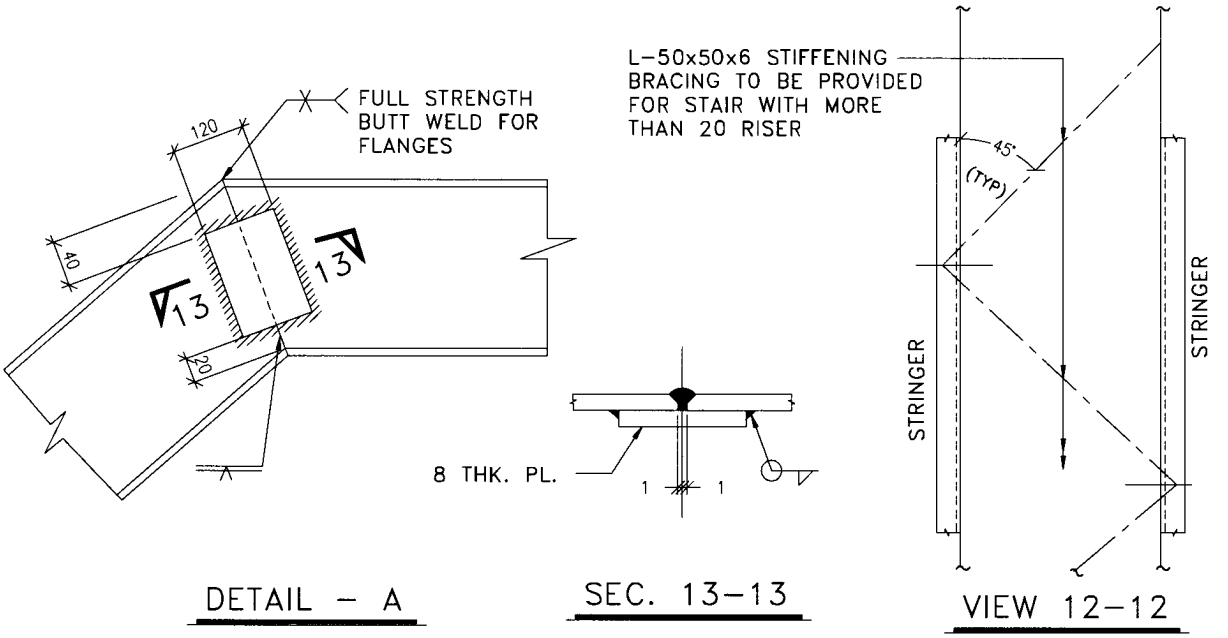


ELEVATION SHOWING STRINGER BRACINGS

TYP. DET. OF CHEQ. PL. STEP



DETAIL − A

SEC. 13−13

VIEW 12−12

STAIR DETS WITH CHEQURED PLATE STEPS

Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
7	01 08 19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R K TRIVEDI
6	18 09 13	REVISED AND ISSUED AS STANDARD	VPS	PJ SINGH	PK MITTAL	D MALHOTRA

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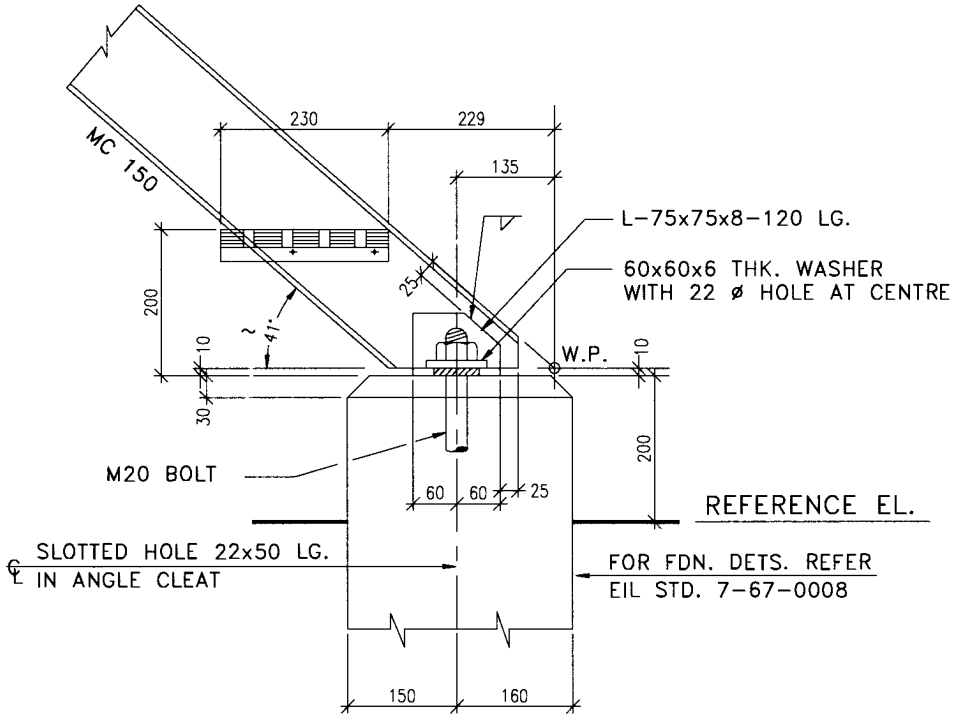
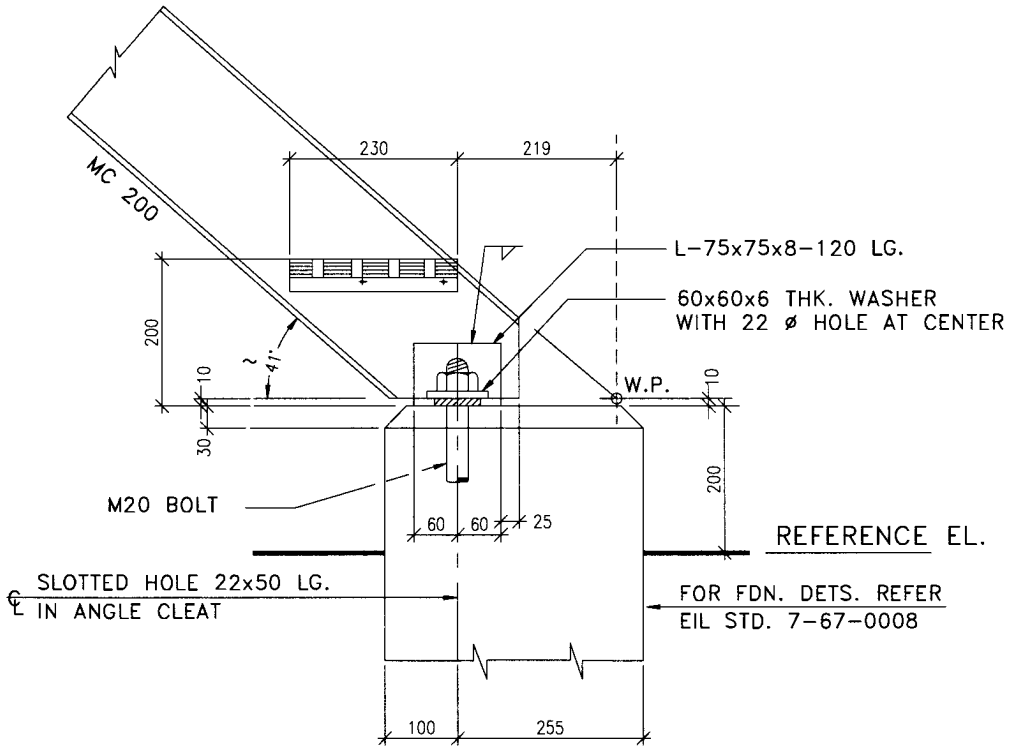


DETAIL – B



DETAIL – C

Rev No.	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
7	01 08.19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R.K TRIVEDI
6	18 09 13	REVISED AND ISSUED AS STANDARD	VPS	PJ SINGH	PK MITTAL	D MALHOTRA

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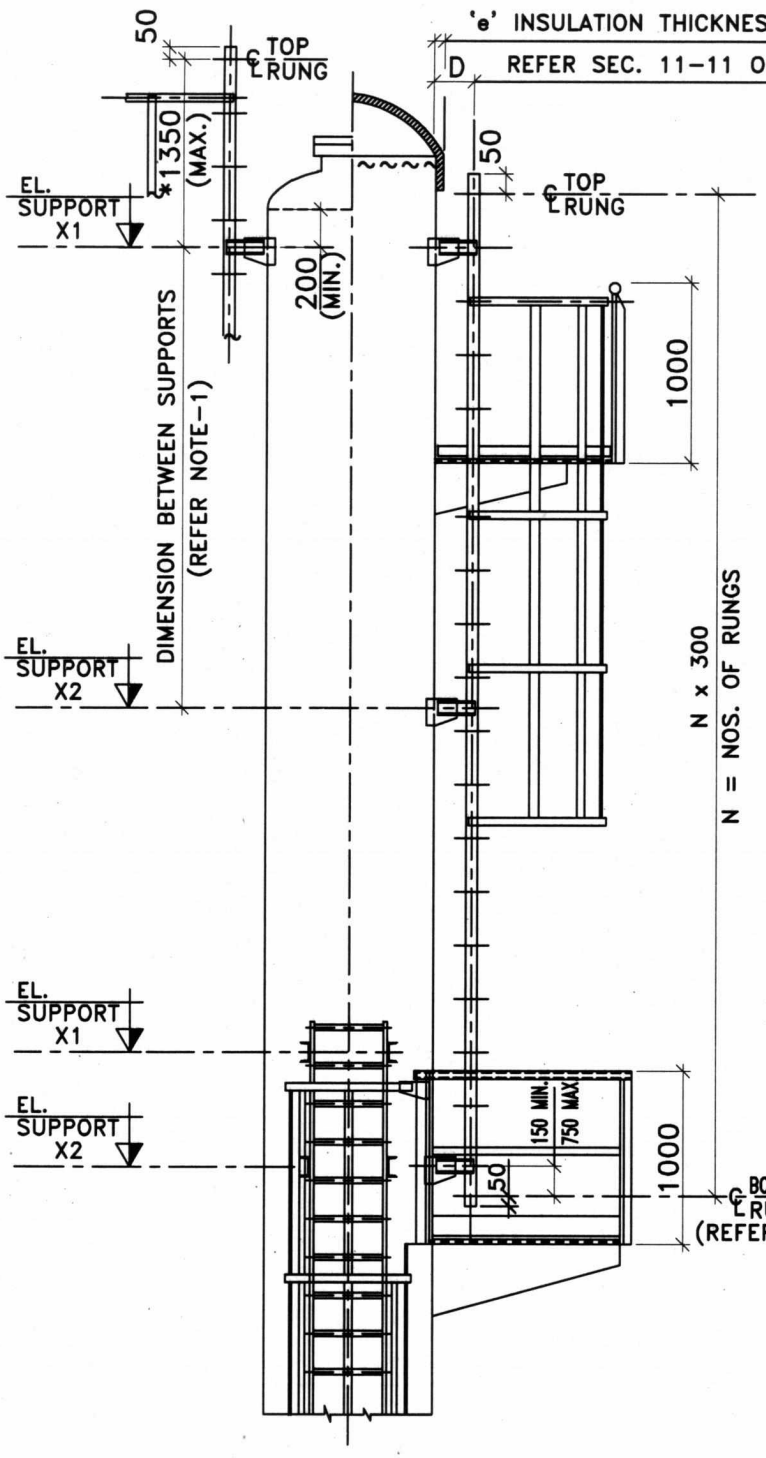
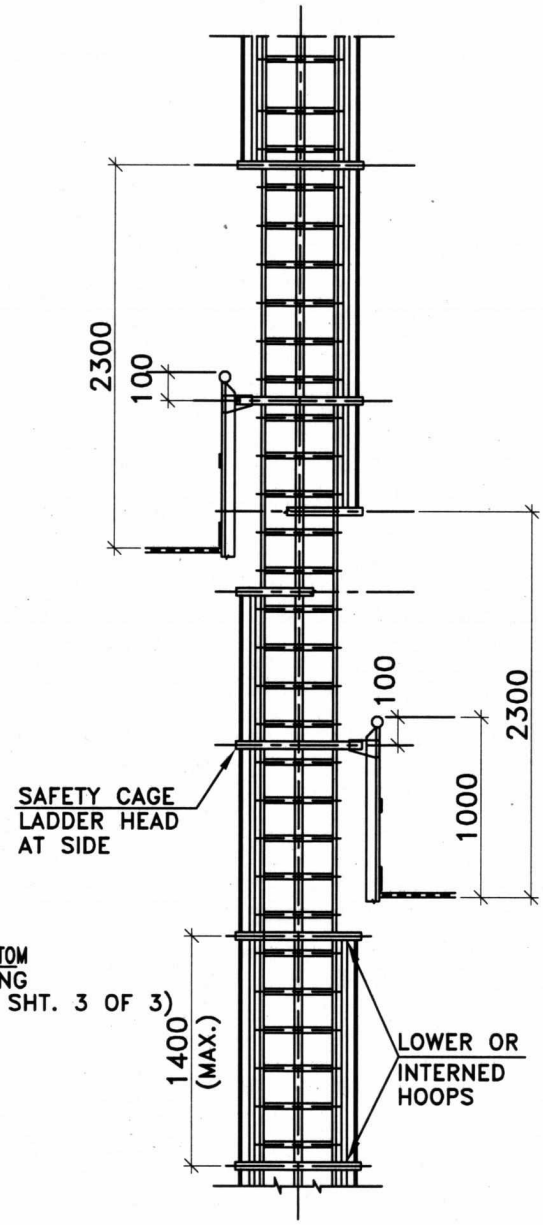
DETAILS OF STEEL LADDER



LADDER FOR SIDE ENTRY



LADDER FOR SIDE ENTRY

VESSEL DIA (mm)	DISTANCE 'D' (mm)
UPTO 800	200 + e
> 800 ⩽ 3200	260 + e
> 3200 ⩽ 8000	275 + e

* MC100 SHALL BE ADOPTED FOR DISTANCE MORE THAN 1350 UPTO 2000

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
9	14.12.23	REVISED AND ISSUED AS STANDARD	JITENDER GUPTA	AMARJEET	ANURAG SINHA	MAINAK NANDI
8	01.08.19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	S.CHANDA

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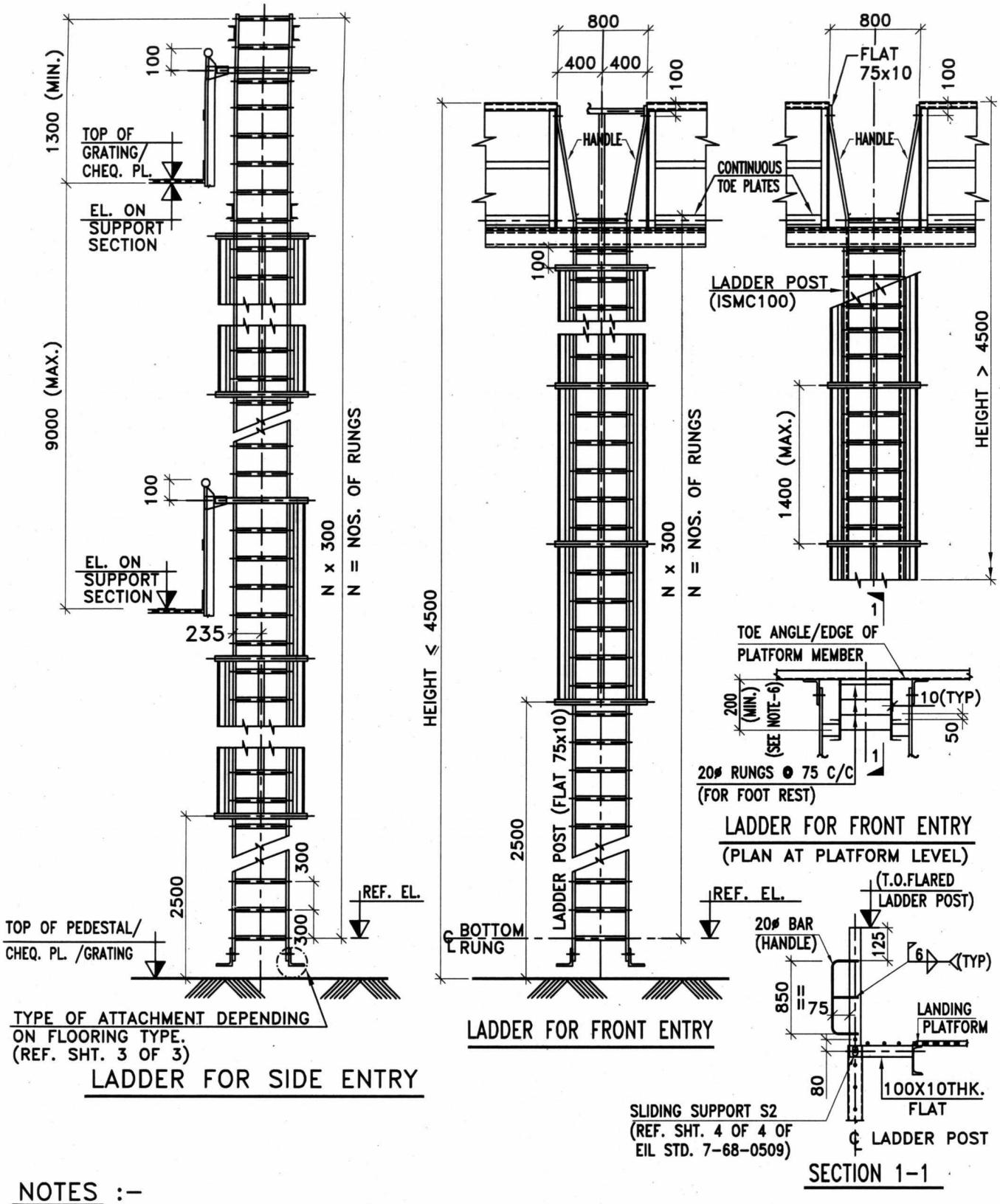

NOTES :-

1. LADDER POSTS SHALL BE OF FLAT (75x10) UPTO 3.60m (MAX.) BETWEEN SUPPORTS AND ISMC 100 UPTO 7.0m (MAX.) BETWEEN SUPPORTS.
2. RUNGS SHALL BE 20 ø. FOR STEEL LADDER JOINT DETAILS, REFER EIL STD. 7-68-0509.
3. SUPPORT TYPE 'X1' CORRESPONDS TO FIXED SUPPORT AND 'S2/X2' CORRESPONDS TO SLIDING SUPPORT. FOR EACH LADDER, ONLY ONE FIXED SUPPORT SHALL BE PROVIDED. REMAINING SUPPORT(S) SHALL BE OF SLIDING TYPE.
4. SUPPORT ELEVATION X1, X2 CORRESPOND TO ℄ OF BOLT HOLES.
5. SUPPORTS 'X1' IS CAPABLE TO SUSTAIN A LOAD FOR 9000 mm LONG LADDER ONLY.
6. LADDER SHALL BE GIVEN SUITABLE SLOPE (MAX.6°),IF NECESSARY,TO AVOID FOULING WITH ANCHOR CHAIRS.

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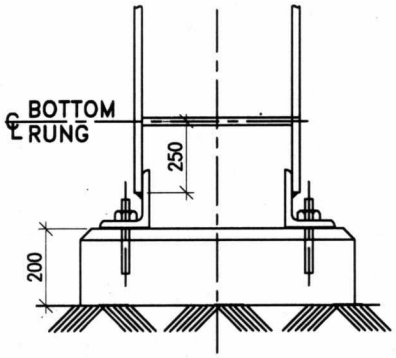
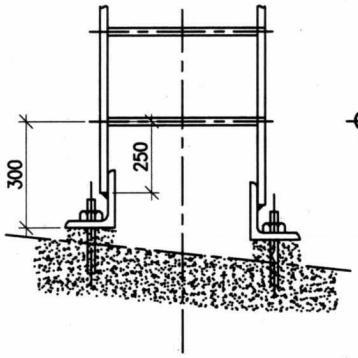
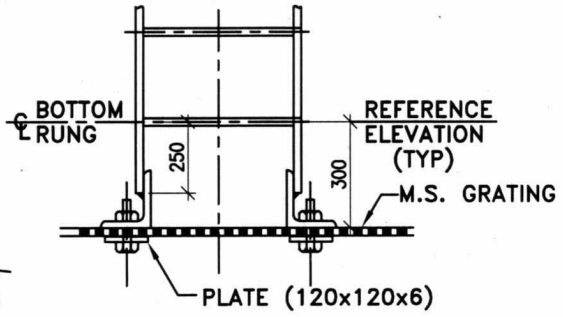
TYPE OF ATTACHMENT	NATURE OF SUPPORT SECTION	REMARKS
A1, A2	SITE WITHOUT PAVING	
B1, B2	CONCRETE FLOOR	A1, B1, C1, D1 : FIXED TYPE
C1, C2, D1, D2	CHEQUERED PLATE / GRATING FLOORING	A2, B2, C2, D2 : SLIDING TYPE



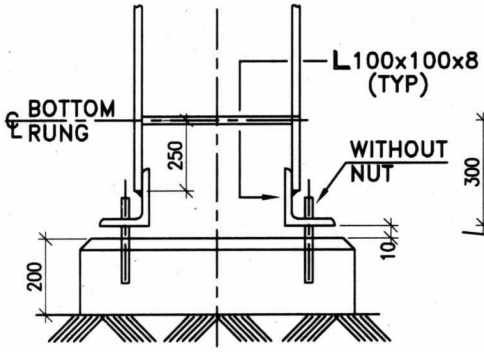
TYPE – A1



TYPE – B1



TYPE – C1



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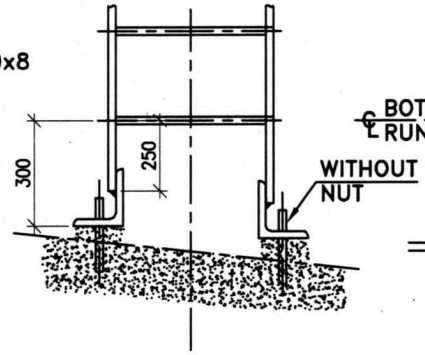

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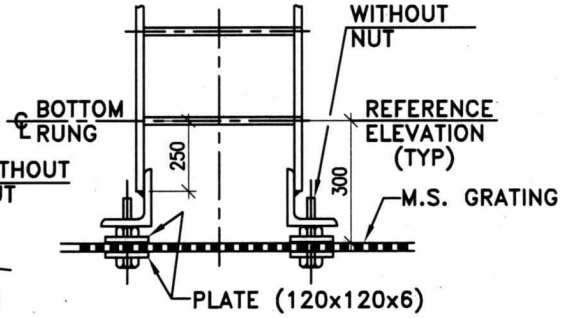

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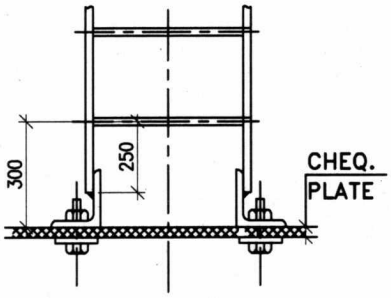
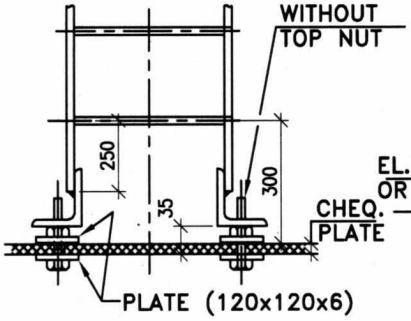


TYPE – D1



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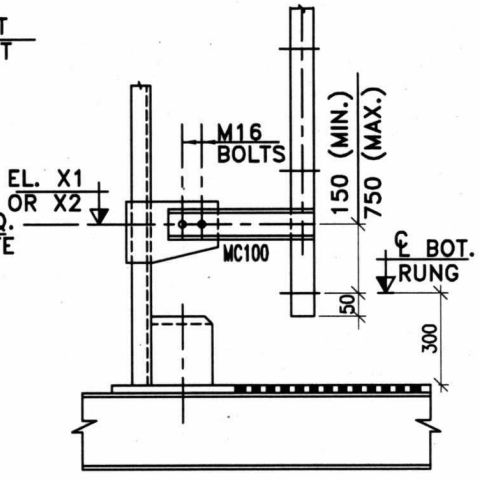

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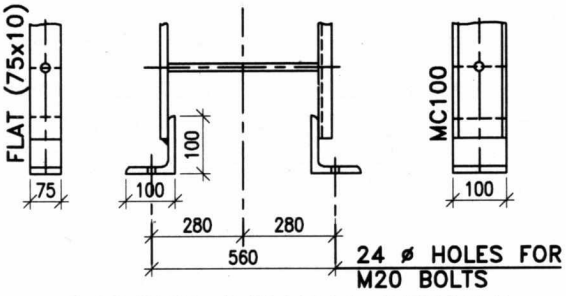

LADDER BOTTOM DETAILS

NOTE :-

IN CASE OF TOWERS BOTTOM RUNG SHALL BE 300 mm FROM FGL /HPP.

TYPE OF ATTACHMENT AT BASE

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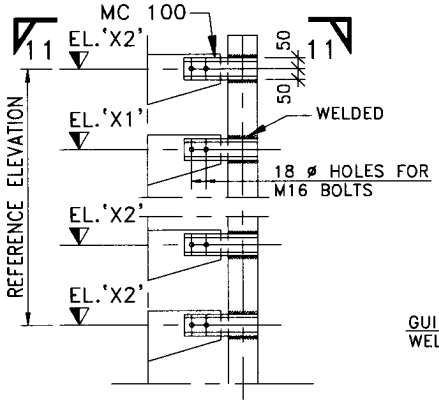
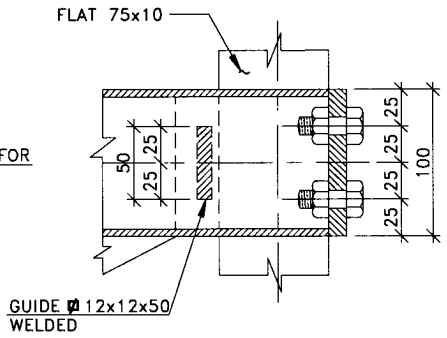
STEEL LADDER JOINT DETAILS



LADDER ATTACHMENT TO VESSELS



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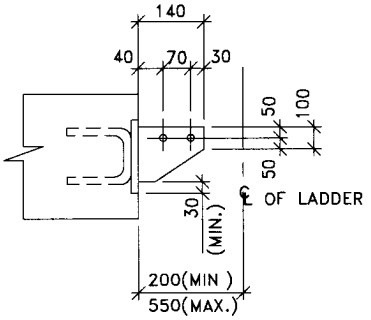

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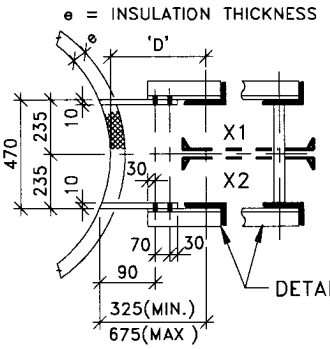
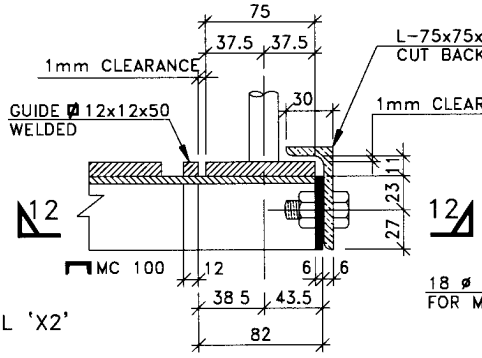
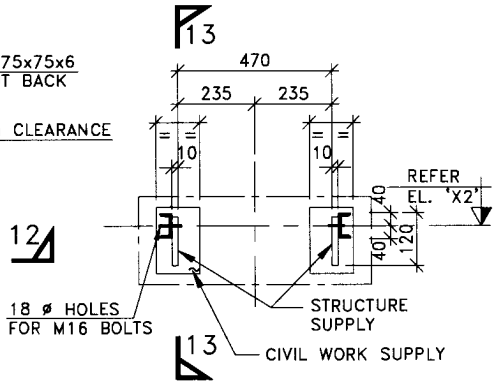


DETAIL 'X2'

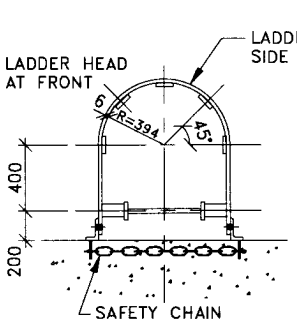
(FOR LADDER POST FLAT 75x10)

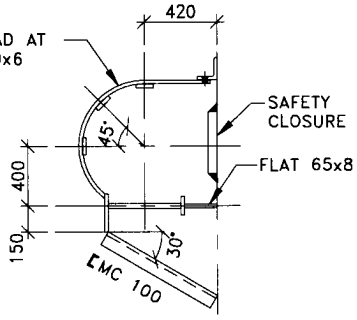




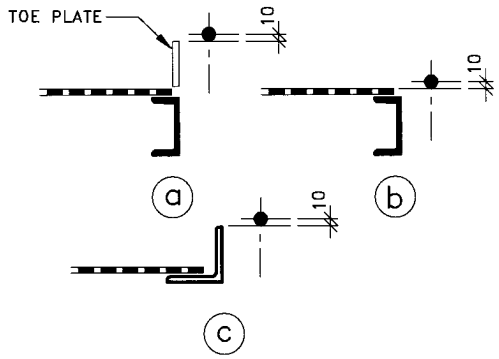
LADDER ATTACHMENT TO CONCRETE

SECTION 11–11

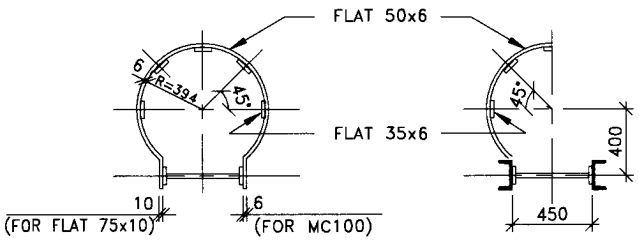




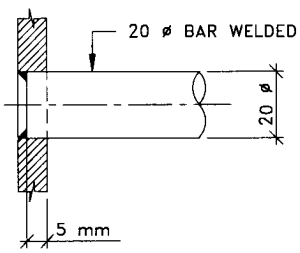
SAFETY CAGE HOOP DETAILS



LOCATION OF RUNG FOR LADDER



LOWER AND INTERMEDIATE CAGE



ATTACHMENT OF BAR

Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
7	01 08 19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R K TRIVEDI
6	28 11 13	REVISED AND ISSUED AS STANDARD	VPS	AJS	P K MITTAL	S CHANDA

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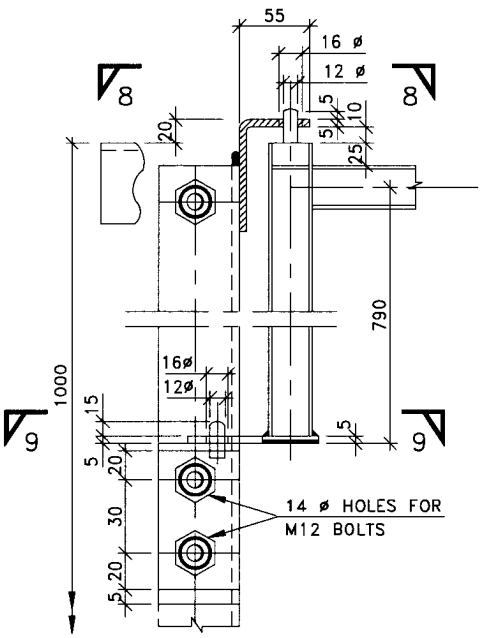
STEEL LADDER JOINT DETAILS



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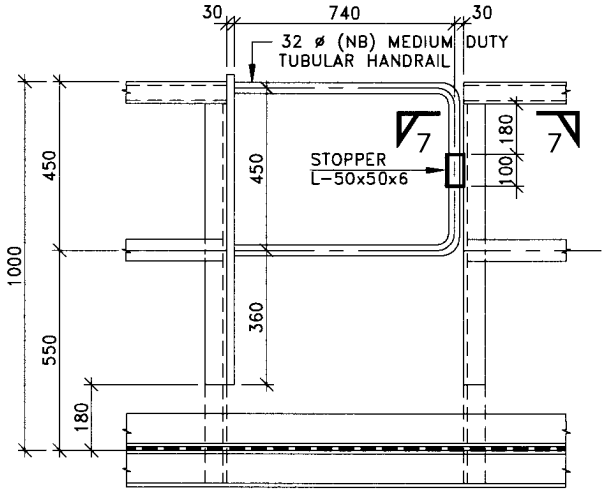

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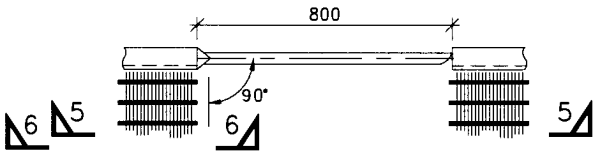

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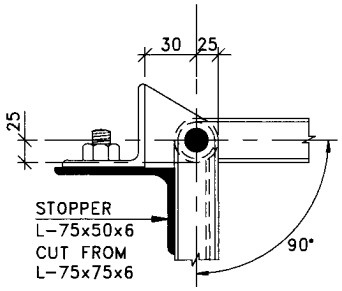

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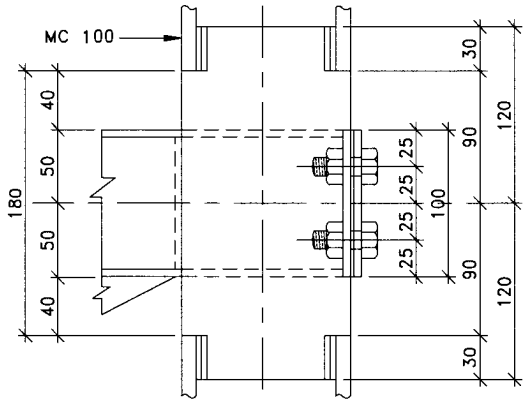

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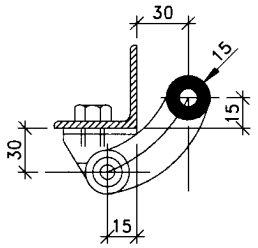

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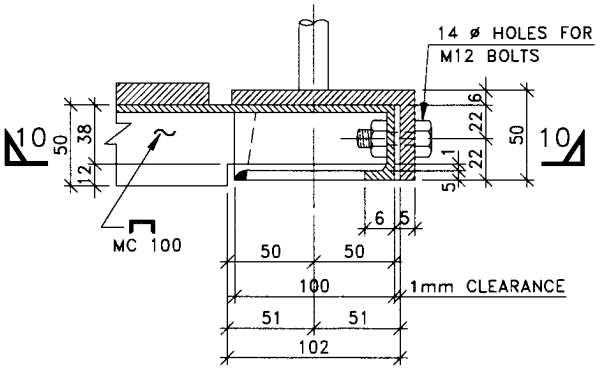
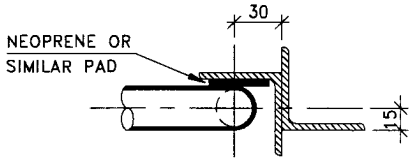


DETAIL 'X2'

(FOR LADDER POST MC 100)



SECTION 7-7

Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
7	01 08 19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R K TRIVEDI
6	28 11 13	REVISED AND ISSUED AS STANDARD	VPS	AJS	P K MITTAL	S CHANDA

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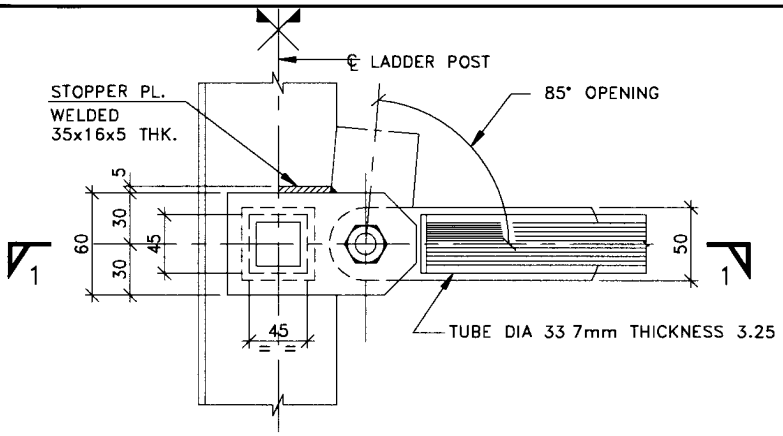
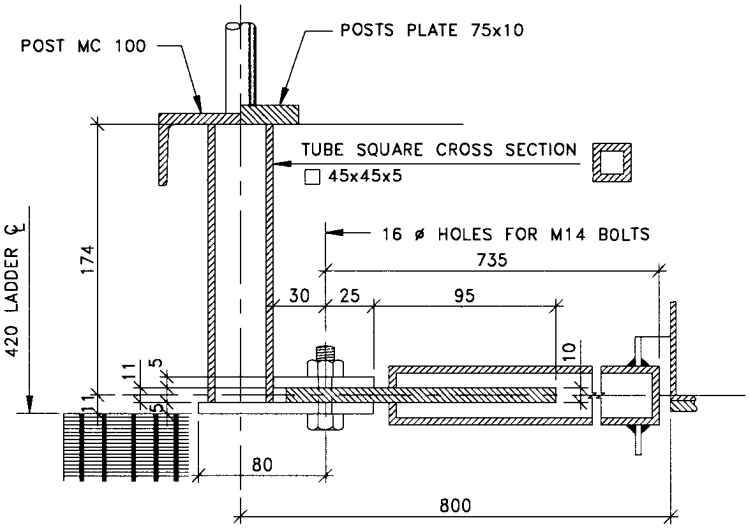
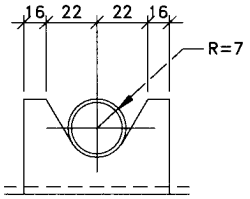


SAFETY BAR INSTALLATION ON LADDER POSTS



SECTION 1–1



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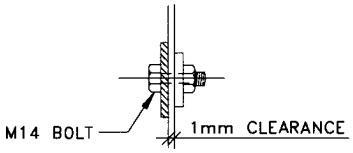

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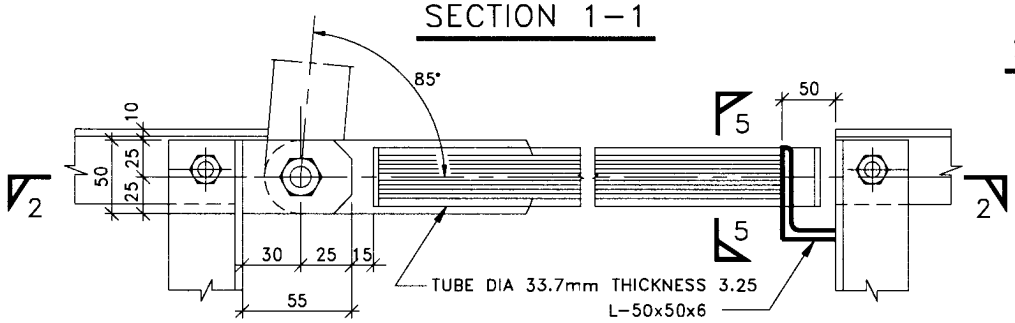
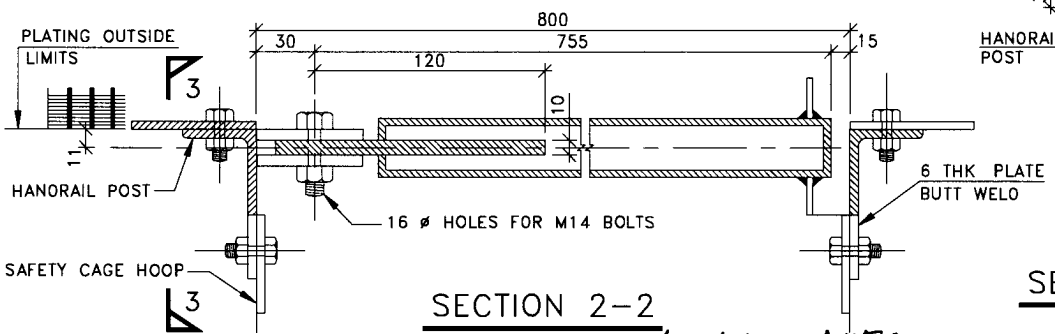
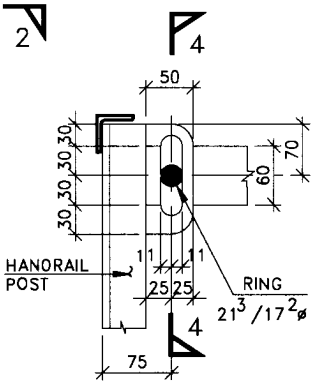


SAFETY BAR INSTALLATION ON HANDRAIL POSTS



SECTION 2–2



SAFETY CAGE HOOP ATTACHMENT TO HANDRAIL POST

SECTION 3–3

Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
					Approved by	
7	01 08 19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R K TRIVEDI
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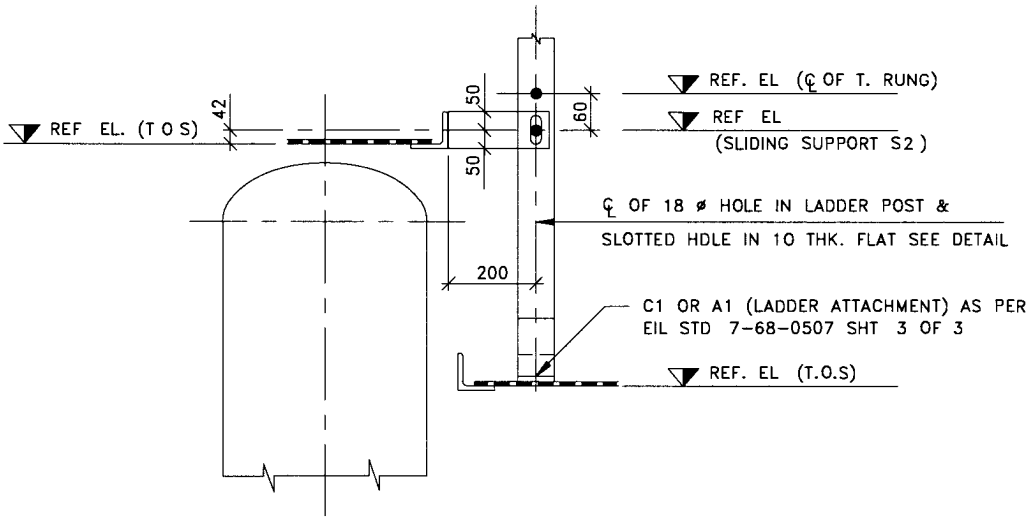
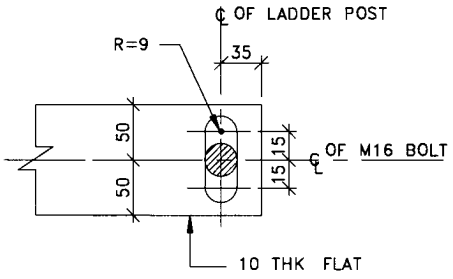


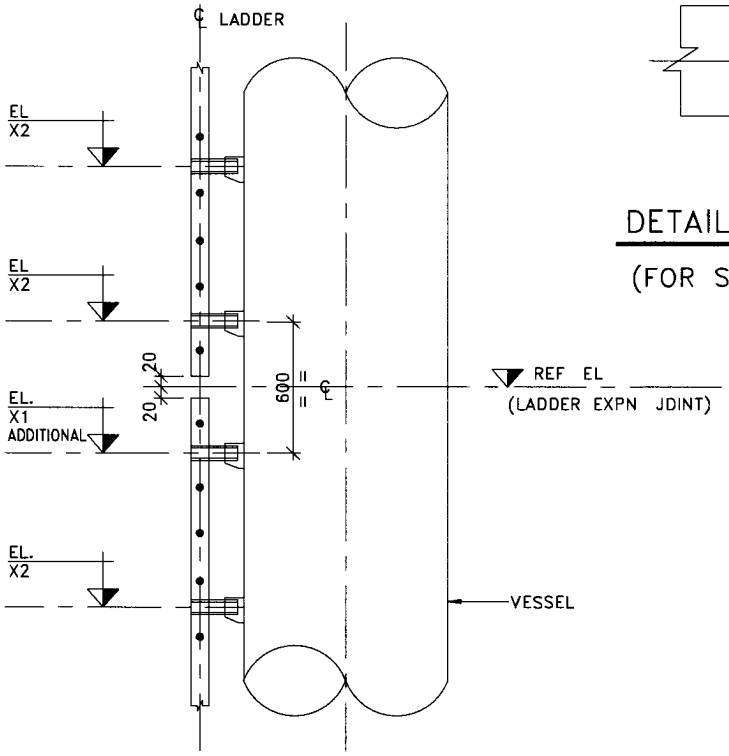
SLIDING CONN. DET. OF LADDER

(WITH TOE ANGLE OF PLATFORM ON THE HEAD OF VESSEL)



DETAIL OF SLOTTED HOLE

(FOR SLIDING SUPPORT S2)



DET. OF LADDER EXPANSION JOINT

(WHEN DISTANCE BETWEEN TOP AND BOT. MOST SUPPORT ⩾ 9000)

Rev. No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
7	01 08 19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R K TRIVEDI
6	28 11 13	REVISED AND ISSUED AS STANDARD	VPS	AJS	P K MITTAL	S.CHANDA

Approved by

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NOTES :-

1. ELECTRICAL DEPTT. & INSTRUMENTATION DEPTT. WILL PROVIDE FOLLOWING INFORMATION ON THEIR DRAWINGS WHICH WILL BE ISSUED FOR CONSTRUCTION:
   a) LAYOUT AND SIZE OF THE CABLE TRENCH.
   b) TYPE OF COVER REQUIRED i.e. PRECAST RCC / CHEQUERED PLATE.
   c) LIVE LOAD ON THE COVERS IF MORE THAN AS DEFINED IN TABLE 2.
   d) INSERT PLATE REQUIREMENT AND ITS SPACING.
   e) LAYOUT AND SIZE OF OPENING FOR PANELS. (SHEET 15 OF 16)
2. GRADE OF CONCRETE AND REBARS FOR CABLE TRENCH & PRECAST COVER SHALL BE AS PER GENERAL NOTES OF THE PROJECT. HOWEVER, M25 AS MINIMUM GRADE OF RCC AND FE500D AS MINIMUM GRADE OF REINFORCEMENT HAS BEEN CONSIDERED IN DESIGN.
3. R.C.C. CABLE TRENCHES ARE DESIGNED FOR A SURCHARGE LOAD OF 1 T/M^2 .
4. STRUCTURAL STEEL FOR PRECAST COVER SUPPORTS INCLUDING INSERT PLATES IS ALSO IN THE SCOPE OF CIVIL CONTRACTOR.
5. ALL OTHER STRUCTURAL STEEL WORKS INCLUDING CHEQUERED PLATE SHALL BE UNDER THE SCOPE OF ELECTRICAL CONTRACTOR.
6. STRUCTURAL STEEL SHALL CONFORM TO MINIMUM E250 GRADE A/BR/B0 AS PER IS 2062. CHEQUERED PLATE SHALL CONFORM TO IS 3502.
7. Cc STANDS FOR CLEAR COVER. CLEAR COVER SHALL BE 30MM MINIMUM, UNLESS NOTED OTHERWISE. IN CASE CLEAR COVER IS MORE FOR A PROJECT, THE ELEMENT THICKNESS SHALL BE INCREASED ACCORDINGLY.
8. 5MM GAP TO BE FILLED WITH 1:3 CEMENT MORTAR.

