



Bhagyanagar Gas
Limited

**Mechanical Works for development and construction of CNG
Mother Stations in Hyderabad GA**

Bid Document No. BGL/742/2026-27

Volume II
of II

SECTION -09

DRAWING

STANDARD DRAWINGS

SPECTACLE BLIND
FLANGE

DRAWING NO.

SD-PI-001

SHEET NO.

1 OF 1

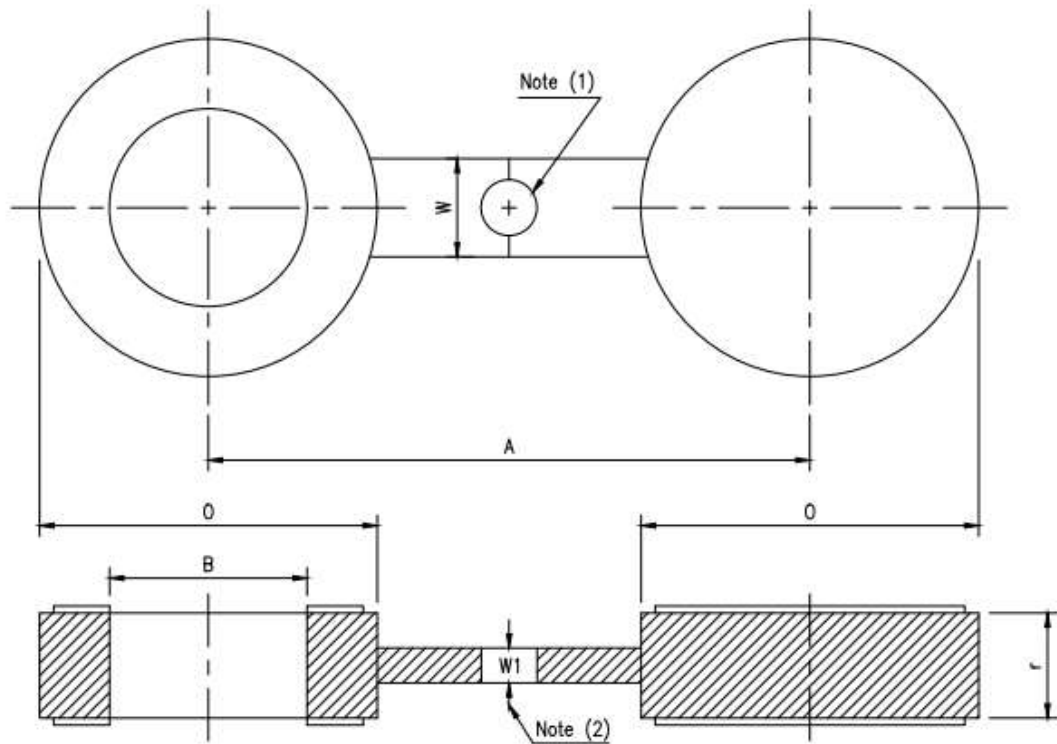


TABLE-4 DIMENSIONS OF CLASS 600 RAISED FACE FIGURE 8 BLANKS

NPS	INSIDE DIAMETER B, in.	OUTSIDE DIAMETER O, in.	CENTERLINE DIMENSION A, in.	THICKNESS r, in.	WEB WIDTH W, in.
1/2	0.62	2.00	2.62	0.25	1.50
3/4	0.82	2.50	3.25	0.25	1.50
1	1.05	2.75	3.50	0.25	2.25
1 1/4	1.44	3.12	3.98	0.38	2.25
1 1/2	1.68	3.62	4.50	0.38	2.62
2	2.16	4.25	5.00	0.38	2.25
2 1/2	2.64	5.00	5.88	0.50	2.62
3	3.26	5.75	6.62	0.50	2.62
3 1/2	3.76	6.25	7.25	0.62	3.00
4	4.26	7.50	8.50	0.62	3.00
5	5.30	9.38	10.50	0.75	3.38
6	6.36	10.38	11.50	0.88	3.38
8	8.33	12.50	13.75	1.12	3.75
10	10.42	15.62	17.00	1.38	4.12
12	12.39	17.88	19.25	1.62	4.12
14	13.62	19.25	20.75	1.75	4.50
16	16.62	22.12	23.75	2.00	4.88
18	17.62	24.00	25.75	2.12	5.25
20	19.58	26.75	28.50	2.50	5.25
24	23.50	31.00	33.00	2.88	6.00

NOTES:

- (1) Hole size (where required due to bolt spacing) shall be the same as the flange bolt hole, and located such that it will not interfere with bolting between two flanges.
 (2) The thickness of the web (or tie bar) dimension W1 shall be 0.25 in. minimum.

0	10.05.17	ISSUED WITH TENDER	US		DK		AD	
REV. NO.	DATE	SUBJECT OF REVISION	PREP		CHKD		APPD	

ANCHOR FOR BARE PIPE
SIZE 2" THRU 24"
TYPE-G5 (FOR OFFSITE)

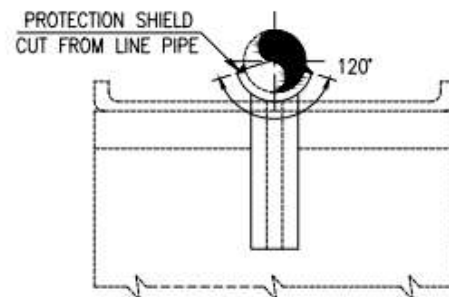
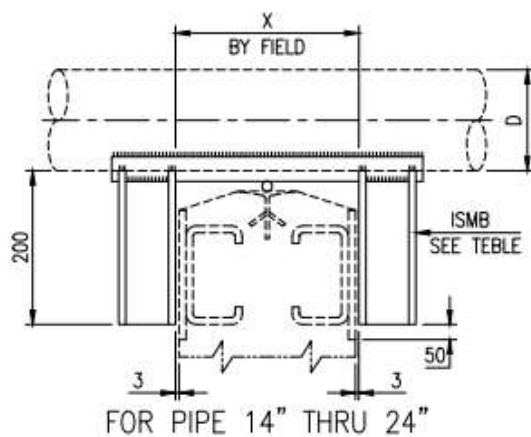
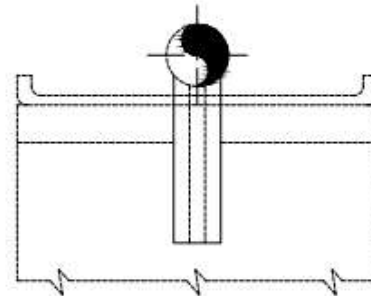
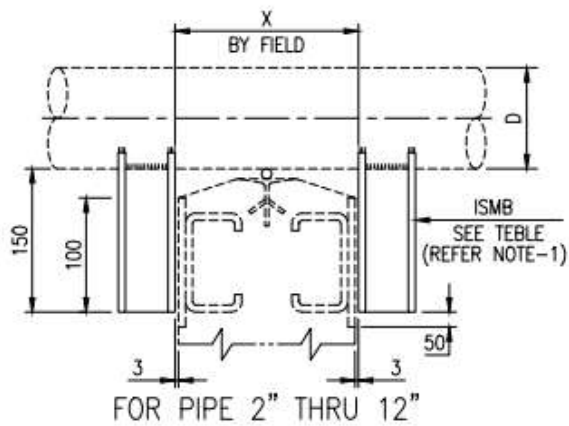
DRAWING NO.

SD-PI-002

SHEET NO.

1 OF 1

D	8	10	12	14	16	18	20	24
I BEAM	150				200			250



G4 - D
NOM. PIPE DIA. IN INCHES
TYPE

SYMBOL

NOTE:-

1. FOR SUPPORTING DETAILS FOR PIPE SIZE 2" THRU 6", REFER STD. 00004-PL-PI-STD-009

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

CROSS GUIDE FOR BARE
PIPE SIZE 2" THRU 24"
TYPE-G4 (OFFSITE)

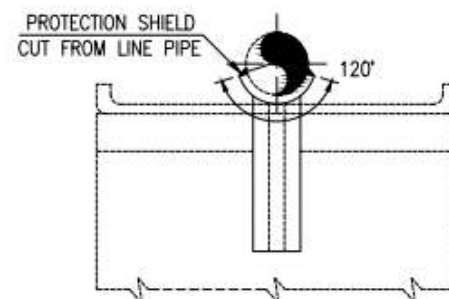
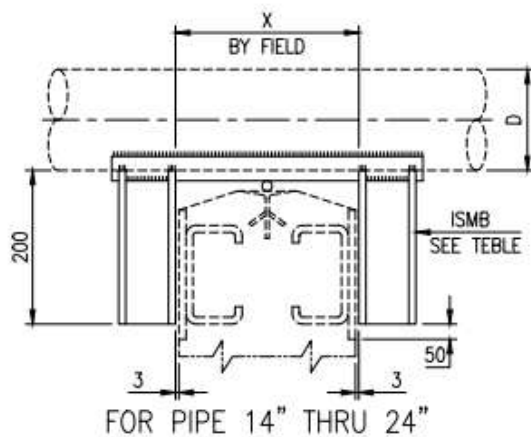
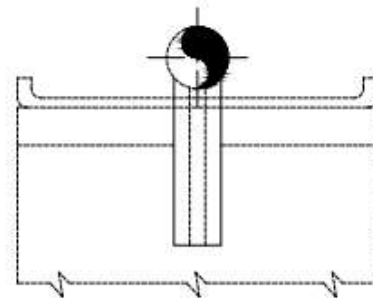
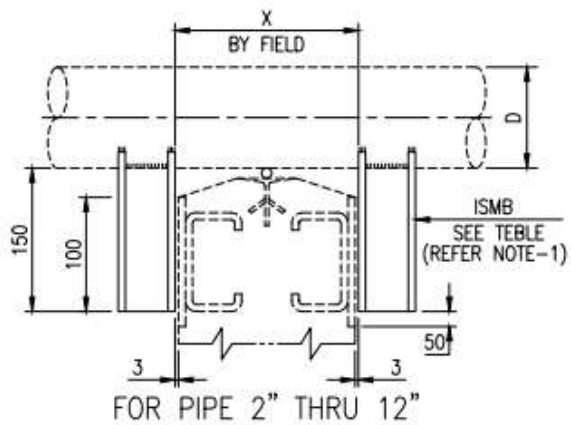
DRAWING NO.

SD-PI-003

SHEET NO.

1 OF 1

D	8	10	12	14	16	18	20	24
I BEAM	150				200			250



G4 - D
NOM. PIPE DIA. IN INCHES
TYPE

SYMBOL

NOTE:-

1. FOR SUPPORTING DETAILS FOR PIPE SIZE 2" THRU 6", REFER STD.

STD.00004-PL-PI-STD-009

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

**CROSS GUIDE FOR BARE
PIPE SIZE 2" THRU 24"
TYPE-G3**

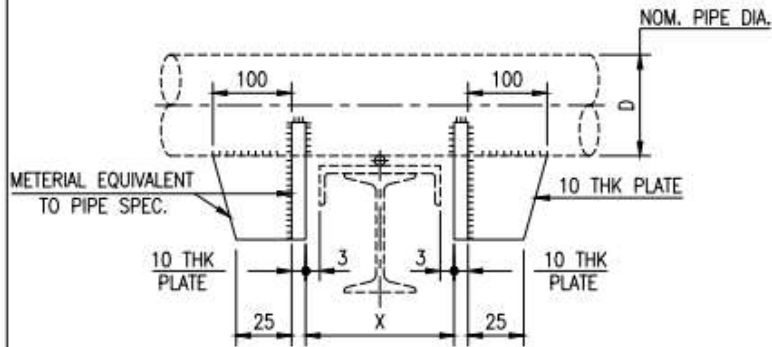
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SD-PI-004

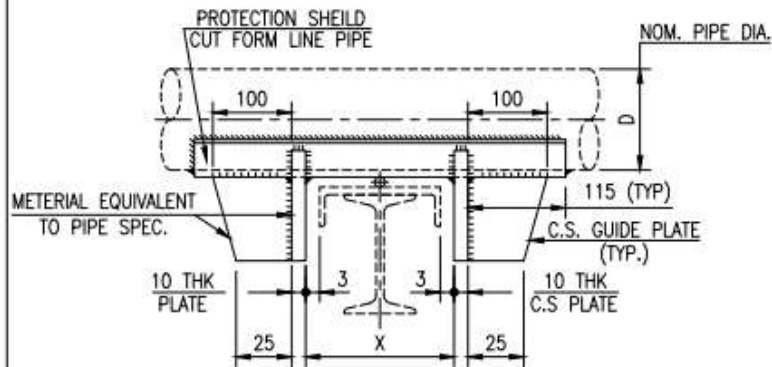
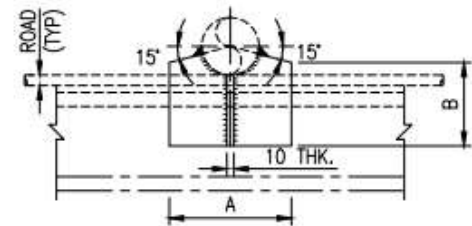
SHEET NO.

1 OF 1

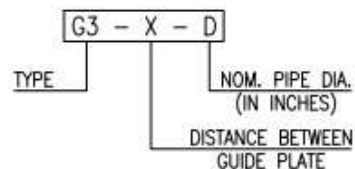
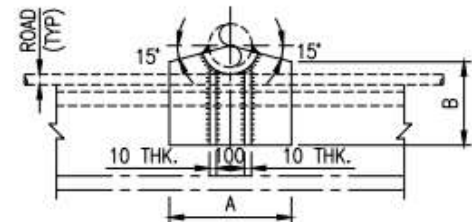
CROSS GUIDE													
D	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
A	100	130	154	208	280	314	364	396	446	498	548	598	650
B	67	78	86	106	131	145	163	175	193	212	231	248	268



CROSS GUIDE 2" THRU 12"



CROSS GUIDE 14" THRU 24"



SYMBOL

NOTE:-

1. PROTECTION SHIELD SHALL BE CUT FROM LINE PIPE.

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

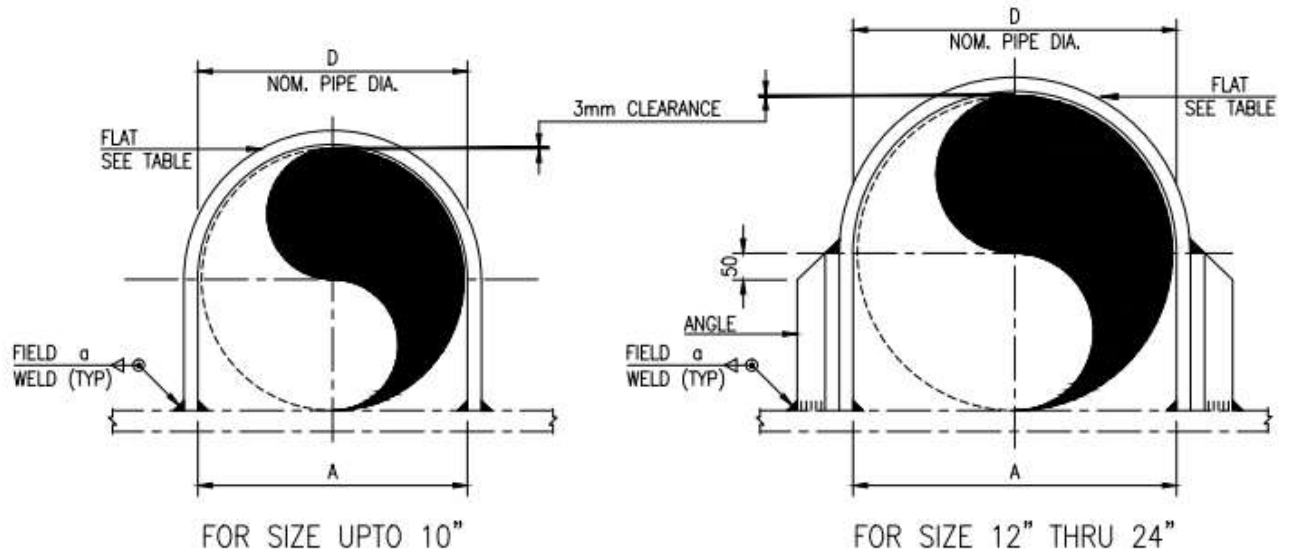
GUIDE SUPPORT FOR BARE PIPE
SIZE 1/2" THRU 24" TYPE-G1

DRAWING NO.

SD-PI-005

SHEET NO.

1 OF 1



D	A	a	FLAT SIZE	ANGLE SIZE
1/2"	26	6	40 x 6	-
3/4"	33			
1"	40			
1 1/4"	48			
1 1/2"	55			
2"	65			
2 1/2"	80			
3"	95	10	50 x 10	-
3 1/2"	107			
4"	120			
5"	146			
6"	174			
8"	225			
10"	278			
12"	328	10	65 x 12	75x75x10
14"	362			
16"	412	10	75 x 12	90x90x10
18"	463			
20"	515			
24"	616			

G1 - D

TYPE

NOM. PIPE DIA. (INCH)

SYMBOL

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

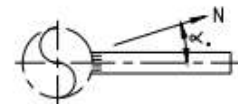
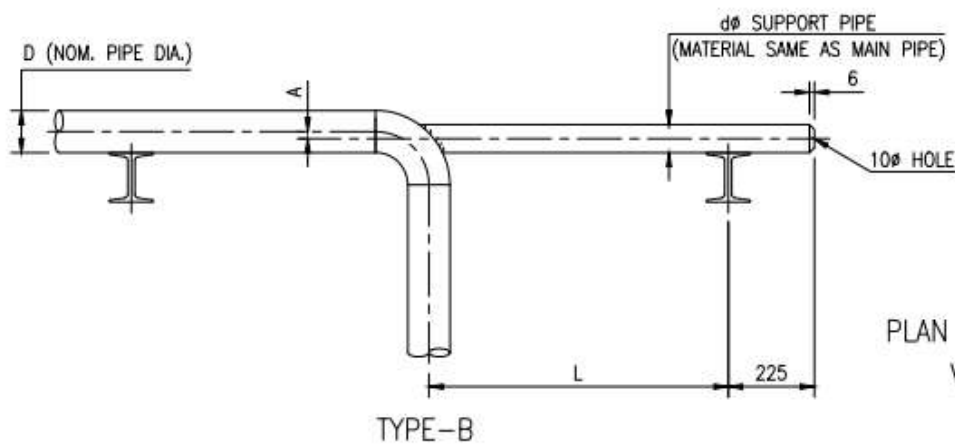
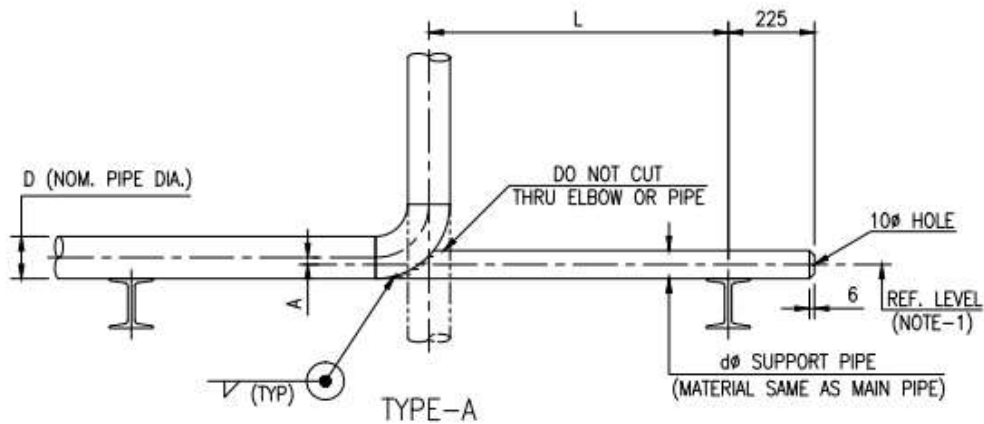
**DUMMY PIPE SUPPORT FOR
BARE PIPE SIZE 2" THRU 24"
TYPE-B-39**

DRAWING NO.

SD-PI-006

SHEET NO.

1 OF 1

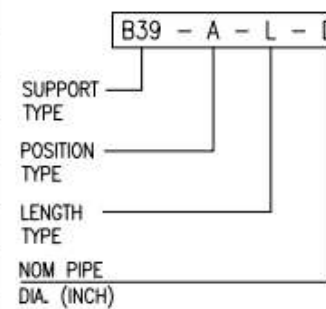


PLAN FOR SUPPORT ON
VERTICAL PIPE

FOR L, 1500 OR LESS		
D	d (NOTE 2)	A
2"	2"-SCH.40	-
3"	2"-SCH.40	15
4"	3"-SCH.40	13
6"	3"-SCH.40	40
8"	4"-SCH.40	52
10"	6"-SCH.40	52
12"	6"-SCH.40	78
14"	8"-SCH.40	68
16"	8"-SCH.40	94
18"	8"-SCH.40	119
20"	10"-SCH.40	118
24"	10"-SCH.40	168

FOR L, OVER 1500		
D	d (NOTE 2)	A
2"	2"-SCH.40	-
3"	2"-SCH.40	15
4"	3"-SCH.40	13
6"	4"-SCH.40	27
8"	6"-SCH.40	25
10"	8"-SCH.40	27
12"	8"-SCH.40	52
14"	10"-SCH.40	41
16"	10"-SCH.40	67
18"	10"-SCH.40	92
20"	12"-SCH.40	92
24"	12"-SCH.40	143

REFER LEVEL
(NOTE-1)



SYMBOL

NOTES:-

1. REF. LEVEL & α TO BE GIVEN IN CASE SUPPORT IS WELDED TO VERTICAL PIPE.
2. IN CASE SIZE AND/OR SCH. OF SUPPORT PIPE (d) LISTED IN THE TABLE IS NOT AVAILABLE USE NEXT HIGHER SIZE AND/OR NEAREST EQUIVALENT THICKNESS AVAILABLE.

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

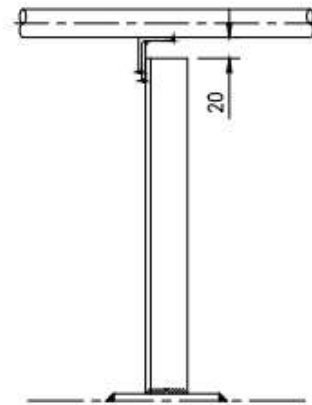
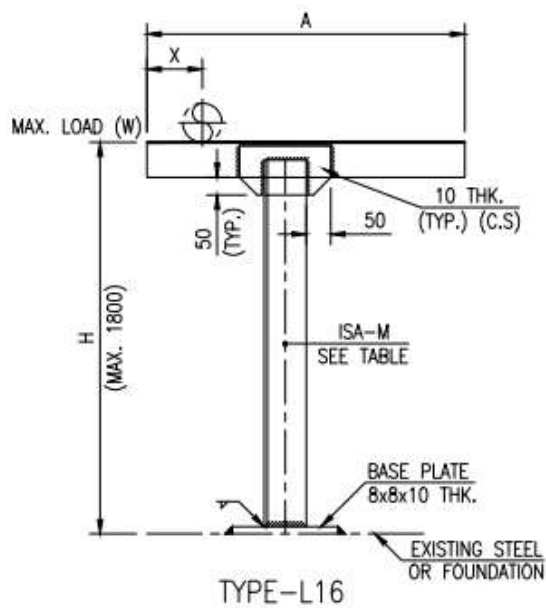
LOW SUPPORT STANCHION
TYPE-L16 AND L-16A

DRAWING NO.

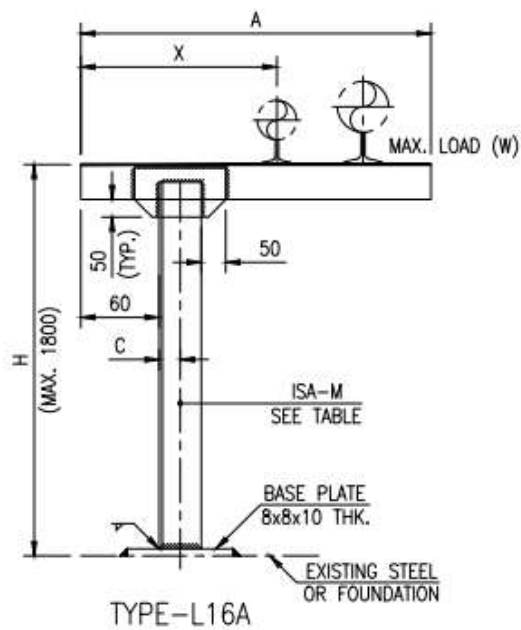
SD-PI-007

SHEET NO.

1 OF 1

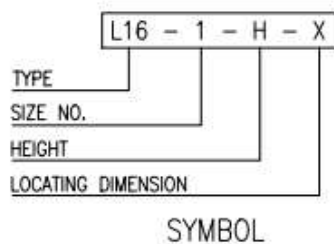


SIDE VIEW



NOTE:-

1. DO NOT USE FOR ANCHORING THE PIPE.



SIZE NO.	MAX. LOAD (W) Kg.	M	A	B	C
1	500	ISA 80x80x8	600	150	45
2	800	ISA 100x100x10	700	150	60
3	1500	ISA 130x130x12	800	150	80

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

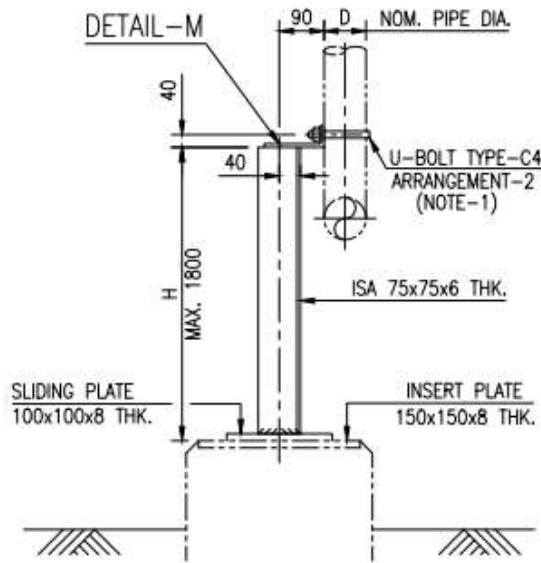
LOW SUPPORT SLIDING AND
FIXED FOR PIPE SIZE 3/4"
THRU 1 1/2" TYPE L-15

DRAWING NO.

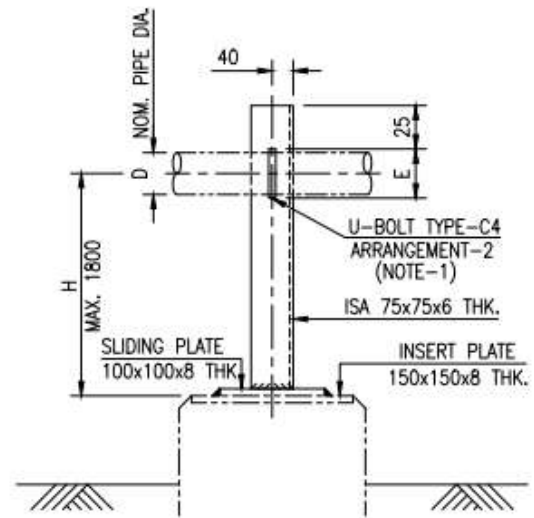
SD-PI-008

SHEET NO.

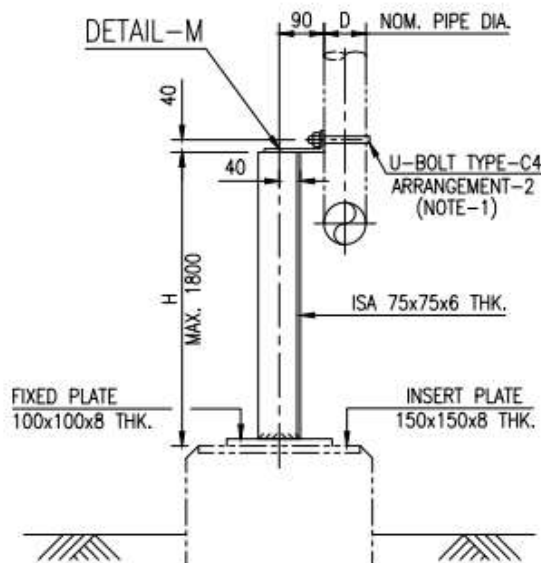
1 OF 1



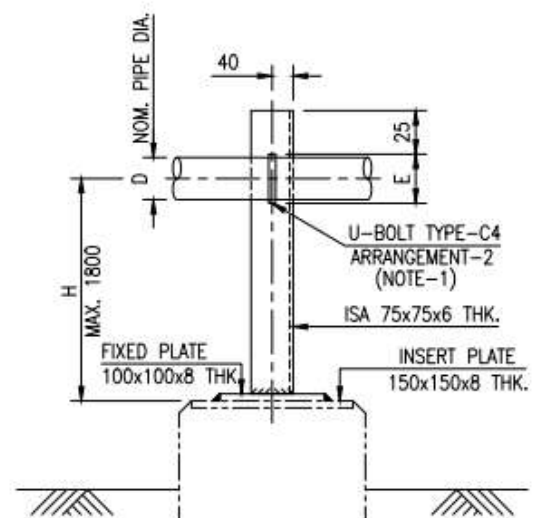
ARRANGEMENT TYPE-1
(SLIDING)



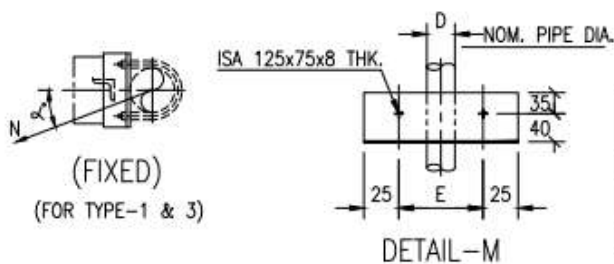
ARRANGEMENT TYPE-2
(SLIDING)



ARRANGEMENT TYPE-3
(FIXED)



ARRANGEMENT TYPE-4
(FIXED)



$\alpha' =$ (FOR TYPE 1 & 3)		L15 - 1 - H - D	
TYPE		ARRANGEMENT TYPE	
HEIGHT		NOM. PIPE DIA. (INCH)	
D	E		
3/4"	36		
1"	45		
1 1/2"	60		

SYMBOL

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

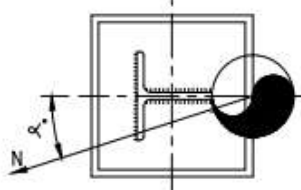
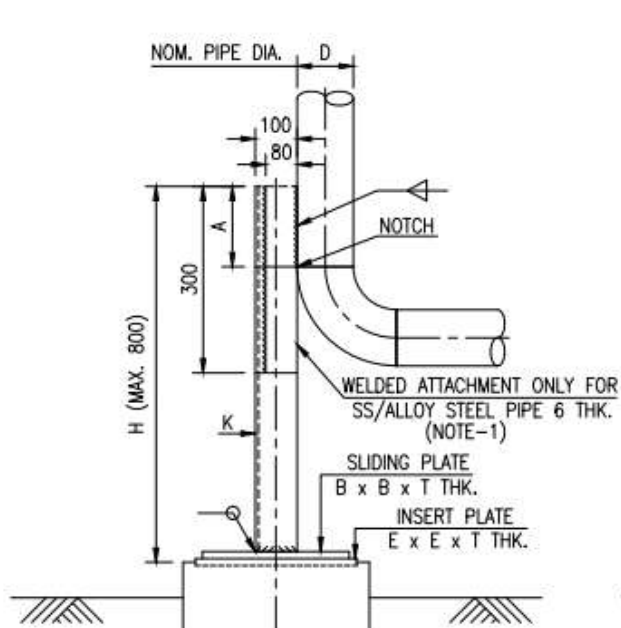
LOW SUPPORT SLIDING FOR
BARE & INSULATED PIPE
SIZE 2" THRU 24" TYPE-L6

DRAWING NO.

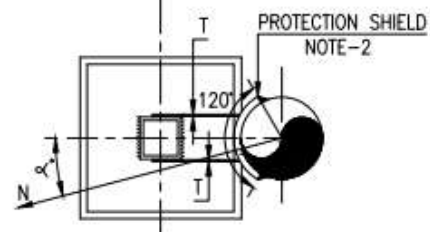
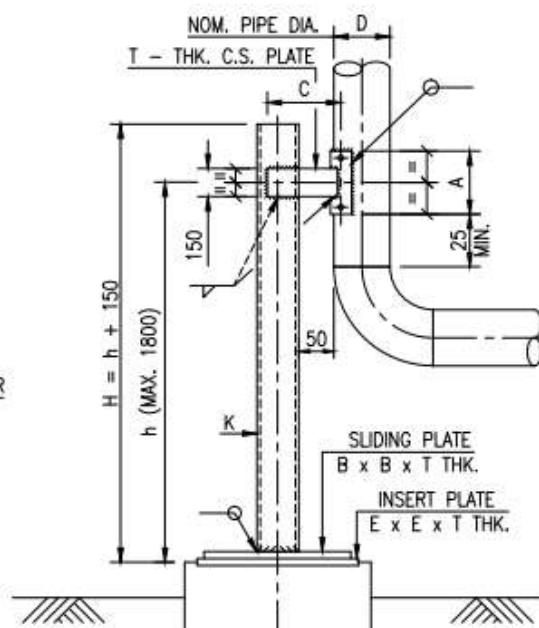
SD-PI-009

SHEET NO.

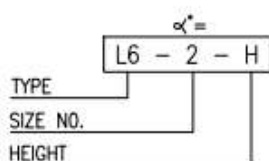
1 OF 1



FOR PIPE SIZES 2" THRU 4"



FOR PIPE SIZES 6" THRU 24"



SYMBOL

NOTES:-

1. MATERIAL FOR WELDED ATTACHMENT SHALL BE EQUIVALENT TO PIPE MATERIAL.
2. PROTECTION SHIELD IS TO BE CUT FROM LINE PIPE.

SIZE NO.	D	K	A	T	C	E	B
1	2" TO 4"	CUT FROM ISMB 200	200	10	-	250	150
2	6" TO 10"	ISMC-125 2 NOS.	200	12	150	300	200
3	12" TO 24"	ISMC-225 2 NOS.	300	12	230	400	300

FOR TEMP. UP TO 400 °C ONLY

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

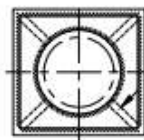
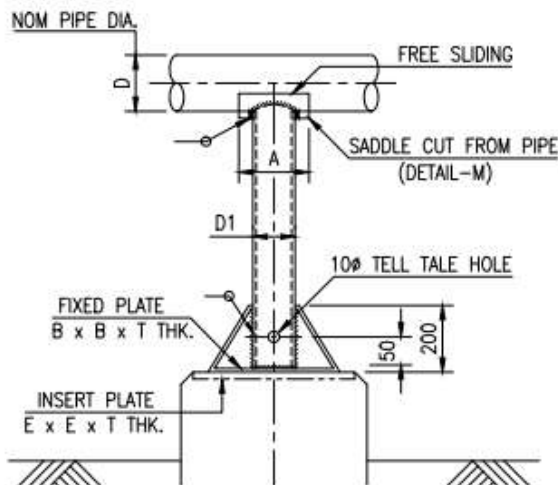
LOW SUPPORT SLIDING FOR BARE
PIPE SIZE 3/4" THRU 36"
TYPE-L5 & L5A

DRAWING NO.

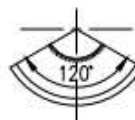
SD-PI-010

SHEET NO.

1 OF 1



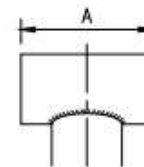
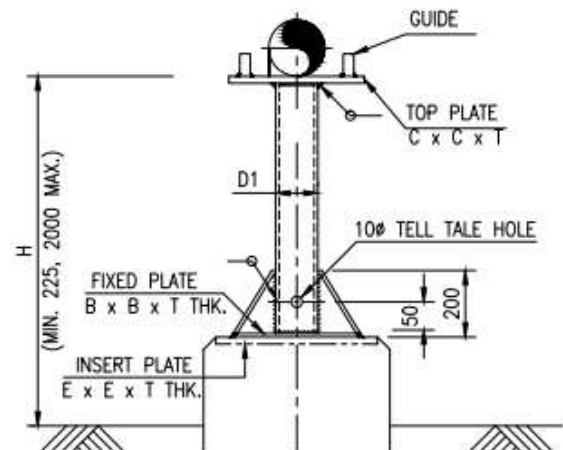
10 THK. PLATE TO BE
WELDED WHEN H EXCEEDS 1000



DETAIL-M

TYPE
SIZE NO.
HEIGHT

SYMBOL



TYPE
SIZE NO.
HEIGHT

SYMBOL

SIZE NO.	D	A	D1 (NOTE-1)	C	B	E	T
1	3/4"	2" NB x 100 Lg.	2" HEAVY IS :1239	150	150	200	12
	1"						
	1.1/2"	3" NB x 100 Lg.		200			
	2"						
2	3"	6" NB x 150 Lg.	2" HEAVY IS :1239	200	150	200	12
	4"						
3	6"	10" NB x 250 Lg.	3" HEAVY IS :1239	300	200	250	16
	8"						
4	10"	14" NB x 350 Lg.	4" HEAVY IS :1239	350	200	250	16
	12"						
5	14"	18" NB x 350 Lg.	6" HEAVY IS :1239	400	250	300	20
	16"						
6	18"	20" NB x 350 Lg.	8" SCH. 40	400	300	350	20
7	20"	24" NB x 350 Lg.	10" SCH. 40	450	350	400	20
	24"						
8	26"	30" NB x 350 Lg.	12" SCH. 40				
	30"						
	36"	36" NB x 400 Lg.		550	400	500	20

NOTES:-

1. IN CASE SIZE AND/OR SCH. OF SUPPORT PIPE (D) LISTED IN THE TABLE IS NOT AVAILABLE, USE NEXT HIGHER SIZE AND/OR NEAREST EQUIVALENT THICKNESS AVAILABLE.
2. MATERIAL FOR SUPPORT PIPE & PLATE SHALL BE CARBON STEEL.

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

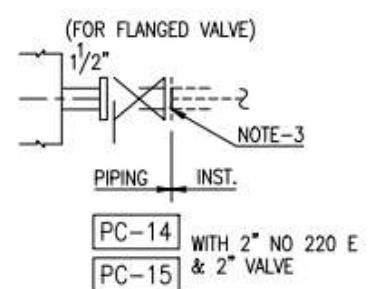
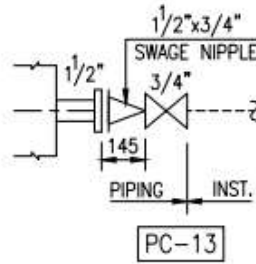
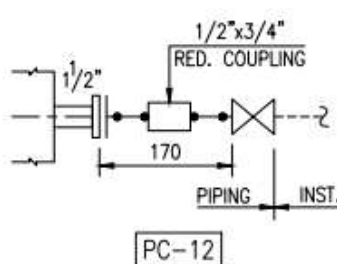
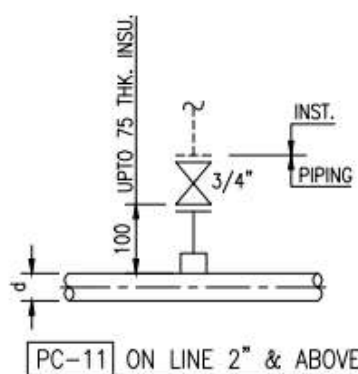
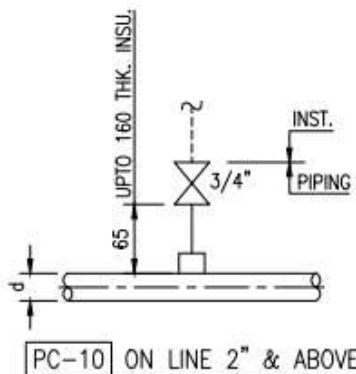
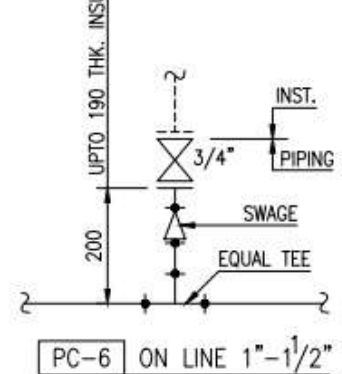
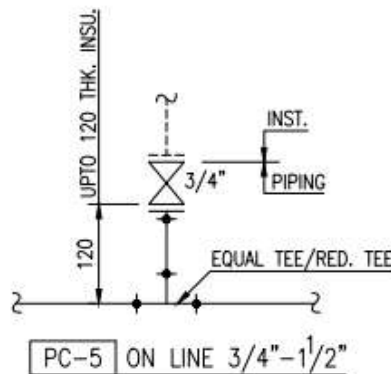
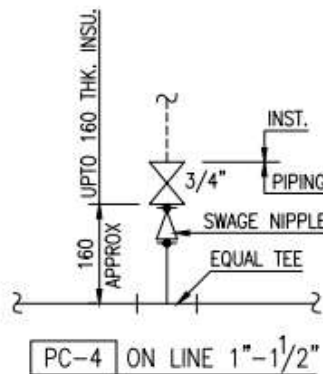
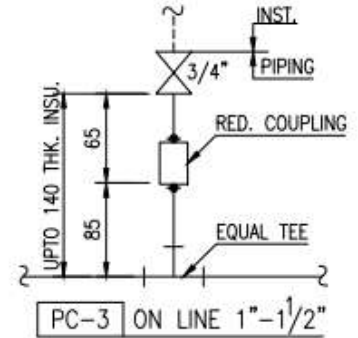
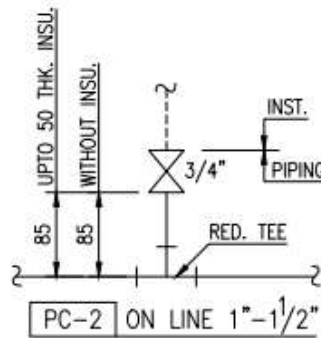
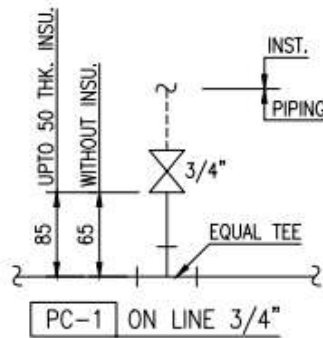
PRESSURE TAPPINGS
(PA, PG, PC, PT, PIC ETC.)

DRAWING NO.

SD-PI-011

SHEET NO.

1 OF 1



NOTES:-

1. THE INDICATED DIMENSIONS ARE MINIMUM WHICH ALSO COVER INSULATION TO THE EXTENT SHOWN ABOVE. IN HIGHER THICKNESS OF INSULATION THAN INDICATED, THE DIFFERENCE SHALL BE ADDED IN THE DIMENSIONS SHOWN ABOVE ACCORDINGLY.
2. PRESSURE TAPPING SHALL BE PROVIDED WITH GATE, GLOBE OR PLUG VALVE (FLGD. SW. OR SCR'D) WITH TEE (EQ. OR RED.) HALF COUPLING (.W. OR SCR'D) OR STUB-IN AS PER PIPING SPECIFICATION.
3. IN CASE OF FLGD. VALVES BOLTING & GASKET ON BOTH SIDES OF VALVE SHALL BE IN PIPING SCOPE.
4. IN CASE OF TAPPING PROVIDED OTHER THAN INDICATED IN THIS STD FOR LAYOUT REASONS DETAILED DIMENSIONS WILL BE CALLED FOR OR CARRIED OUT.

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

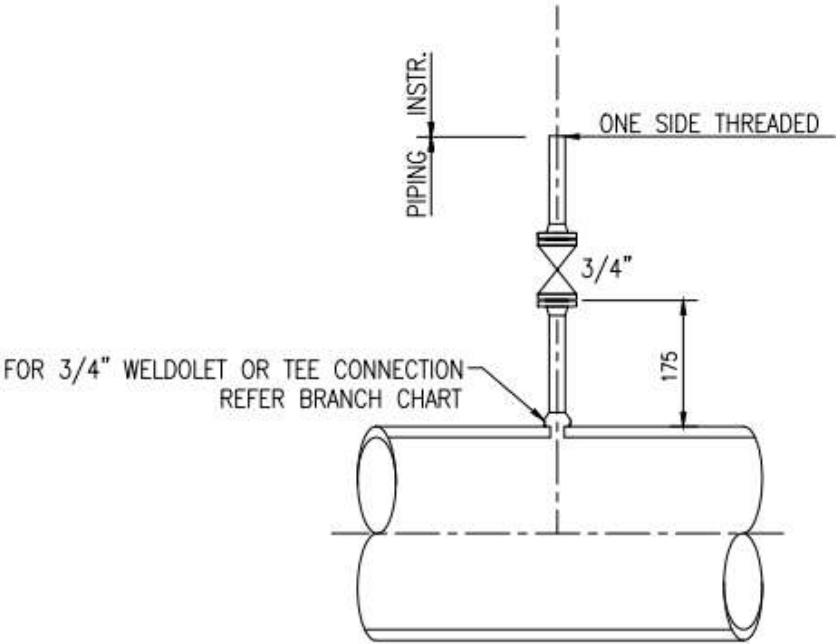
DETAIL OF PRESSURE
CONNECTIONS ABOVE GROUND
PIPE

DRAWING NO.

SD-PI-012

SHEET NO.

1 OF 1



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REV. NO.	DATE	SUBJECT OF REVISION	PREP		CHKD		APPD	

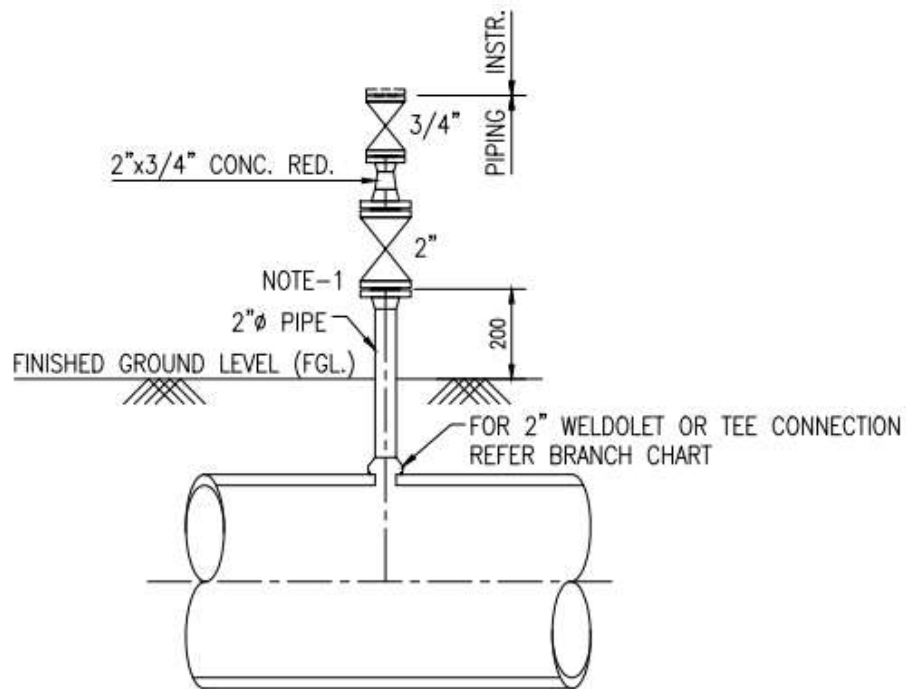
DETAIL OF PRESSURE CONNECTIONS
UNDER GROUND PIPE

DRAWING NO.

SD-PI-013

SHEET NO.

1 OF 1



NOTE:

- 1 INSULATION GASKET SHALL BE INSTALLED.

0	10.05.17	ISSUED WITH TENDER	US		DK		AD	
REV. NO.	DATE	SUBJECT OF REVISION	PREP		CHKD		APPD	

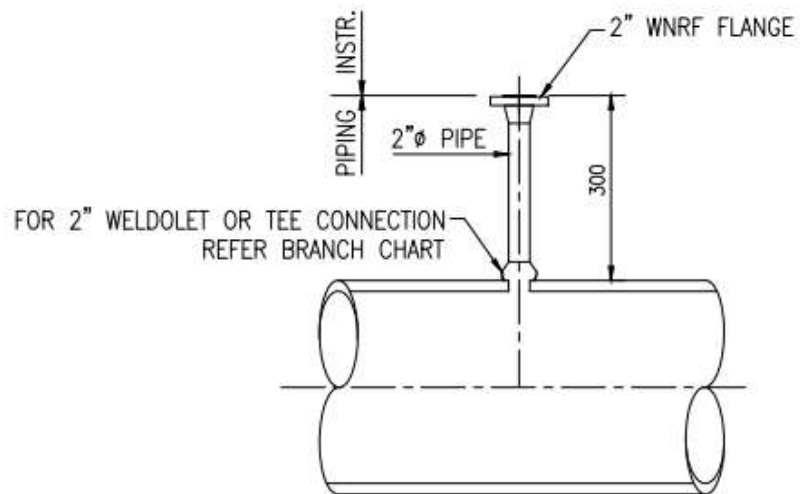
DETAIL OF TEMPERATURE CONNECTIONS
ABOVE GROUND PIPE

DRAWING NO.

SD-PI-014

SHEET NO.

1 OF 1



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REV. NO.	DATE	SUBJECT OF REVISION	PREP		CHKD		APPD	

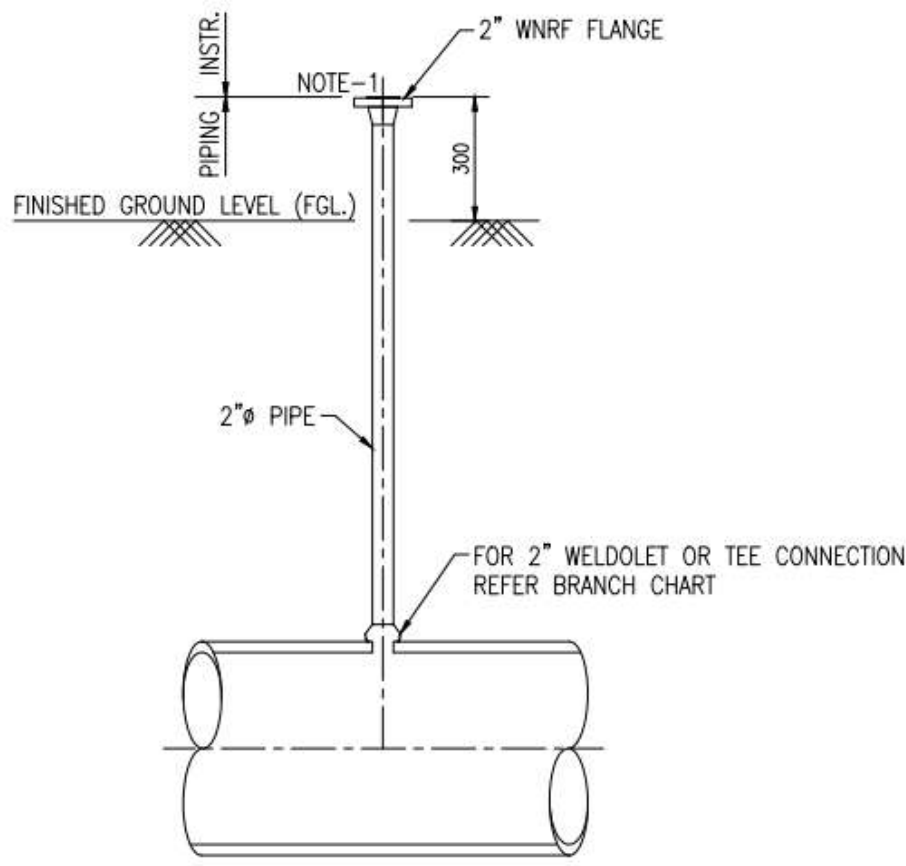
DETAIL OF TEMPERATURE
CONNECTIONS UNDER GROUND
PIPE

DRAWING NO.

SD-PI-015

SHEET NO.

1 OF 1



NOTE:
1 INSULATION GASKET SHALL BE INSTALLED.

0	10.05.17	ISSUED WITH TENDER	US		DK		AD	
REV. NO.	DATE	SUBJECT OF REVISION	PREP		CHKD		APPD	

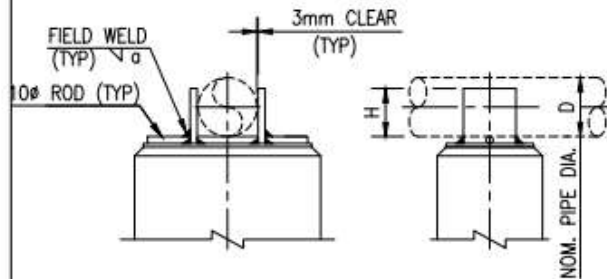
GUIDE SUPPORT FOR BARE PIPE
(SIZE 1/2" TO 24") TYPE G2

DRAWING NO.