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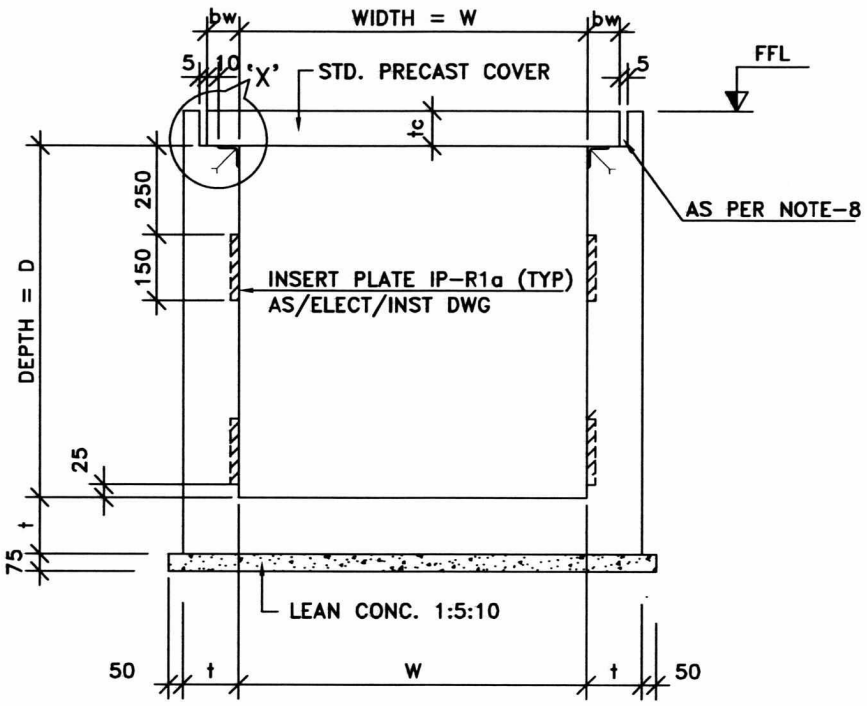
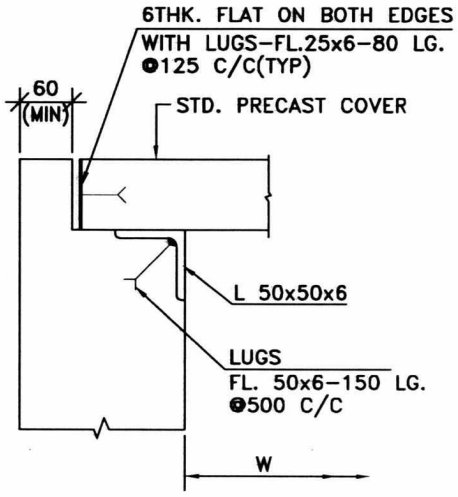


TYP. SECTION OF CABLE TRENCH



DETAIL – 'X'
(TYP.)

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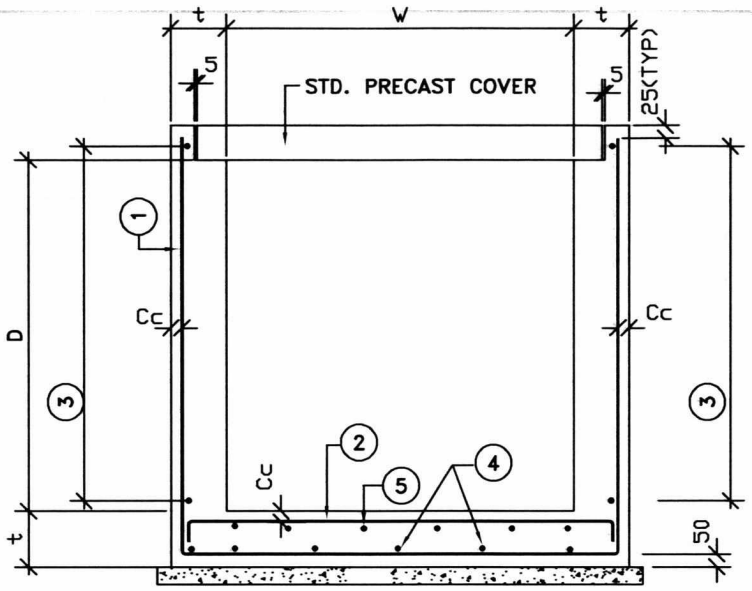
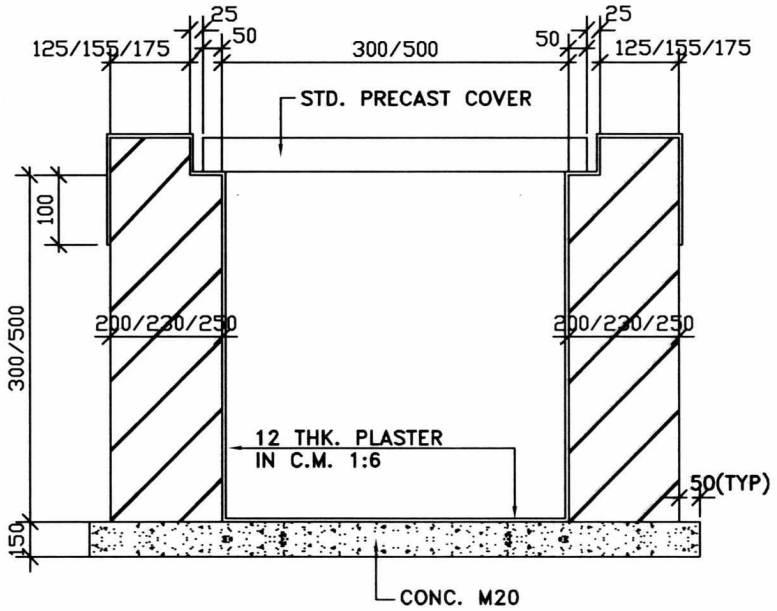


CABLE TRENCH SECTION WITH R.C.C.

(FOR DETS OF R/F BARS ① TO ⑥ REFER TABLE–1 SHT 5 OF 16)



CABLE TRENCH SECTION WITH BRICK MASONRY

(IN C.M. 1:6)

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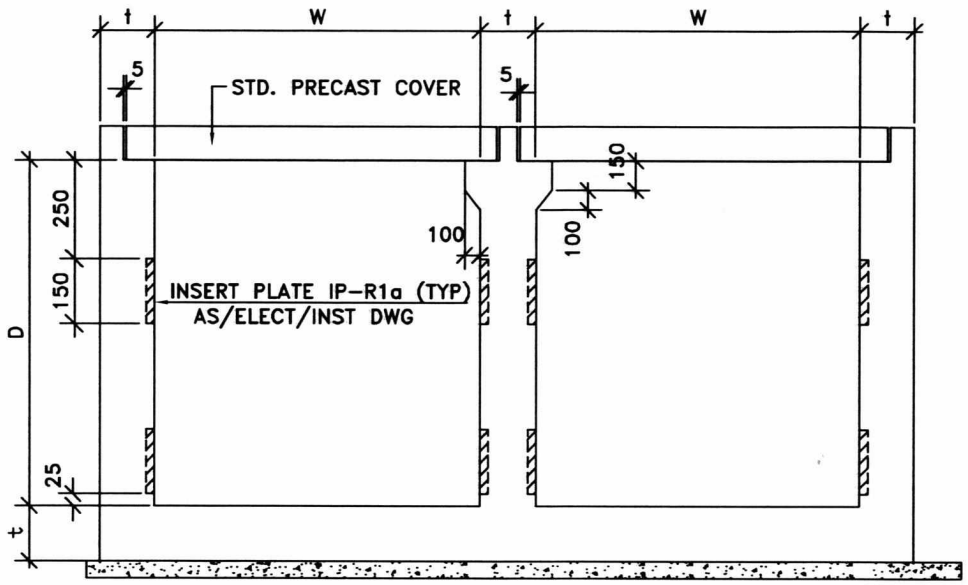
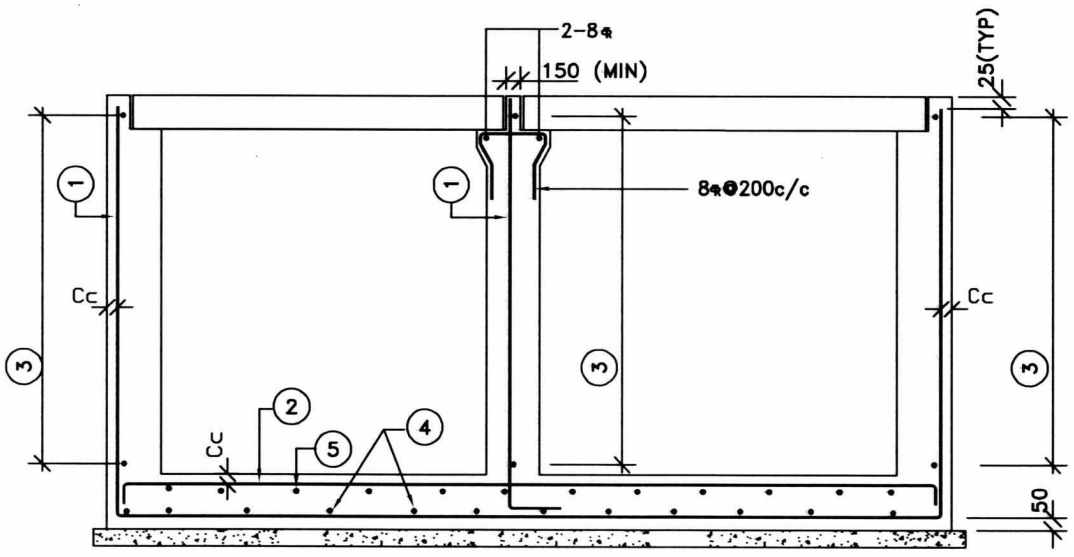


CABLE TRENCH SECTION WITH PARTITION



CABLE TRENCH SECTION WITH PARTITION

(FOR DETS OF R/F BARS ① TO ⑤ REFER TABLE-1 SHT 5 OF 16)

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TABLE-1 DETAIL OF CABLE TRENCH REINFORCEMENT

S.NO.	WORKING DIMENSIONS				R/F CONFORMING TO GRADE Fe-500D(TMT) OF IS:1786.					APPROX. QUANTITIES PER METRE LENGTH.		
	DEPTH	WIDTH	THICK-NESS	CLEAR COVER	BAR MARK (REF. SHT. 10 & 11 OF 16)					LEAN CONC. 1:5:10	CONC.	REBARS
	D (mm)	W (mm)	t (mm)	Cc (mm)	(1)	(2)	(3)	(4)	(5)	(m^3)	(m^3)	(kg)
1.	300	300	125	30	8ϕ-200C/C.	—	8ϕ-300C/C.	8ϕ-300C/C.	ϕ —	0.045	0.15	3.80
2.	300	500	125	30	8ϕ-200C/C.	—	8ϕ-300C/C.	8ϕ-300C/C.	—	0.048	0.17	4.70
3.	500	500	125	30	8ϕ-200C/C.	—	8ϕ-300C/C.	8ϕ-300C/C.	—	0.060	0.22	5.60
4.	750	750	125	30	8ϕ-200C/C.	10ϕ-150C/C.	8ϕ-300C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.079	0.32	19.0
5.	1000	1000	125	30	10ϕ-150C/C.	8ϕ-200C/C.	8ϕ-300C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.098	0.41	26.0
6.		1250	125	30	10ϕ-150C/C.	8ϕ-150C/C.	8ϕ-300C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.116	0.44	29.0
7.		1500	150	30	10ϕ-150C/C.	12ϕ-150C/C.	8ϕ-300C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.139	0.57	36.0
8.		2000	175	30	10ϕ-150C/C.	12ϕ-150C/C.	8ϕ-250C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.180	0.77	49.0
9.	1250	500	150	30	10ϕ-150C/C.	8 ϕ-250C/C.	8ϕ-300C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.063	0.50	27.1
10.		750	150	30	10ϕ-150C/C.	8 ϕ-200C/C.	8ϕ-300C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.08	0.54	29.5
11.		1000	150	30	10ϕ-150C/C.	10ϕ-200C/C.	8ϕ-300C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.101	0.57	32.0
12.		1250	150	30	10ϕ-150C/C.	10ϕ-150C/C.	8ϕ-300C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.120	0.61	37.0
13.		1500	150	30	10ϕ-150C/C.	12ϕ-150C/C.	8ϕ-300C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.139	0.65	43.0
14.		2000	175	30	10ϕ-150C/C.	12ϕ-150C/C.	8ϕ-250C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.180	0.85	49.0
15.	1500	1000	175	30	12ϕ-200C/C.	8ϕ-250C/C.	8ϕ-250C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.105	0.76	36.0
16.		1250	175	30	12ϕ-200C/C.	8ϕ-175C/C.	8ϕ-250C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.124	0.81	40.0
17.		1500	175	30	12ϕ-200C/C.	10ϕ-175C/C.	8ϕ-250C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.143	0.85	44.0
18.		2000	175	30	12ϕ-200C/C.	12ϕ-175C/C.	8ϕ-250C/C.	8ϕ-300C/C.	8ϕ-300C/C.	0.180	0.94	56.0
19.	2200	2250	250	30	12ϕ-150C/C.	12ϕ-150C/C.	8ϕ-200C/C.	8ϕ-250C/C.	8ϕ-250C/C.	0.206	1.80	95.0

NOTES-

1. THE QUANTITIES GIVEN IN THIS TABLE ARE FOR ESTIMATION PURPOSE ONLY.
2. PREFERABLY THE DEPTH OF CABLE TRENCH SHALL NOT BE MORE THAN THE WIDTH.
3. TRENCHES OF DEPTH 300 & 500mm IN BRICK MASONRY WHEREVER SPECIFIED.

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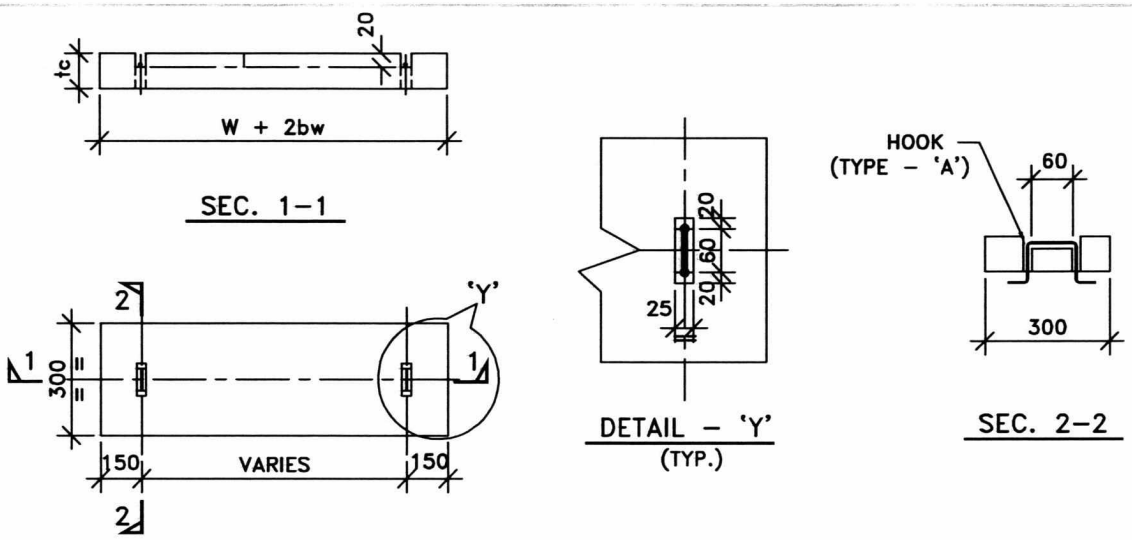

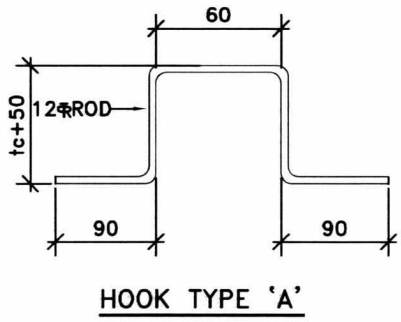

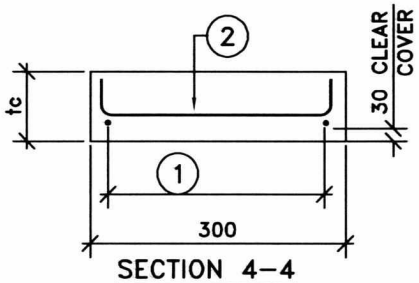

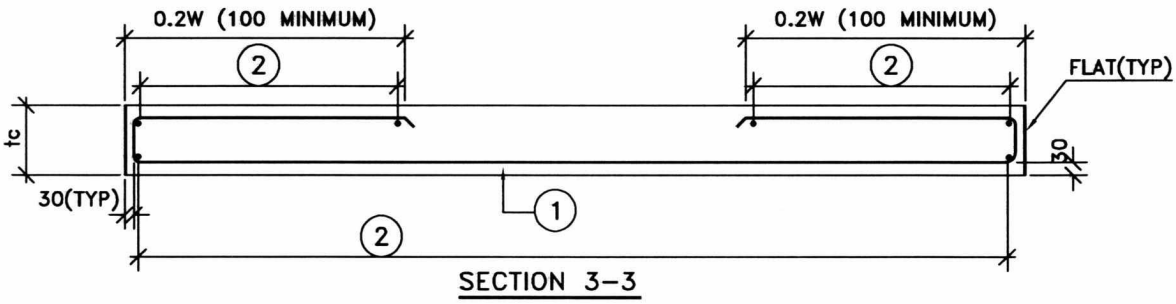

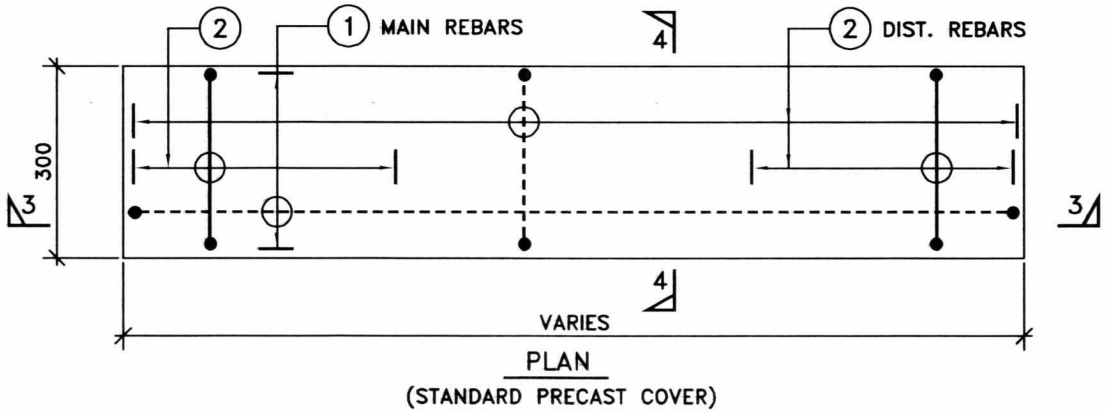

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TABLE-2: DETAIL OF STANDARD PRECAST COVERS

S.NO.	TYPE	WORKING DIMENSIONS				DESIGN LOAD ON EACH COVER		FOR ONE UNIT OF WIDTH 300 mm				
		CLEAR WIDTH OF TRENCH W (mm)	BEARING OF COVER bw (mm)	TOTAL LENGTH OF COVER W+2bw (mm)	THICK-NESS OF COVER tc (mm)	TOTAL U.D.L. (KG/m²)	EQUV. CONCEN. LOAD AT CENTRE OF SPAN (kgs)	REINFORCEMENT CONFORMING TO GRADE Fe-500D(TMT) OF IS:1786		APPROX. QUANTITIES		SELF WEIGHT (kgs)
								BAR MKD. (1)	BAR MKD. (2)	CONCRETE	REINF. (kg)	
1.	PC-1	300	50	400	100	≤2000	≤1000	3-8ϕ	3-8ϕ	0.012	0.94	30
2.	PC-2	500	50	600	100	≤2000	≤1000	3-8ϕ	3-8ϕ	0.018	1.18	45
3.	PC-3A	750	50	850	100	≤1500	≤750	3-8ϕ	4-8ϕ	0.026	1.62	64
4.	PC-3B				100	>1500 ≤2000	>750 ≤1000	4-8ϕ	4-8ϕ	0.026	1.96	64
5.	PC-4A	1000	50	1100	100	≤1500	≤750	4-8ϕ	5-8ϕ	0.033	2.57	83
6.	PC-4B				120	>1500 ≤2000	>750 ≤1000	4-8ϕ	5-8ϕ	0.040	2.57	99
7.	PC-5A	1250	50	1350	120	≤1500	≤750	4-8ϕ	5-8ϕ	0.049	2.98	122
8.	PC-5B				120	>1500 ≤2000	>750 ≤1000	4-10ϕ	5-8ϕ	0.049	4.22	122
9.	PC-6A	1500	75	1650	120	≤1500	≤750	3-10ϕ	6-8ϕ	0.060	3.96	149
10.	PC-6B				130	>1500 ≤2000	>750 ≤1000	4-10ϕ	6-8ϕ	0.065	4.99	161
11.	PC-7A	2000	75	2150	130	≤1500	≤750	4-10ϕ	7-8ϕ	0.083	6.36	210
12.	PC-7B				140	>1500 ≤2000	>750 ≤1000	4-12ϕ	7-8ϕ	0.090	8.67	226
13.	PC-8A	2250	75	2400	140	≤1500	≤750	4-10ϕ	8-8ϕ	0.101	6.89	252
14.	PC-8B				150	>1500 ≤2000	>750 ≤1000	4-12ϕ	8-8ϕ	0.108	9.50	270

NOTES :-

1. FOR LOCATION OF BARS MKD. (1) AND (2) REFER SHT. 6 OF 16.
2. ALL PRECAST COVERS SHALL BE MARKED (T) ON THE TOP FOR PROPER PLACEMENT.
3. THE QUANTITIES GIVEN IN THIS TABLE ARE FOR ESTIMATION PURPOSE ONLY.
4. DESIGN IS VALID FOR EITHER TOTAL UDL OR EQUV. POINT LOAD AT CENTRE OF SPAN.

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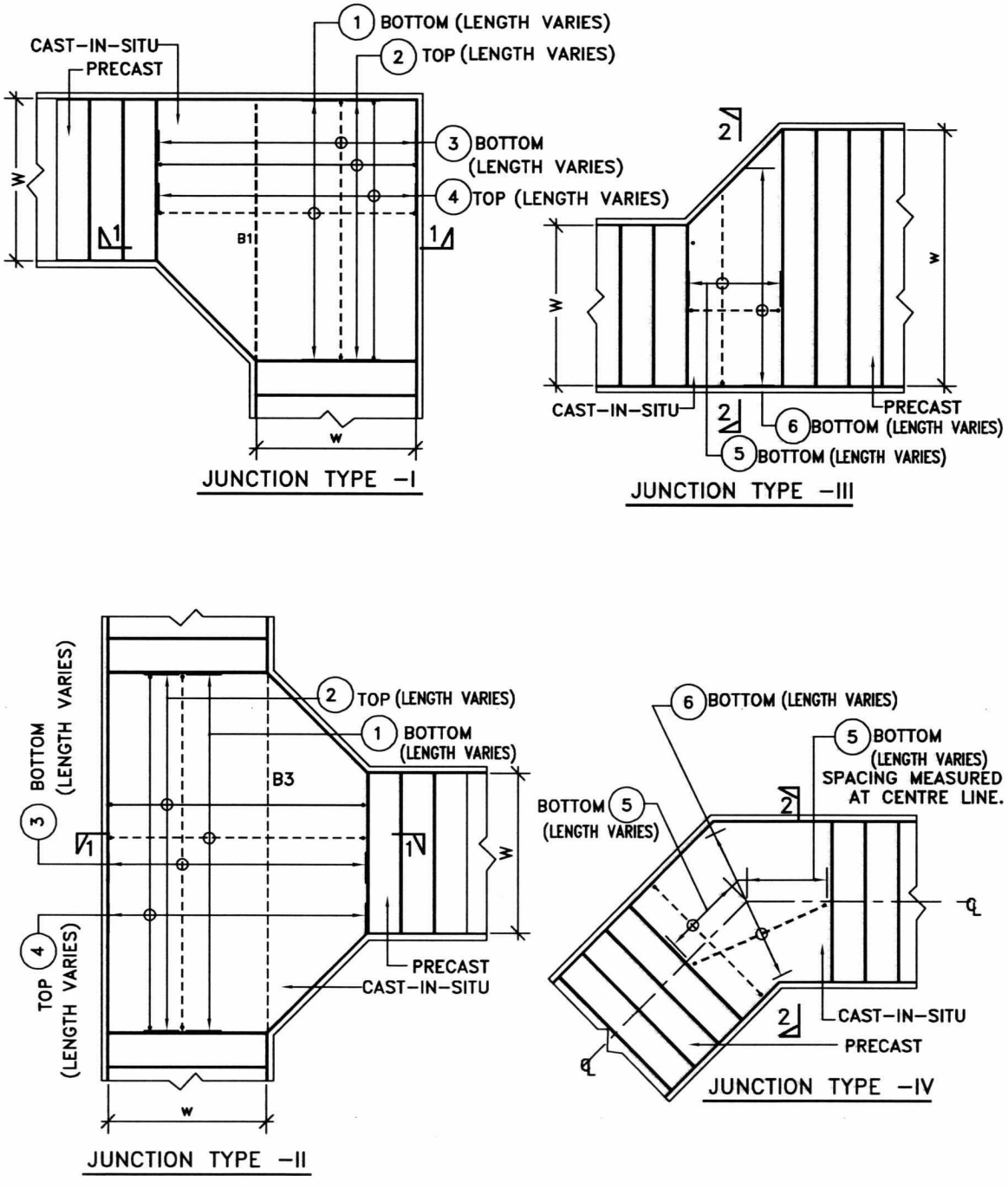

CAST-IN-SITU COVERS

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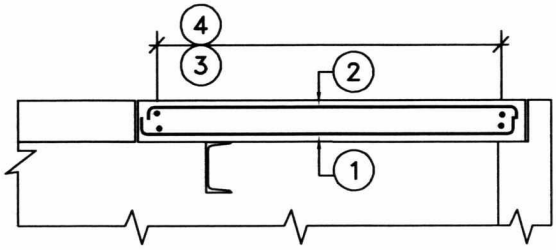
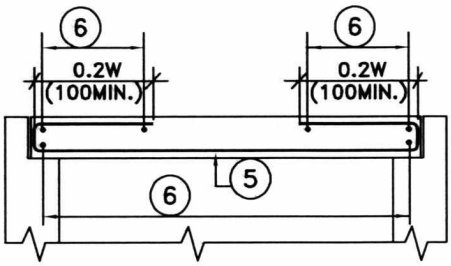


SECTION 1–1



SECTION 2–2

TABLE–3:DETAIL OF CAST–IN–SITU COVERS

S.NO.	W (mm)	tc (mm)	REINFORCEMENT DETAIL FOR CAST–IN–SITU COVERS					
			JUNCTION TYPE I & II				JUNCTION TYPE III & IV	
			BAR MARK (1)	BAR MARK (2)	BAR MARK (3)	BAR MARK (4)	BAR MARK (5)	BAR MARK (6)
1.	300	100	8ϕ@120c/c	–	8ϕ@150c/c	–	8ϕ@150c/c	8ϕ@200c/c
2.	500	100	8ϕ@120c/c	–	8ϕ@150c/c	–	8ϕ@150c/c	8ϕ@200c/c
3.	750	100	8ϕ@120c/c	8ϕ@200c/c	8ϕ@200c/c	8ϕ@200c/c	8ϕ@150c/c	8ϕ@200c/c
4.	1000	120	8ϕ@120c/c	8ϕ@200c/c	8ϕ@300c/c	8ϕ@300c/c	8ϕ@150c/c	8ϕ@300c/c
5.	1250	120	10ϕ@120c/c	8ϕ@200c/c	8ϕ@300c/c	8ϕ@300c/c	10ϕ@150c/c	8ϕ@300c/c
6.	1500	130	10ϕ@120c/c	8ϕ@200c/c	8ϕ@300c/c	8ϕ@300c/c	10ϕ@150c/c	8ϕ@300c/c
7.	2000	140	12ϕ@120c/c	8ϕ@200c/c	8ϕ@300c/c	8ϕ@300c/c	12ϕ@150c/c	8ϕ@300c/c
8.	2250	150	12ϕ@120c/c	8ϕ@200c/c	8ϕ@300c/c	8ϕ@300c/c	12ϕ@150c/c	8ϕ@300c/c

NOTES :–

1. THE CAST–IN–SITU COVERS ARE DESIGNED FOR TOTAL UDL OF 2000 kg/m. OR AN EQUIVALENT POINT LOAD OF 1000 kg ACTING AT MID SPAN.
2. FOR CONNECTION DETAIL AND SIZES OF B1 & B3 REFER SHT.8 OF 16 & 12 OF 16.
3. FOR LOCATION OF BAR MARKS (1) TO (6) REFER ABOVE SECTIONS 1–1 & 2–2.

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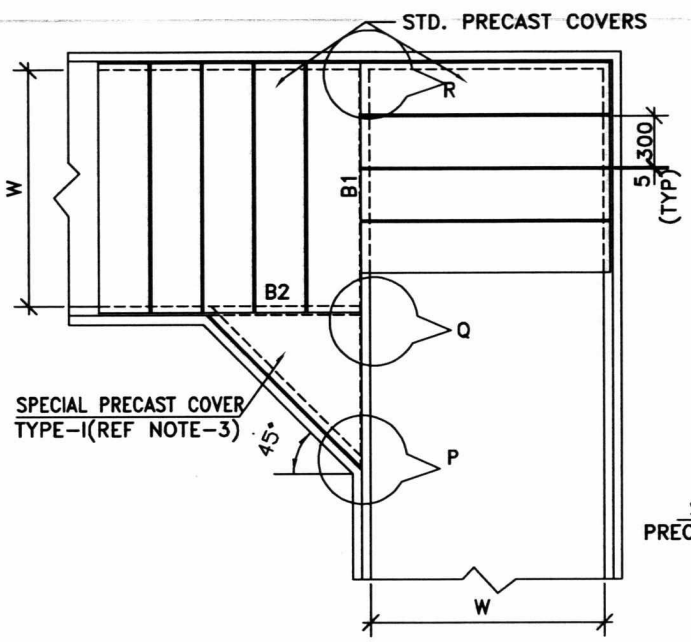
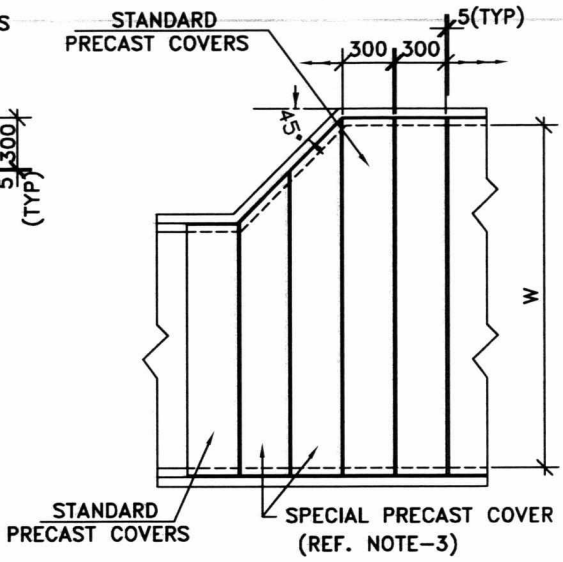


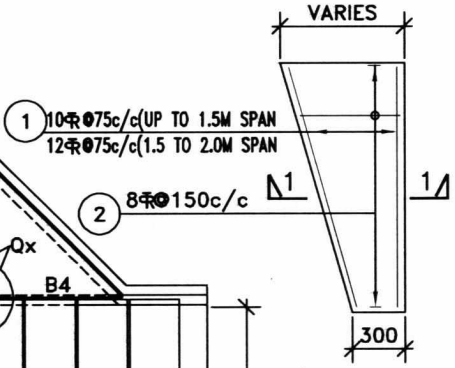
JUNCTION TYPE – I



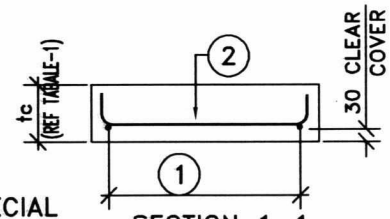
JUNCTION TYPE – III

NOTES :

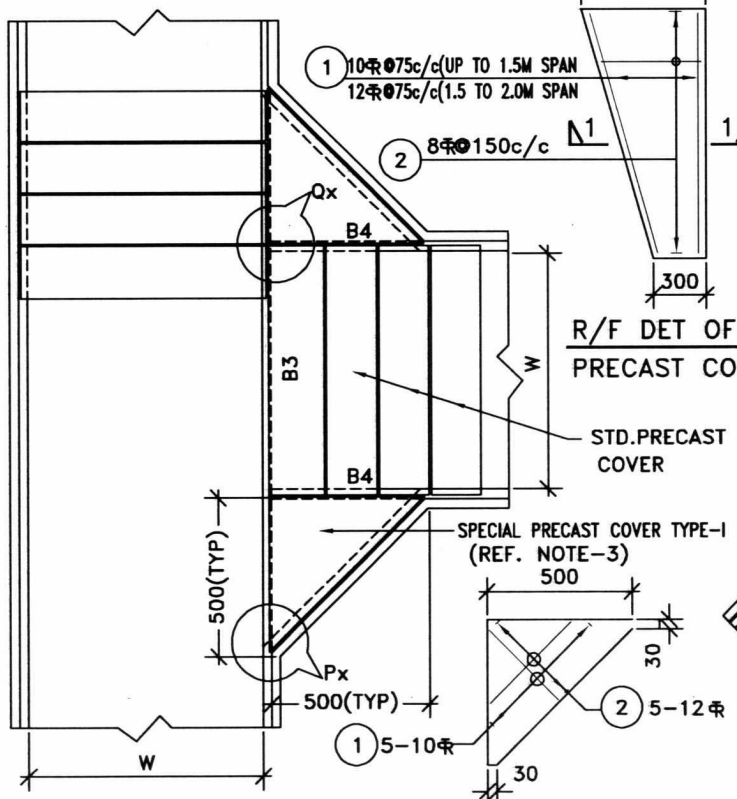
1. FOR DETAILS P, Q, Px, Qx & R REFER SHT. 11 OF 16.
2. FOR DETAIL OF BEAMS B1 TO B4 REF. TABLE 4 SHT 12 OF 16.
3. SPECIAL PRECAST COVER AT JUNCTION OF CABLE TRENCH PREFERABLY BE IN CAST-IN-SITU (REF SHT 8 OF 16)



R/F DET OF SPECIAL
PRECAST COVER TYPE-II

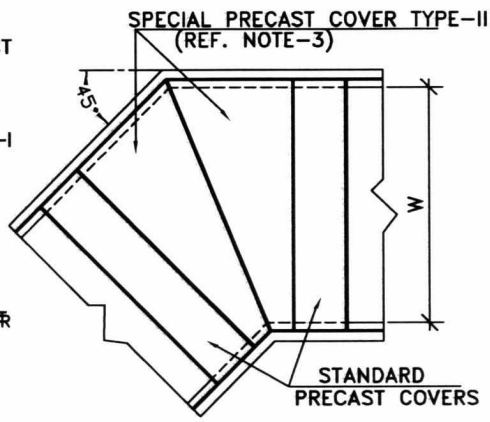


SECTION 1-1



JUNCTION TYPE – II

R/F DET OF SPECIAL
PRECAST COVER TYPE-I



JUNCTION TYPE – IV

SPECIAL PRECAST COVERS

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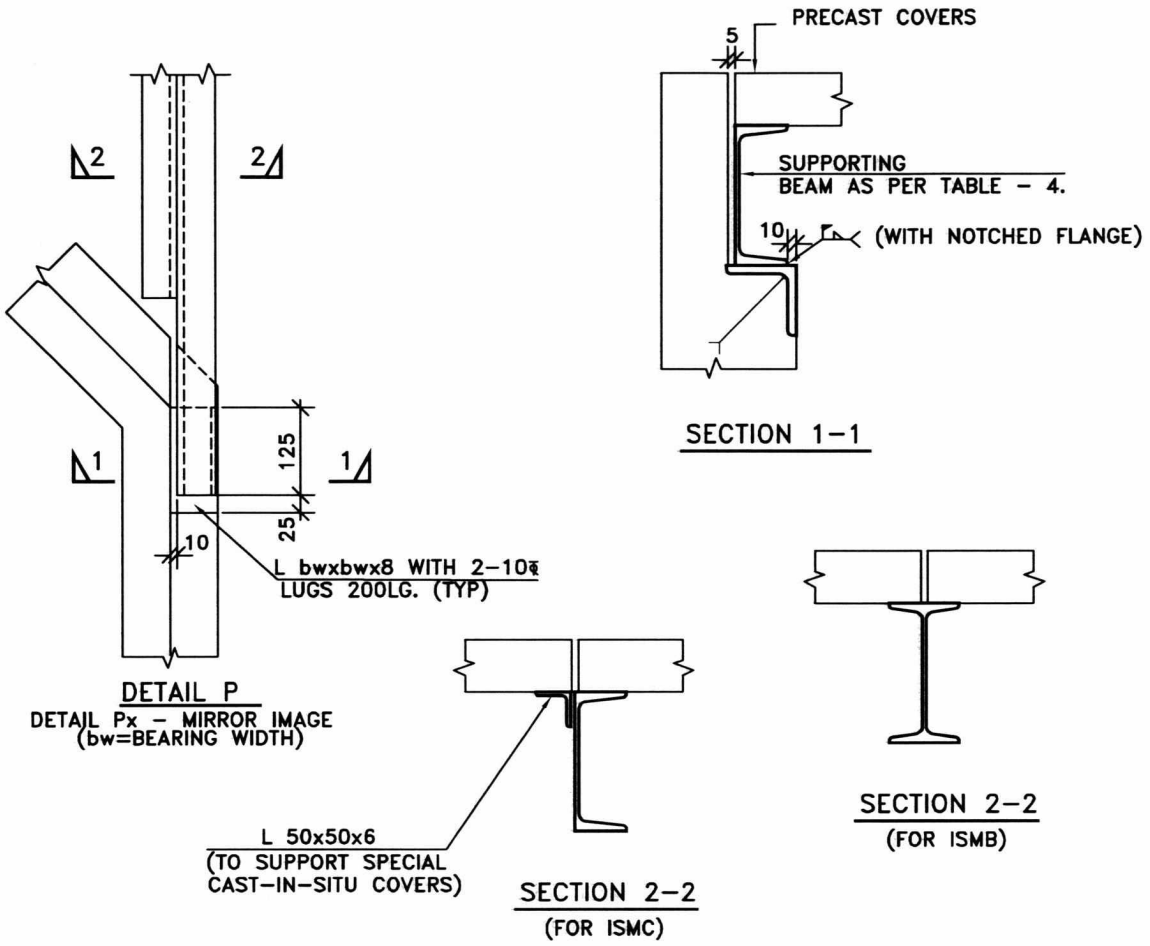

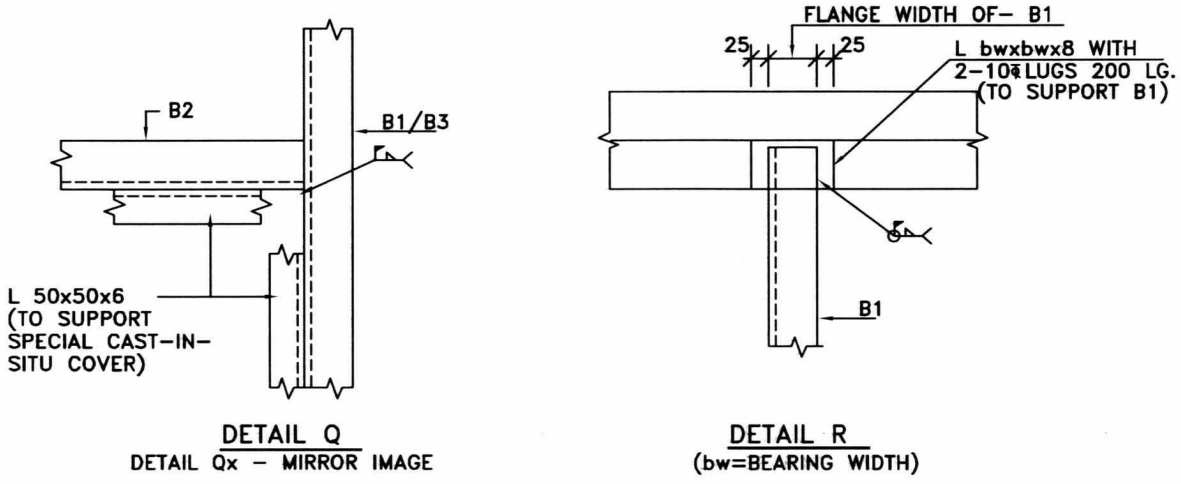

SUPPORTING MEMBERS

(FOR LOCATION OF DET. P, Q, Px, Qx & R REF. SHT. 10 OF 16)

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TABLE–4: DETAIL OF SUPPORTING MEMBERS AT JUNCTIONS

S.NO.	WIDTH OF MAIN TRENCH W	JUNCTION TYPE – I				JUNCTION TYPE – II			
		SUPPORTING MEMBER B1		SUPPORTING MEMBER B2		SUPPORTING MEMBER B3		SUPPORTING MEMBER B4	
		SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH
1.	300	MC 100	1020	MC 100	625	MC 100	1650	MC 100	625
2.	500	MC 100	1220	MC 100	625	MC 150	1850	MC 100	625
3.	750	MC 100	1470	MC 100	625	MC 150	2100	MC 100	625
4.	1000	MC 100	1720	MC 100	625	MC 150	2350	MC 100	625
5.	1250	MC 150	1970	MC 100	625	MC 150	2600	MC 100	625
6.	1500	MC 150	2270	MC 100	625	MC 150	2900	MC 100	625
7.	2000	MC 150	2770	MC 100	625	MC 200	3400	MC 100	625
8.	2250	MC 150	3020	MC 100	625	MC 200	3650	MC 100	625

NOTE

THE SUPPORTING MEMBERS ARE DESIGNED FOR COVER WT. PLUS A POINT LOAD OF 1000 KG. AT MID SPAN.

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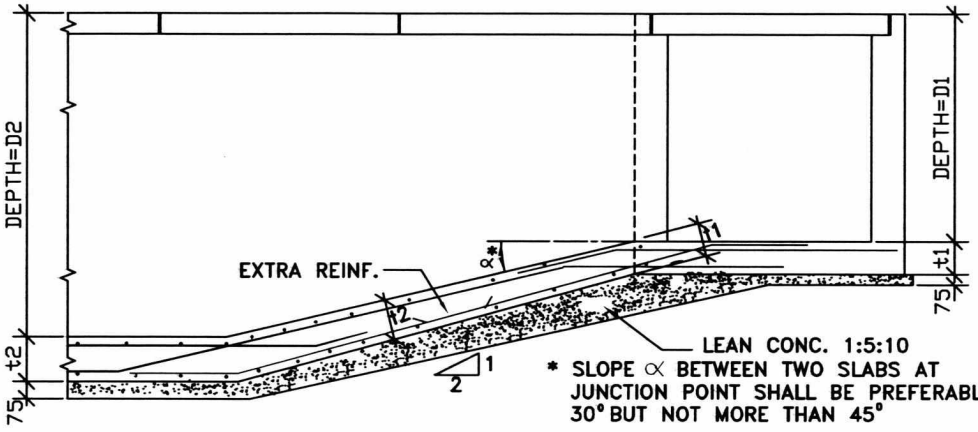

TYPICAL DETAIL AT JUNCTION FOR DIFFERENT DEPTHS OF TRENCH.

(R/F DETAIL OF TRENCH IN SLOPE SHALL BE BASED ON DEPTH D2).

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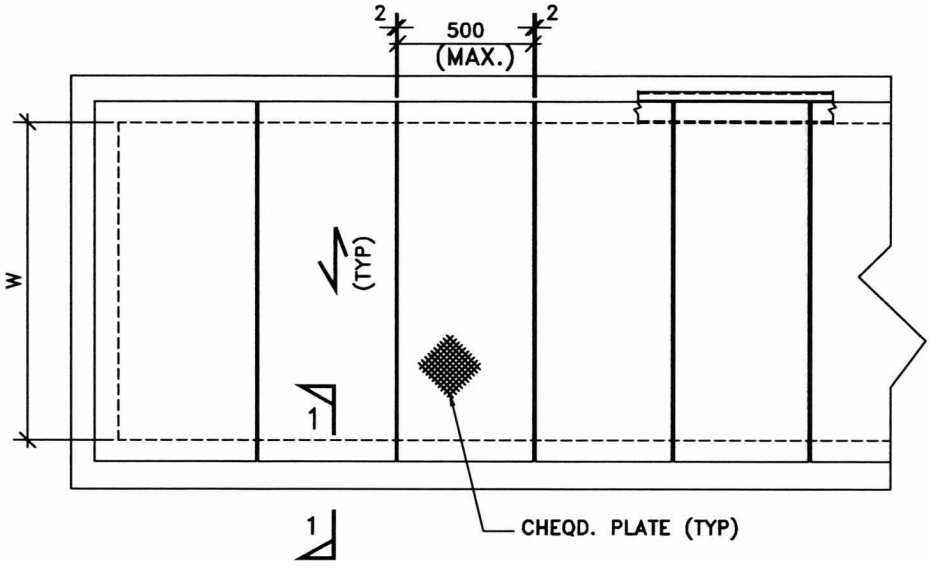
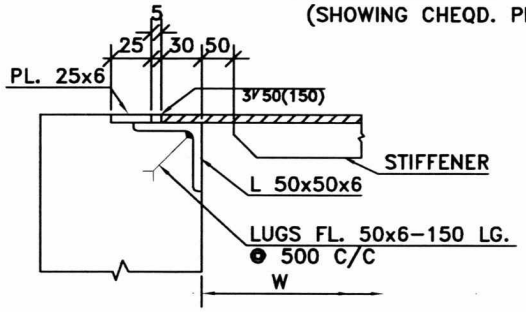
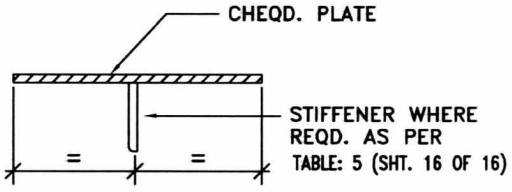


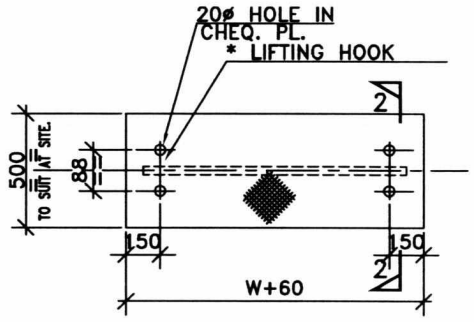
TYPICAL TRENCH PLAN
(SHOWING CHEQD. PLATE)



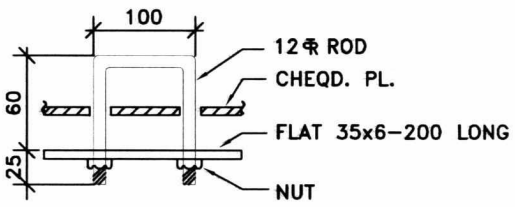
SECTION 1-1



SECTION 2-2



TYP. CHEQD. PLATE DETAIL
(SHOWING CHEQD. PLATE)



TYP. LIFTING HOOK DETAIL

* ONE HOOK FOR SPAN UPTO 500
TWO HOOKS FOR SPAN ABOVE 500.

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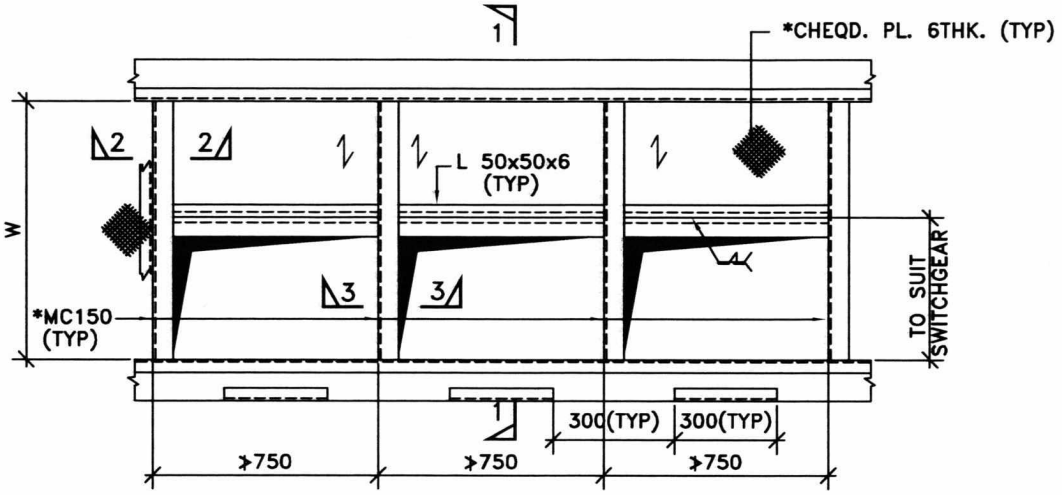
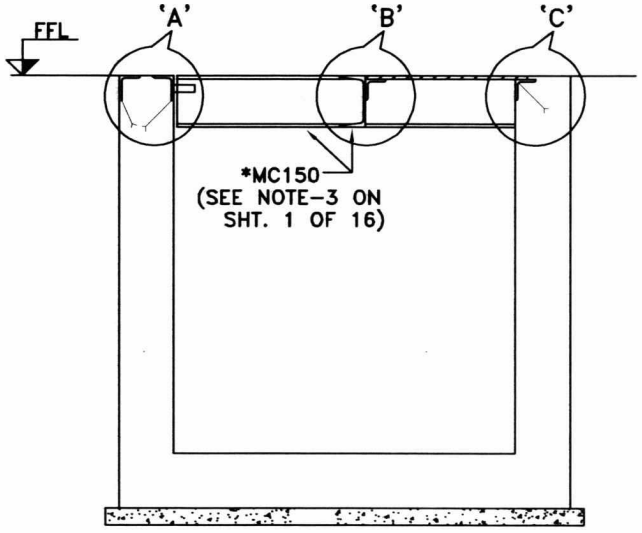
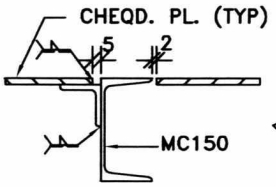


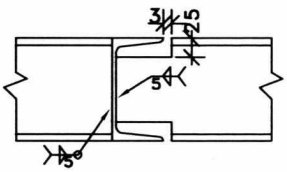
TYPICAL TRENCH PLAN
(AT SWITCH GEARS)



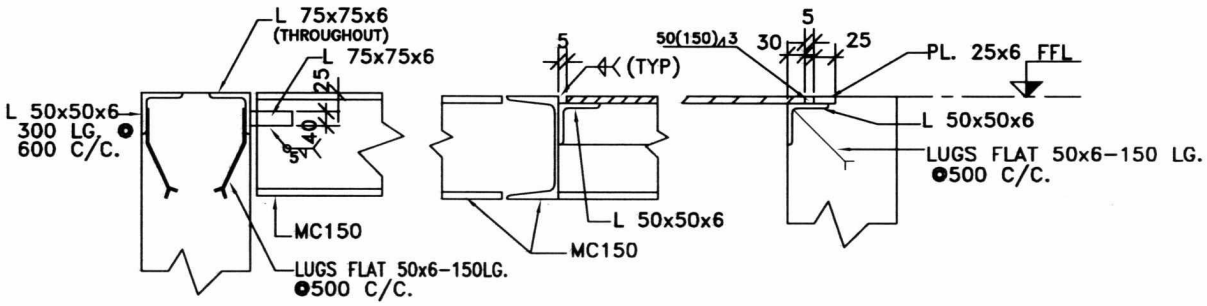
SECTION 1–1



SECTION 2–2



SECTION 3–3



DETAIL A DETAIL B DETAIL C

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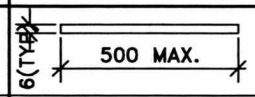
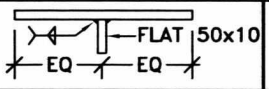
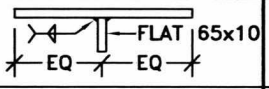
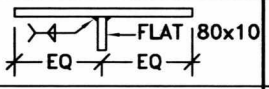
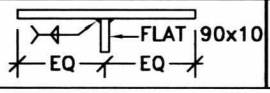
TABLE– 5: DETAIL OF CHEQUERED PLATE COVER

S.NO.	TYPE	SECTION	SECTION PROPERTIES FOR 500mm WIDE PLATE			RECOMMENDED SPAN (W) mm
			WT. kg/m	I=cm^4	Zmin =cm^3	
1.	I		23.55	0.90	3.00	W < 500
2.	II		27.45	44.90	9.16	500 < W ⩽ 1250
3.	III		28.62	91.00	14.76	1250 < W ⩽ 1500
4.	IV		29.79	160.30	21.66	1500 < W ⩽ 2000
5.	V		30.62	221.16	26.97	2000 < W ⩽ 2250

NOTE–

THE DESIGN IS BASED ON A LIVE LOAD OF 500 Kg/m^2 AND MAXIMUM ALLOWABLE DEFLECTION = W/200 (W = SPAN)

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NOTES :-

1. THIS STANDARD IS BASED ON FOLLOWING PRINCIPLES OF LAYING CABLES IN THE PLANT AREA
   a) UNIT AREA – CABLES IN RCC TRENCH/BRICK MASONRY TO BE FILLED WITH SAND AND COVERED WITH PRECAST RCC SLABS.
   b) INSIDE BUILDING – CABLES IN RCC TRENCH TO BE COVERED WITH CHEQUERED PLATE/RCC COVERS.
   c) OFFSITE AREA – AS PER PROJECT SPECIFIC REQUIREMENT.
2. ELECTRICAL DEPTT. & INSTRUMENTATION DEPTT. WILL PROVIDE FOLLOWING INFORMATION ON THEIR DRAWINGS WHICH WILL BE ISSUED FOR CONSTRUCTION:
   a) LAYOUT AND SIZE OF THE CABLE TRENCH.
   b) TYPE OF COVER REQUIRED i.e. PRECAST RCC / CHEQUERED PLATE.
   c) LIVE LOAD ON THE COVERS IF MORE THAN AS DEFINED IN TABLE 2.
   d) INSERT PLATE REQUIREMENT AND ITS SPACING.
   e) LAYOUT AND SIZE OF OPENING FOR PANELS. (SHEET 15 OF 17)
3. RELEVANT GENERAL CIVIL DRAWINGS SHALL BE REFERRED FOR THE TRENCHES IN UNIT & OFFSITE AREA.
4. R.C.C. CABLE TRENCHES ARE DESIGNED FOR A SURCHARGE LOAD OF 10.0 T HYDRA.
5. GRADE OF CONCRETE AND REBARS FOR CABLE TRENCH & PRECAST COVER SHALL BE AS PER GENERAL NOTES OF THE PROJECT. HOWEVER, M25 AS MINIMUM GRADE OF RCC AND Fe500D AS MINIMUM GRADE OF REINFORCEMENT HAS BEEN CONSIDERED IN DESIGN.
6. THIS STANDARD IS NOT APPLICABLE FOR CABLE TRENCH / COVERS AT ROAD CROSSING.
7. STRUCTURAL STEEL FOR CABLE SUPPORTS INCLUDING INSERT PLATES IS IN SCOPE OF CIVIL CONTRACTOR.
8. ALL OTHER STRUCTURAL STEEL WORKS SHALL BE UNDER THE SCOPE OF ELECTRICAL CONTRACTOR INCLUDING CHEQUERED PLATE.
9. STRUCTURAL STEEL SHALL CONFORM TO MINIMUM E250 GRADE A/BR/B0 AS PER IS 2062. CHEQUERED PLATE SHALL CONFORM TO IS 3502.
10. Cc STANDS FOR CLEAR COVER. CLEAR COVER SHALL BE 30MM MINIMUM, UNLESS NOTED OTHERWISE. IN CASE CLEAR COVER IS MORE FOR A PROJECT, THE ELEMENT THICKNESS SHALL BE INCREASED ACCORDINGLY.
11. 5MM GAP TO BE FILLED WITH 1:3 CEMENT MORTAR.

PRECAST COVERS DESIGNED FOR 10 T. HYDRA

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
6	19.03.24	REVISED AND ISSUED AS STANDARD	ANURAG KR. SINHA	MAITRAYEE MAJUMDER	ANURAG SINHA	MAINAK NANDI
5	20.06.22	REVISED AND ISSUED AS STANDARD	ANURAG KR. SINHA	S.C.MAITY	ANURAG SINHA	S. MAZUMDAR

Approved by

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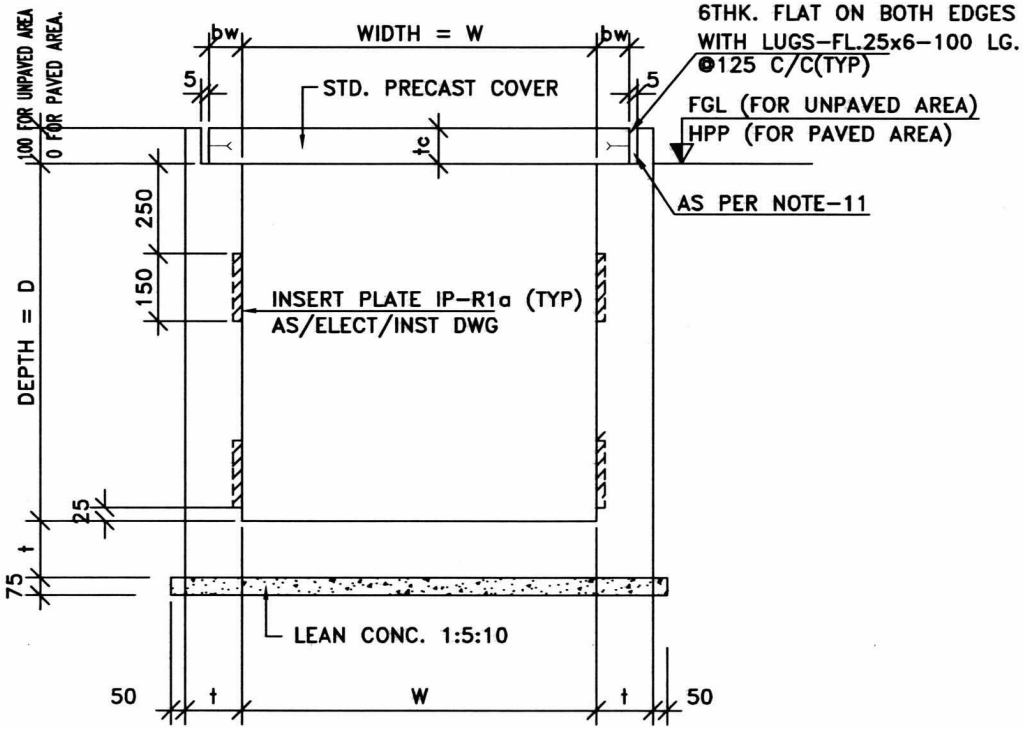

TYP. SECTION OF CABLE TRENCH

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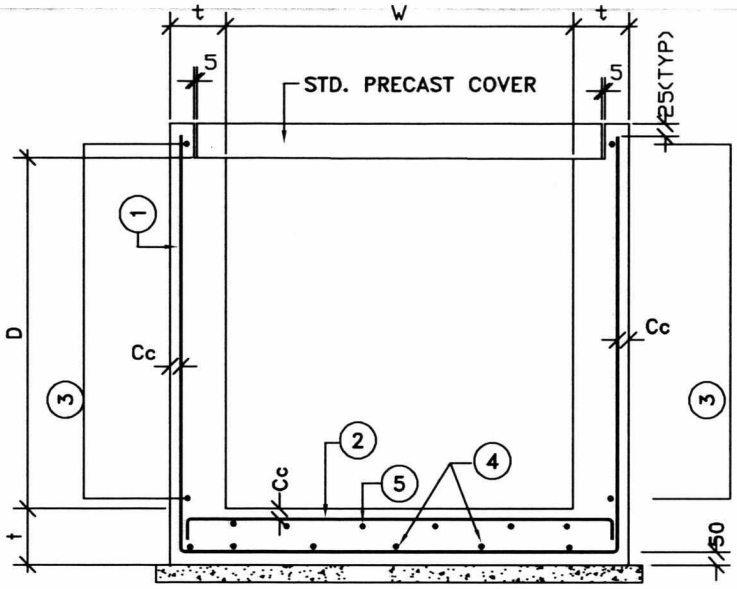
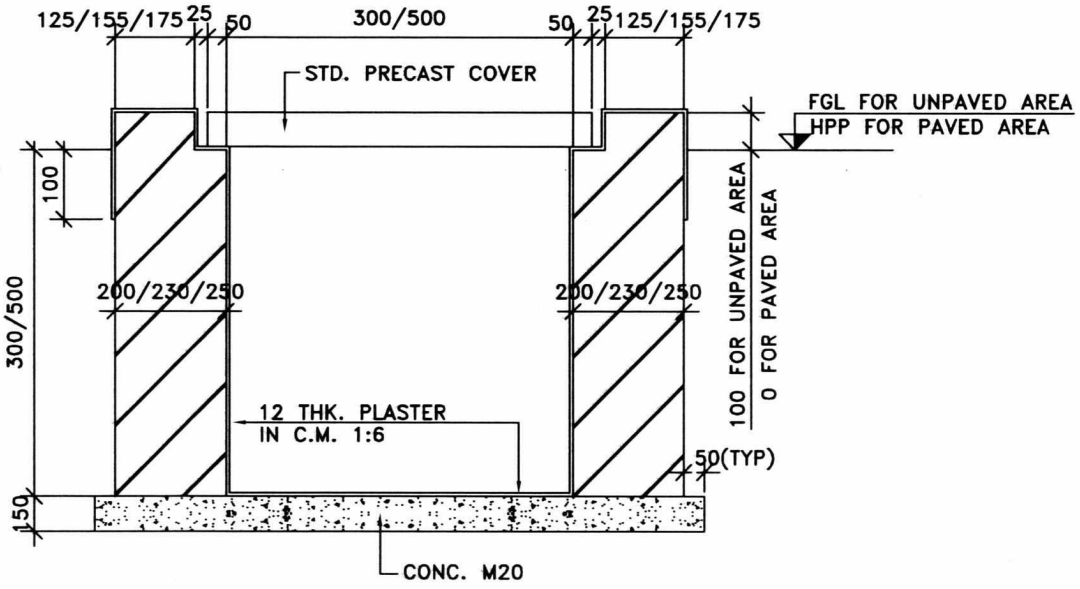


CABLE TRENCH SECTION WITH R.C.C.

(FOR DETS OF R/F BARS ① TO ⑤ REFER TABLE-1 SHT 5 OF 17)



CABLE TRENCH SECTION WITH BRICK MASONRY

(IN C.M. 1:6)

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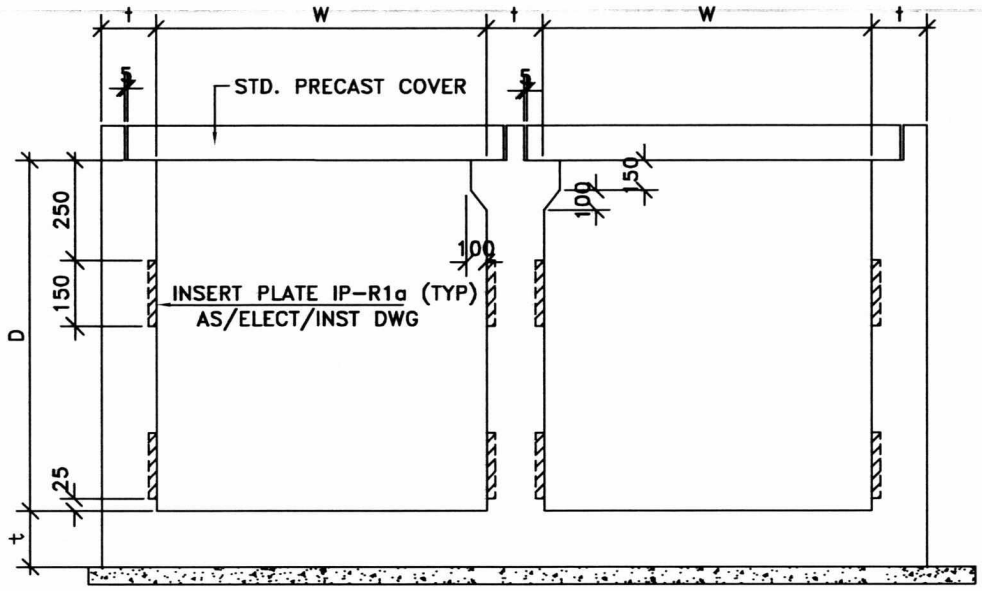
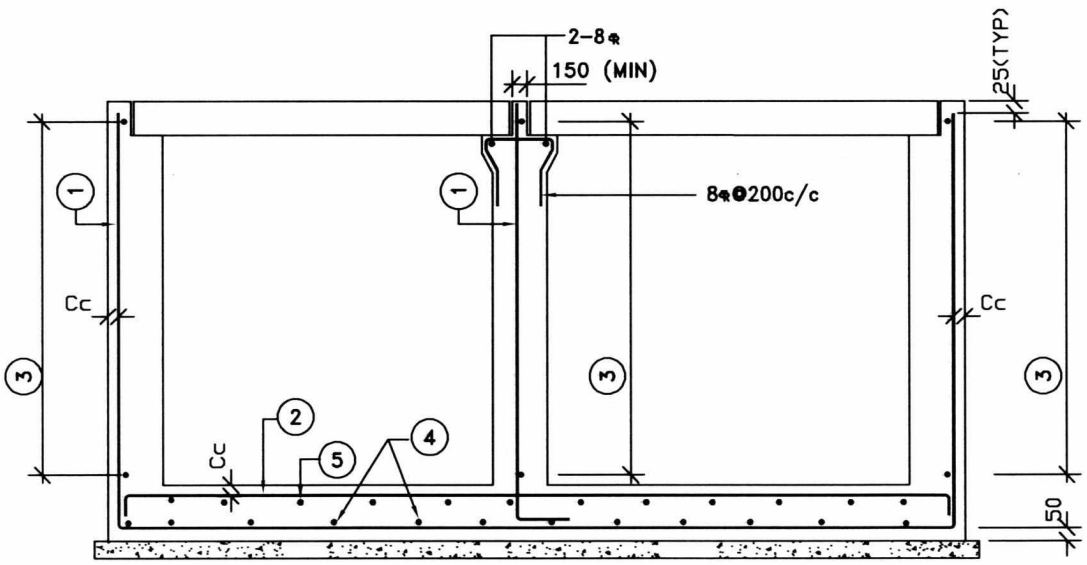


CABLE TRENCH SECTION WITH PARTITION



CABLE TRENCH SECTION WITH PARTITION

(FOR DETS OF R/F BARS ① TO ⑤ REFER TABLE-1 SHT 5 OF 17)

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TABLE– 1: DETAIL OF CABLE TRENCH REINFORCEMENT

S.NO.	WORKING DIMENSIONS			R/F CONFORMING TO IS: 1786 GRADE Fe–500(TMT).					APPROX. QUANTITIES PER METRE LENGTH.		
	DEPTH	WIDTH	THICK–NESS	BAR MARK (REF. SHT. 10 OF 17)					LEAN CONC. 1:5:10	CONC.	REBARS
	D (mm)	W (mm)	t (mm)	(1)	(2)	(3)	(4)	(5)	(m^3)	(m^3)	(kg)
1.	300	300	125	8 ϕ–200C/C.		8 ϕ–300C/C.	8 ϕ–300C/C.		0.045	0.09	3.80
2.	300	500	125	8 ϕ–200C/C.		8 ϕ–300C/C.	8 ϕ–300C/C.		0.048	0.11	4.70
3.	500	500	125	8 ϕ–200C/C.		8 ϕ–300C/C.	8 ϕ–300C/C.		0.060	0.15	5.60
4.	750	750	125	8 ϕ–200C/C.	8 ϕ–150C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.079	0.25	19.0
5.	1000	1000	150	10 ϕ–150C/C.	8 ϕ–150C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.098	0.41	26.0
6.		1250	150	10 ϕ–150C/C.	8 ϕ–150C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.116	0.44	29.0
7.		1500	150	10 ϕ–150C/C.	12 ϕ–150C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.139	0.47	36.0
8.		2000	150	10 ϕ–150C/C.	12 ϕ–150C/C.	8 ϕ–250C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.180	0.65	49.0
9.	1250	1000	150	10 ϕ–150C/C.	10 ϕ–150C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.101	0.57	32.0
10.		1250	150	10 ϕ–150C/C.	10 ϕ–150C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.120	0.61	37.0
11.		1500	150	10 ϕ–150C/C.	12 ϕ–150C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.139	0.65	43.0
12.		2000	150	10 ϕ–150C/C.	12 ϕ–150C/C.	8 ϕ–250C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.180	0.72	49.0
13.	1500	1000	200	12 ϕ–200C/C.	10 ϕ–150C/C.	8 ϕ–250C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.105	0.88	36.0
14.		1250	200	12 ϕ–200C/C.	10 ϕ–150C/C.	8 ϕ–250C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.124	0.93	40.0
15.		1500	200	12 ϕ–200C/C.	10 ϕ–150C/C.	8 ϕ–250C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.143	0.98	44.0
16.		2000	200	12 ϕ–200C/C.	12 ϕ–175C/C.	8 ϕ–250C/C.	8 ϕ–300C/C.	8 ϕ–300C/C.	0.180	1.08	56.0

NOTES–

1. THE QUANTITIES GIVEN IN THIS TABLE ARE FOR ESTIMATION PURPOSE ONLY.
2. PREFERABLY THE DEPTH OF CABLE TRENCH SHALL NOT BE MORE THAN THE WIDTH.
3. TRENCHES OF DEPTH 300 & 500mm IN BRICK MASONRY WHEREVER SPECIFIED.

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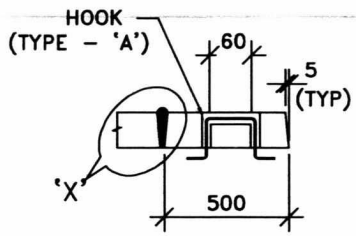
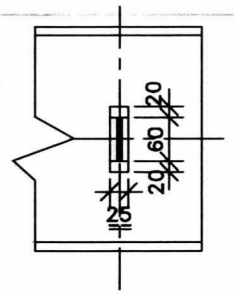
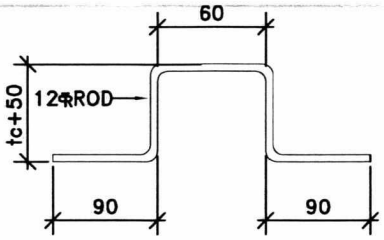


SEC. 2–2



DETAIL – 'Y'
(TYP.)



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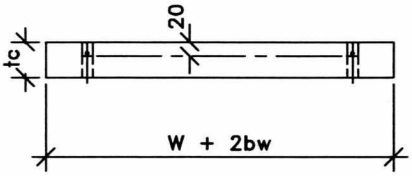
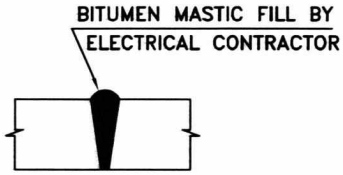


SEC. 1–1



DETAIL – 'X'
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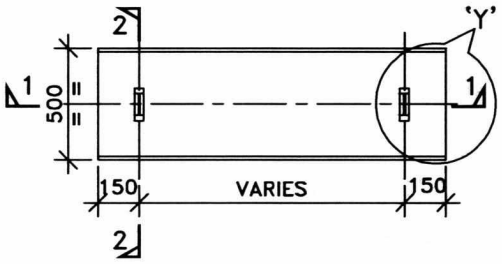
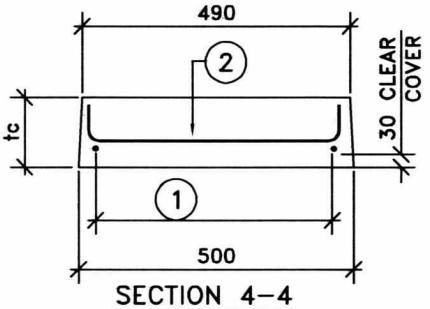
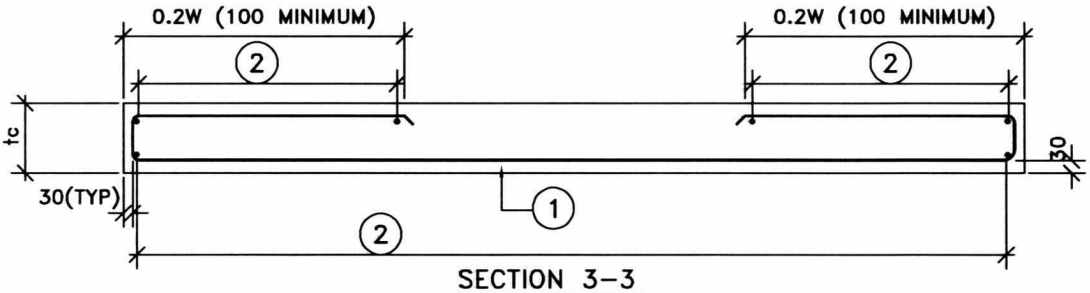


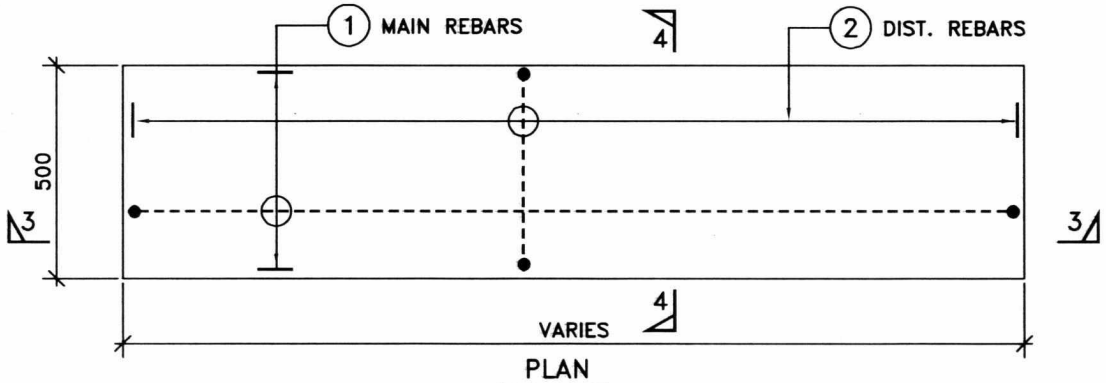
PRECAST R.C.C. COVERS



SECTION 4–4



SECTION 3–3



PLAN
(STANDARD PRECAST COVER)

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TABLE-2: DETAIL OF STANDARD PRECAST COVERS

S.NO.	TYPE	WORKING DIMENSIONS				DESIGN LOAD ON EACH COVER	FOR ONE UNIT OF WIDTH 500 mm INCLUDING LIFTING HOOK				
		CLEAR WIDTH OF TRENCH W (mm)	BEARING OF COVER bw (mm)	TOTAL LENGTH OF COVER W+2bw (mm)	THICK-NESS OF COVER tc (mm)	CONCENTRATED LOAD AT CENTRE OF SPAN (kgs)	REINFORCEMENT CONFORMING TO IS: 1786, GRADE Fe-500 (TMT).		APPROX. QUANTITIES		SELF WEIGHT (kgs)
							BAR MKD. (1)	BAR MKD. (2)	CONCRETE (m^3)	REINF. (kg)	
1.	PC-1	300	50	400	150	≤5000	5-8ϕ	3-8ϕ	0.030	2.00	75
2.	PC-2	500	50	600	150	≤5000	7-10 ϕ	4-8ϕ	0.045	4.30	113
3.	PC-3	750	50	850	200	≤5000	7-10ϕ	5-8ϕ	0.085	6.64	213
4.	PC-4	1000	50	1100	200	≤5000	7-12ϕ	5-8ϕ	0.110	11.36	275
5.	PC-5	1250	50	1350	250	≤5000	7-12ϕ	6-8ϕ	0.168	14.37	422
6.	PC-6	1500	75	1650	250	≤5000	7-12ϕ	7-8ϕ	0.207	17.16	517
7.	PC-7	2000	75	2150	250	≤5000	5-16ϕ	9-8ϕ	0.268	26.74	672

NOTES :-

1. FOR LOCATION OF BARS MKD. (1) AND (2) REFER SHT. 6 OF 17.
2. ALL PRECAST COVERS SHALL BE MARKED (T) ON THE TOP FOR PROPER PLACEMENT.
3. THE QUANTITIES GIVEN IN THIS TABLE ARE FOR ESTIMATION PURPOSE ONLY.
4. DESIGN IS VALID FOR POINT LOAD AT CENTRE OF SPAN.

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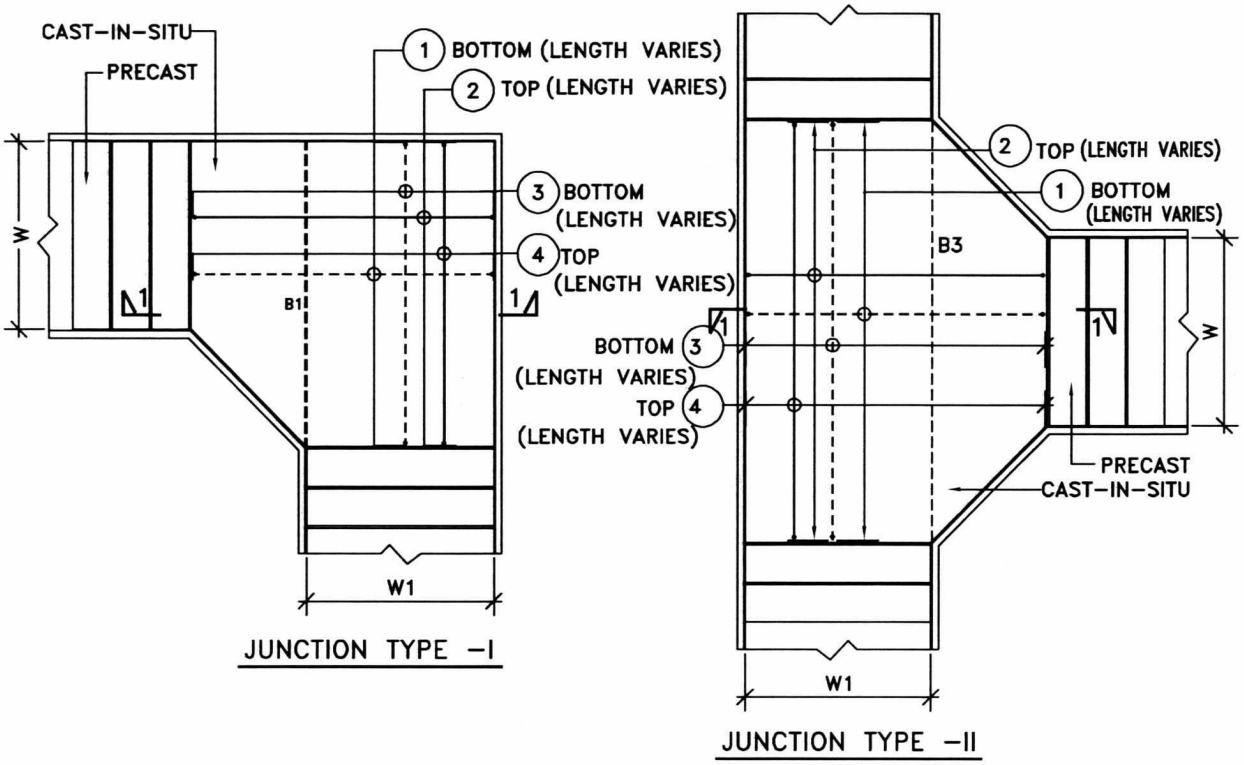

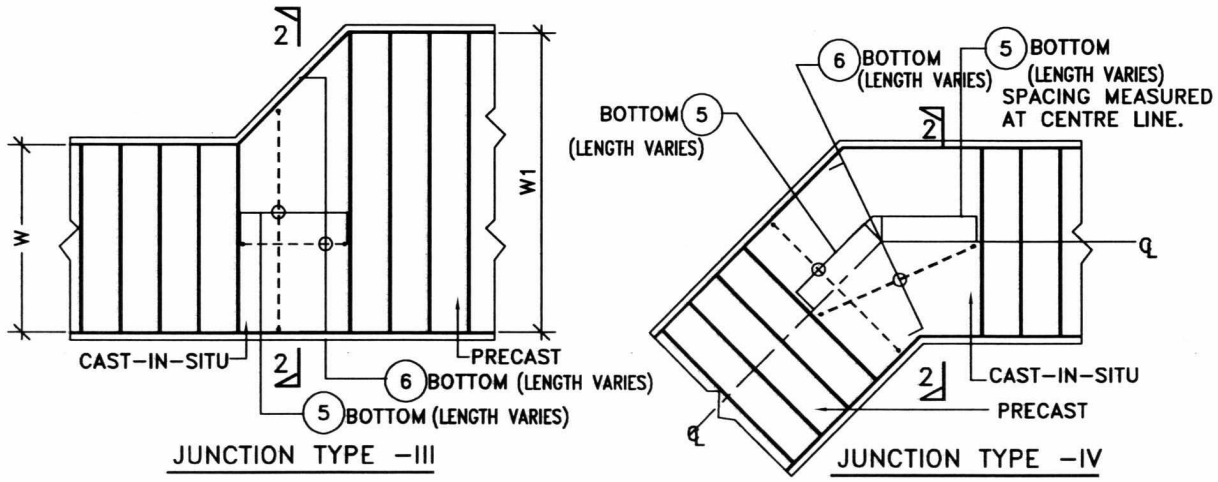

CAST-IN-SITU COVERS

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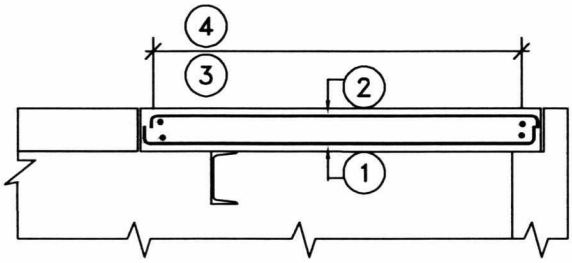
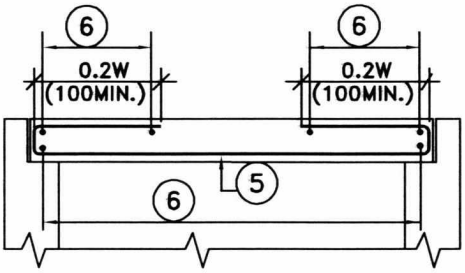


SECTION 1–1



SECTION 2–2

TABLE–3:DETAIL OF CAST–IN–SITU COVERS

S.NO.	CLEAR WIDTH OF TRENCH W1 (mm)	tc (mm)	REINFORCEMENT DETAIL FOR CAST–IN–SITU COVERS					
			JUNCTION TYPE I & II				JUNCTION TYPE III & IV	
			BAR MARK ①	BAR MARK ②	BAR MARK ③	BAR MARK ④	BAR MARK ⑤	BAR MARK ⑥
1.	300	150	8ϕ@120c/c	–	8ϕ@150c/c	–	8ϕ@120c/c	8ϕ@150c/c
2.	500	150	8ϕ@100c/c	–	8ϕ@150c/c	–	8ϕ@120c/c	8ϕ@150c/c
3.	750	200	10ϕ@150c/c	8ϕ@150c/c	8ϕ@150c/c	8ϕ@150c/c	10ϕ@200c/c	8ϕ@150c/c
4.	1000	200	12ϕ@120c/c	8ϕ@150c/c	8ϕ@200c/c	8ϕ@200c/c	10ϕ@200c/c	8ϕ@200c/c
5.	1250	250	12ϕ@150c/c	8ϕ@150c/c	8ϕ@200c/c	8ϕ@200c/c	12ϕ@200c/c	8ϕ@200c/c
6.	1500	250	12ϕ@200c/c	8ϕ@150c/c	8ϕ@200c/c	8ϕ@200c/c	12ϕ@200c/c	8ϕ@200c/c
7.	2000	250	16ϕ@200c/c	8ϕ@150c/c	8ϕ@200c/c	8ϕ@200c/c	12ϕ@150c/c	8ϕ@200c/c

NOTES :–
1. THE CAST–IN–SITU COVERS ARE DESIGNED FOR POINT LOAD OF 5000 kg ACTING AT MID SPAN.
2. FOR CONNECTION DETAIL AND SIZES OF B1 & B3 REFER SHT. 8 OF 17 AND 12 OF 17.
3. FOR LOCATION OF BAR MARKS ① TO ⑥ REFER ABOVE SECTIONS 1–1 & 2–2.

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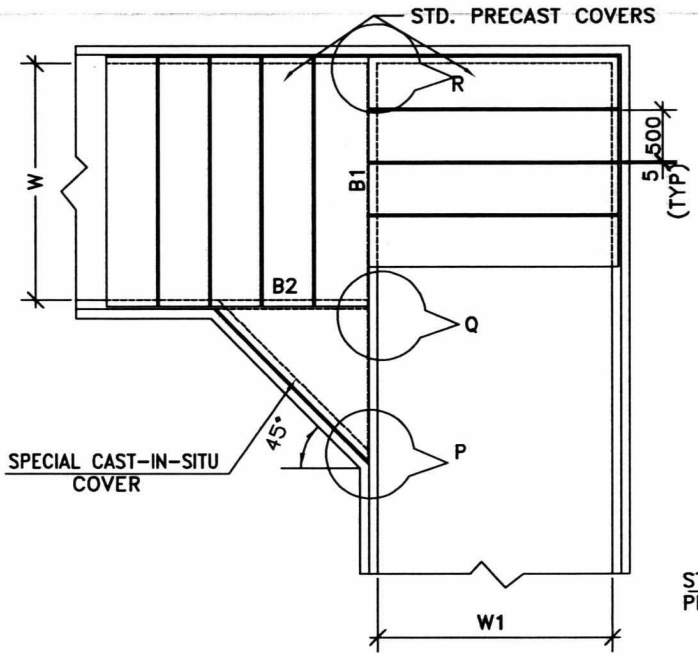
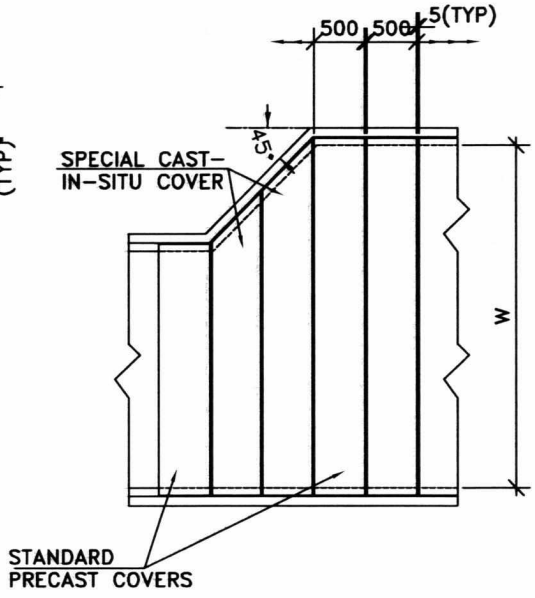


JUNCTION TYPE – I



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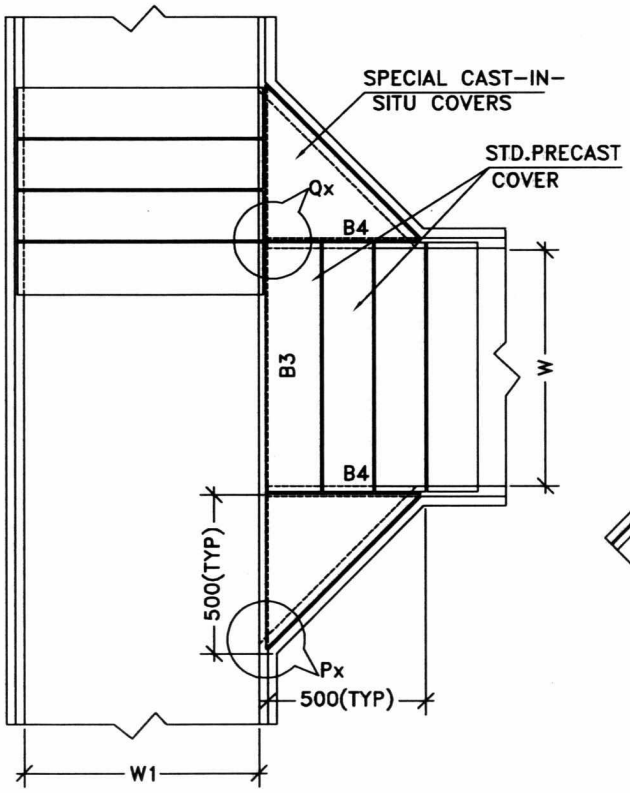
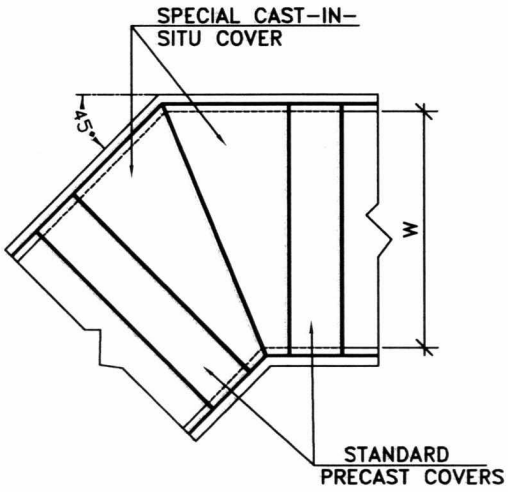


JUNCTION TYPE – II

NOTES :

1. FOR DETAILS P, Q, Px, Qx & R REFER SHT. 11 OF 17.
2. FOR DETAIL OF BEAMS B1 TO B4 REF. TABLE 4 SHT 12 OF 17.



JUNCTION TYPE – IV

SPECIAL CAST-IN-SITU COVERS

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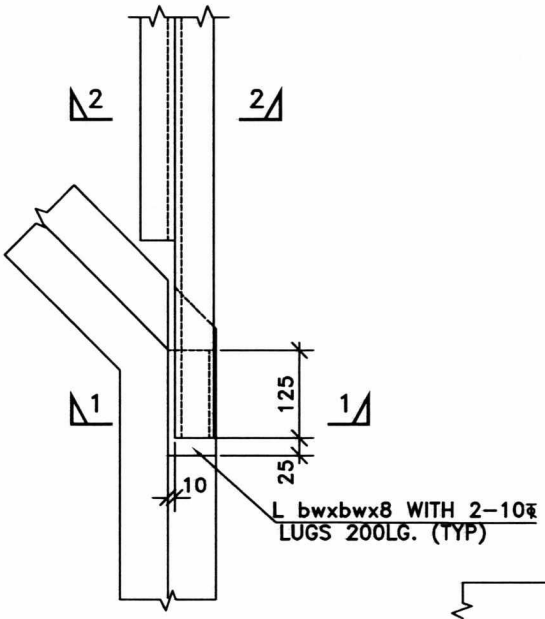
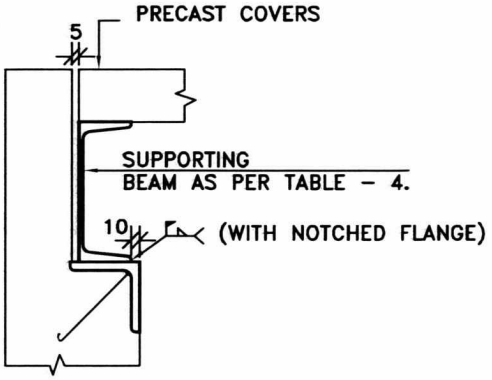
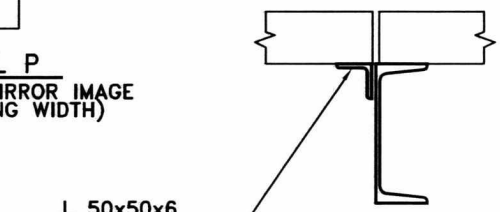


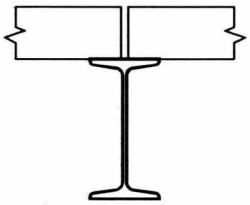
DETAIL P
DETAIL Px – MIRROR IMAGE
(bw=BEARING WIDTH)



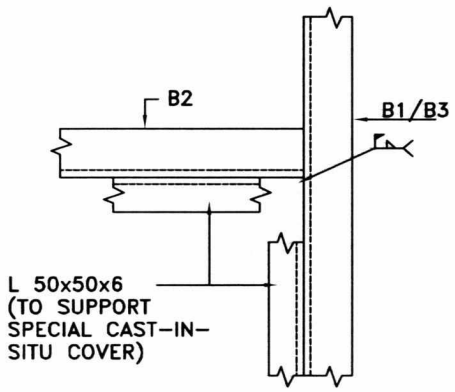
SECTION 1–1



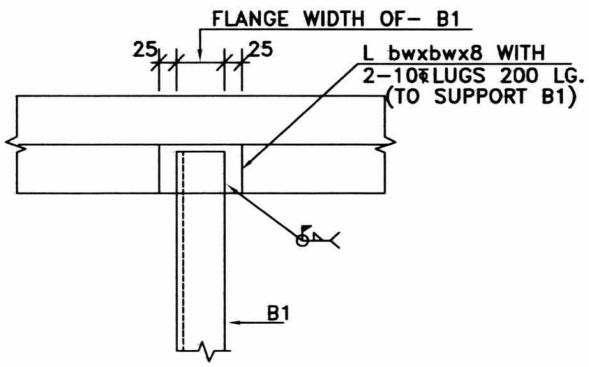
SECTION 2–2
(FOR ISMC)



SECTION 2–2
(FOR ISMB)



DETAIL Q
DETAIL Qx – MIRROR IMAGE



DETAIL R
(bw=BEARING WIDTH)

SUPPORTING MEMBERS

(FOR LOCATION OF DET. P, Q, Px, Qx & R REF. SHT. 10 OF 17)

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TABLE–4: DETAIL OF SUPPORTING MEMBERS AT JUNCTIONS

S.NO.	WIDTH OF MAIN TRENCH W	JUNCTION TYPE – I				JUNCTION TYPE – II			
		SUPPORTING MEMBER B1		SUPPORTING MEMBER B2		SUPPORTING MEMBER B3		SUPPORTING MEMBER B4	
		SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH
1.	300	MC 100	1020	MC 100	625	MC 100	1650	MC 100	625
2.	500	MC 100	1220	MC 100	625	MC 150	1850	MC 100	625
3.	750	MC 100	1470	MC 100	625	MC 150	2100	MC 100	625
4.	1000	MC 100	1720	MC 100	625	MC 150	2350	MC 100	625
5.	1250	MC 150	1970	MC 100	625	MC 150	2600	MC 100	625
6.	1500	MC 150	2270	MC 100	625	MC 150	2900	MC 100	625
7.	2000	MC 150	2770	MC 100	625	MC 200	3400	MC 100	625
8.	2250	MC 150	3020	MC 100	625	MC 200	3650	MC 100	625

NOTE

THE SUPPORTING MEMBERS ARE DESIGNED FOR COVER WT. PLUS A POINT LOAD OF 1000 KG. AT MID SPAN.

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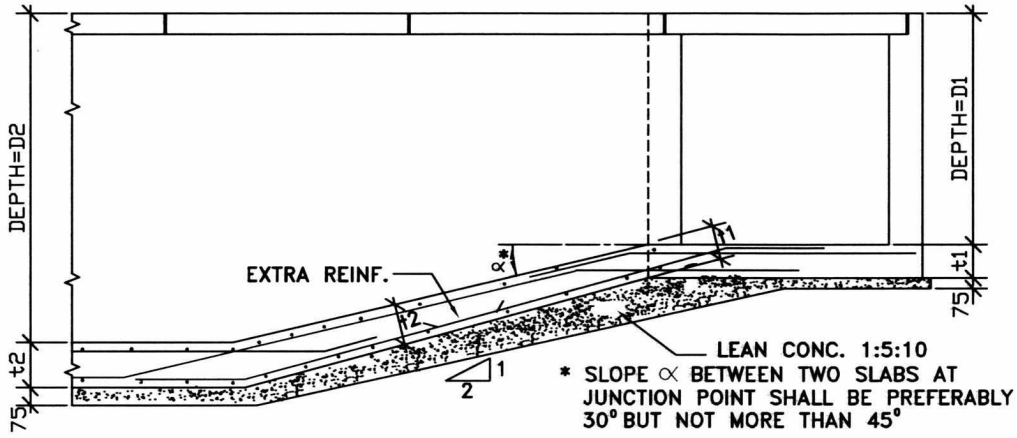

TYPICAL DETAIL AT JUNCTION FOR DIFFERENT DEPTHS OF TRENCH.

(R/F DETAIL OF TRENCH IN SLOPE SHALL BE BASED ON DEPTH D2).