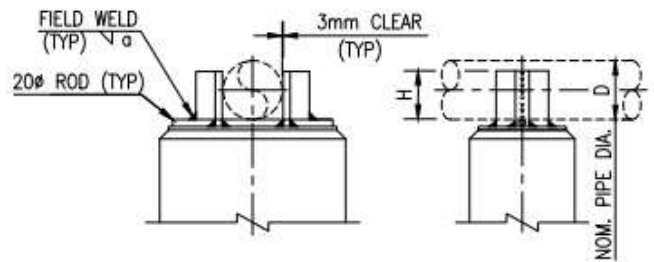
SD-PI-016

SHEET NO.

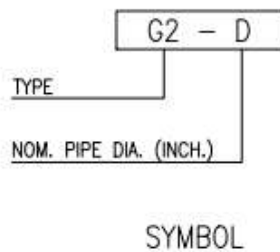
1 OF 1



FOR SIZES UPTO 4"



FOR SIZES 6" THRU 24"



D	H	a	METERIAL
2" & SMALLER	40	6	FLAT 60 x 10
3" TO 4"	70	6	FLAT 75 x 10
6" TO 8"	130	6	2 NOS. ISA 50 x 50 x 6
10" TO 18"	230	10	2 NOS. ISA 75 x 75 x 10
20" TO 24"	350	10	2 NOS. ISA 90 x 90 x 10

NOTES:-

GUIDE ANGLES SHOULD BE SUITABLY TRIMMED WHEREVER THESE OBSTRUCT ADJOINING GUIDE ANGLES.

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

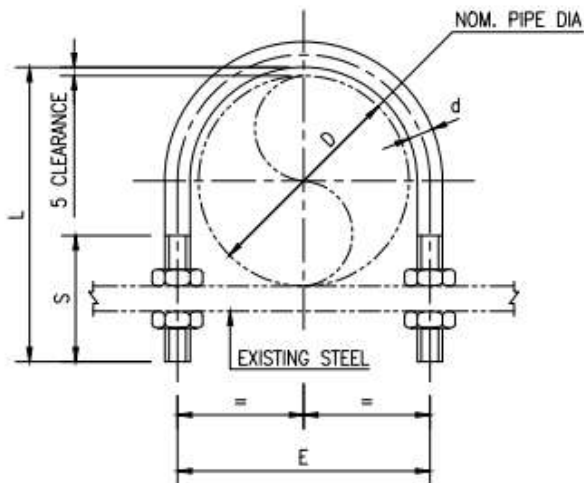
**U-BOLT FOR BARE PIPE
(SIZE 1/2" TO 24")**

DRAWING NO.

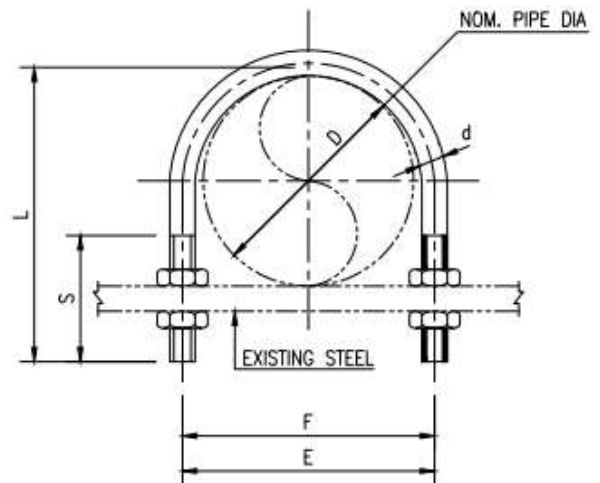
SD-PI-017

SHEET NO.

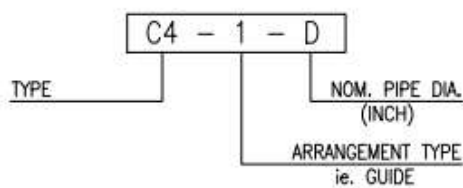
1 OF 1



**GUIDE
ARRANGEMENT TYPE-1
(1/2" TO 24")**



**FIXED
ARRANGEMENT TYPE-2
(1/2" TO 1 1/2")**



SYMBOL

D	O.D. (mm)	'U' CLAMP				
		L	E	S	d	F
1/2"	21	65	30	50	6	24
3/4"	27	70	36	50	6	30
1"	33	75	45	55	8	37
1 1/2"	48	90	60	55	8	52
2"	60	105	72	60	8	64
3"	89	145	106	80	12	94
4"	114	170	130	80	12	119
6"	168	240	190	100	16	173
8"	219	290	242	100	16	226
10"	273	345	296	100	16	280
12"	324	420	351	130	20	331
14"	356	450	382	130	20	362
16"	408	500	435	130	20	414
18"	457	565	490	140	24	465
20"	508	620	540	140	24	515
24"	610	720	645	140	24	620

0	10.05.17	ISSUED WITH TENDER	US		DK		AD	
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**VENTS AND DRAINS
(ON LINES 2" AND ABOVE)**

DRAWING NO.

SD-PI-018

SHEET NO.

1 OF 1

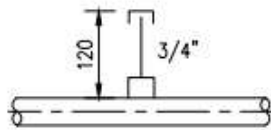
TYPE

VENT

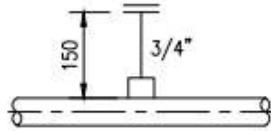
DRAIN

TYPE

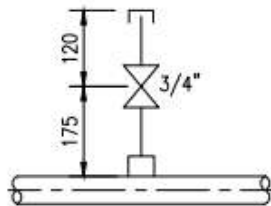
VP1
V1C



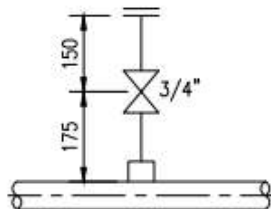
V2F



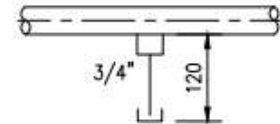
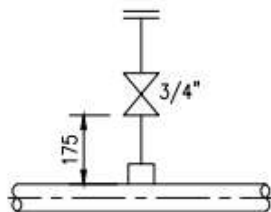
V3
V3C



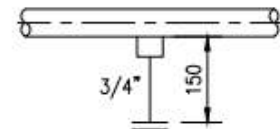
V4F



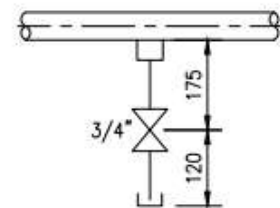
V5F



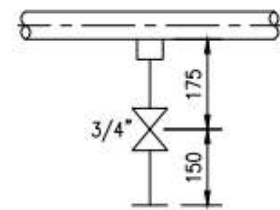
D1
D1C



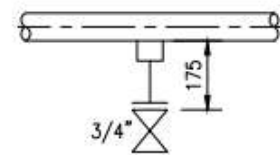
D2F



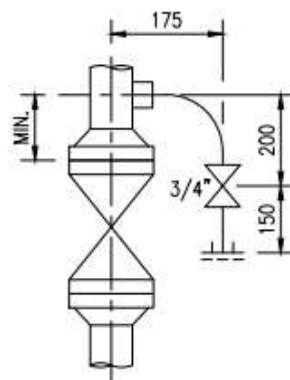
D3
D3C



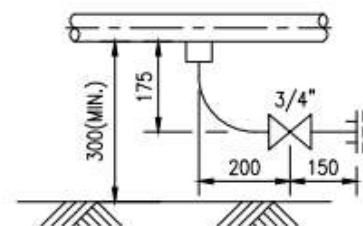
D4F



D5F



DC9
DF9



DC10
DF10

NOTES:-

1. DELETED.
2. VENTS & DRAINS SHALL BE PROVIDED WITH GATE, GLOBE OR PLUG VALVE (FLG'D.) WITH HALF COUPLING. OR STUB IN, WITH CAP OR FLANGE & BLIND FLANGE AS PER PIPING SPECIFICATIONS.
3. DELETED.
4. LEGEND : V = VENT; D = DRAIN; C = CAP; F = FLANGE; P = PLUG.

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

**VENTS AND DRAINS
(ON LINES 1 1/2" AND BELOW)**

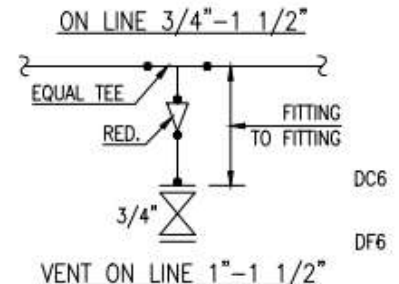
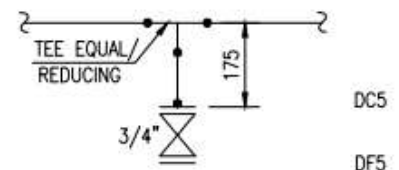
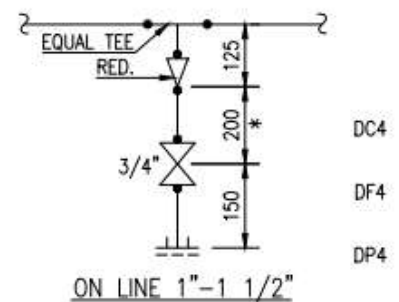
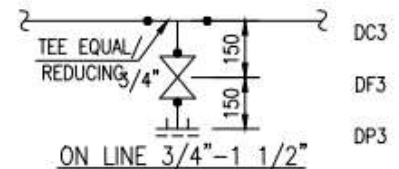
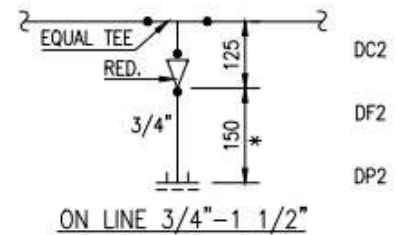
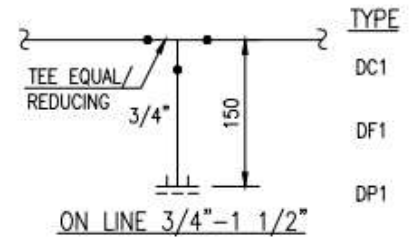
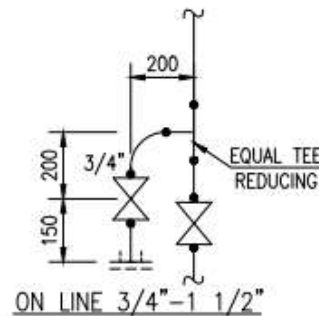
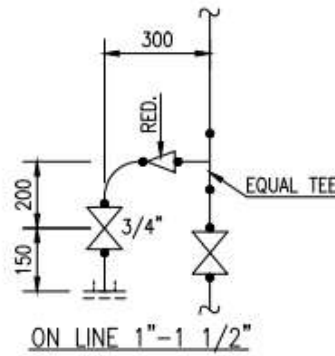
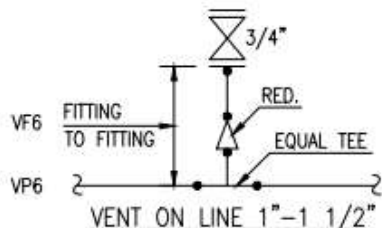
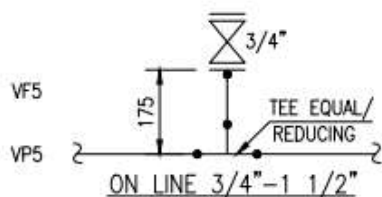
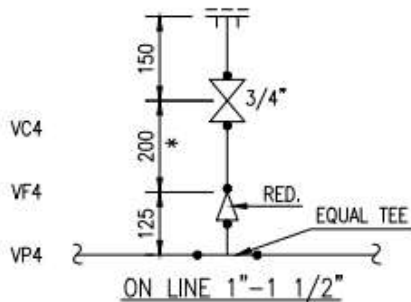
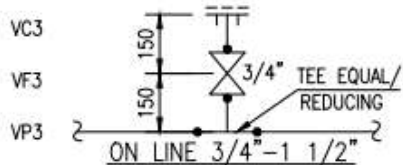
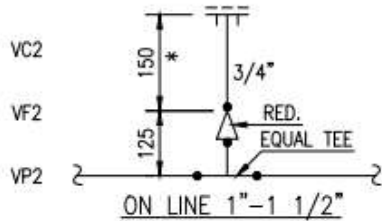
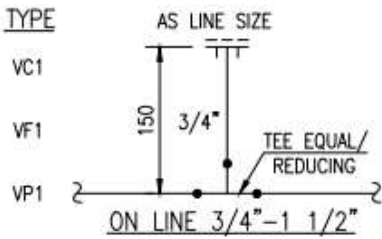
DRAWING NO.

SD-PI-019

SHEET NO.

1 OF 1

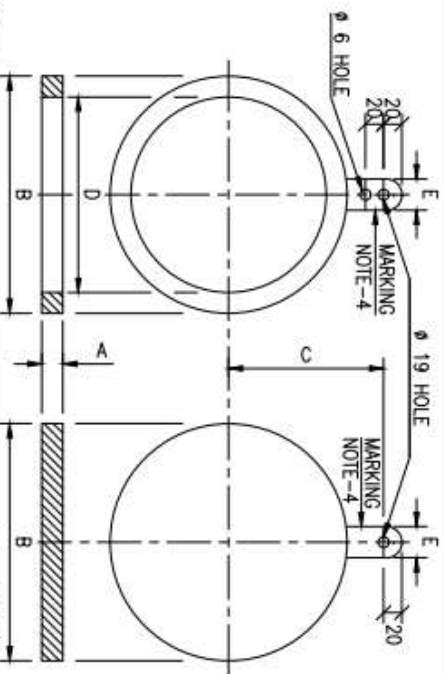
TYPE



NOTES:-

1. DIMENSIONS ARE VALID FOR 50mm(MAX) INSULATION THICKNESS, INCREASE DIMENSIONS AS REQUIRED, DIMENSIONS MARKED '*' ARE MAXIMUM AND MAY BE REDUCED TO SUIT.
2. VENTS & DRAINS SHALL BE PROVIDED WITH GATE, GLOBE OR PLUG VALVE (FLGD.) WITH TEE (EQUAL OR REDUCING), HALF COUPLING OR STUB IN, CAP OR PLUG FLANGE AND BLIND FLANGE AS PER PIPING SPECIFICATION.
LEGEND : V = VENT; D = DRAIN; C = CAP; F = FLANGE; RED. = REDUCER, COUPLING OR SOCKET; P = PLUG.

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD



- NOTES:-
1. PROVIDE CONCENTRIC SERRATED FINISH ON BOTH SIDES WITH GROOVES 0.8 mm APART AND DEPTH APPROX 0.4 mm.
 2. DIMENSIONS ARE FOR FLANGES TO ANSI B16.5 FOR SIZE UP TO 24" & MSS-SP-44 FOR SIZE ABOVE 24" FOR FLANGES TO API 605 CALCULATE DIMM.
 3. THE DIA METER RATING AND MATERIAL SPECIFICATION SHALL BE MARKED ON WELDED FIXED PLATE.
 4. MATERIAL AS PER PIPE CLASS.

PIPE SIZE INCH	150# FF						APPROX WT KGS		300# FF						APPROX WT KGS		600# FF						APPROX WT KGS		PIPE SIZE INCH
	A	B	C	D	E	F	BLIND SPEC ER	A	B	C	D	E	F	BLIND SPEC ER	A	B	C	D	E	F	BLIND SPEC ER				
1"	5	62	105	29	25	4	0.2	0.1	5	70	115	29	25	4	0.2	0.1	5	70	125	29	25	4	0.28	0.15	1"
1 1/2"	5	82	115	43	25	4	0.3	0.2	5	92	125	43	25	4	0.4	0.3	7	92	125	43	25	4	0.5	0.35	1 1/2"
2"	7	102	125	55	25	4	0.4	0.3	7	108	130	55	25	4	0.6	0.4	10	108	130	55	25	4	0.75	0.5	2"
2 1/2"	7	121	140	65	25	4	0.8	0.6	10	127	150	65	25	6	1.1	0.7	15	127	150	65	25	6	1.2	0.9	2 1/2"
3"	7	134	150	80	40	4	0.9	0.7	10	146	155	80	40	6	1.7	1.0	15	146	155	80	40	6	2.0	1.2	3"
4"	8	170	165	106	40	6	1.8	1.0	13	178	180	106	40	6	2.1	1.2	18	190	180	106	40	6	3.7	2.4	4"
6"	11	218	190	157	40	6	3.7	1.5	18	248	210	157	40	6	7.2	3.8	24	263	225	157	40	8	11.0	6.2	6"
8"	15	275	220	207	40	6	7.5	2.7	21	305	240	207	40	8	13.5	6.3	30	314	260	207	40	10	19.5	10.0	8"
10"	18	335	250	260	40	8	13.0	4.3	26	358	270	260	40	10	22.5	8.8	37	397	300	260	40	10	37.0	19.0	10"
12"	19	405	290	312	40	8	22.0	8.0	30	418	310	312	40	10	35.0	13.8	43	454	325	312	40	15	57.0	27.5	12"
14"	22	445	320	342	40	10	28.0	12.5	34	480	340	342	40	15	52.0	23.5	48	448	350	342	40	15	71.0	33.0	14"
16"	26	510	350	393	40	10	42.0	15.0	38	536	375	393	40	15	70.0	30.0	54	560	390	393	40	20	110	55	16"
18"	29	545	370	445	40	10	53.0	17.0	43	592	400	445	40	20	100	42.0	62	608	415	445	40	20	140	65	18"
20"	30	600	400	496	40	15	70.0	20.0	48	650	440	496	40	20	128	49.0	67	678	450	496	40	20	190	83	20"
24"	37	710	450	597	50	15	120	52.0	57	772	510	597	50	20	210	74.0	81	785	515	597	50	25	307	125	24"
TOLERANCE	± 0.3	± 0.5		± 0.5	± 1.0				± 0.3	± 0.5		± 0.5	± 1.0				± 0.3	± 0.5		± 0.5	± 1.0			TOLERANCE	

							DRAWING NO.	REV.
0	10.05.17	ISSUED WITH TENDER	US	OK	AD		SD-P-021	0
NO.	DATE	REVISION	DRN	CHKD	APPD			
						SPACERS BLINDS 150#,.300 # & 600# FF		

**SYMBOLS OF PIPING
ELEMENTS ON DRAWINGS**

DRAWING NO.

SD-PI-023

SHEET NO.

1 OF 4

DESCRIPTION	FLANGED	SCREWED	WELDED (NOTE-1)	SOCKET WELD
90° ELBOW				
ELBOW (TURNED UP)				
ELBOW (TURNED DOWN)				
MITERED BEND 90°				
MITERED BEND 45°				
45° ELBOW				
45° ELBOW (TURNED UP)				
45° ELBOW (TURNED DOWN)				
TEE EQUAL/UNEQUAL				
TEE (OUTLET UP)				
TEE (OUTLET DOWN)				
CROSS				
CONCENTRIC REDUCER				
ECCENTRIC REDUCER				
DEAD END				
LATERAL				
SIGHT GLASS				
UNION				
HALF COUPLING				
FULL COUPLING				
HOSE COUPLING				

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

**SYMBOLS OF PIPING
ELEMENTS ON DRAWINGS**

DRAWING NO.

SD-PI-023

SHEET NO.

2 OF 4

DESCRIPTION	FLANGED	SCREWED	WELDED (NOTE-1)	SOCKET WELD
GATE VALVE (PLAN)				
GATE VALVE (ELEVATION)				
GLOBE VALVE (PLAN)				
GLOBE VALVE (ELEVATION)				
ANGLE VALVE (PLAN)				
ANGLE VALVE (ELEVATION)				
CHECK VALVE (PLAN OR ELEVATION)				
ANGLE STOP CHECK VALVE (PLAN)				
ANGLE STOP CHECK VALVE (ELEVATION)				
PLUG VALVE (PLAN)				
PLUG VALVE (ELEVATION)				
BALL VALVE (PLAN)				
BALL VALVE (ELEVATION)				
NEEDLE VALVE (PLAN OR ELEVATION)				
RELIEF VALVE (PLAN)				
RELIEF VALVE (ELEVATION)				
CONTROL VALVE GLOBE TYPE(PLAN)				
CONTROL VALVE GLOBE TYPE(ELEVATION)				
CONTROL VALVE BUTTERFLY TYPE(PLAN)				
CONTROL VALVE BUTTERFLY TYPE(ELEV.)				
SOLENOID OPERATED VALVE(PLAN OR ELEV.)				

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

**SYMBOLS OF PIPING
ELEMENTS ON DRAWINGS**

DRAWING NO.

SD-PI-023

SHEET NO.

3 OF 4

DESCRIPTION	FLANGED	SCREWED	WELDED (NOTE-1)	SOCKET WELD
BUTTERFLY VALVE (PLAN OR ELEVATION)				
DIAPHRAGM VALVE (PLAN OR ELEVATION)				
3-WAY PLUG VALVE (PLAN OR ELEVATION)				
4-WAY PLUG VALVE (PLAN OR ELEVATION)				
EXPANSION JOINT				
ANGLE CONTROL VALVE				
CHAIN OPERATING VALVE				
GEAR OPERATED VALVE (BEVEL GEAR)PLAN				
GEAR OPERATED VALVE (SPUR GEAR)PLAN				
MOTOR OPERATING VALVE				
STEAM TRAP				
Y-STRAINER				

DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
SLIP ON FLANGE		STUB - IN (WITH OR WITHOUT RENIF)	
WELDNECK FLANGE			
SCREWED FLANGE		STUB - IN (SADDLE RENIF)	
SOCKET WELD FLANGE			
SPACER		STUB - IN WITH RENIF (IN PLAN)	
SPACER BLIND			
SPECTALE FIG. 8 (BLIND)		INSULATED (LINES 12" AND BELOW)	
SPECTALE FIG. 8 (OPEN)			

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

**SYMBOLS OF PIPING
ELEMENTS ON DRAWINGS**

DRAWING NO.

SD-PI-023

SHEET NO.

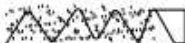
3 OF 4

DESCRIPTION	FLANGED	SCREWED	WELDED (NOTE-1)	SOCKET WELD
BUTTERFLY VALVE (PLAN OR ELEVATION)				
DIAPHRAGM VALVE (PLAN OR ELEVATION)				
3-WAY PLUG VALVE (PLAN OR ELEVATION)				
4-WAY PLUG VALVE (PLAN OR ELEVATION)				
EXPANSION JOINT				
ANGLE CONTROL VALVE				
CHAIN OPERATING VALVE				
GEAR OPERATED VALVE (BEVEL GEAR)PLAN				
GEAR OPERATED VALVE (SPUR GEAR)PLAN				
MOTOR OPERATING VALVE				
STEAM TRAP				
Y-STRAINER				

DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL
SLIP ON FLANGE		STUB - IN (WITH OR WITHOUT RENIF)	
WELDNECK FLANGE			
SCREWED FLANGE		STUB - IN (SADDLE RENIF)	
SOCKET WELD FLANGE			
SPACER		STUB - IN WITH RENIF (IN PLAN)	
SPACER BLIND			
SPECTALE FIG. 8 (BLIND)		INSULATED (LINES 12" AND BELOW)	
SPECTALE FIG. 8 (OPEN)			

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

	GASKET THICKNESS	DRAWING NO.	
		SD-PI-024	
		SHEET NO.	1 OF 1

TYPICAL CROSS SECTION	DESCRIPTION		THICKNESS OF GASKET	COMPRESSED THICKNESS (NOTE -1)
	FLAT RING FOR RAISED FACE FLANGE	COMPRESSED ASBESTOS FOR SYNTHETIC RUBBER	2.0	2.0
	FULL FACE FOR FLAT FACE FLANGES			
	SPIRAL WOUND METAL FLAT RING GASKET, NON METALLIC FILTER, AND A STEEL SOLID RING TYPE CENTERING DEVICE- FOR RAISED FACE FLANGES.		4.4	3.0
	FLAT METAL JACKETED GASKET, NON METALLIC FILTER COMPLETELY ENCLOSED WITHIN A FULLY ANNEALED DOUBLE METAL JACKET-FORRAISED FACE FLANGES		3.0	2.0
	CORRUGATED METAL JACKETED GASKET, NON METALLIC FILTER, COMPLETELY ENCLOSED WITHIN A FULLY ANNEALED DOUBLE METAL CORRUGATED JACKET- FOR RAISED FACE FLANGES.		3.2	1.0
	CORRUGATED METAL GASKET-FULLY ANNEALED CORRUGATED METAL WITH FILTER MATERIAL CEMENTED TO THE CORRUGATIONS ON BOTH FACES -FOR RAISED FACE FLANGES		3.2	1.0
	SOLID METAL FLAT RING FOR SMALL TONGUE AND GROOVE FLANGES.		AS SPECIFIED	
	SOLID METAL FLAT RING FOR LARGE TONGUE AND GROOVE FLANGES.		AS SPECIFIED	
	SOLID METAL OCTAGONAL RING FOR R.T.J FLANGES		DIMENSIONS SHALL BE AS PER ASME B 16.20(NOTE-2)	
	SOLID METAL OVAL RING FOR R.T.J FLANGES		DIMENSIONS SHALL BE AS PER ASME B 16.20(NOTE-2)	
	FULLY ANEALED CORRUGATED METAL FOR RAISED FACE FLANGES.		3.2	1.0

0	10.05.17	ISSUED WITH TENDER	US		DK		AD	
REV. NO.	DATE	SUBJECT OF REVISION	PREP		CHKD		APPD	

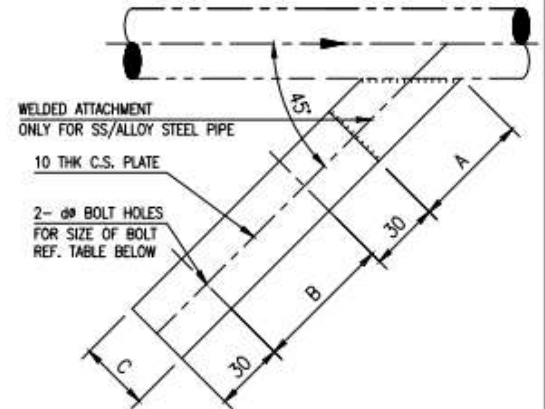
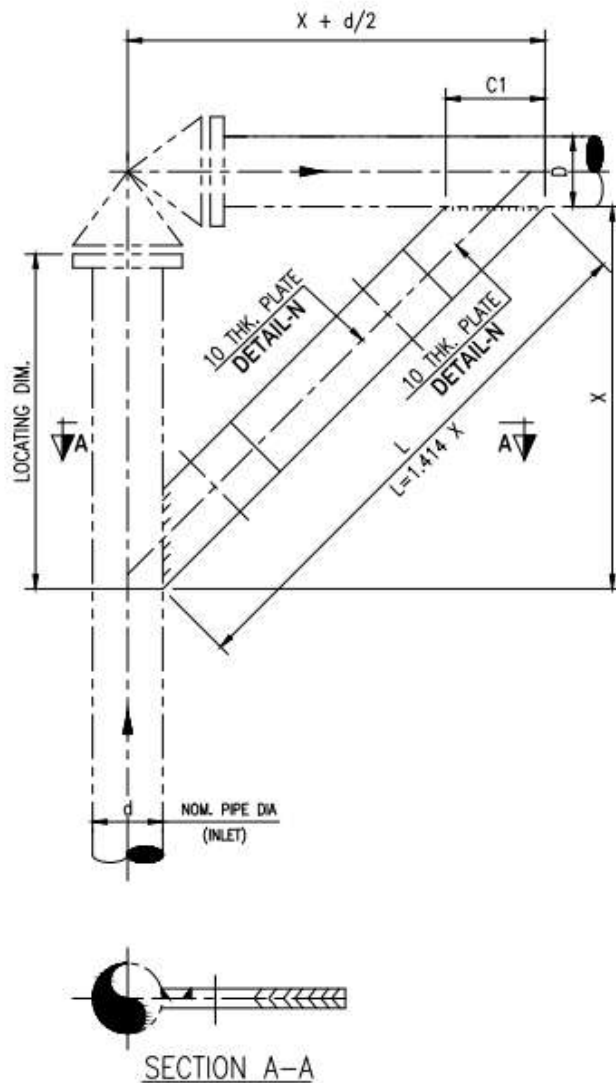
**SUPPORTING ARRANGEMENT
FOR ANGLE AND RELIEF VALVES
TYPE-SP2**

DRAWING NO.

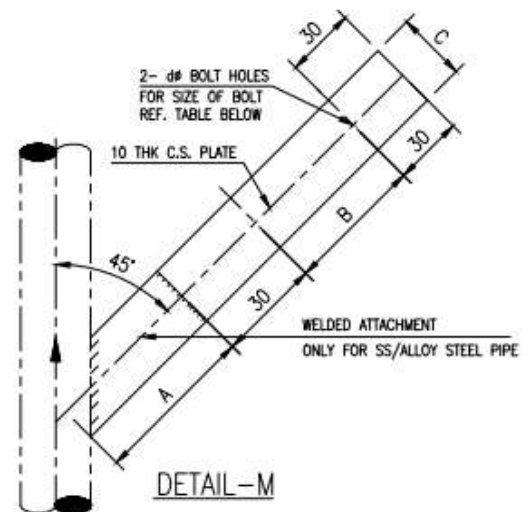
SD-PI-025

SHEET NO.

1 OF 1



DETAIL-N



DETAIL-M

SP2 - L - d/D REF. LEVEL

TYPE

LENGTH

NOM. INLET PIPE DIA./
NOM. OUTLET PIPE DIA.

SYMBOL

NOTES:-

1. MATERIAL FOR WELDED ATTACHMENT SHALL BE EQUIVALENT TO PIPE MATERIAL.

D	BOLT SIZE $d\phi$	A	C	B MIN.	C1	D1
1" TO 4"	M12 X 50	75	50	150	71	14
6" TO 12"	M16 X 50	100	75	200	106	18

FOR TEMP. UP TO 400 °C ONLY

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

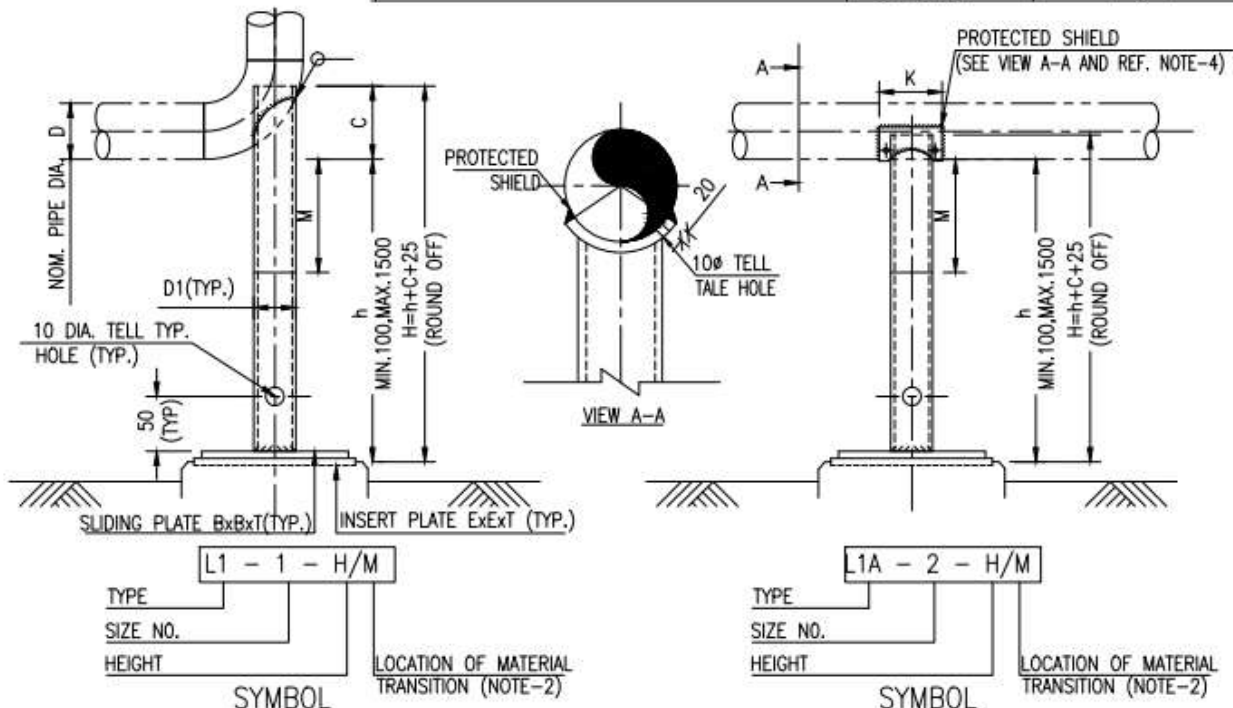
LOW SUPPORT SLIDING FOR BARE
& INSULATED PIPE SIZE 2"
THRU 36" TYPE-L1 AND L1A

DRAWING NO.

SD-PI-026

SHEET NO.

1 OF 1



SIZE NO.	D	D1 (NOTE-3)	B	T	C (NOTE-5)	E	K (NOTE-4)
1	2"	2" S40/10S	150	10	70	250	160
	3"				115		
2	4"	3" S40/10S	200	10	137	300	190
	6"				174		
3	8"	4" S40/10S	200	12	205	300	215
	10"				262		
	12"				287		
4	14"	6" S40/10S	250	12	388	350	270
	16"				418		
5	18"	8" S40/10S	300	12	454	400	320
6	20"	10" S40/10S	350	12	554	450	375
	24"				615		
7	26"	12" S40/10S	400	16	675	500	425
	30"				800		
	36"				950		

NOTES:-

- INSERT AND SLIDING PLATE MATERIAL SHALL BE CARBON STEEL WHERE DESIGN TEMP. IS $>345^{\circ}\text{C}$ WITH $h < 200\text{MM}$, SLIDING PLATE MATERIAL SHALL BE EQUIVALENT TO PIPE MATERIAL.
- DIMENSION "M" LOCATES THE POINT OF MATERIAL TRANSITION ON THE SUPPORT. THE STUB MATERIAL SHALL BE EQUIVALENT TO THAT OF LINE PIPE AND THE LOWER SUPPORT PIPE SHALL BE CARBON STEEL. MINIMUM VALUE OF M SHALL BE "INSULATION THICKNESS+25MM".
 - FOR CARBON STEEL(CS) LINE PIPE, THE ENTIRE SUPPORT PIPE SHALL BE CS, THAT IS $M=0$.
 - FOR ALLOY STEEL(AS) OR STAINLESS STEEL(SS) LINE -PIPE, SUPPORT PIPE SHALL CONSIST OF THE FOLLOWING-
 - FOR h LESS THAN OR EQUAL TO 500MM, ENTIRE SUPPORT PIPE MATERIAL SHALL BE EQUIVALENT TO THAT OF LINE PIPE, THAT IS $M=h$.
 - FOR h GREATER THAN 500MM, SUPPORT PIPE SHALL BE COMPOSITE WITH $M=\text{INSULATION THK.}+25\text{MM}$ OR 100MM, WHICHEVER IS GREATER.
- IN CASE SIZE AND/OR SCH. OF SUPPORT PIPE (D1) LISTED IN THE TABLE IS NOT AVAILABE USE NEXT HIGHER SIZE AND/OR NEAREST HIGHER THICKNESS AVAILABLE.
- PROTECTION SHIELD (LENGTH=KMM) CUT FROM LINE-PIPE OR EQUIVALANT PLATE SHALL BE PROVIDED ON HORIZONTAL LINE AS FOLLOWS-
 - FOR 150# AND 300# CLASS PIPEING
 - CS AND AS LINES - 10" AND ABOVE
 - SS LINES - 2" AND ABOVE
 - FOR 600# AND HIGHER CLASS PIPING
 - CS, AS AND SS LINES - 10" AND ABOVE
- DIMENSION "C" IS TO BE MODIFIED IF OTHER THAN 1.5 D RADIUS ELBOWS ARE USED.
- IN CASE CALCULATED h EXCEEDS THE MAX. VALUE, PEDESTAL SHALL BE RAISED ACCORDINGLY.

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

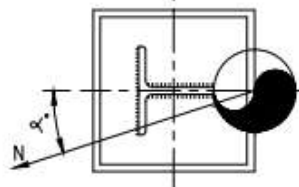
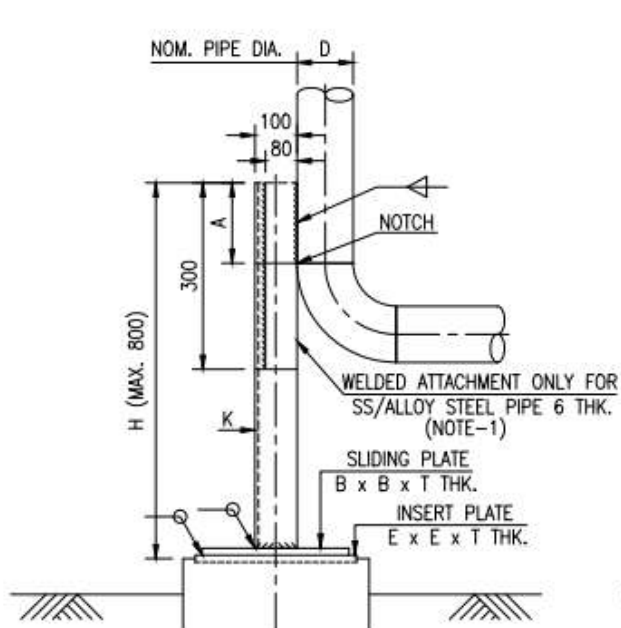
LOW SUPPORT FIXED FOR BARE
& INSULATED PIPE SIZE 2"
THRU 24" TYPE-L6

DRAWING NO.

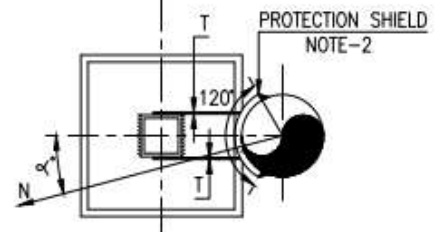
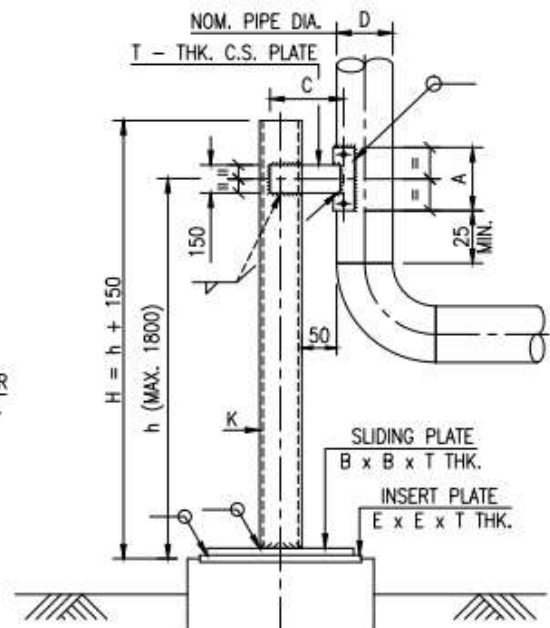
SD-PI-027

SHEET NO.

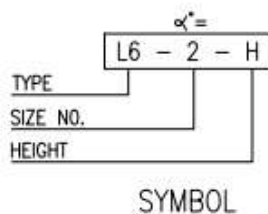
1 OF 1



FOR PIPE SIZES 2" THRU 4"



FOR PIPE SIZES 6" THRU 24"



NOTES:-

1. MATERIAL FOR WELDED ATTACHMENT SHALL BE EQUIVALENT TO PIPE MATERIAL.
2. PROTECTION SHIELD IS TO BE CUT FROM LINE PIPE.

SIZE NO.	D	K	A	T	C	E	B
1	2" TO 4"	CUT FROM ISMB 200	200	10	-	250	150
2	6" TO 10"	ISMC-125 2 NOS.	200	12	150	300	200
3	12" TO 24"	ISMC-225 2 NOS.	300	12	230	400	300

FOR TEMP. UP TO 400 °C ONLY

0	10.05.17	ISSUED WITH TENDER	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

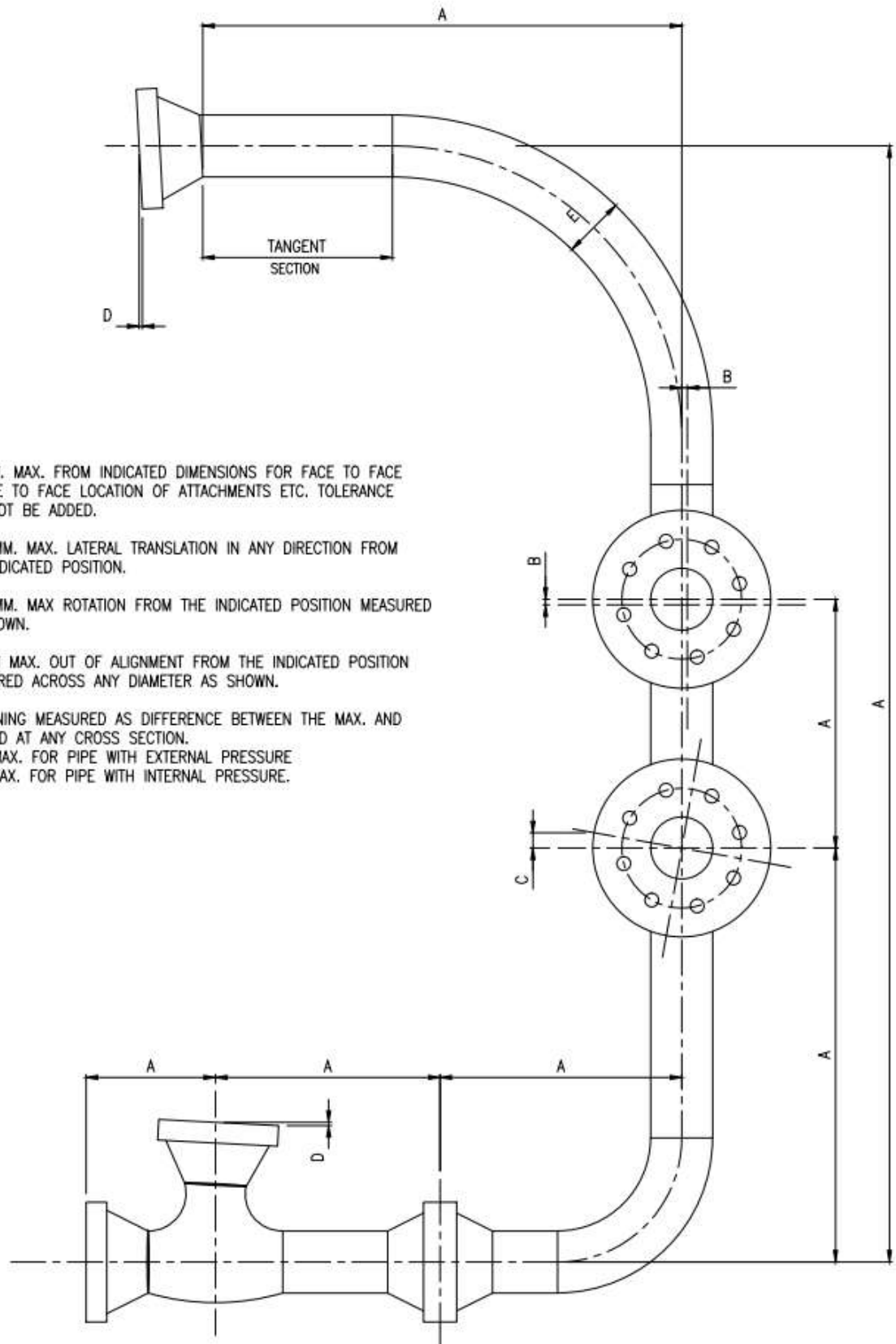
**TOLERANCES
FOR FABRICATION**

DRAWING NO.

SD-PI-028

SHEET NO.

1 OF 1



- A ± 3 MM. MAX. FROM INDICATED DIMENSIONS FOR FACE TO FACE CENTRE TO FACE LOCATION OF ATTACHMENTS ETC. TOLERANCE CAN NOT BE ADDED.
- B ± 1.5 MM. MAX. LATERAL TRANSLATION IN ANY DIRECTION FROM THE INDICATED POSITION.
- C ± 1.5 MM. MAX ROTATION FROM THE INDICATED POSITION MEASURED AS SHOWN.
- D ± 1 MM MAX. OUT OF ALIGNMENT FROM THE INDICATED POSITION MEASURED ACROSS ANY DIAMETER AS SHOWN.
- E FLATTENING MEASURED AS DIFFERENCE BETWEEN THE MAX. AND MIN. OD AT ANY CROSS SECTION.
 -3% MAX. FOR PIPE WITH EXTERNAL PRESSURE
 8% MAX. FOR PIPE WITH INTERNAL PRESSURE.

0	10.05.17	ISSUED FOR STANDARD	US	DK	AD
REV. NO.	DATE	SUBJECT OF REVISION	PREP	CHKD	APPD

ABBREVIATIONS

DRAWING NO.

SD-PI-029

SHEET NO.

1 OF 1

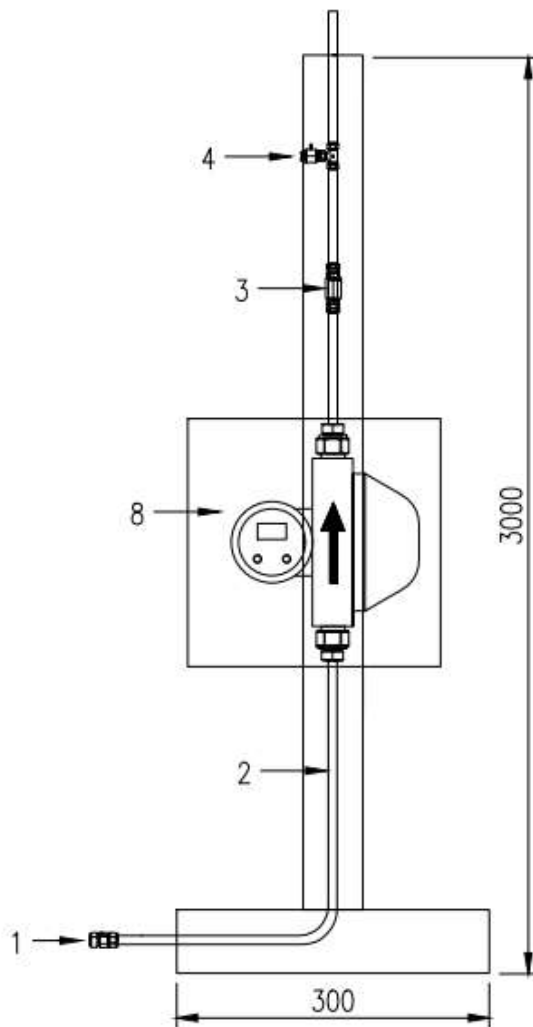
M&F	MALE & FEMALE	SO	SLIP ON
MI	MALLEABLE IRON	SOL	SOCKOLET
MOLY OR MO	MOLYBDENUM	SP. GR	SPECIFIC GRAVITY
MR	MATERIAL REQUISITION	SR	SHORT RADIUS
MTO	MATERIAL TAKE OFF	SS	STAINLESS STEEL
MS	MILD STEEL	ST	STEAM TRAP
MSS	MANUFACTURER'S STANDARD SOCIETY	STN	STATION
MH	MAN HLOE	STM	STEAM
NPT	NATIONAL PIPE THREAD	STD	STANDARD
NPSH	NET POSITIVE SUCTION HEAD	SW	SOCKET WELD
NIP	NIPPLE	SWG	SWAGE NIPPLE / STD WIRE GAGE
OD	OUTSIDE DIAMETER	STA	STEAM TRAP ASSEMBLY
PC.MK	PIECE MARK	TOG	TOP OF GRATING
PE	PLAIN END	TEMP.	TEMPERATURE
PL	PLATE	TOL	THREDOLET
PLTF	PLATFORM	T&C	THREADED & COUPLED
P.S	PIPE SUPPORT	THRD	THREADED
PSE	PLAIN SMALL END	T&G	TONGUE & GROOVE
PRESS.	PRESSURE	TBE	THREADED BOTH ENDS
PSI	POUNDS PER SQUARE INCH	TLE	THREADED LARGE END
POE	PLAIN ONE END	TSE	THREADED SMALL END
PSIG	POUNDS PER SQUARE INCH GAUGE	TOS	TOP OF STEEL
RAD OR R	RADIUS	TOE	THREADED ONE END
RED.	REDUCER	TYP	TYPICAL
RF	RAISED FACE	VC	VENT CONNECTION
R/L	RANDOM LENGTH	VERT.	VERTICAL
REF.	REFERENCE	WP	WORKING PRESSURE, WORKING POINT
RPM	REVOLUTIONS PER MINUTE		INVERT LEVEL OF PIPE
RTJ	RING TYPE JOINT		BOTTOM LEVEL OF THE PIPE
SH	SPRING HANGER		CENTRELINE ELEVATION OF PIPE
SHT	SHEET	WN	WELD NECK
SCH	SCHEDULE	WT	WEIGHT
SCRD	SCREWED	WOL	WELDOLET
S	SAMPLE CONNECTION	WLD	WELD
SG	SIGHT GLASS	XS	EXTRA STRONG
SC	SAMPLE COOLER	XXS	DOUBLE EXTRA STRONG
SMLS	SEAMLESS		

NOTE:

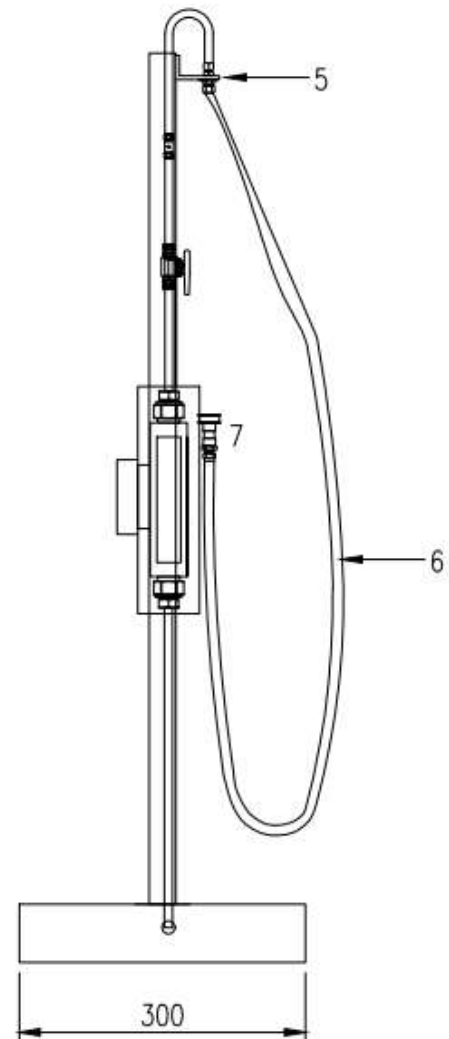
1. FOR ABBREVIATIONS RELATED TO CIVIL ENGINEERING/UNDERGROUND PIPING WORK,
REFER CIVIL ENGINEERING STANDARD.

0	10.05.17	ISSUED WITH TENDER	US		DK		AD	
REV. NO.	DATE	SUBJECT OF REVISION	PREP		CHKD		APPD	

	LCV LOADING POST WITH FLOW METER	DRAWING NO.	
		SD-ME-001	
		SHEET NO.	1 OF 1



FRONT VIEW



SIDE VIEW

S.NO.	PART NAME	MATERIAL	MAKE/MODEL
1	UNION 3/4" OD	SS 316	SWAGELOK/PARKER/ DK LOK
2	TUBE 3/4" OD	A 269/213 TP316	SANDVIK/TUBACEX
3	TWO WAY BALL VALVE 3/4" OD	SS 316	SWAGELOK/PARKER/ DK LOK
4	BLEED VALVE 1/4" NPTM	SS 316	SWAGELOK/PARKER/ DK LOK
5	BULKHEAD UNION 3/4" OD	SS 316	SWAGELOK/PARKER/ DK LOK
6	FILL HOSE 1/2" ID, LENGTH-4Mtr. (SS BRAIDED STAINLESS STEEL)	5000 PSIG	SWAGELOK/TUBACEX/ETON
7	QRC 1/2" NPTF	SS 316	SWAGELOK/PARKER/ DK LOK
8	FLOW METER WITH INTEGRATED DISPLAY (COROLIS TYPE) 0-100 Kg/min.	-	MICRO MOTION / E&H

NOTES :

1. ALL DIMENSIONS IN MM.
2. THIS DWG. IS INDICATIVE ONLY, VENDOR TO FURNISH FINAL DWG. BASED ON ARRANGEMENT FOR CNG FILLING FOR APPROVAL POST ORDER.
3. HOSE SHOULD CONFIRM TO NFPA52/CSA NGV 4.2-2014/CSA12.52-2014.