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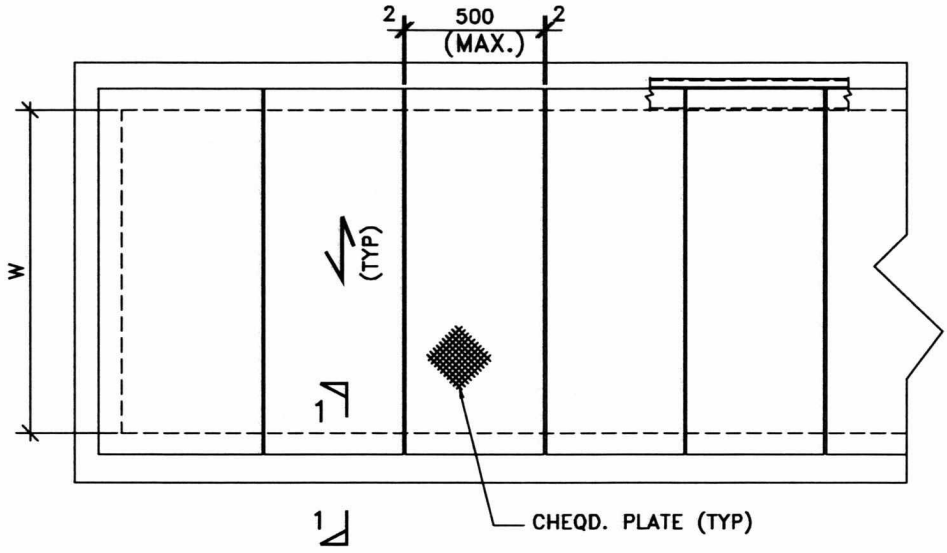
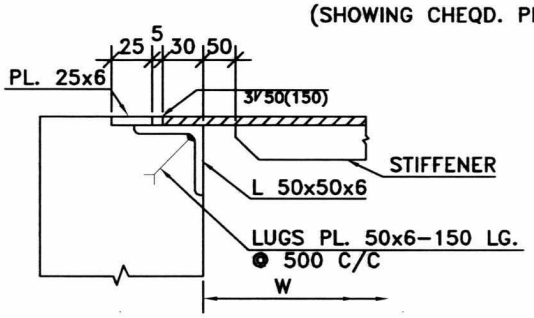
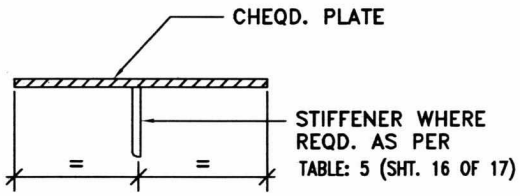


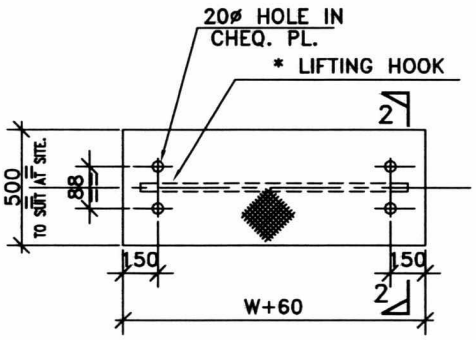
TYPICAL TRENCH PLAN
(SHOWING CHEQD. PLATE)



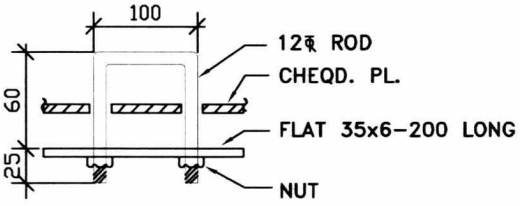
SECTION 1-1



SECTION 2-2



TYP. CHEQD. PLATE DETAIL
(SHOWING CHEQD. PLATE)



TYP. LIFTING HOOK DETAIL

* ONE HOOK FOR SPAN UPTO 500
TWO HOOKS FOR SPAN ABOVE 500.

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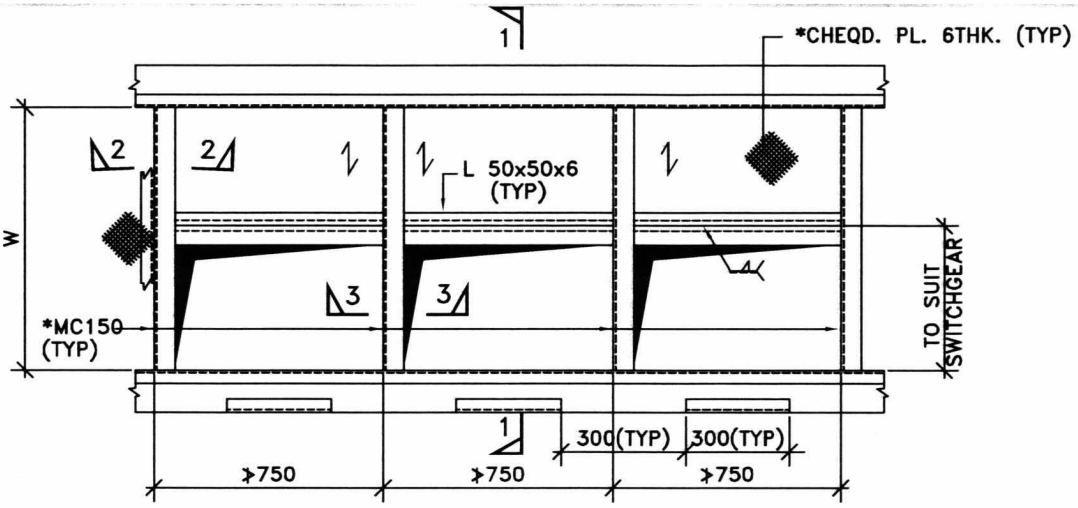
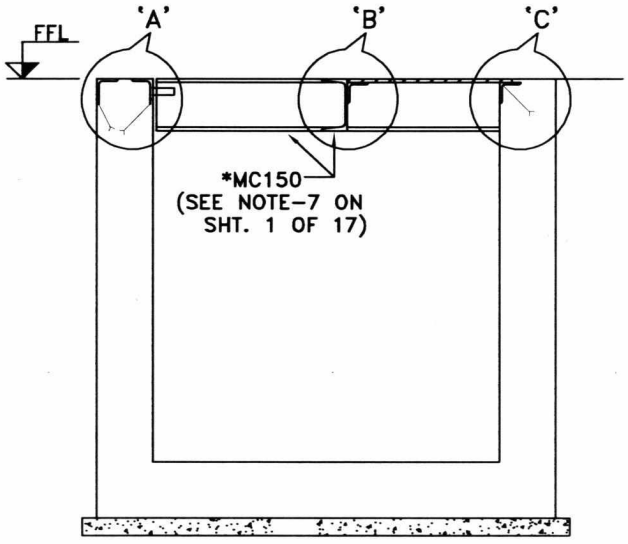
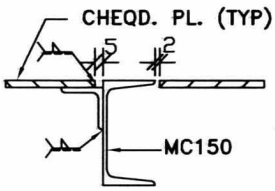


TYPICAL TRENCH PLAN
(AT SWITCH GEARS)



SECTION 1-1



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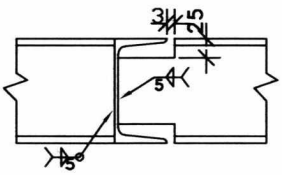
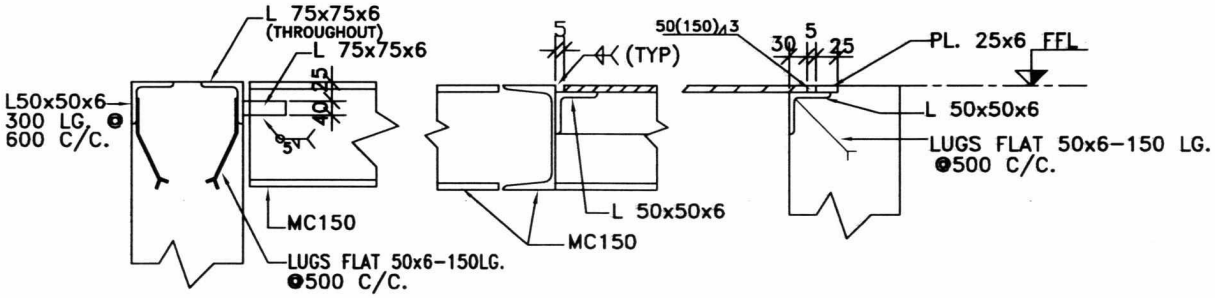


SECTION 3-3



DETAIL A DETAIL B DETAIL C

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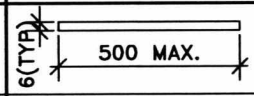
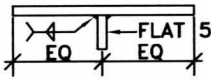
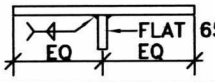
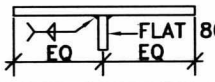
TABLE– 5: DETAIL OF CHEQUERED PLATE COVER

S.NO.	TYPE	SECTION	SECTION PROPERTIES FOR 500mm WIDE PLATE			RECOMMENDED SPAN (W) mm
			WT. kg/m	I=cm^4	Zmin =cm^3	
1.	I		23.55	0.90	3.00	W < 500
2.	II		27.45	44.90	9.16	500 < W ⩽ 1250
3.	III		28.62	91.00	14.76	1250 < W ⩽ 1500
4.	IV		29.79	160.30	21.66	1500 < W ⩽ 2000

NOTE–

THE DESIGN IS BASED ON A LIVE LOAD OF 500 Kg/m^2 AND MAXIMUM ALLOWABLE DEFLECTION = W/200 (W = SPAN)

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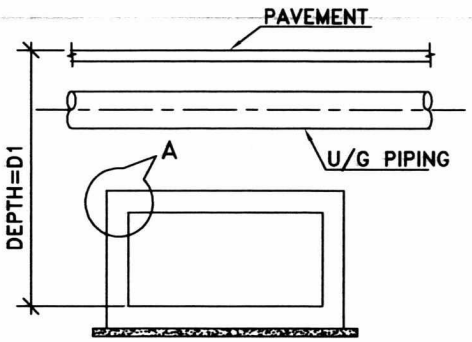
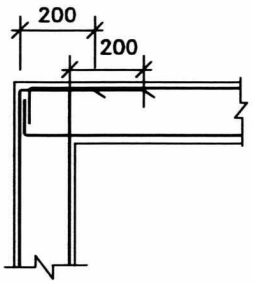
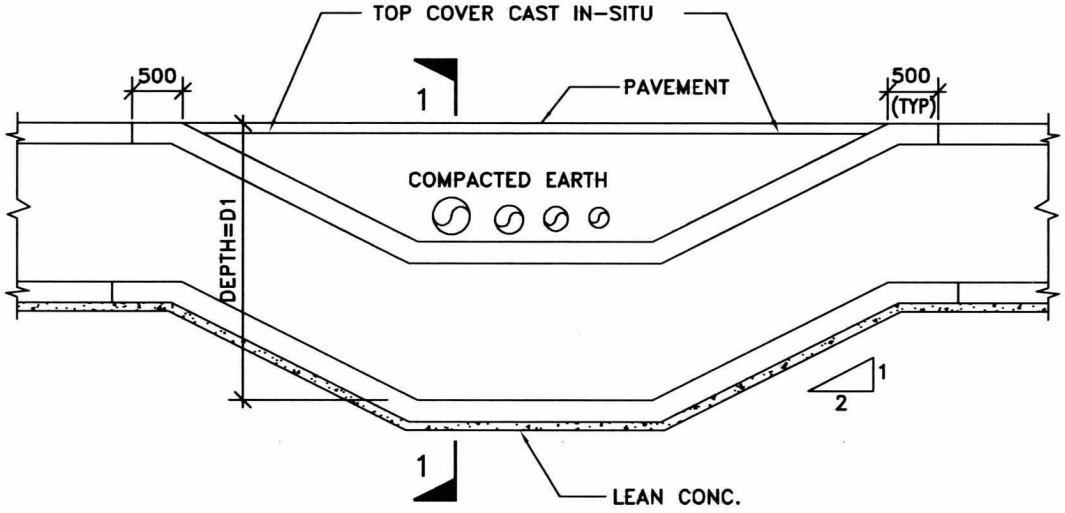


SECTION 1–1



DET. A



TYPICAL DETAIL AT JUNCTION FOR DIFFERENT DEPTHS OF TRENCH.

NOTES : –

(1) TOP COVER FOR THE INDICATED PORTION SHALL BE CAST IN SITU. RCC DETAILS FOR THE COVER SLAB SHALL BE SAME AS THE PRECAST COVERS OF SAME SPAN, EXCEPT THE CORNER DETAIL WHICH IS SHOWN HERE.

(2) RC DETAILS FOR THE TRENCH WALL / BASE SHALL BE BASED ON DEPTH "D1".

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NOTES :

1. ALL DIMENSIONS ARE IN mm & LEVELS IN METRES.
2. MAX. WEIGHT OF EACH PRECAST TRENCH IS 5T.
3. THIS STANDARD IS SHOWING JOINT DETAILS AND LIFTING LUG OF PRECAST ELEMENTS ONLY.
4. FOR THICKNESS, R/F DETAILS OF WALL AND PRECAST COVER REFER STD.NO. 7–68–0625, 7–68–0626 & 7–68–0655.
5. LEAN CONCRETE TO BE SUITABLY ALIGNED/LEVEL TO ENSURE MATCHING OF WALL WITH FGL/HPP.
6. LIFTING POCKET SHALL BE FILLED WITH CONCRETE AFTER ERECTION/ALIGNMENT.

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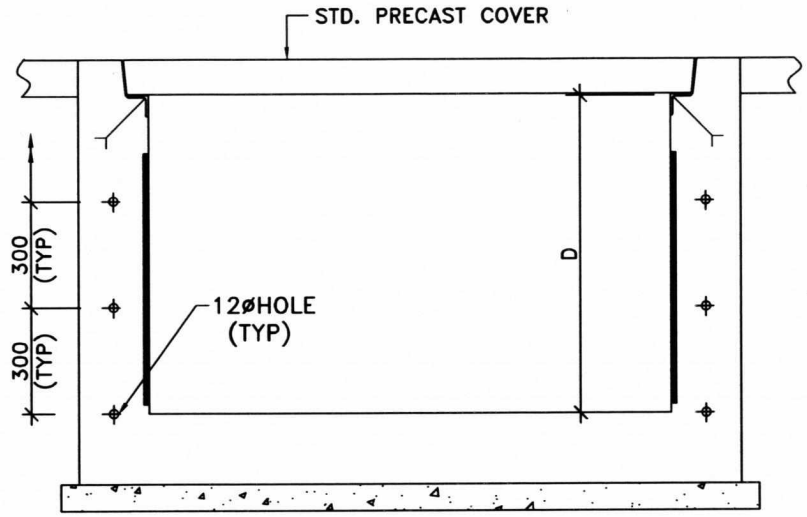
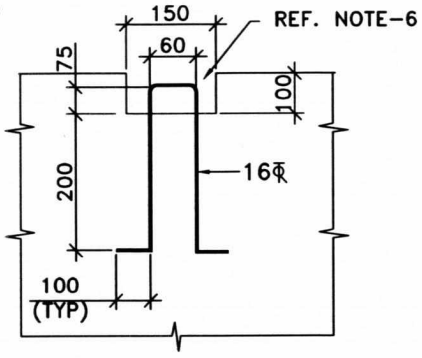
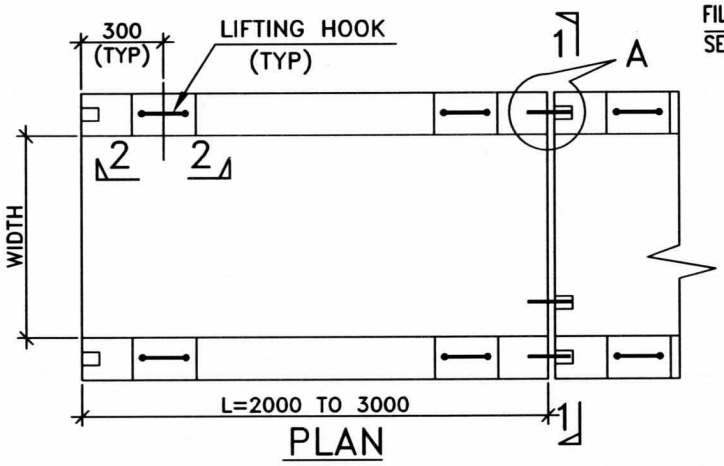


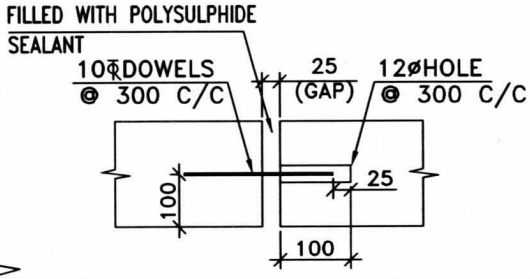
SECTION 1–1



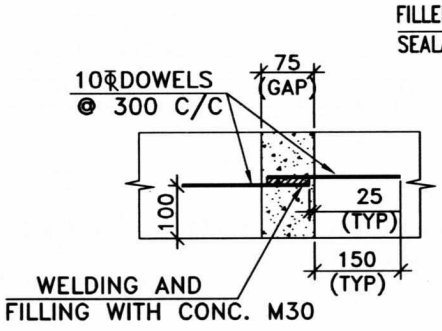
VIEW 2–2
(LIFTING HOOK DET.)



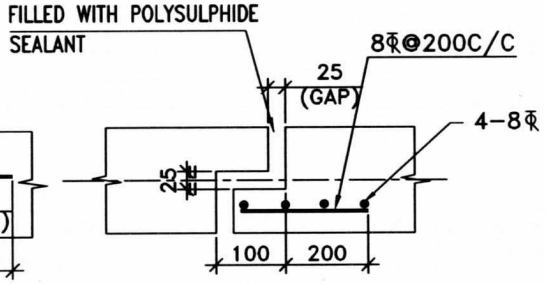
PLAN



DET.–A (ALT.–I)
(REFER ALT–II & ALT–III ALSO)



ALT.–II



ALT.–III

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
2	20–06–2022	REAFFIRMED AND ISSUED AS STANDARD	ANURAG KR. SINHA	S.C.MAITY	ANURAG SINHA	SANJAY MAZUMDAR
1	29–09–2016	REAFFIRMED AND ISSUED AS STANDARD	JITENDER	ALPANA	RAJANJI SRIVASTAVA	R. NANDA

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NOTES :-

1. FOR LOCATION OF TRENCHES SUBJECTED TO CRANE LOADING, REFERENCE SHALL BE MADE TO RELEVANT GENERAL CIVIL DRAWINGS.
2. ELECTRICAL DEPTT. & INSTRUMENTATION DEPTT. WILL PROVIDE FOLLOWING INFORMATION ON THEIR DRAWINGS WHICH WILL BE ISSUED FOR CONSTRUCTION:
   a) LAYOUT AND SIZE OF CABLE TRENCH.
   b) INSERT PLATE REQUIREMENTS AND ITS SPACING.
   c) LOCATION & SIZE OF G.I. CONDUIT SLEEVES.
3. GRADE OF CONCRETE AND REBARS FOR CABLE TRENCH & PRECAST COVER SHALL BE AS PER GENERAL NOTES OF THE PROJECT. HOWEVER, M25 AS MINIMUM GRADE OF RCC AND FE500D AS MINIMUM GRADE OF REINFORCEMENT HAS BEEN CONSIDERED IN DESIGN.
4. CABLE TRENCHES ARE DESIGNED FOR THE FOLLOWING CONSIDERATIONS:
   a) CLASS-AA TRACKED VEHICULAR LOADS AS GIVEN IN IRC:6 (i.e UDL OF 11.40 T/SQ.M).
   b) CLASS-70R WHEELED VEHICULAR LOADS AS GIVEN IN IRC:6 (i.e. MAXIMUM TYRE PRESSURE OF 52.73 T/SQ.M).
   c) SURCHARGE LOADS FOR VEHICLES CALCULATED AS PER IRC: 6.
   d) NET SAFE BEARING CAPACITY OF SOIL IS 5 MT/SQ.M AT FOUNDATION LEVEL.
   e) WATER TABLE AT ANY DEPTH.
5. CABLE TRENCHES FOR JUNCTIONS WHEREVER REQUIRED SHALL BE DESIGNED & DETAILED SPECIFICALLY BASED ON THE AVAILABLE LAYOUT.
6. EVERY FIFTH COVER SHALL HAVE LIFTING HOOK OF TYPE H1 (REF. SHT. 4 OF 6).
7. CABLE TRENCHES IN UNIT AREAS (CLASSIFIED) SHALL BE FILLED WITH SAND.
8. JOINTS BETWEEN PRECAST COVERS TO BE FILLED AFTER CABLE LAYING.
9. CLEAR COVER SHALL BE 30MM MINIMUM, UNLESS NOTED OTHERWISE. IN CASE CLEAR COVER IS MORE FOR A PROJECT, THE ELEMENT THICKNESS SHALL BE INCREASED ACCORDINGLY.
10. 25X3 THK MS FLAT TO BE PROVIDED AFTER PLACEMENT OF PRECAST COVER.THE SAME IS TO BE LOCALLY BENT IN CASES WHERE THE WIDTH OF COVER SLAB IS LESS THAN THE TRENCH OUTER-TO-OUTER WIDTH.

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
6	19.03.24	REVISED & REISSUED AS STANDARD	ANURAG KR. SINHA	MAITRAYEE MAJUMDER	ANURAG SINHA	MAINAK NANDI
5	20.06.22	REVISED & REISSUED AS STANDARD	ANURAG KR. SINHA	S.C.MAITY	ANURAG SINHA	SANJAY MAZUMDAR

Approved by

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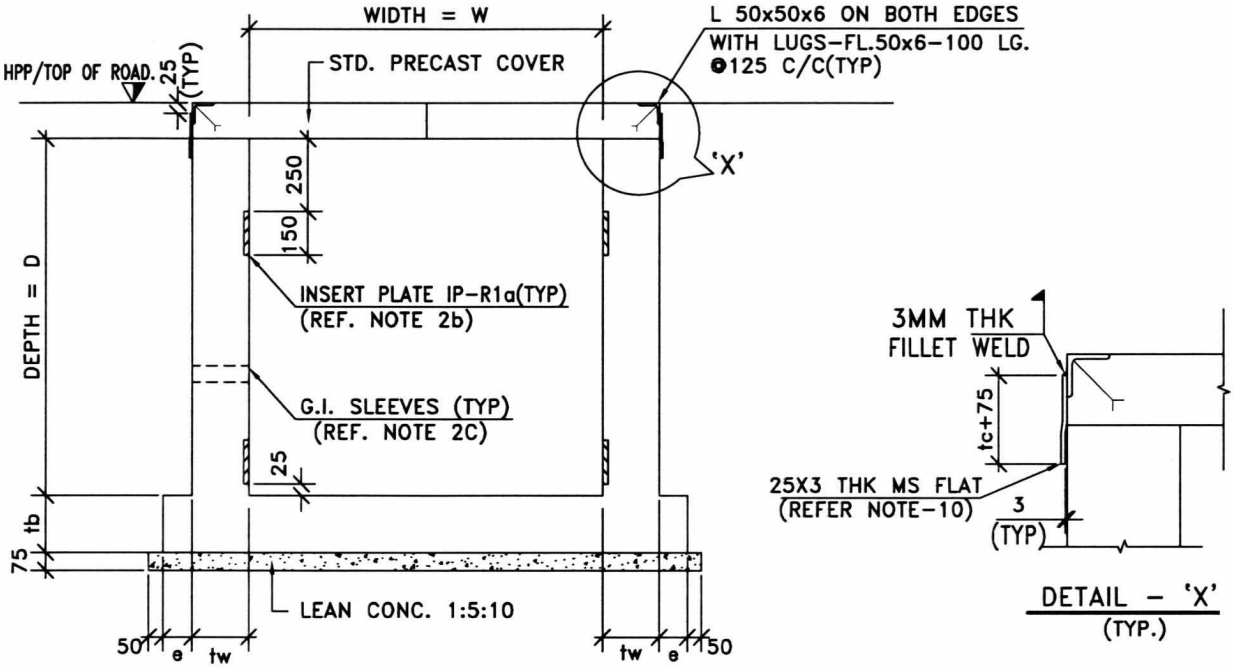
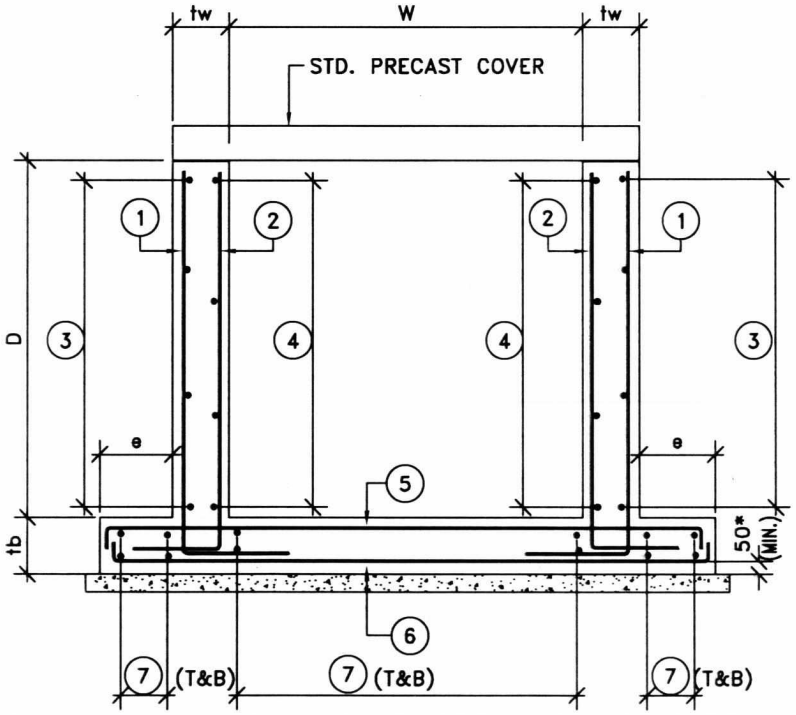


TYP. SECTION OF CABLE TRENCH



TYPICAL CABLE TRENCH SECTION

(FOR DETS OF R/F BARS ① TO ⑦ REFER TABLE-1 SHT 3 OF 6)

* REFER NOTE-9

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TABLE :1– DETAIL OF CABLE TRENCH REINFORCEMENT

S.NO.	WORKING DIMENSIONS					R/F CONFORMING TO IS: 1786							APPROX. QUANTITIES PER METRE LENGTH.		
	DEPTH D (mm)	WIDTH W (mm)	WALL THICK-NESS tw (mm)	BASE THICK-NESS tb (mm)	PROJEC-TION e (mm)	BAR MARK ①	②	③	④	⑤	⑥	⑦	LEAN CONC. 1:5:10 (m^3)	CONC. (m^3)	REINF. (kg)
1.	300	300	150	150	300	10ϕ-150C/C.	8ϕ-150C/C.	8ϕ-300C/C.	8ϕ-300C/C.	10ϕ-175C/C.	10ϕ-175C/C.	8ϕ-300C/C.	0.10	0.31	32.10
2.		500	150	150	300	10ϕ-150C/C.	8ϕ-150C/C.	8ϕ-300C/C.	8ϕ-300C/C.	10ϕ-175C/C.	10ϕ-175C/C.	8ϕ-300C/C.	0.12	0.34	33.80
3.	500	500	150	200	300	10ϕ-150C/C.	8ϕ-150C/C.	8ϕ-300C/C.	8ϕ-300C/C.	10ϕ-175C/C.	10ϕ-175C/C.	8ϕ-250C/C.	0.12	0.40	41.50
4.	750	750	200	200	400	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-250C/C.	8ϕ-250C/C.	10ϕ-175C/C.	10ϕ-175C/C.	8ϕ-250C/C.	0.16	0.72	60.70
5.	1000	750	200	200	400	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-250C/C.	8ϕ-250C/C.	12ϕ-175C/C.	12ϕ-175C/C.	8ϕ-250C/C.	0.16	0.82	74.10
6.		1000	200	200	500	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-250C/C.	8ϕ-250C/C.	12ϕ-175C/C.	12ϕ-175C/C.	8ϕ-250C/C.	0.19	0.92	83.50
7.		1250	200	200	450	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-250C/C.	8ϕ-250C/C.	12ϕ-175C/C.	12ϕ-175C/C.	8ϕ-250C/C.	0.20	0.95	90.30
8.		1500	200	200	450	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-250C/C.	8ϕ-250C/C.	12ϕ-175C/C.	12ϕ-175C/C.	8ϕ-250C/C.	0.22	1.00	90.50
9.		2000	200	200	500	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-250C/C.	8ϕ-250C/C.	12ϕ-175C/C.	12ϕ-175C/C.	8ϕ-250C/C.	0.27	1.12	100.00
10.	1250	1000	200	200	500	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-250C/C.	8ϕ-250C/C.	12ϕ-125C/C.	12ϕ-125C/C.	8ϕ-250C/C.	0.19	1.00	129.40
11.		1250	200	200	450	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-250C/C.	8ϕ-250C/C.	12ϕ-125C/C.	12ϕ-125C/C.	8ϕ-250C/C.	0.20	1.05	132.80
12.		1500	200	200	450	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-250C/C.	8ϕ-250C/C.	12ϕ-125C/C.	12ϕ-125C/C.	8ϕ-250C/C.	0.22	1.10	137.90
13.		2000	200	200	500	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-250C/C.	8ϕ-250C/C.	12ϕ-125C/C.	12ϕ-125C/C.	8ϕ-250C/C.	0.27	1.20	147.80
14.	1500	1000	250	200	500	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-200C/C.	8ϕ-200C/C.	12ϕ-150C/C.	12ϕ-150C/C.	8ϕ-250C/C.	0.19	1.30	109.30
15.		1250	250	250	450	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-200C/C.	8ϕ-200C/C.	12ϕ-150C/C.	12ϕ-150C/C.	8ϕ-200C/C.	0.20	1.45	114.80
16.		1500	250	250	450	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-200C/C.	8ϕ-200C/C.	12ϕ-150C/C.	12ϕ-150C/C.	8ϕ-200C/C.	0.22	1.50	120.30
17.		2000	250	250	500	12ϕ-150C/C.	10ϕ-250C/C.	8ϕ-200C/C.	8ϕ-200C/C.	12ϕ-150C/C.	12ϕ-150C/C.	8ϕ-200C/C.	0.27	1.70	128.50

NOTES–

1. TRENCH IS DESIGNED FOR LOADS AND CONDITIONS SPECIFIED IN NOTE 4 (SHT.1 OF 6).
2. THE QUANTITIES GIVEN IN THIS TABLE ARE FOR ESTIMATION PURPOSE ONLY.

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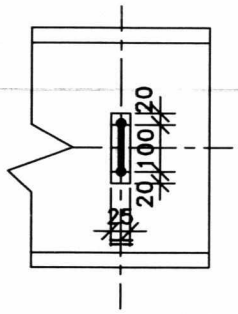
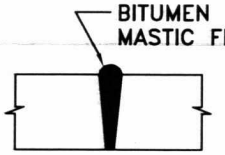
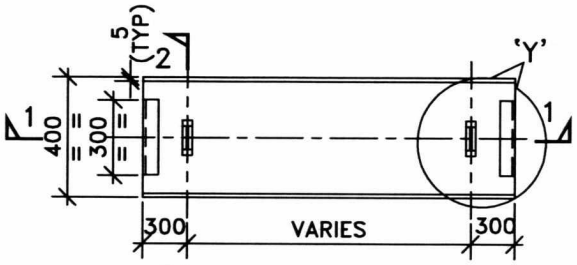


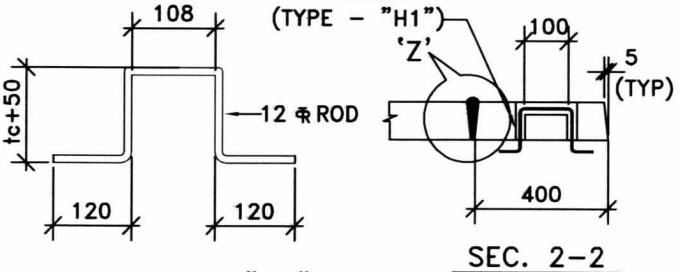
DETAIL – 'Y'
(TYP.)



DETAIL – 'Z'
(TYP.)

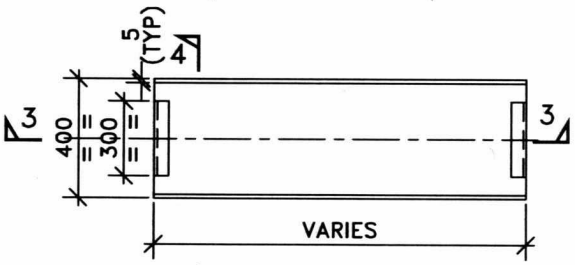


TYPE – A
(WITH LIFTING HOOK TYPE H1)

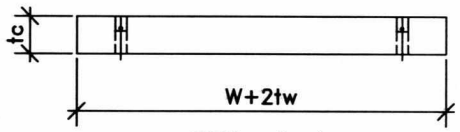


HOOK TYPE "H1"

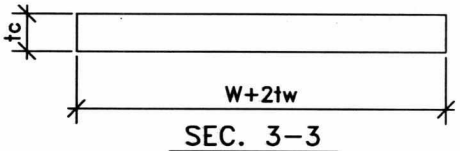
SEC. 2–2



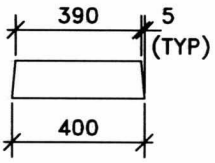
TYPE – B
(WITHOUT LIFTING HOOK)



SEC. 1–1



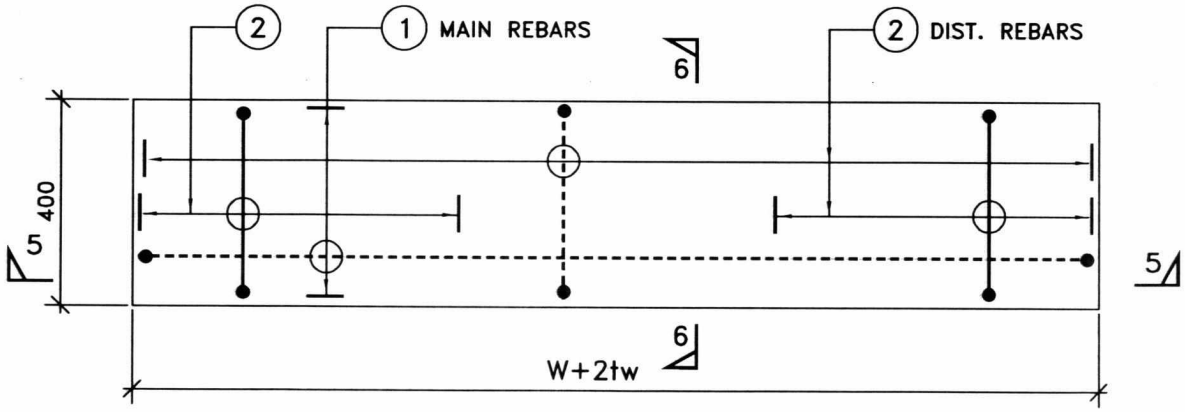
SEC. 3–3



SEC. 4–4

*ONE HOOK IN THE MIDDLE FOR TRENCH WIDTH UPTO 500
TWO HOOKS AS SHOWN FOR TRENCH WIDTH ABOVE 500

PRECAST R.C.C. COVERS



PLAN
(STANDARD PRECAST COVER TYPE PC–1 TO PC–3)

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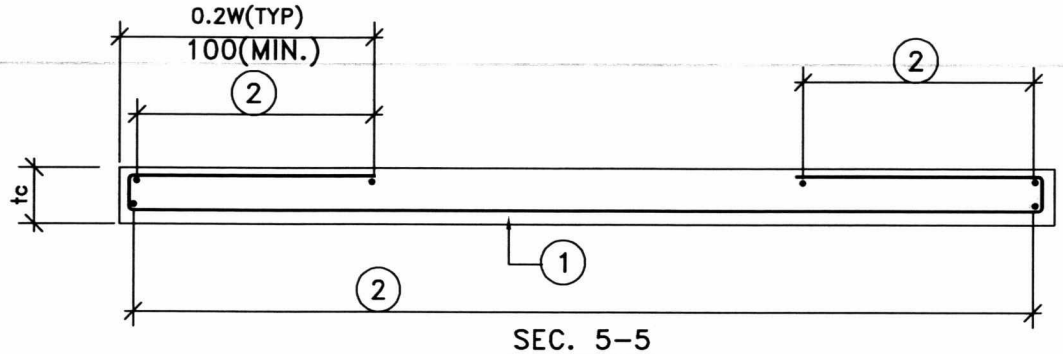
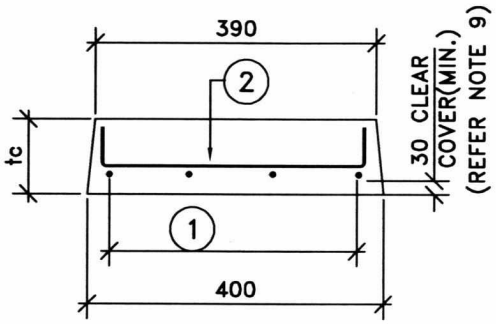
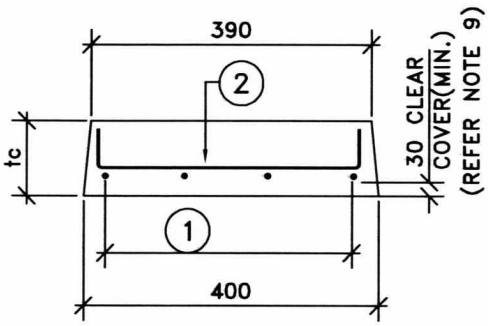


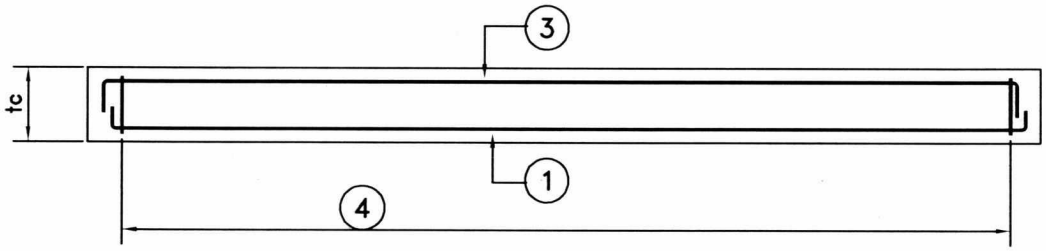
SEC. 5–5



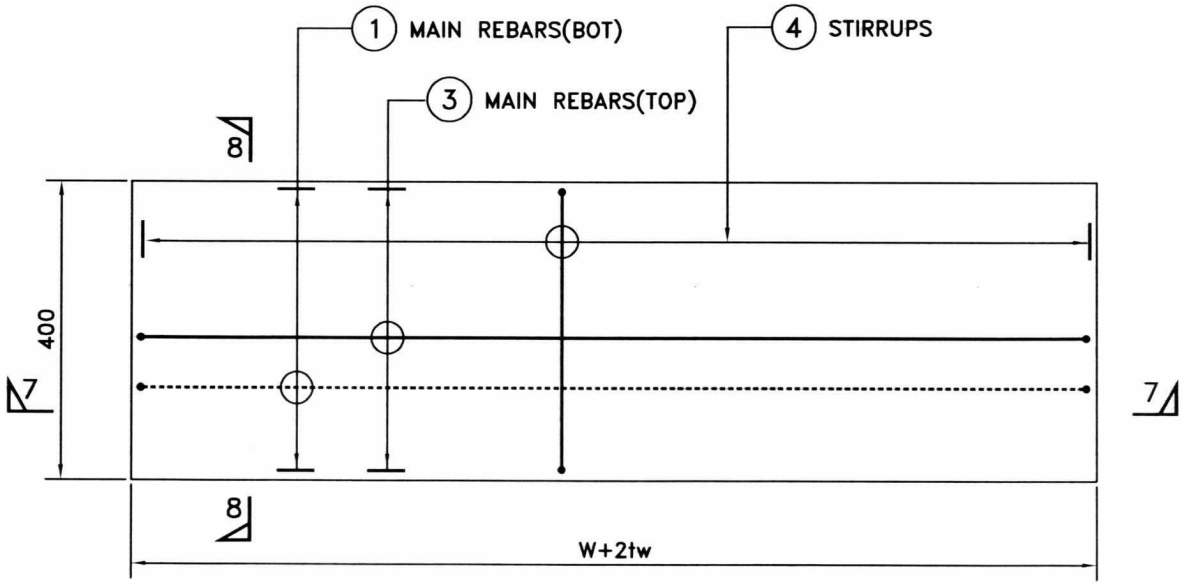
SEC. 6–6



SEC. 8–8



SEC. 7–7



PLAN

(STANDARD PRECAST COVER SLAB TYPE PC–4 TO PC–7)

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TABLE 2: DETAILS OF STANDARD PRECAST COVERS

S.NO.	TYPE	WORKING DIMENSIONS				FOR ONE UNIT OF WIDTH 400 mm						SELF WEIGHT (kg)
						REINFORCEMENT CONFORMING TO IS:1786				APPROX. QUANTITIES		
		CLEAR WIDTH OF TRENCH W (mm)	BEARING OF COVER SLAB tw (mm)	TOTAL LENGTH OF COVER SLAB W+2tw (mm)	THICK-NESS OF COVER SLAB tc (mm)	BAR MKD. (1)	BAR MKD. (2)	BAR MKD. (3)	BAR MKD. (4)	CONCRETE (m^3)	REINF. (kg)	
1.	PC-1	300	150	600	150	4-10ϕ	8-10ϕ	-	-	0.036	5.481	90.0
2.	PC-2	500	150	800	150	4-10ϕ	8-10ϕ	-	-	0.048	5.975	120.0
3.	PC-3	750	200	1150	200	4-10ϕ	9-10ϕ	-	-	0.069	8.185	230.0
4.	PC-4	1000	200	1400	200	4-12ϕ	-	3-10ϕ	17-10ϕ	0.112	20.343	280.0
			250	1500					18-10ϕ	0.120	15.506	300.0
5.	PC-5	1250	200	1650	200	5-12ϕ	-	3-10ϕ	19-10ϕ	0.132	18.210	330.0
			250	1750					20-10ϕ	0.140	17.333	350.0
6.	PC-6	1500	200	1900	250	5-12ϕ	-	3-10ϕ	15-10ϕ	0.190	17.765	475.0
			250	2000					16-10ϕ	0.200	16.519	500.0
7.	PC-7	2000	200	2400	250	5-12ϕ	-	3-10ϕ	31-10ϕ	0.240	29.667	600.0
			250	2500					32-10ϕ	0.250	28.420	625.0

NOTES :-

1. FOR LOCATION OF BARS MKD. (1) TO (4) REFER SHT. 4 OF 6 & SHT. 5 OF 6.
2. ALL PRECAST COVER SLABS SHALL BE MARKED (T) ON THE TOP FOR PROPER PLACEMENT.
3. THE QUANTITIES GIVEN IN THIS TABLE ARE FOR ESTIMATION PURPOSE ONLY.
4. COVER SLABS ARE DESIGNED FOR LOADS SPECIFIED IN NOTE 4 (SHT. 1 OF 6).

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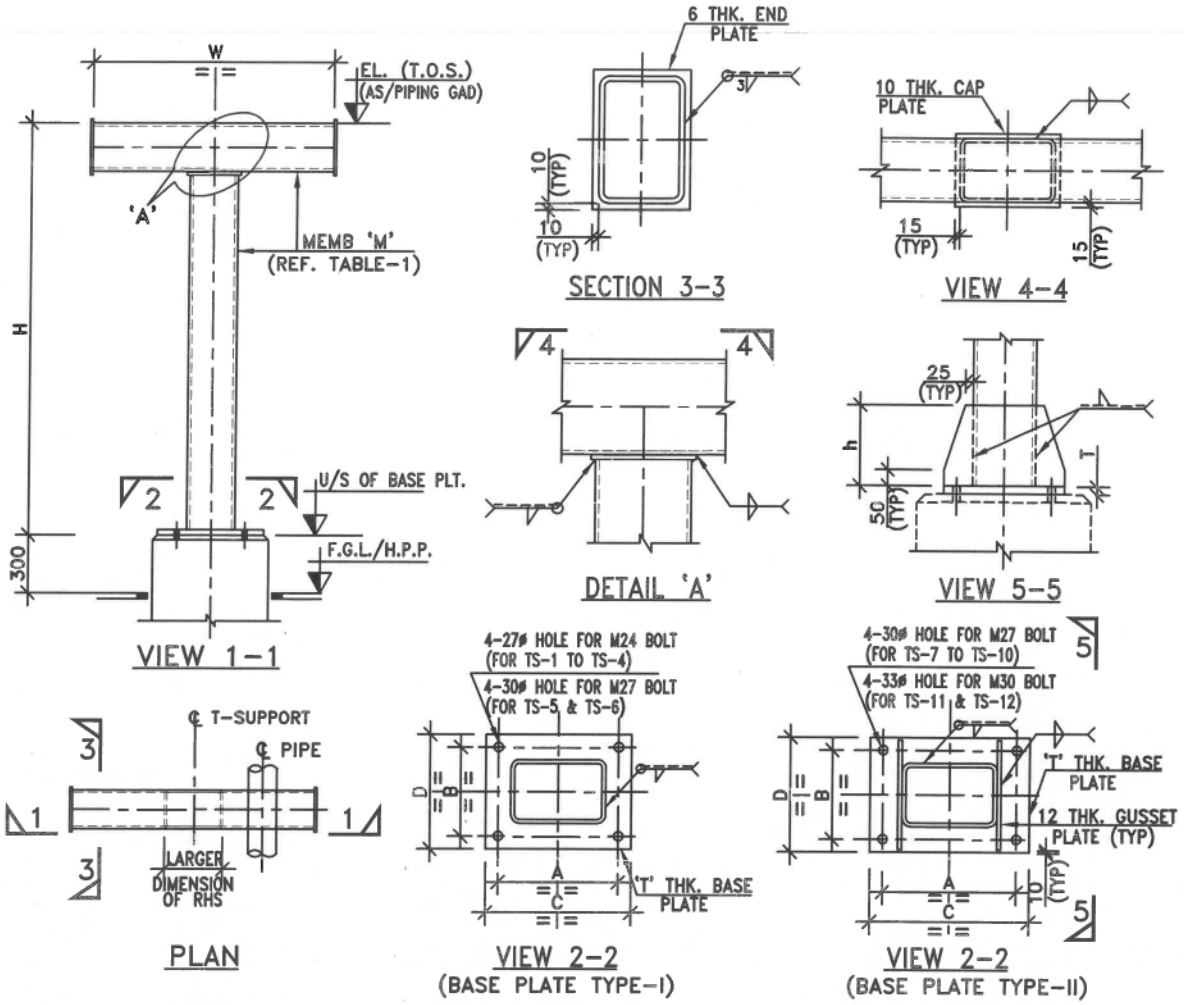

TABLE-1 (TABLE FOR SUPER STRUCTURE DETAIL OF T-SUPPORTS)

SL. NO.	T-SUPPT. MKD.	WIDTH 'W'	HEIGHT 'H'	MEMB 'M' (RHS/SHS)	BASE PLT. TYPE	DIMENSIONS						APPX. QTY IN KG
						A	B	C	D	T	h	
1*	TS-1	UPTO 750	UPTO 2000	220x140x6	I	320	240	400	320	20	–	110
2	TS-2			180x180x6	I	280	280	360	360	20	–	110
3*	TS-3	UPTO 750	2000<H≤3000	260x180x6	I	360	280	440	360	25	–	180
4	TS-4			220x220x6	I	320	320	400	400	25	–	180
5*	TS-5	UPTO 750	3000<H≤4000	300x200x8	I	400	300	500	400	25	–	320
6	TS-6			250x250x8	I	350	350	450	450	25	–	320
7*	TS-7	750<W≤1500	UPTO 1500	220x140x6	II	340	260	440	360	25	200	140
8	TS-8			180x180x6	II	300	300	400	400	25	200	145
9*	TS-9	750<W≤1500	1500<H≤2300	260x180x6	II	380	300	480	400	28	250	210
10	TS-10			220x220x6	II	340	340	440	440	28	250	215
11*	TS-11	750<W≤1500	2300<H≤3000	300x200x8	II	440	340	540	440	28	250	335
12	TS-12			250x250x8	II	390	390	490	490	28	250	340

* RHS IS PREFERED OVER SHS

LEGEND:-

RHS – RECTANGULAR HOLLOW SECTION
SHS – SQUARE HOLLOW SECTION

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
2	13.03.25	REAFFIRMED AND ISSUED AS STANDARD	JG	AJS	ANURAG SINHA	M.NANDI
1	15.07.19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R.K.TRIVEDI

Approved by

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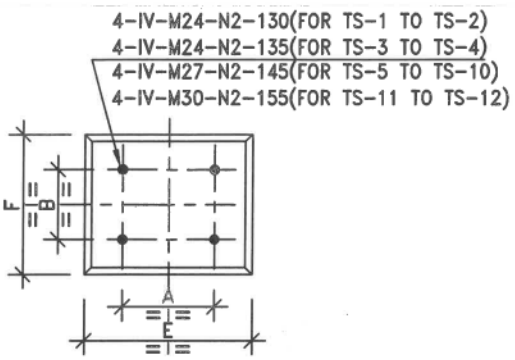
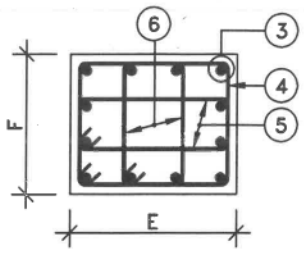
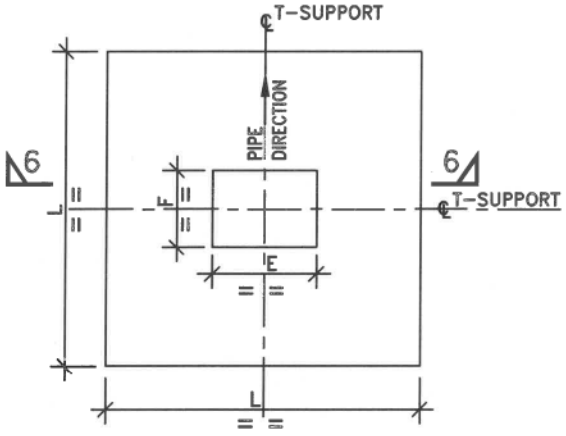


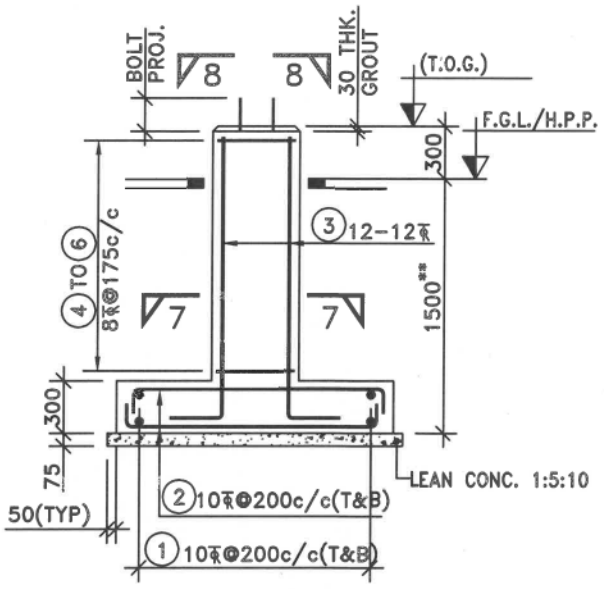
VIEW 8-8



SECTION 7-7



FOUNDATION PLAN



SECTION 6-6

** DEPTH OF FDN. CAN BE INCREASED TO CLEAR U/G PIPING IF ANY.

TABLE-2 (TABLE FOR FOOTING DETAIL OF T-SUPPORTS)

SL. NO.	T-SUPPORT MARKED	PED SIZE		5.0≤ S.B.C<10.0 T/sqM		10.0≤ S.B.C<15.0 T/sqM		S.B.C≥15.0 T/sqM	
		E	F	FDN. SIZE L	QTY IN m^3	FDN. SIZE L	QTY IN m^3	FDN. SIZE L	QTY IN m^3
1	TS-1	600	500	1800	1.42	1600	1.22	1500	1.13
2	TS-2	550	550	1800	1.43	1600	1.22	1500	1.13
3	TS-3	600	550	1900	1.58	1700	1.36	1600	1.26
4	TS-4	600	600	1900	1.62	1700	1.41	1600	1.31
5	TS-5	700	600	2000	1.83	1800	1.60	1700	1.50
6	TS-6	650	650	2000	1.83	1800	1.61	1700	1.50
7	TS-7	650	600	2100	1.91	1800	1.56	1700	1.45
8	TS-8	600	600	2100	1.86	1800	1.51	1700	1.41
9	TS-9	700	600	2200	2.08	1900	1.71	1800	1.60
10	TS-10	650	650	2200	2.09	1900	1.72	1800	1.61
11	TS-11	750	650	2300	2.32	2000	1.93	1900	1.81
12	TS-12	700	700	2300	2.32	2000	1.94	1900	1.82

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NOTES:-

A. DESIGN PARAMETERS :

1. FOLLOWING LOADS HAVE BEEN CONSIDERED IN DESIGN:
   a) VERTICAL LOAD = 1.0 MT FOR 750 WIDTH
      = 2.0 MT FOR 1500 WIDTH } INCLUDING PIPE EMPTY WEIGHT
   b) WIND INTENSITY = 150 Kg/sqm.
   c) WIND ON MAXIMUM 24" PIPE HAS BEEN CONSIDERED
   d) PIPE FRICTION COEFFICIENT IN EITHER DIRECTION = 0.3
2. ALLOWABLE HORIZONTAL DEFELECTION = H/250

B. MATERIAL PROPERTIES :

1. CONC GRADE SHALL BE AS PER GENERAL NOTES OF THE PROJECT BUT NOT LOWER THEN M25.
2. GRADE OF REINFORCEMENT STEEL SHALL BE AS PER GENERAL NOTE OF THE PROJECT BUT NOT LESS THAN Fe500D.
3. HOLLOW SECTION SHALL BE YSt 310 (MINIMUM) AS PER IS:4923.
4. ALL STRUCTURAL STEEL OTHER THAN HOLLOW SECTION SHALL BE AS PER IS:2062 GRADE A/BR/BO.

C. GEOTECH :

1. SOIL BEARING CAPACITY (SBC) SHALL BE AS/GEOTECH RECOMMENDATION OF THE PROJECT.

D. GENERAL :

1. ALL WELDS ARE 6mm FILLET WELD U.N.O.
2. ANCHOR BOLT SHALL BE AS PER EIL STD. NO. 7-68-0417.
3. GROUT SHALL BE NON SHRINK TYPE AS PER GENERAL NOTES OF THE PROJECT.

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NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. STRUCTURAL STEEL TO BE USED SHALL CONFORM TO IS:2062 GRADE–A/B.
3. R/F SHALL BE HIGH STRENGTH DEFORMED BARS OF GRADE Fe500D CONFORMING TO IS:1786.
4. CONCRETE WORKS SHALL BE AS PER GENERAL NOTES OF THE PROJECT.
5. GUSSET PLATES SHALL BE 8mm THICK UNO.
6. ALL CONNECTIONS SHALL BE WELDED USING 6mm THICK FILLET WELD.
7. ANCHOR BOLTS SHALL BE AS PER EIL STD. NO. 7–68–0417.
8. FOUNDATIONS SHOWN IN THIS STANDARD ARE VALID FOR S.B.C. OF 5T/Sqm OR MORE AT FOUNDATION LEVEL.
9. GROUT SHALL BE ORDINARY 1:2 CEMENT SAND MORTAR.
10. THE STRUCTURES ARE DESIGNED FOR ELECTRICAL CABLE & TRAY LOAD OF 85Kg/m.
11. LOCATION OF CENTRE OF CABLE TRAY SUPPORTS SHALL BE AS PER GEN. CIVIL & PIPING GADS.

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
4	13.03.25	REAFFIRMED AND ISSUED AS STANDARD	JITENDER	AMARJEET	ANURAG SINHA	MAINAK NANDI
3	15.07.19	REAFFIRMED AND ISSUED AS STANDARD	JG	AVM	RAJANJI SRIVASTAVA	R.K.TRIVEDI

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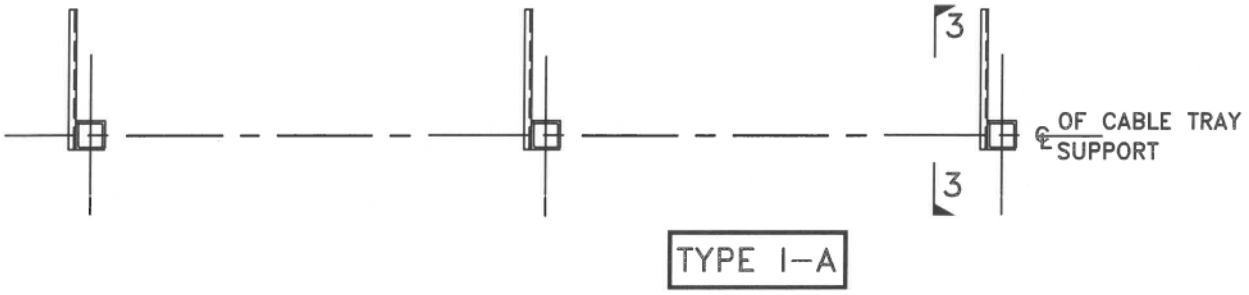
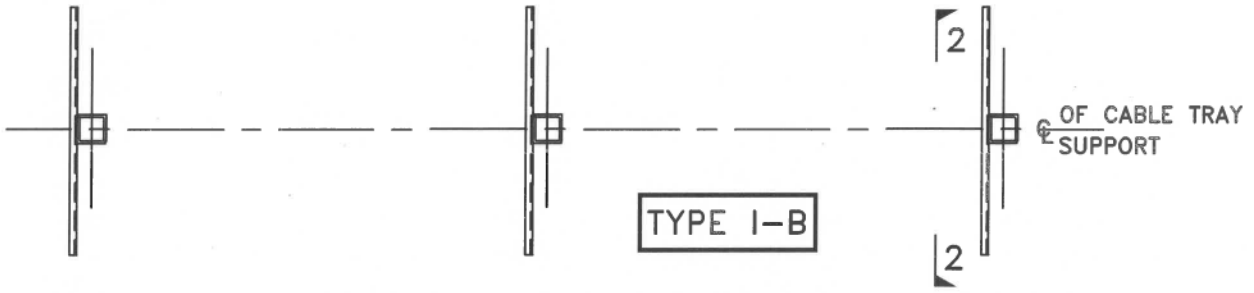
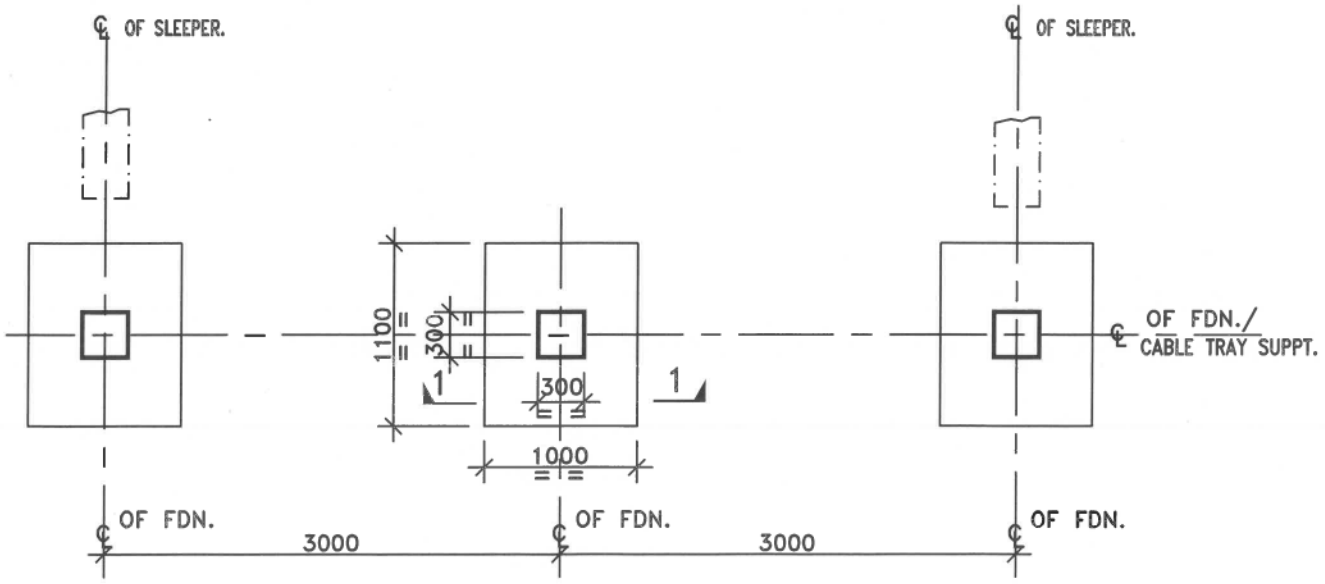
(A) 600mm WIDE TWO TIERED CABLE TRAY SUPPORTS TYPE-1



TYPICAL G.A.OF CABLE TRAY SUPPT.
(FOR 1 SIDE CABLE TRAY)



TYPICAL G.A.OF CABLE TRAY SUPPT.
(FOR 2 SIDE CABLE TRAY)



TYPICAL FDN. LAYOUT
(FOR 1 SIDE & 2 SIDE CABLE TRAY SUPPT.)

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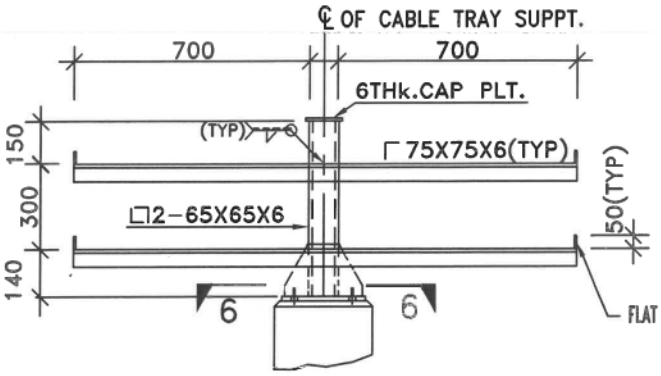
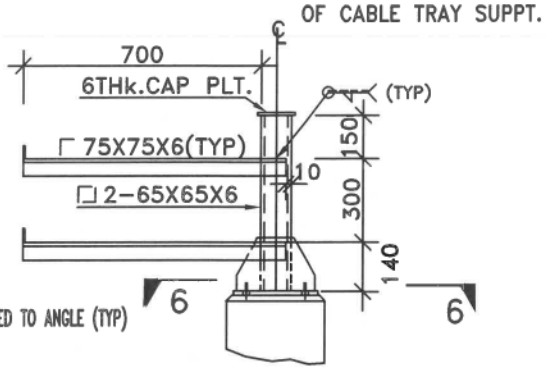
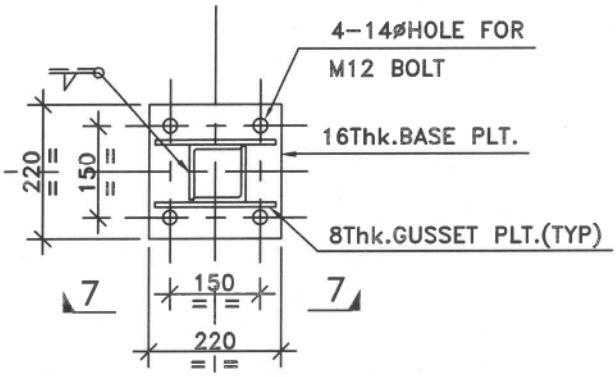


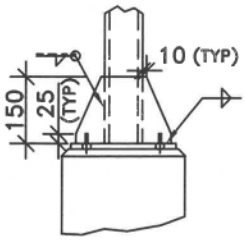
VIEW 2-2
(FOR 2 SIDE CABLE TRAY STR.)



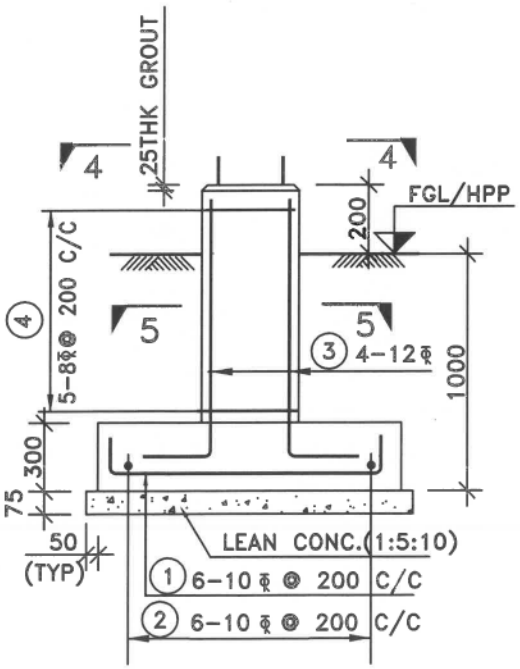
VIEW 3-3
(FOR 1 SIDE CABLE TRAY STR.)



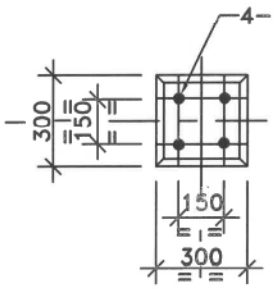
VIEW 6-6



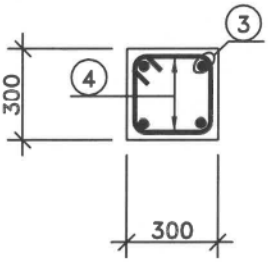
VIEW 7-7



SECTION 1-1



VIEW 4-4



SEC. 5-5

QUANTITIES (FOR EACH SUPPT.)		
PCC 1:5:10	=	0.10 CUM.
* CONC.	=	0.45 CUM.
STRL. STEEL	=	25 KG. (FOR 1 SIDE STR.)
	=	35 KG. (FOR 2 SIDE STR.)

(* GRADE OF CONC. SHALL BE AS PER GENERAL NOTES OF PROJECT.)

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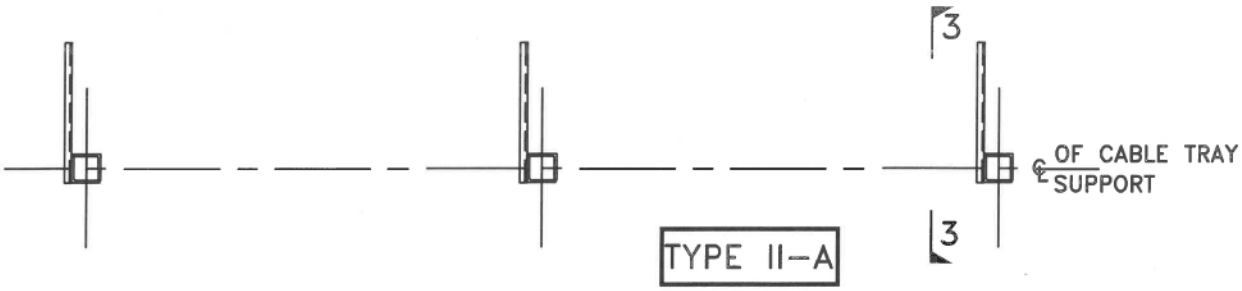
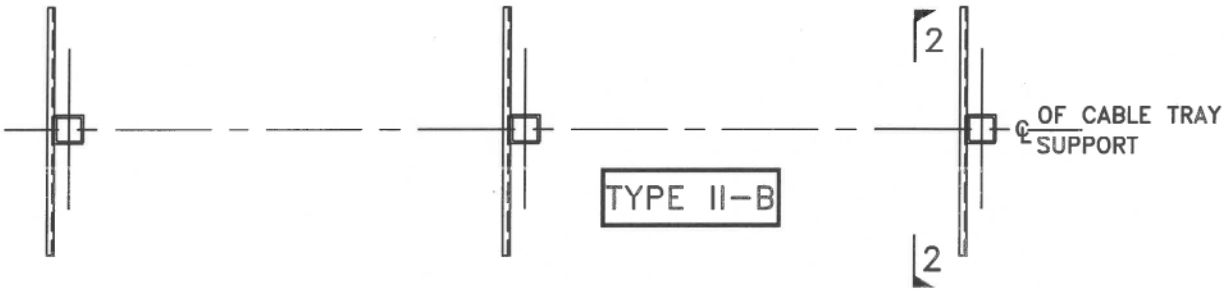
(B) 750mm WIDE TWO TIERED CABLE TRAY SUPPORTS TYPE–II



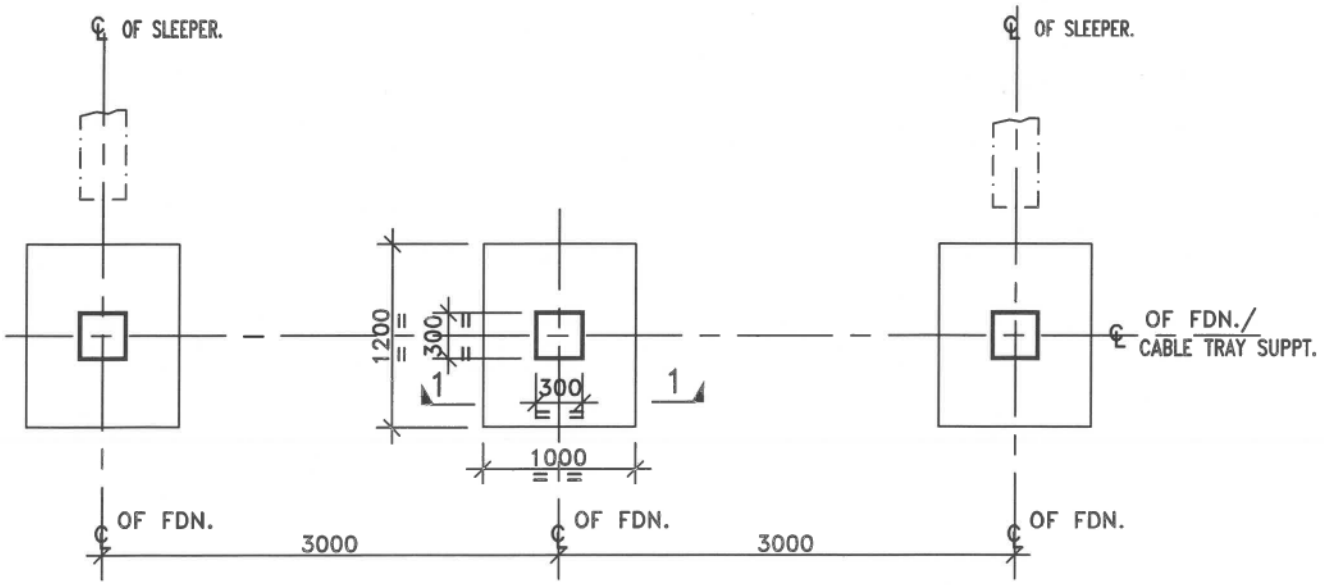
TYPICAL G.A.OF CABLE TRAY SUPPT.

(FOR 1 SIDE CABLE TRAY)



TYPICAL G.A.OF CABLE TRAY SUPPT.

(FOR 2 SIDE CABLE TRAY)



TYPICAL FDN. LAYOUT

(FOR 1 SIDE & 2 SIDE CABLE TRAY SUPPT.)

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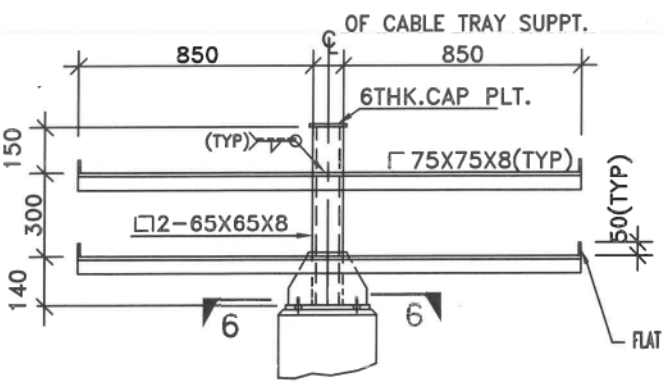
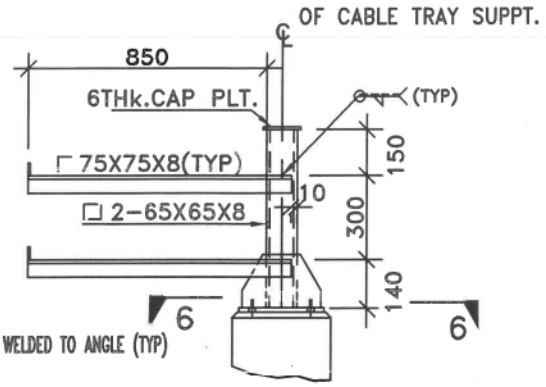
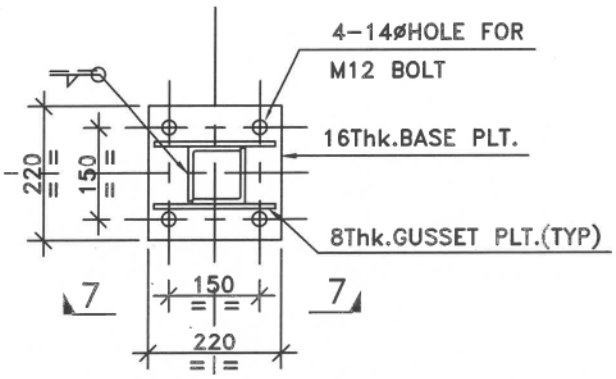


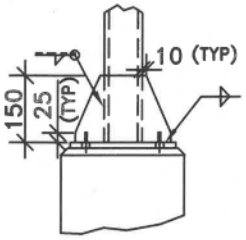
VIEW 2-2
(FOR 2 SIDE CABLE TRAY STR.)



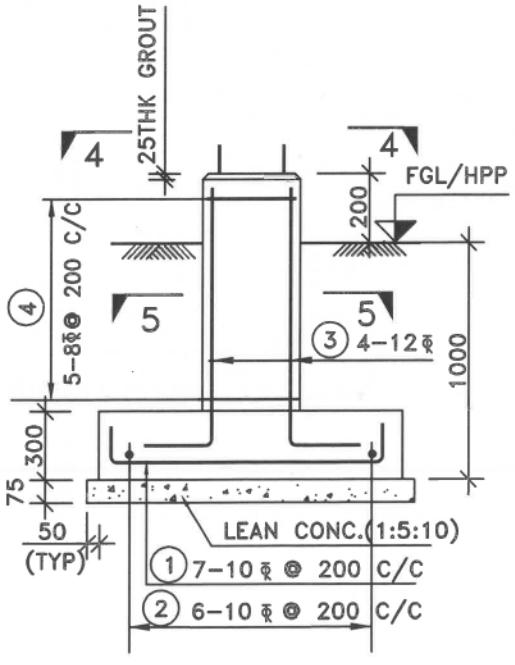
VIEW 3-3
(FOR 1 SIDE CABLE TRAY STR.)



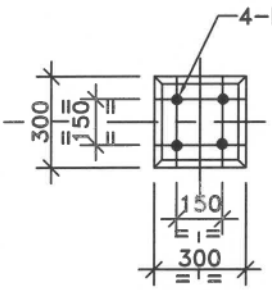
VIEW 6-6



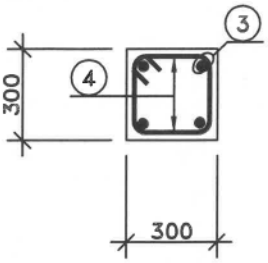
VIEW 7-7



SECTION 1-1



VIEW 4-4



SEC. 5-5

QUANTITIES (FOR EACH SUPPT.)		
PCC 1:5:10	=	0.11 CUM.
* CONC.	=	0.5 CUM.
STRL. STEEL	=	35 KG. (FOR 1 SIDE STR.)
	=	45 KG. (FOR 2 SIDE STR.)

(* GRADE OF CONC. SHALL BE AS PER GENERAL NOTES OF PROJECT.)

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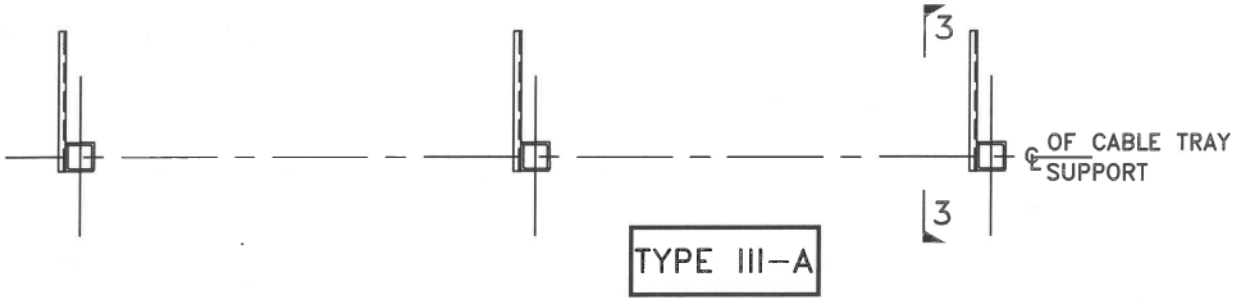
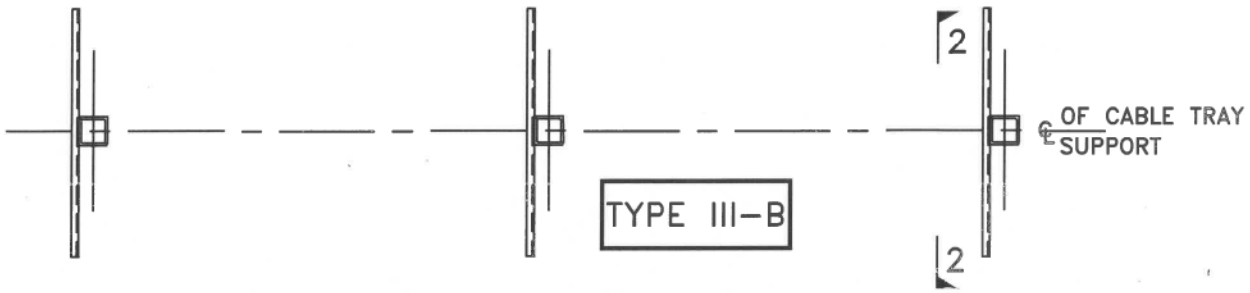
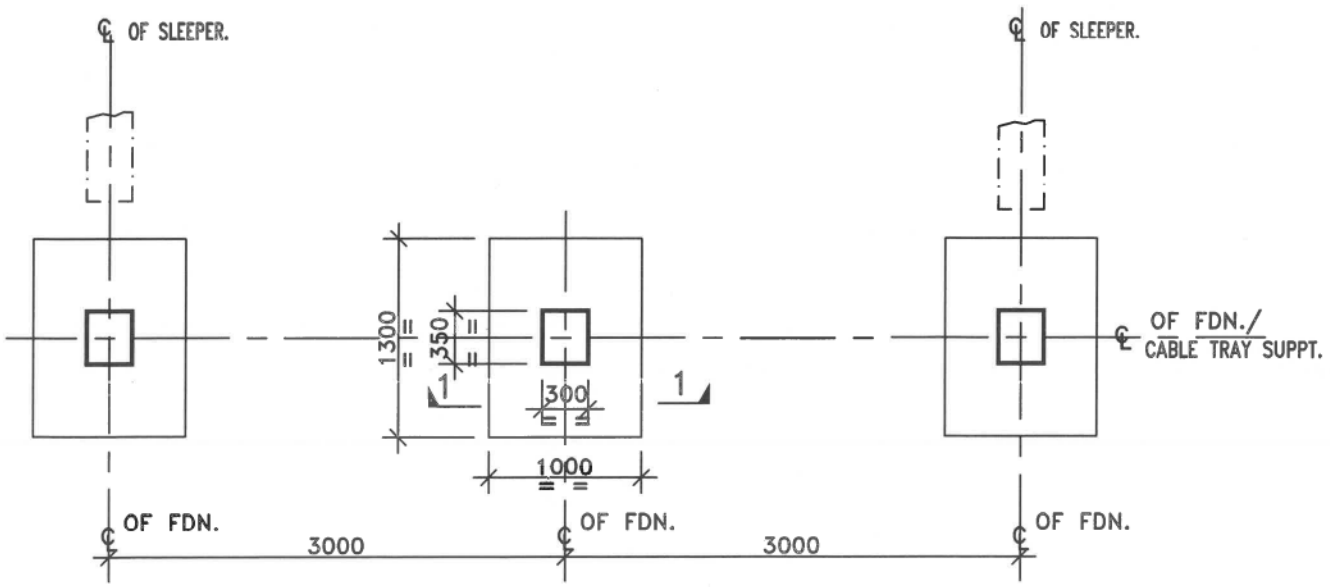
(C) 600mm WIDE THREE TIERED CABLE TRAY SUPPORTS TYPE–III



TYPICAL G.A.OF CABLE TRAY SUPPT.
(FOR 1 SIDE CABLE TRAY)



TYPICAL G.A.OF CABLE TRAY SUPPT.
(FOR 2 SIDE CABLE TRAY)



TYPICAL FDN. LAYOUT
(FOR 1 SIDE & 2 SIDE CABLE TRAY SUPPT.)

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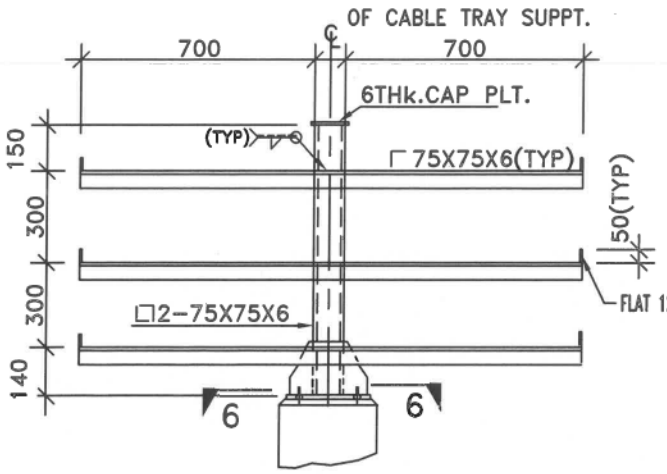
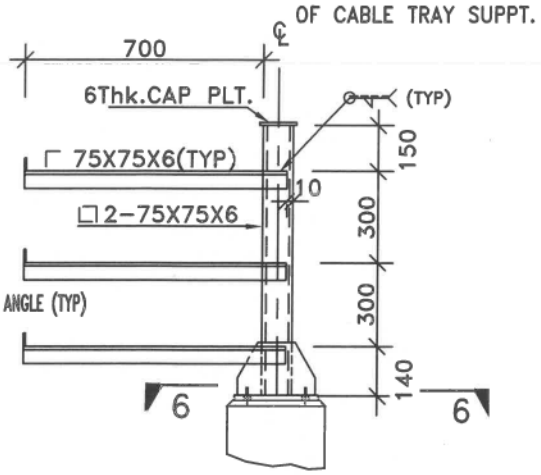
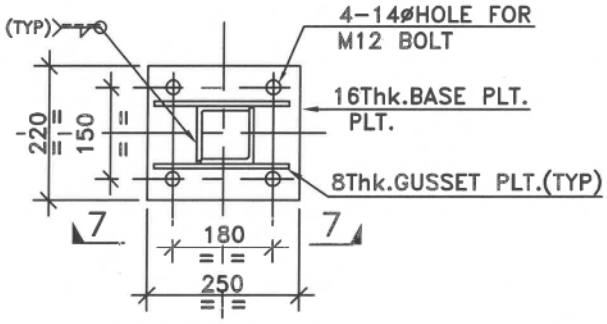


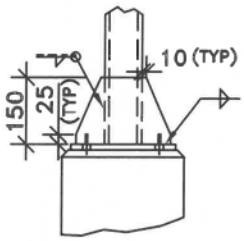
VIEW 2-2
(FOR 2 SIDE CABLE TRAY STR.)



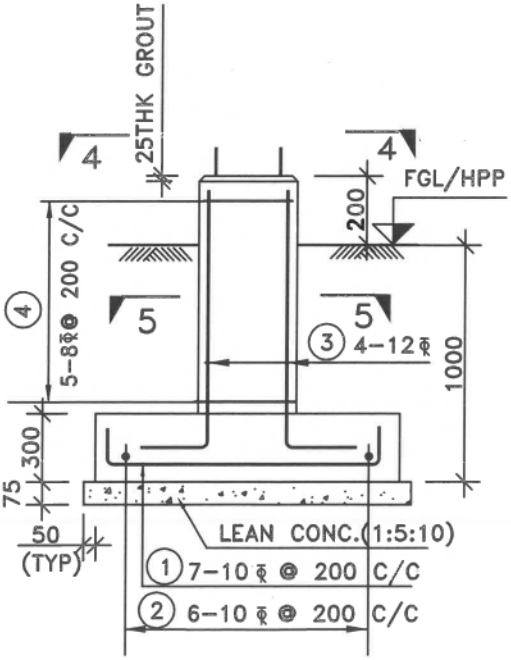
VIEW 3-3
(FOR 1 SIDE CABLE TRAY STR.)



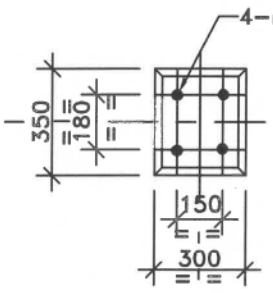
VIEW 6-6



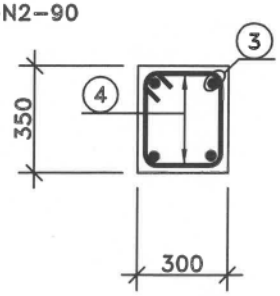
VIEW 7-7



SECTION 1-1



VIEW 4-4



SEC. 5-5

QUANTITIES (FOR EACH SUPPT.)		
PCC 1:5:10	=	0.12 CUM.
* CONC.	=	0.50 CUM.
STRL. STEEL	=	40 KG. (FOR 1 SIDE STR.)
	=	55 KG. (FOR 2 SIDE STR.)

(* GRADE OF CONC. SHALL BE AS PER GENERAL NOTES OF PROJECT.)

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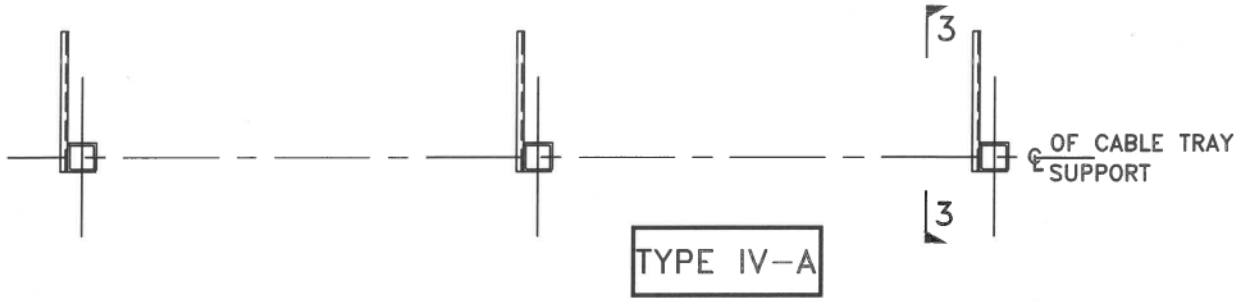
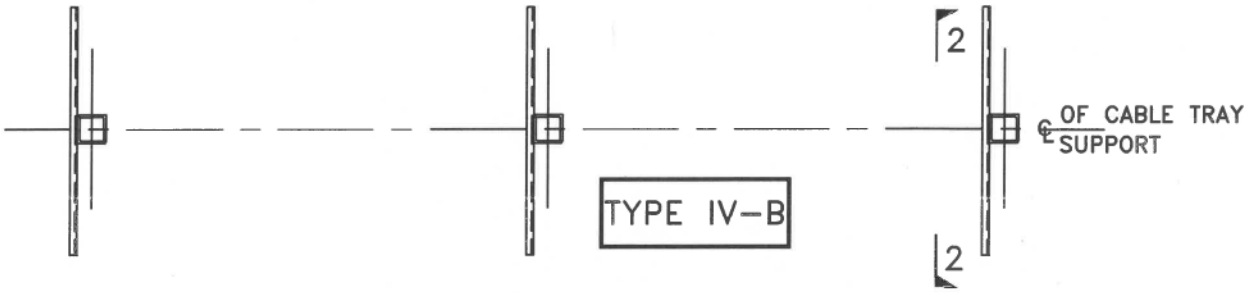
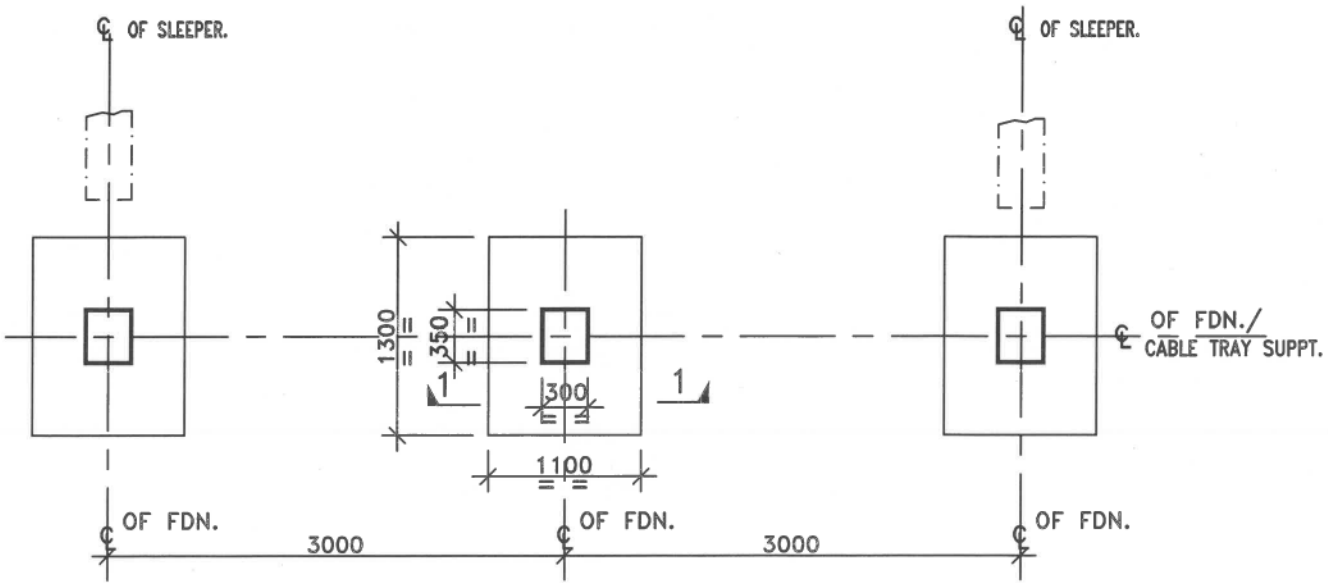
(D) 750mm WIDE THREE TIERED CABLE TRAY SUPPORTS TYPE–IV



TYPICAL G.A.OF CABLE TRAY SUPPT.
(FOR 1 SIDE CABLE TRAY)



TYPICAL G.A.OF CABLE TRAY SUPPT.
(FOR 2 SIDE CABLE TRAY)



TYPICAL FDN. LAYOUT
(FOR 1 SIDE & 2 SIDE CABLE TRAY SUPPT.)

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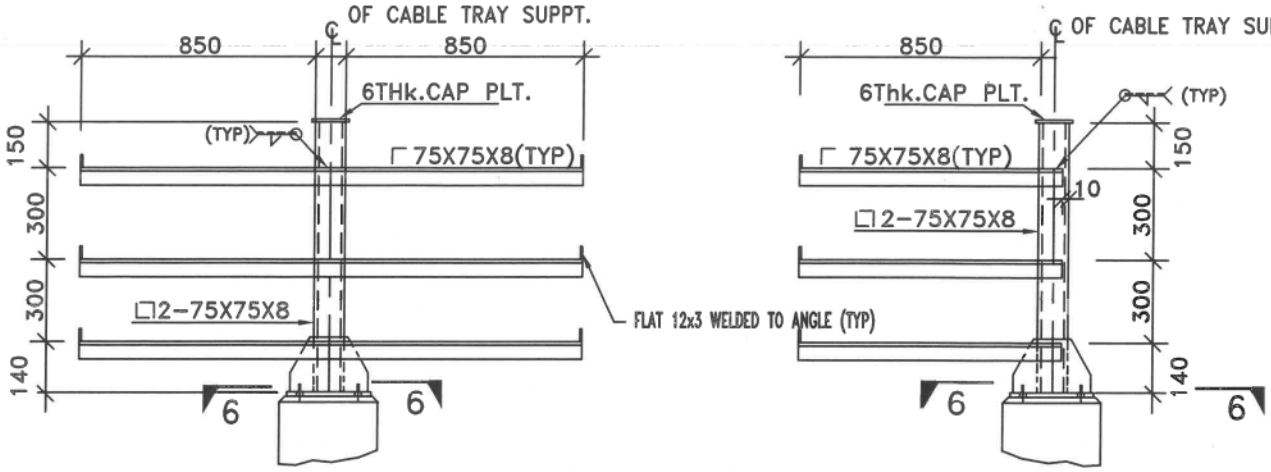
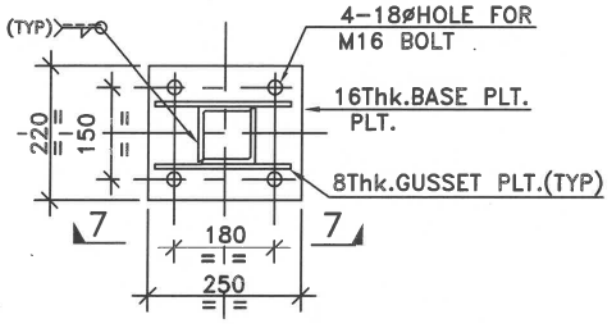
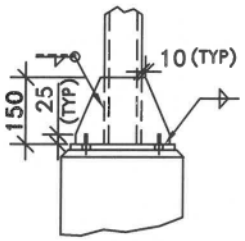


VIEW 2-2
(FOR 2 SIDE CABLE TRAY STR.)

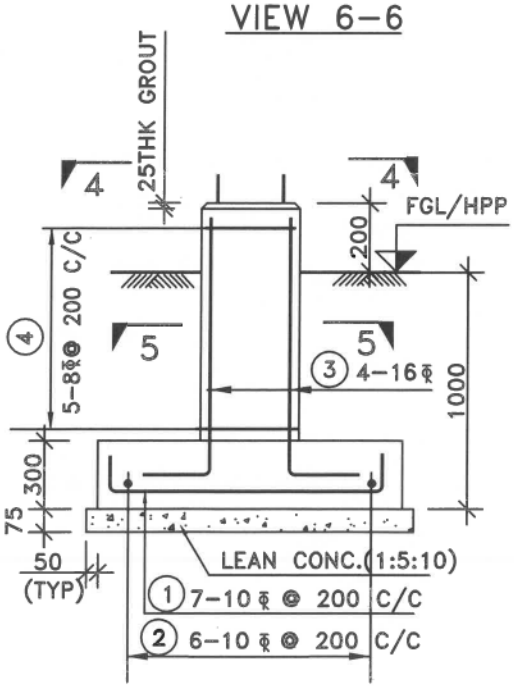
VIEW 3-3
(FOR 1 SIDE CABLE TRAY STR.)



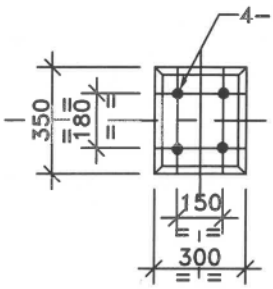
VIEW 6-6



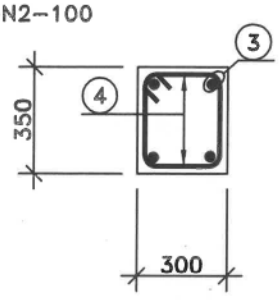
VIEW 7-7



SECTION 1-1



VIEW 4-4



SEC. 5-5

QUANTITIES (FOR EACH SUPPT.)		
PCC1:5:10	=	0.12 CUM.
* CONC.	=	0.55 CUM.
STRL. STEEL	=	45 KG. (FOR 1 SIDE STR.)
	=	65 KG. (FOR 2 SIDE STR.)