0	24.09.19	ISSUED FOR REVIEW	DK		RR		AD	
REV. NO.	DATE	SUBJECT OF REVISION	PREP		CHKD		APPD	

**LIST OF ATTACHMENT
CIVIL-STRUCTURAL AND ARCHITECTURAL**

CONTENTS

1.0 LIST OF ATTACHMENTS.....3

2.0 STANDARD DRAWINGS3

3.0 SPECIFICATIONS.....6

4.0 PROJECT SPECIFIC DRAWINGS.....4

1.0 LIST OF ATTACHMENTS

Contractor shall carry out all works strictly in accordance with the drawings/documents/specifications indicated in subsequent paragraphs.

2.0 STANDARD DRAWINGS

Sr. No	Standard Drawings Number	Description	Sheet	Rev No
1		Detail of Road Curves and Crossing	1	3
2		Chain Link Fencing	2	3
3		Detail Of Soak Pit	1	3
4		Detail Of Septic Tank	1	3
5		Standard section of storm water drains	1	3
6		Trench Sand Bedding	1	3
7		Concrete Bedding & Encasement for Pipes	1	3
8		Pipe Culvert for Storm Water Drainage	1	3
9		Rain Water Harvesting Pit	1	3
10		Cross Section of Road	3	3
11		Sand trap (for tank farm)	1	3
12		Man Holes (SWS) type-1 for depth < 1M(ϕ <300)	1	3
13		Man Holes type-2 sanitary waste system for depth <2M(ϕ ≤500)	1	3
14		Details of masonry dyke and fire wall (tank farm)	1	3
15		Brick masonry compound wall	1	3
16		Tank pad details with stone ring wall (for tank height up to 10.0m)	1	3
17		Brick footpath	1	3
18		RCC pavement details	1	3
19		Concrete trapezoidal storm water drain (height (h)<3.0m)	1	3
20		Steps on earthen dykes and road	1	3

Sr. No	Standard Drawings Number	Description	Sheet	Rev No
		embankments		
21		Area plan for Topo survey	1	3
22		Standard Typ. Details of Cable Trench	1	3
23		R.C.C Flooring Details(Type I & II)	2	3
24		Handrail On Steel Platform	1	3
25		Sliding T- Support	2	3
26		Small operating platforms on grade/ RCC elevation structure	3	3
27		Standard Grating Details	3	3
28		Pipe sleeper Crossover	3	3
29		Miscellaneous Details	1	3
30		Details of Steel Ladder	3	3
31		Metal Insert Plates	7	3
32		Cantilever Pipe Support	1	3
33		Standard for Ring wall foundation for storage tanks (liquid temp. up to 190° c)	4	3
34		Standard for detail of Pedestal for stair / ladder	1	3
35		Details of Block foundation for transformers (up to 2000 KVA rating)	1	3
36		Details for M.S. rungs for conc. structures	1	3
37		Steel stairs	6	3
38		Reinforcement details at circular cut-out in slab	1	3
39		Reinforcement details at sq. / rect. cut-out in slab	1	3
40		Standard lugs	1	3
41		Box culvert Type I,II,III & IV	1	3
42		Typical grating support.	1	3
43		Typical Chequered Plate Support	1	3

Sr. No	Standard Drawings Number	Description	Sheet	Rev No
44		M.S. anchor bolt assemblies	4	3
45		RCC pipe support	1	3
46		Standard for Detail of False Flooring	3	3
47		Wash Basin Fixing Detail	1	3
48		European Type W.C. Fixing Detail	1	3
49		Urinal Fixing Detail	1	3
50		Standard for Detail of Glazed Aluminum Doors	2	3
51		Wooden Flush Door	1	3
52		Glazed Aluminum Window	1	3
53		False Ceiling	1	3
54		Standard for Detail of Hung Gate	4	3
55		Standard for Detail of Steel Door (Pressed Steel Single Shutter)	2	3
56		Typ. Plinth protection	1	3
57		Aluminum sliding window	1	3
58		Aluminum ventilator	1	3
59		Standard for Detail of Barbed wire fencing(With angle Iron post)	1	3

3.0 SPECIFICATIONS

Sr. No	Specification Number	Description	Sheet	Rev no
1		Topographic survey of stations	09	3
2		Earthwork in site grading	09	3
3		Earthwork for underground piping	08	3
4		Roads and flexible pavements (up to WBM layer)	12	3
5		Concrete pavement	11	3
6		Flexible pavement with bitumen premix carpet	09	3
7		RCC pipe culverts & ERC crossing etc.	06	3
8		Tank pads	08	3
9		Gravel filling	06	3
10		Misc. civil & structural works for underground services	07	3
11		Plumbing & drainage	09	3
12		Chain link fencing	08	3
13		General scope	05	3
14		Materials	17	3
15		Earth work in foundations	13	3
16		Plain and reinforced cement concrete	35	3
17		Structural steel works	26	3
18		Steel works (tubular hollow sections)	14	3
19		Miscellaneous steel works	13	3
20		Brick masonry	09	3
21		Stone masonry	10	3
22		Demolition & dismantling	08	3
23		Miscellaneous items	09	3

Sr. No	Specification Number	Description	Sheet	Rev no
24		Soil investigations	35	3
25		Driven cast-in-situ piles	09	3
26		Construction and installation of RCC bored cast-in-situ piles	09	3
27		Testing of concrete piles	13	3
28		Floor finishing	19	3
29		Wood work	08	3
30		Steel aluminum doors, windows and ventilators	09	3
31		Plastering & Pointing	10	3
32		Roof Treatment	05	3
33		White washing, Colour washing, distempering, painting and polishing	15	3
34		Roofing	10	3
35		False ceiling, false flooring, under deck insulation & partitioning	12	3
36		Acid proof tile lining	06	3
37		Inspection and Test Plan (ITP) for Civil Structural & Architectural Works	31	3

STANDARD DRAWING FOR
OF ROAD CURVES
AND CROSSINGS

STANDARD DRAWING NO.

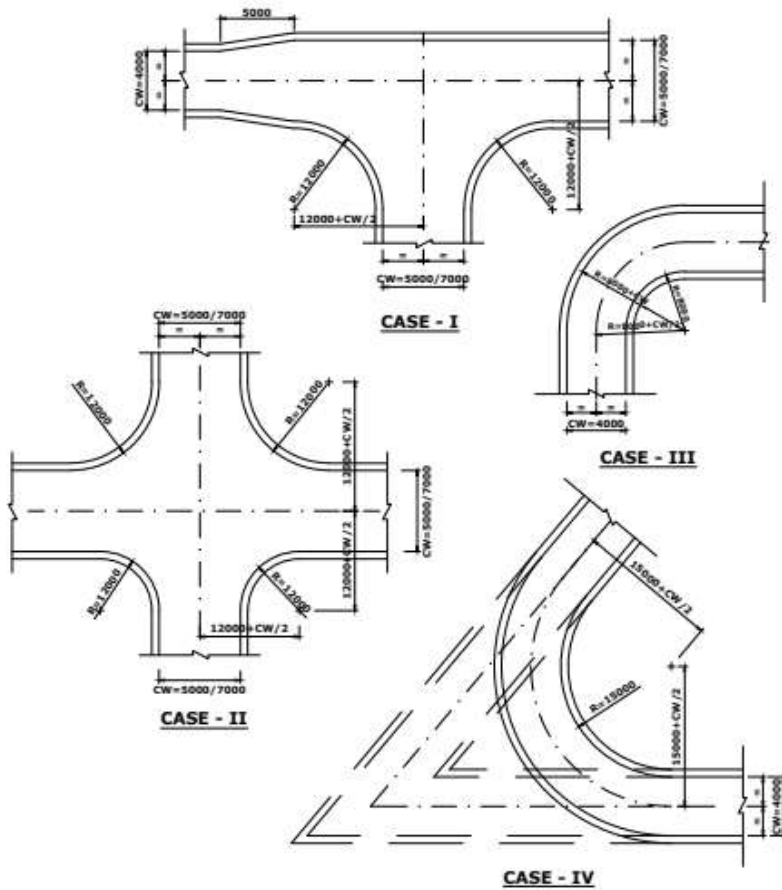
REV. SIZE

SHEET NO.

1 OF 1

03

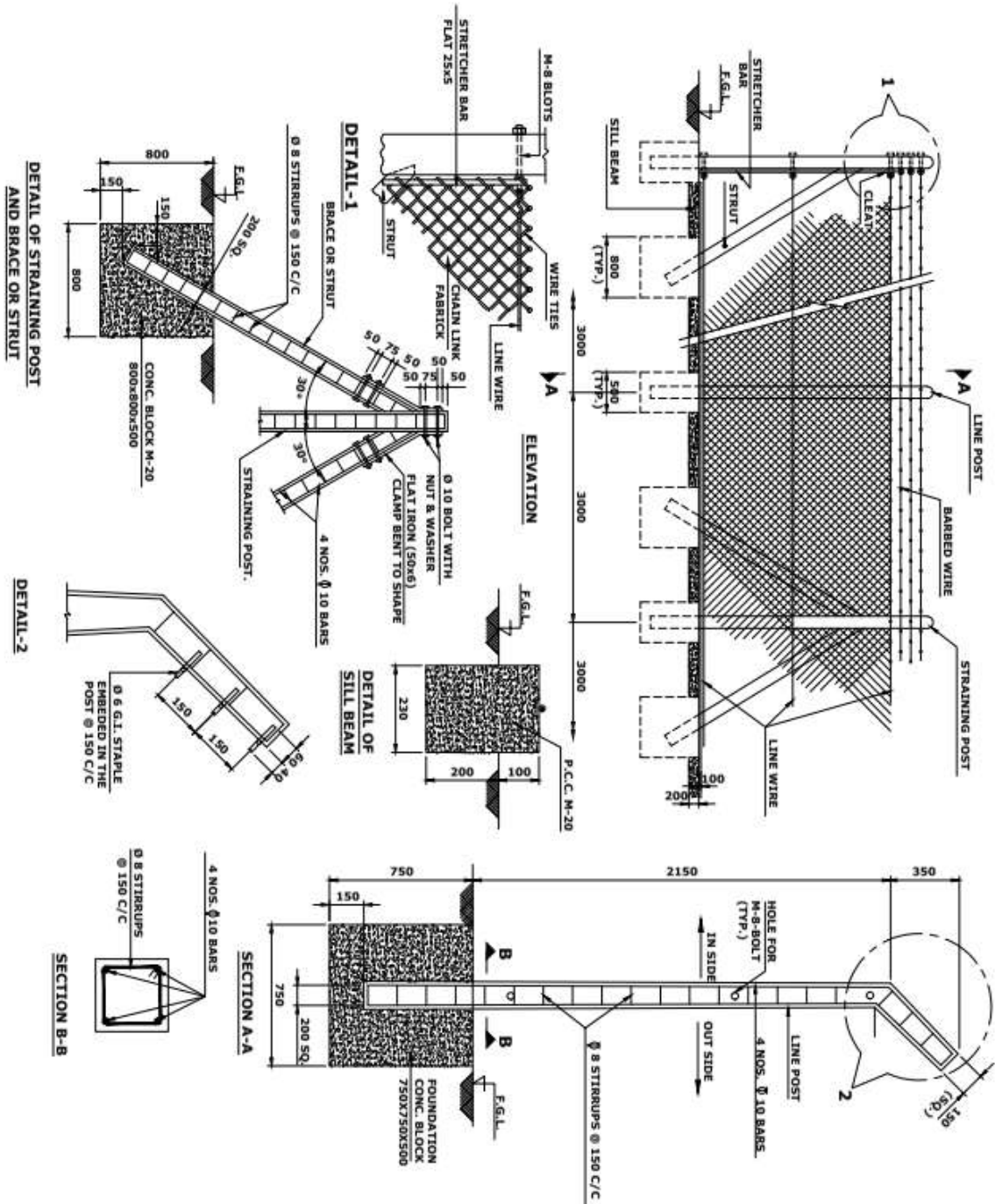
A4



NOTES:-

1. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE MENTIONED.
2. MINIMUM RADIUS OF CURVES FOR ROADS WITH $CW=4.0m$
3. MINIMUM RADIUS OF CURVES FOR ROADS WITH $CW>4.0m$ SHALL BE 12m.
4. RADIUS OF CURVES FOR APPROACH ROADS TO BUILDINGS AND OTHERS AREAS MAY BE REDUCED AS PER SERVICES REQUIRMENTS.
5. FOR ROAD CURVES WITH ACUTE ANGLE TURNING. THE MINIMUM RADIUS SHALL BE 15m AND ANGLE NOT LESS THAN 50° .

6. RADIUS OF CURVES AND CROSSING WHEN DIFFERENT FROM THOSE GIVEN IN THIS STANDARD TO MEET ANY SPECIAL REQUIRMENT SHALL BE SO MARKED IN THE AREA DRAWINGS.



NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. THE GALVANISED STEEL BARBED WIRE A1 TO IS:2778 SHALL HAVE LINE WIRE OF ϕ 2.5 MM POINT WIRE OF ϕ 2.0 MM & MINIMUM WEIGHT OF COMPLETE BARBED WIRE SHALL BE 108gm/m WITH 75 MM DISTANCE BETWEEN TWO BARS.
3. LINE POST SHALL BE PLACED AT 3.0 M C/C.
4. STRUT SHALL BE PROVIDED AT EVERY 15 TH. POST LAST BUT ONE END POST & CORNER POST ON BOTH SIDE & END POST ON ONE SIDE ONLY.
5. REINF. STEEL SHOWN THUS (SHALL CONFORM TO IS:1786 LATEST & REINF. STEEL SHOWN THUS ϕ SHALL CONFORM TO GRADE Fe 415 (MIN.) LATEST.
6. STRAINING BOLTS SHALL BE PROVIDED AT THE END POST & AT PLACES AS DIRECTED BY ENGINEER. INCHARGE.
7. SIZE OF STRAINING POST SHALL BE SAME AS THAT OF LINE POST.
8. GRADE OF CONC. SHALL BE AS FOLLOWS:
MODERATE SOIL SEVERE/ AGGRASSIVE SOIL

i) LINE & STRAINING POSTS	RCC M25	RCC M30
ii) FOUNDATION BLOCKS	PCC M20	PCC M20
iii) STILL BEAM	PCC M20	PCC M20
iv) BRACE OR STRUT	RCC M25	RCC M30
9. MANUFACTURE OF CONC. POSTS SHALL CONFORM TO IS:4996.
10. THE CHAIN LINK FABRIC SHALL CONFORM TO IS:2721.
11. STRETCHER BAR SHALL BE HOT DIP GALVANISED.
12. SUITABLE INSERTS SHALL BE PROVIDED ON THE TOP OF THE STILL BEAM TO TIE THE BOTTOM LINE WIRE WITH THE STILL BEAM.

DETAIL OF CHAIN LINK FENCING (WITH CONC. POST)

TYPE-I

[illegible]

TYPICAL FENCING DETAIL

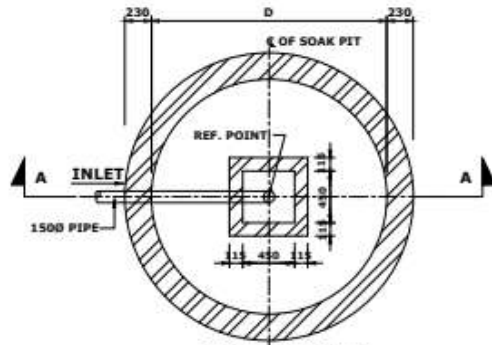


DETAIL OF CHAIN LINK
ENCING & GATE (WITH STEEL POST)

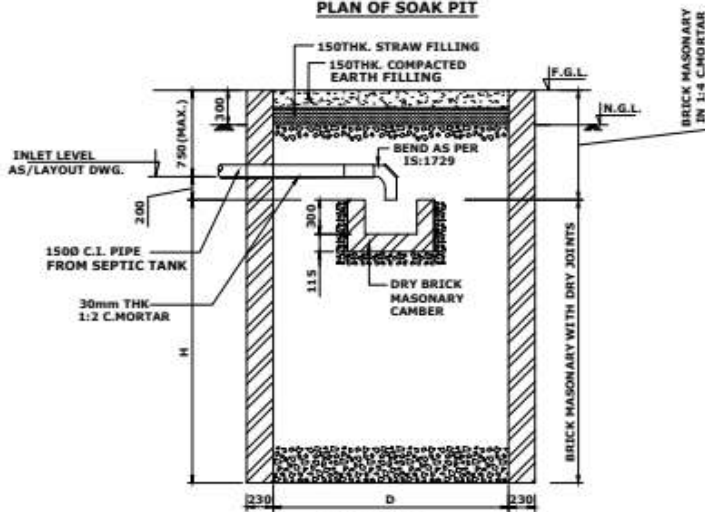
TYPE-II

STANDARD DRAWING FOR
DETAIL OF SOAKPIT

STANDARD DRAWING NO.	REV.	SIZE
	03	A4
SHEET NO.	1 OF 1	



PLAN OF SOAK PIT



SECTION A-A

TABLE

TYPE	NO. OF USERS	DEPTH IN METERS	DIA IN METERS	AREA OF ABSORPTION
1	10	2.5	2.5	24.53
2	25	5.0	3.25	59.35
3	50	7.0	3.6	89.30
4	100	10.0	5.0	196.25

NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS EXCEPT LEVELS AND CO-ORDINATES WHICH ARE IN METERS.
2. THE FILLING OF BRICK BATS IN SOAKPIT SHALL BE DONE SIMULTANEOUSLY WITH CONST. OF BRICK WALLS AS WORK PROGRESS.
3. C.I. PIPE SHALL CONFORM TO IS: 3486.
4. DEPTH AND DIA CAN BE SUITABLY ADJUSTED TO GIVE THE ABSORPTIVE AREA DEPENDING UPON THE SUB SOIL WATER TABLE.
5. BOTTOM OF THE SOAKPIT SHOULD NOT BE LESS THAN 600mm ABOVE THE SUB SOIL WATER.

STANDARD DRAWING FOR
DETAIL OF SEPTIC TANK

STANDARD DRAWING NO.

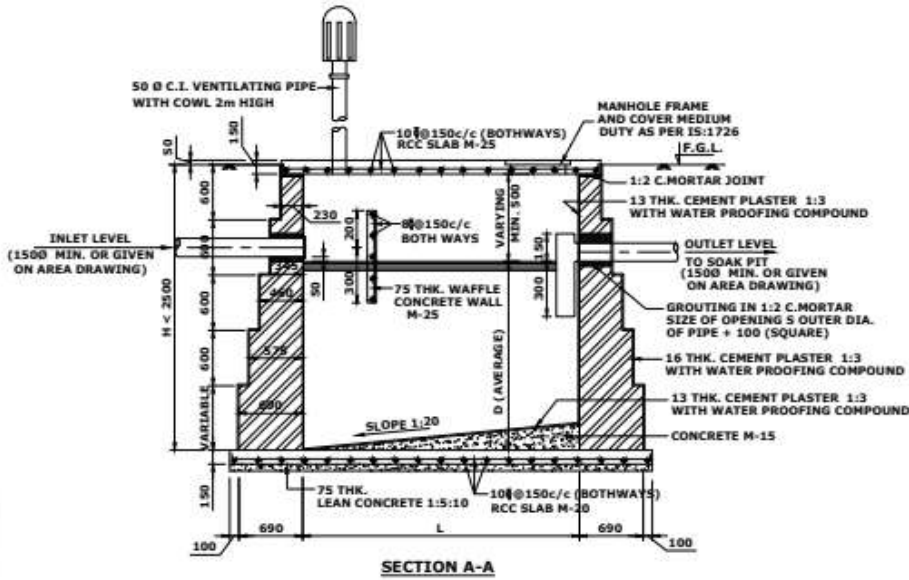
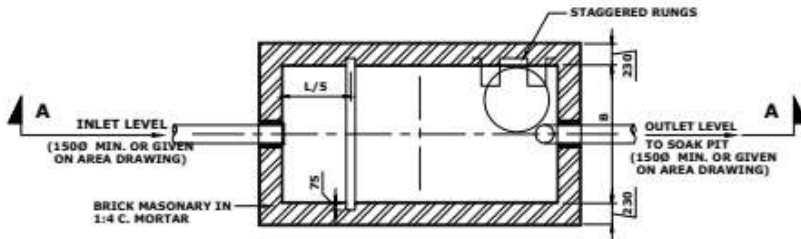
REV. SIZE

SHEET NO.

1 OF 1

03

A4

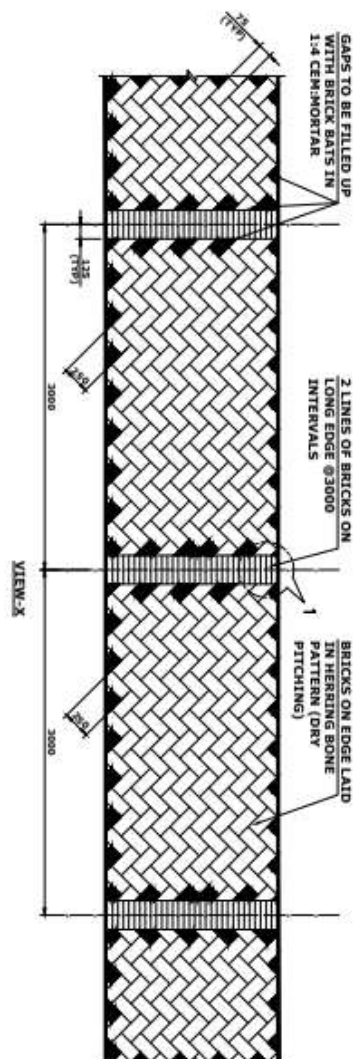


RECOMMENDED DIMENSIONS OF SEPTIC TANK

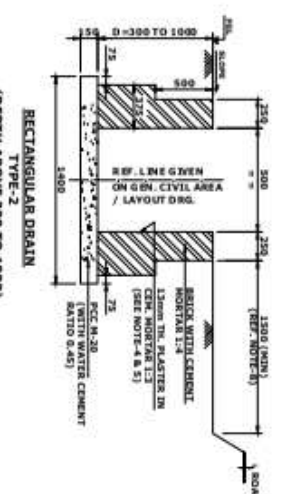
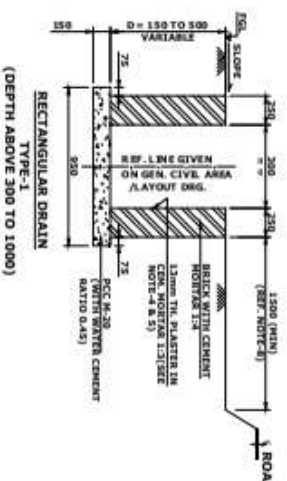
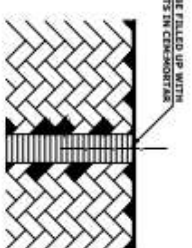
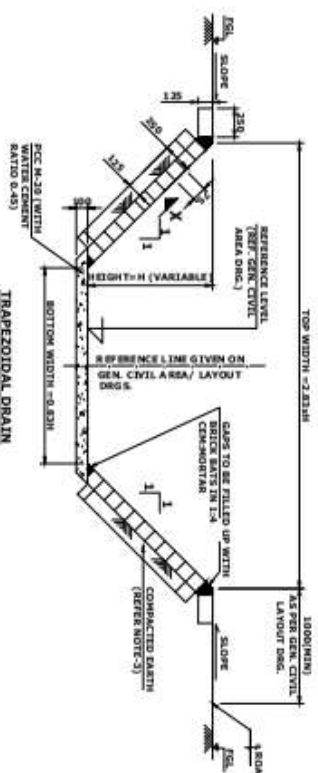
TYPE	NO. OF USERS	LENGTH (L)	BREADTH (B)	LIQUID DEPTH (D)
1	10	2000	900	1000
2	20	2300	1100	1300
3	30	4000	1400	1300
4	50	4750	1700	1500

NOTES:-

1. ALL DIMENSIONS ARE IN MM. & LEVEL IN METRES.
2. FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. CLEAR COVER TO MAIN REINF. SHALL BE: (a) SLAB = 30 mm
4. Ø DENOTES HIGH YIELD STRENGTH DEFORMED BARS OF GRADE Fe 415 (MIN.) CONFORMING TO IS -1786.
5. DESLUDGING SHALL BE DONE PERIODICALLY EVERY YEAR PREFERABLY BY A PORTABLE NON CLDG. PUMP.



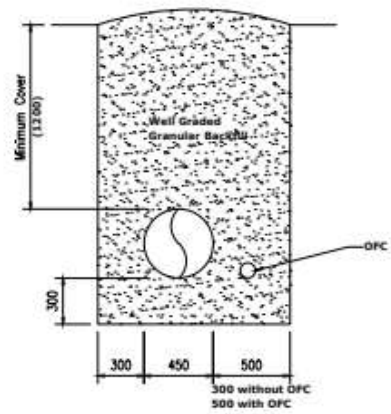
- NOTES:-
1. ALL DIMENSIONS ARE IN MM, UNLESS NOTED OTHERWISE.
 2. (a) THIS STD. IS APPLICABLE FOR OFFSITE AREAS ONLY.
(b) WHEREVER TYPE 1 & 2 DRAINS ARE LAID IN EXPANSIVE SOIL, A LAYER OF MINIMUM 250mm THICK SAND SHALL BE PROVIDED BELOW AND AROUND THE SIDES OF DRAIN.
 3. (c) TRAPEZOIDAL DRAIN (TYPE-2) IS NOT SUITABLE FOR AREAS WITH EXPANSIVE SOIL AND SANDY SOIL.
 4. 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.
 5. 13mm 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.
 6. 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.
 7. EXACT THICKNESS OF BRICK MASONRY WORK SHALL BE ACCORDING TO THE SIZE OF LOCALLY AVAILABLE BRICK HERE BRICK SIZE IS CONSIDERED AS 250x125x75.
 8. THIS STANDARD DRG. SHALL BE VALID WHERE WATER TABLE IS UP TO FGL.
 9. 1500 mm (MIN) HAS BEEN KEPT TO AVOID THE IMPACT OF SURCHARGE PRESSURE OF ROAD EMBANKMENT OF THE WALL OF THE DRAIN.



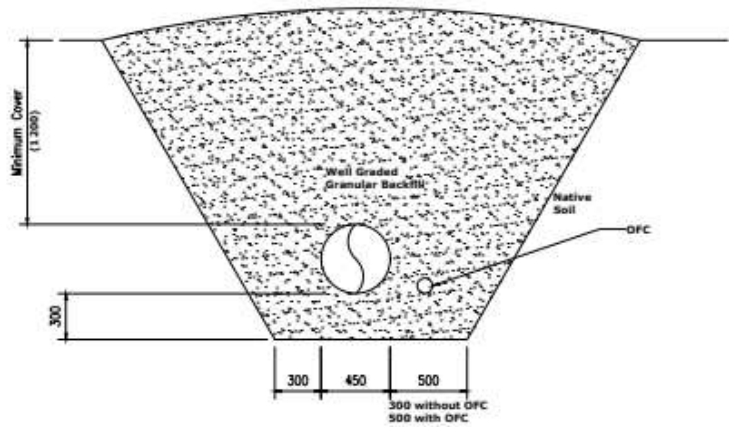
STANDARD SECTION OF
STORM WATER DRAINS

STANDARD FOR TRENCH SAND BEDDING	STANDARD DRAWING NO.		REV.	SIZE
			03	A4
	SHEET NO.	1 OF 1		

For Rocky Strata / Gravel Area :



For Clay Soil :



STANDARD DRAWING FOR
CONCRETE BEDDING AND
ENCASEMENT FOR PIPES

STANDARD DRAWING NO.

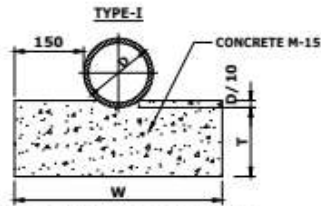
REV. SIZE

SHEET NO.

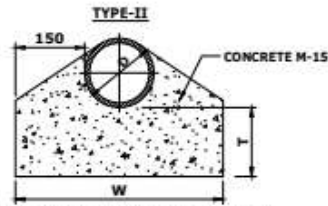
1 OF 1

03

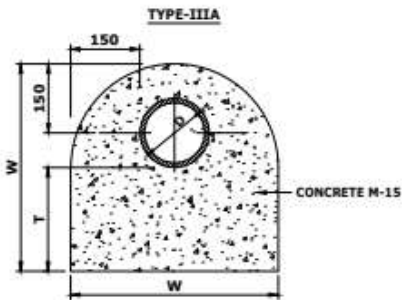
A4



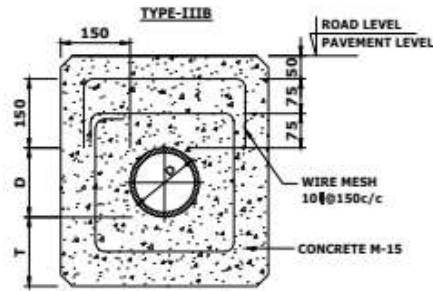
SECTION ELEVATION OF BEDDING
(FOR C.S PIPE SEWER WHERE SUPPORT IS REQUIRED)



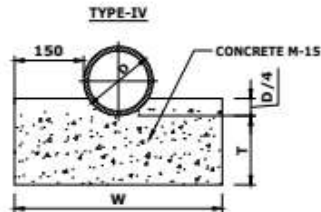
SECTION ELEVATION OF HAUNCHING
(FOR HDPE, SW PIPE SEWERS)



SECTION ELEVATION SURROUND OR ENCASEING
(FOR SEWERS UNDER ROADS COVER > 600mm)



SECTION ELEVATION SURROUND OR ENCASEING
(FOR SLEEVES/PIPES CULVERTS UNDER ROADS FOR COVER < 600mm)



SECTION ELEVATION CONCRETE GRADE BEDDING
(FOR SEWERS - CONCRETE PIPE)

LEGEND

D = EXTERNAL DIA OF PIPE
W = D+300
T = 100 FOR PIPES UNDER 150 NOMINAL DIA.
T = 150 FOR PIPES OF 150 NOMINAL DIA AND ABOVE.

NOTES:-

- BEDDING:- WHERE BEDDING IS USED, THE CONCRETE SHALL BE BROUGHT UP TO ATLEAST TO THE INVERT LEVEL OF THE PIPE TO FORM A CRADLE & TO AVOID LINE CONTACT BETWEEN THE PIPE AND BED.
- HAUNCHING:- THE FULL WIDTH OF THE BED SHALL BE CARRIED TO THE LEVEL OF THE HORIZONTAL DIAMETER OF THE PIPE AND SPLAYS FROM THIS LEVEL CARRIED ON BOTH SIDES OF THE PIPE TO MEET THE PIPE BARREL TANGENTIALLY.
- SURROUNDED OR ENCASEING TYPE-III A:- THE SURROUND OR ENCASEING SHALL BE SIMILAR TO HAUNCHING UP TO THE HORIZONTAL DIA OF THE PIPE & THE PORTION OVER THIS SHALL BE FINISHED IN A SEMI-CIRCULAR FORM TO GIVE A UNIFORM ENCASEING FOR THE TOP HALF OF THE PIPE.
TYPE-III B:- IT IS SIMILAR TO TYPE-III A ABOVE EXCEPT THAT THE TOP PORTION OVER THIS SHALL BE FINISHED RECTANGULAR AS SHOWN AND THE SECTION PROVIDED WITH REINFORCEMENT AS PER REQUIREMENTS.
- CONCRETE CRADLE BEDDING:- IS THE METHOD OF BEDDING PIPES IN WHICH THE LOWER PART OF THE PIPE EXTERIOR IS BEDDED IN CRADLE CONSTRUCTION OF CONCRETE WITH DIMENSION AS SHOWN.
- CONCRETE WORK SHALL BE CONFORM TO IS: 456.

STANDARD DRAWING FOR
PIPE CULVERT FOR STORM
WATER DRAINAGE

STANDARD DRAWING NO.

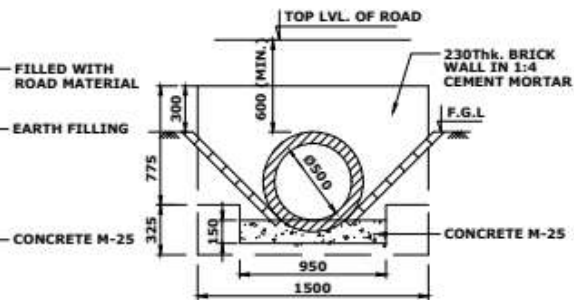
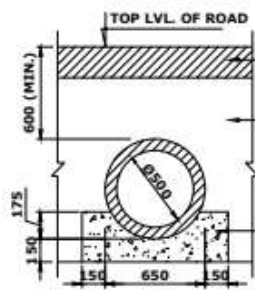
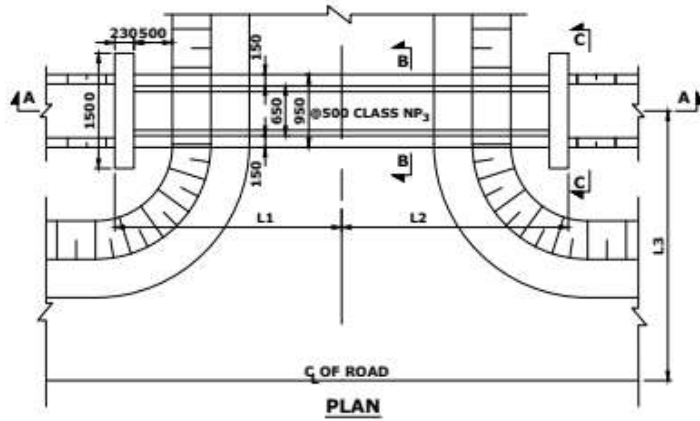
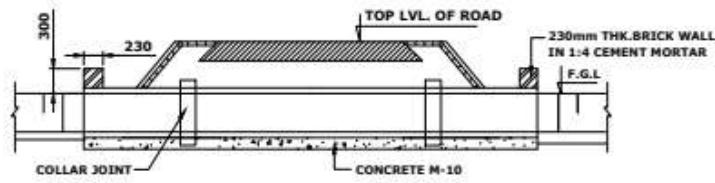
REV. SIZE

SHEET NO.

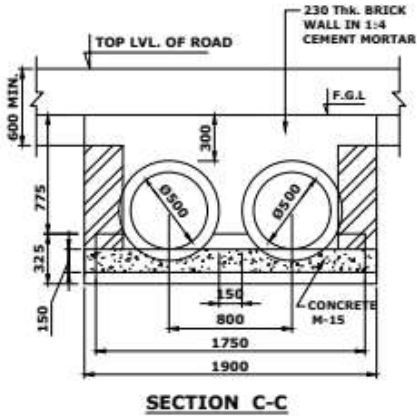
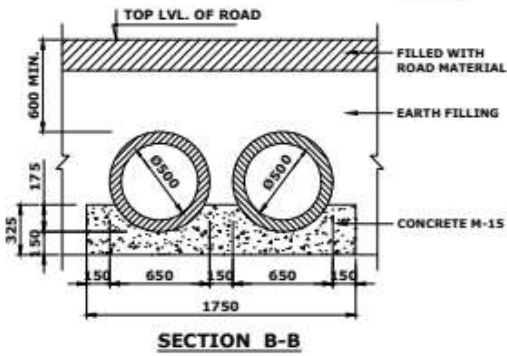
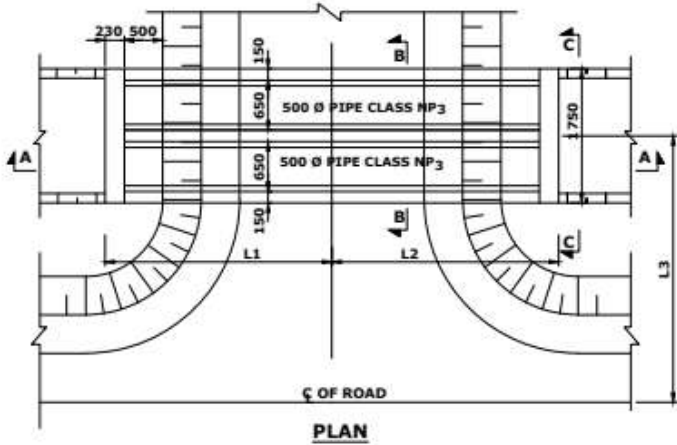
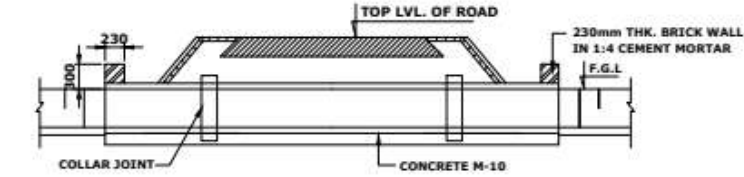
1 OF 2

03

A4



	STANDARD DRAWING FOR PIPE CULVERT FOR STORM WATER DRAINAGE	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	2 OF 2		



STANDARD DRAWING FOR RAIN WATER HARVESTING PIT	STANDARD DRAWING NO.		REV.	SIZE
			03	A4
	SHEET NO.	1 OF 1		

SECTION A-A

TO SUIT SITE
125 mm THK. RCC SLAB
10 Ø 200 C/C
100 Ø PVC OVERFLOW PIPE (2 NOS)
TYP GROUTING IN 1:2 cm6 DIA MS RUNGS
MORTAR SIZE OF OPENING
OUTER DIA OF PIPE + 100 sq.
3000
COPPING
GRAVEL (ØS. TO 10mm)
COARSE SAND
BOULDERS (ØS TO 30mm)
150mm THK. PCC 1:4:8
HANDHOLE FRAME B25 4076
600mm PROJECTION WITH SLOTTED HOLES
PGL
150 DIA PVC PIPE UP TO GROUND WATER LEVEL
100 Ø PVC PIPE
WATER TABLE

PLAN OF INFILTRATION WELL

100 Ø PVC OVERFLOW PIPE 2 NOS.
R1500
6000 CI COVER
220 THK. BRICK WALL
R300
3000 RCC INLET PIPE
12 DIA 2 NOS
10 Ø 200 C/C
125 THK SLAB GRADE OF CONC. M-25

DETAIL OF COPPING

220
2-12 Ø
Ø 150 C/C RING
2-12 Ø

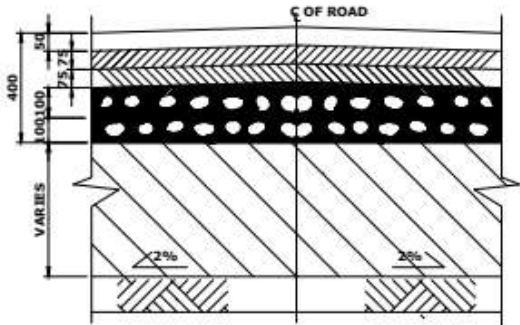
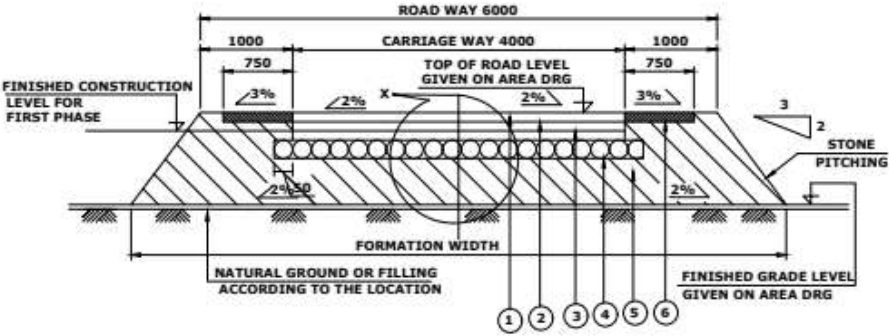
DETAIL OF SLAB REINFORCEMENT

REINF. STEEL SHOWN THUS Ø SHALL CONFORM TO GRADE Fe415 (MIN.) LATEST

DETAIL OF MS RUNGS

150 150
100X130X75 CONCRETE GROUT
220 THK. BRICK WALL
100 MS RUNGS Ø 300
C/C STAGGERED EMBEDDED IN CONCRETE

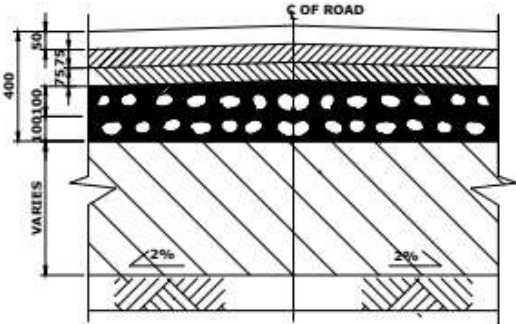
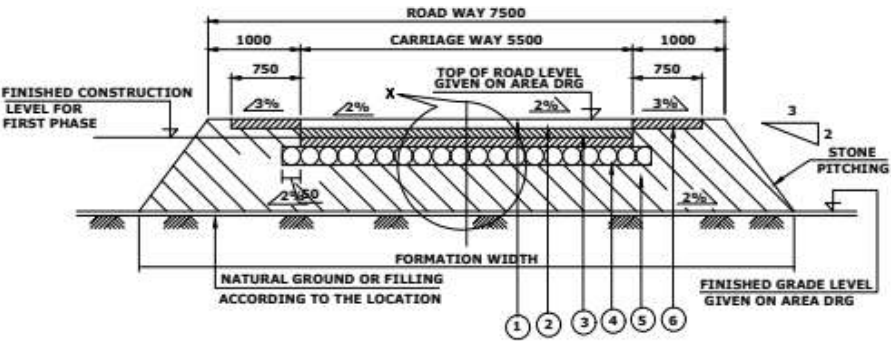
	STANDARD DRAWING FOR CROSS SECTION OF ROAD (6.0 M WIDE)	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 3		



DETAIL - X

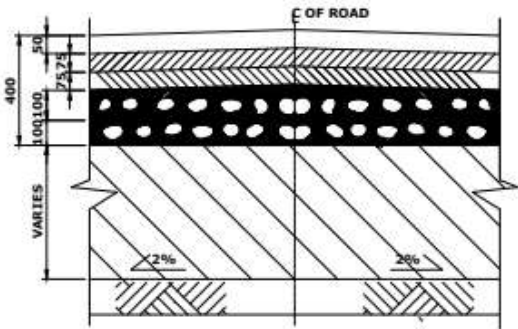
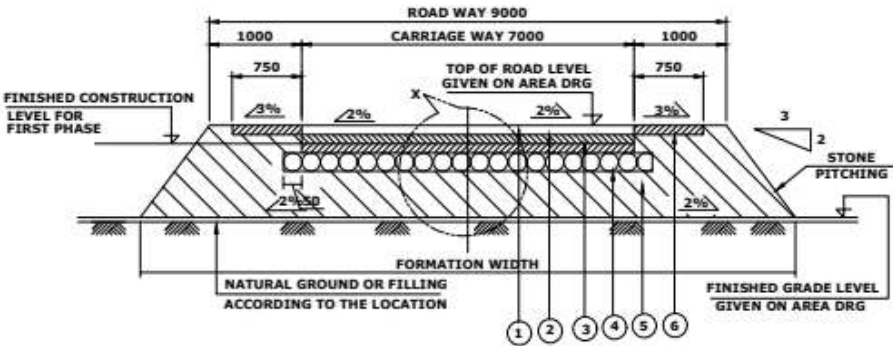
- LEGEND**
1. PREMIX BITUMENOUS CARPET WITH SEAL COAT.
 2. SECOND LAYER WATER BOUND MACADAM COURSE WITH GRADE-II AGGREGATE.
 3. FIRST LAYER WATER BOUND MACADAM COURSE WITH GRADE-II AGGREGATE.
 4. SUB BASE COURSE TWO LAYERS OF WBM WITH GRADE-I AGGREGATE.
 5. APPROVED MATERIAL FROM SITE COMPACTED TO 90% OF MAXIMUM LAB. DRY DENSITY AS IS 2720 PART VIII.
 6. 75mm THK. WATER BOUND MACADAM COURSE WITH GRADE-II AGGREGATE.

	STANDARD DRAWING FOR CROSS SECTION OF ROAD (7.5 M WIDE)	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	2 OF 3		



DETAIL - X

	STANDARD DRAWING FOR CROSS SECTION OF ROAD (9.0 M WIDE)	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	3 OF 3		



DETAIL - X

STANDARD DRAWING FOR
SAND TRAP
(FOR TANK FARM)

STANDARD DRAWING NO.

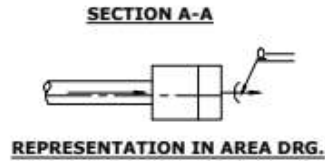
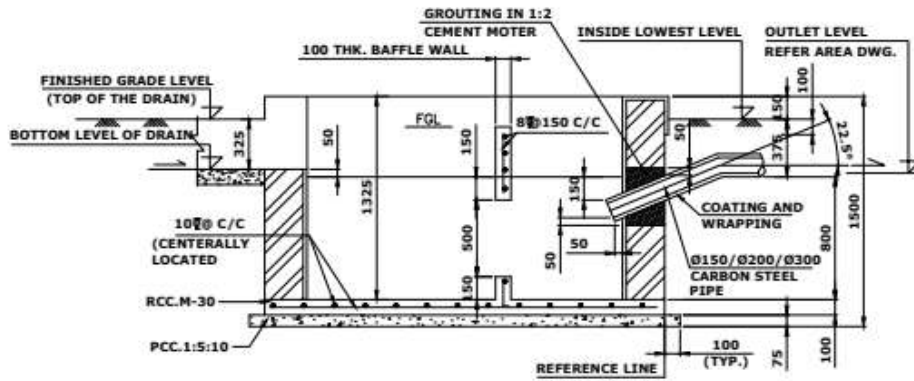
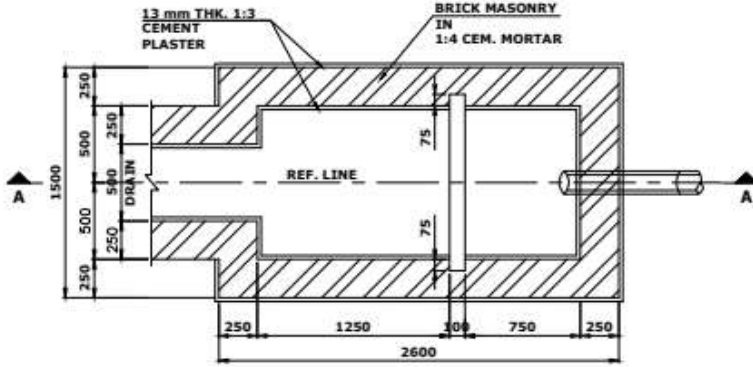
REV. SIZE

SHEET NO.

1 OF 1

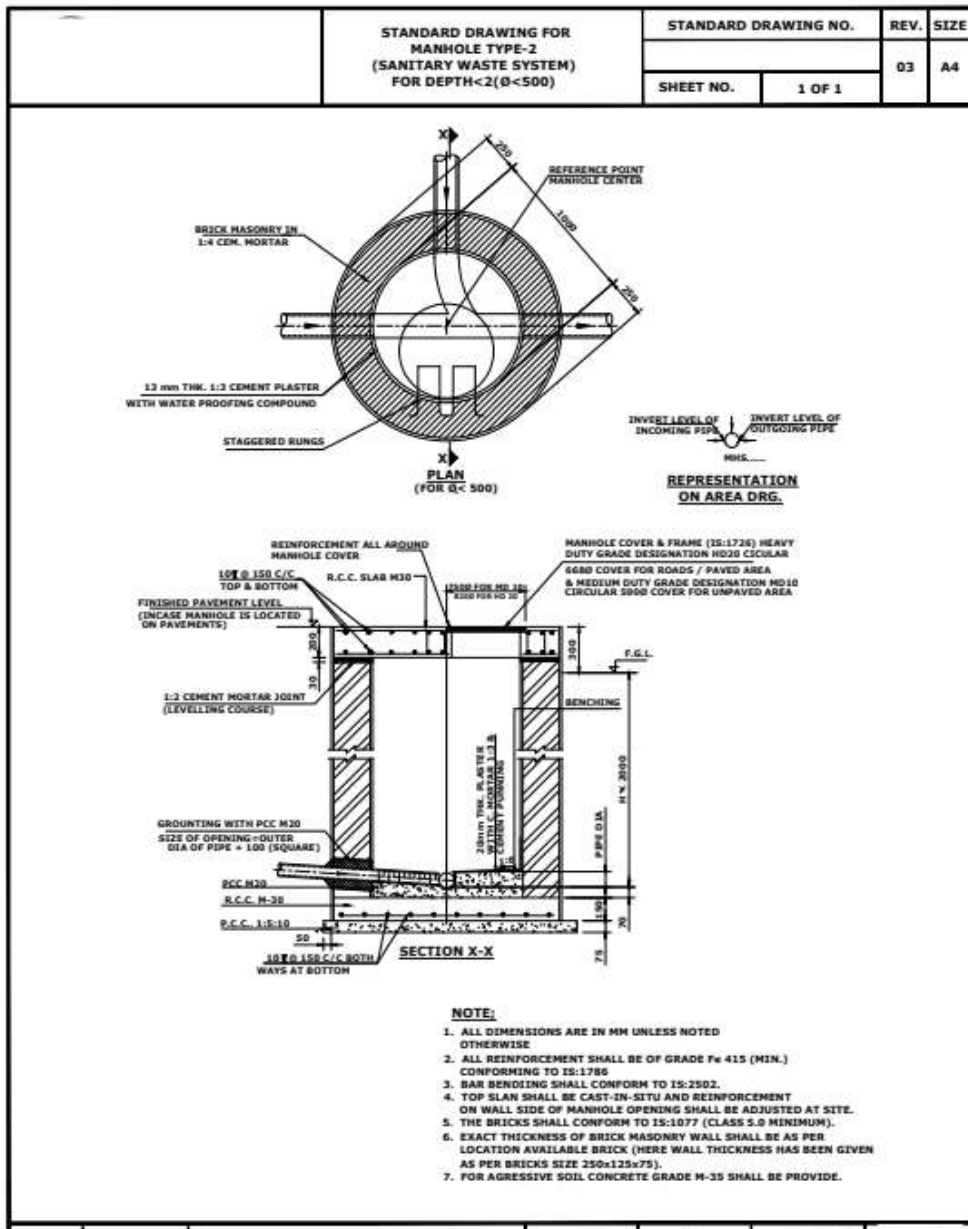
03

A4



NOTES :-

1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. EXACT THICKNESS OF BRICK MASONRY SHALL BE ACCORDING TO THE SIZE OF LOCALLY AVAILABLE BRICK. HERE BRICK SIZE IS CONSIDERED AS 250x125X75.

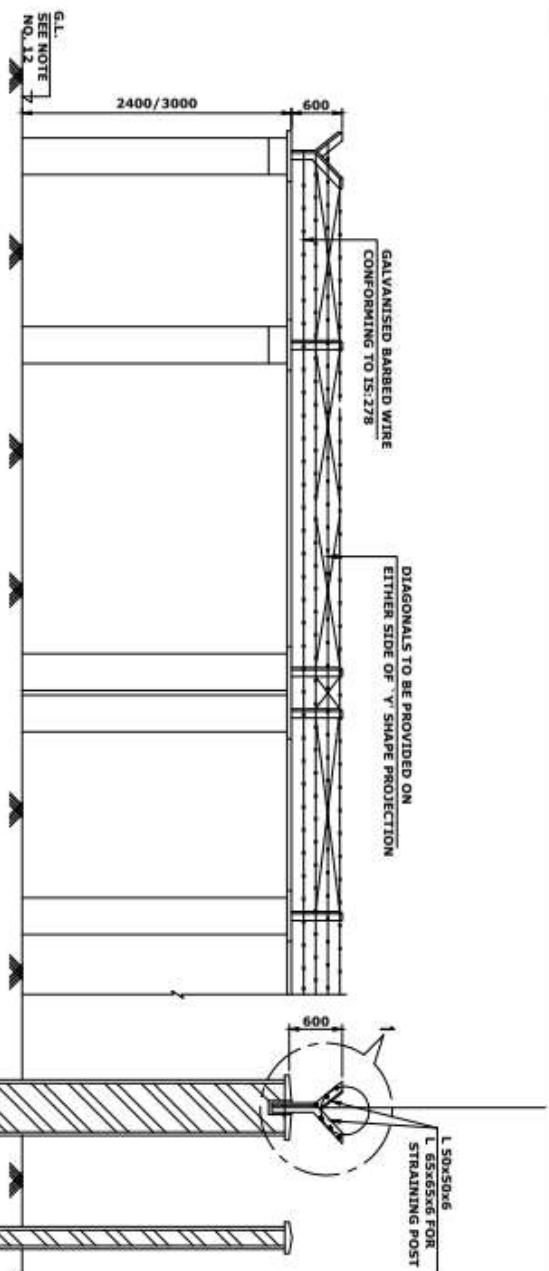




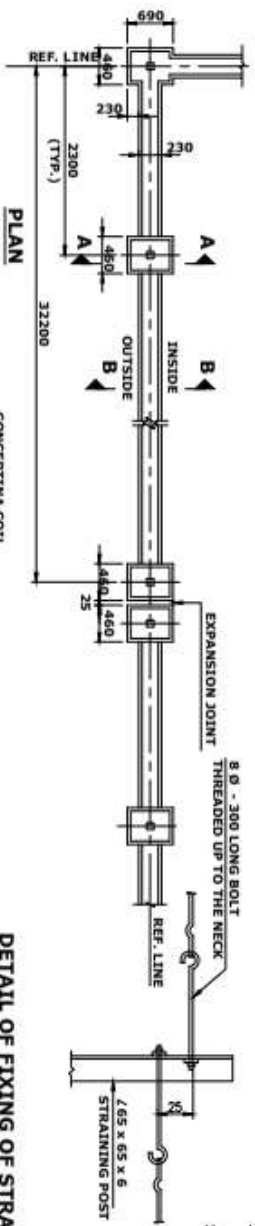
8. THE BRICKS OF CLASS 5.0 (MINIMUM) SHALL BE USED.



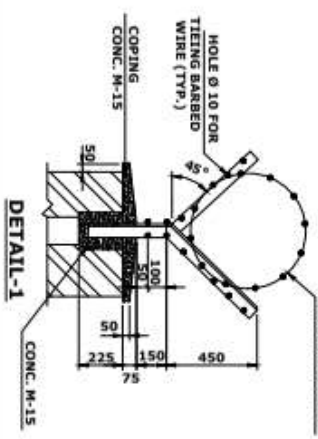
DETAILS OF MASONRY DYKE AND FIRE WALL (TANK FARM)



ELEVATION
(ALL BARBED WIRE ROWS NOT SHOWN)



PLAN



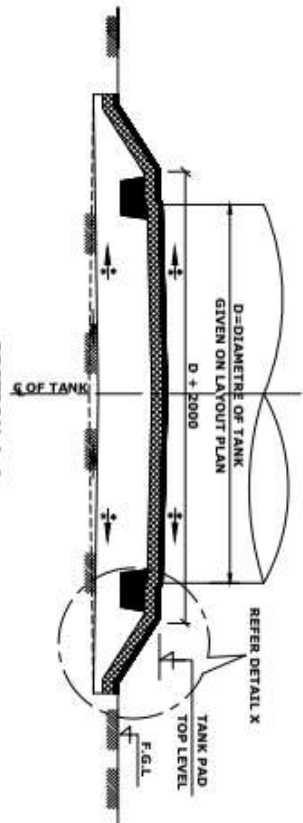
DETAIL-1

DETAIL OF FIXING OF STRAINING BOLT WITH STRAINING POST

NOTES:-

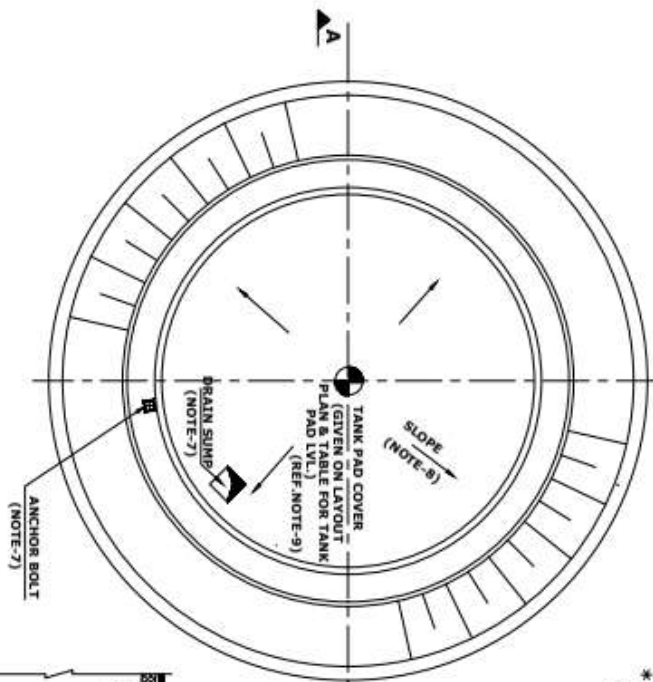
1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. CEMENT MORTAR FOR BRICK MASONRY AND PLASTER SHALL BE 1:6 (1 CEMENT : 6 SAND)
3. PLASTER SHALL BE 13 mm THK. ON EVEN SURFACE AND 16 THK. ON UNEVEN SURFACE.
4. POCKETS FOR ANGLE IRON MEMBERS SHALL BE 150x150 IN PLAN AND OF 3 BRICK COURSE IN DEPTH AND SHALL BE GROUTED WITH CONC. M-15
5. GALVANISED BARBED WIRE SHALL CONFORM TO IS:278.
6. STRAINING BOLT SHALL BE PROVIDED AT EVERY 90M APPX.
7. EXPANSION JOINTS SHALL PROVIDE A CONTINUOUS VERTICAL SEPERATION THROUGH THE FULL THICKNESS OF MASONRY WALL EXTENDING FROM TOP OF WALL TO BASE CONCRETE.
8. NECESSARY STEPS SHALL BE GIVEN IN THE HEIGHT OF THE WALL SO THAT THE HEIGHT OF WALL IS NOT LESS THAN 3050 MM ABOVE G.L. AT ANY POINT.
9. EARTH AVAILABLE FROM THE EXCAVATION OF FOUNDATION SHALL BE FILLED 2.5 M ON EITHER SIDE TO THE FINISHED GRADE LEVEL AND COMPACTED WITH PROPER SLOPE FOR DRAINAGE OF WATER AWAY FROM THE WALL.
10. WEEP HOLES SHALL BE PROVIDED IN THE COMPOUND WALL WHEREVER REQUIRED AT SUITABLE LOCATION DIRECTED BY ENGINEER-IN CHARGE.
11. FOR FOUNDATION DETAILS REFER RELEVANT STRL. DRG.
12. (G.L.) GRADE LEVEL MEANS F.G.L. OR N.G.L. ADJACENT TO THE COMPOUND WALL ON EITHER SIDE AS APPLICABLE. THE HEIGHT OF COMPOUND WALL (2400 / 3000) SHALL BE GOVERNED FROM THE HIGHER GRADE EITHER INSIDE OR OUTSIDE THE COMPOUND WALL.

BRICK MASONRY
COMPOUND WALL

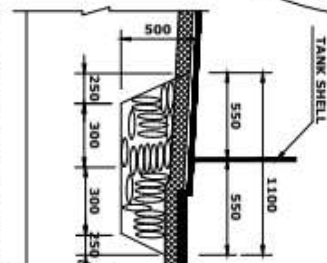


SECTION A-A

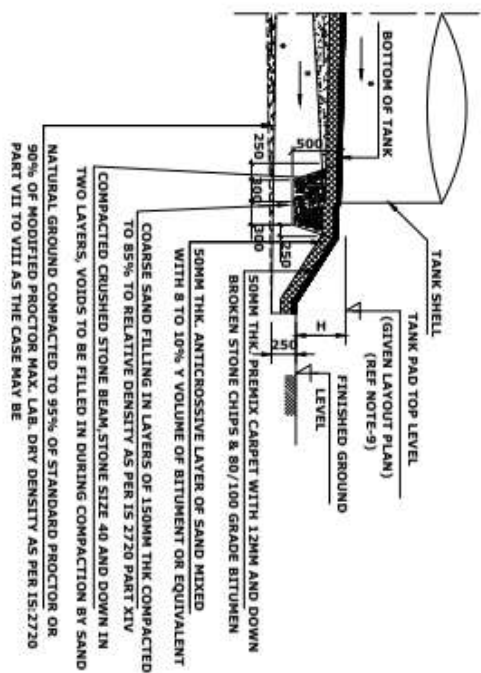
* FOR SLOPE AND DIRECTION
REFER TANK DATA SHEET
(REFER NOTE NO.8)



PLAN



PART ENLARGED DETAIL -X

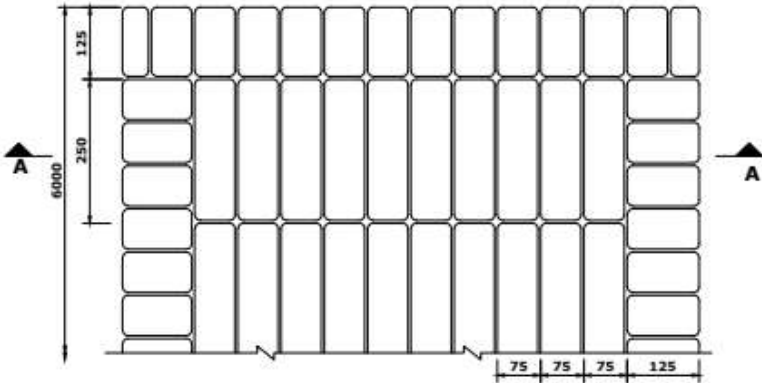
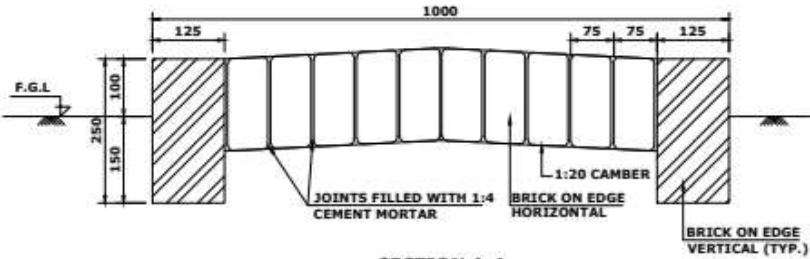


NOTES:-

1. ALL DIMENSIONS ARE IN MM & ALL LEVELS ARE IN METRES UNLESS OTHERWISE SPECIFIED
2. THIS FOUNDATION IS VALID FOR TANK HEIGHT UPTO 10.0M
3. SOIL STRATUM AT EXCAVATION LEVELS FOR TANKS PADS SHALL BE THOROUGHLY EXAMINED BEFORE STARTING THE FILLING FOR TANK PADS. INCASE LOOSE SOILS ARE MET WITH OR DRY DENSITY OF SOIL POOR, IT SHALL BE COMPACTED TO 95% OF STANDARD PROCTOR OR 90% OF MODIFIED PROCTOR DENSITY AS PER IS:2720 PART VII OR VIII AS THE CASE MAY BE & TESTED TO THE SATISFACTION OF ENGINEER IN CHARGE
4. SAND USED FOR FILLING SHALL BE APPROVED BY ENGINEER IN CHARGE. USE OF DUST LIME SAND IS PROHIBITED. SAND FILLING SHALL BE IN 150 THK. LAYERS. EACH SHALL BE THOROUGHLY COMPACTED TO 85% RELATIVE DENSITY AS PER IS:2720 PART XIV
5. ANTICORROSIVE LAYER OVER SAND FILLING CONSISTS OF SIFTED DRY SAND HAVING 1.5 EFFECTIVE SIZE MIXED WITH BINDING MATERIAL 8 TO 10% BY VOLUME OF BITUMEN OR EQUIVALENT
6. PREMIX CARPET SHALL BE LAID AFTER INSULATION OF TANK AND AS PER INSTRUCTIONS OF THE ENGINEER IN CHARGE
7. FOR SIZE AND LOCATION OF ANCHOR BOLTS AND DRAIN SUMP REFER RELEVANT TANK DATA SHEET
8. INWARD/OUTWARD SLOPE OF TANK PAD TOP SHALL BE VARIATED WITH RELEVANT TANK DATA SHEET.
9. THE TANK PAD LEVEL SHALL BE GIVEN AS 'TO BE CONSTRUCTED' AND ALSO AS 'FINAL TANK PAD LEVEL AFTER SETTLEMENT DURING HYDROTEST'. THE DIFFERENCE BETWEEN TWO LEVELS BEING THE EXPECTED SETTLEMENT

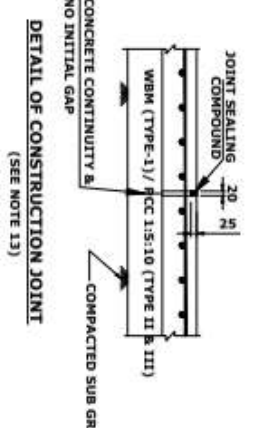
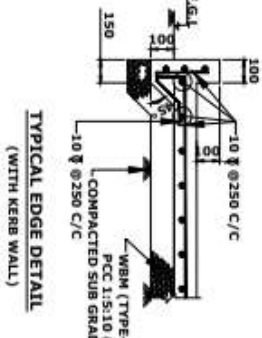
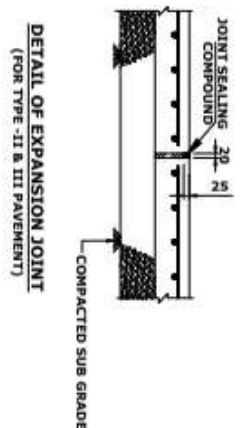
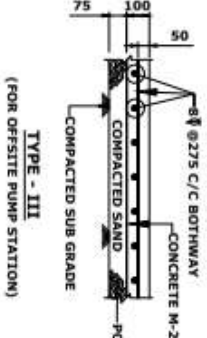
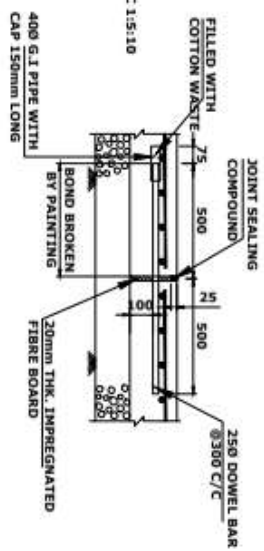
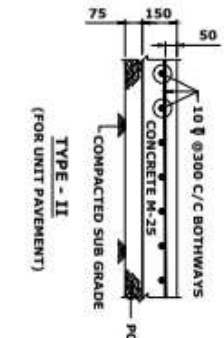
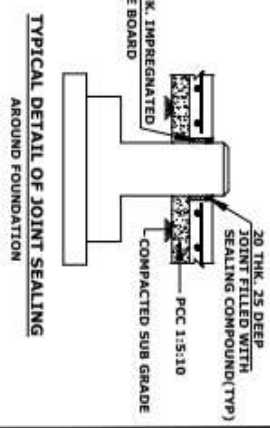
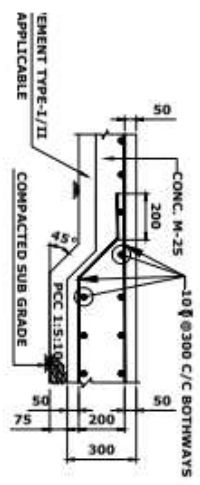
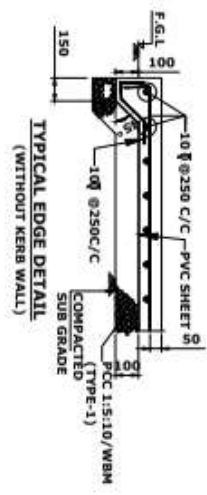
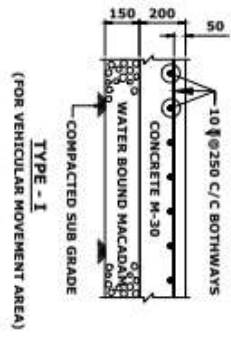
TANK PAD DETAILS WITH
STONE RING WALL
(FOR TANK HEIGHT UPTO 10.0M)

	STANDARD DRAWING FOR BRICK FOOTPATH	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 1		



- NOTES:-**
- ALL DIMENSIONS ARE IN MILLIMETERS.
 - AFTER EVERY 6000 LENGTH OF FOOTPATH A BREAK OF 100 mm WIDTH SHALL BE LEFT UNPAVED TO ALLOW THE SURFACE DRAINAGE.

LEGEND:-
F.G.L = FINISH GRADE LEVEL

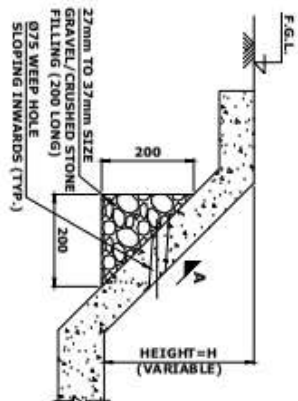


NOTES:-

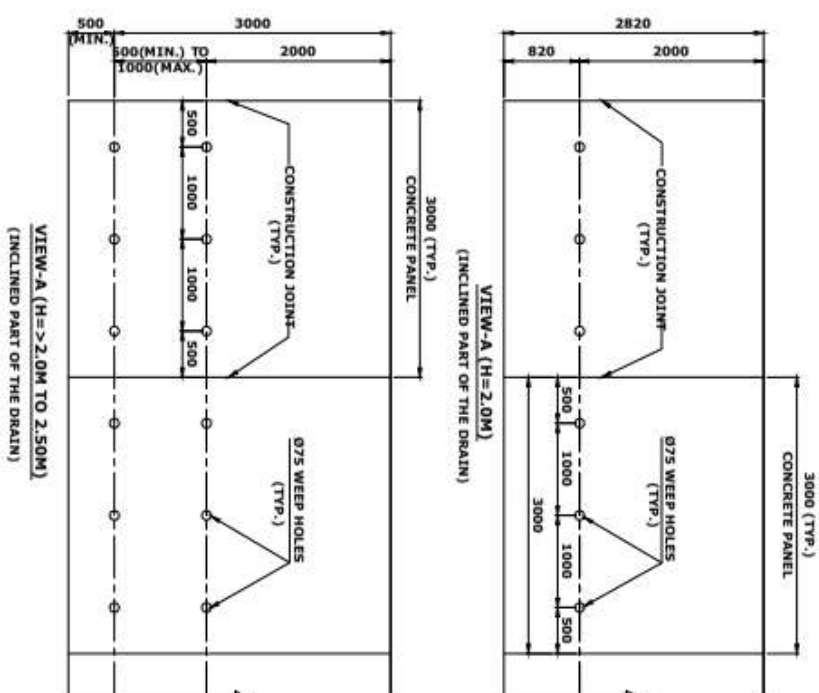
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. CONCRETE SHALL BE CONFORM TO IS:456.
3. Ø DENOTES HIGH YIELD DEFORMED BARS OF GRADE Fe415 (MIN.) CONFORMING TO IS:1786. UNLESS OTHERWISE SPECIFIED.
4. JOINT SEALING COMPOUND IN PAVING AND AROUND EQUIPMENT FOUNDATIONS SHALL CONFORM TO IS:1834 TYPE-B.
5. EXPANSION AND SEALING JOINT FILLER MATERIAL SHALL BE FILLED WITH BITUMEN PREFORMED FIBRES IMPREGNATED FIBRE, CONFORMING TO IS:1838, PART-1.
6. CONCRETE PAVING SHALL BE SLOPED STEEPEST TO 1:100 UNLESS OTHERWISE SHOWN IN DETAIL.
7. ENGINEERING DRAWING, SLOPE OF THE SUB GRADE SHALL BE PREPARED TO MATCH WITH SLOPE OF PAVEMENT.
8. SUB GRADE BELOW PAVEMENT SHALL BE THOROUGHLY COMPACTED TO 95% OF LAB DRY DENSITY AS PER IS:2720, PART VIII.
9. CAST IN-SITU CONCRETE FOR PAVEMENT SHALL BE LAID IN ALTERNATE PANELS OF SIZES AS DEFINED IN THIS STANDARD DRAWING HOWEVER, THE PANEL SIZE SHALL BE ADJUSTED AROUND COLUMNS & FOUNDATION.
10. EXPANSION JOINTS SHALL BE SPACED AT 14.0M (MAX.) FOR TYPE-I PAVEMENT & 13M C/C (MAX.) FOR TYPE-II PAVEMENTS.
11. EXPANSION JOINTS SHALL BE SPACED AT 15 M C/C & CONSTRUCTION JOINTS SHALL BE SPACED AT 7.5M C/C (MAXIMUM) FOR TYPE-III PAVEMENTS.
12. THIS STANDARD NOT VALID FOR CAUSTIC HANDLING AREAS.
13. LIMITATION OF SINGLE AXLE LOAD ON RCC PAVEMENT:
FOR TYPE-I PAVEMENT : MAX. UPTO 12.0 TONNE
FOR TYPE-II PAVEMENT : MAX. UPTO 6.0 TONNE
(FOR SMALL VEHICLES LIKE FORK LIFT)
14. CONSTRUCTION JOINTS MAY BE PROVIDED IN CASE PANEL SIZE IS LESS THAN THE REQUIREMENT OF EXPANSION SUIT SITE REQUIREMENTS.
15. FOR PIPE SUPPORT DETAILS COMING IN THICKENED PAVEMENT AREA REFER RELEVANT PIPING GAD / PIPING STANDARDS.

GEO-TECHNICAL RECOMMENDATION SHALL BE FOLLOWED FOR SUBGRADE TREATMENT FOR PAVEMENTS IN BLACK COTTON SOIL AREAS/JOB SPECIFIC REQUIREMENT

RCC PAVEMENT DETAILS



DETAIL OF WEEP HOLE



1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. CONCRETE LINING SHALL BE DONE AFTER THE SIDES OF DRAIN ARE CUT, COMPACTED TO 90% OF MAX. LABORATORY DRY DENSITY AND DRESSED TO THE REQUIRED SLOPE.
3. CONCRETING ON THE SIDE SLOPES SHALL BE DONE IN PANELS OF 3.0 METER LENGTH.
4. WHEREVER CONCRETE TRAPEZOIDAL DRAIN IS LAID IN EXPANSIVE/ BLACK COTTON SOIL, A LAYER OF 250 mm THICK SAND SHALL BE PROVIDED BELOW AND AROUND THE SIDE OF DRAIN.
5. NO WEEP HOLES SHALL BE PROVIDED UPTO 1.5M HEIGHT (H) I.e. 2.0 (APPROX.) INCLINED PART OF THE DRAIN FROM FGL TO ELIMINATE POLLUTION IN THE DRAIN DUE TO CONTAMINATED SUB-SURFACE FLOW.
6. THE VIEW OF INCLINED PART OF DRAIN ARE SHOWN HERE AS A GUIDELINE FOR THE LOCATION OF WEEP HOLES AND FOR THE PANELS OF CONCRETING. HOWEVER, FOR DEPTHS OTHER THAN SHOWN HERE, THE GUIDELINE SHALL REMAIN SAME.

STEPS ON EARTHEN DYKES
AND ROAD EMBANKMENTS

STANDARD DRAWING NO.

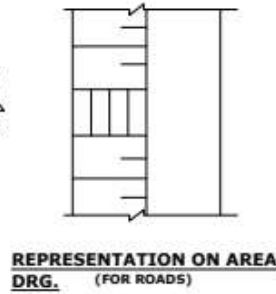
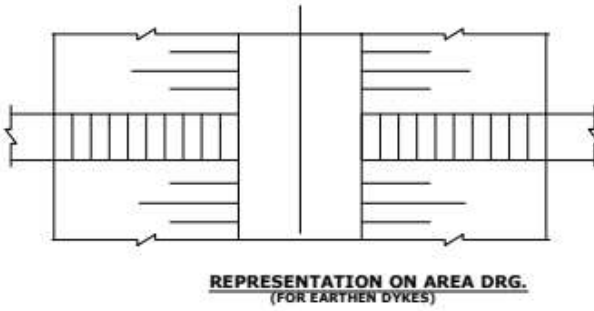
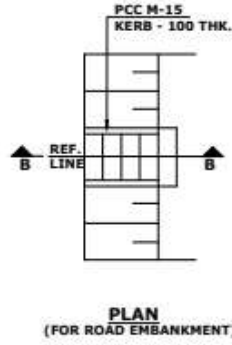
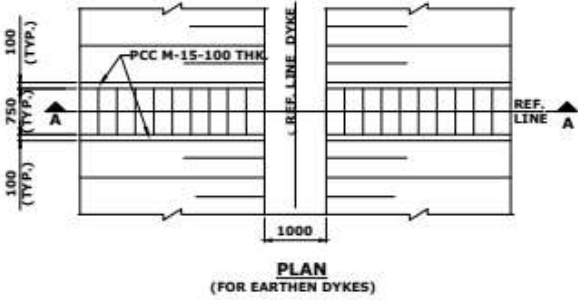
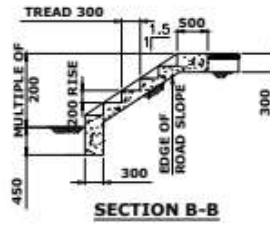
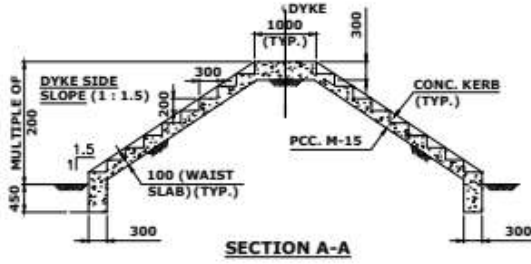
REV. SIZE

SHEET NO.

1 OF 1

03

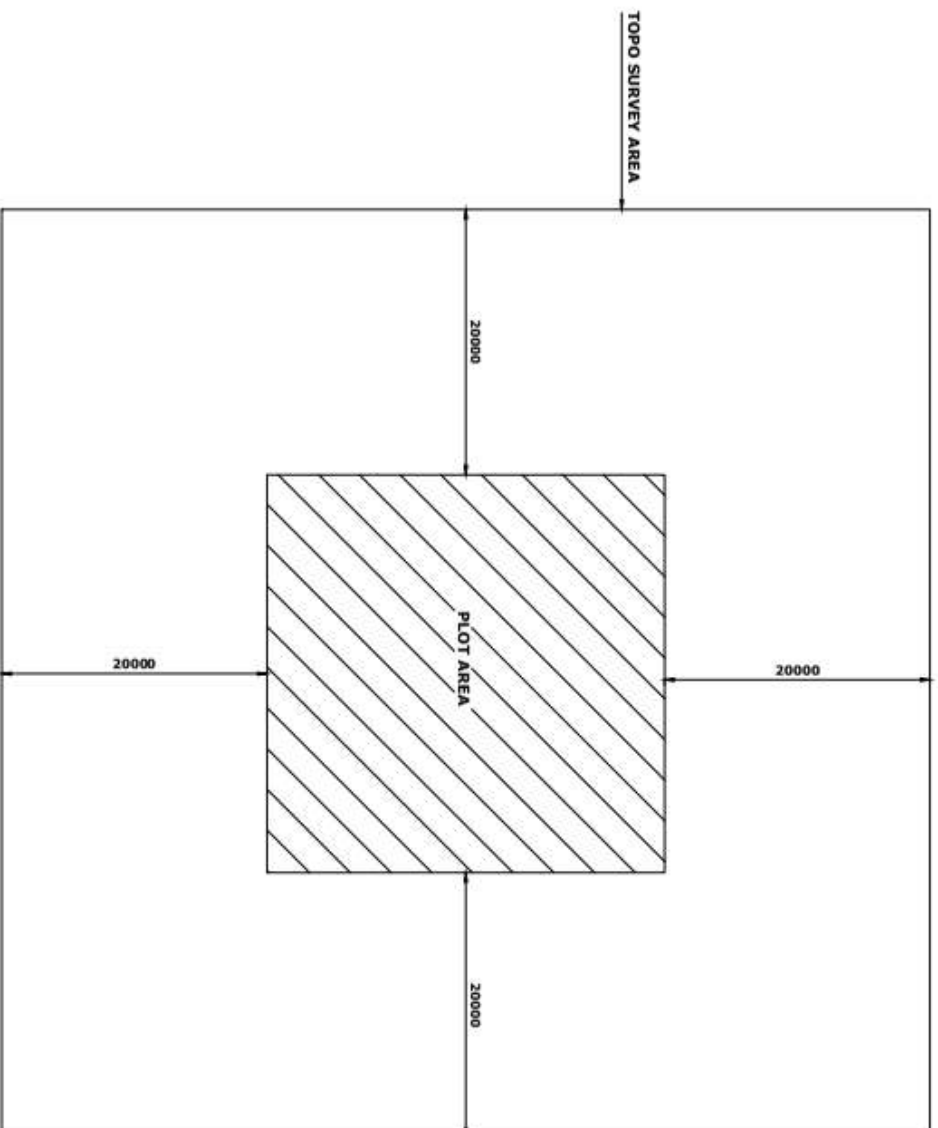
A4



NOTES :-

1. ALL HANDRAIL AND UPRIGHT SHALL BE AS PER RESPECTIVE TYPE.

NOTES:-
1. ALL DIMENSION ARE IN MM AND CO-ORDINATES
AND LEVELS ARE IN METERS UNLESS
OTHERWISE SPECIFIED.

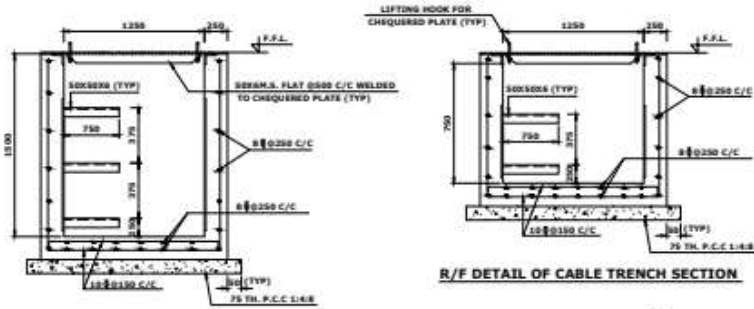


AREA PLAN FOR TOPO SURVEY

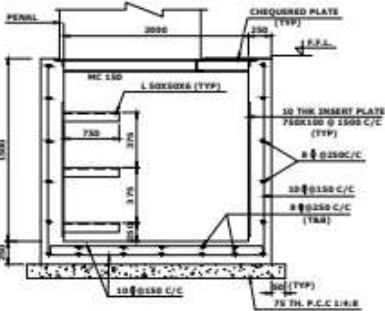
AREA PLAN FOR TOPO SURVEY

1

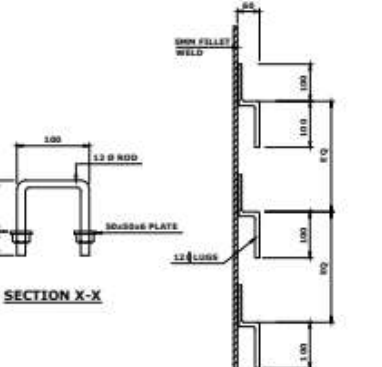
STANDARD TYP.DETAILS OF CABLE TRENCH	STANDARD DRAWING NO.		REV.	SIZE
			03	A4
	SHEET NO.	1 OF 1		



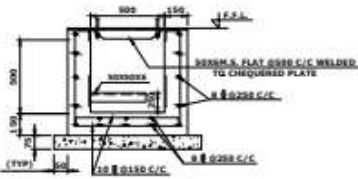
R/F DETAIL OF CABLE TRENCH SECTION



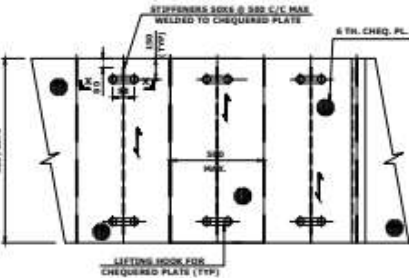
SUPPORTING PANELS



TYP. DETAIL OF INSERT PLATE

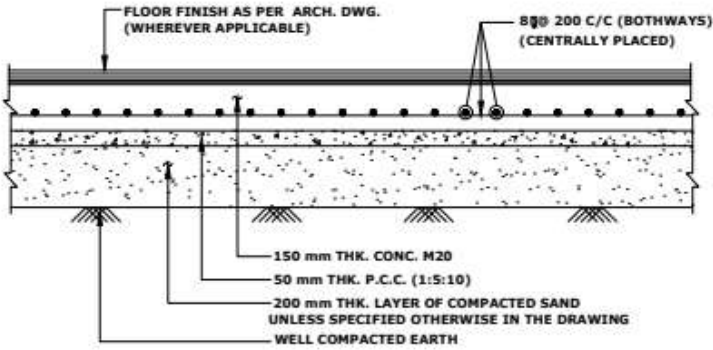


R/F DETAIL OF CABLE TRENCH SECTION

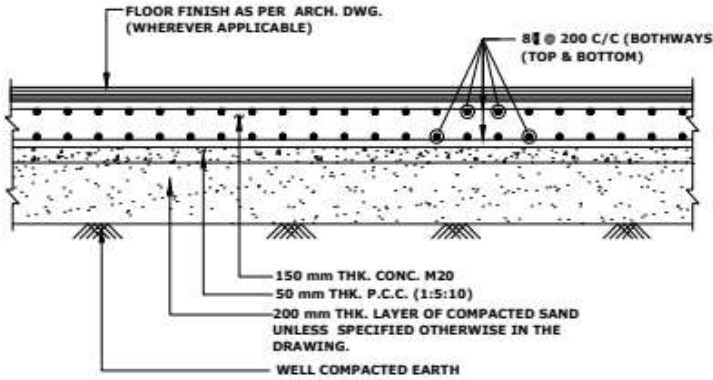


DETAIL OF CHEQUERED PLATE

	R.C.C FLOORING DETAILS	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 2		

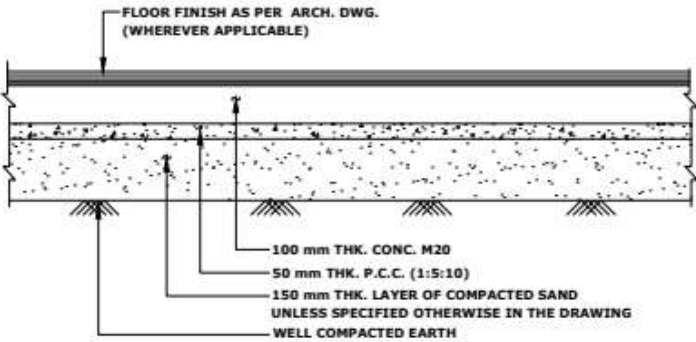


TYPE-I
(FOR PLANT BUILDINGS, SUB-STATION, CONTROL ROOM, PUMP HOUSE,
UTILITY COMPRESSOR HOUSE, PARKING AREA, STORE &
PORCH)



TYPE-II
(FOR WAREHOUSE, WORKSHOP, CEMENT GODOWN, FIRE STATION
& PROCESS COMPRESSOR HOUSE)

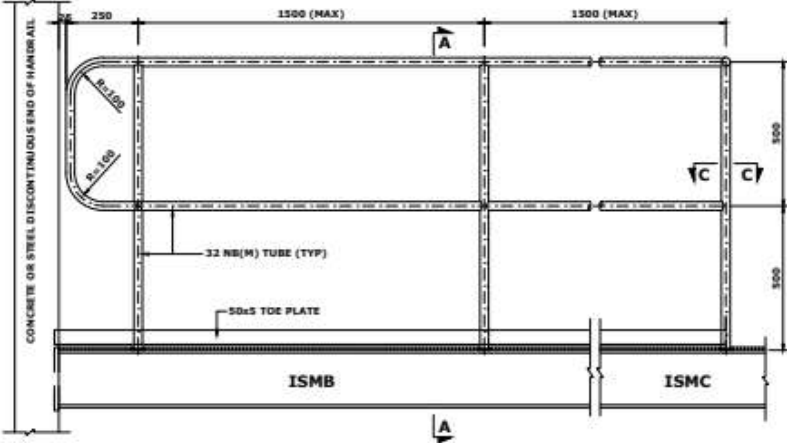
	R.C.C FLOORING DETAILS	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	2 OF 2		



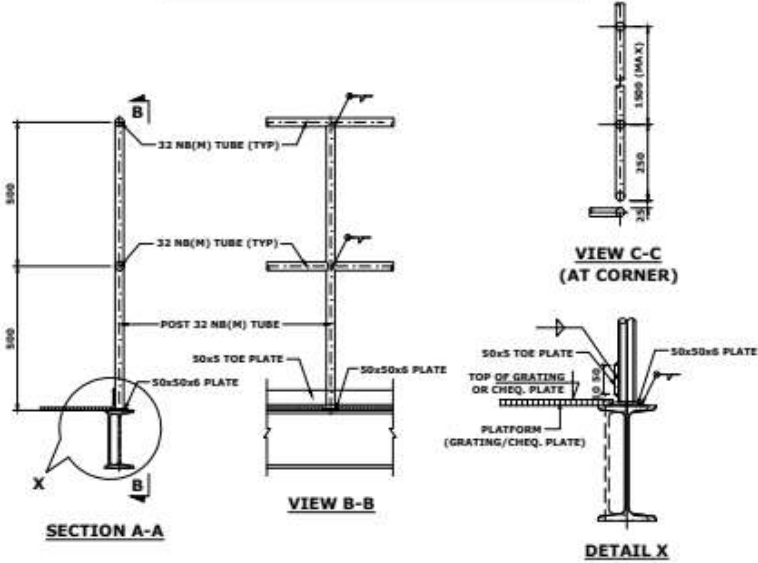
TYPE-III
 (FOR NON-PLANT BUILDINGS, ADMINISTRATION,
 LABORATORY, CANTEEN, TIME OFFICE, SITE OFFICE ETC.,)

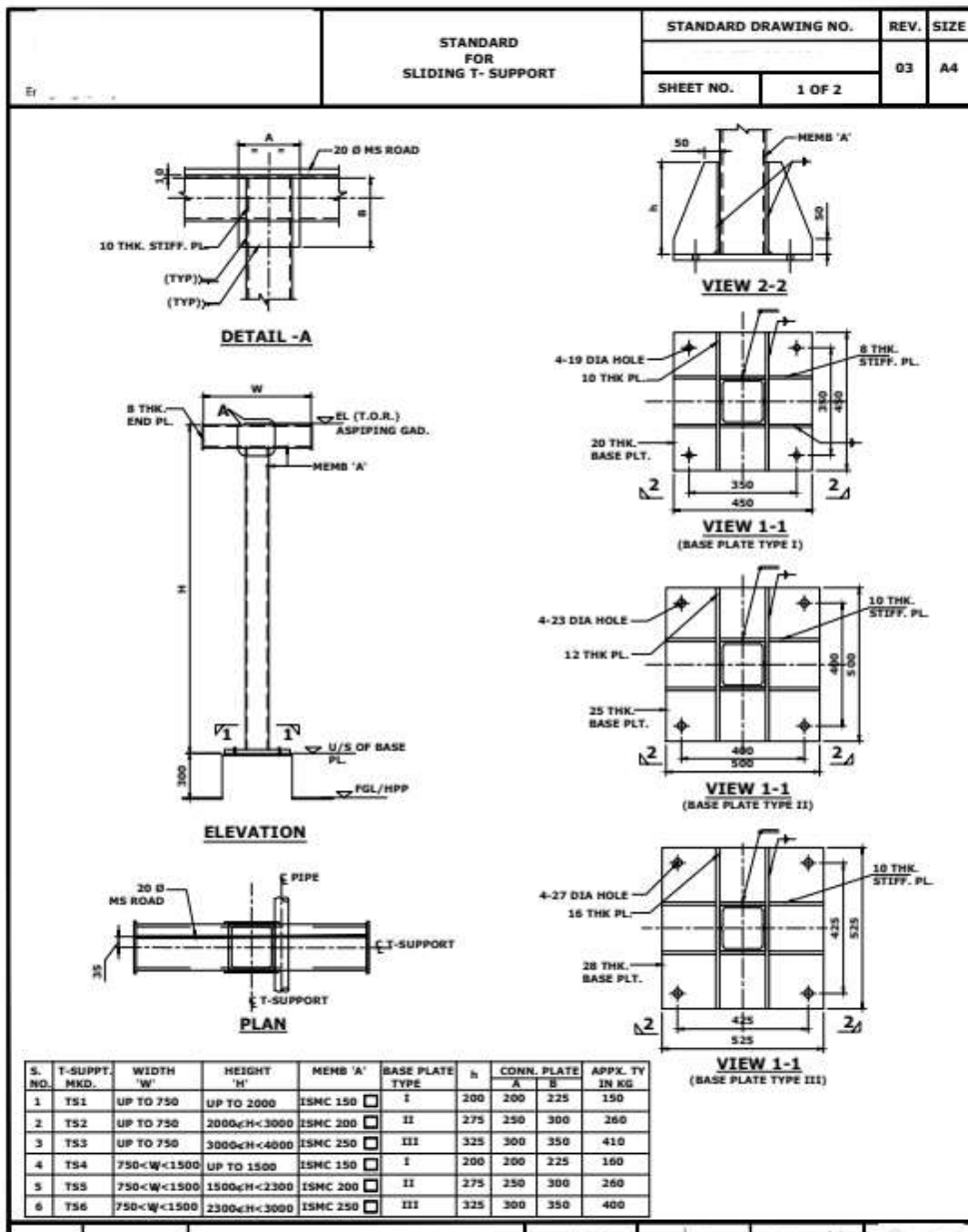
- NOTES:-**
1. ALL DIMENSIONS ARE IN mm
 2. STRUCTURAL CONCRETE SLAB SHALL BE CAST IN ALTERNATE PANELS AND NO DIMENSION OF THE PANEL SHALL EXCEED 4.5 m

	STANDARD FOR HANDRAIL ON STEEL PLATFORM	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 1		



HORIZONTAL HANDRAIL ON STEEL PLATFORM





**STANDARD
FOR
SLIDING T- SUPPORT**

STANDARD DRAWING NO.

REV. SIZE

SHEET NO.

2 OF 2

03

A4

ELEVATION

FDN. PLAN

NOTES :-

1. FOLLOWING LOADS HAVE BEEN CONSIDERED IN DESIGN:
 - a) VERTICAL LOAD = 1.0 MT FOR 750 WIDTH
= 2.0 MT FOR 1500 WIDTH
 - b) WIND INTENSITY = 150 Kg/sqm
 - c) WIND ON 18" PIPE HAS BEEN CONSIDERED
 - d) PIPE FRICTION COEFFICIENT IN BOTH DIRECTION = 0.30

SECTION 3-3

VIEW -4-4
(FOR SUPPORT TS1 & TS4)

VIEW -4-4
(FOR SUPPORT TS2 & TS5)

VIEW -4-4
(FOR SUPPORT TS3 & TS6)

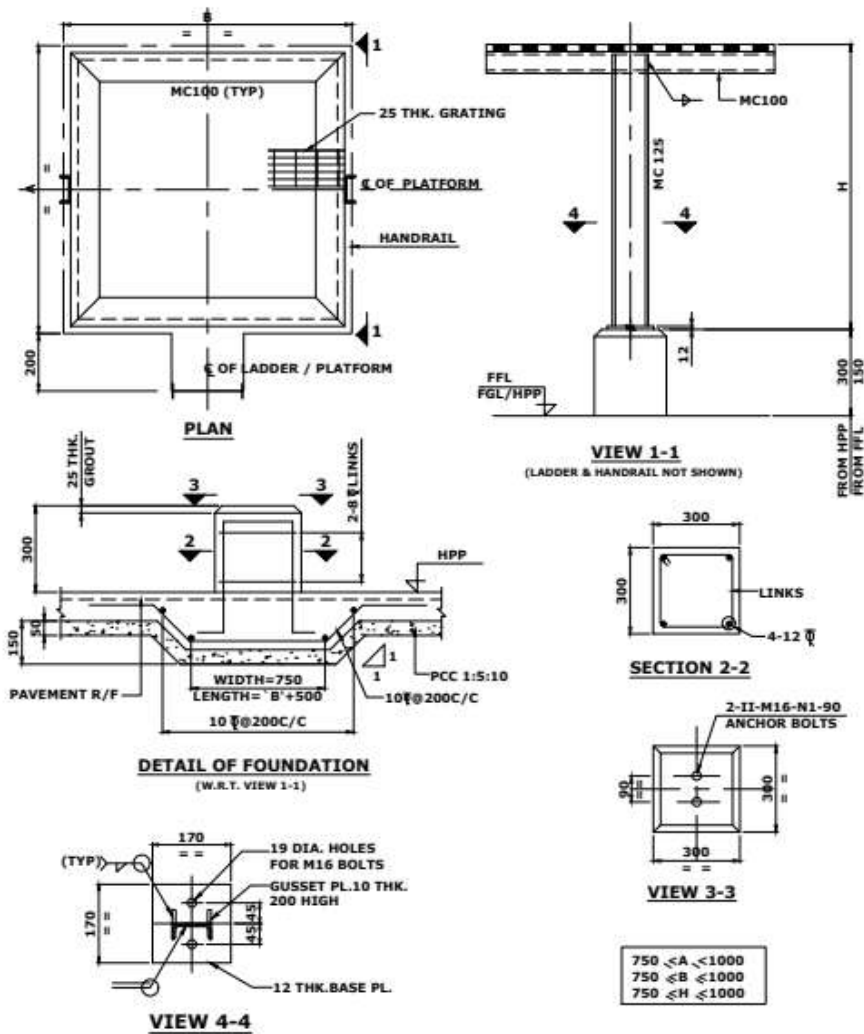
* DEPTH OF FDN. CAN BE INCREASED TO CLEAR U/G PIPING IF ANY.

S. NO.	T-SUPPLY. MKD.	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		
				FDN SIZE		QTY IN m ³	FDN. SIZE		QTY IN m ³	FDN. SIZE		QTY IN m ³
d	b	L	B		L	B		L	B			
1	TS1	600	600	1800	1800	1.51	1600	1600	1.31	1500	1800	1.22
2	TS2	650	650	2000	2000	1.83	1750	1750	1.55	1600	1600	1.40
3	TS3	675	675	2250	2250	2.20	1800	1800	1.66	1800	1800	1.66
4	TS4	600	600	2000	2000	1.74	1750	1750	1.46	1600	1600	1.31
5	TS5	650	650	2250	2250	2.15	1800	1800	1.60	1700	1700	1.50
6	TS6	675	675	2250	2250	2.20	1900	1900	1.77	1900	1900	1.77

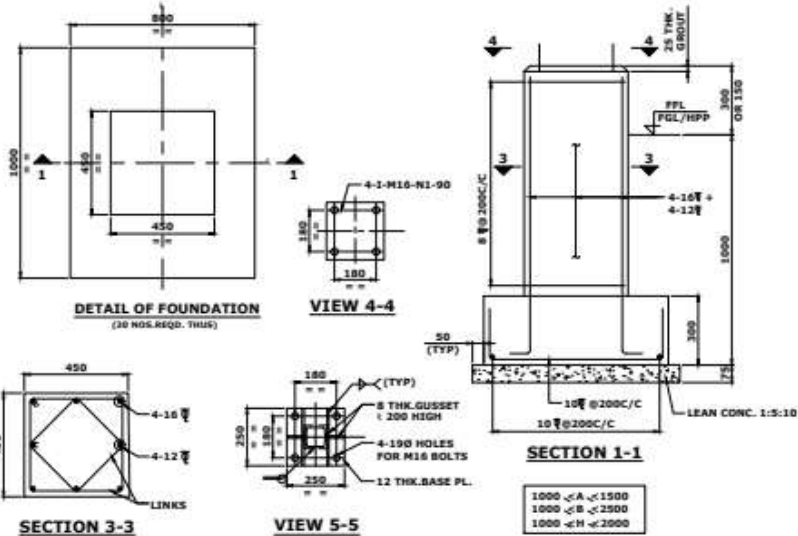
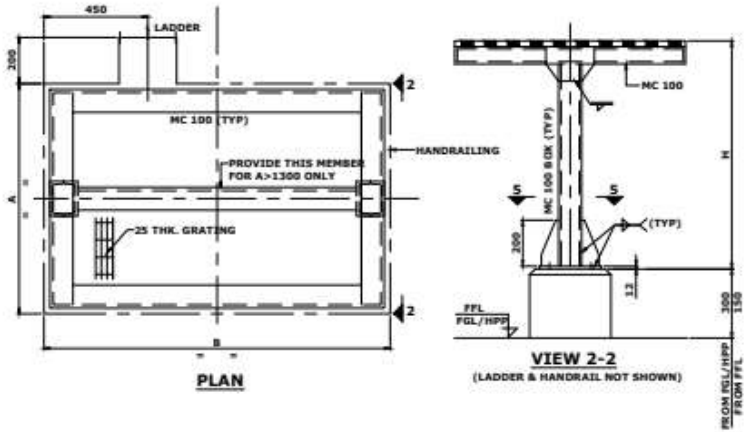
	SMALL OPERATING PLATFORMS ON GRADE/RCC ELEVATION STRUCTURE	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 3		

NOTES:-

1. THIS STANDARD COVERS DETAILS OF OPERATING PLATFORM ON GRADE, OR ON ELEVATED R.C.C. STRUCTURE FOR A MAXIMUM HEIGHT OF 2300mm ABOVE FGL AND/OR 2150mm ABOVE FFL.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. STRUCTURAL STEEL SHALL CONFORM TO IS:2062 GRADE-A.
4. GRADE OF CONCRETE SHALL BE AS MENTIONED IN GENERAL NOTES FOR CONCRETE WORKS FOR THE PROJECT.
5. R/F BARS SHALL BE COLD WORKED STEEL HIGH STRENGTH DEFORMED BARS OF GRADE Fe415 CONFORMING TO IS:1786.
6. CONCRETE & STEEL WORKS SHALL BE AS PER GENERAL NOTES OF THE PROJECT.
7. THE LOCATION AND ORIENTATION OF PLATFORMS SHALL BE AS PER PIPING GAD.
8. IF NOT GALVANIZED GRATING SHALL BE WELDED ALONG THE LINE OF SUPPORT. GALVANIZED GRATING SHALL BE CLAMPED.
9. UP TO H> 2000 HANDRAIL SHALL BE TYPE-IV HANDRAIL FOR OTHER PLATFORMS SHALL BE TYPE-VII. TOP RAIL OF HANDRAIL SHALL BE 32 NB (M) PIPE.
10. ALL GUSSET PLATES SHALL BE 8mm THICK, UNLESS NOTED OTHERWISE.
11. ALL CONNECTIONS SHALL BE WELDED USING 6mm THICK FILLET WELDS. CONNECTIONS AT CORNER LOCATIONS SHALL BE WITH SUITABLE CLEAT ANGLE.
12. FOUNDATIONS SHOWN IN THIS STANDARD ARE VALID UP TO S.B.C. OF 5.00 T/M² AT FOUNDATION LEVEL.
13. CONSTRUCTION JOINTS IN PAVEMENT SHALL BE SUITABLY LOCATED AT SITE IN CASE THICKNESS PAVEMENT IS ADOPTED FOR PLATFORM FOUNDATIONS.
14. GROUT SHALL BE 1:2 CEMENT SAND MORTAR TYPE.



	SMALL OPERATING PLATFORMS ON GRADE/RCC ELEVATION STRUCTURE	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	3 OF 3		



TYP.DETAILS OF PLATFORMS FOR

	STANDARD GRATING DETAILS	STANDARD DRAWING NO.		REV.	SIZE
		-----		03	A4
		SHEET NO.	1 OF 3		

NOTES:-

1. THIS STANDARD No VPC-STD-CS-6036 GIVES DESIGN AND DETAILS OF GRATING.
2. THE TYPE OF GRATING TO BE USED SHALL BE CALLED OUT ON THE DESIGN DRAWING.
3. THE TYPE OF GRATING TO BE USED SHALL BE CALLED OUT ON THE DESIGN DRAWING.
4. MATERIAL FOR THE GRATING (M.S. ROUNDS / M.S. FLATS) SHALL CONFORM TO IS:2026 GR-A. COMMERCIAL QUALITY MATERIAL WILL BE ALLOWED ONLY AFTER ASCERTAINING ITS WELDABILITY / STRENGTH.
5. THE NET WORKING LOADS ARE BASED ON A LIMITING VERTICAL DEFLECTION OF SPAN/200 OR 6mm WHICHEVER IS LESS.
6. THE PANEL WIDTH OF 1056 SHOWN ON THE SUBSEQUENT SHEETS IS INDICATIVE. IT MAY BE INCREASED OR DECREASED AS REQUIRED TO SUIT THE GEOMETRY OF THE PLATFORM AND CONVENIENCE OF HANDLING.
7. MAIN / SECONDARY MEMBERS OF THE GRATING SHALL BE PLACED AS PER THE SPACINGS. HOWEVER IF THE SIZE OF THE GRATING IS NOT IN MULTIPLES OF THE SPACING, ADJUSTMENT SHALL BE MADE AT THE ENDS ONLY.
8. THE GRATING WEIGHTS ARE COMPUTED FOR A PANEL SIZE OF 1056 X 1000.
9. REMOVABLE GRATING PANEL SHALL BE FIXED WITH THE SUPPORTING MEMBERS BY CLAMPS ONLY.
10. UNSUPPORTED EDGES OF ADJACENT GRATING PANELS SHALL BE CONNECTED BY TACK WELD OR U-CLAMPS MADE OUT OF 25X3 THK. M.S. FLATS WITH M-6 BOLTS AT BOTTOM. MINIMUM TWO TACK WELDS OR TWO CLAMPS PER PANEL SHALL BE PROVIDED.
11. GRATINGS SHALL NOT BE USED FOR SUPPORTING THE PIPES DIRECTLY. ADDITIONAL MEMBER MC100 SHALL BE PROVIDED UNDER THE GRATING FOR SUPPORTING THE PIPE HAVING A MAXIMUM LOAD OF 500kg. THIS MEMBER SHALL SPAN IN SAME DIRECTION AS GRATING.
12. FOR GRATING PANELS WITH CUTOUTS / OPENINGS; STRENGTHENING SHALL BE CARRIED OUT AS PER THE DETAILS GIVEN ON SHEET 3 OF 3.