(* GRADE OF CONC. SHALL BE AS PER GENERAL NOTES OF PROJECT.)

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NOTES :-

1. ALL DIMENSIONS ARE IN mm.
2. THE TYPE OF GRATING TO BE USED SHALL BE CALLED OUT ON THE DESIGN DRAWING.
3. MATERIAL FOR THE GRATING SHALL CONFORM TO FOLLOWING STANDARDS:

		CARBON STEEL (CS) GRATING	STAINLESS STEEL (SS) GRATING
(a)	MAIN MEMBER & END FLAT	IS 2062 (GRADE E250) SUB QUALITY-A/BR/BO	GRADE 409M CONFORMING TO ASTM 240/480 (UNS S40977)
(b)	CROSS MEMBER (SQ.TWISTED ACROSS BAR)	IS 7887	GRADE 409M CONFORMING TO ASTM 240/480 (UNS S40977) OR DESIGNATION X12Cr13 CONFORMING TO IS 6527/6528
(c)	FLAT FOR CLAMP	IS 513	GRADE 409M CONFORMING TO ASTM 240/480 (UNS S40977) OR DESIGNATION X12Cr12 CONFORMING TO IS 6603
(d)	DISC	CS 1038 GRADE	GRADE 1.4404 CONFORMING TO DIN EN 1.4404 OR GRADE 316/316L CONFORMING TO ASTM 240/480
(e)	STUD	CS 1038 GRADE	GRADE 1.4462 CONFORMING TO DIN EN 1.4462 OR GRADE F51 CONFORMING TO ASTM A182

4. ALL GRATINGS SHALL BE MANUFACTURED BY ELECTRO-FORGING PROCESS.
5. CARBON STEEL GRATINGS INCLUDING TOE PLATES & FLATS (AROUND OPENINGS) AND CLAMPS SHALL BE HOT DIP GALVANISED IN ACCORDANCE WITH IS 2629 AND TESTED AS PER IS 2633 & IS 6745. QUANTITY OF ZINC COATING SHALL BE MINIMUM 900 gm/sqm OF SURFACE AREA (0.12 mm MINIMUM AVERAGE THICKNESS). CLAMP BOLTS & NUTS SHALL HAVE MINIMUM AVERAGE ZINC COATING OF 375 gm/sqm (0.054 mm MINIMUM AVERAGE THICKNESS).
6. THE PANEL WIDTH SHOWN ON SUBSEQUENT SHEETS IS INDICATIVE. IT MAY BE INCREASED OR DECREASED AS REQUIRED TO SUIT THE GEOMETRY OF PLATFORM & CONVENIENCE OF HANDLING.
7. GRATINGS SHALL NOT BE USED FOR SUPPORTING THE PIPES DIRECTLY. ADDITIONAL MEMBERS (MINIMUM MC125) SHALL BE PROVIDED UNDER THE GRATING FOR SUPPORTING THE PIPE HAVING A MAXIMUM LOAD OF 500 Kg. THIS MEMBER SHALL SPAN IN SAME DIRECTION AS GRATING.
8. GRATING PANEL SHALL BE ALIGNED AND TACK WELDED TO THE SUPPORTING MEMBERS. FIXING OF GRATING PANEL WITH SUPPORTING MEMBERS SHALL EITHER BE DONE BY CLAMPS/ DISC (WITHOUT REMOVING TACK WELD) OR ALTERNATIVELY BY INTERMITTENT/STITCH WELDING 50(50).

   REMOVABLE GRATING PANEL AS SHOWN IN DRAWINGS SHALL BE FIXED BY CLAMPS/ DISC ONLY.
9. FOR GRATING PANELS WITH CUTOUTS/ OPENINGS; STRENGTHENING SHALL BE CARRIED OUT AS PER THE DETAILS GIVEN ON SHEET 6. ADDITIONAL MEMBERS WHEREVER SHOWN SHALL BE PROVIDED IN THE STRUCTURE.
10. THE FABRICATED GRATING SHALL FULFILL THE FOLLOWING MINIMUM REQUIREMENTS:
    (a) UNFUSED JOINTS ARE NOT IN EXCESS OF 5% OF TOTAL JOINTS AND ARE WELDED BY SMAW/GMAW PROCESS.
    (b) THE JOINTS ARE ABLE TO SUSTAIN A MINIMUM PULL OUT LOAD OF 1.2 TIMES THE SHEAR CAPACITY OF THE CROSS MEMBER.
11. EVERY FIFTH MAIN MEMBER SHALL NECESSARILY BE WELDED TO THE END FLAT FROM ONE SIDE. HOWEVER, THE END MAIN MEMBER SHALL ALWAYS BE WELDED TO THE END FLATS.
12. OPENINGS UP TO 200 mm DIA ARE NOT SHOWN ON THE DRAWING. THE SAME SHALL BE MADE AT SITE DURING ERECTION OF PIPING.
13. FOR CARBON STEEL GRATING, REPAIR TO THE DAMAGED AREA OF GALVANIZED COATING DUE TO WELDING AFTER ERECTION SHALL BE CARRIED OUT AS PER RECOMMENDED PRACTICE OF IS 11759 USING COLD GALVANIZING SPRAY PROCESS. ORGANIC PAINT SYSTEM IS NOT ACCEPTABLE.
14. MAXIMUM LENGTH OF SINGLE CONTINUOUSLY SUPPORTED GRATING SHALL BE FIXED ON THE BASIS OF HANDLING. HOWEVER PREFERABLY LENGTH OF GRATING SHALL BE RESTRICTED TO 6 M.
15. GRATING FASTENER DISC AND THREADED STUDS SHALL BE CERTIFIED BY EOTA (EUROPEAN ORGANIZATION FOR TECHNICAL ASSESSMENT). FOR INSTALLATION, PILOT HOLE SHALL BE DRILLED WITHOUT SELF-TAPPING. THE STUD WITH PRE-MOUNTED NEOPRENE (FOR CS)/ CHLOROPRENE (FOR SS) WASHER SHALL BE FASTENED INTO THE PILOT HOLE WITH PREDEFINED TORQUE VALUE BASED ON THE MANUFACTURER'S GUIDELINES. THE GRATING DISC SHALL THEN BE FIXED WITH ALLEN-TYPE BIT. VENDOR SHALL PROVIDE THE ENTIRE ARRANGEMENT INCLUDING THE SPECIALIZED TOOLS WITH INSTALLATION INSTRUCTIONS. VENDOR SHALL CARRY OUT PULL OUT LOAD TEST (WITH A LOAD VALUE SPECIFIED FOR THE GRATING PANEL) ON A SAMPLE STUD. THE VENDOR SHALL ALSO PROVIDE INSTALLATION TRAINING TO THE SITE WORKERS. HOT WORK PERMIT (NON-OPEN FLAME TYPE) MAY BE REQUIRED FOR INSTALLATION OF GRATING WITH DISC MECHANISM BASED ON HEAT DISSIPATION REPORT PROVIDED BY THE VENDOR.

    CARBON STEEL STUDS & DISC SHALL BE HOT DIP GALVANIZED (MIN. 900 gm/sqm FOR DISC & MIN. AVERAGE 375 gm/sqm FOR STUDS) OR SHALL HAVE A COATING THAT CAN WITHSTAND NEUTRAL SALT SPRAY TEST OF 2000H AS PER DIN EN ISO 9227.
16. STAINLESS STEEL GRATINGS INCLUDING LOCALIZED WELDING AREAS SHALL BE CHEMICALLY TREATED AS PER ASTM A380/A380M.
17. FOR STAINLESS STEEL GRATINGS, ELECTRODE OF GRADE E309L SHALL BE USED.

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
6	04.07.24	REVISED & ISSUED AS STANDARD	JITENDER	AMARJEET	ANURAG SINHA	MAINAK NANDI
5	29.12.22	REVISED & ISSUED AS STANDARD	JITENDER	AMARJEET	ANURAG SINHA	S.MAZUMDAR

Approved by

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TABLE–1

USE OF GRATING TYPE AT VARIOUS LOCATIONS & NET SAFE WORKING LOADS FOR GRATING TYPE–I & II

TYPE	APPLICATION	l	500 TO 800	900	1000	1100	1250	1400
		EITHER OF w(UDL IN KN/SQM) OR P(LINEAR LOAD IN KN/M)						
I	1. EQUIPMENT PLATFORM 2. WALKWAY FOR CABLE TRAY IN PIPE RACK 3. OPERATING PLATFORM FROM GRADE/SUPER STRUCTURE 4. APPROACHES	w	19.60	14.80	10.80	8.10	5.30	3.40
		P	9.00	8.00	6.60	5.40	4.00	2.70
II	1. STAIRS 2. FLOOR GRATING FOR a) COMPRESSOR HOUSE b) TECHNOLOGICAL STRUCTURE c) PIPE RACK WITH VALVE / PIPE SUPPORTS d) MAINTENANCE PLATFORM	w	19.60		17.60	13.20	8.70	5.50
		P	14.60	13.00	10.70	8.80	6.30	4.40

NOTE:– THE NET SAFE WORKING LOADS GIVEN ON TABLE–1 ARE BASED ON LIMITING VERTICAL DEFLECTION OF SPAN/200 OR 6mm, WHICHEVER IS LESS.

SYMBOLS :–

l = EFFECTIVE SPAN IN mm

b = BEARING WIDTH IN mm

w = UDL IN KN/SQM

P = LINEAR LOAD IN KN/M AT MID SPAN ALONG PANEL WIDTH.

= GRATING SPAN DIRECTION

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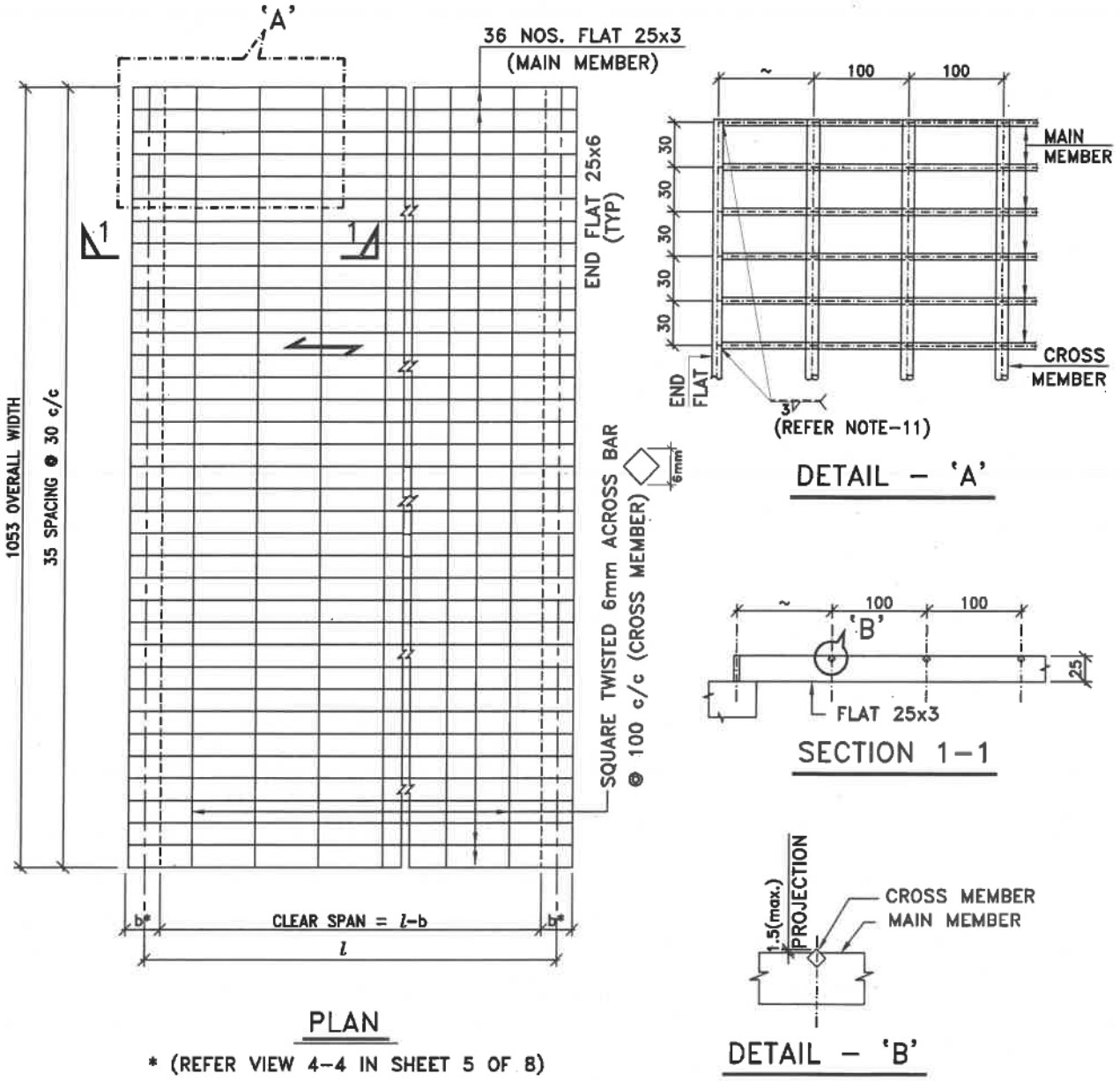

TABLE-2

WT. OF GRATING IN kg/m² (INDICATIVE ONLY, NOT FOR PAYMENT)				PROPERTIES WIDTH = 1053mm			REMARKS
FLAT 25x6	FLAT 25x3	SQUARE TWISTED 6mm ACROSS BAR	TOTAL	Ixx cm^4	Zxx cm^3	MR kgm	WEIGHT OF WELD, CLAMPS/DISC, GALVANISATION, ETC. NOT CONSIDERED
2.35	19.89	1.80	24.04	14.84	11.87	195.94	

GRATING TYPE - I

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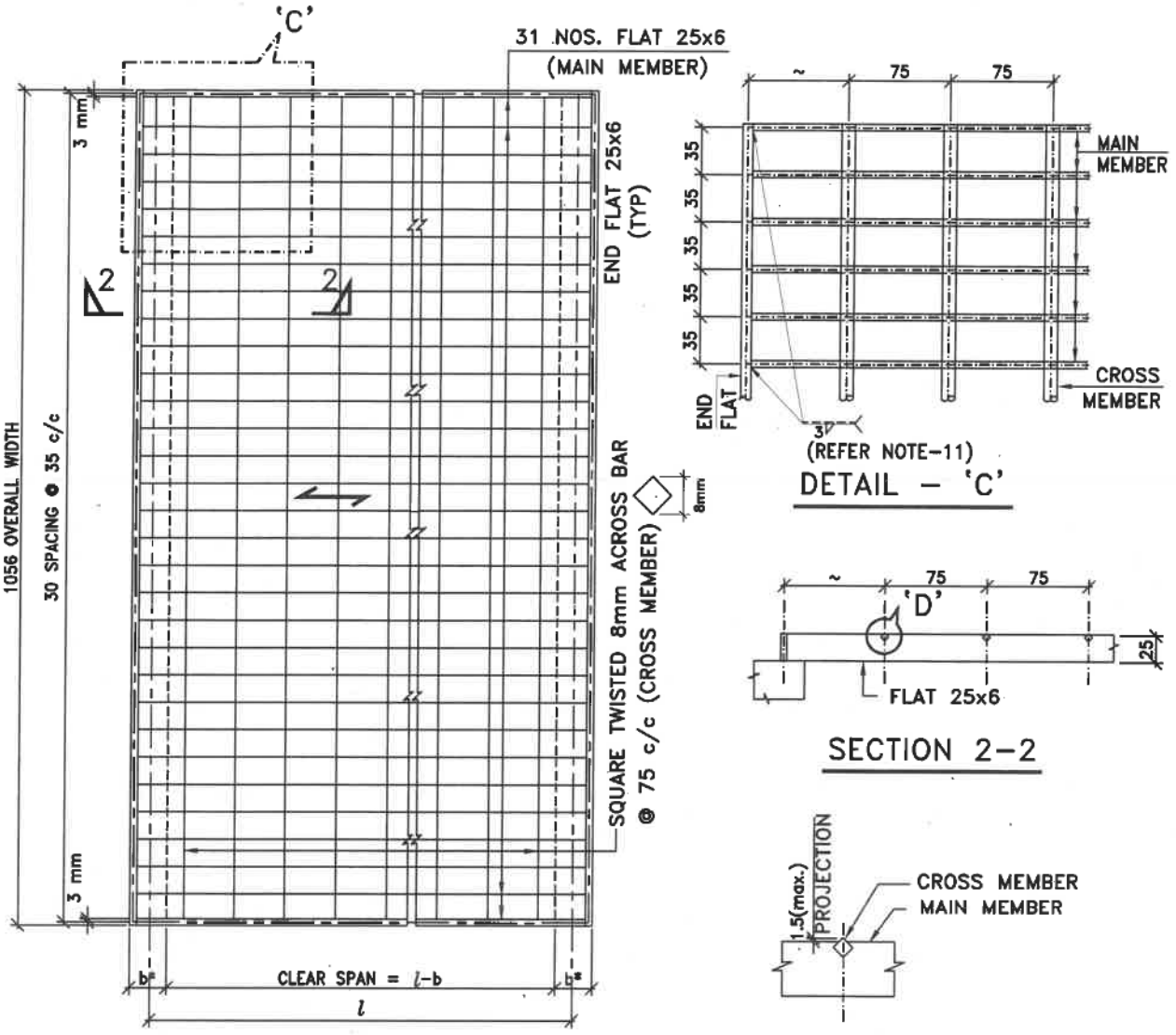

TABLE-3

WT. OF GRATING IN kg/sqm (INDICATIVE ONLY, NOT FOR PAYMENT)			PROPERTIES WIDTH = 1056mm			REMARKS
FLAT 25x6	SQUARE TWISTED 8mm ACROSS BAR	TOTAL	Ixx cm^4	Zxx cm^3	MR kgm	WEIGHT OF WELD, CLAMPS/DISC, GALVANISATION, ETC. NOT CONSIDERED
36.49	3.23	39.72	24.2	19.4	319.69	

GRATING TYPE - II

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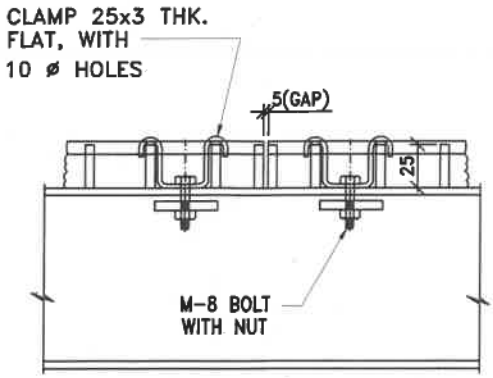
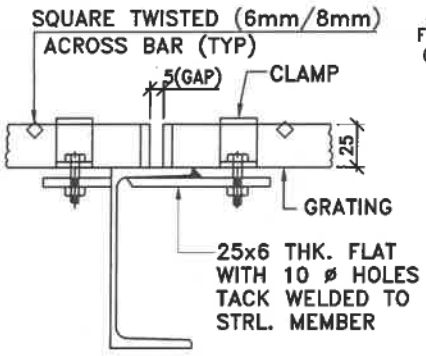
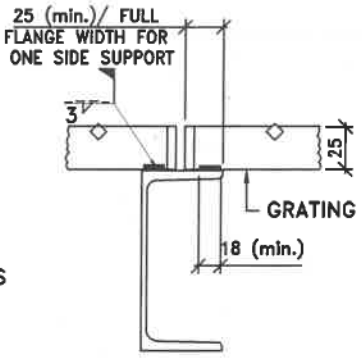


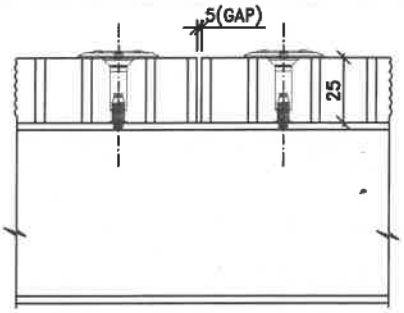
VIEW 3-3
GRATING FIXED WITH CLAMP



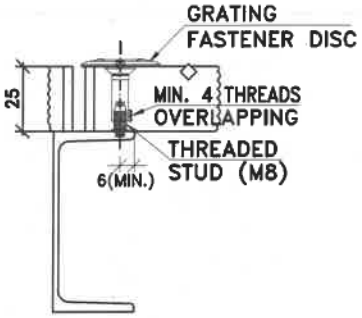
VIEW 4-4
GRATING FIXED WITH CLAMP
(REFER NOTE-8, 13 & 16)



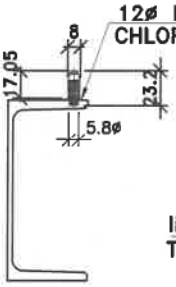
VIEW 4-4/VIEW 4B-4B
GRATING FIXED WITH WELDING
(REFER NOTE-8, 13 & 16)



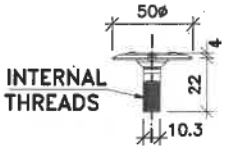
VIEW 4A-4A
GRATING FIXED WITH DISC



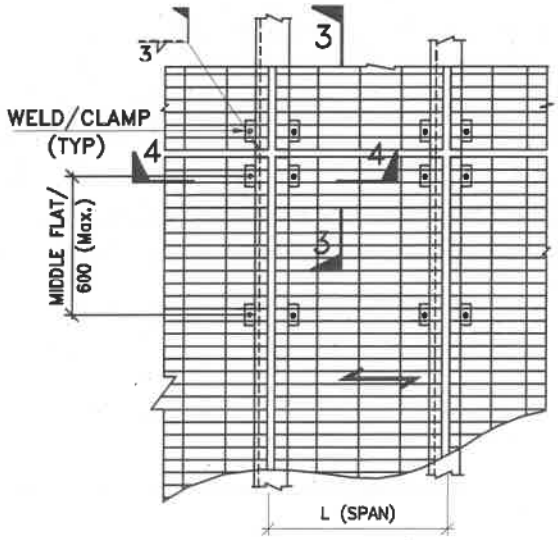
VIEW 4B-4B
GRATING FIXED WITH DISC
(REFER NOTE-8, 13, 15 & 16)



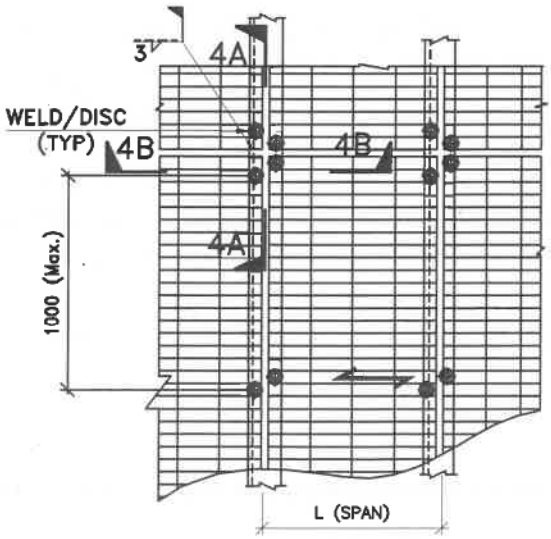
THREADED STUD
FIXING DETAILS
(REFER NOTE-15)



GRATING FASTENER
DISC DETAILS
(REFER NOTE-15)



OPTION-1
(WITH CLAMP)



OPTION-2
(WITH DISC)

FIXING DETAIL OF GRATING PANELS

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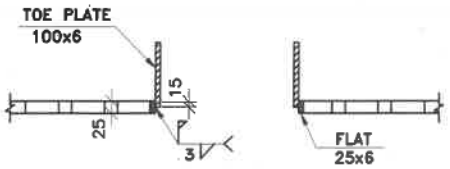
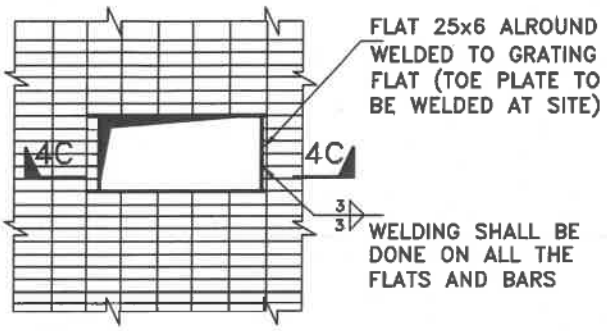
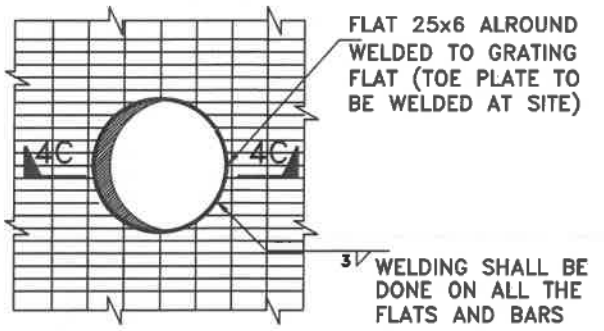


SEC. 4C–4C

(REFER NOTE–5, 13 & 16)



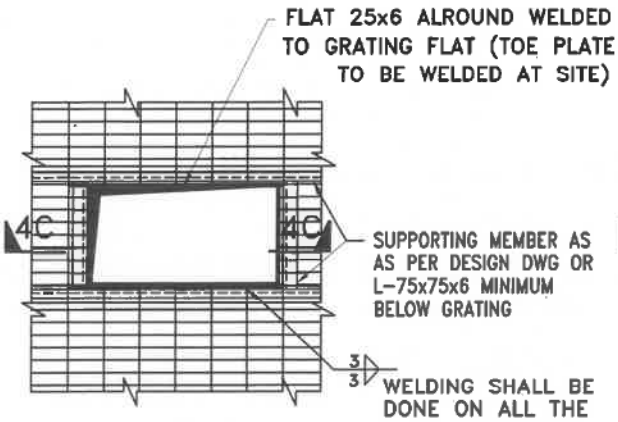
RECTANGULAR



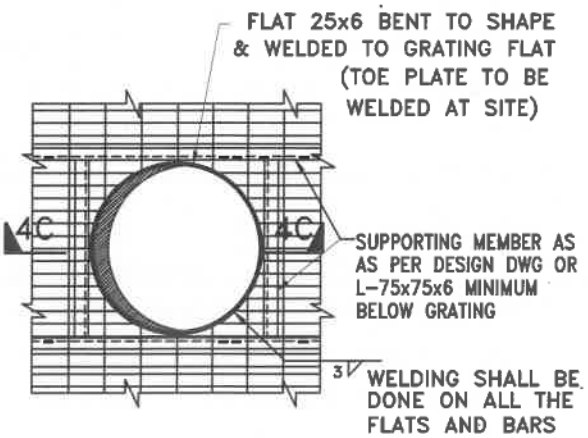
CIRCULAR

(SIZE OF OPENING >200 & UP TO 400 mm)

(FOR OPENING UP TO 200 MM REFER NOTE–12)



RECTANGULAR



CIRCULAR

SIZE OF OPENING GREATER THAN 400 mm

TYPICAL DETAIL OF GRATING STRENGTHENING AT OPENINGS

(REFER NOTE–9)

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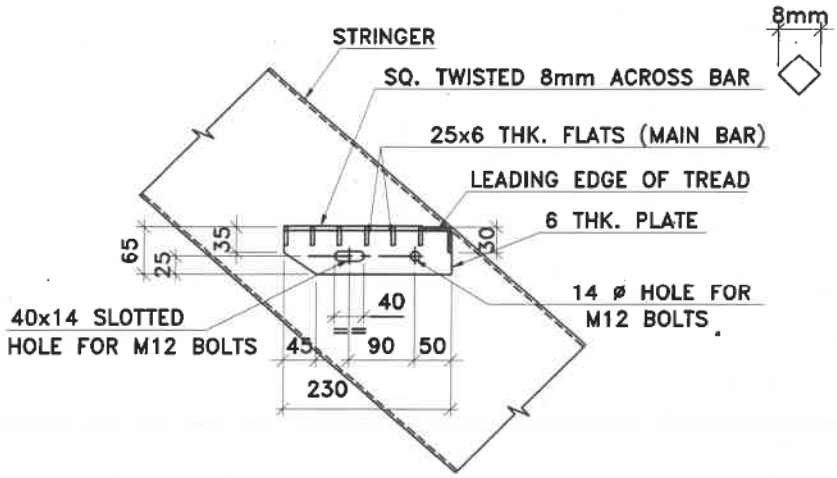
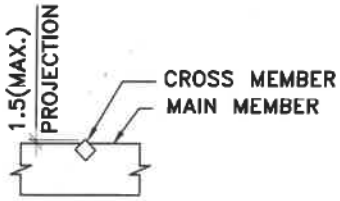
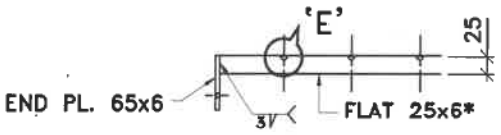
DET. OF 25 THK. GRATING STAIRCASE TREAD FOR 750 & 1000 WIDE STAIR



VIEW 6–6

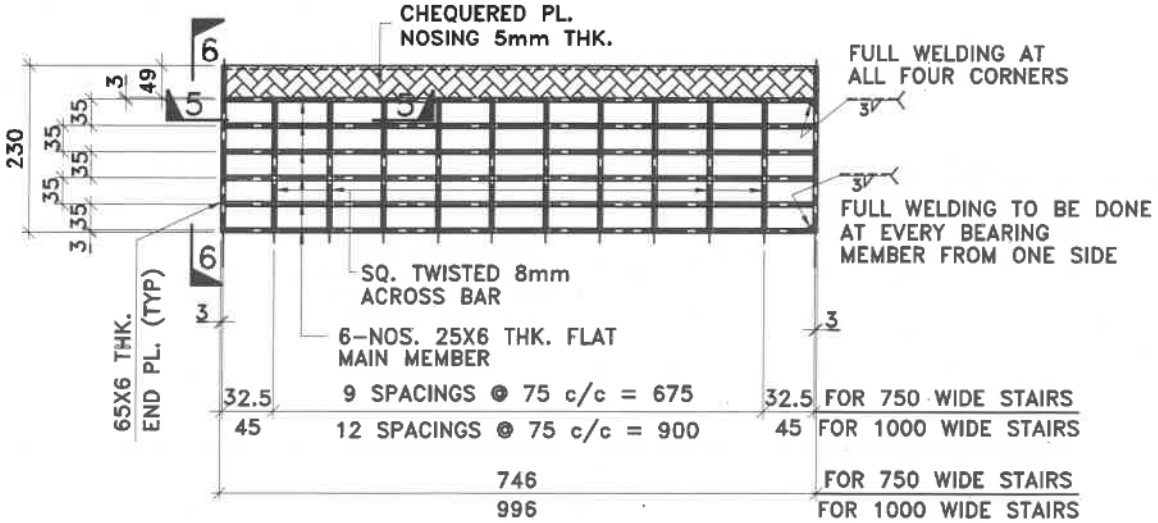


DETAIL– 'E'



SECTION 5–5

*ALL THE FLATS TO BE WELDED TO THE END FLATS



PLAN

(REFER NOTE–13 & 16)

TYP. DETAIL OF GRATING TO BE USED AS TREAD FOR 750/1000 WIDE STAIRS

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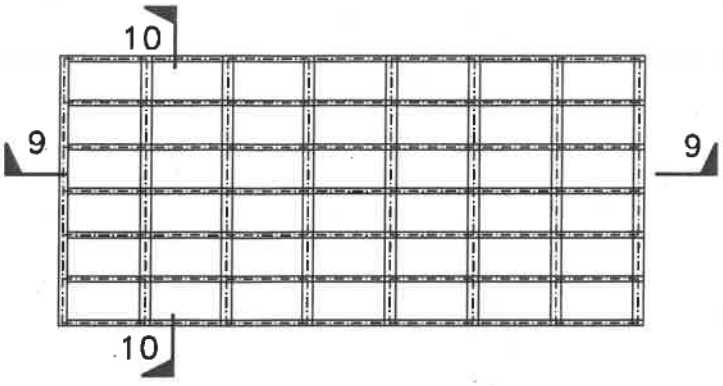
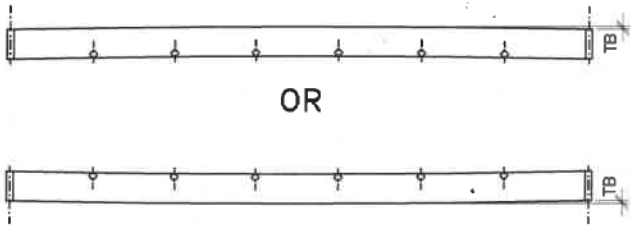
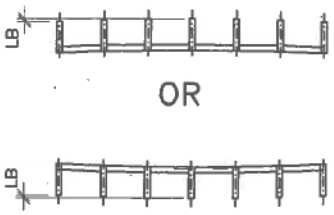




SECTION 9–9
(TB=TRANSVERSE BOW)



SECTION 10–10
(LB=LONGITUDINAL BOW)

TABLE–4 (PERMISSIBLE AND MANUFACTURER TOLERANCES)

PERMISSIBLE TOLERANCES LOCATION	TOLERANCE (MM)
LENGTH OF GRATING PANEL OR INDIVIDUAL BEARING BAR	+0 / –5
WIDTH OF GRATING	+0 / –5
DEPTH OF BEARING BAR: FOR 25MM	+1 / –0.5
THICKNESS OF BEARING BAR:	±0.4
BINDING: TOP OF CROSS BAR ABOVE MAIN BAR	+0.5 / –0.5
MANUFACTURING TOLERANCES LOCATION	TOLERANCE (MM)
DIFFERENCE BETWEEN THE LENGTH OF DIAGONALS	±5 (OUT OF SQUARENESS OF GRATING PANEL)
CROSS BARS IN EITHER DIRECTION FROM PERPENDICULAR ALIGNMENT WITH MAIN BARS	1:100
CROSS BAR SPACING	±5 PER 1500 LENGTH OF BEARING BARS
BEARING BAR LEAN	1:10
TRANSVERSE BOW (TB) OF PANEL BEFORE FASTENING TO SUPPORTS	1:100
LONGITUDINAL BOW (LB) OF PANEL BEFORE FASTENING TO SUPPORTS	1:200

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ABBREVIATIONS

ABD	AMINE BLOW DOWN
A/G	ABOVE GROUND
API	AMERICAN PETROLEUM INSTITUTE
ANSI	AMERICAN NATIONAL STANDARD INSTITUTE
AWWA	AMERICAN WATER WORKS ASSOCIATION
BC	BOX CULVERT
BCR	BEARING COOLING RETURN
BE	BEVEL END
BF	BLIND FLANGE
BL	BED LEVEL
BOP	BOTTOM OF PIPE
BOTT.EL	BOTTOM ELEVATION(CABLE DUCT ETC)
CBD	CLOSE BLOW DOWN
CI	CAST IRON
C/C	CENTRE TO CENTRE
℄	CENTRE LINE
CONC.RED	CONCENTRIC REDUCER
CONC	CONCRETE
CPLG	COUPLING
CS	CARBON STEEL
CONN	CONNECTION
CONT	CONTINUATION
CRWS	CONTAMINATED RAIN WATER SEWER
CW	CONSTRUCTION WATER/CARRIAGE WAY
CWPH	COOLING WATER PUMP HOUSE
CWS	CAUSTIC WASTE SEWER
COL	COLUMN
DIA	DIAMETER
DWG	DRAWING
DISCH.	DISCHARGE
ETP	EFFLUENT TREATMENT PLANT
ECC	ECCENTRIC
EL	ELEVATION
ERC	ELECTRIC CABLE ROAD CROSSING
EWSS	EYE WASH & SAFETY SHOWER
FCR	FOR CONTINUATION REFER
FF	FLAT FACE
FGL	FINISHED GROUND LEVEL
F TO F	FACE TO FACE
FFL	FINISHED FLOOR LEVEL
FLGD.	FLANGED
FDN	FOUNDATION
GLV	GALVANISED
GT	GALVANISED BLACK STEEL TUBE
GR	GROUND/GRADE
HC	HOSE COUPLING
HP	HORSE POWER
HS	HOSE STATION
HPP	HIGH POINT OF PAVEMENT
ID	INSIDE DIAMETER
INST	INSTRUMENT
INV	INVERT
IRC	INSTRUMENT CABLE ROAD CROSSING
MDS	MECHANICAL DATA SHEET
MK	MARK
MR	MATERIAL REQUISITION
MTO	MATERIAL TAKE OFF
MS	MILD STEEL
MH	MANHOLE
NGL	NATURAL GROUND LEVEL
OD	OUTSIDE DIAMETER
OHT	OVERHEAD TANK
OWS	OILY WATER SEWER
PC	PIPE CULVERT
PDS	PROCESS DATA SHEET
PE	PLAIN END
PR	PURCHASE REQUISITION
PWS	PROCESS WASTE SEWER
PWB	PIPE WAY BRIDGE
RCC	REINFORCED CEMENT CONCRETE
R	RADIUS
RF	RAISED FACE
REF	REFERENCE
RW	ROAD WAY
SO	SLIP ON
SOR	SCHEDULE OF RATES
SS	STORM SEWER
STD	STANDARD
SCRC	STREET CABLE ROAD CROSSING
STN	STATION
SWS	SANITARY WASTE SEWER
TEMP	TEMPERATURE
TOS	TOP OF SLEEPER
TYP	TYPICAL
TWDK	TEMPORARY DRINKING WATER
U/G	UNDER GROUND
WCS	COOLING WATER SUPPLY
WCR	COOLING WATER RETURN
WDK	DRINKING WATER
WF	FIRE WATER
WR	RAW WATER
WH	HORTICULTURE WATER
WT	TREATED WATER
WF	FILTERED WATER
WWS	WASTE WATER SYSTEM

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5	14.03.2024	REVISED & ISSUED AS STANDARD	MK	AK	SKN	MN

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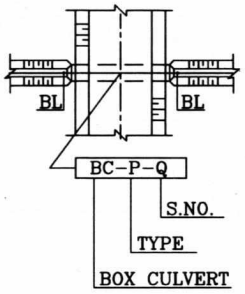
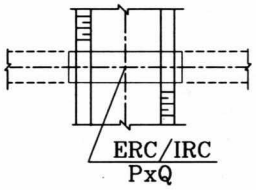
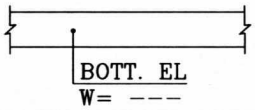
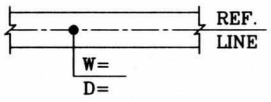
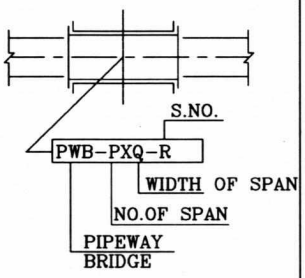
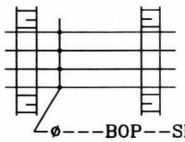
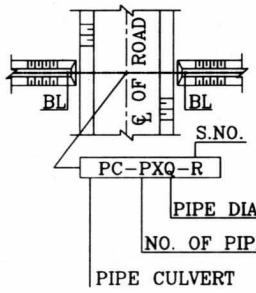
LEGENDS

○	NATURAL GROUND LEVEL		BOX CULVERT REPRESENTATION ON AREA DRAWING
●	FINISHED GROUND LEVEL		
⊖	ROAD TOP LEVEL/ PAVEMENT TOP LEVEL		
⊕	FINISHED FLOOR LEVEL OF BUILDING		
—·—·—	CENTRE LINE		
— — —	LAND ACQUISTION LIMIT		ERC–ELELCTRIC CABLE PxQ ROAD CROSSING NO.OF PIPE IN EACH LAYER NO. OF LAYERS
▬▬▬	COMPOUND WALL		
———	BATTERY LIMIT		
—··—··—	MATCHING LINE		R.C.C. CABLE TRENCH
ROAD–A	ROAD–A REPRESENTATION ON LAYOUTS (A=COORDINATE OF ROAD ℄)		
ROAD–A	ROAD–A REPRESENTATION IN AREA DRAWINGS (A=COORDINATE OF ROAD ℄)		BURIED CABLE TRENCH D=DEPTH W=WIDTH
HIGHER EDGE / LOWER EDGE	SIDE SLOPE		PIPEWAY BRIDGE
BL	TRAPEZOIDAL DITCH REPRESENTATION ON AREA DRAWING		
BL TYPE---	RECTANGULAR DITCH REPRESENTATION ON AREA DRAWING		
BL	TRAPEZOIDAL DITCH REPRESENTATION ON LAYOUT DRAWING		
BL TYPE---	RECTANGULAR DITCH REPRESENTATION ON LAYOUT DRG.		PIPE SLEEVES
BL BL PC/BC---	PIPE CULVERT BOX CULVERT REPRESENTATION ON LAYOUT DRG.		
	PIPE CULVERT REPRESENTATION ON AREA DRAWING	ø--- -CW-PIPE CLASS---	CONSTRUCTION WATER PIPE LINE
		ø--- -WT-PIPE CLASS---	TREATED WATER PIPE LINE
		ø--- -TWDK-PIPE CLASS---	TEMPORARY DRINKING WATER PIPE LINE
		ø--- -WDK-PIPE CLASS---	DRINKING WATER PIPE LINE

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5	14.03.2024	REVISED & ISSUED AS STANDARD	MK	AK	SKN	MN

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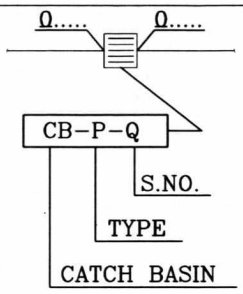
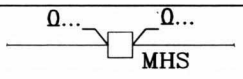
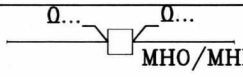
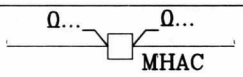
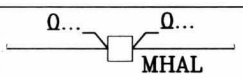
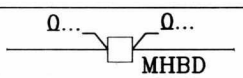
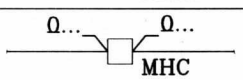
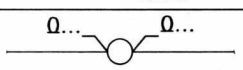
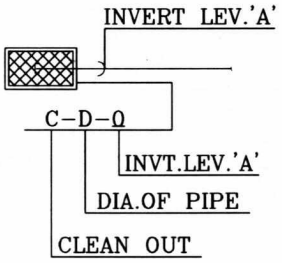
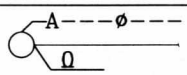
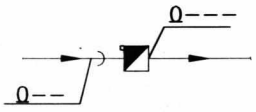
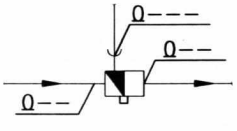
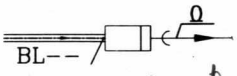
ø--- -WCS-PIPE CLASS---	COOLING WATER SUPPLY PIPE		45° BEND (TURNED DOWN)
ø--- -WCR-PIPE CLASS---	COOLING WATER RETURN PIPE		CATCH BASIN
ø--- -WF-PIPE CLASS---	FIRE WATER PIPE LINE		
ø--- -WH-PIPE CLASS---	HORTICULTURE WATER PIPE LINE		
ø--- -WS-PIPE CLASS---	SERVICE WATER PIPE LINE		
ø--- -SS-PIPE CLASS---	STORM SEWER		PIPE INVERT LEVEL
ø--- -DS-PIPE CLASS---	SANITARY WATER SEWER		SANITARY SEWER MANHOLE
ø---OWS/PWS-PIPE CLASS--	OILY WASTE SEWER/ PROCESS WASTE SEWER		OILY/PROCESS SEWER MANHOLE
ø--- -CTBD-PIPE CLASS--	COOLING TOWER BLOW DOWN		ACIDIC SEWER MANHOLE
ø--- -ACID-PIPE CLASS--	ACIDIC SEWER		ALKALI SEWER MANHOLE
ø---ALKALI-PIPE CLASS--	ALKALI SEWER		CTBD SEWER MANHOLE
ø---SANITARY PUMPING-PIPE CLASS---	SANITARY PUMPING MAIN		CHEMICAL SEWER MANHOLE
	GATE VALVE		CIRCULAR MANHOLE
	GLOBE VALVE		CLEAN OUT
	BUTTERFLY VALVE		
	CHECK VALVE		
	FLOAT VALVE		
	PIPE WITH FLANGED END		FUNNEL FOR STORAGE TANK DRAIN
	BLIND FLANGED END		RECTANGULAR SEALED MANHOLE (SINGLE COMPARTMENT)
TYPE	VALVE PIT IN PIPE LINE		
	90° BEND (TURNED UP)		RECTANGULAR SEALED MANHOLE (DOUBLE COMPARTMENT)
	90° BEND (TURNED DOWN)		
	45° BEND (TURNED UP)		SAND TRAP

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5	14.03.2024	REVISED & ISSUED AS STANDARD	MK	AK	SKN	MN

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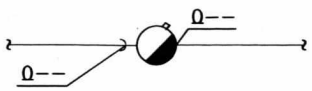
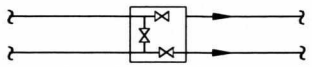
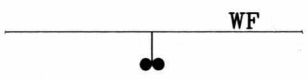
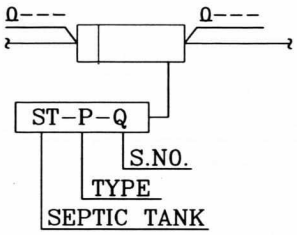
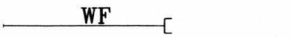
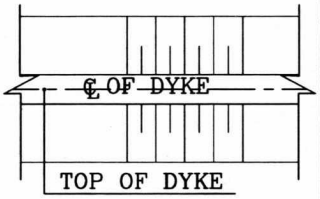
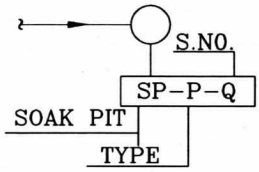
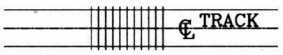
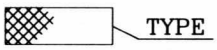
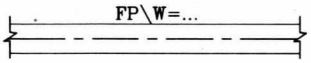
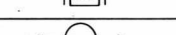
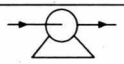
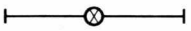
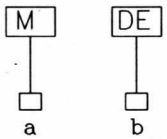
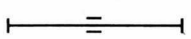
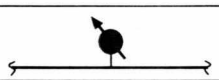
	SEALED MANHOLE (CIRCULAR)		WATER MONITOR FOR FOR FIRE WATER SYST.
			FOAM MONITOR FOR FOR FIRE WATER SYST.
	THREE WAY VALVE PIT (VALVE PITS OUTSIDE TANKFARM AREA FOR DRAINAGE)		DOUBLE HEADED FIRE HYDRANT AWAY FROM HEADER
	SEPTIC TANK		FIRE HOSE COUPLING
			EARTHEN DYKE
	SOAK PIT		RAILWAY TRACK REPRESENTATION ON LAYOUT
			RAILWAY TRACK REPRESENTATION ON AREA DWG.
	GULLY TRAP		PIPE RACK
	GATE		PIPE WAY
	BARBED WIRE FENCING	EQPT. SYMBOLS	
	CHAIN LINK FENCING		HOSE CABINET
	R.C.C. PAVEMENT		HOSE REEL
	FOOTPATH W=WIDTH OF FOOTPATH		DELUGE VALVE ASSEMBLY
	SLIDING SLEEPER		PUMP (HORIZONTAL)
	ANCHOR SLEEPER		PUMP VERTICAL a) ELECT. DRIVE b) DEISEL DRIVE
	GUIDE SLEEPER		
	JUMP OVER SLEEPER		
	FIRE HYDRANT SINGLE HEADED		WATER CUM FOAM MONITOR
	FIRE HYDRANT DOUBLE HEADED		

Rev. No	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
5	14.03.2024	REVISED & ISSUED AS STANDARD	MK	AK	SKN	MN

Approved by

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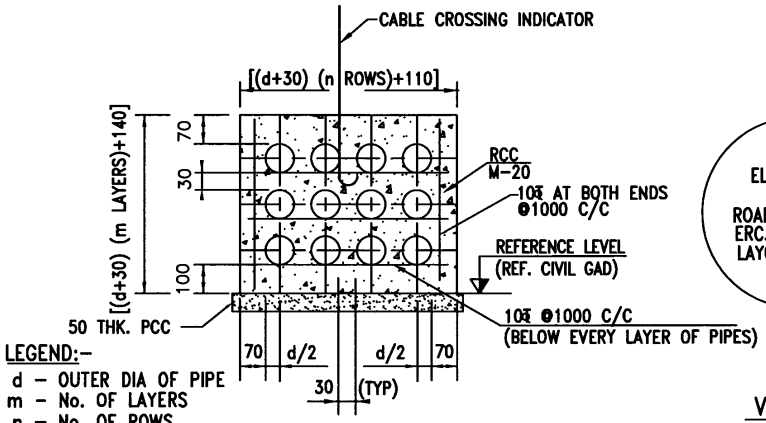
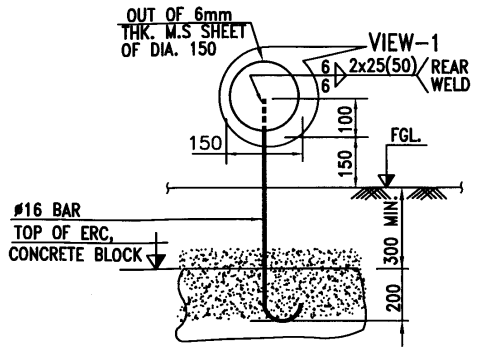


SECTION Y-Y

ELECTRICAL CABLE ROAD CROSSING ERC...(NO. AS LAYOUT DWG.)