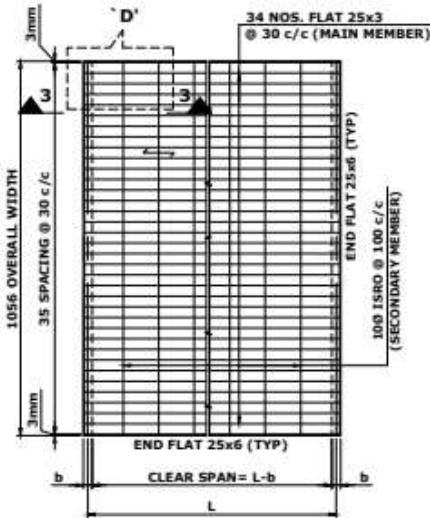
NET SAFE WORKING LOADS FOR GRATING

L	500	600	700	800	900	1000	1100	1250	1400
d	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	
w	> 2000				1515	1105	830	540	345
p	1475	1225	1050	915	810	670	550	400	275

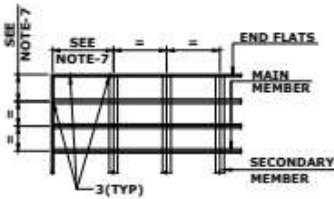
SYMBOLS :-

- L = EFFECTIVE SPAN IN mm b = BEARING WIDTH IN mm
 d = VERTICAL DEFLECTION IN mm w = UDL IN kg/m²
 p = UNIFORMLY DISTRIBUTED LINEAR LOAD IN kg/m AT MID SPAN ALONG PANEL WIDTH.
 L_g = GRATING SPAN

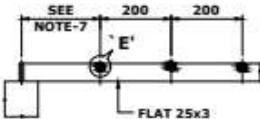
STANDARD GRATING DETAILS	STANDARD DRAWING NO.		REV.	SIZE
			03	A4
	SHEET NO.	2 OF 3		



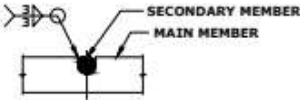
PLAN



DETAIL - 'D'



SECTION 3-3

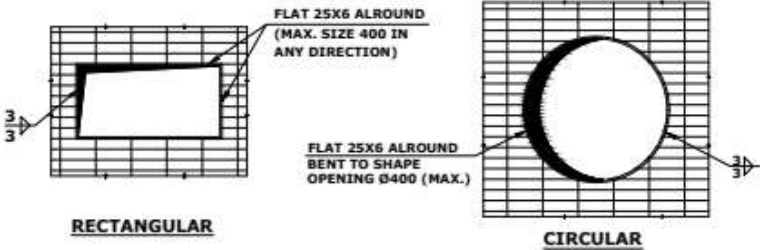


DETAIL - 'E'

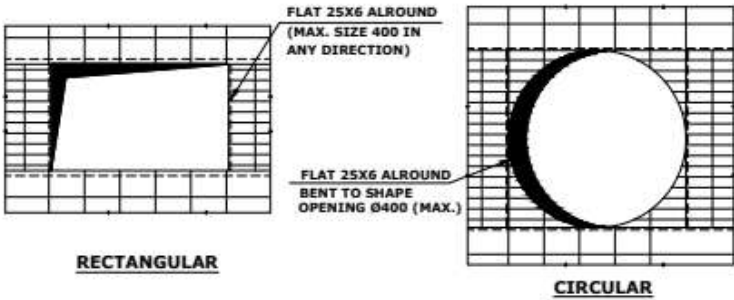
GRATING

WEIGHT OF GRATING IN kg/m ²				PROPERTIES WIDTH - 1056			APPLICATION	NOTES
25X6	25X3	100 ISRO	TOTAL	Lxx cm ⁴	Zxx cm ³	MR kgm	EQUIPMENT PLATFORM STAIRCASE PUMP HOUSE CROSS OVER	REFER SHT. 1 OF 3
4.6	18.8	5.4	28.8	14.84	11.87	195.94		

STANDARD GRATING DETAILS	STANDARD DRAWING NO.		REV.	SIZE
	SHEET NO.		03	A4
	3 OF 3			

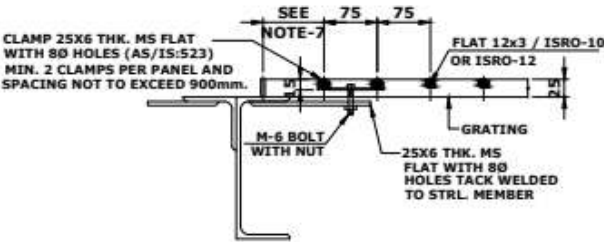


(MAXIMUM SIZE OF OPENING 400 mm)



(SIZE OF OPENING GREATER THAN 400 mm)

TYPICAL DETAIL OF GRATING STRENGTHENING AT OPENINGS



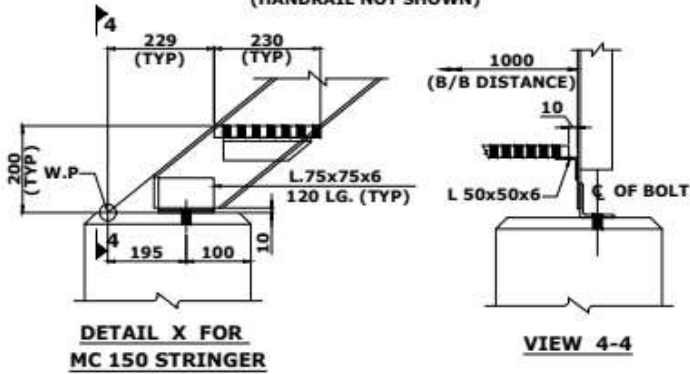
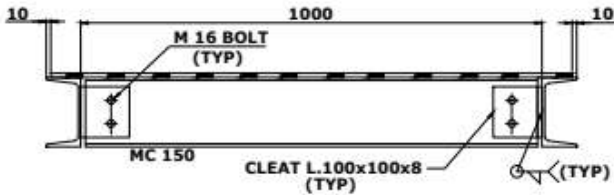
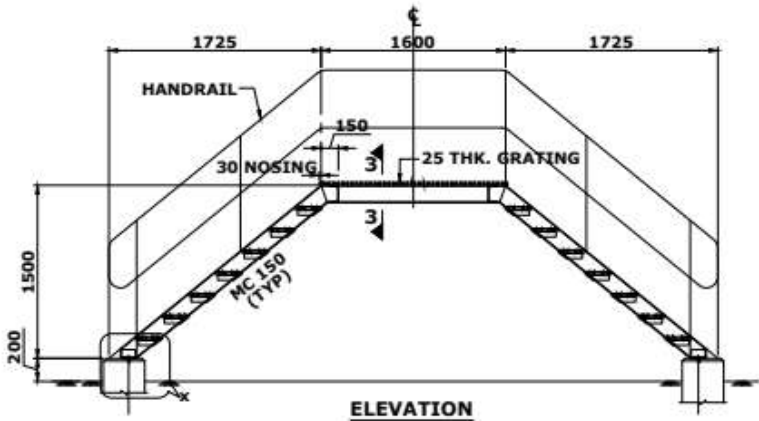
FIXING DETAIL FOR REMOVABLE GRATING PANELS WITH CLAMPS
(SEE NOTE - 9)

	PIPE SLEEPER CROSSOVER	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 3		

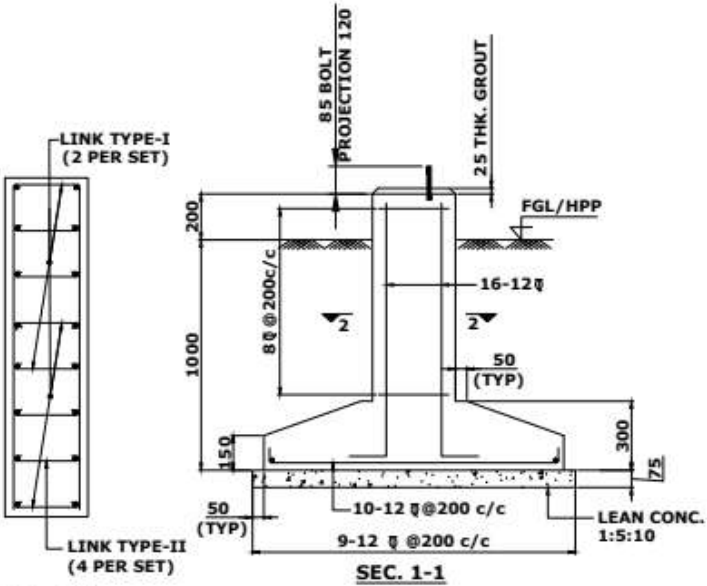
NOTES :-

- ALL DIMENSIONS ARE IN MILLIMETERS
- THE LOADING CONSIDER ARE :-
 - LIVE LOAD = 2.0 KN/m² ON CROSSOVER
 - SELF WEIGHT OF MEMBER INCLUDING GRATINGS
- ALL STRUCTURE STEEL SHALL CONFORM TO IS: 2062 GRADE-A
- GRADE OF CONCRETE SHALL BE AS MENTIONED IN GENERAL NOTES FOR CONCRETE WORKS, FOR THE PROJECT
- R/F BARS SHALL BE COLD WORKED STEEL HIGH STRENGTH DEFORMED BARS OF GRADE Fe 415 (MIN.) CONFORMING TO IS: 1786
- CONCRETE AND STEEL WORK SHALL BE AS PER GENERAL NOTES FOR THE PROJECT.
- LOCATION AND ORIENTATION OF PLATFORMS SHALL BE AS PER PIPING GAD.
- STAIRCASE DETAIL AS PER VPC-STD-CS-6047.
- STAIRCASE ON EACH SIDE OF CROSSOVER SHALL HAVE INCLINATION OF 41° TO HORIZONTAL, WITH RISERS NOT EXCEEDING 200mm.
- GRATING SHALL BE AS PER VPC-STD-CS-6036.
- UPTO> 2000 HANDRAIL SHALL BE AS PER VPC-STD-CS-6033.
- GUSSET PLATES SHALL BE 8mm. THICK UNLESS NOTED OTHERWISE.
- ANCHOR BOLTS SHALL BE AS PER VPC-STD-CS-6054.
- PIPE SLEEPERS HAVE BEEN ASSUMED TO BE 500mm. (MAXIMUM) ABOVE GRADE AND WITH A MAXIMUM LENGTH OF 5000mm SYMMETRICALLY LOCATED WITH RESPECT TO CENTRE LINE THUS REQUIRING SINGLE SPAN CROSSOVERS.

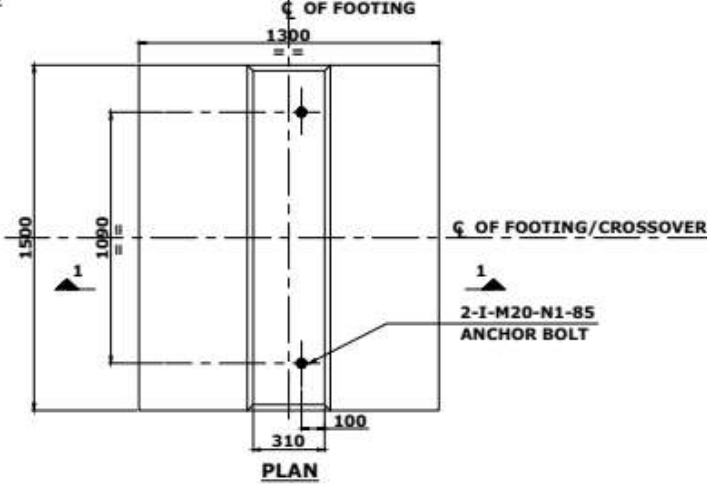
	PIPE SLEEPER CROSSOVER	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	2 OF 3		

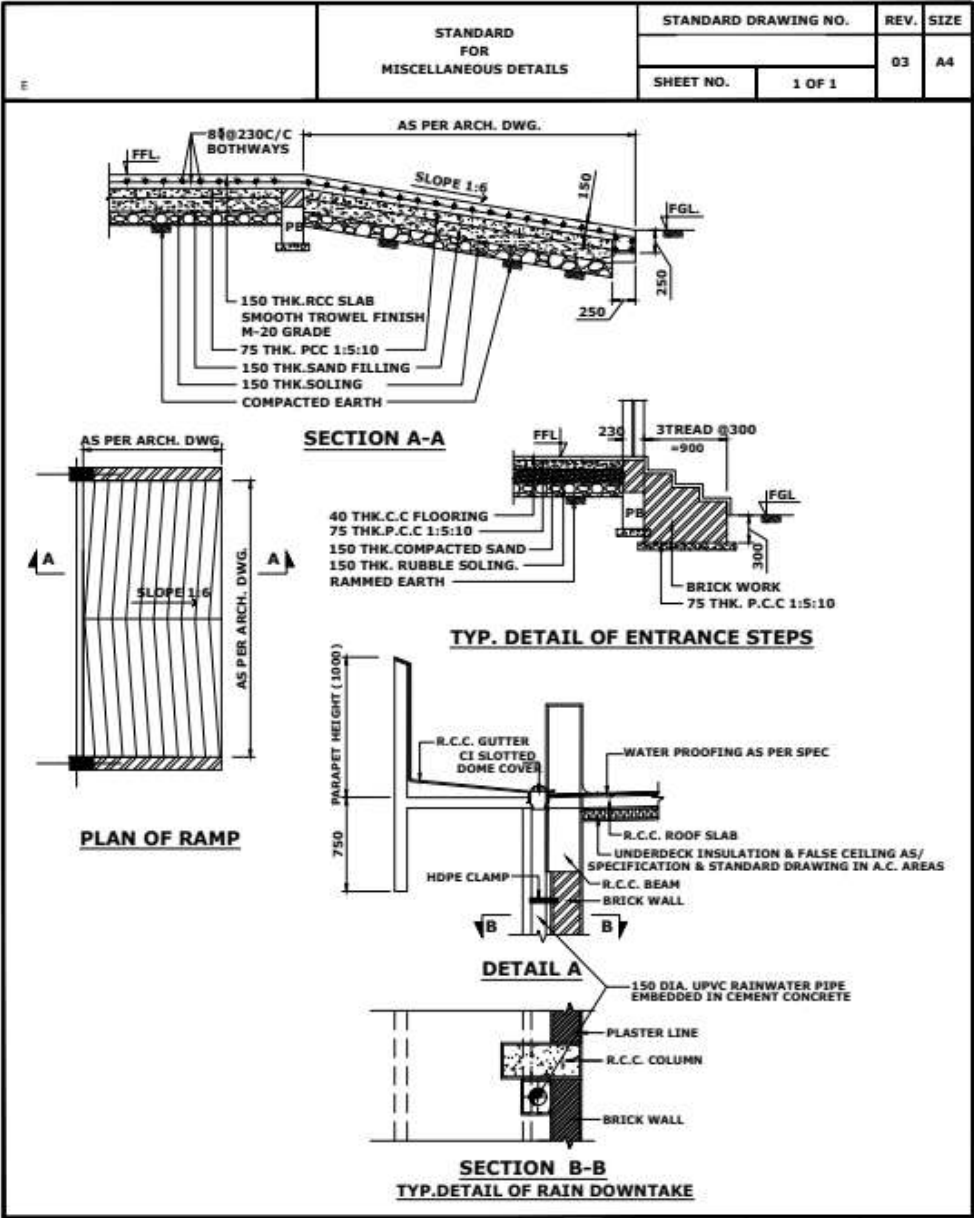


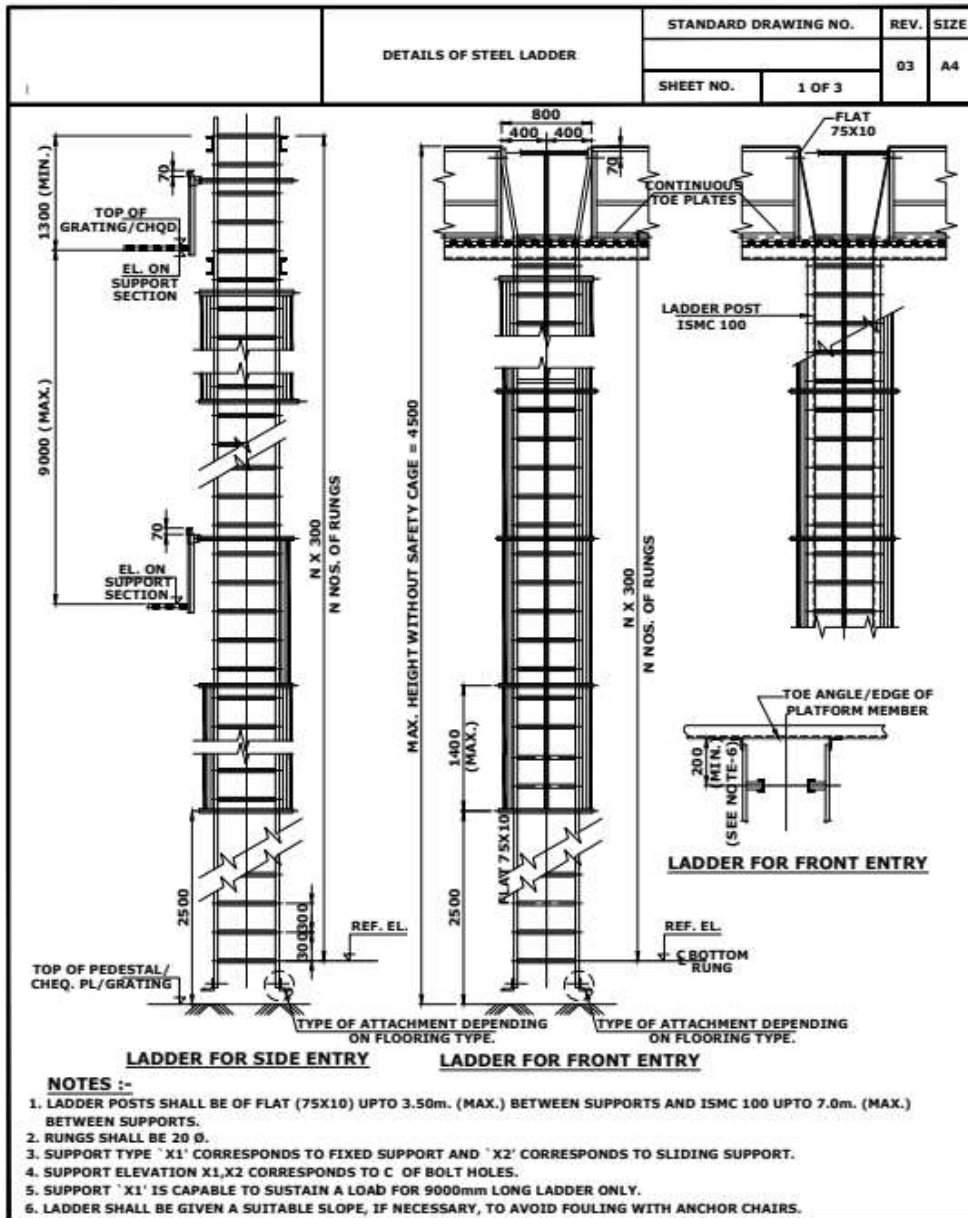
	PIPE SLEEPER CROSSOVER	STANDARD DRAWING NO.		REV.	SIZE
		1		03	A4
		SHEET NO.	3 OF 3		

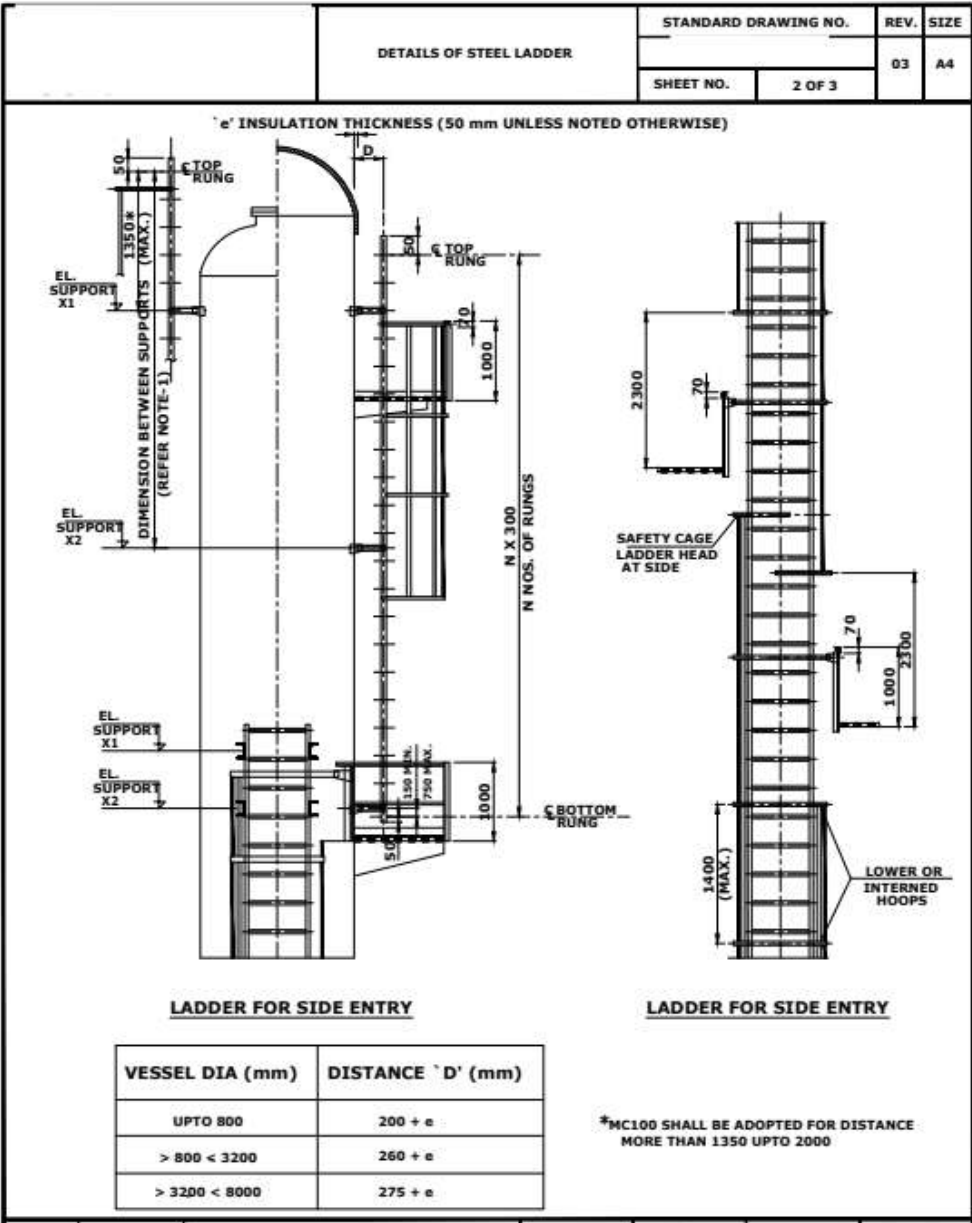


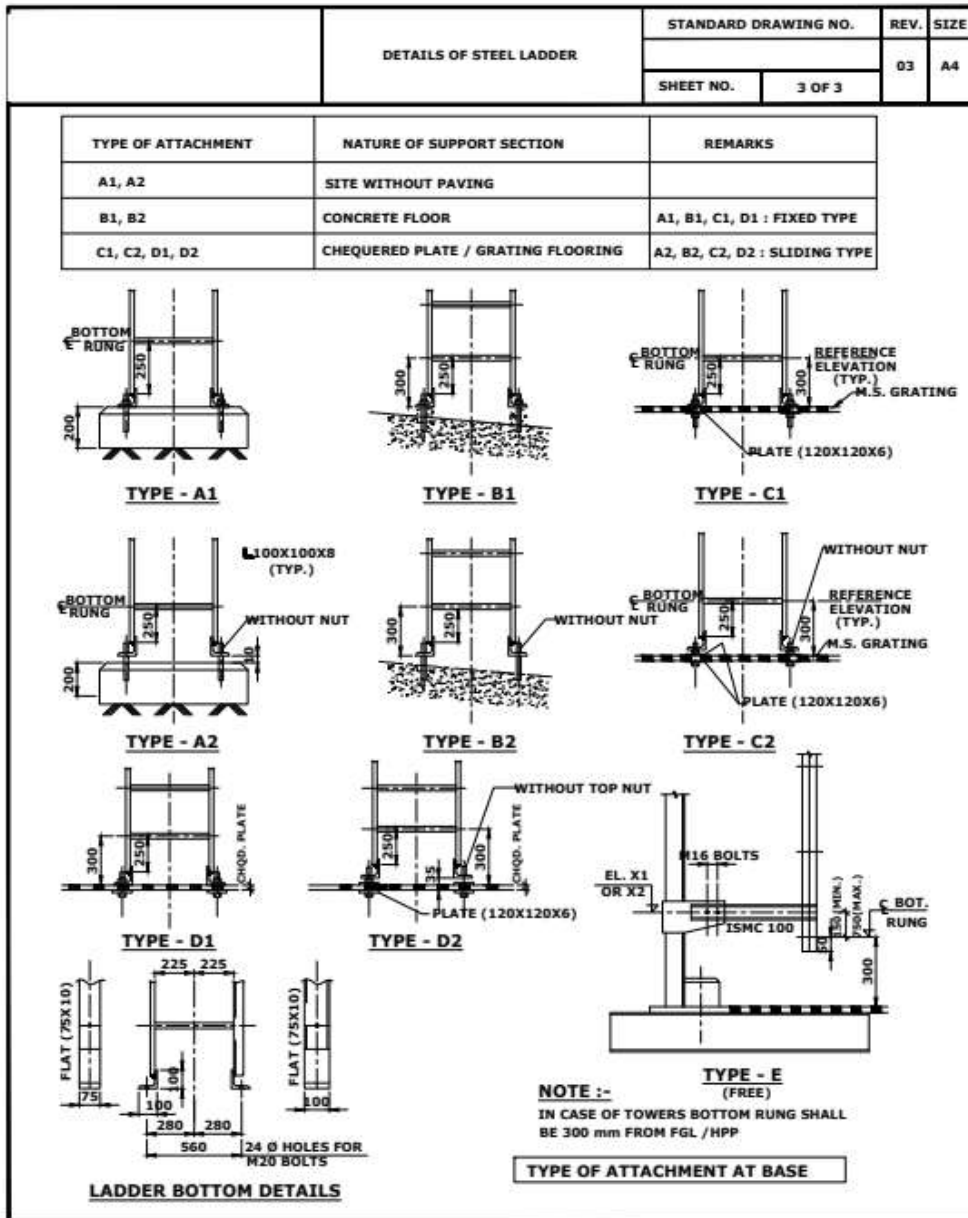
SEC. 2-2











	METAL INSERT PLATES	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 7		

GENERAL NOTES:-

- ALL LUGS SHALL BE OF HIGH STRENGTH DEFORMED BARS OF
GRADE Fe415 CONFORMING TO IS:1786 (WITH GUARANTEED WELDABILITY)
AND SHALL BE CONNECTED TO METAL INSERT PLATES BY 6 mm FILLET
WELDS AS SHOWN IN SKETCHES.
- METAL INSERT PLATES SHALL BE CONFORMING TO IS:2062 (GR-A).
- METAL INSERT PLATES MARKED ON DRAWING REFER AS UNDER

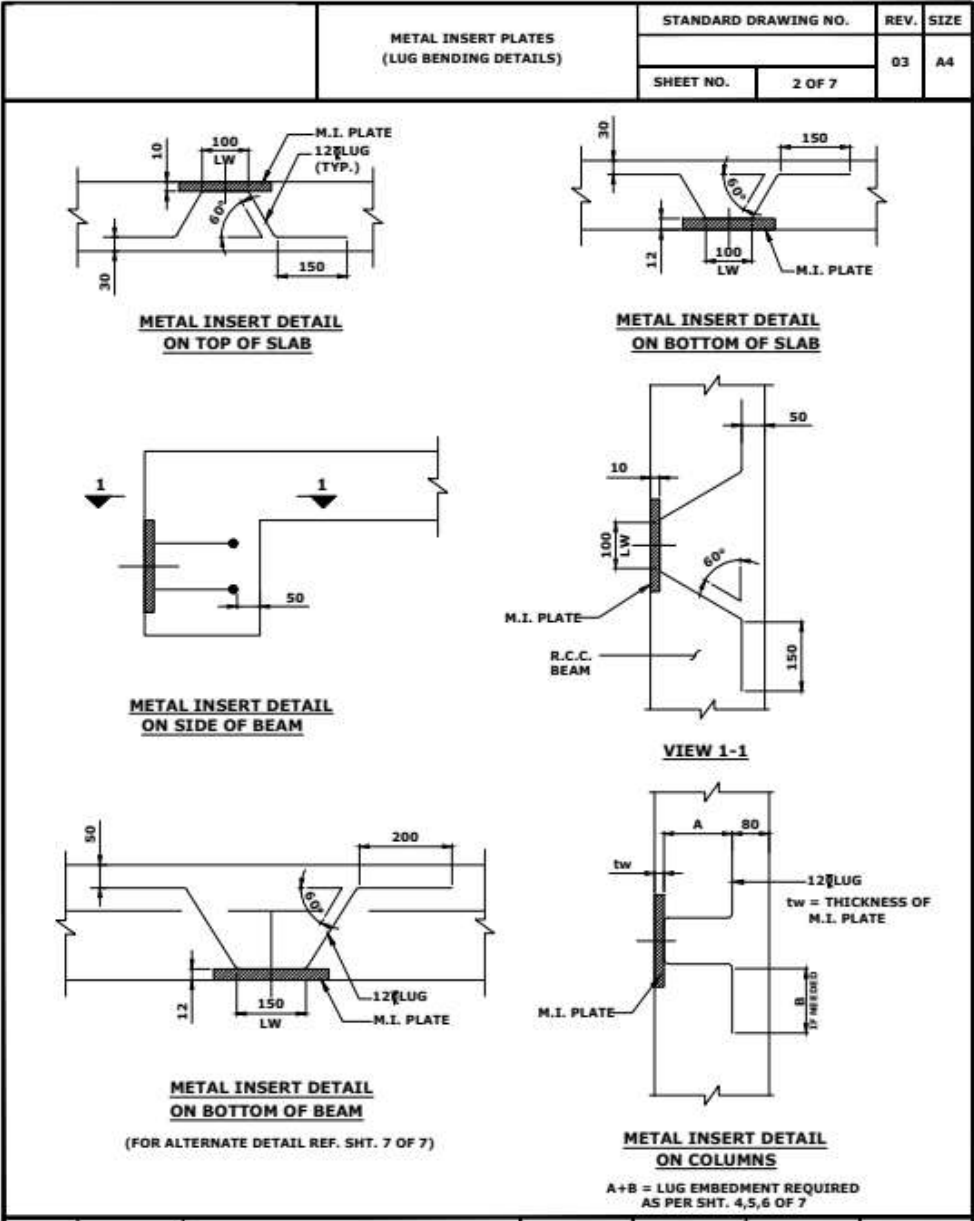
IP -(A) @ (C)

IP = INSERT PLATE

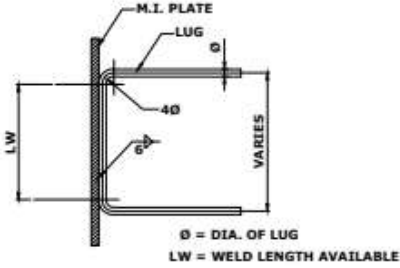
A = TYPE OF INSERT PLATE

C = ELEVATION OF INSERT PLATE (TOP EDGE)

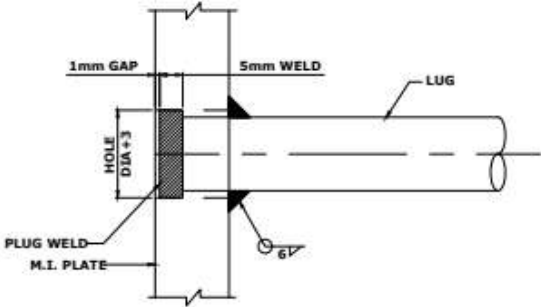
e.g IP-R9a @ EL.110.300 MEANS INSERT TYPE R9a AT EL.110.300.
- METAL INSERT PLATES SHALL BE KEPT FLUSH WITH CONCRETE SURFACE.
- THE LONGER SIDE OF METAL INSERT PLATE SHALL BE KEPT VERTICAL
UNLESS SHOWN OTHERWISE.
- METAL INSERT PLATE ON COLUMN OR BEAM SHALL BE KEPT SYMMETRICAL
ABOUT C OF COLUMN OR BEAM, UNLESS SHOWN OTHERWISE.



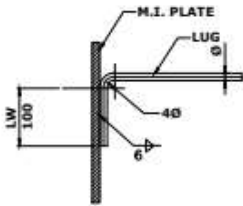
	METAL INSERT PLATES	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	3 OF 7		



BENDING DIMENSIONS FOR 12mm & 16mm LUGS
(FOR SPACING OF LUGS ≥ 190)
(NOT APPLICABLE FOR S1, S2 & R1)



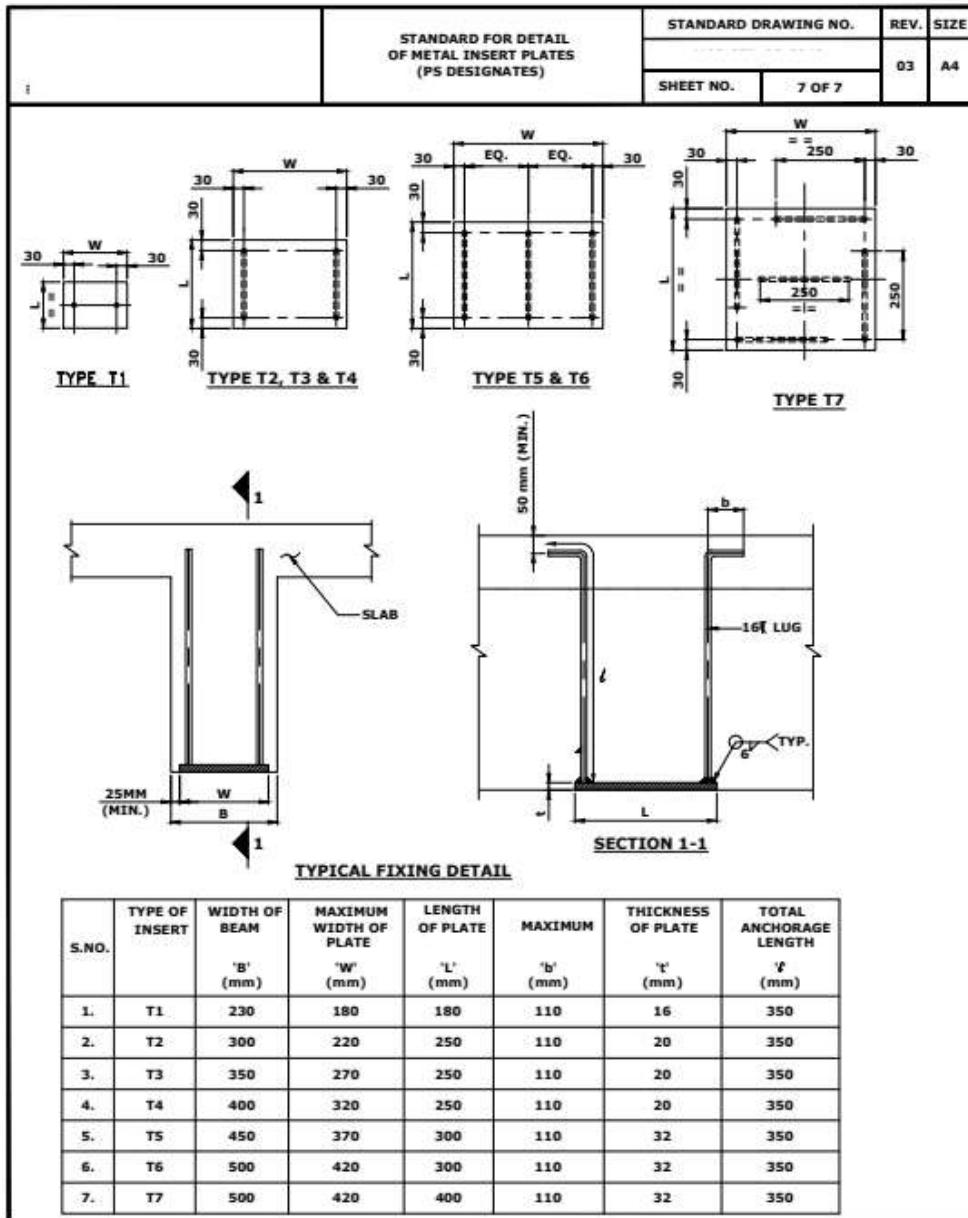
WELD DETAIL OF 12mm & 16mm LUGS WITH M.I. PLATE
(FOR SPACING OF LUGS < 190)
(VALID FOR S1, S2 & R1)



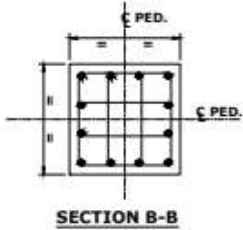
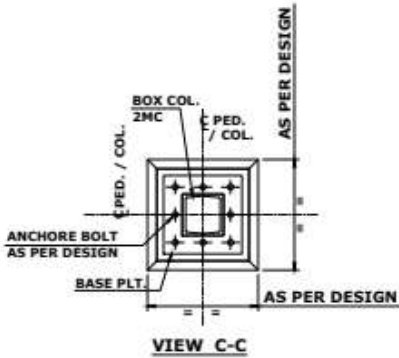
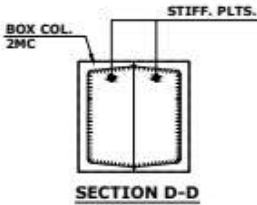
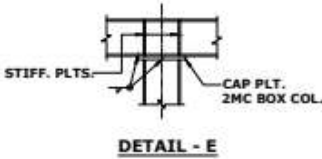
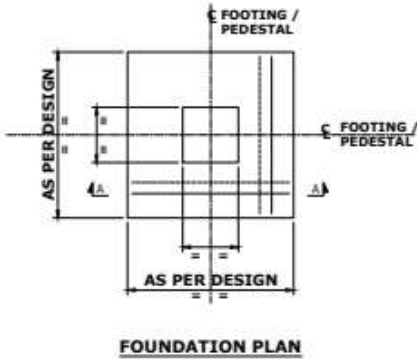
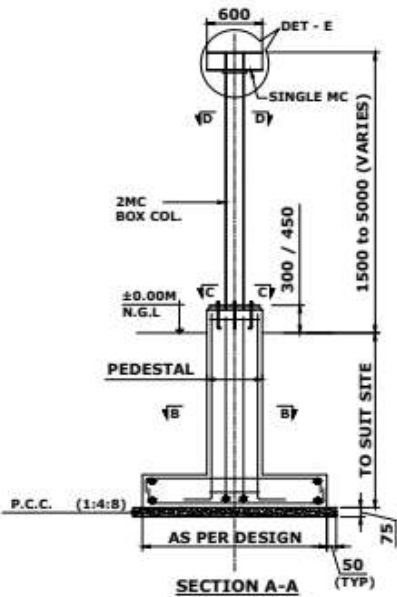
BENDING DIMENSIONS FOR 12mm & 16mm LUGS
(VALID FOR R9, R10, R12, R13, R14, PS11 & PS12)

S. NO.	TYPE OF INSERT	DIA OF LUGS	THK. OF INSERT	DETAILS OF INSERT PLATE		S. NO.	TYPE OF INSERT	DIA OF LUGS	THK. OF INSERT	DETAILS OF INSERT PLATE	
				PLAN	CROSS SECTION					PLAN	CROSS SECTION
1.	51a	12	12			7.	57a	12	12		
	51b	16	16				57b	16	16		
2.	52a	12	12			8.	R1a	12	12		
	52b	16	16				R1b	16	16		
3.	53a	12	12			9.	R2a	12	12		
	53b	16	16				R2b	16	16		
4.	54a	12	12			10.	R3a	12	12		
	54b	16	16				R3b	16	16		
5.	55a	12	12			11.	R4a	12	12		
	55b	16	16				R4b	16	16		
6.	56a	12	12			12.	R5a	12	12		
	56b	16	16				R5b	16	16		

				METAL INSERT PLATES (R DESIGNATES)		STANDARD DRAWING NO.		REV.	SIZE		
								03	A4		
						SHEET NO.		5 OF 7			
S. NO.	TYPE OF INSERT	DIA. OF LUGS	THK. OF INSERT	DETAILS OF INSERT PLATE		S. NO.	TYPE OF INSERT	DIA. OF LUGS	THK. OF INSERT	DETAILS OF INSERT PLATE	
				PLAN	CROSS SECTION					PLAN	CROSS SECTION
13.	R6a	12	12			18.	R11a	12	12		
	R6b	16	16				R11b	16	16		
				SIZE 250x400						SIZE 350x400	
14.	R7a	12	12			19.	R12a	12	12		
	R7b	16	16				R12b	16	16		
				SIZE 250x500						SIZE 350x500	
15.	R8a	12	12			20.	R13a	12	12		
	R8b	16	16				R13b	16	16		
				SIZE 300x400						SIZE 350x600	
16.	R9a	12	12			21.	R14a	12	12		
	R9b	16	16				R14b	16	16		
				SIZE 300x500						SIZE 400x500	
17.	R10a	12	12								
	R10b	16	16								
				SIZE 300x600							



	STANDARD FOR DETAIL OF CANTILEVER PIPE SUPPORT	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 1		

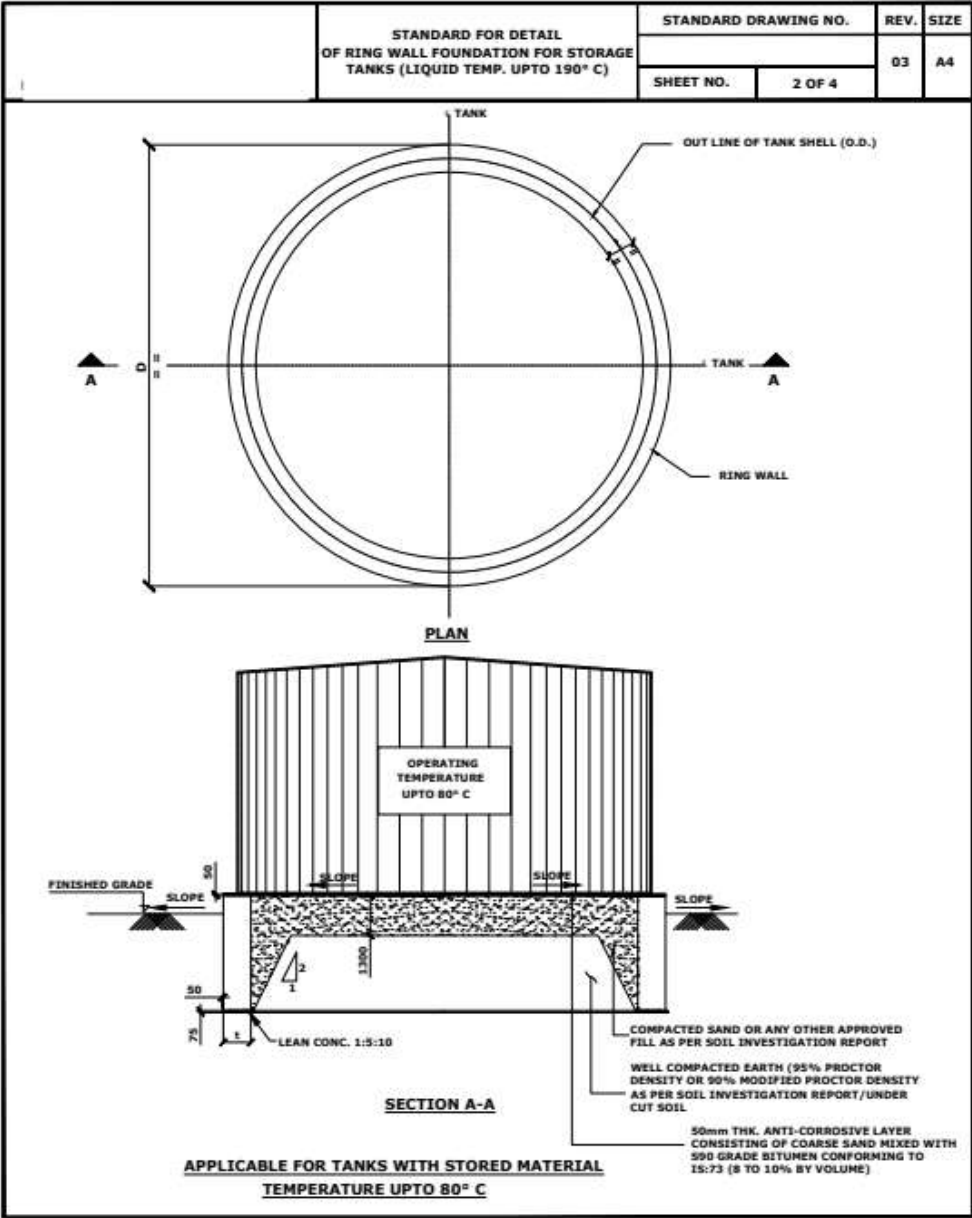


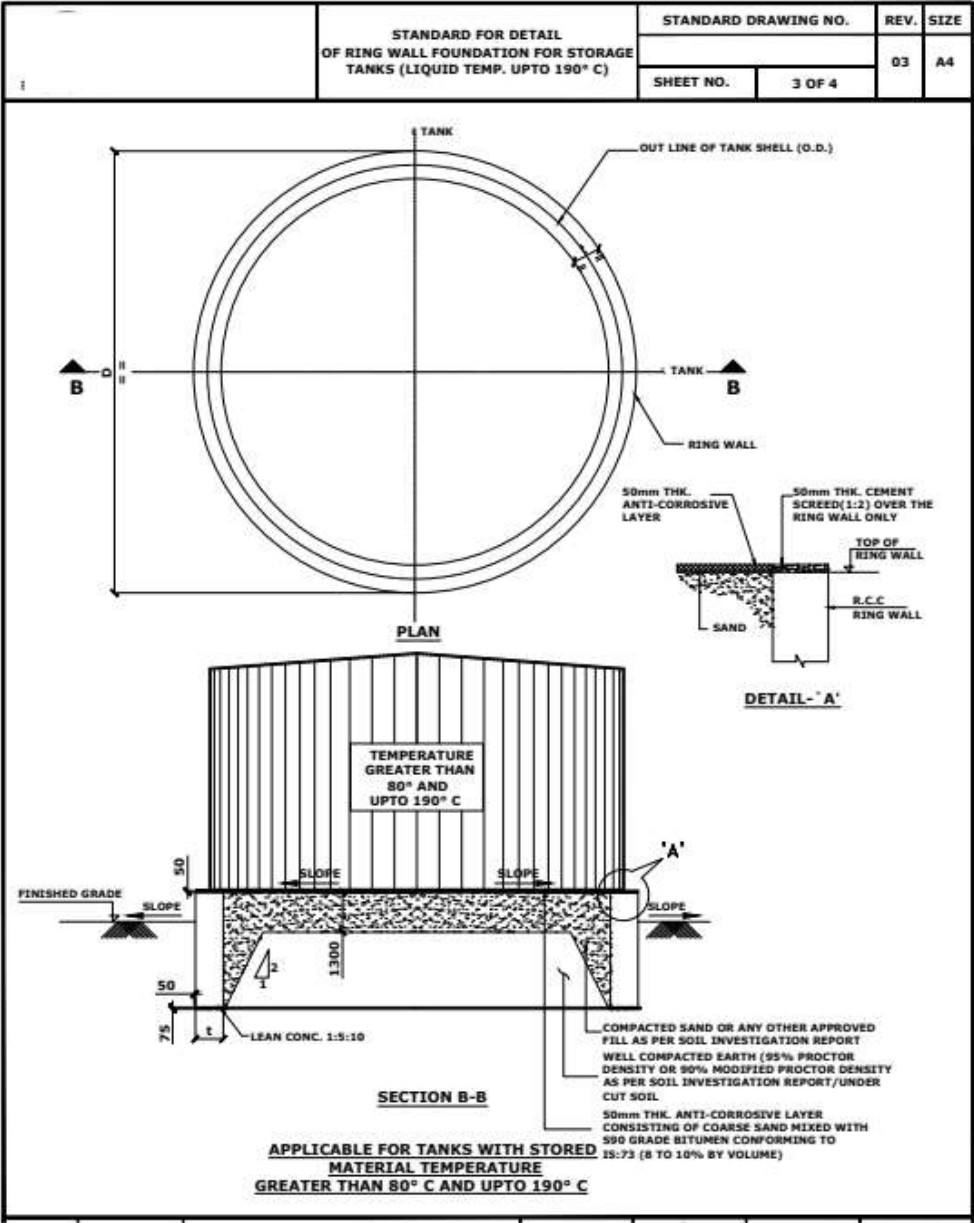
1	STANDARD FOR DETAIL OF RING WALL FOUNDATION FOR STORAGE TANKS (LIQUID TEMP. UPTO 190° C)	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 4		

NOTES:-

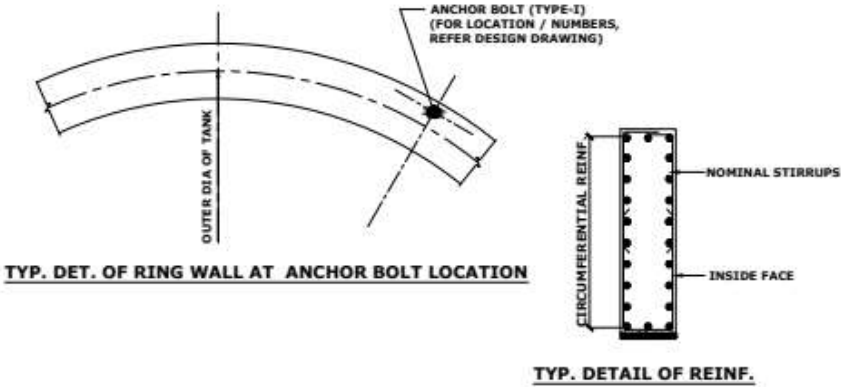
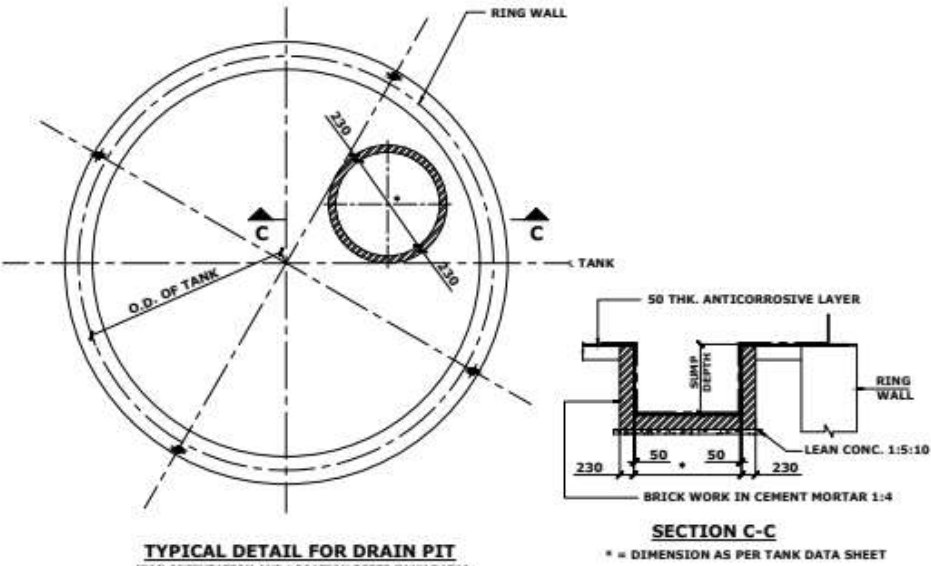
- ALL DIMENSIONS ARE IN mm.
- JOB SPECIFIC DRAWING SHALL BE REFERRED FOR THE FOLLOWING :-
 - RING BEAM DETAILS INCLUDING TOP & BOTTOM LEVEL.
 - ANCHOR BOLT LOCATION AND DETAILS.
 - DRAIN LOCATION AND OTHER DETAILS.
 - SPECIFIC REQUIREMENT ON GROUND TREATMENT.
- SLOPE OF TOP OF SAND FILL AND ANTI-CORROSIVE LAYER SHALL MATCH WITH TANK BOTTOM.

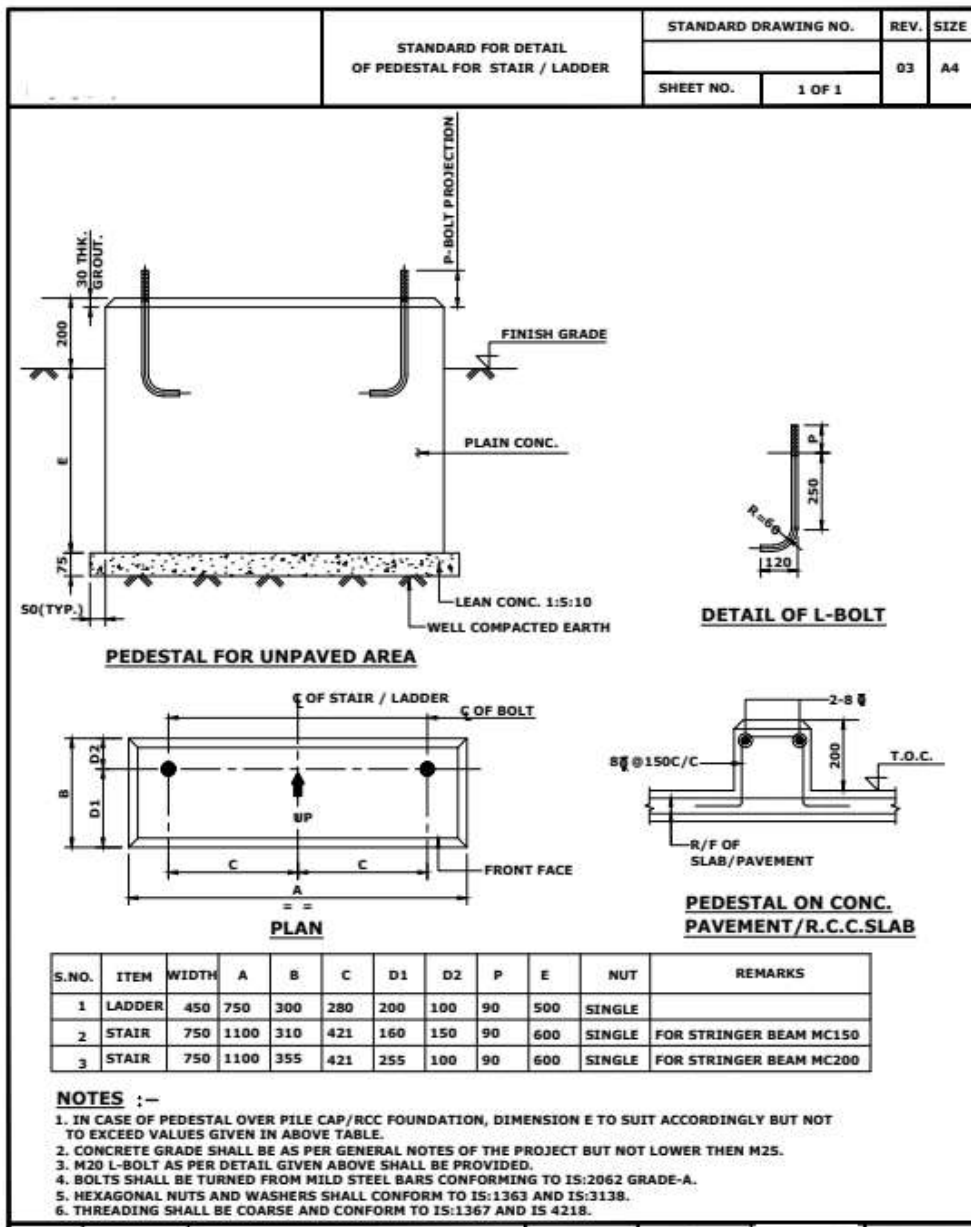
THIS STANDARD IS NOT APPLICABLE FOR ACID / CAUSTIC / PRESSURISED TANKS AS WELL AS FOR TANKS WHERE STRESS RELIEVING IN POSITION IS ENVISAGED.

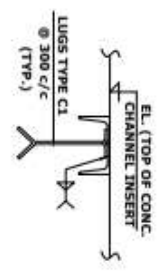
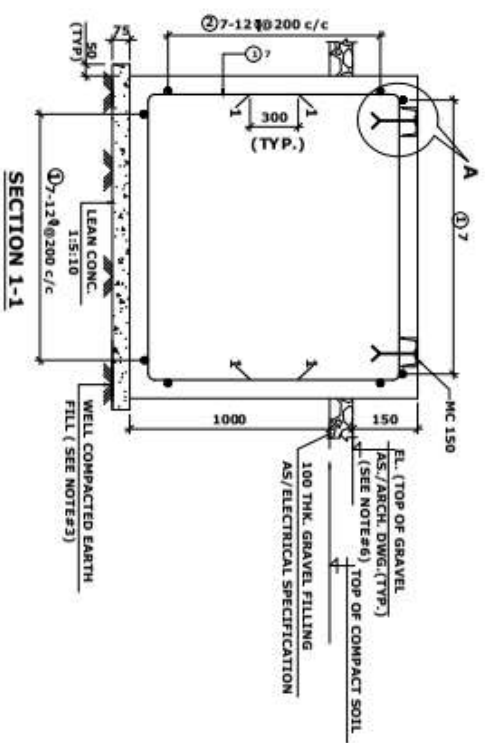




E	STANDARD FOR DETAIL OF RING WALL FOUNDATION FOR STORAGE TANKS (LIQUID TEMP. UPTO 190° C)	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	4 OF 4		



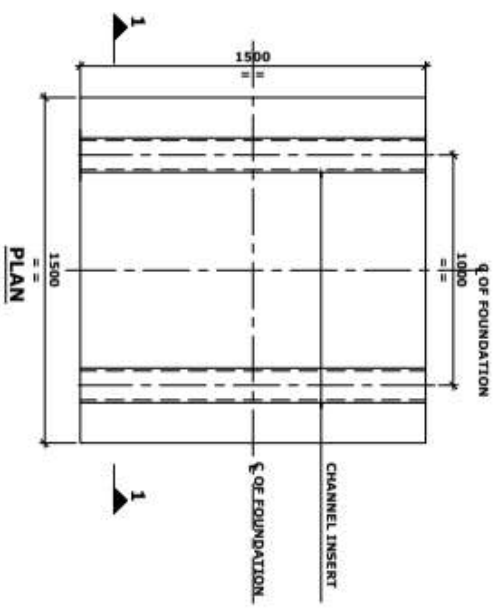




FOR LOCATION & LAYOUT OF TRANSFORMER FDN. REFER RELEVANT ELECTRICAL DRGS.

SECTION 1-1

DETAIL A



PLAN

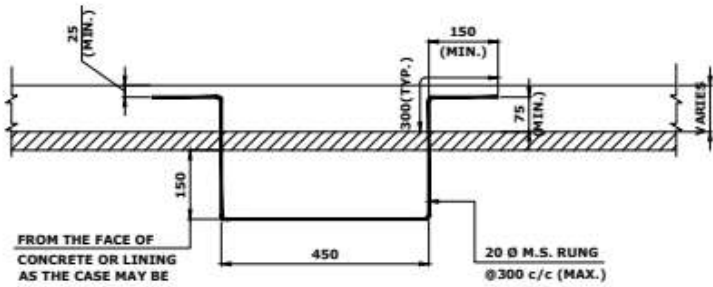
NOTES:

1. CONCRETE GRADE SHALL BE AS PER GENERAL NOTES OF THE PROJECT BUT NOT LOWER THAN M25.
2. R/F SHALL BE HIGH YIELD STRENGTH DEFORMED BARS CONFORMING TO IS:1786 GRADE Fe 415 (MIN.)
3. FOUNDATION SHALL REST ON WELL COMPACTED EARTH FILL AS/ SPECIFICATIONS.
4. SUITABLE END STOPPERS SHALL BE PROVIDED (BY OTHERS) AT CHANNEL ENDS AFTER THE INSTALLATION OF TRANSFORMER.
5. SBC OF SOIL CONSIDERED IS 5 MT/M² AND A MAXIMUM EQUIPMENT WEIGHT OF 6.5 MT.
6. TOP OF COMPACTED SOIL FILL SHALL BE 50mm ABOVE THE TOP OF APPROACH ROAD LEVEL.

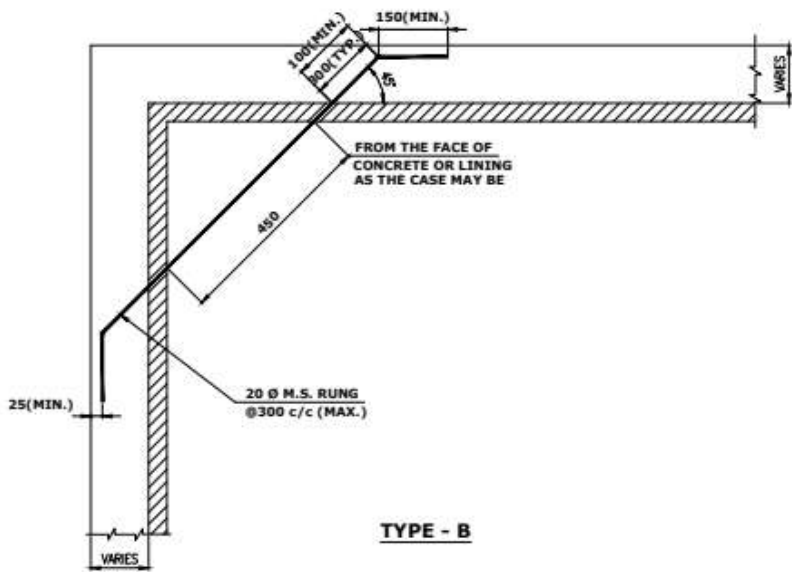
TYPE	BAR MARK	Ψ	A	B	C	CUT LENGTH (mm)	NOS. REQD.	TOTAL LENGTH (mm)	UNIT WT. IN kg./m	QUANTITIES FOR ONE SET				REMARKS
										HYD. BARS (kg.)	CONC. 15:10 (m ³)	STRL. CONC. (m ³)	STRL. STEEL (kg.)	
①	12	1400	750	750	2825	28	79100	0.89		108.00	0.34	3.00	50.00	
②	12	1400	850	850	3025	14	42350	0.89						

STANDARD FOR DETAIL OF BLOCK FOUNDATION FOR TRANSFORMERS (UPTO 2000KVA RATING)

	STANDARD FOR DETAIL OF M.S. RUNGS FOR CONC. STRUCTURES	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 1		

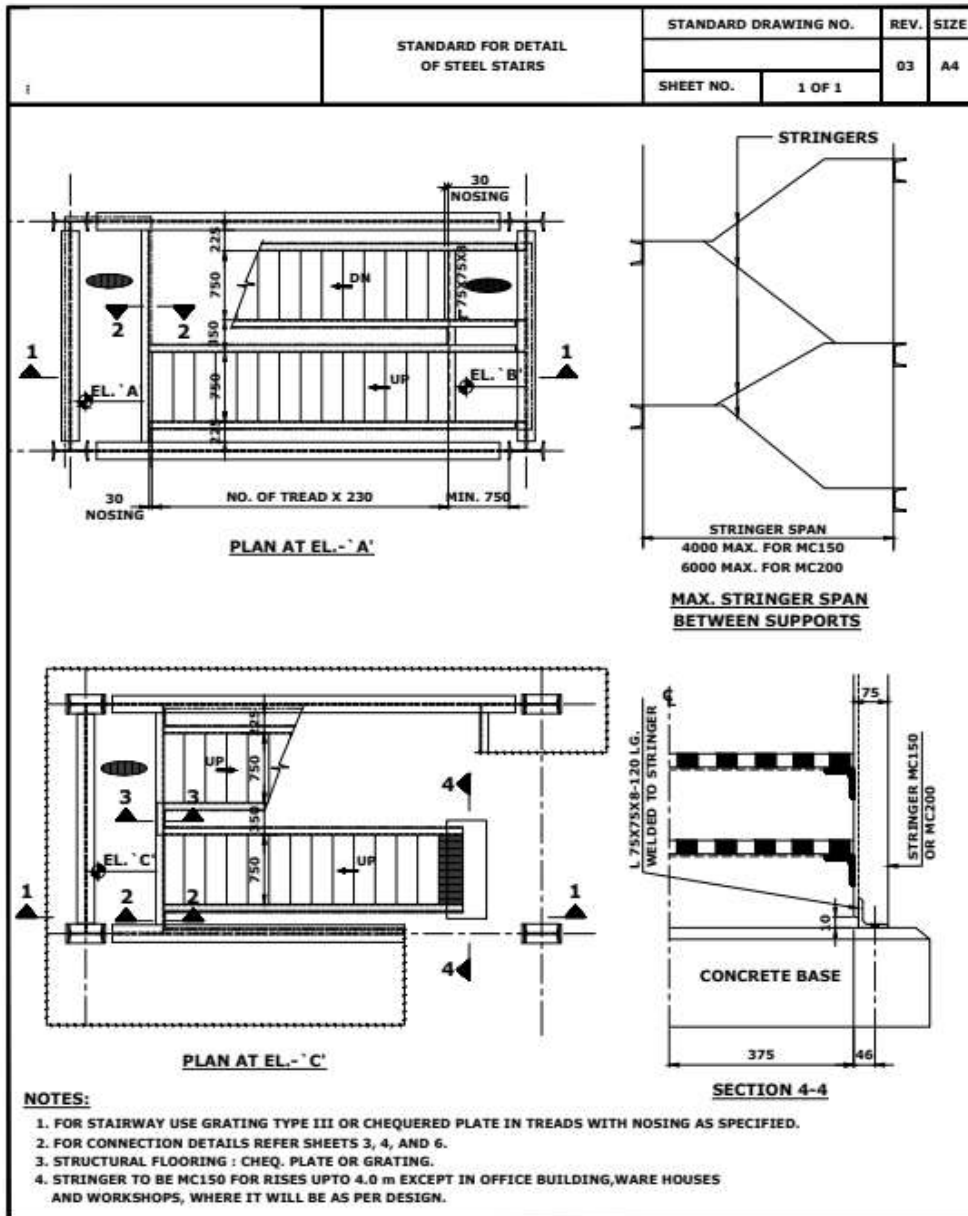


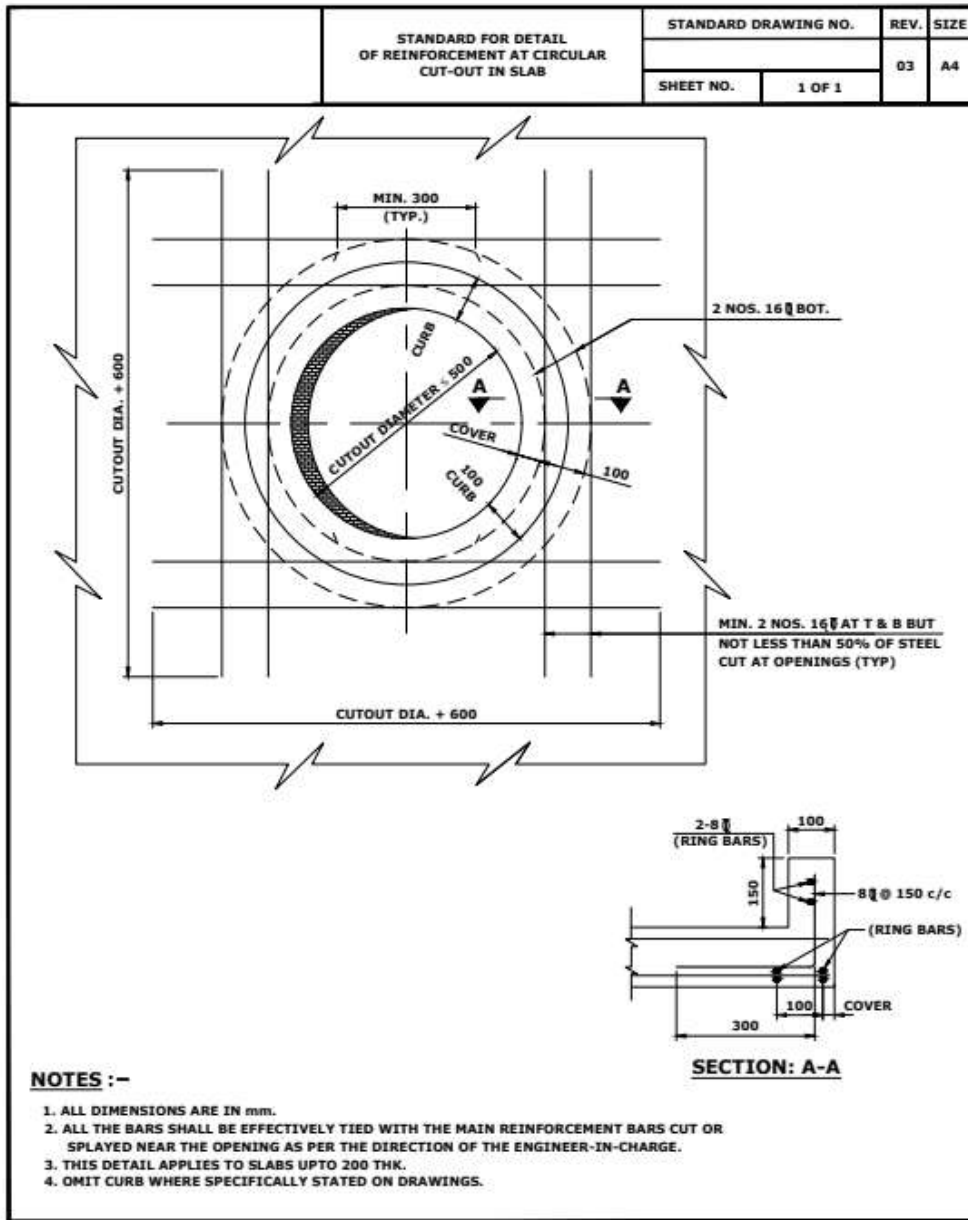
TYPE - A

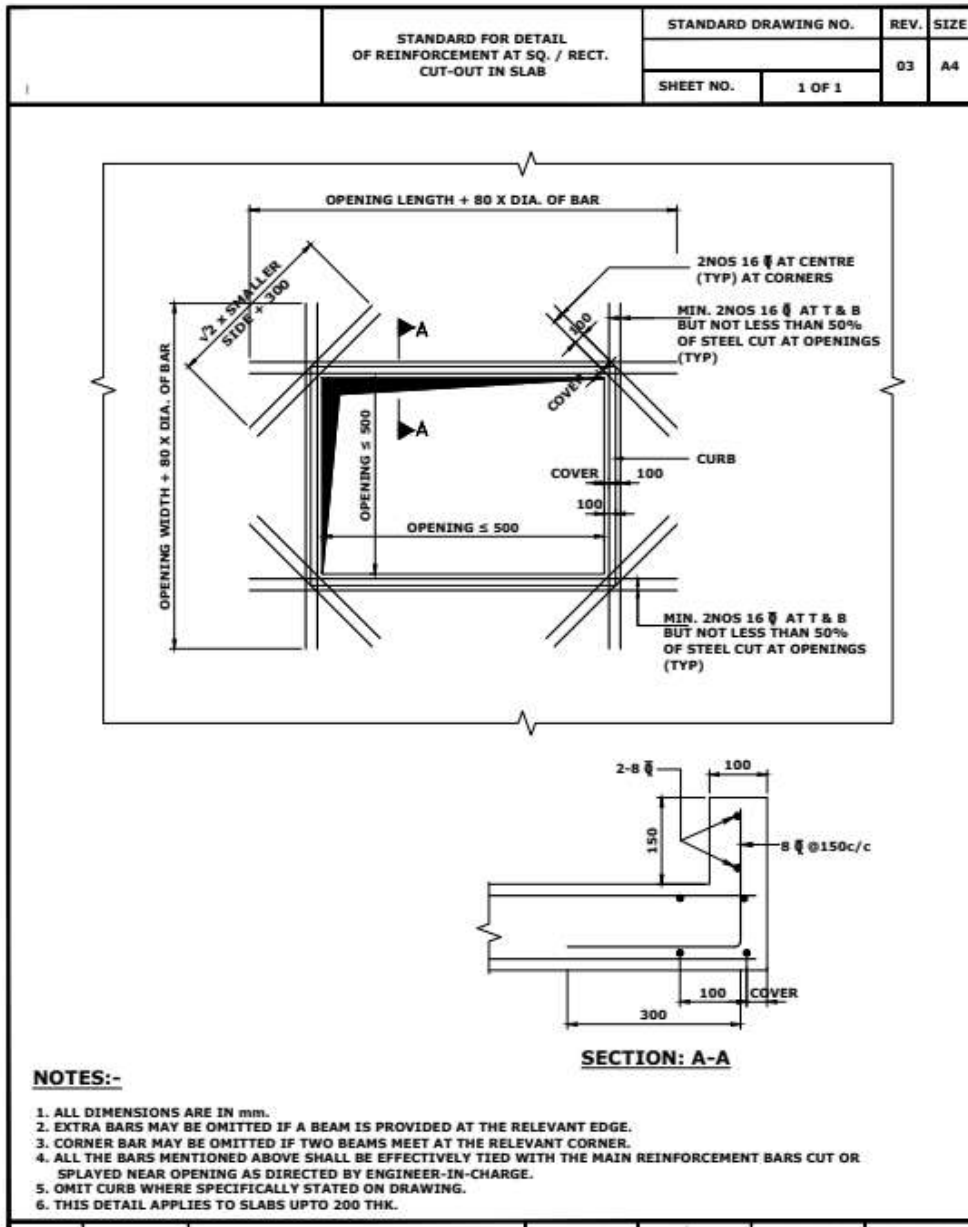


TYPE - B

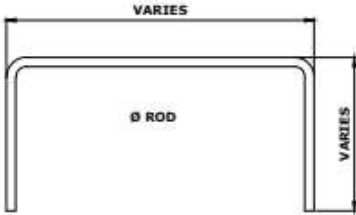
- NOTES :-**
- ALL DIMENSIONS ARE IN mm.
 - FIRST RUNG SHALL BE AT 300mm FROM TOP.



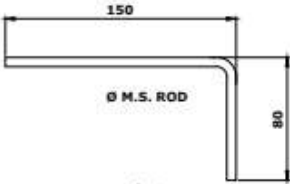




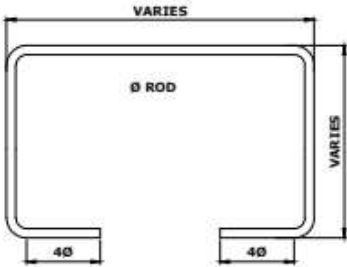
	STANDARD FOR DETAIL OF LUGS	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 1		



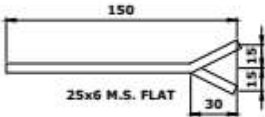
TYPE-`A1`



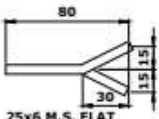
TYPE-`B`



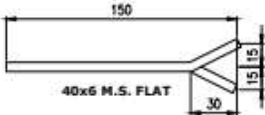
TYPE-`A2`



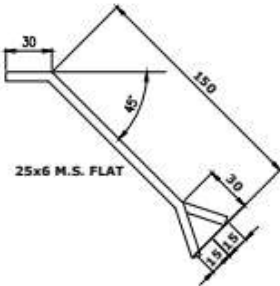
TYPE-`C1`



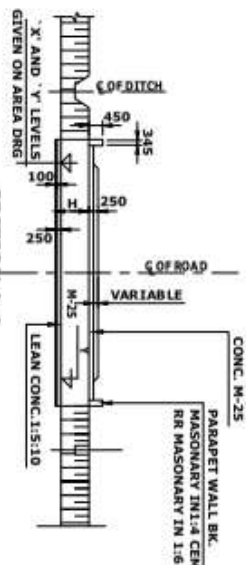
TYPE-`C3`



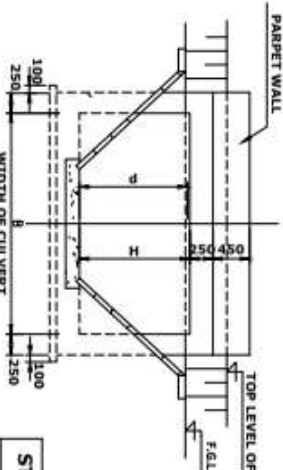
TYPE-`C2`



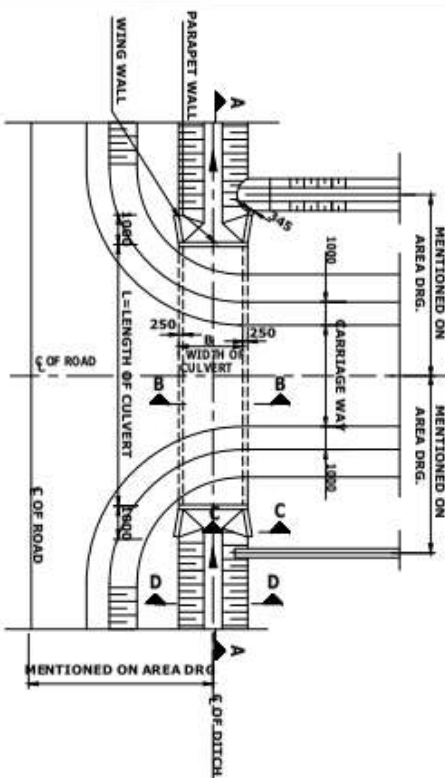
TYPE-`C4`



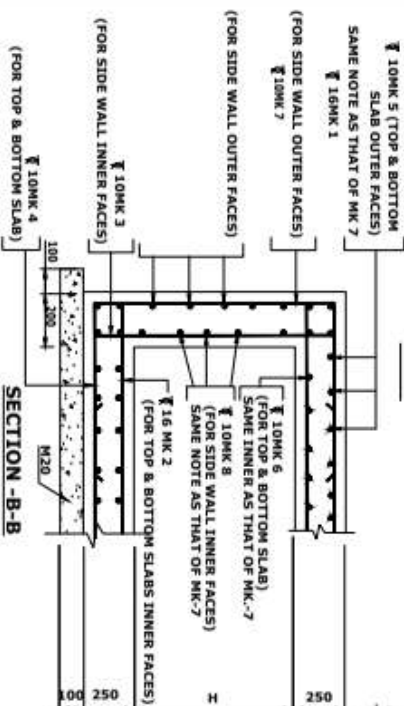
SECTION A-A



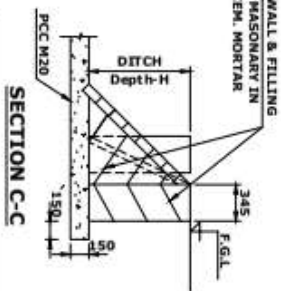
SECTION D-D



PLAN



SECTION B-B



SECTION C-C

NOTES:-
BARS OF VARYING DIMENSIONS FOR
DIFFERENT CULVERTS DEPENDING
UPON THE LENGTH OF CULVERT.

- NOTES:-
1. ALL DIMENSIONS ARE IN MM EXCEPT LEVELS WHICH ARE IN METRES.
 2. BOX CULVERT ARE DESIGNED FOR I.R.C CLASS 'A' & CLASS 'AA' LOADING.
 3. ALL REINFORCEMENT SHOWN THUS SHALL BE OF COLD TWISTED.
 4. BARS BENDING SHALL CONFORM TO IS:2502
 5. REINFORCEMENT CONCRETE SHALL BE M:25 CONFORMING TO IS : 456 LATEST
 6. ALL BRICK WORK SHALL BE IN 1:4 CEMENT MORTAR AS PER IS : 2212
 7. OVERLAP FOR BARS SHALL BE 500 AND SHALL BE STAGGERED.
 8. FOR AGGRESSIVE SOIL PCC M20 AND RCC M25 SHALL BE USED.

STANDARD DIMENSIONS OF BOX CULVERT WITH BILLS OF MATERIAL

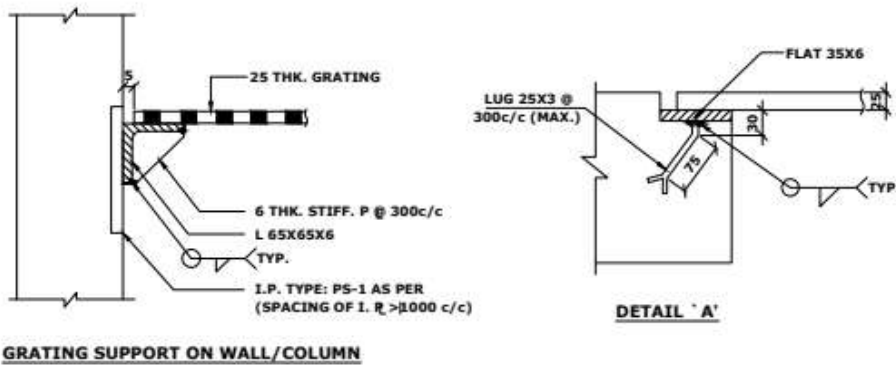
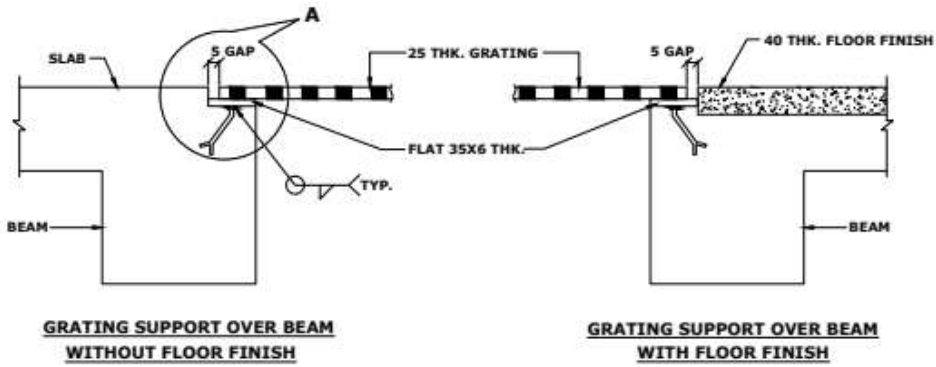
TYPE	WIDTH DEPTH (BXH)	PER METRE LENGTH OF CULVERT		WING WALL & PARAPET PER CULVERT	
		WEIGHT OF REINFORCEMENT	CONC. 1:5:10	CONC. BK.WALL IN 1:4 MORTAR	1/3 CEM PLASTER 1:4:8 AFTER 13mm THK.
I	1700X850	16.0, 1.17	0.21M ³	1.53M ³	2.44M ³
II	2000X1000	16.0, 1.67	0.27M ³	1.75M ³	2.77M ³
III	2200X1100	16.0, 1.297	0.291M ³	1.90M ³	3.0M ³
IV	2600X1300	16.0, 1.447	0.33M ³	2.20M ³	3.44M ³

REINFORCEMENT BENDING SCHEDULE

MARK	TYPE OF CULVERT	STEEL DIA & SPACING	A	MARK	B	CUT LENGTH
MK-1	I	016 150C/C	1250	725	2704	
	II	016 125C/C	1400	850	3004	
	III	016 100C/C	1500	930	3264	
	IV	016 100C/C	1700	1070	3744	
MK-2	I	016 150C/C	2100	2100	2100	
	II	016 125C/C	2400	2400	2400	
	III	016 100C/C	2600	2600	2600	
	IV	016 100C/C	3000	3000	3000	
MK-3	I	010 200C/C	1250	1250	1250	
	II	010 200C/C	1400	1400	1400	
	III	010 200C/C	1500	1500	1500	
	IV	010 200C/C	1700	1700	1700	
MK-4	I	010 200C/C	2100	2100	2100	
	II	010 200C/C	2400	2400	2400	
	III	010 200C/C	2600	2600	2600	
	IV	010 200C/C	3000	3000	3000	
MK-5	I	010 200C/C				
MK-6	II	010 100C/C				
MK-7	III	010 100C/C				
MK-8	IV	010 200C/C				

STANDARD FOR DETAIL
OF BOX CULVERT
TYPE-I, II, III & IV

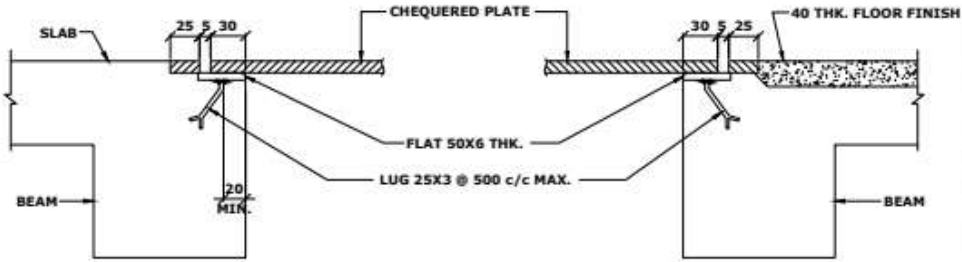
	STANDARD FOR DETAIL OF TYPICAL GRATING SPORT.	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 1		



NOTES:

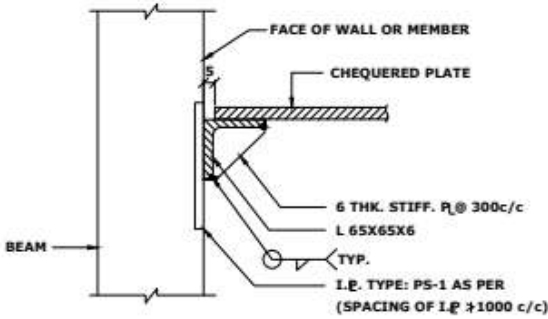
1. M.S. LUGS SHALL BE SUITABLY BENT IF CONCRETE THICKNESS IS LESS THAN THE LENGTH OF LUGS OR LUGS INTERFERE WITH R/F BARS.
2. ALL DIMENSIONS ARE IN mm.

	STANDARD FOR DETAIL TYPICAL CHEQUERED PLATE SUPPORT.	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 1		



**CHQD. R SUPPORT OVER BEAM
WITHOUT FLOOR FINISH**

**CHQD. P1 SUPPORT OVER BEAM
WITH FLOOR FINISH**



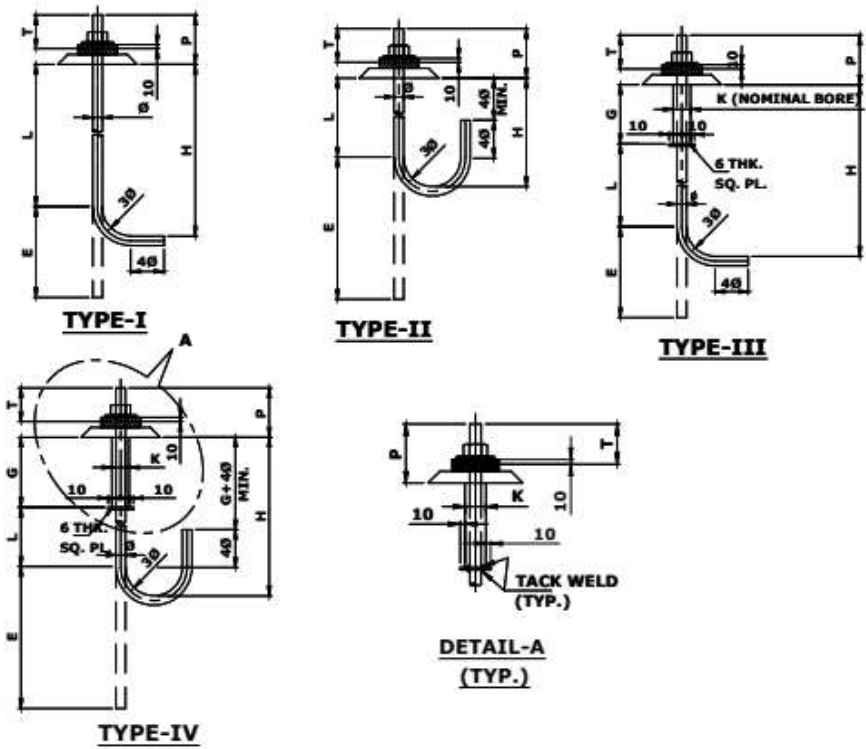
GRATING SUPPORT ON WALL/COLUMN

NOTES:

1. M.S. LUGS SHALL BE SUITABLY BENT IF CONCRETE THICKNESS IS LESS THAN THE LENGTH OF LUGS OR LUGS INTERFERE WITH R/F BARS.
2. ALL DIMENSIONS ARE IN mm.

	M.S. ANCHOR BOLT ASSEMBLIES	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 4		

GRADE OF CONC.	BOLT TYPE	DIMENSIONS MM	BOLT DIA (Ø) IN MM													
			10	12	16	18	20	22	24	27	30	33	36	39		
M25	I & III	L	200	250	400	400	450	550	550	650	700	800	850	950		
		E	95	115	155	170	190	210	230	255	285	315	345	370		
		H	230	286	448	454	510	616	622	731	790	899	958	1067		
		TYPE-I	230	286	448	454	510	616	622	731	790	899	958	1067		
		TYPE-III	380	436	598	604	610	916	922	1181	1240	1349	1408	1517		
	II & IV	L	150	150	250	250	300	350	350	450	500	550	600	650		
		E	150	180	240	270	300	330	360	405	450	495	540	585		
		H	180	186	298	304	360	416	422	531	590	649	708	767		
		TYPE-II	180	186	298	304	360	416	422	531	590	649	708	767		
		TYPE-IV	330	336	440	454	660	716	722	981	1040	1099	1158	1217		
M30	I & III	L	180	220	315	335	380	445	470	550	600	680	735	815		
		E	95	115	155	170	190	210	230	255	285	315	345	370		
		H	210	260	365	390	450	515	545	635	690	780	845	935		
		TYPE-I	210	260	365	390	450	515	545	635	690	780	845	935		
		TYPE-III	360	410	515	540	750	815	845	1085	1140	1230	1295	1385		
	II & IV	L	150	150	200	200	250	275	300	350	375	425	450	500		
		E	150	180	240	270	300	330	360	405	450	495	540	585		
		H	180	190	250	255	310	345	375	435	465	525	560	620		
		TYPE-II	180	190	250	255	310	345	375	435	465	525	560	620		
		TYPE-IV	330	340	400	405	610	645	675	885	915	975	1010	1070		

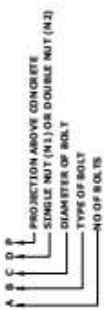


[illegible]

GRADE OF CONC.	BOLT TYPE	DIMENSIONS MM	BOLT DIA (Ø) IN MM																				
			10	12	16	18	20	22	24	27	30	33	36	39	42	45	48	52	56	60	64	68	72
M 25&M30	V & VI	E	50	60	70	75	80	90	95	105	110	120	130	140	150	155	165	180	190	200	215	225	240
	V & VI	K	50	50	50	50	50	60	60	60	60	80	80	100	100	100	100	100	125	135	150	150	150
	VII & VIII	THREADED (T)	40	45	55	60	60	65	70	75	80	90	95	100	105	110	120	125	135	140	150	160	165
	VII & VIII	LENGTH	50	60	70	75	80	90	95	105	110	120	130	140	150	155	165	180	190	200	215	225	240
	VII	Ø3					16	16	16	16	16	16	16	16	16	16	20	20	20	20	20	20	
	VIII	Ø3																					
	VII & VIII	G	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6
	IX	L	80	100	150	170	200																
	XI	L	18.5	220	310	335	385	435	465	535	590	660	720										
	M25																						
M30																							

NOTES :-

1. BOLTS SHALL BE MARKED ON THE DRAWING AS UNDER :



1. BOLTS SHALL BE TURNED FROM M.S. ROUNDS CONFORMING TO IS 2042.
2. NUTS AND WASHERS SHALL CONFORM TO IS-1363 AND IS 3138.
3. THREADED SHALL BE COARSE CONFORMING TO IS-1367 AND IS 4218.
4. ANCHOR BOLTS SHALL BE SET ACCURATELY AND HELD IN POSITION BY TEMPLATE BEFORE CONCRETING.
5. THE LENGTH OF SLEEVE SHALL BE AS PER DRAWING.
6. WITH BOLTS AND SLEEVE FOR BOLT TYPE III, IV, VII AND VIII.
7. SLEEVE SHALL BE M.S. TUBES (MEDIUM) AS PER IS-1239.
8. REFER DISCHG DRAWINGS FOR PROJECTION (P) OF BOLT ABOVE TOP OF CONCRETE.
9. ANCHOR BOLTS SHALL BE TEMPERED BEFORE MACHINING IF MADE BY FORGING. THE FORGING TEMPERATURE SHALL BE A MIN 900° C BUT LOWER THAN SUPER HEATING TEMPERA TURE.

FOUNDATION PLAN
(FOUNDATION LOAD LESS THAN 8 KN)

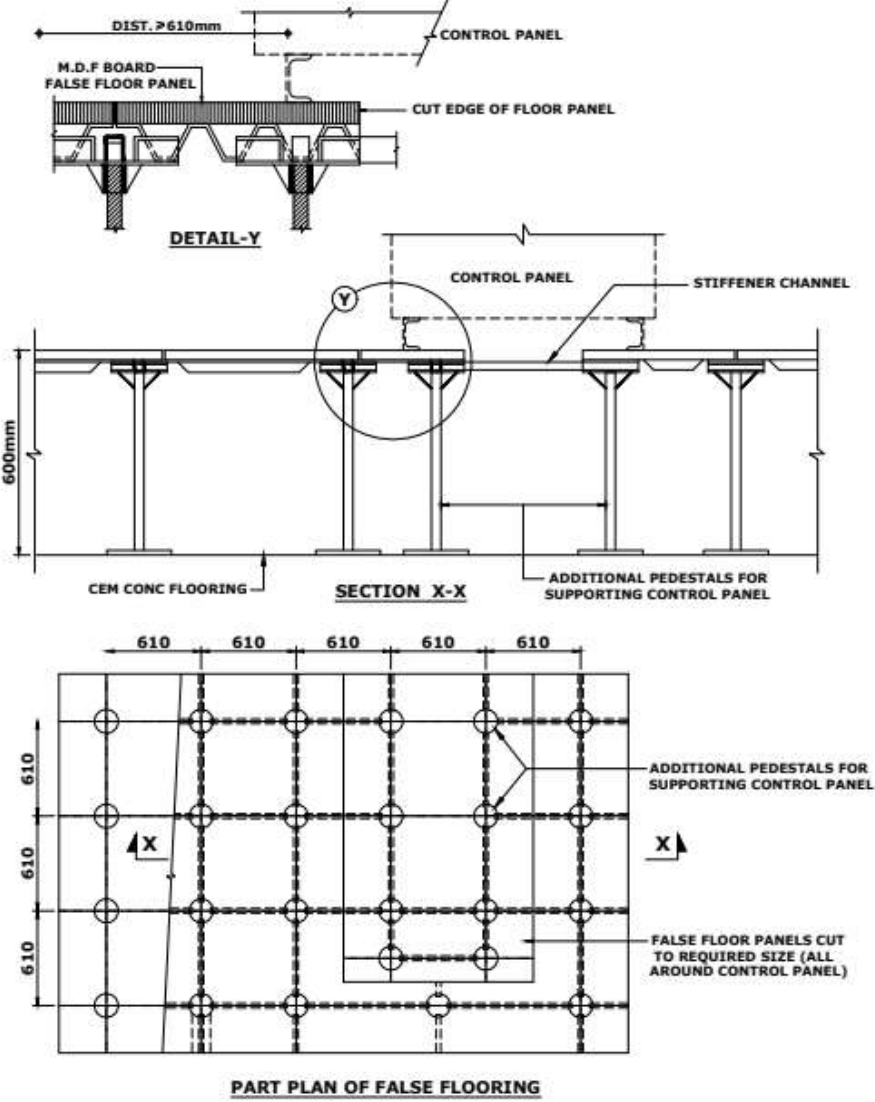
FOUNDATION PLAN
(FOUNDATION LOAD > 8 KN AND < 15 KN)

SECTION 1-1

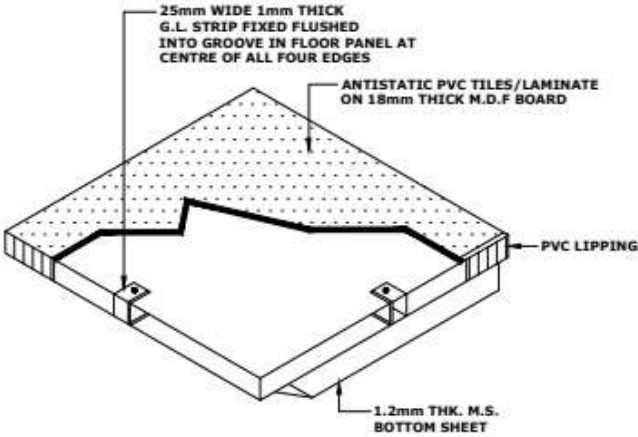
SECTION 2-2

PEDESTAL PLAN

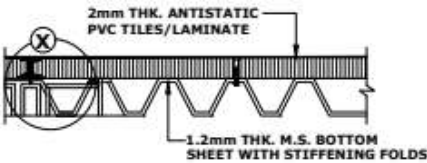
	STANDARD FOR DETAIL OF FALSE FLOORING	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 3		



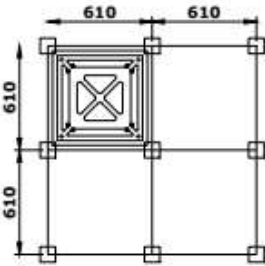
STANDARD FOR DETAIL OF FALSE FLOORING	STANDARD DRAWING NO.		REV.	SIZE
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	SHEET NO.	2 OF 3		



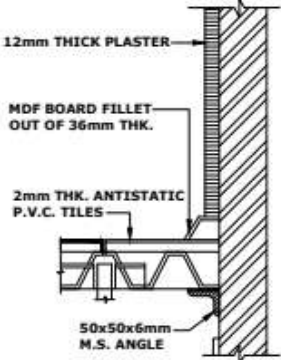
ISOMETRIC VIEW OF A PANEL



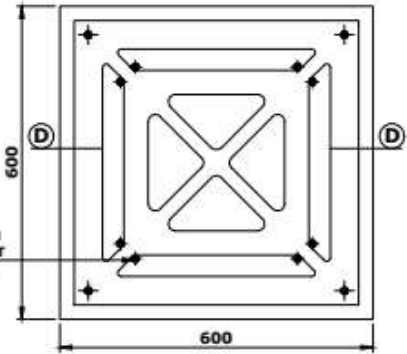
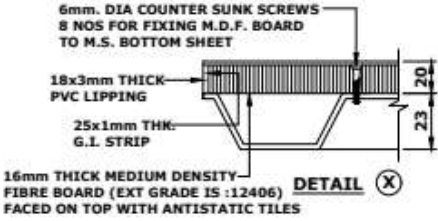
SECTION D-D



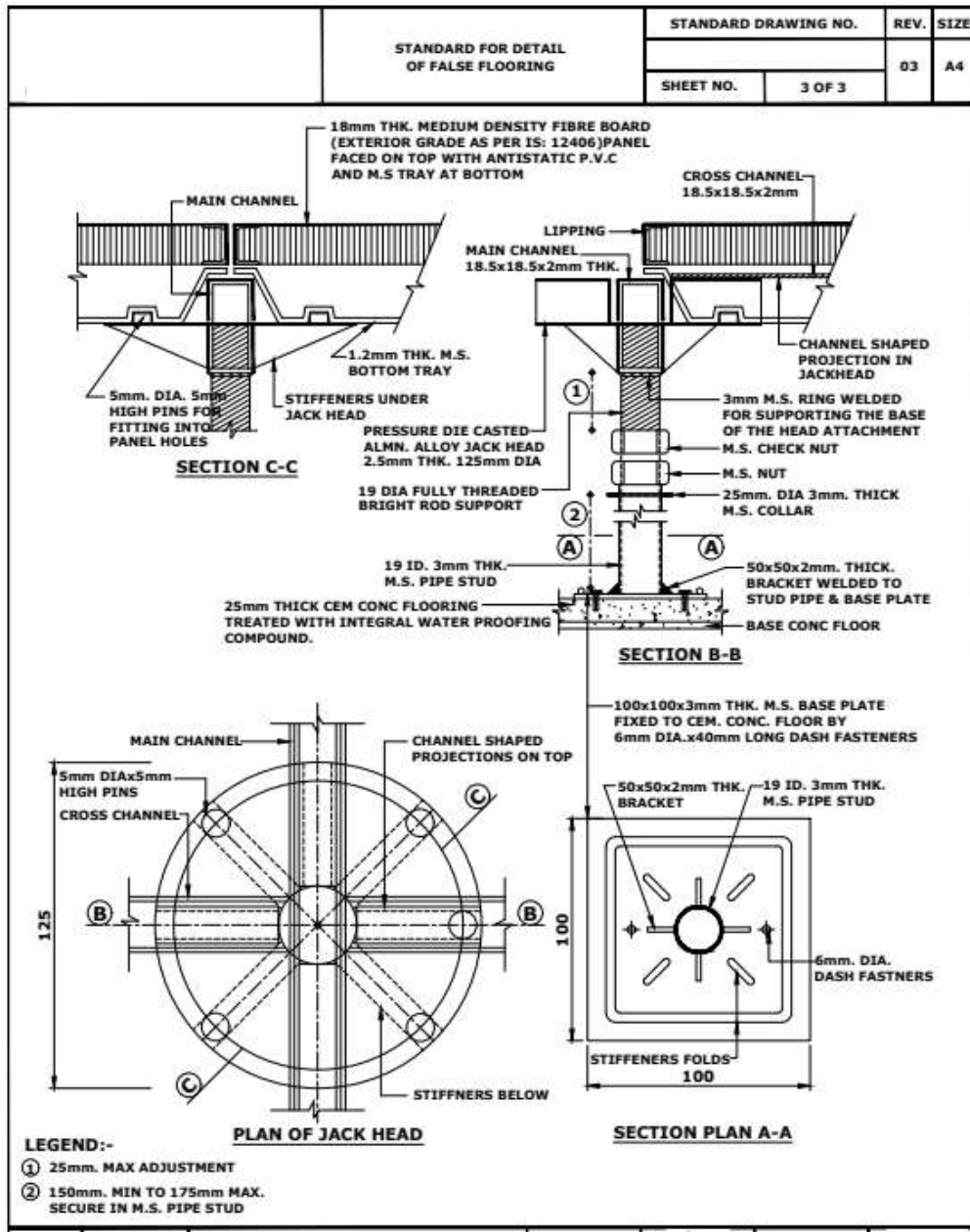
PART OF GRID PLAN



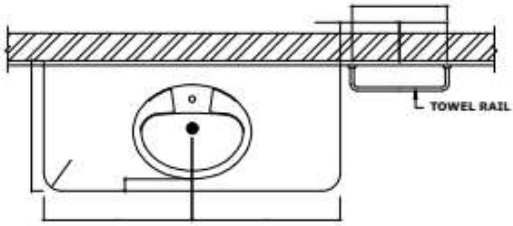
DET. OF JUNCTION WITH THE WALL



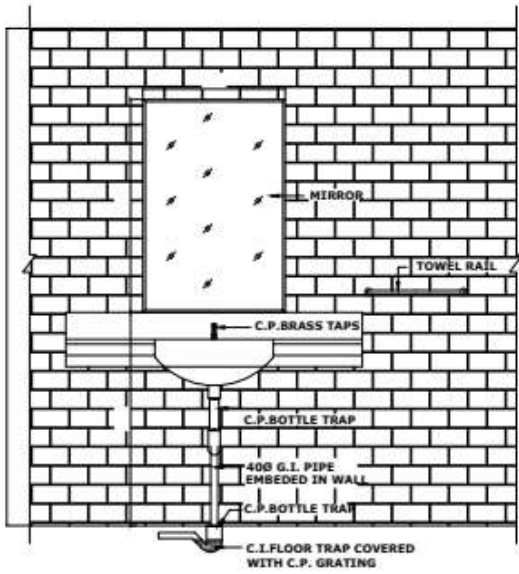
PLAN OF FLOOR PANEL



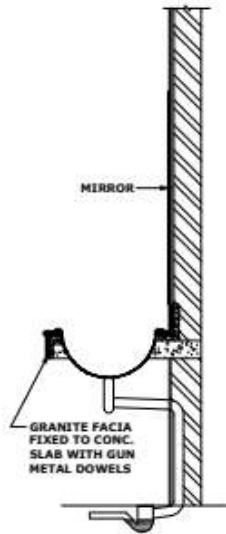
E	STANDARD FOR DETAIL OF WASH BASIN FIXING DETAIL	STANDARD DRAWING NO.		REV.	SIZE
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		SHEET NO.	1 OF 1		