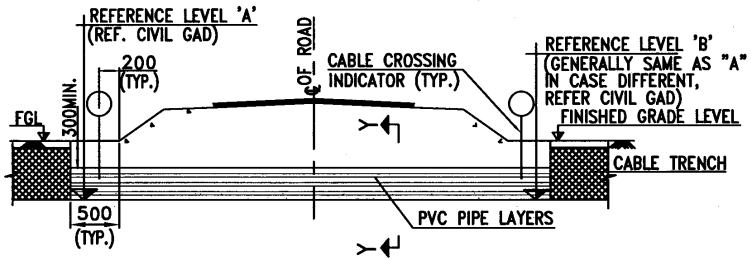
VIEW-1
(SEE NOTE-6)



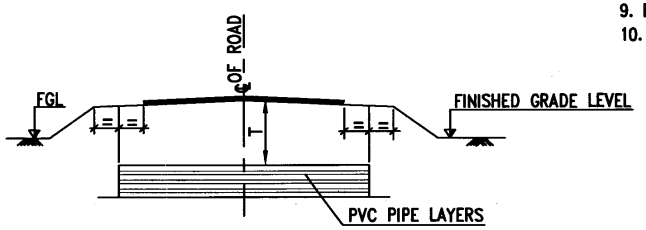
DETAILS OF CABLE CROSSING INDICATOR

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. CONDUIT MATERIAL P.V.C. PIPES OF NOM. OUT SIDE PIPE DIA. ϕ110, ϕ160 OR ϕ210 AS PER LAYOUT PLAN.
3. PIPES SHALL CONFIRM TO IS:4985 CLASS-I AND EMBEDDED IN RCC M-20.
4. BACK FILLING OVER ERC/ IRC/ SCRC SHALL BE DONE IN CONFORMATION TO SUB GRADE REQUIREMENT FOR ROADS AS PER 7-65-0011/JOB DRAWING FOR ROAD CROSS SECTION.
5. IN CASE CABLE CROSSING IS REQUIRED TO CROSS THE OPEN DITCHES ON EITHER SIDE, AS SHOWN IN STD.NO.7-51-0322, THE LENGTH AND THE LEVEL OF CABLE CROSSING SHALL BE DECIDED CLEARING THE SERVICES ALONG ROAD SIDE.
6. CABLE CROSSING INDICATOR MADE OF 6mm THICK MILD STEEL PLATE AS PER IS: 2062, ENAMEL PAINTED IN TRAFFIC GREEN (RAL 6024) BACKGROUND ON BOTH SIDES WITH WHITE LETTERING.
7. THE SHAPE OF PVC REMOVABLE TYPE CAP AS SHOWN IS INDICATIVE.
8. PVC PIPES WILL BE TIED WITH SUPPORTING 10 BARS AND 16 SWG BINDING WIRE AT @ 1000C/C.
9. REINFORCEMENT SHALL BE OF GRADE Fe500 TMT BAR CONFIRMING TO IS: 1786.
10. 'T' IS THE THICKNESS OF ROAD CRUST.



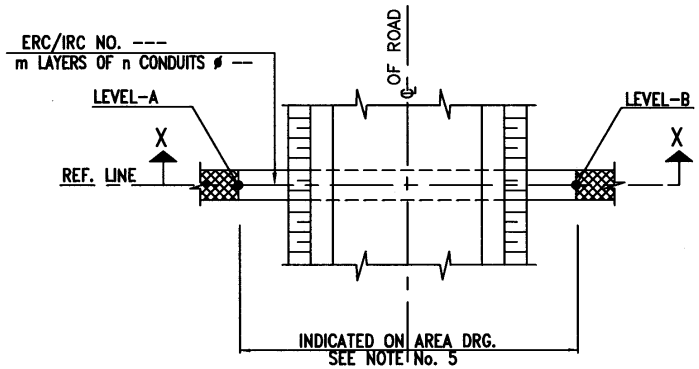
SECTION X-X
(APPLICABLE FOR ERC & IRC)



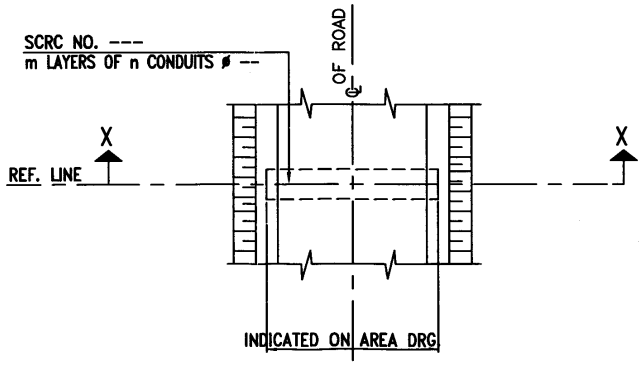
SECTION X-X
(APPLICABLE FOR SCRC)
(REFER SECTION Y-Y FOR CROSS SECTION DETAILS OF SCRC)

LEGENDS:

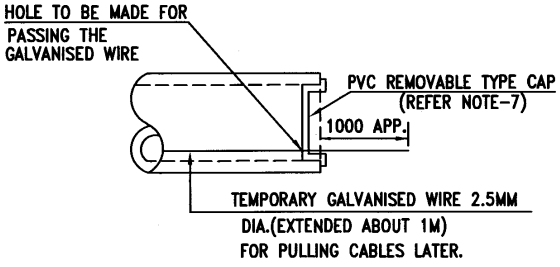
SCRC	STREET CABLE ROAD CROSSING
ERC	ELECTRICAL ROAD CROSSING
IRC	INSTRUMENTATION ROAD CROSSING



PLAN
(REPRESENTATION ON AREA DRG.)



PLAN
(REPRESENTATION ON AREA DRG.)



SLEEVE END PLUGGING DETAIL

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
5	21.12.20	REVISED AND ISSUED AS STANDARD	ADP	AK	A.SINHA	SM
4	25.07.14	REAFFIRMED AND ISSUED AS STANDARD	HV	RKS	RBB	SC

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(भारत सरकार का उपक्रम) (A Govt. of India Undertaking)

CABLE CROSSING UNDER ROAD (P.V.C. PIPES)

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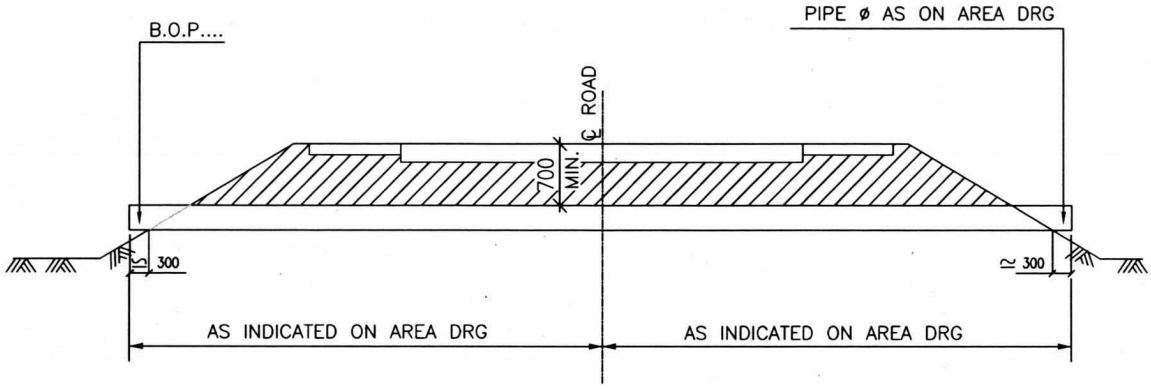
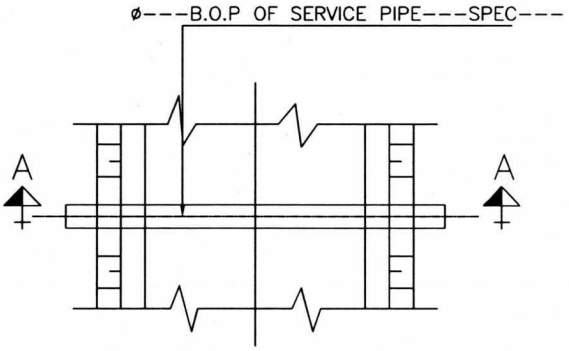


SECTION – A A

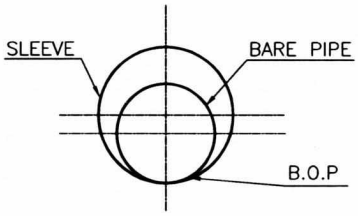


PLAN

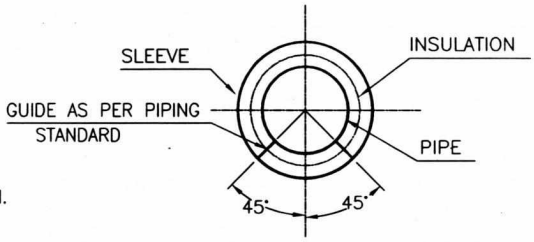
REPRESENTATION ON AREA DRG.

TABLE OF SLEEVE

BARE PIPE SIZE OR OUTER ø OF INSULATION IN CASE OF INSULATED PIPE	SLEEVE PIPE SIZE
1 1/2"	4"
2"	4"
3"	6"
4"	6"
6"	10"
8"	10"
10"	14"
12"	14"
14"	16"
16"	20"
18"	20"
20"	24"
22"	24"
24"	30"



CASE–I BARE PIPE



CASE – II INSULATED PIPE

NOTES: –

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. MOC FOR PIPE SLEEVES SHALL BE AS PER APPROVED DESIGN BASIS.
3. C.S. PIPE SLEEVES SHALL BE PROVIDED WITH CORROSION PROTECTION COATING AS PER JOB SPECIFICATION.
4. PIPE SLEEVES WITH INADEQUATE CLEAR COVER SHALL BE ENCASED AS PER EIL STD. NO. 7–65–0213.
5. ENDS OF THE PIPE SLEEVES SHALL BE PLUGGED WITH BITUMEN IMPREGNATED MINERAL WOOL.
6. FOR CASE–II (INSULATED PIPE) THE OUTER DIAMETER OF THE SERVICE PIPE TO BE CONSIDERED AS OUTER DIAMETER OF INSULATION

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
5	14.03.24	REVISED & ISSUED AS STANDARD	MK	AK	SKN	MN
4	08.06.18	REAFFIRMED & ISSUED AS STANDARD	Anil	HV/AK	RS	RKT

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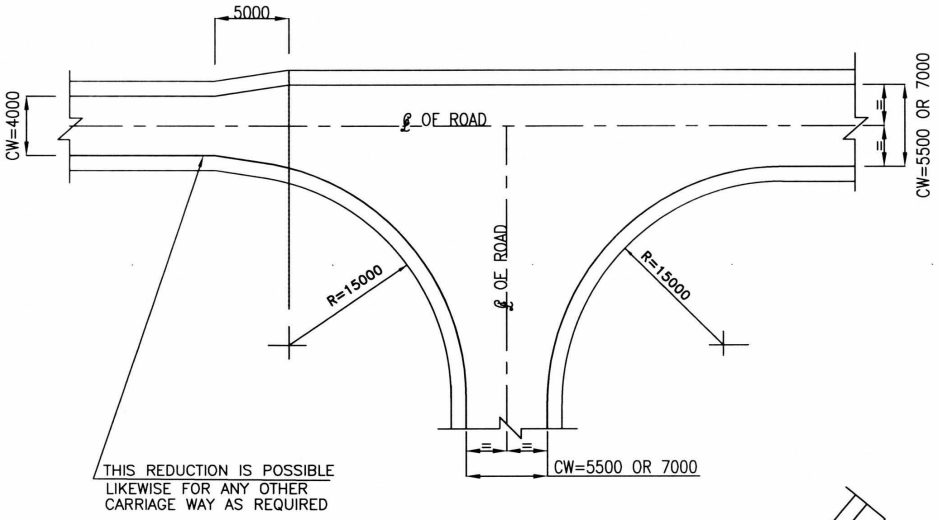
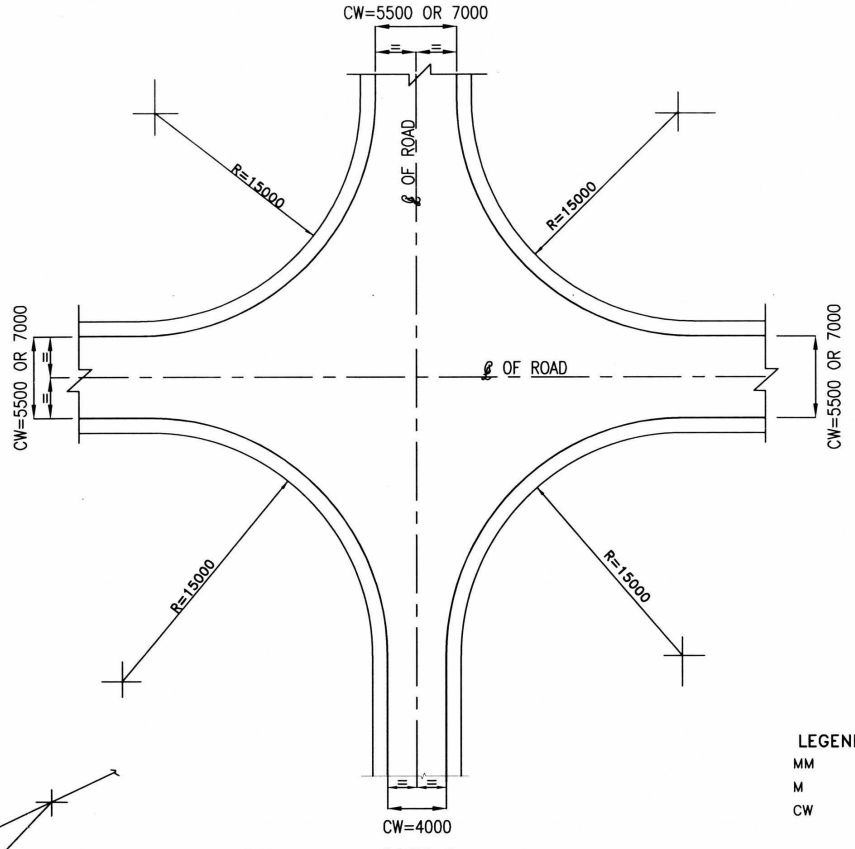
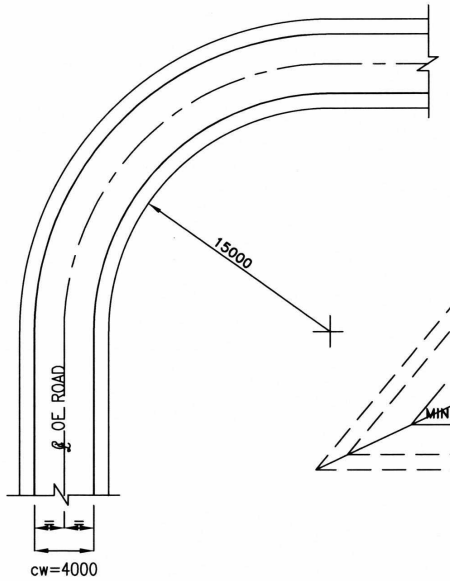


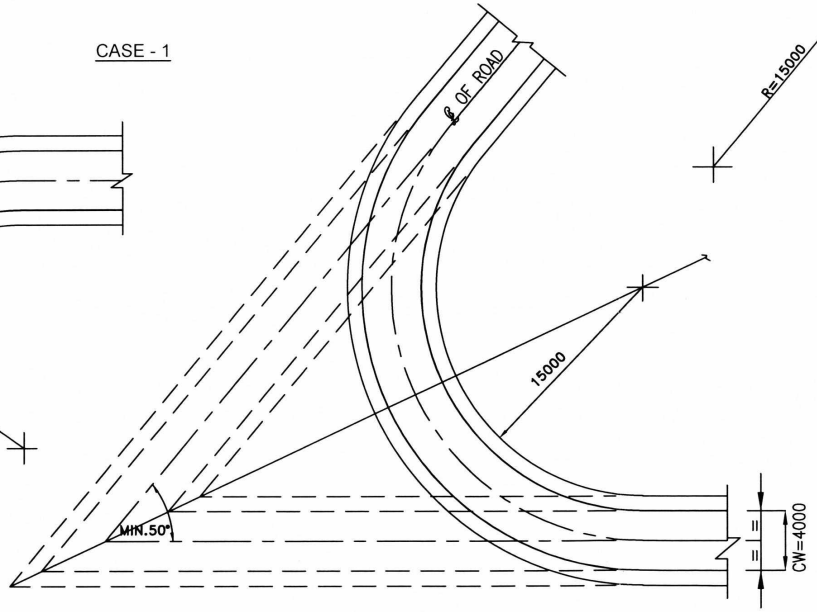
CASE - 1



CASE - 2



CASE - 3



CASE - 4

LEGEND:–

MM	MILLIMETRE
M	METRE
CW	CARRIAGE WAY

NOTES:–

1. ALL DIMENSIONS ARE IN MM UNLESS STATED OTHER WISE.
2. GENERALLY THE RADII OF CURVES AT CROSSING SHALL BE AS GIVEN IN THIS DRAWING AS EXPLAINED BELOW.
3. RADII OF CURVES FOR APPROACH ROADS TO BUILDINGS AND OTHERS AREAS MAY BE REDUCED AS PER SERVICE REQUIREMENTS.
4. FOR ROADS CURVES WITH ACUTE ANGLE TURNING, ANGLE SHOULD NOT BE LESS THAN 50°.
5. RADII OF CURVES AND CROSSING WHEN DIFFERENT FROM THOSE GIVEN IN THIS STANDARD TO MEET ANY SPECIAL REQUIREMENT SHALL BE SO MARKED IN THE AREA DRAWINGS.
6. THIS ROAD CURVES & CROSSING STANDARD IS APPLICABLE WITHIN INDUSTRIAL PLANT ONLY.
7. REFERENCE CODE– IRC-86
8. 5% SUPER ELEVATION (e) TO BE PROVIDED.

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	6	14.03.2024	REVISED AND REISSUED AS STANDARD	MK	AK	SKN	MN		7-65-0010 Rev. 6
						Approved by			Page 1 of 1

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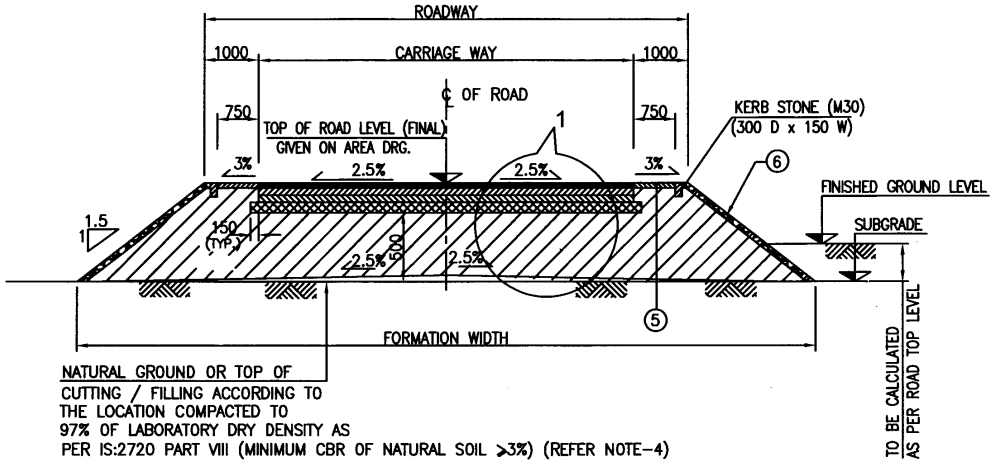
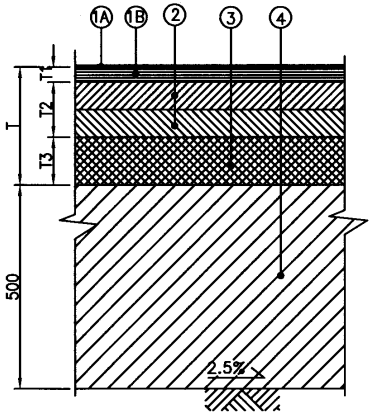


CROSS SECTION OF ROAD



DETAIL - 1

LEGEND :-

(1A)(1B) WEARING COURSE & BINDER COURSE (T1) FINAL FINISH.
T1A – 30 mm THK. BITUMINOUS CONCRETE (WEARING COURSE)
(AS PER SECTION 507 OF MORTH SPECIFICATION) WITH SEAL COAT
T1B – 60 mm THK. DENSE BITUMINOUS MACADAM (DBM)
(AS PER SECTION 505 OF MORTH SPECIFICATION)

(2) BASE COURSE (T2)
– 250 mm THK. WET MIX MACADAM (WMM) (2 LAYERS OF 125 mm EACH) CONFIRMING TO IRC/MORTH SPECIFICATION FOR ROAD & BRIDGE WORKS (SECTION 406).

(3) SUB BASE COURSE (T3)
– ONE LAYER OF 150 mm THK GRANULAR SUB BASE OF GRADE II CONFIRMING TO MORTH SPECIFICATION FOR ROAD AND BRIDGE WORKS (SECTION 401).

(4) SUB GRADE 500 mm THICK
APPROVED MATERIAL (HAVING MINIMUM CBR 8%)
COMPACTED TO AT LEAST 97 % OF LABORATORY DRY DENSITY
WITH HEAVY COMPACTION AS PER IS 2720 PART (VIII)
(IN LAYERS NOT EXCEEDING 200 mm OF LOOSE THICKNESS)

(5) 60 mm THK. INTER LOCKING PAVER BLOCKS (CATEGORY A) AS PER IRC:SP:63 OVER 20 mm THK. SAND BED (LEVELING COURSE).

(6) IF THE ROAD HEIGHT IS MORE THAN 1M ABOVE FGL, BRICK MASONRY / RANDOM RUBBLE MASONRY ON EDGE PITCHING IN 1:6 MORTAR/ PCC M20 LINING (IN 3 M x 3 M PANEL) SHALL BE PROVIDED ON SIDE SLOPES OF EMBANKMENT.

DESIGN PARAMETERS

EFFECTIVE CBR OF SUBGRADE = 6% (REFER NOTE–3)
MILLION STANDARD AXEL = 3 msa

T (TOTAL CRUST THICKNESS)
= T1A + T1B + T2 + T3

WEARING COURSE — LOAD BEARING CRUST

NOTES:-

1. ALL DIMENSIONS ARE IN MM, UNLESS MENTIONED OTHERWISE.
2. BITUMEN GRADE SHALL BE AS PER TABLE 500–1 OF MORTH SPECIFICATION :–

LOWEST DAILY MEAN AIR TEMPERATURE, °C	HIGHEST DAILY MEAN AIR TEMPERATURE, °C		
	LESS THAN 20°C	20°C TO 30°C	MORE THAN 30°C
MORE THAN –10°C	VG–10	VG–20	VG–30
–10°C OR LOWER	VG–10	VG–10	VG–20

3. THE EFFECTIVE CBR OF ROAD DESIGN HAS BEEN CONSIDERED AS 6% CONSIDERING 500mm THICK. SUB GRADE OF 8% CBR AND SOIL BELOW SUB GRADE LEVEL OF 3% (MINIMUM) CBR.
4. IF CBR OF SOIL BELOW SUB GRADE IS LESS THAN 3%, GEOTECH RECOMMENDATION FOR SOIL IMPROVEMENT SHALL BE FOLLOWED FOR GROUND BELOW SUB GRADE.
5. FOR CONSTRUCTION OF ROADS MORTH SPECIFICATION FOR ROADS & BRIDGES WORKS SHALL BE FOLLOWED.
6. DURING MICRO GRADING, IF REQUIRED, ADDITIONAL LAYER OF BITUMINOUS CONCRETE AND/ OR DENSE BITUMINOUS MACADAM (DBM) MAY BE PROVIDED IN THE DAMAGED PORTION OF ROAD.

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Rev. No.	Date	Purpose	Prepared by	Checked by	Approved by: Stds. Committee Convenor	Approved by: Stds. Bureau Chairman
1	21.12.2020	REVISED & ISSUED AS STANDARD	NS	GYAS/AK	ANURAG SINHA	SANJAY MAZUMDAR
0	27.11.2017	ISSUED AS STANDARD	Anil	NS/AK	R. SRIVASTAVA	RAKESH NANDA

CROSS SECTION OF ROAD

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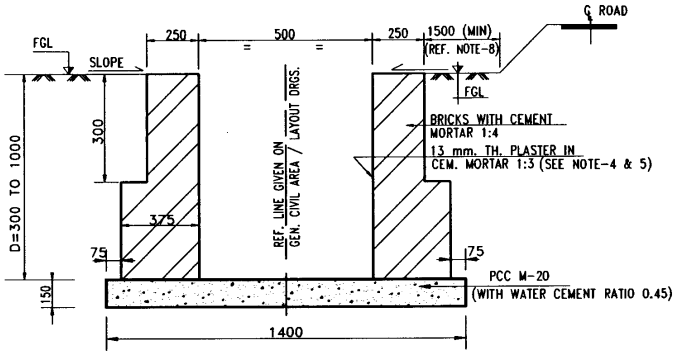
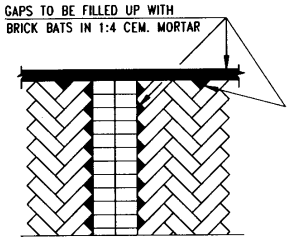


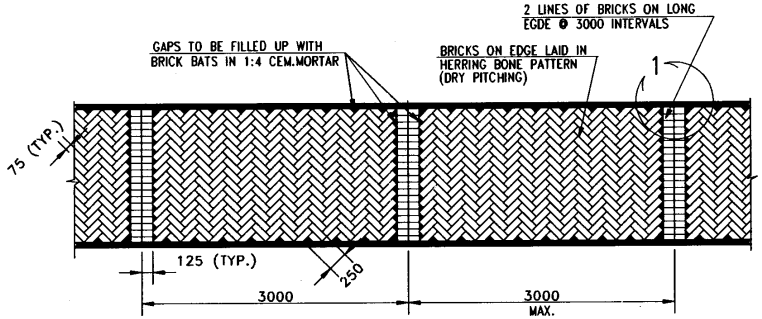
RECTANGULAR DRAIN
TYPE-2
(DEPTH ABOVE 300 TO 1000)



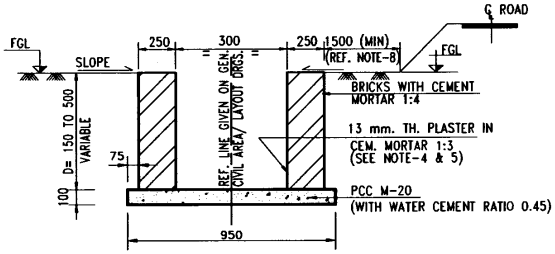
DETAIL – 1
(TYP)

NOTES:–

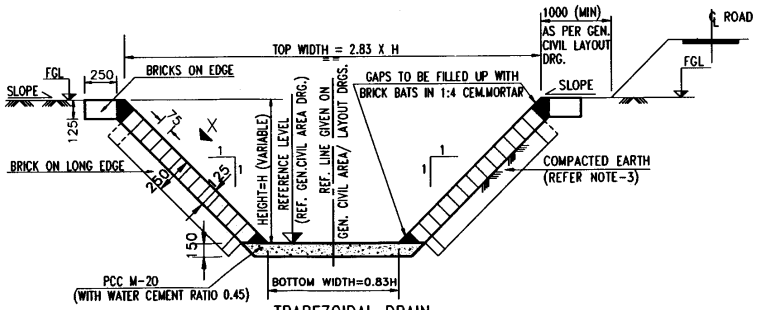
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. (a) THIS STD. IS APPLICABLE FOR OFFSITE AREAS ONLY.
   (b) WHEREVER TYPE 1 & 2 DRAINS ARE LAID IN EXPANSIVE SOIL, A LAYER OF MINIMUM 250mm THICK SAND SHALL BE PROVIDED BELOW AND AROUND THE SIDES OF DRAIN.
   (c) TRAPEZODIAL DRAIN (TYPE–3) IS NOT SUITABLE FOR AREAS WITH EXPANSIVE SOIL AND SANDY SOIL.
3. BRICK PITCHING SHALL BE DONE ONLY AFTER THE SIDES OF DRAIN ARE CUT, COMPACTED TO 90% OF MAX. LABORATORY DRY DENSITY AND DRESSED TO THE REQUIRED SLOPE.
4. 13 mm. THK. PLASTER IN CEM. MORTAR 1:3 SHALL BE PROVIDED ON BENDS UP TO A DISTANCE OF 1.5M ON EITHER SIDE OF THE BEND FOR ALL DRAINS. FLUSH CEMENT POINTING IN CEMENT MORTAR 1:3 SHALL BE DONE AT OTHER PLACES.
5. INTERNAL PLASTER OF SAME SPECIFICATION AS SHOWN IN NOTE–4 IN RECTANGULAR DRAIN TYPE–1 & 2 SHALL BE DONE ONLY FOR THE PORTION OF DRAIN LOCATED NEAR BUILDING.
6. EXACT THICKNESS OF BRICK MASONRY WORK SHALL BE ACCORDING TO THE SIZE OF LOCALLY AVAILABLE BRICK. HERE BRICK SIZE IS CONSIDERED AS 250X125X75.
7. THIS STANDARD ORG. SHALL BE VALID WHERE WATER TABLE IS UPTO FGL.
8. 1500 mm (MIN) HAS BEEN KEPT TO AVOID THE IMPACT OF SURCHARGE PRESSURE OF ROAD EMBANKMENT ON THE WALL OF THE DRAIN.



VIEW – X



RECTANGULAR DRAIN
TYPE–1
(UPTO 500 DEPTH)



TRAPEZOIDAL DRAIN
TYPE–3
(FOR H = 300 TO 2000)

इंजीनियर्स इंडिया लिमिटेड (भारत सरकार का उपक्रम) ENGINEERS INDIA LIMITED (A Govt. of India Undertaking)	7	28.09.20	REAFFIRMED AND ISSUED AS STANDARD	SK	RKS	AS	SM	STANDARD SECTIONS OF BRICK STORM WATER DRAINS	STANDARD No. 7-65-0101 Rev. 7
	6	23.07.14	UPDATED & ISSUED AS STANDARD	RBT	RKS	RBB	SC		Page 1 of 1
	Rev. No.	Date	Purpose	Prepared by	Checked by	Approved by: Stds. Committee Convenor	Approved by: Stds. Bureau Chairman		

Format No. 8-00-0001-F5 Rev. 0

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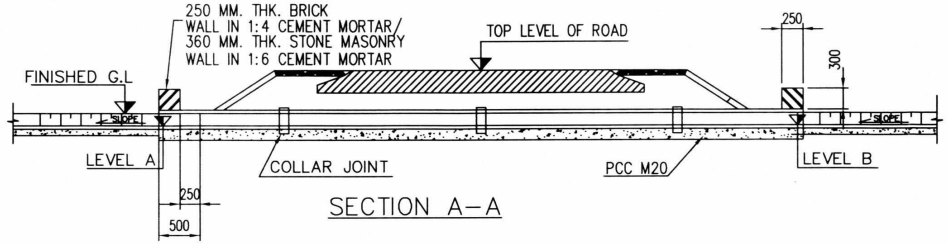
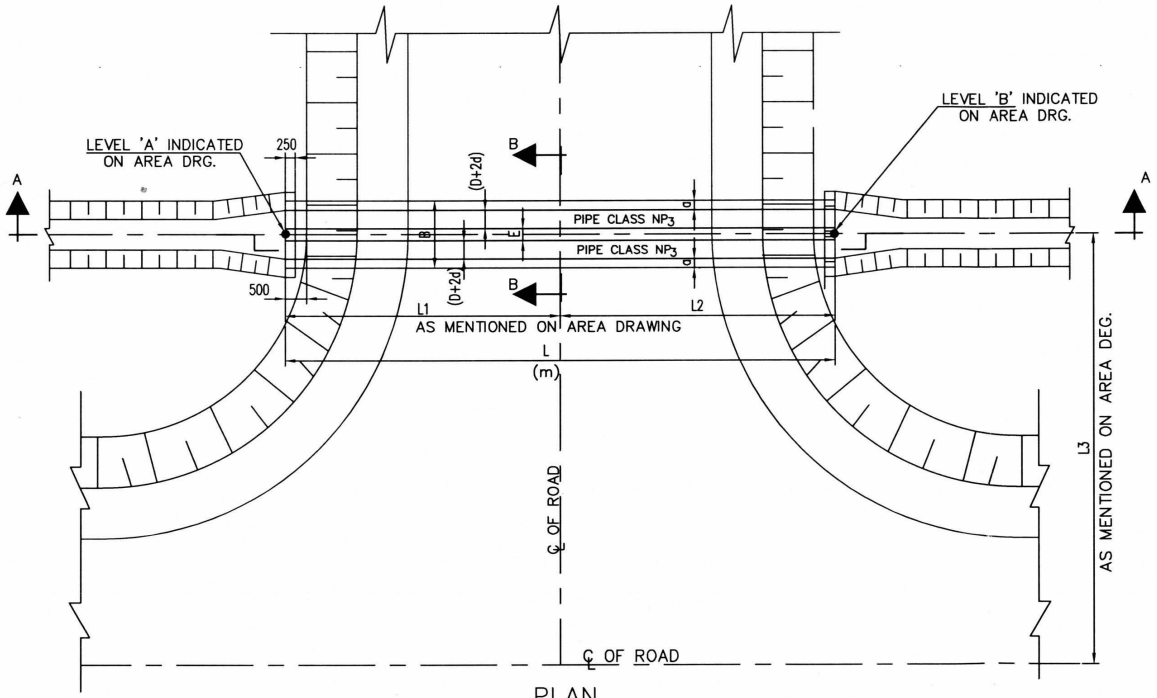
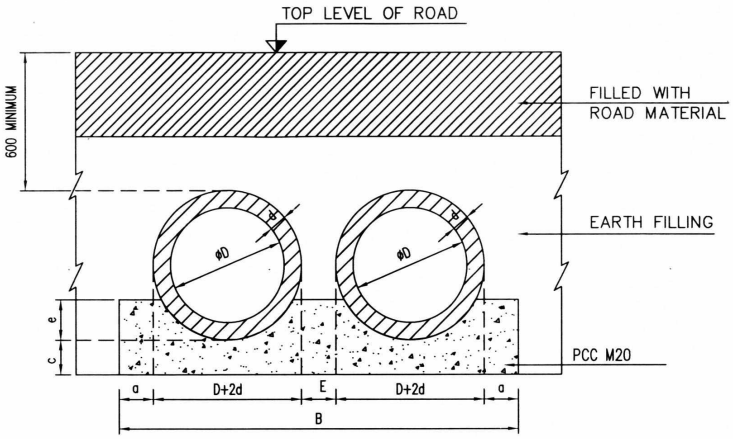


SECTION A–A



PLAN



SECTION B–B

PIPE DIA IN MM (D)	PIPE WALL THICKNESS IN MM (d)	PIPE OUTER DIA IN MM	a (MM)	E (MM)	B (MM)	c (MM)	e (MM)
500	75	650	150	350	1950	200	175
600	85	770	150	350	2190	200	175
700	85	870	200	400	2540	275	200
800	95	990	200	400	2780	275	200

NOTES:–

1. ALL DIMENSIONS ARE IN MM UNLESS SPECIFIED OTHERWISE.
2. THIS STANDARD SHALL BE READ ALONG WITH STANDARD NO. 7–65–0213.
3. THIS STANDARD IS NOT APPLICABLE FOR BLACK COTTON SOIL/POOR SOIL (N<4).
4. JOINTS IN PIPE SHALL BE EXTERNAL FLUSH JOINTS FOR PIPES OF INTERNAL DIA UPTO 700mm AND SHALL BE INTERNAL FLUSH JOINTS FOR PIPES OF DIA MORE THAN 700mm (REFERENCE CLAUSE 6.3 OF IS:458).
5. PIPES / SPIGOT JOINTS SHALL BE ENCASED AS PER EIL STD. 7–65–0213, WHEREVER ADEQUATE CLEAR COVER OVER PIPE IS NOT AVAILABLE.
6. REGULAR LINED DRAIN ALONG WITH WING WALLS UPTO A DISTANCE OF 5.0M ON EITHER SIDE OF PIPE CULVERT SHALL BE MADE BEFORE PUTTING THE CULVERT IN USE.
7. THE CONCRETE PIPE SHALL CONFORM TO IS: 458.

VALID FOR DIA 500 TO 800

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
5	14.03.24	REVISED AND ISSUED AS STD.	MK	AK	SKN	MN

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PIPE CULVERT FOR STORM WATER DRAINAGE

STANDARD No.
7-65-0103 Rev. 5
Page 1 of 2

Format No. 8-00-0001-F5 Rev. 0
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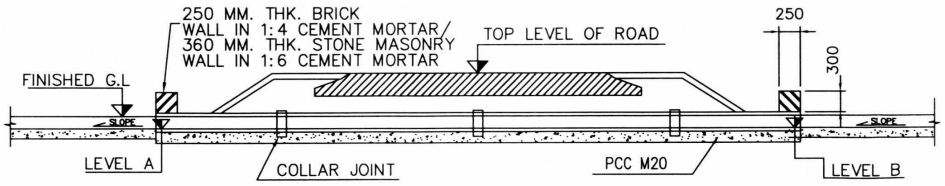
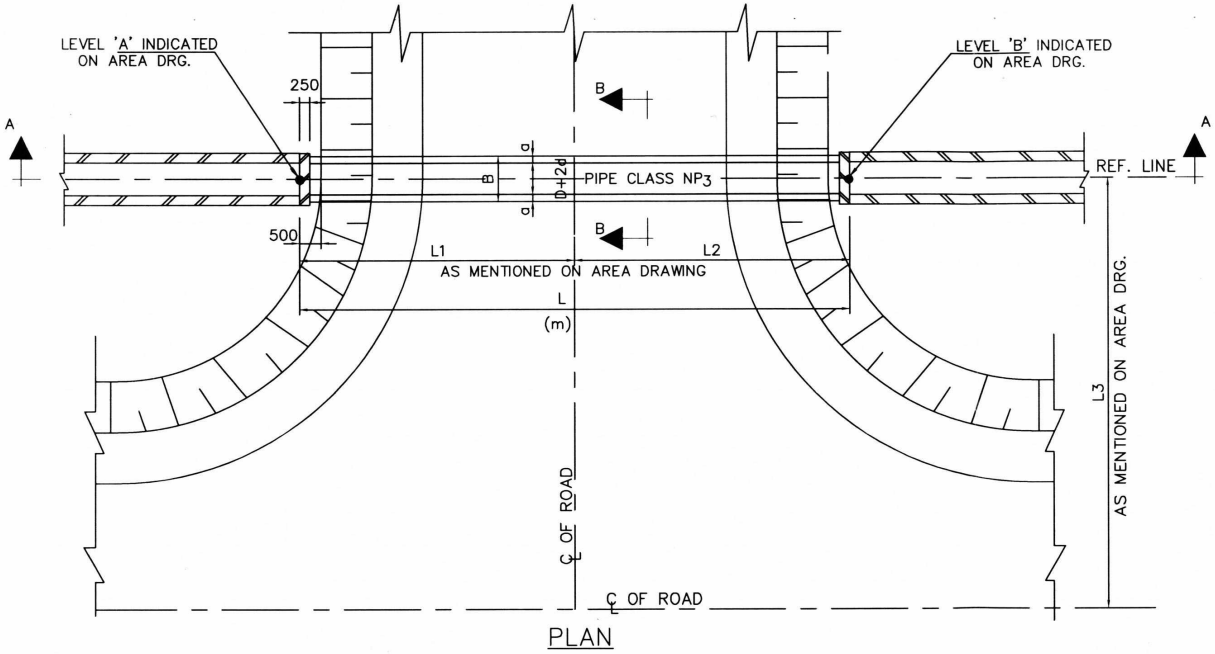
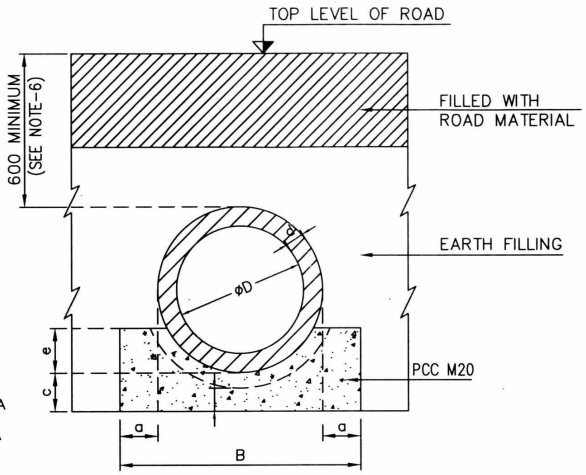


SECTION A–A



PLAN



SECTION B–B

NOTES: –

1. FOR NOTES, REFER PAGE 1 OF 2.

PIPE DIA IN MM (D)	BARREL WALL THICKNESS IN MM (d)	PIPE OUTER DIA IN MM	a (MM)	B (MM)	c (MM)	e (MM)
350	75	500	150	800	200	125
500	75	650	150	950	200	175
600	85	770	150	1070	200	175
700	85	870	200	1270	275	200
800	95	990	200	1390	275	200

VALID FOR DIA 350 TO 800

						STANDARD No.
5	14.03.24	REVISED AND ISSUED AS STD.	MK	AK	SKN	MN	PIPE CULVERT FOR STORM WATER DRAINAGE	7-65-0103 Rev. 5
Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman		Page 2 of 2
					Approved by			

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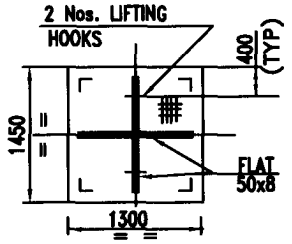
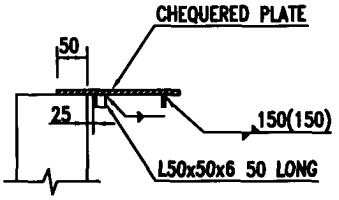
NOTE:

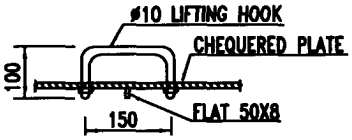
1. ALL DIMENSIONS ARE IN MILIMETERS UNLESS NOTED OTHERWISE.
2. REFER STRUCTURAL GENERAL NOTES OF THE PROJECT FOR REINFORCED CONCRETE STRUCTURES FOR FOLLOWING:
   a) GRADE OF CONCRETE
   b) GRADE AND TYPE OF CEMENT
   c) REINFORCEMENT STEEL BARS
   d) CLEAR COVER IN R.C.C. WORKS
3. THIS STD. IS APPLICABLE FOR UNIT AREA, OFFSITE AREA AND AREA WHERE GROUND WATER TABLE IS UPTO FGL.



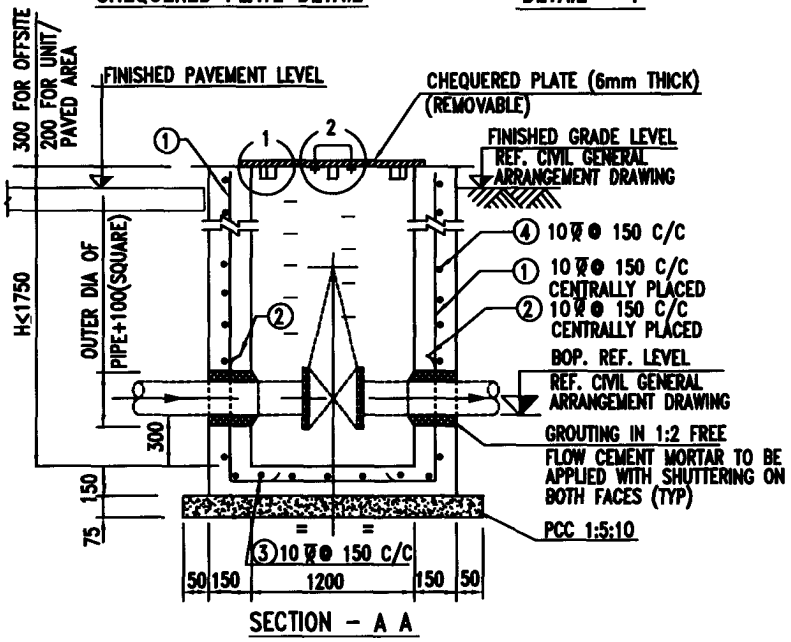
CHEQUERED PLATE DETAIL



DETAIL – 1



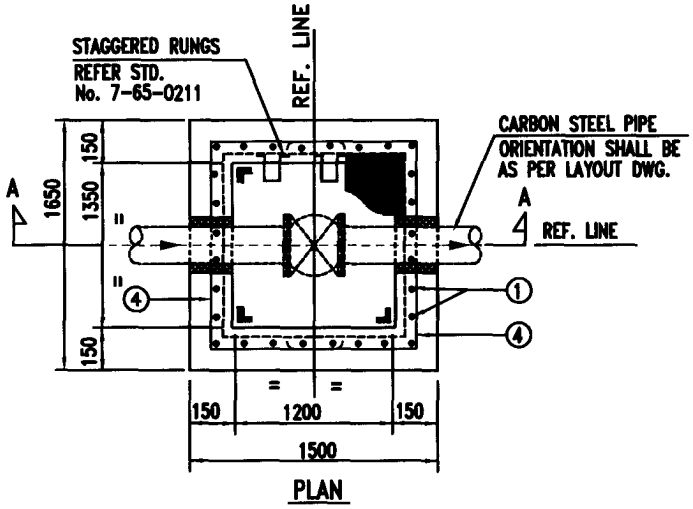
DETAIL – 2



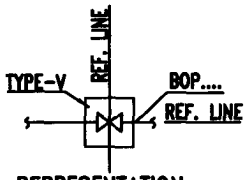
SECTION – A A

BAR BENDING SCHEDULE:

BAR MARK	DIA	BAR SHAPE
①	10 Ø	H+325 (OFFSITE), H+225 (UNIT), 450
②	10 Ø	600, 1350, 600
③	10 Ø	600, 1500, 600
④	10 Ø	1530, 1380, 300



PLAN



REPRESENTATION ON CIVIL GENERAL ARRANGEMENT DRAWING

Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
					Approved by	
4	28 02 2020	UPDATED & ISSUED AS STANDARD	SP	RKS	RS	RKT
3	05 06 14	UPDATED & ISSUED AS STD.	JKU	RKS	RBB	SC

Page No. 1990 of 2390_Tender Document No. B999-000-81-46-GE-T-8202-0
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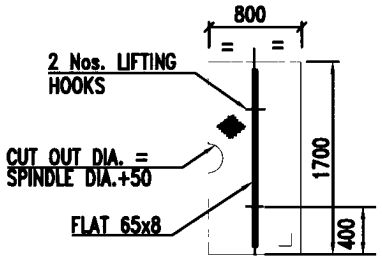
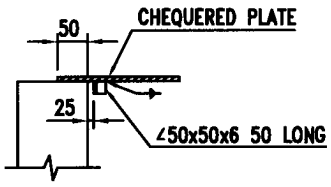


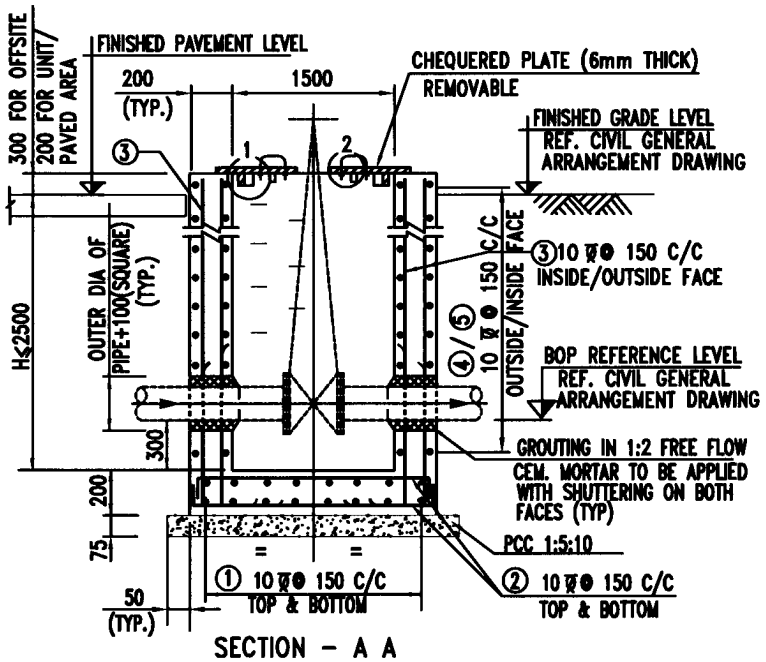
PLAN
CHEQUERED PLATE
(2.NOS PER VALVE PIT)



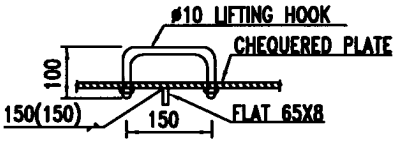
DETAIL - 1

NOTE:

1. ALL DIMENSIONS ARE IN MILIMETERS UNLESS NOTED OTHERWISE.
2. REFER STRUCTURAL GENERAL NOTES OF THE PROJECT FOR REINFORCED CONCRETE STRUCTURES FOR FOLLOWING:
   a) GRADE OF CONCRETE
   b) GRADE AND TYPE OF CEMENT
   c) REINFORCEMENT STEEL BARS
   d) CLEAR COVER IN R.C.C. WORKS
3. THIS STD. IS APPLICABLE FOR UNIT AREA, OFFSITE AREA AND AREA WHERE GROUND WATER TABLE IS UPTO FGL.