PLAN

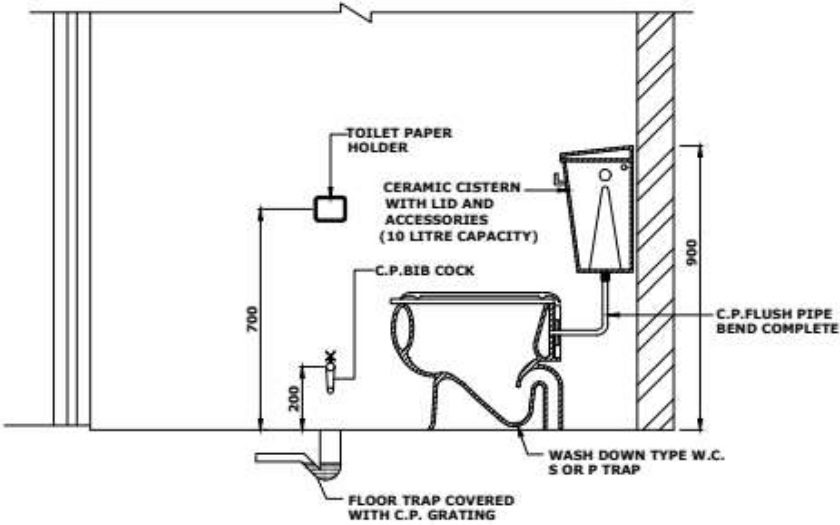
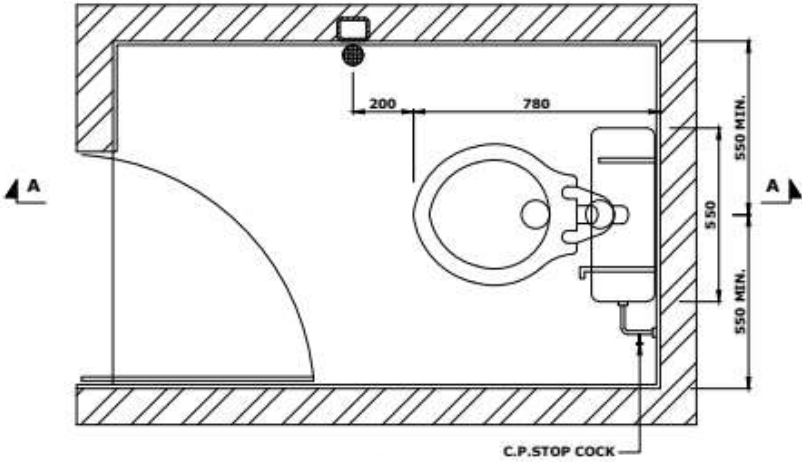


ELEVATION

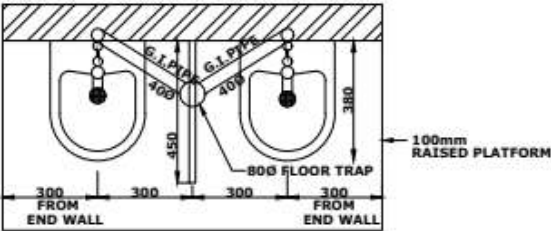


SECTION

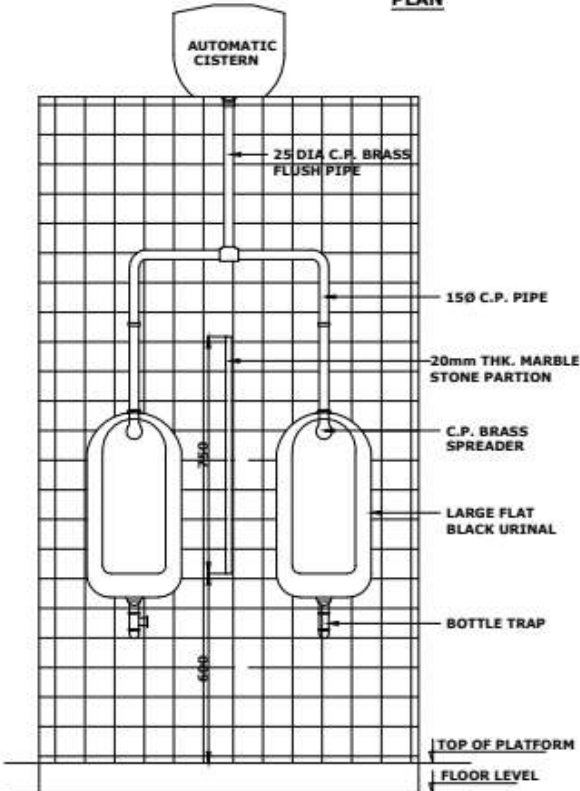
E	STANDARD FOR DETAIL OF EUROPEAN TYPE W.C. FIXING DETAIL	STANDARD DRAWING NO.		REV.	SIZE
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		SHEET NO.	1 OF 1		



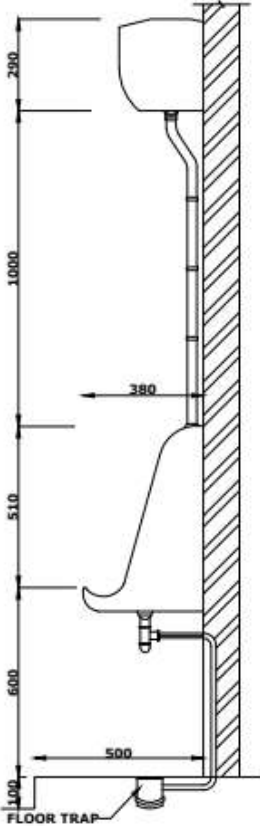
STANDARD FOR DETAIL OF URINAL FIXING DETAIL	STANDARD DRAWING NO.		REV.	SIZE
	1		03	A4
	SHEET NO.	1 OF 1		



PLAN

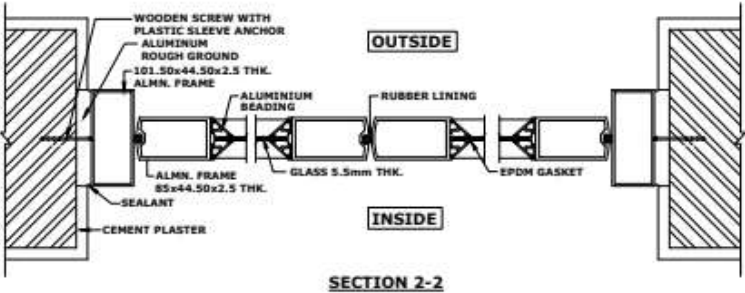
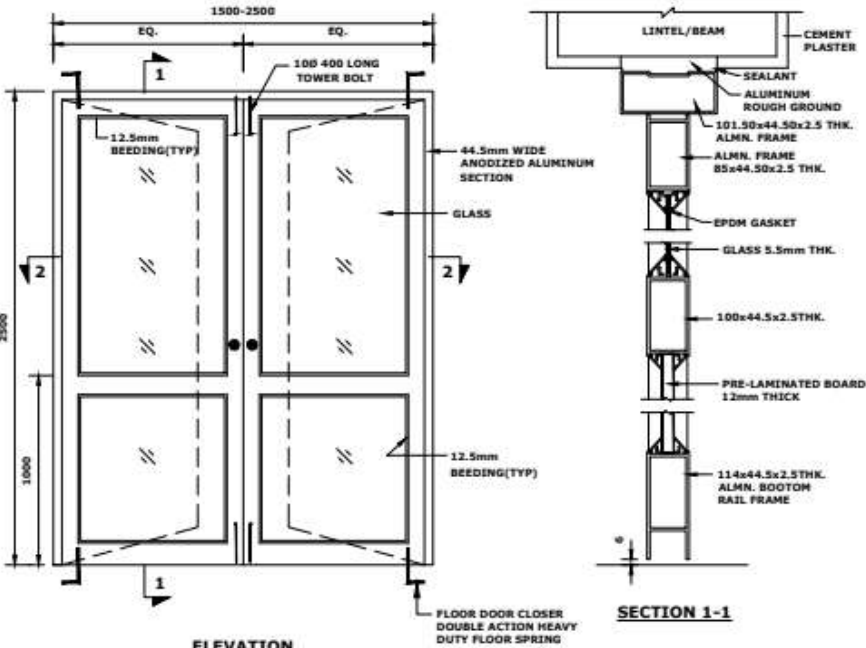


ELEVATION

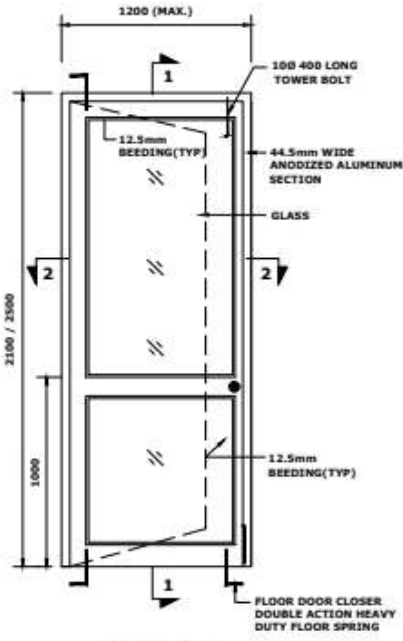


SIDE ELEVATION

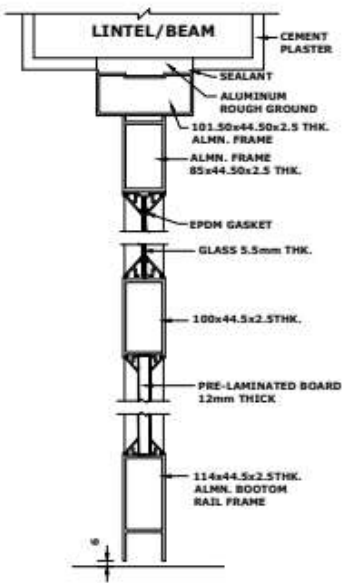
STANDARD FOR DETAIL OF GLAZED ALUMINUM DOOR	STANDARD DRAWING NO.		REV.	SIZE
	SHEET NO.		03	A4
	1 OF 2			



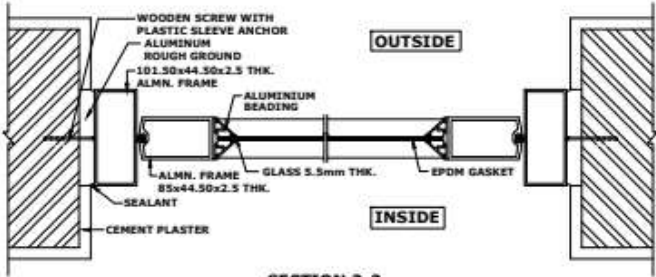
STANDARD FOR DETAIL OF GLAZED ALUMINUM DOOR	STANDARD DRAWING NO.		REV.	SIZE
			03	A4
	SHEET NO.	2 OF 2		



ELEVATION

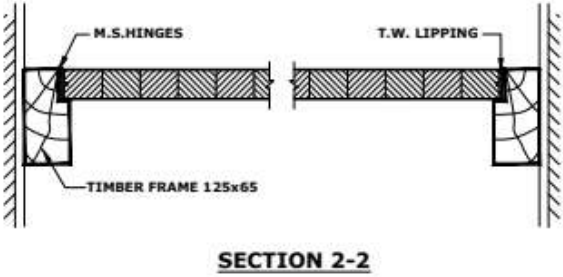
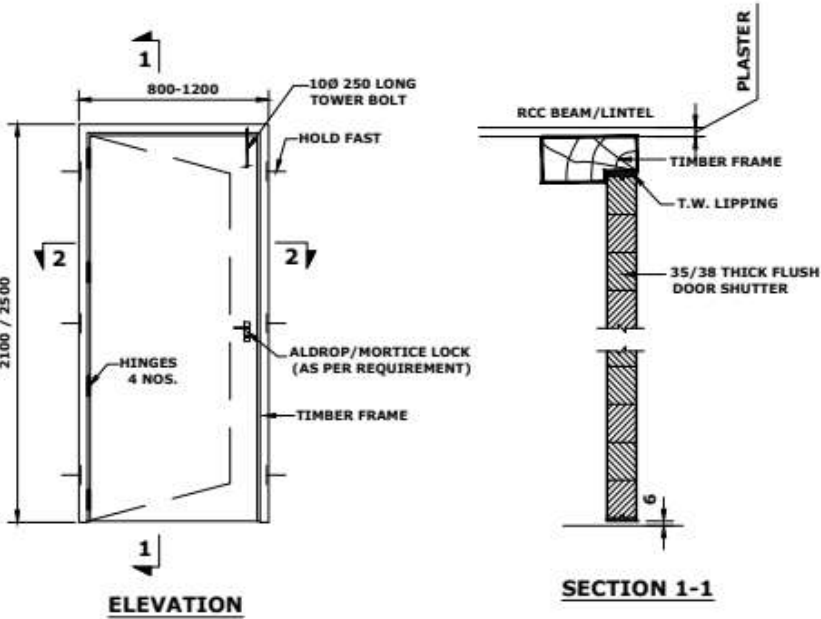


SECTION 1-1

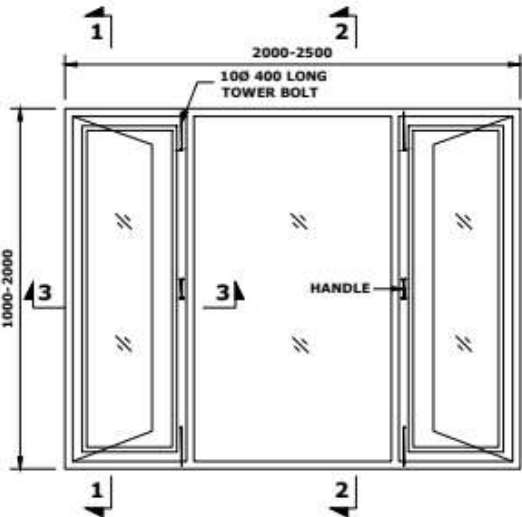


SECTION 2-2

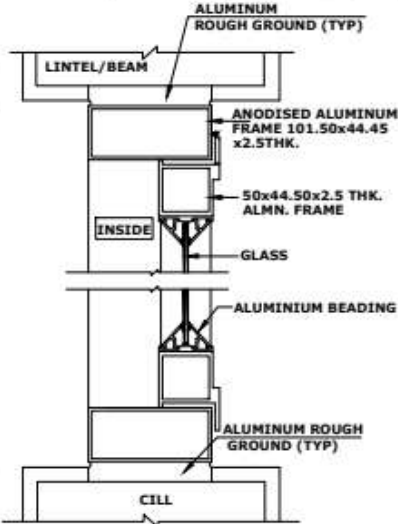
	STANDARD FOR DETAIL OF WOODEN FLUSH DOOR	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 1		



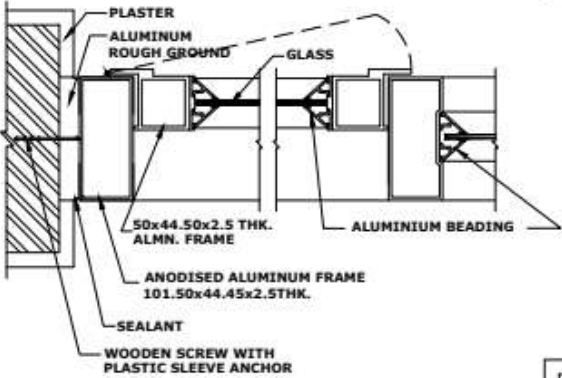
STANDARD FOR DETAIL OF GLAZED ALUMINUM WINDOW	STANDARD DRAWING NO.		REV.	SIZE
			03	A4
	SHEET NO.	1 OF 1		



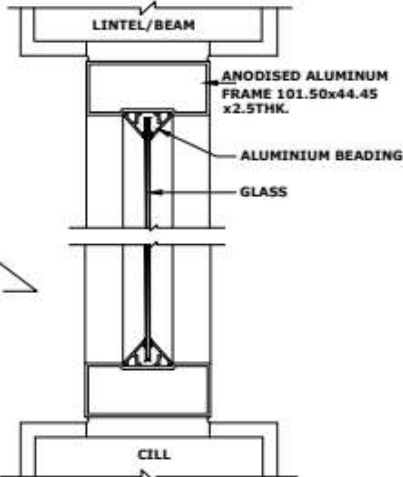
ELEVATION



SECTION 1-1

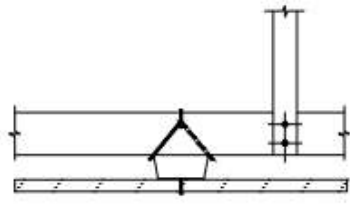
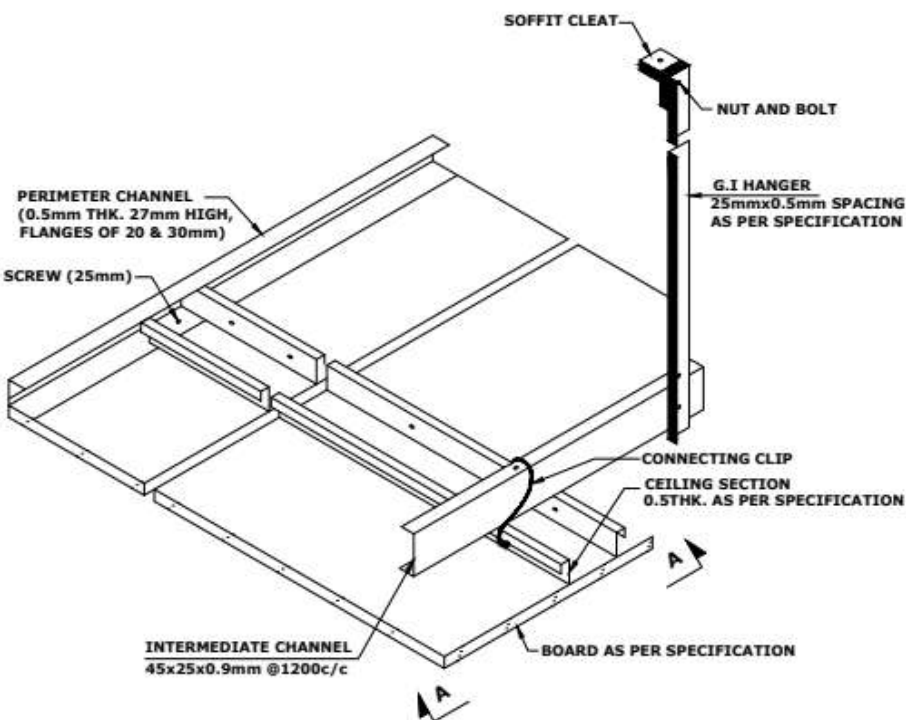


SECTION 3-3

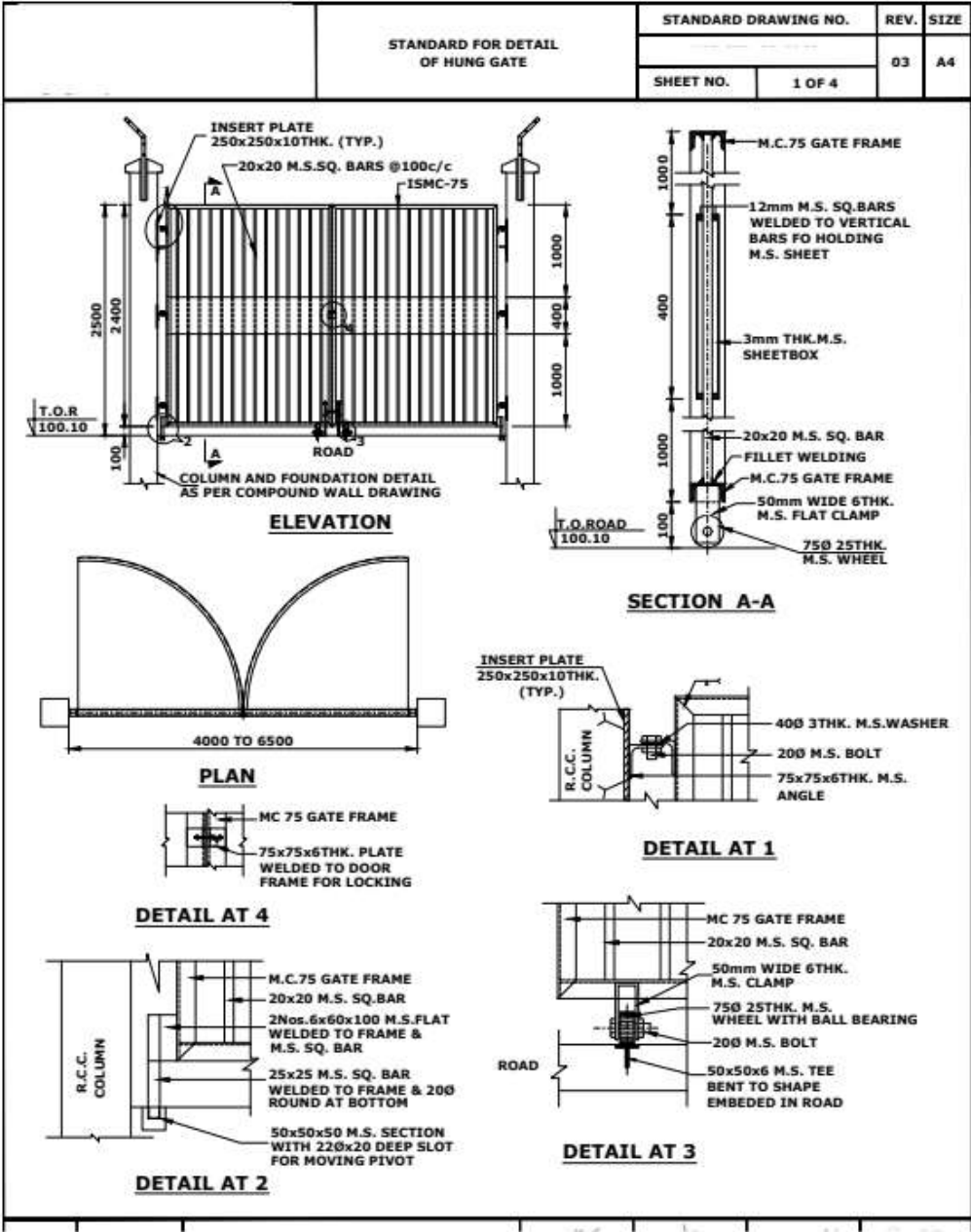


SECTION 2-2

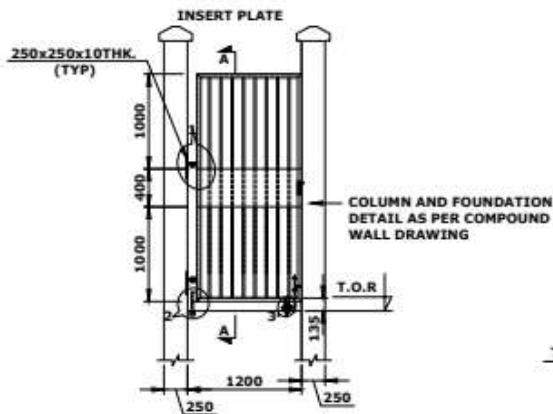
E	STANDARD FOR DETAIL OF FALSE CEILING	STANDARD DRAWING NO.		REV.	SIZE
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		SHEET NO.	1 OF 1		



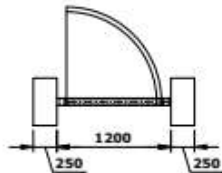
VIEW A-A



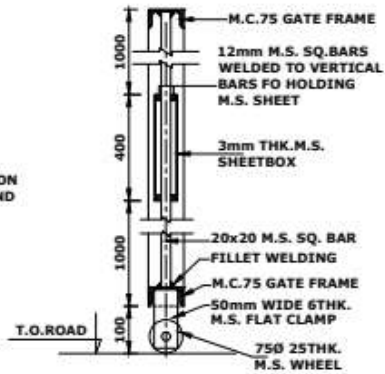
STANDARD FOR DETAIL OF HUNG GATE	STANDARD DRAWING NO.		REV.	SIZE
			03	A4
	SHEET NO.	2 OF 4		



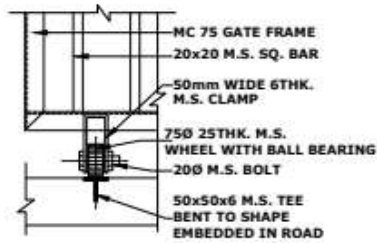
ELEVATION



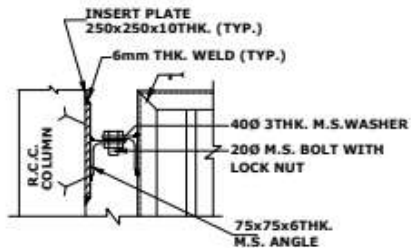
PLAN



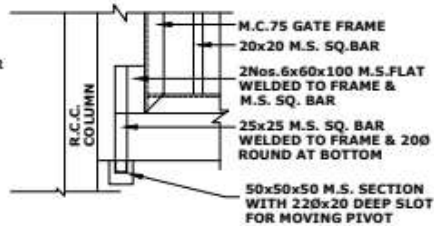
SECTION A-A



DETAIL AT 3

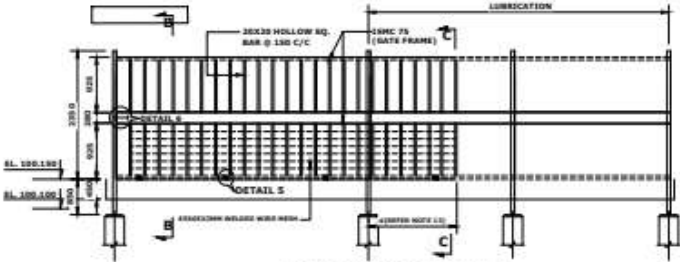


DETAIL AT 1

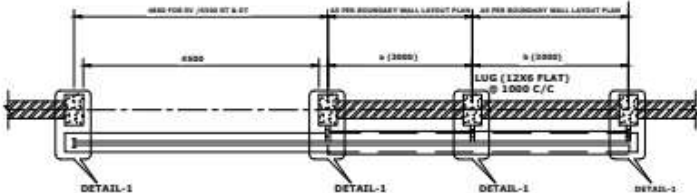


DETAIL AT 2

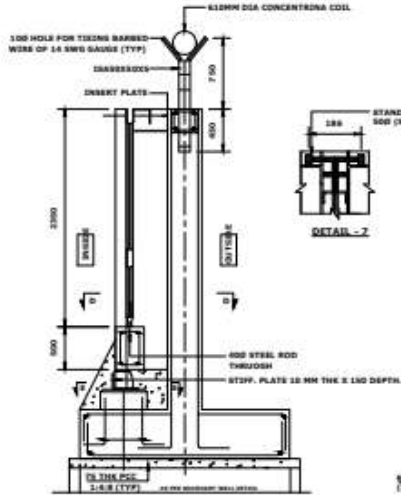
STANDARD FOR DETAIL OF HUNG GATE	STANDARD DRAWING NO.		REV.	SIZE
	-----		03	A4
	SHEET NO.	3 OF 4		



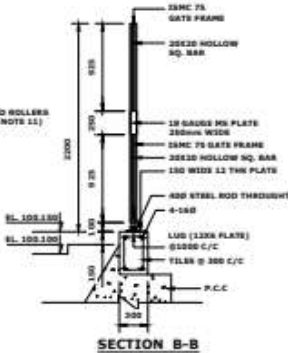
ELEVATION OF SLIDING GATE



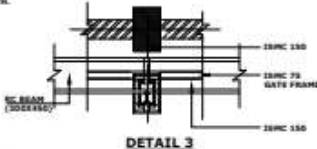
PLAN OF SLIDING GATE



SECTION A-A



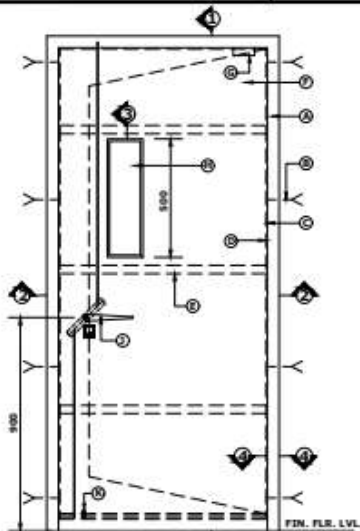
SECTION B-B



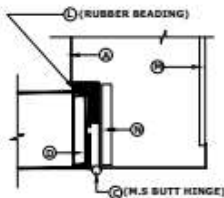
DETAIL 3

CONTINUED ON SHEET 4

	STANDARD FOR DETAIL OF STEEL DOOR (PRESSED STEEL) SINGLE SHUTTER	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 2		



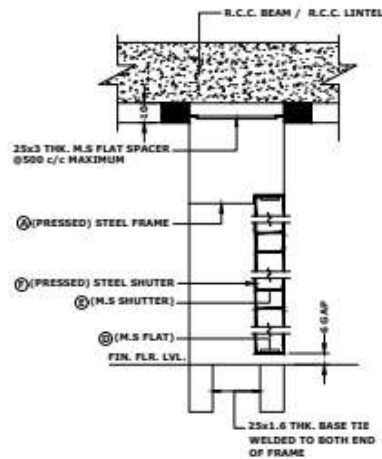
ELEVATION



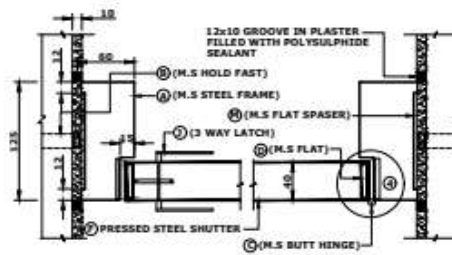
SECTION 4-4

LEGEND:-

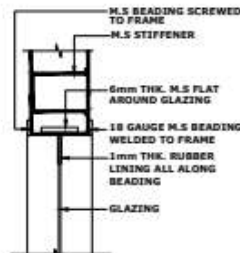
- ① 18 GAUGE PRESSED STEEL FRAME FINISHED WITH SYNTHETIC ENAMEL PAINT / ELECTROSTATIC. POWER COATING OVER RED-OXIDE ZINC CHROMATE PRIMER AS PER TENDER ITEMS
- ② M.S. HOLDFAST 300x25x6 THK. @MAXIMUM 600 C/C WELDED TO FRAME SPACER (M.)
- ③ 150 LONG M.S. BUTT HINGE @MAXIMUM 600C/C SCREWED TO FRAME AND SHUTTER.
- ④ 6 THK. M.S. FLAT CONTINUOUS ALONG PERIMETER OF SHUTTER.
- ⑤ 35 WIDE 16 GAUGE M.S. HORIZONTAL STIFFENER @500 C/C MAXIMUM.
- ⑥ 22 GAUGE PRESSED STEEL SHUTTER (OVERALL 40 THK.)
- ⑦ OVER HEAD HYDRAULIC DOOR CLOSER (HEAVY DUTY)
- ⑧ VISION PANEL AS PER SPECIFICATION (OPTIONAL)
- ⑨ 3 WAY SPRING LOADED LATCH AND LOCKING SYSTEM.
- ⑩ SPRING LOADED PRESSURE DIE CAST ZINC ALLOY DOOR STOPPER.
- ⑪ NEOPRENE RUBBER BEADING FIXED WITH NEOPRENE RUBBER ADHESIVE (DUNLOP S-75B OR EQUIVALENT ALONG FRAME REBATE.
- ⑫ 50x5 THK. M.S. FLAT SPACER WELDED TO FRAME AT HOLD FAST LOCATION.
- ⑬ 40x150x5 THK. M.S. PAD WELDED TO FRAME AT ALL HINGE & LOCK LOCATION.



SECTION 1-1

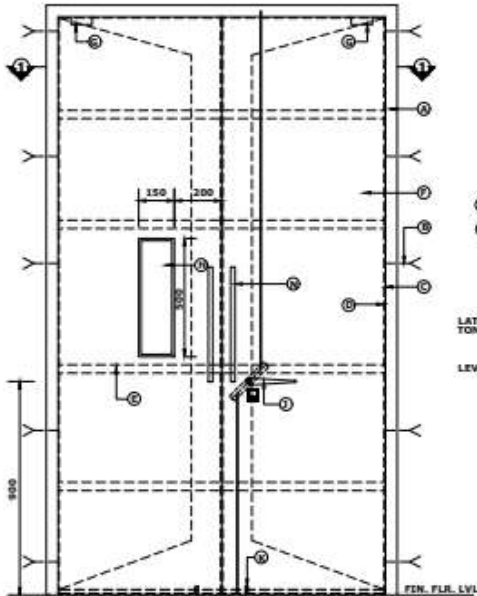


SECTIONAL PLAN 2-2

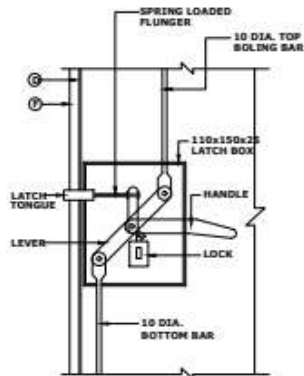


SECTION 3-3

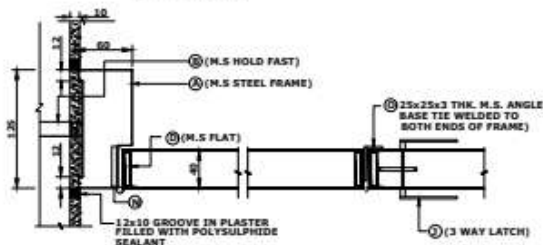
STANDARD FOR DETAIL OF STEEL DOOR (PRESSED STEEL) SINGLE SHUTTER	STANDARD DRAWING NO.		REV.	SIZE
			03	A4
	SHEET NO.	2 OF 2		



ELEVATION



DETAIL OF 3 - WAY LATCH

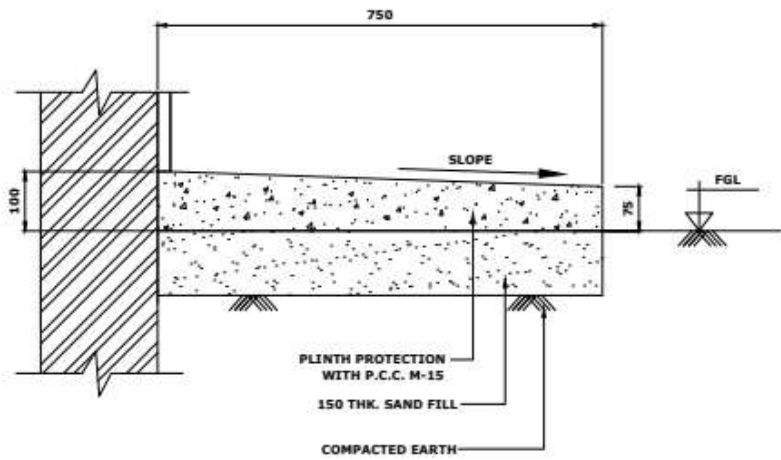


SECTIONAL PLAN 1-1

LEGEND:-

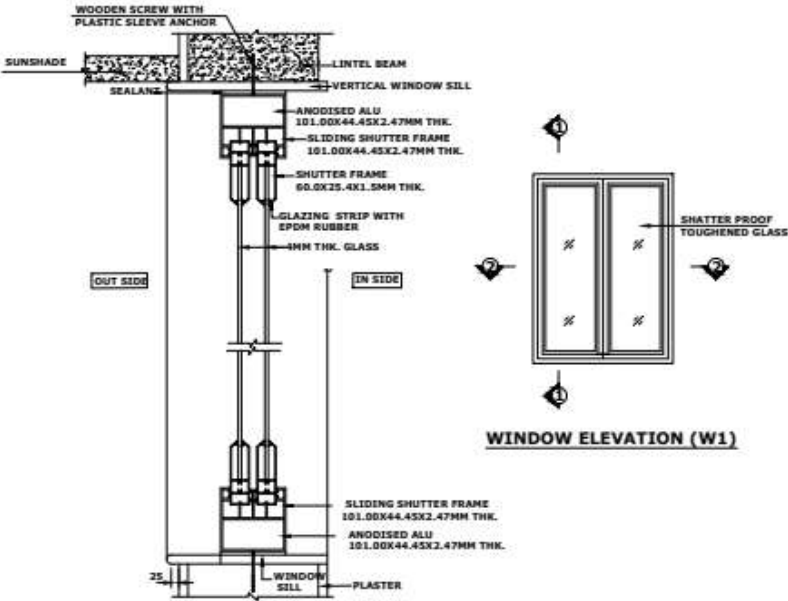
- | | |
|---|---|
| <p>① 18 GAUGE PRESSED STEEL FRAME FINISHED WITH SYNTHETIC ENAMEL PAINT / ELECTROSTATIC. POWER COATING OVER RED-OXIDE ZINC CHROMATE PRIMER AS PER TENDER ITEMS</p> <p>② M.S. HOLDFAST 300x25x5 THK. @MAXIMUM 600 C/C WELDED TO FRAME SPACER (M.S.)</p> <p>③ 150 LONG M.S. BUTT HINGE @MAXIMUM 600 C/C SCREWED TO FRAME AND SHUTTER.</p> <p>④ 6 THK. M.S. FLAT CONTINUOUS ALONG PERIMETER OF SHUTTER.</p> <p>⑤ 35 WIDE 16 GAUGE M.S. HORIZONTAL STIFFNER @500 C/C MAXIMUM.</p> <p>⑥ 22 GAUGE PRESSED STEEL SHUTTER (OVERALL 40 THK.)</p> <p>⑦ OVER HEAD HYDRAULIC DOOR CLOSER SHEAVY DUTY</p> <p>⑧ VISION PANEL AS PER SPECIFICATION (OPTIONAL)</p> | <p>⑨ 3 WAY SPRING LOADED LATCH AND LOCKING SYSTEM.</p> <p>⑩ SPRING LOADED PRESSURE DIE CAST ZINC ALLOY DOOR STOPPER.</p> <p>⑪ NEOPRENE RUBBER BEADING FIXED WITH NEOPRENE RUBBER ADHESIVE (DUNLOP S-758 OR EQUIVALENT ALONG FRAME REBATE.</p> <p>⑫ 50x5 THK. M.S. FLAT SPACER WELDED TO FRAME AT HOLD FAST LOCATION.</p> <p>⑬ PRESSURE DIE CAST ZINC ALLOY DOOR HANDLE 12 DIA. 300mm LONG.</p> <p>⑭ 25x45x3 THK. M.S. ANGLE (VERTICAL) WELDED TO ONE SHUTTER FOR BEADING AT MEETING POINT.</p> <p>⑮ 40x150x5 THK. M.S. PAD PLATE WELDED AT ALL HINGES AND LOCK LOCATIONS.</p> |
|---|---|

	STANDARD FOR DETAIL OF TYPICAL PLINTH PROTECTION DETAIL	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 1		

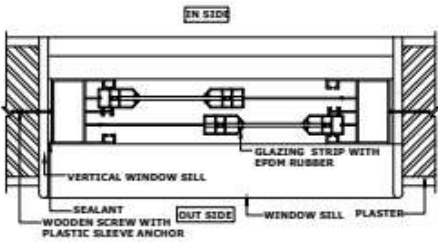


TYP. PLINTH PROTECTION DETAIL

STANDARD FOR DETAIL OF ALUMINIUM SLIDING WINDOW	STANDARD DRAWING NO.		REV.	SIZE
			03	A4
	SHEET NO.	1 OF 1		

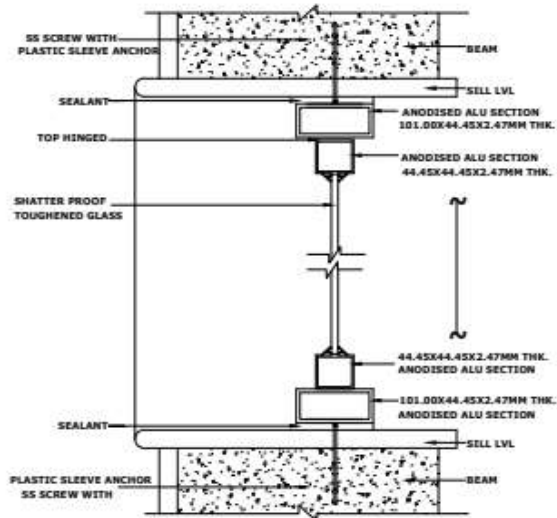


SECTION 1-1

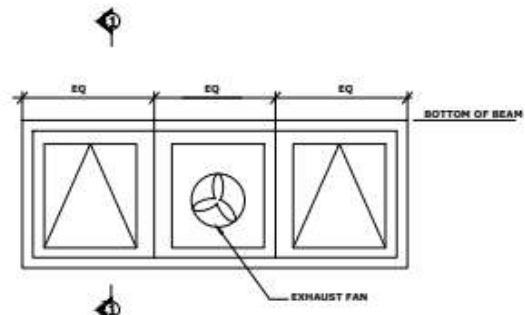


SECTION 2-2
DOUBLE PANEL ALUMINIUM WINDOW

	STANDARD FOR DETAIL OF ALUMINUM VENTILATOR	STANDARD DRAWING NO.		REV.	SIZE
				03	A4
		SHEET NO.	1 OF 1		



SECTION 1-1



VENTILATOR ELEVATION



- STANDARD FOR DETAIL
OF BARBED WIRE FENCING
(WITH ANGLE IRON POST)

STANDARD DRAWINGS

GENERAL NOTES-LIGHTING	STANDARD DRAWING NO.		REV.	SIZE
			02	A4
	SHEET NO.	1 OF 1		

GENERAL NOTES:

1. ENTIRE ELECTRICAL INSTALLATION SHALL BE CARRIED OUT STRICTLY IN ACCORDANCE WITH THE ELECTRICALLY RULES, OISD REGULATION ISI CODES, FIRE INSURANCE AND OTHER APPLICABLE CODES AND REGULATIONS.

2. EXCEPT AS SPECIFICALLY APPROVED BY THE CLIENT/CONSULTANT AT SITE INSTALLATION OF LIGHTING FITTING SHALL BE TAKEN ONLY AFTER ALL MAJOR SERVICE SUCH AS EQUIPMENT ERECTION, PIPING ETC. IN THAT PARTICULAR AREA HAVE BEEN COMPLETED.

3. ALL CABLES FROM LIGHTING PANEL TO LIGHTING FITTING SHALL BE IDENTIFIED WITH STAINLESS STEEL STRIP TAGS GIVING CIRCUIT REFERENCE NUMBER.

4. WIRING TO LIGHTING FITTING INSIDE PLANT AREA SHALL BE CARRIED OUT BY NEANS OF 3c x 2.5 SQ. MM YWY CABLES. FOR EARTHING OF LIGHTING FITTING AND JUNCTION BOX THIRD CORE SHALL BE USED.

5. GENERALLY IN PLANT AREA, THE LIGHTING FITTING SHALL BE DIRECTLY CONTROLLED FROM NINIATURE CIRCUIT BREAKERS PROVIDED IN THE LIGHTING DISTRIBUTION BOARD. HOWEVER, LOCAL CONTROL SWITCHES SHALL BE PROVIDED WHEREVER NECESSARY. i.e. FOR CONTROLLING LIGHTING FITTINGS IN TOILET BLOCK/OFFICE/STORE ROOM/SUB-STATION/CABLE CELLAR ENTRANCE ETC.

6. EXCEPT AS NOTED, MOUNTING HEIGHT OF BOTTOM LINE OF VARIOUS EQUIPMENT FROM FINISHED FLOOR LEVEL SHALL BE AS FOLLOWS:

A) SUB-LIGHTING DISTRIBUTION BOARD : 1200mm

B) LIGHTING CONTROL SWITCHES : 1200mm

C) RECEPTACLE WITH SWITCH : 800mm

7. EXCEPT AS SPECIFIED, CABLES FOR STREET LIGHTING SHALL BE DIRECTLY BURIED IN GROUND OR ROUTED IN CABLE TRENCH/DUCTS AS THE CASE MAY BE.

8. LIGHTING CABLES SHALL BE TAKEN THROUGH HIME PIPE BURIED IN GROUND AT SUITABLE DEPTH AT ALL ROAD CROSSING.

9. SINGLE PHASE SWITCHED SOCKET OUTLETS INCLUDING 10A & ABOVE SHALL BE FED AND CONTROLLED FROM PANEL (PP).

10. LIGHTING WIRING IN CONDUIT SHALL BE CARRIED OUT BY USING 19/25mm DIA. HEAVY GAUGE STEEL RIGID CONDUIT AND COPPER CONDUCTOR PVC FLEXIBLE WIRE SHALL BE USED :

A) LIGHTING FITTING & 6/16 AMPS. COMMERCIAL TYPE SWITCHED : 2.5 SQ.MM

B) 16/32A METAL CLAD INDUSTRIAL SWITCH SOCKET OUTLETS : 4.0 SQ.MM

C) FOLLOWING COLOUR WIRE SHALL BE USED :

1. FOR 'R' PHASE : RED COLOUR COPPER CONDUCTOR PVC FLEXIBLE WIRE

2. FOR 'Y' PHASE : YELLOW COLOUR COPPER CONDUCTOR PVC FLEXIBLE WIRE

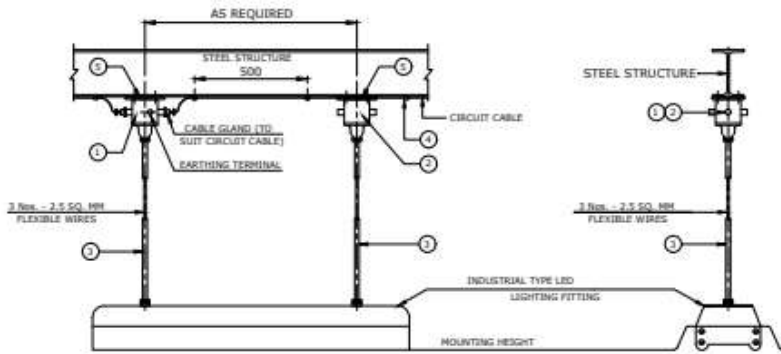
3. FOR 'B' PHASE : BLUE COLOUR COPPER CONDUCTOR PVC FLEXIBLE WIRE

4. FOR 'N' PHASE : BLACK COLOUR COPPER CONDUCTOR PVC FLEXIBLE WIRE

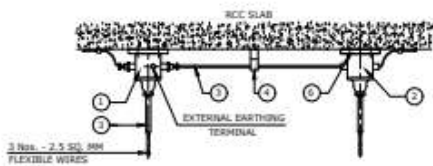
5. FOR EARTH : GREEN COLOUR 1.5 SQ. MM COPPER CONDUCTOR PVC FLEXIBLE WIRE

12. ALL SITE FABRICATED STEEL ASSEMBLIES SHALL BE PAINTED WITH TWO COATS OF ANTI-CORROSIVE PAINT AND TWO COATS OF EPOXY PAINTS.

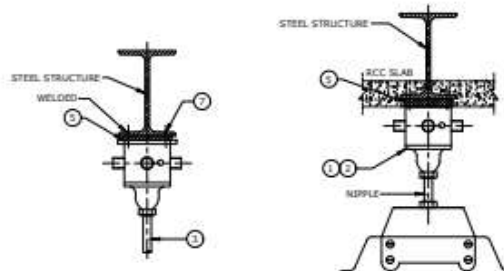
13. ALL HARDWARE SHALL BE OF STAINLESS STEEL.



TYPICAL MOUNTING ARRANGEMENT OF LED
LIGHTING FITTING ON STRUCTURE STEEL & WIRING
WITH PVC INSULATED CABLE MOUNTING TYPE : SM1

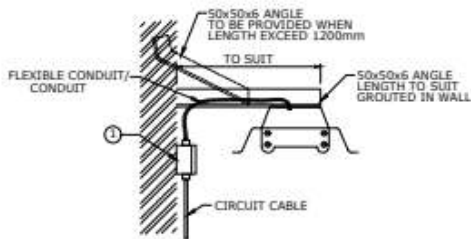


TYPICAL MOUNTING ARRANGEMENT OF LED
LIGHTING FITTING ON R.C.C. SLAB & CONDUIT WIRING



TYPICAL MOUNTING DETAILS OF
J.B. ON STRUCTURAL STEEL

MOUNTING TYPE : CM1



BRACKET MOUNTING ON
WALL/COLUMN MTG. TYPE : BM1

MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	JUNCTION BOX WITH CONE COVER, BALL & SOCKET WITH TERMINAL BLOCK.	1 NO.	
2	CURRY JUNCTION BOX WITH CONE COVER, BALL & SOCKET WITHOUT TERMINAL BLOCK.	1 NO.	
3	19mm Ø HEAVY GAUGE CONDUIT WITH BOTH END CHECK NUTS LENGTH TO SUIT MOUNTING HEIGHT (MAXIMUM LENGTH 3 Mtrs.)	2 NOS.	
4	G.L. SADDLE/CLEAT ALONG WITH SUITABLE SIZE OF FIXING SCREW TO SUIT FOR CONDUIT CABLE/CONDUIT.	AS REQUIRED	
5	25 x 6 THK. M.S. PLAT 200mm LONG FOR JUNCTION BOX MOUNTING ON STEEL STRUCTURE.	2 NOS.	
6	COUNTER SUNK SCREW WITH RAWAL PLUG FOR RCC SLAB OR SELF TAPPING COUNTER SUNK SCREW FOR STEEL STRUCTURE.	4 NOS.	
7	SELF TAPPING SCREW WITH WASHER FOR FIXING OF JUNCTION BOX ON 25 x 6mm MS PLAT.	AS REQUIRED	

TYPICAL SUSPENSION MOUNTING DETAILS
OF INDUSTRIAL LED LIGHTING FITTING
WITH SUSPENSION MORE THAN 2 Mtrs.

STANDARD DRAWING NO.

REV.

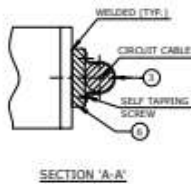
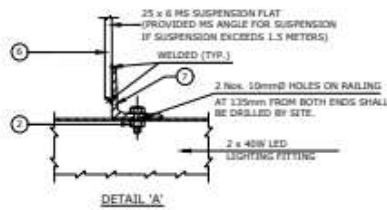
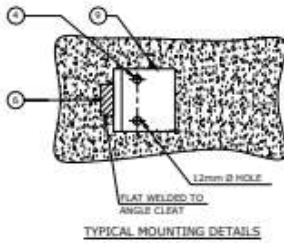
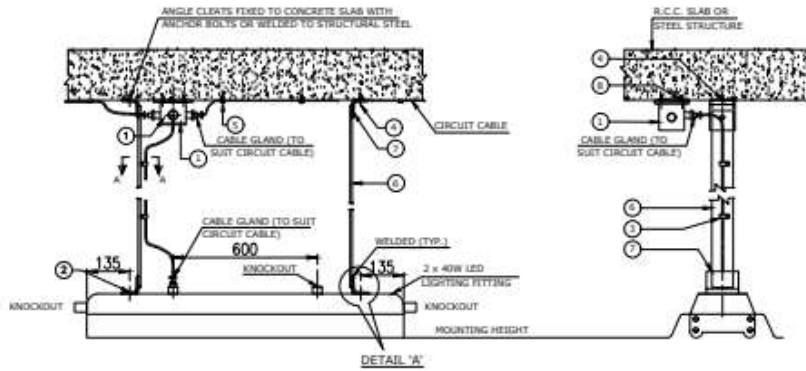
SIZE

02

A4

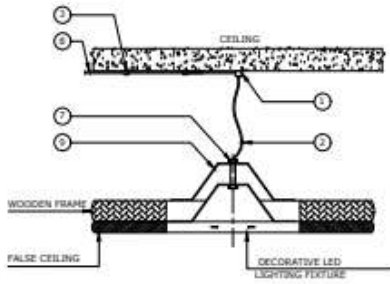
SHEET NO.

1 OF 1

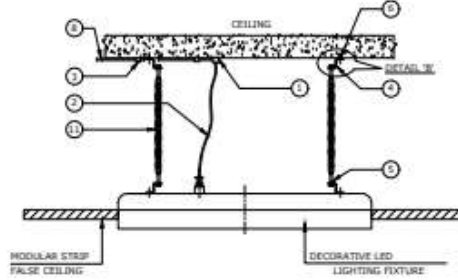


MATERIAL TAKE-OFF

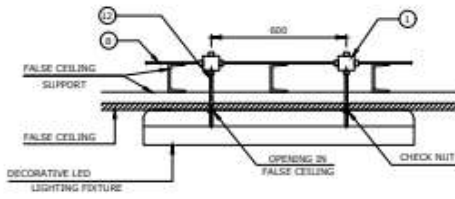
ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	AWAY- 100mm DIA ROUND JUNCTION BOX WITH TERMINAL BLOCK	1 NO.	
2	M8-60mm LONG BOLT WITH NUT AND PLAIN WASHER	2 NOS.	
3	G.I. SADDLE/CLEAT ALONG WITH SUITABLE SIZE OF FIXING SCREW & NUT TO SUIT FOR CIRCUIT CABLE	AS REQUIRED	
4	M10-60mm LONG ANCHOR STUD WITH BOLT & PLAIN WASHER	4 NOS.	
5	SADDLE/CLEAT WITH FIXING SCREW OR M8-60mm LONG STUD, NUTS & LOCK WASHERS FOR CIRCUIT CABLE	AS REQUIRED	
6	25 x 6mm THK. M.S. FLAT (LENGTH TO SUIT)	2 NOS.	
7	ISA 50 x 50 x 6 THK.-75mm LONG ANGLE CLEAT WITH 10 Ø HOLES	4 NOS.	
8	10mm Ø 35 LONG COUNTER SUNK SCREWS WITH RAWAL PLUG	2 NOS.	
9	ISA 50 x 50 x 6 THK.-150mm LONG ANGLE CLEAT WITH 2 NOS. 12 Ø HOLES	2 NOS.	