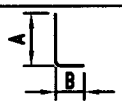
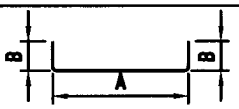
SECTION - A A

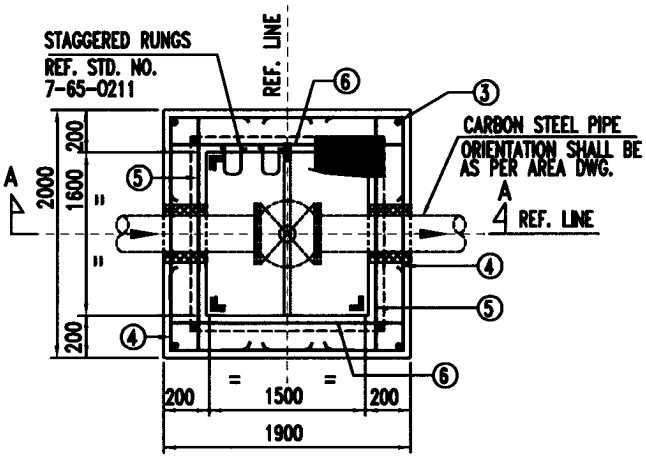


DETAIL - 2

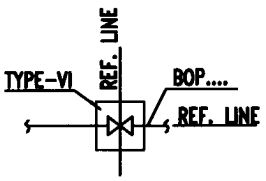
BAR BENDING SCHEDULE:

BAR MARK	DIA	TYPE	A	B	REMARKS
①	10 Ø	II	1890	110	
②	10 Ø	II	1790	110	
③	10 Ø	I	H+410(OFFSITE) H+310(UNIT)	350	
④	10 Ø	II	1890	1150	
⑤	10 Ø	II	1890	350	
⑥	10 Ø	II	1790	350	

TYPE	BAR SHAPE
I	
II	



PLAN



REPRESENTATION ON CIVIL GENERAL ARRANGEMENT DRAWING

Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
					Approved by	
4	28 02 2020	UPDATED & ISSUED AS STANDARD	SP	RKS	RS	RKT
3	25 07 14	UPDATED & ISSUED AS STD	KC	RKS	RBB	SC

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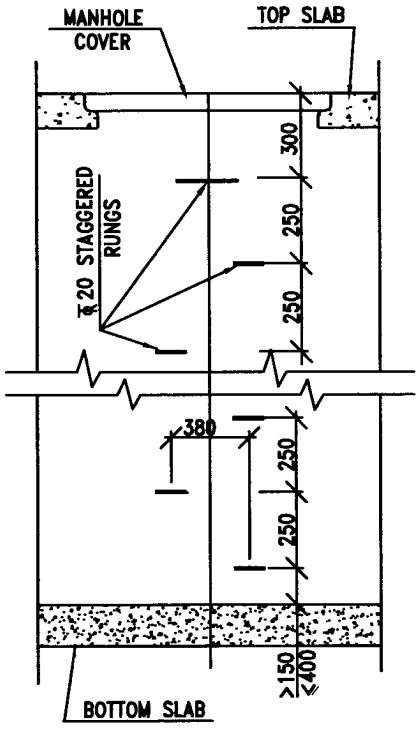

VIEW. A–A
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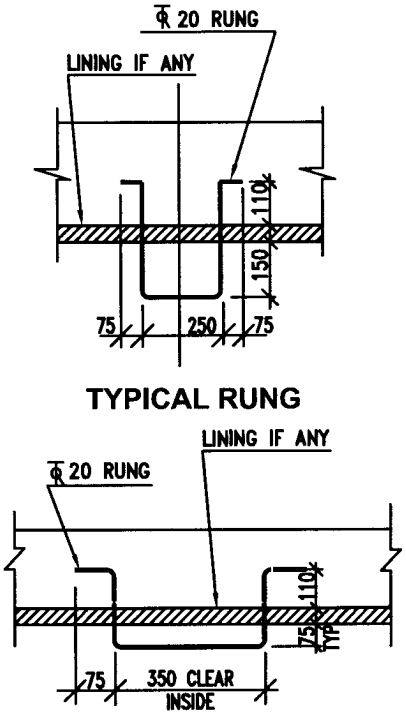
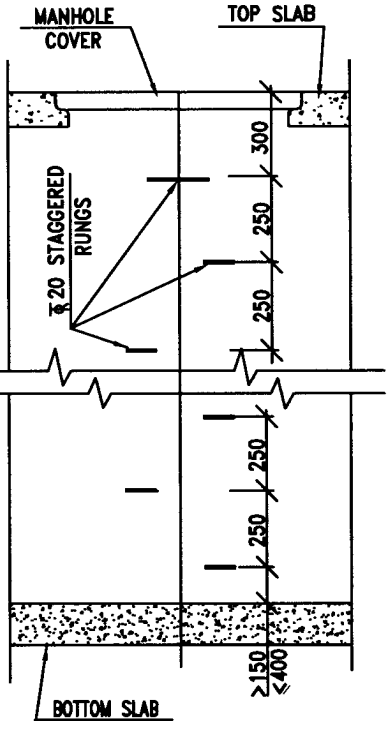
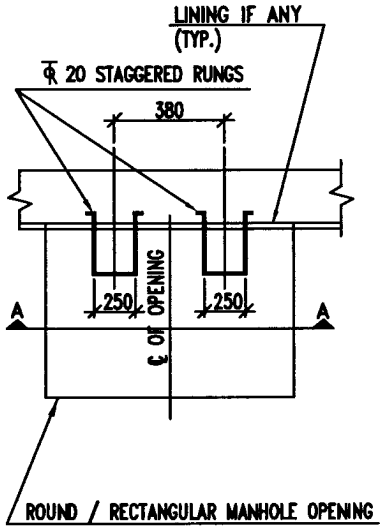


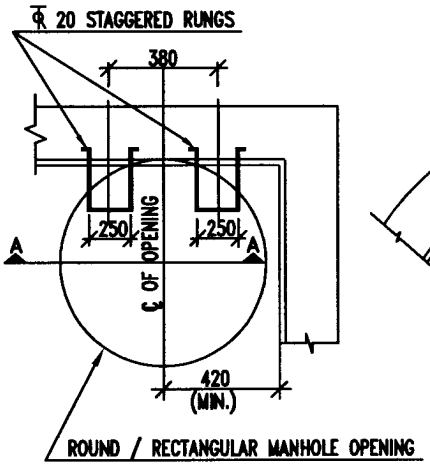
DETAIL OF TOP RUNG



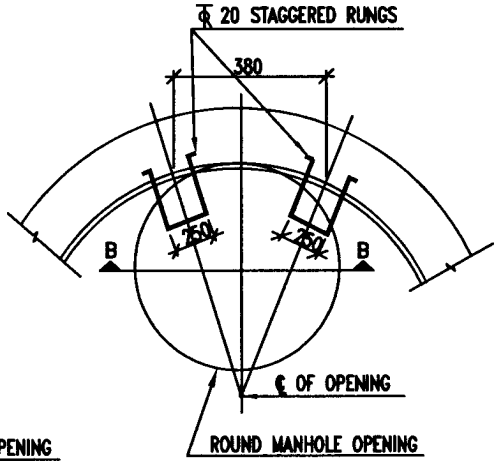
VIEW. B–B



CASE –1



CASE – 2



CASE – 3

NOTE:-

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS SPECIFIED.
2. RUNGS SHALL BE EPOXY COATED OR PAINTED AS PER RELEVANT SPECIFICATION.
3. REFER STRUCTURAL GENERAL NOTES OF THE PROJECT FOR REINFORCED CONCRETE STRUCTURES FOR FOLLOWING:
   a) GRADE OF CONCRETE
   b) GRADE AND TYPE OF CEMENT
   c) REINFORCEMENT STEEL BARS
   d) CLEAR COVER IN R.C.C. WORKS

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
5	30.12 19	REVISED & ISSUED AS STANDARD	YR	DCB	R SRIVASTAVA	RK TRIVEDI
4	05.06.14	REVISED & ISSUED AS STANDARD	JKU	RKS	RBB	SC

Approved by

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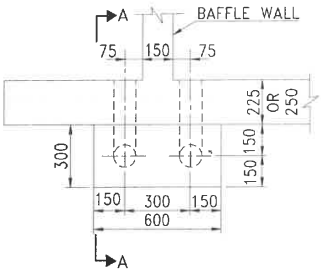
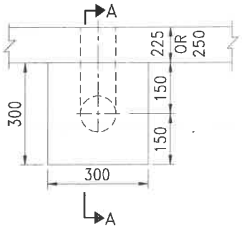
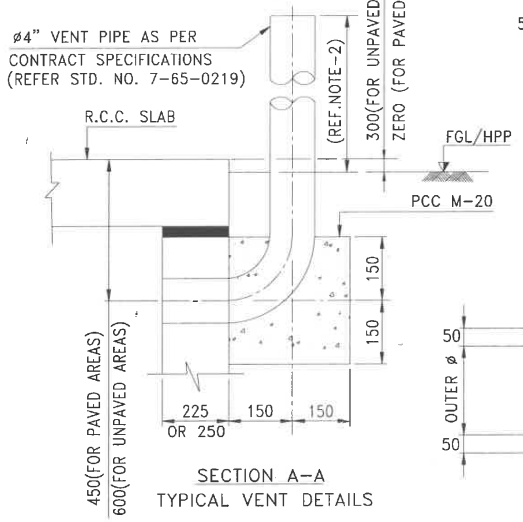


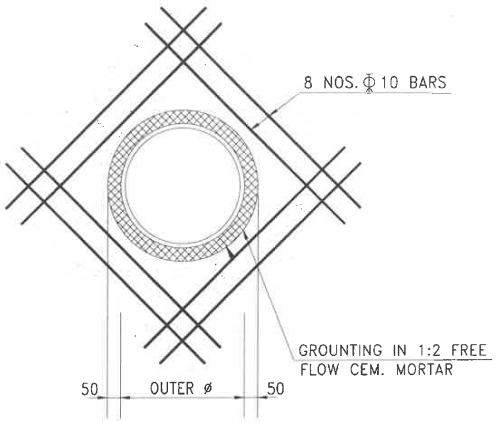
PLAN
DOUBLE VENT PIPE



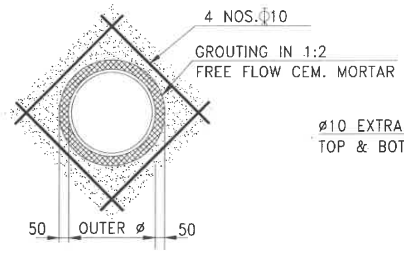
PLAN
SINGLE VENT PIPE



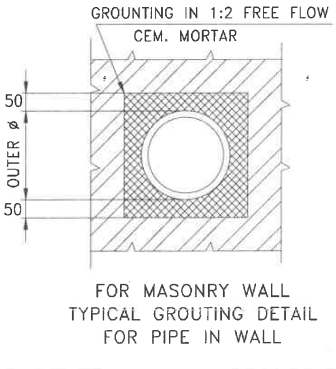
SECTION A-A
TYPICAL VENT DETAILS



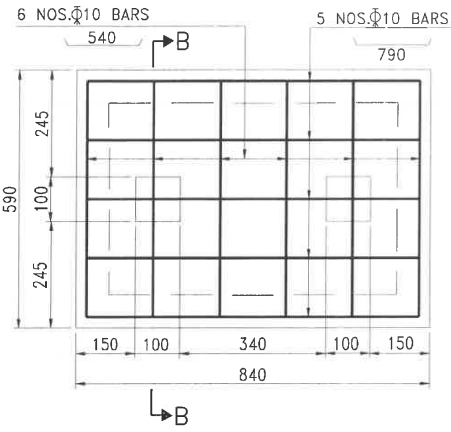
FOR R.C.C.WALL
(PIPE ø>500)



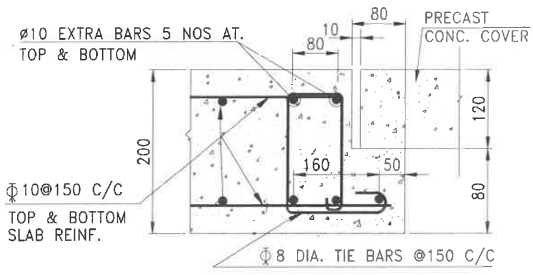
FOR R.C.C.WALL
(PIPE ø≤500)



FOR MASONRY WALL
TYPICAL GROUTING DETAIL
FOR PIPE IN WALL



REINFORCEMENT PLAN
DETAIL OF PRECAST CONC. COVER



FIXING PRECAST CONC.COVER

C.I. FRAM

NOTES

1. ALL
2. FOR
STAN
3. REFE
CONC
a. G
b. G
c. R
d. C
e. A
4. REFE
5. REFE
PROT

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
6	31.05.24	REVISED & ISSUED AS STD.	TP	GYAS	S K NASKAR	M NANDI
5	30.12.19	REVISED & ISSUED AS STD.	YR	DCB	RS	RK TRIVEDI

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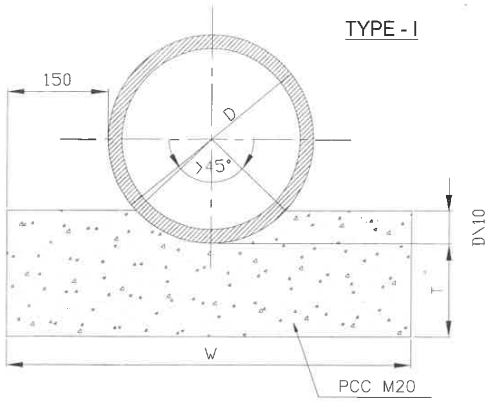
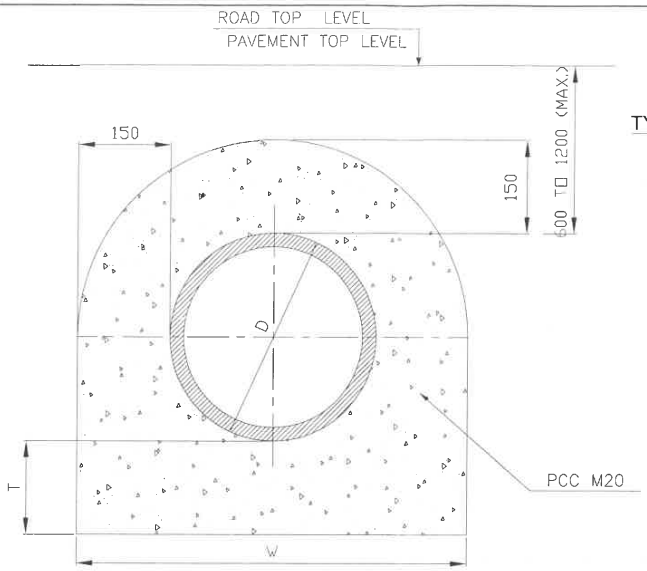
DE

TYPE - I



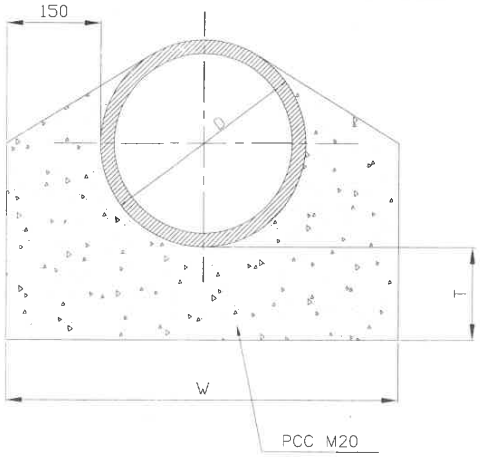
SECTIONAL ELEVATION BEDDING
(FOR C.S PIPE SEWER WHERE SUPPORT IS REQUIRED)

TYPE -IIIA



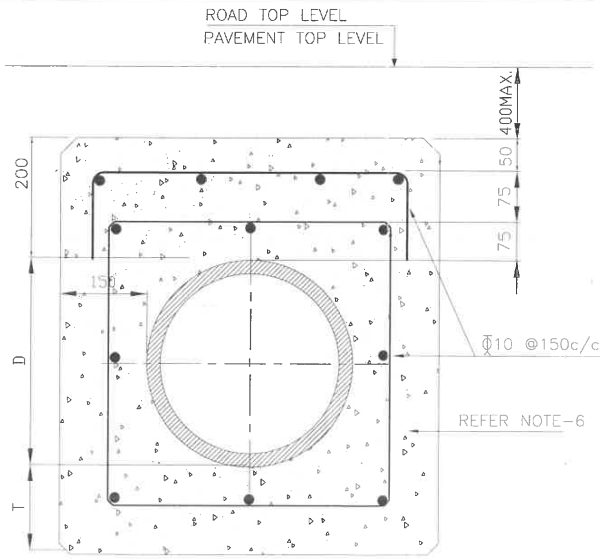
SECTIONAL ELEVATION SURROUND OR ENCASING
(FOR SEWERS UNDER ROADS)
FOR COVER ≥600

TYPE - II



SECTIONAL ELEVATION HAUNCHING
(FOR HDPE PIPE SEWERS)

TYPE - IIIB



SECTIONAL ELEVATION SURROUND OR ENCASING
(FOR SLEEVES/PIPES CULVERTS UNDER ROADS FOR COVER <600MM)

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NOTES:-
1. BEDDI BROU A CRA
2. HAUNC TO TH PIPE OF TH
3. SURRO ENCAS HORIZ SHALL UNIFO TYPE THE TO AS SH AS PE
4. CONCR WHICH CRADLI
5. CONCR
6. REFER STRUC a) GR b) GR c) RE

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
6	16.07.24	REAFFIRMED & ISSUED AS STD.	SJ	GYAS	SKN	MN
5	06.06.18	REAFFIRMED & ISSUED AS STD	CS.	AVM	RS	RKT

इंजीनियर्स इंडिया लिमिटेड ENGINEERS INDIA LIMITED
(भारत सरकार का उपक्रम) (A Govt. of India Undertaking)

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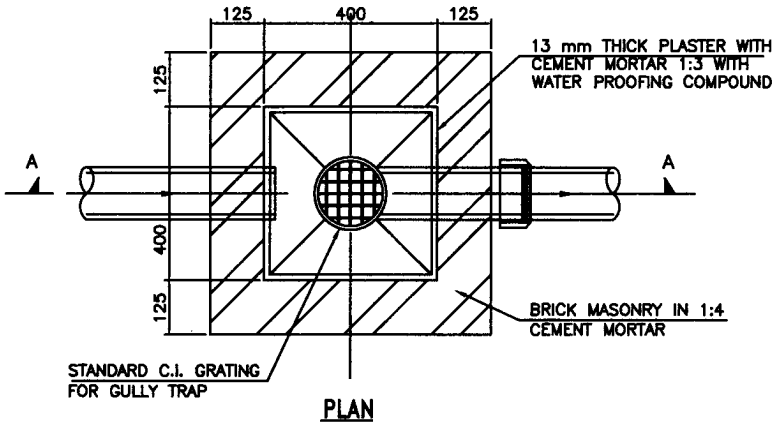
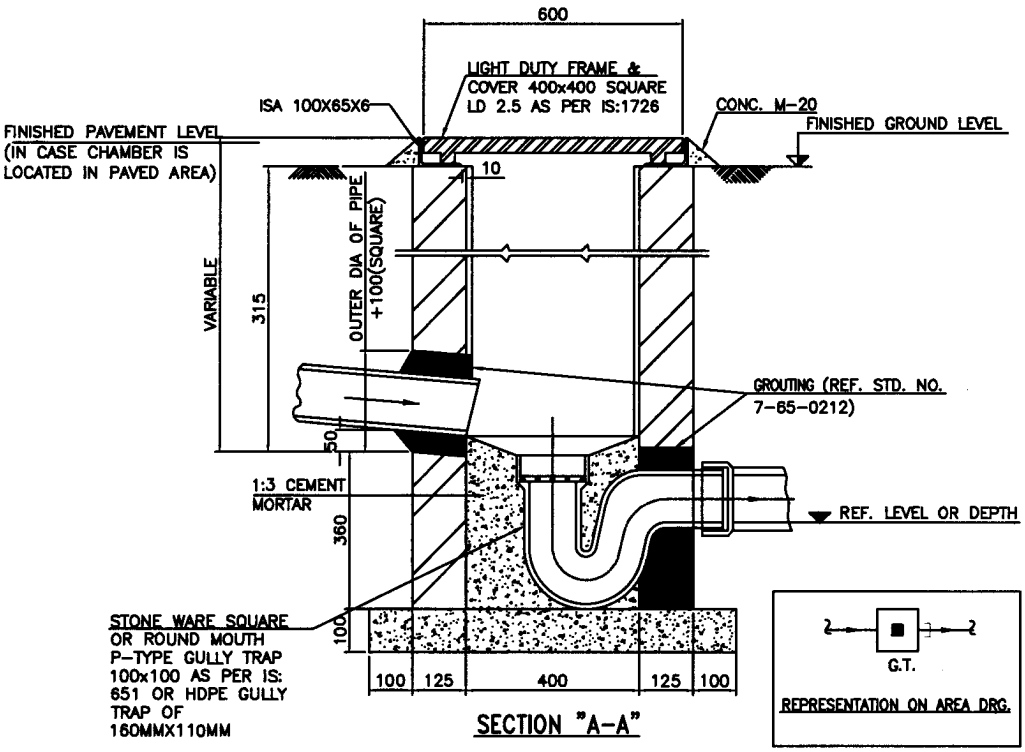
Format No. 8-00-0001-F5 Rev. 0



PLAN



SECTION "A-A"

NOTE:

1. ALL DIMENSIONS ARE IN MM.
2. THE BRICKS SHALL CONFORM TO IS: 1077 (CLASS 5.0 MIN.).
3. EXACT THICKNESS OF BRICK MASONRY WALL SHALL BE AS PER LOCALLY AVAILABLE BRICKS. (HERE WALL THICKNESS HAS BEEN GIVEN AS PER BRICK SIZE OF 250X125X75).
4. HDPE GULLY TRAP MAY BE USED IN PLACE OF STONEWARE GULLY TRAP.

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
7	16.08.21	REVISED & ISSUED AS STANDARD	ADP	GYAS	A.SINHA	S.MAZUMDAR
6	30.12.19	REAFFIRMED & ISSUED AS STANDARD	YR	DCB	R SRIVASTAVA	RK TRIVEDI
5	05.06.14	REAFFIRMED & ISSUED AS STANDARD	GAURAV	RKS	RBB	SC

Approved by

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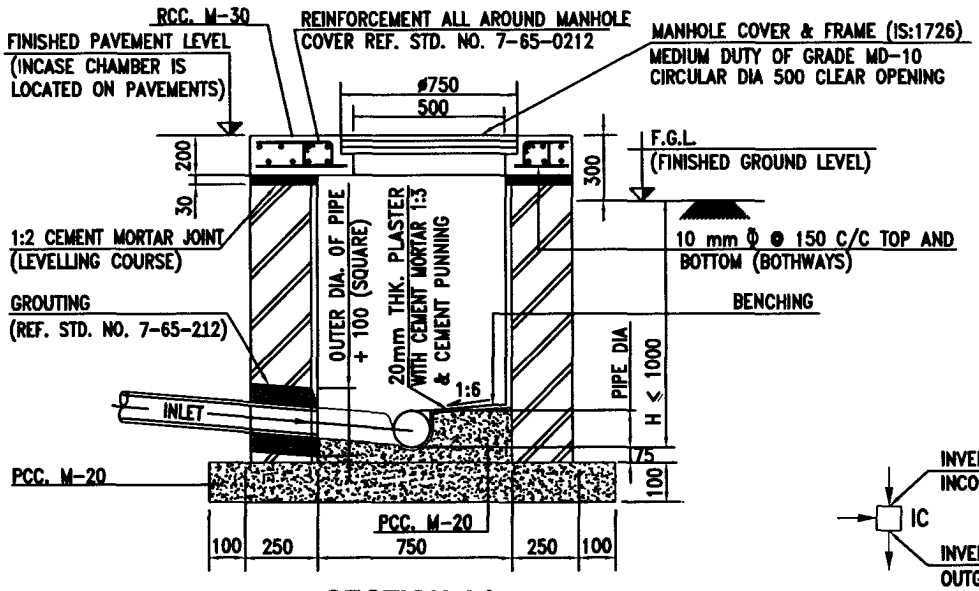
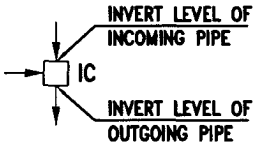
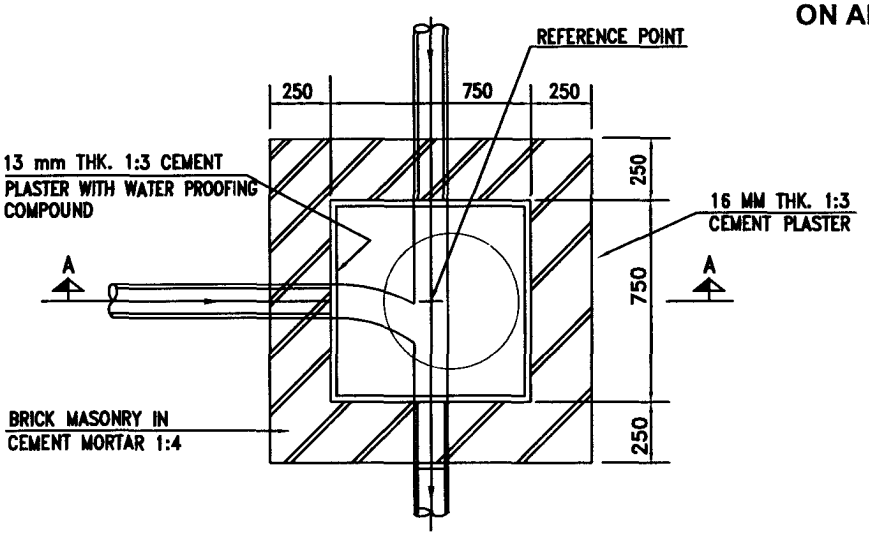


SECTION-AA



REPRESENTATION ON AREA DRAWING



PLAN

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETER UNLESS NOTED OTHERWISE.
2. REFER STRUCTURAL GENERAL NOTES OF THE PROJECT FOR REINFORCED CONCRETE STRUCTURES FOR FOLLOWING
   a. GRADE OF CONCRETE b. GRADE AND TYPE OF CEMENT
   c. REINFORCEMENT STEEL BARS d. CLEAR COVER IN RCC WORKS
3. BAR BENDING SHALL CONFORM TO IS: 2502.
4. TOP SLAB SHALL BE CAST-IN-SITU AND REINFORCEMENT ON WALL SIDE OF MANHOLE OPENING SHALL BE ADJUSTED AT SITE.
5. THE BRICKS SHALL CONFORM TO IS: 1077 (CLASS 5.0 MINIMUM).
6. EXACT THICKNESS OF BRICK MASONRY WALL SHALL BE AS PER LOCALLY AVAILABLE BRICKS (HERE WALL THICKNESS HAS BEEN GIVEN AS PER BRICK SIZE OF 250 X 125 X 75).

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
5	30.12.19	REAFFIRMED & ISSUED AS STANDARD	YR	DCB	R SRIVASTAVA	RK TRIVEDI
4	05.06.14	REVISED & REISSUED AS STANDARD	GAURAV	RKS	RBB	SC

Approved by

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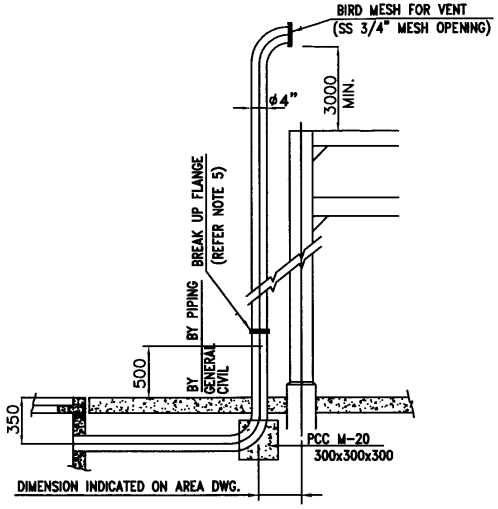
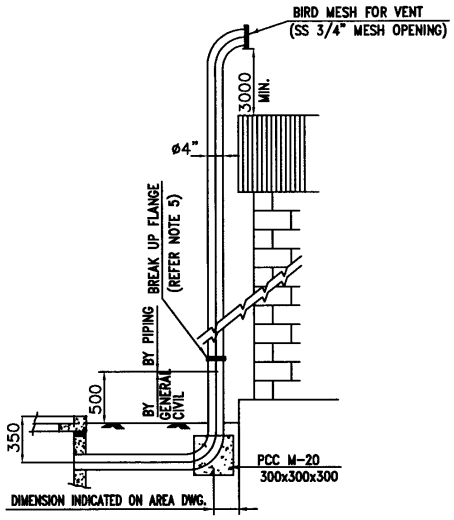
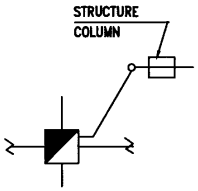


PAVED AREA



UNPAVED AREA

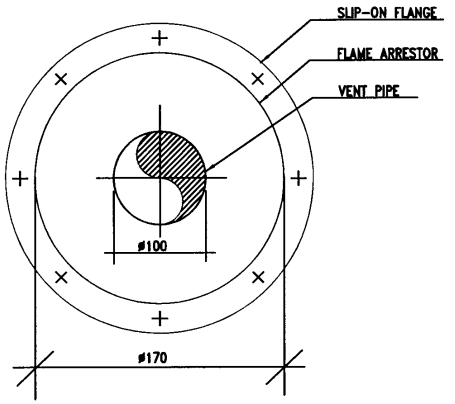
VENTS IN UNIT AREA



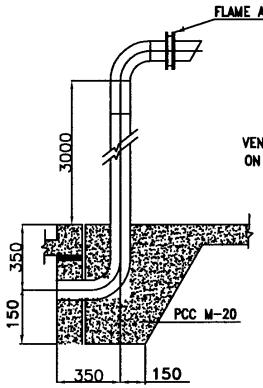
REPRESENTATION ON AREA DRG.

NOTES:-

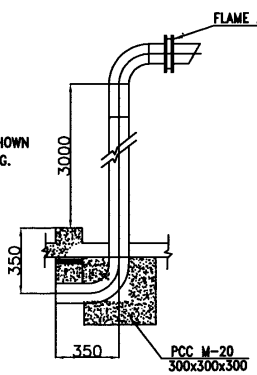
1. ALL DIMENSIONS ARE IN MILIMETERS.
2. MIN. SAFETY DISTANCES SHALL BE MAINTAINED AS BELOW.
   (I) INSIDE BATTERY LIMIT :- ATLEAST 15 M FROM FURNACE OR NAKED FLAME
   (II) OFFSITES :- IF VENTS ARE LESS THAN 15 M FROM NAKED FLAME OR EDGE OF FREE CIRCULATION ROADS, THEY SHALL BE FITTED WITH FLAME ARRESTORS AND LOCATED ATLEAST 4 M FROM EDGE OF ROAD.
3. FOR VENTS IN UNIT AREA : VENT PIPE SHALL BE TAKEN 3M ABOVE THE TOP TIER OF THE PIPE RACK, PLATFORM OR BUILDING PARAPET.
4. FOR VENTS IN OFFSITE AREA : VENT PIPE SHALL BE TAKEN 3M ABOVE THE TOP TIER OF THE PIPE RACK OR BUILDING PARAPET (WITHIN 15M RADIUS). FOR OTHER CASES, THE VENT SHALL BE LOCATED 3M ABOVE THE MANHOLE.
5. BREAK UP FLANGES SHALL BE PROVIDED IN THE RISER (A/G PORTION) OF VENT PIPE AT OPERABLE HEIGHT.
6. MOC OF VENT PIPE SHALL BE AS PER REVEVANT PMS (PIPING MATERIAL SPECIFICATION)



ELEVATION

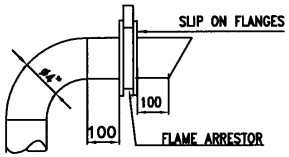


PAVED AREA

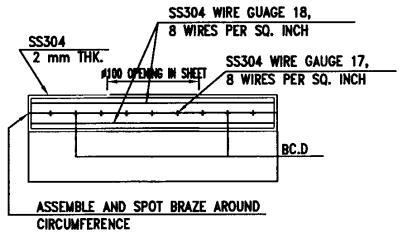


UNPAVED AREA

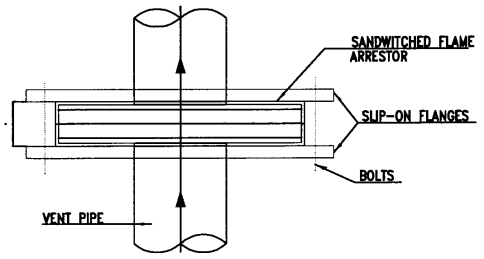
VENTS IN OFFSITE AREA (ISOLATED MAN HOLES)



FLAME ARRESTOR INSTALLATION



FLAME ARRESTOR DETAIL



PLAN

FIXING ARRANGEMENT OF FLAME ARRESTOR

5	30.12.19	REVISED AND ISSUED AS STANDARD	YR	DCB	RS	RK TRIVEDI
4	05.06.14	REVISED AND ISSUED AS STANDARD	Gaurav	RKS	RBB	SC
Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	

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VENT FOR MANHOLES

STANDARD No.
7-65-0219 Rev. 5
Page 1 of 1

Format No. 8-00-0001-F5 Rev. 0

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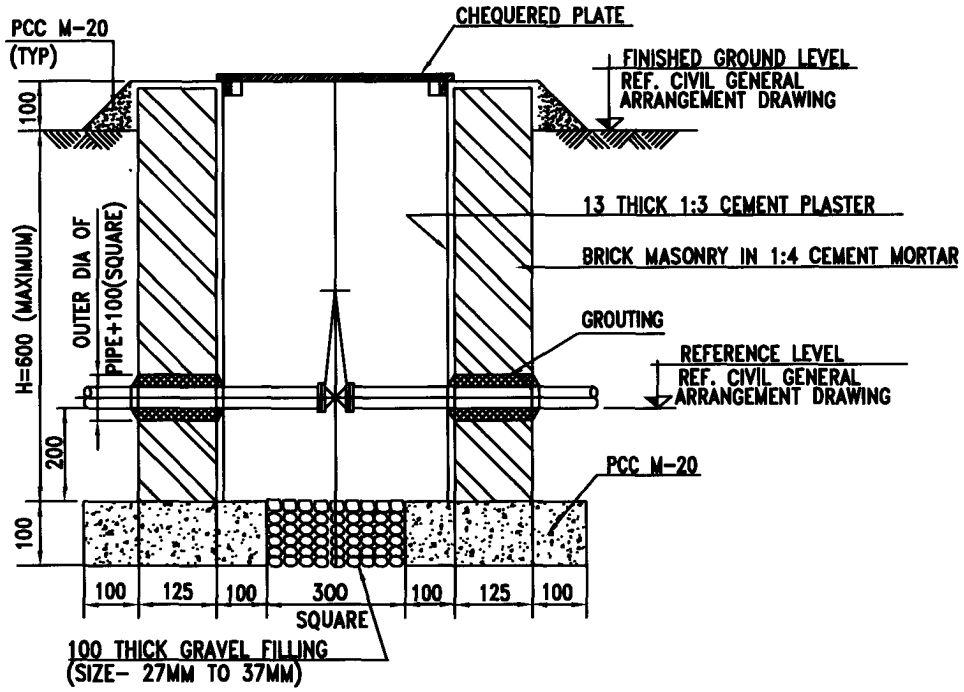
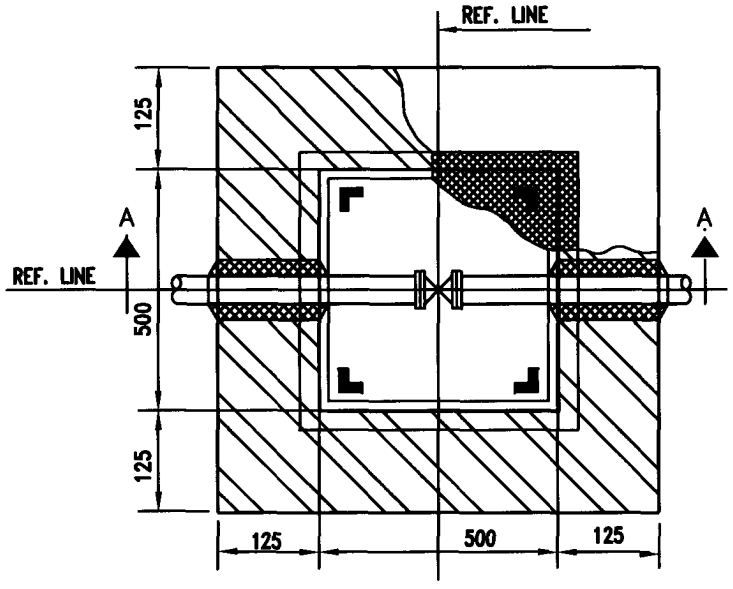


SECTION – AA



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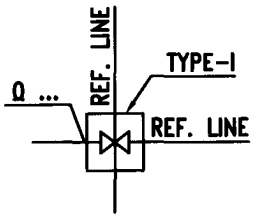

REPRESENTATION ON CIVIL GENERAL ARRANGEMENT DRAWING

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. FOR DETAILS OF CHEQUERED PLATE REFER STANDARD NO. 7-65-0224.
3. FOR DETAILS OF GROUTING REFER STANDARD NO. 7-65-0212.
4. THIS VALVE PIT IS APPLICABLE FOR OFFSITE UNPAVED AREA ONLY.
5. EXACT THICKNESS OF BRICK MASONRY WALL SHALL BE AS PER LOCALLY AVAILABLE BRICKS (HERE WALL THICKNESS HAS BEEN GIVEN AS PER BRICK SIZE OF 250X125X75).
6. THE BRICKS SHALL CONFORM TO IS: 1077 (CLASS 5.0 MINIMUM).
7. THIS STANDARD IS APPLICABLE WHERE GROUND WATER TABLE IS UPTO BOTTOM LEVEL OR BELOW THE VALVE PIT.

Rev No	Date	Purpose	Prepared by	Checked by	Stds Committee Convenor	Stds Bureau Chairman
					Approved by	
6	28 02.2020	REVISED & ISSUED AS STANDARD	RR	RKS	RS	RKT
5	05 06.14	REVISED & ISSUED AS STANDARD	JKU	RKS	RBB	SC

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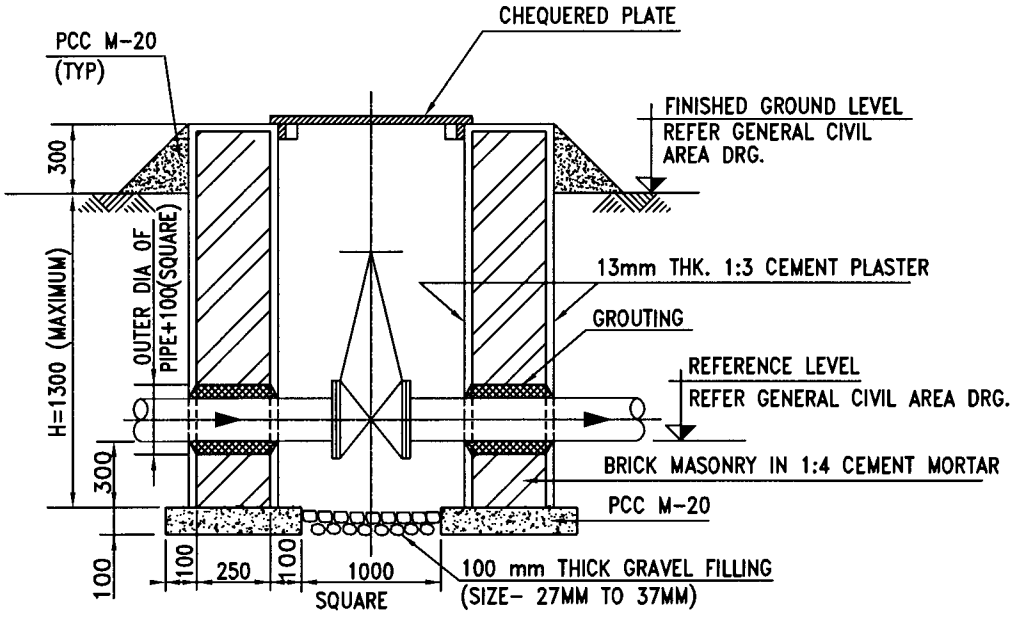
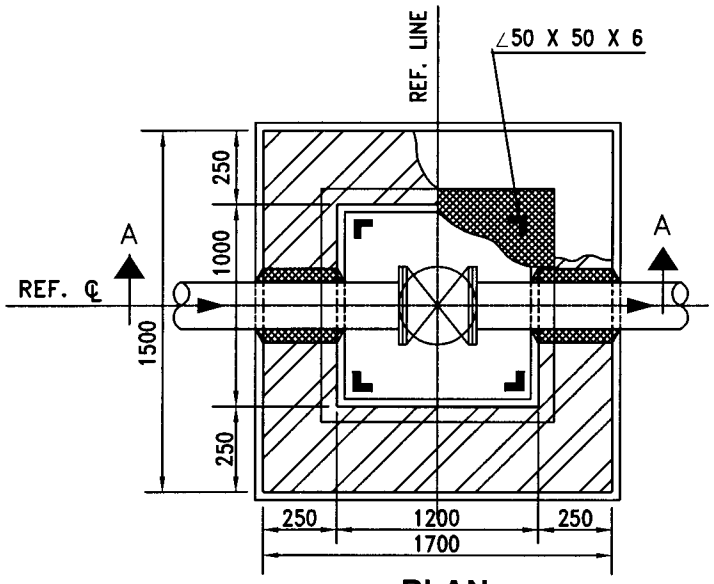
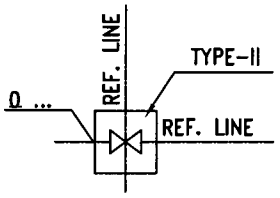


SECTION - A A



PLAN



REPRESENTATION ON AREA DRG.

NOTE:

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7. THIS STANDARD IS APPLICABLE WHERE GROUND WATER TABLE IS UPTO BOTTOM OR BELOW THE VALVE PIT.

Rev. No.	Date	Purpose	Prepared by	Checked by	Stds. Committee Convenor	Stds. Bureau Chairman
					Approved by	
5	23.07.14	REVISED & ISSUED AS STANDARD	KC	RKS	RBB	SC
4	19.05.09	REVISED & ISSUED AS STANDARD	SKP	RKS	NK	ND

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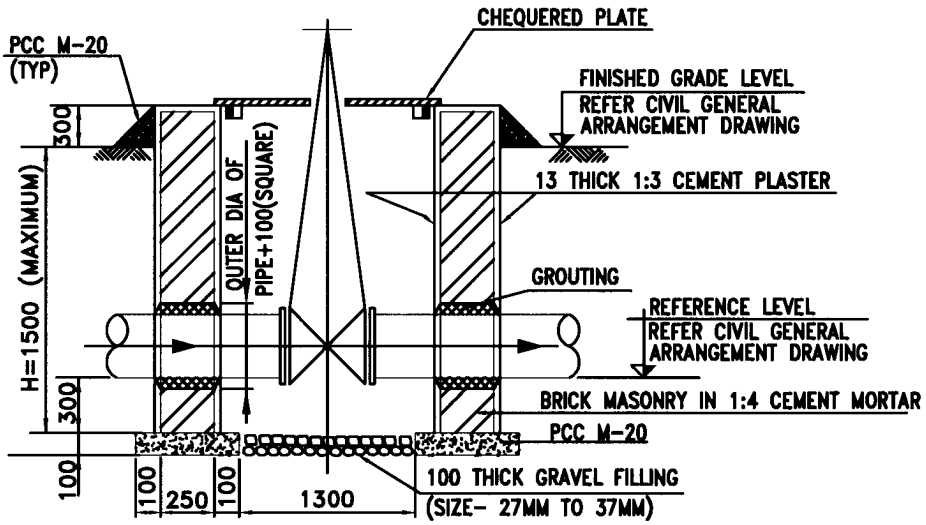
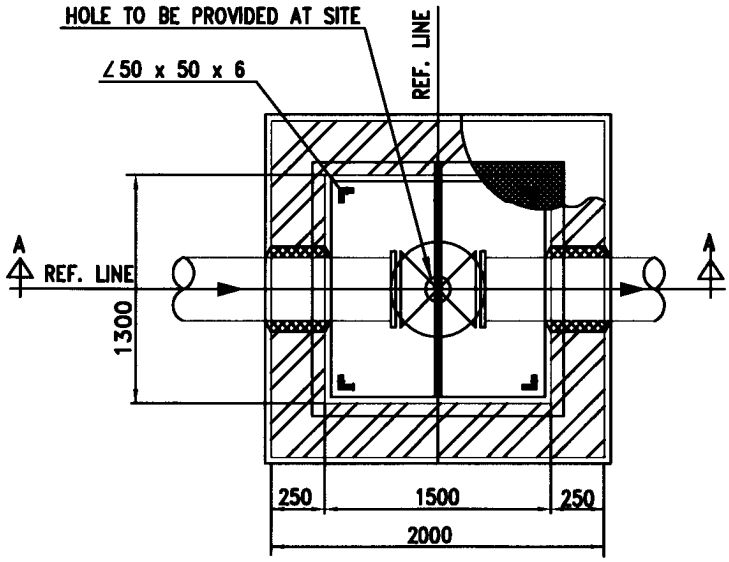


SECTION - A A



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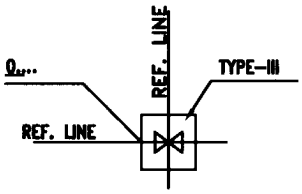

REPRESENTATION ON CIVIL GENERAL ARRANGEMENT DRAWING

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
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Signature Not Verified
Digitally signed by P KONGUPRABAHARAN
Date: 2026.05.09 17:20:46 IST
Location: ePROCURE-EPROC

Rev No	Date	Purpose	Prepared by	Checked by	Stds Convenor	Stds Bureau Chairman
6	28 02.2020	REVISED & ISSUED AS STANDARD	RR	RKS	PKS	RKT
5	23 07 14	REVISED & ISSUED AS STANDARD	JKU	RKS	RBB	SC

Approved by

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