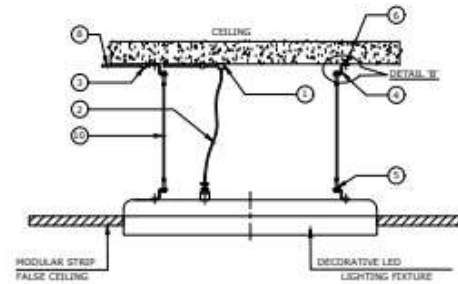
RECESSED MOUNTING FIXTURE
SUPPORTED ON WOODEN FRAME
TYPE : RM1



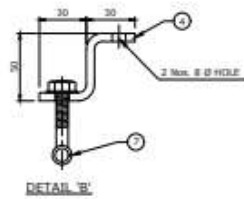
RECESSED MOUNTING FIXTURE
SUPPORTED ON CHAIN
TYPE : RM1



FIXTURE MOUNTED BELOW
FALSE CEILING
TYPE : RM2

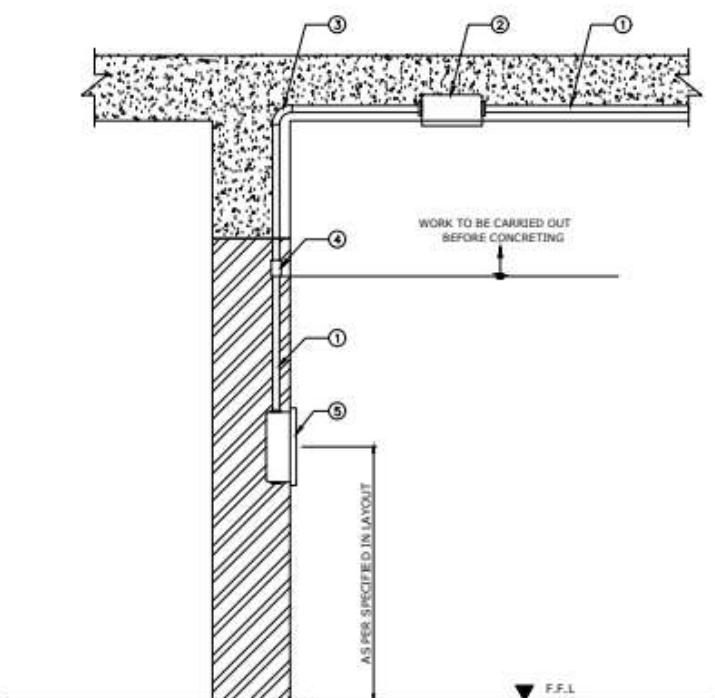


RECESSED MOUNTING FIXTURE
SUPPORTED WITH G.I. WIRE
TYPE : RM1



MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	JUNCTION BOX WITH DOME COVER	1 NO.	
2	19 mm DIA PVC FLEXIBLE PIPE WITH 2 Nos. PVC STRAIGHT ADAPTOR	AS REQUIRED	
3	G.I./PVC SADDLE CLEAT WITH SUITABLE SCREWS	AS REQUIRED	
4	32 x 6mm THK. 110 mm LONG M.S. FLAT BEND 'Z' SHAPE	4 NOS.	
5	M6-30mm LONG G.I. EYE BOLT & NUT WITH WASHER	4 NOS.	
6	M6-35mm LONG ANCHOR STUD WITH NUT AND WASHER	2 NOS.	
7	M6-30mm LONG BOLT WITH SWING NUT AND 2 Nos. PLAIN WASHER	2 NOS.	
8	19mm DIA CONDUIT (AS SPECIFIED)	AS REQUIRED	
9	BRACKET MADE OUT OF 25 x 3mm THK. M.S. PLAT	2 NOS.	
10	10 SWG. G.I. WIRE (LENGTH TO SUIT)	2 NOS.	
11	SUPPORTING CHAIN (LENGTH TO SUIT)	2 NOS.	
12	19mm Ø CONDUIT WITH THREAD AT BOTH END AND NUT	2 NOS.	



TYPICAL INSTALLATION DETAIL OF CONDUIT ENTRY
FROM R.C.C SLAB INTO THE BRICK WALL

MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	PVC/G.I. CONDUIT SIZE AS REQUIRED	AS REQUIRED	
2	WIRE PULL BOX WITH FLAT COVER	AS REQUIRED	
3	PVC/G.I. 90° BEND SIZE AS REQUIRED	AS REQUIRED	
4	PVC/G.I. COUPLING SIZE AS REQUIRED	AS REQUIRED	
5	SWITCH BOARD, SOCKET OUTLET ETC.	AS REQUIRED	

TYPICAL CEILING MOUNTING DETAILS OF
INDUSTRIAL TYPE FIBERGLASS REINFORCED
LED LIGHTING FITTING

STANDARD DRAWING NO.

REV.

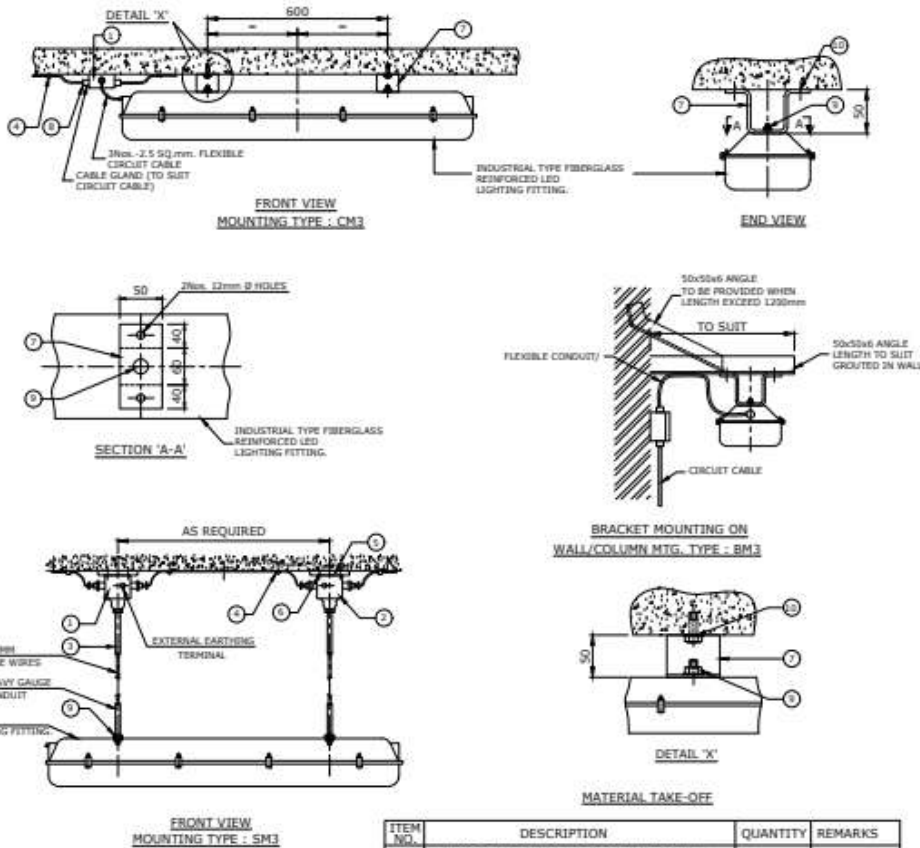
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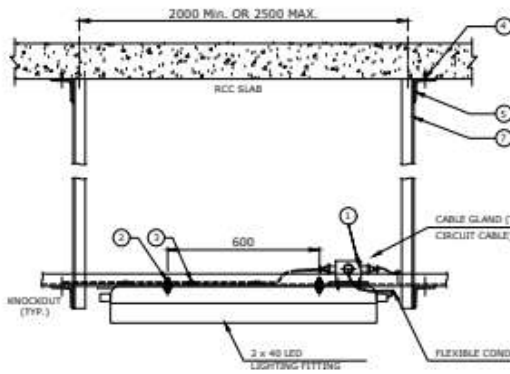
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SHEET NO.

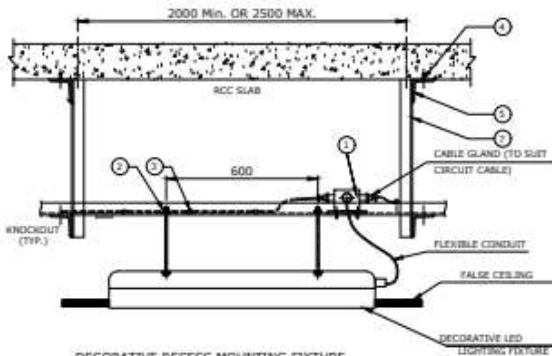
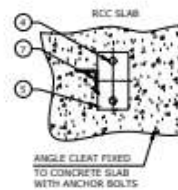
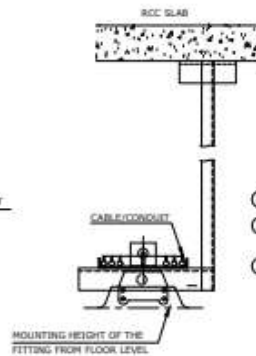
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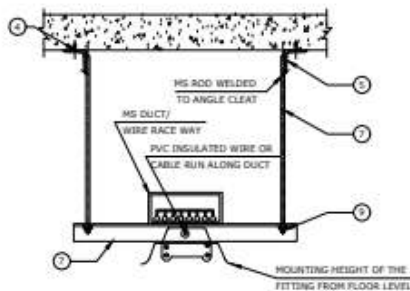
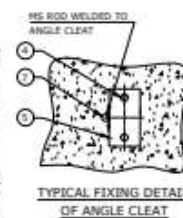
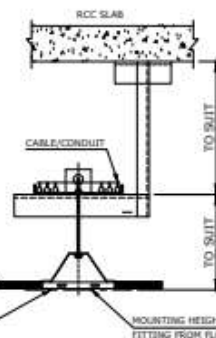
ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	4WAY-125mm DIA ROUND JUNCTION BOX WITH TERMINAL BLOCK.	1 NOS.	
2	DUMMY JUNCTION BOX WITH DOME COVER, BALL & SOCKET WITHOUT TERMINAL BLOCK.	1 NOS.	
3	19mm Ø HEAVY GAUGE CONDUIT WITH BOTH END CHECK NUTS LENGTH TO SUIT MOUNTING HEIGHT (MAXIMUM LENGTH 3 Mtrs.)	2 NOS.	
4	G.I. SADDLE/CLAMP ALONG WITH SUITABLE SIZE OF FIXING SCREW TO SUIT FOR CIRCUIT CABLE/CONDUIT.	AS REQUIRED	
5	25 x 6 THK. M.S. FLAT 200mm LONG FOR JUNCTION BOX MOUNTING ON SLAB/STEEL STRUCTURE.	2 NOS.	
6	COUNTER SUNK SCREW WITH RAIAL PLUG FOR RCC SLAB OR SELF TAPPING COUNTER SUNK SCREW FOR STEEL STRUCTURE.	4 NOS.	
7	240 x 50 x 6 THK. M.S. BRACKET FOR MOUNTING OF LIGHTING FITTING	2 NOS.	
8	M10-40mm LONG SCREW WITH RAIAL PLUG FOR MOUNTING OF M.S. BRACKET TO CEILING	4 NOS.	
9	M6-40mm LONG BOLT WITH NUT & WASHER	2 NOS.	
10	M10-60mm ANCHOR BOLT FOR MOUNTING OF JUNCTION BOX TO CEILING	2 NOS.	
11	M8-25mm G.I. BOLT WITH 2 Nos. PLAIN AND 1 No. SPRING WASHER TO ANGLE	2 NOS.	



INDUSTRIAL SUSPENSION MOUNTING FIXTURE
MOUNTING TYPE : SM4



DECORATIVE RECESS MOUNTING FIXTURE
MOUNTING TYPE : RM4



MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	8WAY-100mm DIA ROUND JUNCTION BOX WITH TERMINAL BLOCK.	1 NO.	
2	15mm DIA CHECK NUT	4 NOS.	
3	G.I. SADDLE ALONG WITH SUITABLE SIZE OF FIXING SCREW & NUT TO SUIT FOR CIRCUIT CABLE/CONDUIT.	AS REQUIRED	
4	M10x80mm LONG ANCHOR STUD WITH BOLT & PLAIN WASHER	AS REQUIRED	
5	ISA 50x6mm THK. 100mm LONG ANGLE CLEAT.	AS REQUIRED	
6	150mm OR 300mm WIDE PERFORATED CABLE TRAY OR DUCT/ WIRE RACE WAY CHANNEL.	AS REQUIRED	
7	ISA 25 x 25 x 6mm THK. ANGLE WELDED TO ANGLE OR 30mm DIA MS ROD WITH THREAD AT BOTTOM END	AS REQUIRED	
8	15mm DIA G.I. PIPE/CONDUIT	AS REQUIRED	
9	NUT SUITABLE FOR M8 BOLT WITH PLAIN WASHER	AS REQUIRED	

NOTES:

1. ALL FABRICATED STEEL STRUCTURE SHALL BE PAINTED WITH TWO COATS OF ANTI CORROSIVE PAINT AND TWO COATS OF EPOXY PAINT OF APPROVED SHED.
2. ALL HARDWARE SHALL BE STAINLESS STEEL.

TYPICAL HANDRAIL PIPE MOUNTING DETAILS
OF LED HPMV/HPSV LIGHTING
FITTING ON PLATFORM

STANDARD DRAWING NO.

REV.

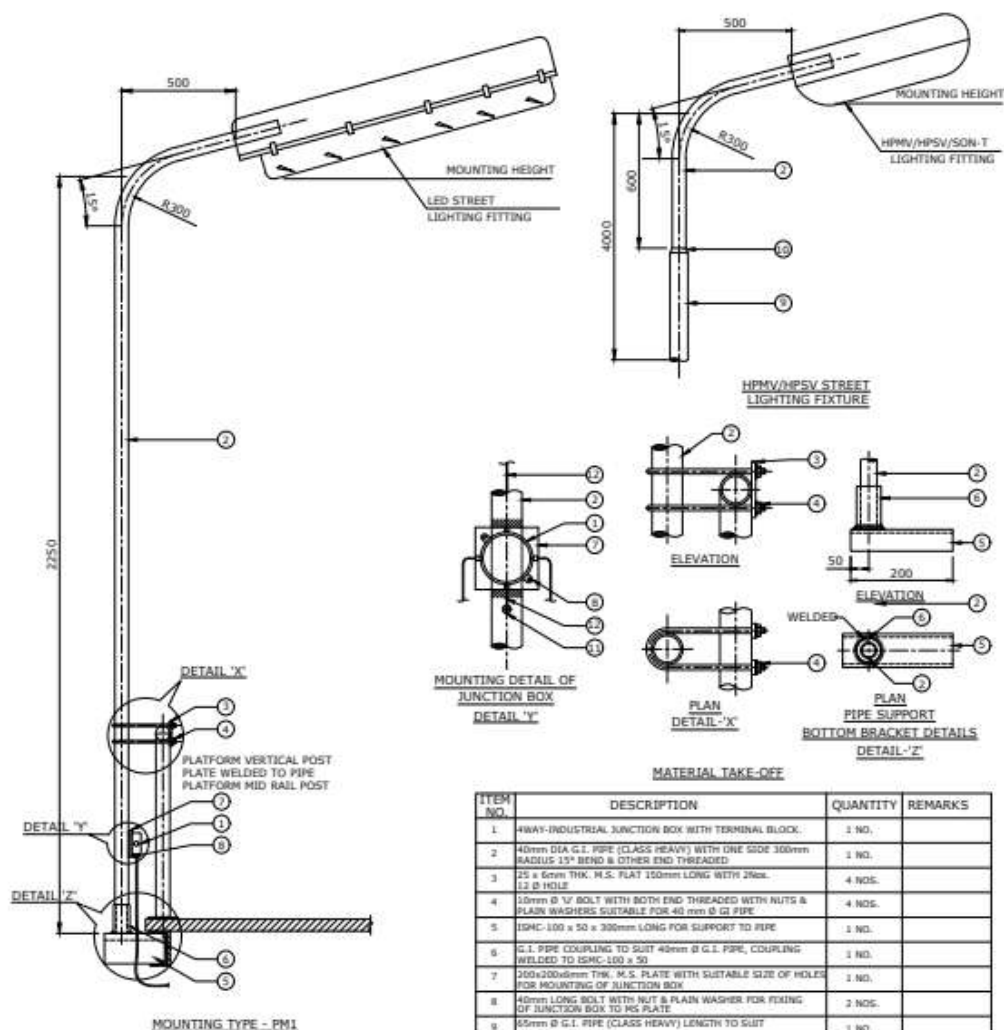
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A4

SHEET NO.

1 OF 1



NOTES:

1. MOUNTING HEIGHT SHALL NOT EXCEED 4 MTRS. FROM THE TOP OF PLATFORM.
2. LIGHT FITTING SHALL BE WITH ONE EXTERNAL EARTH CONNECTION AND USE THIRD CORE OR PVC FLEXIBLE CABLE FOR INTERNAL EARTHING. EARTH JUNCTION BOX WITH TWO EXTERNAL EARTH CONDUCTORS.
3. CABLE GLANDS USED FOR TERMINATION OF FLEXIBLE CABLE SHALL BE DOUBLE SEAL WITH CONE GRIP TYPE.
4. PLUG ALL UNUSED ENTRIES OF LIGHTING FITTING AND JUNCTION BOX WITH THREADED STOPPING PLUGS.
5. WHEN MOUNTING HEIGHT IS MORE THEN 2.25M THEN 65 Ø G.I. PIPE WITH REDUCER SHALL BE USED.

TYPICAL MOUNTING DETAILS
OF LED LIGHTING FITTING
(WALL/COLUMN MOUNTED)

STANDARD DRAWING NO.

REV.

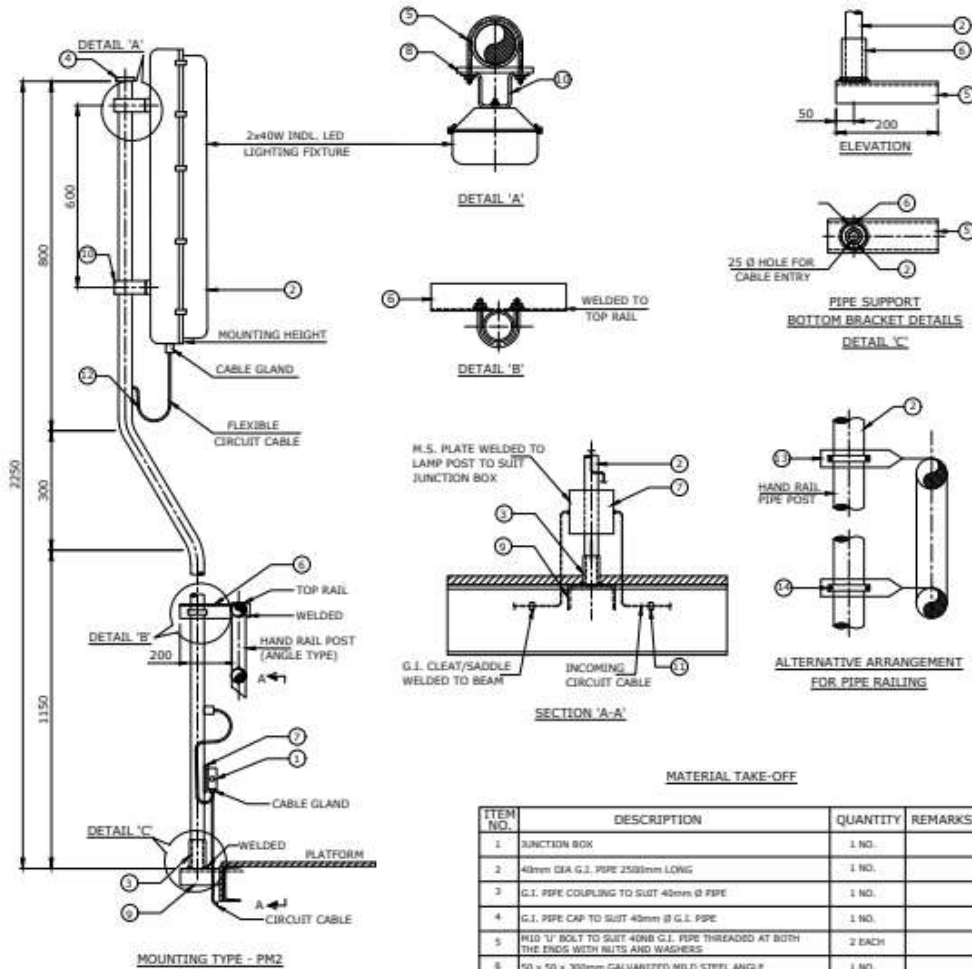
SIZE

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A4

SHEET NO.

1 OF 1



MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	JUNCTION BOX	1 NO.	
2	40mm DIA G.I. PIPE 2500mm LONG	1 NO.	
3	G.I. PIPE COUPLING TO SUIT 40mm Ø PIPE	1 NO.	
4	G.I. PIPE CAP TO SUIT 40mm Ø G.I. PIPE	1 NO.	
5	M10 1/2" BOLT TO SUIT 40mm G.I. PIPE THREADED AT BOTH THE ENDS WITH NUTS AND WASHERS	2 EACH	
6	50 x 50 x 300mm GALVANIZED MILD STEEL ANGLE	1 NO.	
7	100 Sq. x 6mm THK. M.S. PLATE	1 EACH	
8	50 x 6mm M.S. PLAT - 100mm LONG	1 NO.	
9	ISMC-100 x 50 x 6mm THK. -300mm LONG	AS REQUIRED	
10	BRACKET TO BE MADE OUT OF 25 x 6mm M.S. PLAT	2 NOS.	
11	G.I. CLEAT, SADDLE WITH SUITABLE SIZE SCREW	AS REQUIRED	
12	BURDER GROMMET	2 NOS.	
13	75 x 10mm THK. G.I. PLAT - 300mm LONG	2 NOS.	
14	G.I. SADDLE/CLEAT TO SUIT 40mm Ø G.I. PIPE WITH G.I. SCREWS AND WASHERS	AS REQUIRED	

NOTES:

1. ALL NUTS, BOLTS & WASHERS SHALL BE GALVANIZED OR ZINC PASSIVATED.
2. ALL SHARP EDGES AND BLURS SHALL BE REMOVED.
3. SITE FABRICATION STEEL SHALL BE PAINTED IN ACCORDANCE WITH THE CONTRACT SPECIFICATION.
4. ALL SURFACES TO GALVANNEAD FINISHED SHALL BE CLEANED AND APPLIED WITH 2 COATS OF ANTI-CORROSION PAINT AND ZINC RICH PAINT.
5. WHERE POSSIBLE LOCATE LAMP POST ADJACENT TO HANDRAIL POST.

TYPICAL MOUNTING DETAILS
OF STREET LIGHTING FITTING
(WALL/COLUMN MOUNTED)

STANDARD DRAWING NO.

REV.

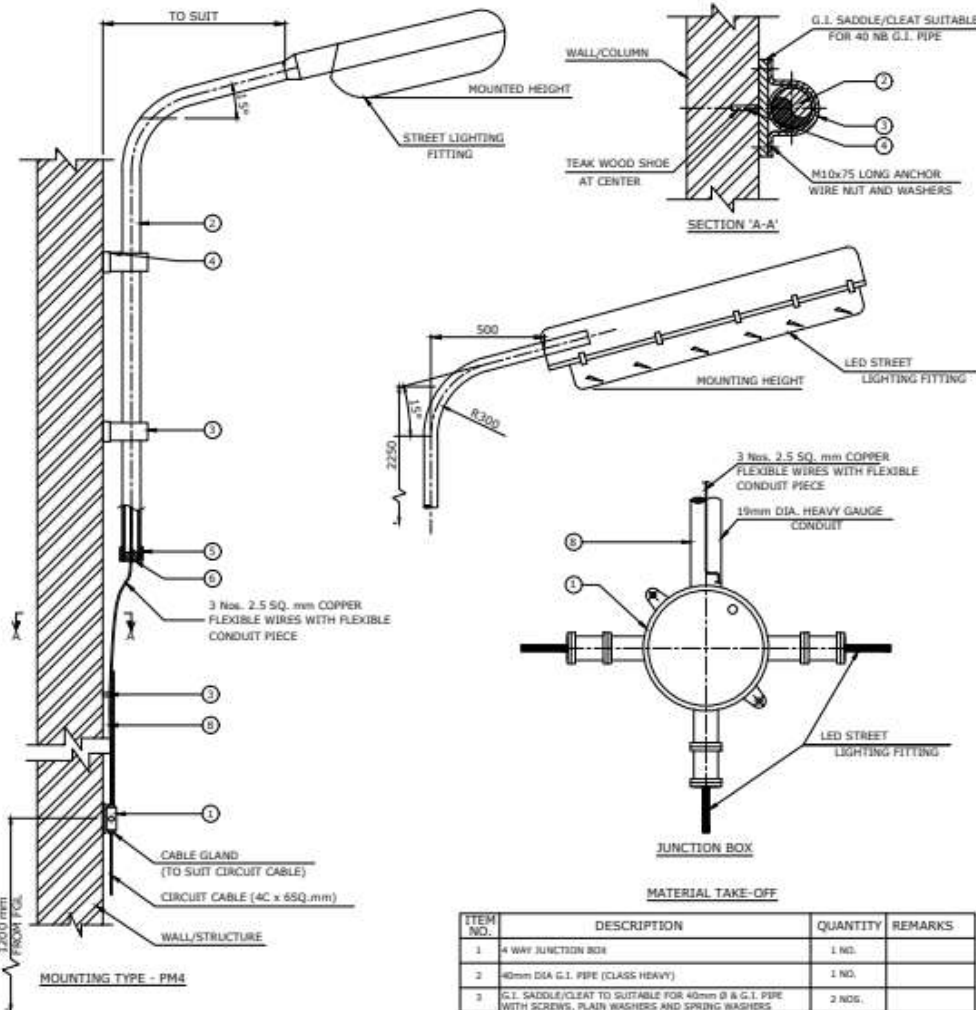
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SHEET NO.

1 OF 1

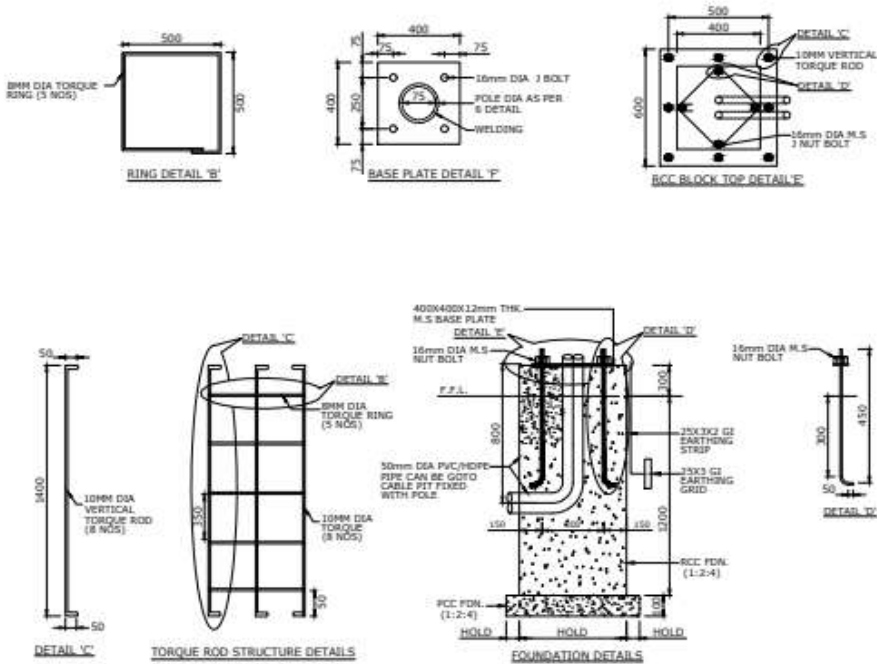


MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	4 WAY JUNCTION BOX	1 NO.	
2	40mm DIA G.I. PIPE (CLASS HEAVY)	1 NO.	
3	G.I. SADDLE/CLEAT TO SUITABLE FOR 40mm Ø & G.I. PIPE WITH SCREWS, PLAIN WASHERS AND SPRING WASHERS	2 NOS.	
4	15mm THK. TEAK WOOD SHOE WITH BITUMINOUS PAINT	1 BLOCK	
5	G.I. PIPE COUPLING (TO SUIT 40mm Ø G.I. PIPE)	1 NO.	
6	BURDER GROMMET (TO SUIT 40mm Ø G.I. PIPE)	1 NO.	
7	30mm DIA G.I. PIPE SLEEVE	1 NO.	
8	19mm DIA G.I. HEAVY GAUGE CONDUIT	AS REQUIRED	
9	10A, 250V D.P. WEATHER PROOF LIGHTING SWITCH WITH BOTTOM ENTRY	1 NO.	
10	SCREW WITH PLAIN WASHER AND RAIN PLUG FOR FIXING JB & LIGHTING SWITCH	8 NOS.	

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	PIPE CAP FOR STREET LIGHTING POLE	1 NO.	
2	40mm OSA PIPE WELDED TO CAP	1 NO.	
3	STEPPER PLATE	1 NO.	
4	STREET LIGHTING POLE (REFER SELECTION TABLE BELOW)	-	
5	2.5 Sq.mm. PVC FLEXIBLE WIRE	AS REQUIRED	
6	STREET LIGHTING LOOPING BOX	1 NO.	
7	CABLE GLAND	2 NOS.	
8	80 NB G.I. PIPE FOR CABLES	AS REQUIRED	
9	250 x 250 x 8mm THK. BASE PLATE	1 NO.	
10	BRICK SOLING (SIZE 230x115x75mm)	15 NOS.	
11	M10 x 30mm LONG FULL THREADED BOLT	8 NOS.	
12	50x8mm THICK G.I. STRIP WELDED TO POLE	2 NOS.	
13	M8 x 30mm LONG THREADED BOLT, NUT & WASHER	4 NOS. EACH	
14	M10, NUT WELDED TO LIGHTING POLE	2 NOS.	
15	PLAIN AND SPRING WASHER SUITABLE FOR M10 BOLT	2 NOS. EACH	
16	M10 FULL THREADED BOLT 40mm LONG	2 NOS.	

TYPICAL MOUNTING DETAILS OF STREET LIGHTING FITTING	STANDARD DRAWING NO.		REV.	SIZE
			02	A4
	SHEET NO.	3 OF 3		

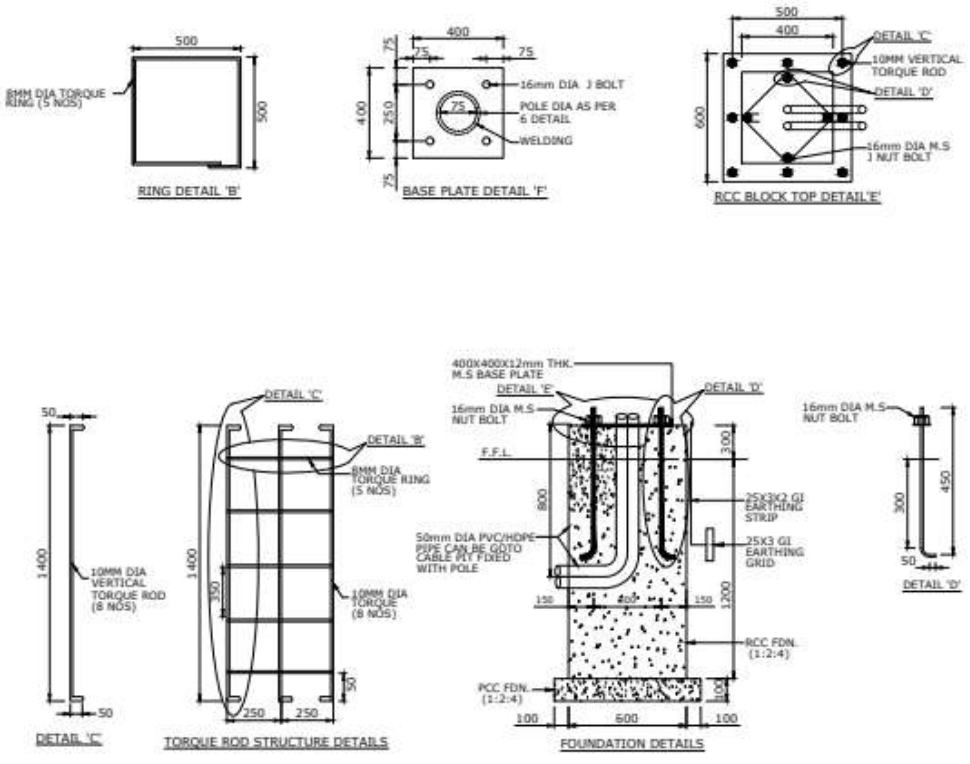


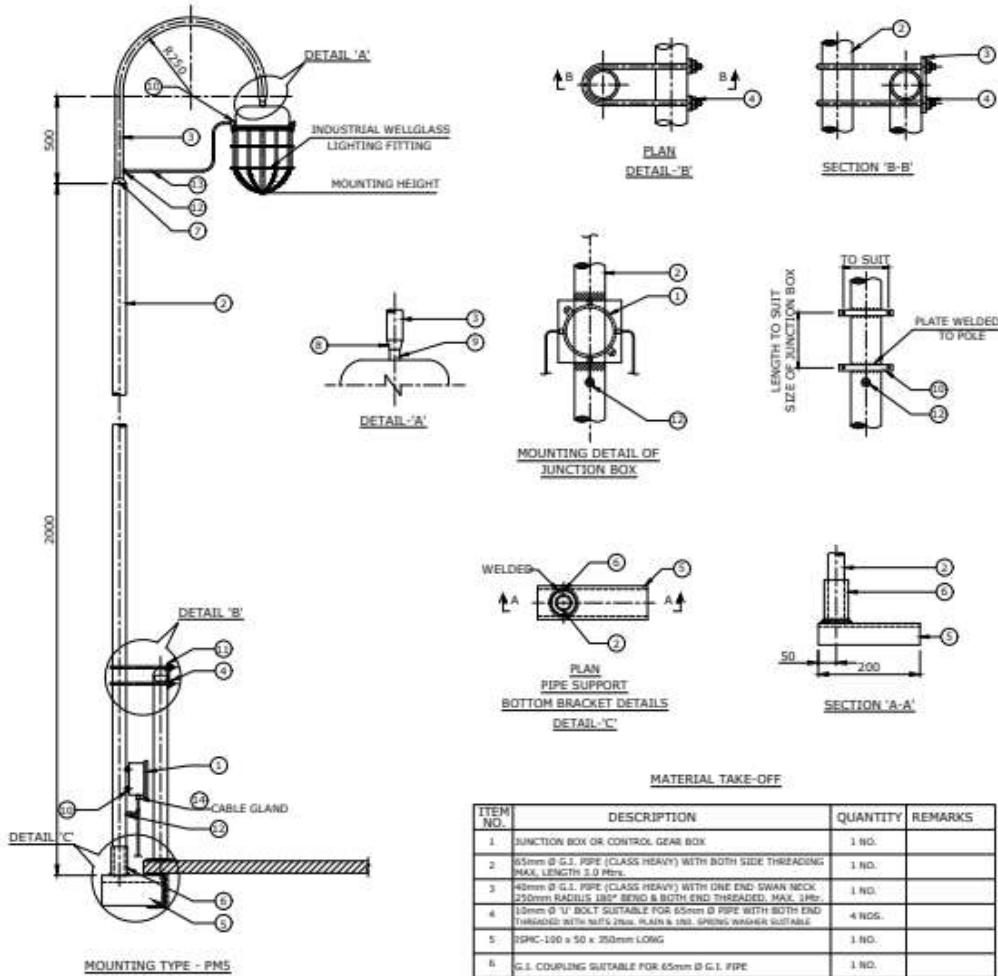
Standard Octagonal Poles (Technical Datasheet)						
Pole Height (M)	Base Plate			Anch Bolt		
	Length (mm)	Width (mm)	Thickness (mm)	Anch Bolt (No. x Dia)	PCD (mm)	Anch Bolt to 6
3	200	200	12	4 X 16	200	100
4	200	200	12	4 X 16	200	100
5	200	200	12	4 X 16	200	100
6	200	200	12	4X 20	200	100
7	200	200	12	4X 20	200	100
8	200	200	12	4X 20	200	100
9	250	250	16	4X 24	250	125
10	200	200	16	4X 20	200	100
10	275	275	16	4X 24	275	137.5
10	250	250	16	4X 24	250	125
11	300	300	16	4X 24	300	150
12	320	320	16	4X 24	320	160
12	300	300	16	4X 24	300	150

Standard Conical Poles (Technical Datasheet)						
Pole Height (M)	Base Plate			Anch Bolt		
	Length (mm)	Width (mm)	Thickness (mm)	Anch Bolt (No. x Dia)	PCD (mm)	Anch Bolt to 6
3	200	200	12	4 X 16	200	100
4	200	200	12	4 X 16	200	100
5	200	200	12	4 X 16	200	100
6	200	200	16	4X 20	220	105
7	250	250	16	4X 20	235	117.5
8	250	250	16	4X 20	235	117.5
9	275	275	16	4X 24	270	135
10	275	275	16	4X 24	270	135
11	300	300	16	4X 24	300	150
12	320	320	16	4X 24	320	160
12	300	300	16	4X 24	320	160

$$D = (300/2) \times PCD$$

VERIFY BASE PLATE DIMENSION AND PCD BEFORE CASTING FOUNDATION



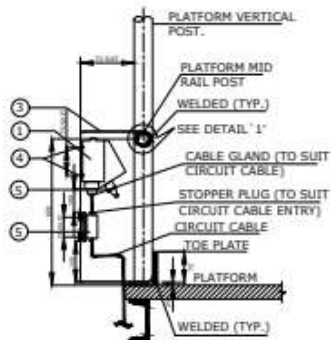


MATERIAL TAKE-OFF

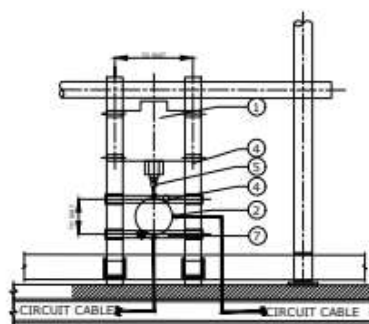
ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	JUNCTION BOX OR CONTROL GEAR BOX	1 NO.	
2	65mm Ø G.I. PIPE (CLASS HEAVY) WITH BOTH SIDE THREADING MAX. LENGTH 2.0 Mtrs.	1 NO.	
3	40mm Ø G.I. PIPE (CLASS HEAVY) WITH ONE END SWAN NECK 250mm RADIUS 180° BEND & BOTH END THREADED. MAX. 1 Mtr.	1 NO.	
4	10mm Ø 'U' BOLT SUITABLE FOR 65mm Ø PIPE WITH BOTH END THREADED WITH NUTS, 2nos. PLAIN & 1nos. SPRING WASHER SUITABLE	4 NOS.	
5	SPR-100 x 50 x 350mm LONG	1 NO.	
6	G.I. COUPLING SUITABLE FOR 40mm Ø G.I. PIPE	1 NO.	
7	G.I. REDUCER - 60 x 40	1 NO.	
8	G.I. REDUCER - 40 x 19	1 NO.	
9	G.I. NIPPLE THREADED AT BOTH END	1 NO.	
10	150x150x6mm THK. M.S. PLATE WITH 2 Nos. 12mm Ø HOLES OR 500x300 LONG G.I. PLATE WITH 2 Nos. 12mm Ø HOLES	1 NO./2 Nos.	REFER VIEW -A'
11	50 x 6 x 150mm LONG G.I. PLATE WITH 2 Nos. 12mm Ø HOLES	4 NOS.	
12	BURDER GROMMET TO SUIT FLEXIBLE WIRE	2 NOS.	
13	2.5 Sq. mm SQ. FLEXIBLE CABLE	3.5Mtrs. MAX.	
14	CABLE GLAND SUITABLE FOR ITEM NO. 13	2 NOS.	

NOTES:

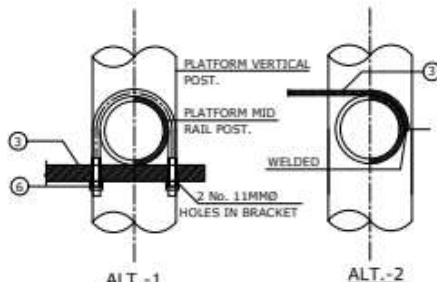
1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. MOUNTING HEIGHT SHALL NOT EXCEED 2.5M FROM THE PLATFORM.
3. CABLE GLAND USED FOR TERMINATION OF FLEXIBLE CABLE SHALL BE DOUBLE SEAL WITH CONE GRIP FOR BRADING.
4. PLUG ALL UNUSED ENTRIES OF LIGHTING FITTING AND JUNCTION BOX WITH THREADED STOPPING PLUGS.
5. ALL NUTS, BOLTS AND WASHERS SHALL BE GALVANIZED.
6. ALL SHARP EDGES AND BURRS SHALL BE REMOVED. SITE FABRICATED STEEL SHALL BE PAINTED WITH TWO COATS OF ANTI-CORROSION PAINT AND TWO COATS OF EPOXY PAINTS.
7. ALL DAMAGE TO GALVANIZED FINISHED SHALL BE MADE GOOD WITH ZINC RICH PAINT.
8. WHERE POSSIBLE LOCATE LAMP POST ADJACENT TO HANDRAIL POST.



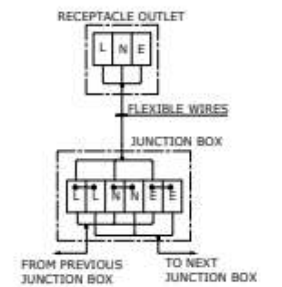
SIDE VIEW



FRONT VIEW

ALTERNATE ARRANGEMENT FOR FIXING
OF BRACKET TO MID RAIL POST

DETAIL - '1'

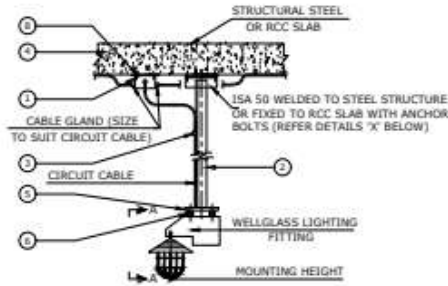
WIRING DIAGRAM FOR JUNCTION
BOX TO RECEPTACLE

MATERIAL TAKE-OFF

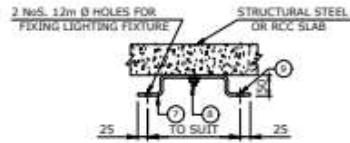
ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1.	SHALL POWER SOCKET OUTLET	AS REQUIRED	
2.	JUNCTION BOX WITH TERMINAL BLOCK	AS REQUIRED	
3.	50 x 8mm THK. (LENGTH AS REQUIRED) MS PLAT FOR FIXING OF POWER SOCKET OUTLET	2 MTRG.	
4.	M6 x 40mm LONG MS BOLT WITH NUT & WASHER FOR FIXING OF JUNCTION BOX ON BRACKET	8 NOS.	
5.	PLUG TO SUIT SHALL POWER SOCKET OUTLET	AS REQUIRED	
6.	M10 1/2" BOLT OF SUITABLE TO MS HANDRAIL POST WITH THREADED BOTH THE SIDE WITH NUT, LOCK NUT & WASHER	2 NOS.	
7.	50 x 8mm THK. (LENGTH AS REQUIRED) MS PLAT FOR FIXING JUNCTION BOX	2 NOS.	

NOTES:

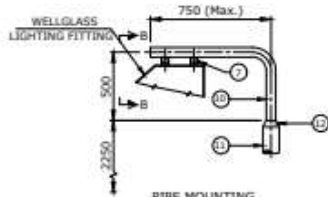
- ALL DIMENSION ARE IN MM.
- DRILLING OF ITEM 3 AND 7 TO BE DETERMINED BY FABRICATOR TO THE SOCKET OUTLET AND JUNCTION BOX.
- JUNCTION BOX, RECEPTABLES AND ACCESSORIES SHALL BE CALLED UP ON THE RELEVANT LAYOUT DRAWING MATERIAL LIST AS REQUIRED.
- ALL CABLE AND GLANDS SHALL CALLED UP ON DISTRIBUTION BOARD SCHEDULE.
- AFTER FABRICATION THE ASSEMBLY IS TO BE PAINTED WITH TWO COATS OF ANTI-CORROSION PAINT AND TWO COATS OF EPOXY PAINT.
- ALL NUTS, BOLTS, WASHERS SHALL BE GALVANIZED OR ZINC PASSIVATED.
- RECEPTABLES AND JUNCTION BOX SHALL BE CERTIFIED FOR THE HAZARDOUS AREA IN WHICH THEY ARE TO BE LOCATED.



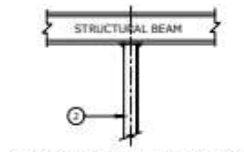
SUSPENSION MOUNTING
MOUNTING TYPE-SMS



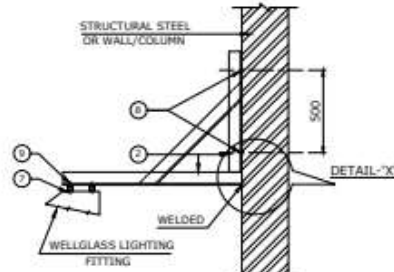
CEILING MOUNTING
MOUNTING TYPE-CMS



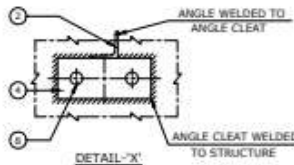
PIPE MOUNTING
MOUNTING TYPE-PM3



MOUNTING ON STRUCTURE OR BEAM
MOUNTING TYPE-SMS



BRACKET MOUNTING
MOUNTING TYPE-BMS

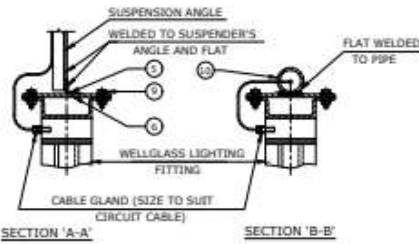


MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	4WAY ROUND JUNCTION BOX	1 NO.	
2	ISA 50 x 50 x 6mm THK. -MAX. LENGTH 2500mm	1 NO.	
3	G.I. SADDLE/CLEAT LONG WITH SCREWS TO SUIT CIRCUIT CABLE	AS REQUIRED	
4	50 x 50 x 6 x 350 LONG ANGLE CLEAT WITH 2 Nos. 12 Ø HOLES (REFER DETAIL - 'X')	1 NO.	
5	25 x 25 x 6 x 300 LONG ANGLE CLEAT	1 NO.	
6	32 x 6 x 200 LONG G.I. FLAT WITH 3 Nos. 12 Ø HOLES	2 NOS.	
7	50 x 6 x 200 LONG G.I. FLAT WITH 2 Nos. 12 Ø HOLES	1 NO.	
8	M10 x 40mm LONG ANCHOR STUD WITH PLAIN AND SPRING WASHERS	1 NO.	
9	M10 x 30mm LONG G.I. BOLT WITH NUT, 2 PLAIN AND SPRING WASHERS	4 NOS.	
10	40mm Ø G.I. PIPE - CLASS HEAVY WITH MAX. LENGTH OF 1.5 Mtrs. WITH THREADED AT BOTH SIDES	1 NO.	
11	65mm Ø G.I. PIPE - CLASS HEAVY WITH MAX. LENGTH OF 1.5 Mtrs. WITH THREADED AT BOTH SIDES	1 NO.	

NOTES:

1. ALL WELDED POINT SHALL CLEANED AND APPLY TWO COAT OF ANTI-CORROSION PAINT AND TWO COATS OF ZINC RICH PAINT.



TYPICAL DETAIL OF CEILING/SUSPENSION
MOUNTED HIGHBAY LIGHTING FITTING

STANDARD DRAWING NO.

REV.

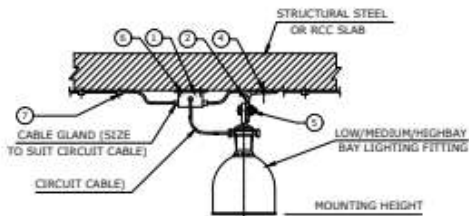
SIZE

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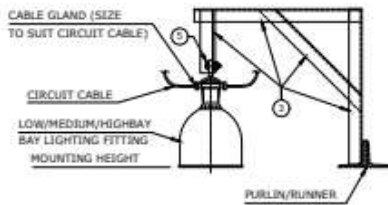
A4

SHEET NO.

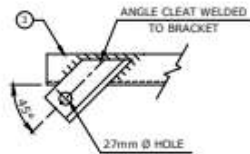
1 OF 1



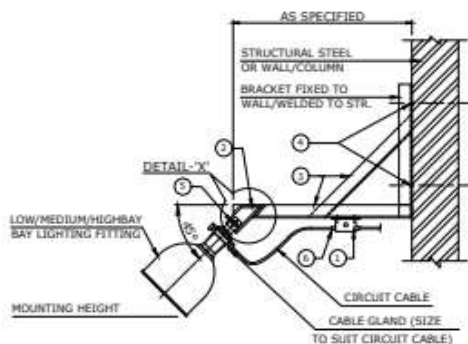
CEILING MOUNTED
LIGHTING FITTING - CM6



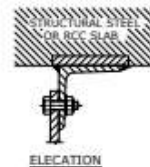
BRACKET MOUNTED ON PURLIN
MOUNTING TYPE-BM6



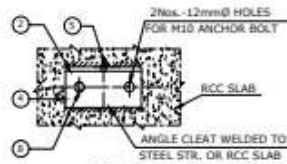
DETAIL-'X'



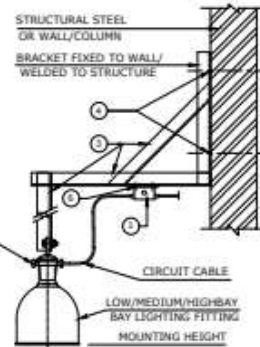
BRACKET MOUNTED 30° OR 45°
MOUNTING TYPE-BM6



ELEVATION



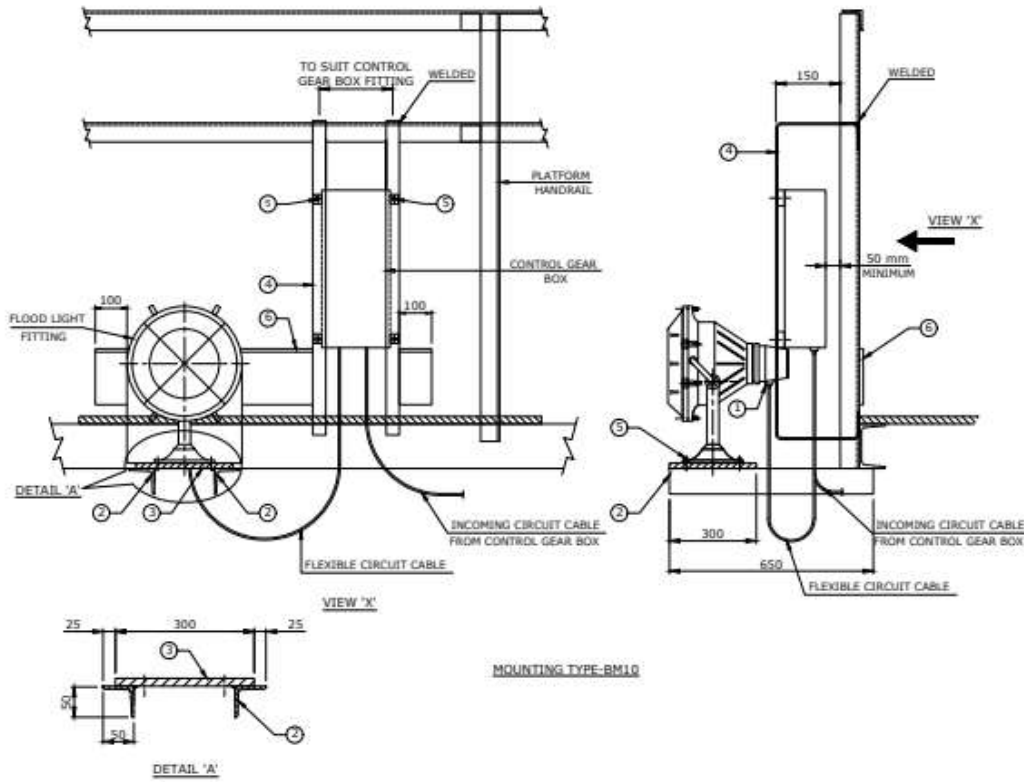
PLAN
MOUNTING DETAIL ON
R.C.C. SLAB



BRACKET MOUNTING
MOUNTING TYPE-BM6

MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	4WAY ROUND JUNCTION BOX	1 NO.	
2	ISA 50 x 50 x 6mm THK. 140mm LONG ANGLE CLEAT WITH 2 Nos. 12mm Ø HOLES	1 NO.	
3	ISA 50 x 50 x 6mm THK. LENGTH TO SUIT MTG. HEIGHT OR BRACKET SUSPENSION MOUNTING TYPE TO SUIT HEIGHT	1 NO.	
4	M10-58mm LONG ANCHOR STUD WITH LOCK WASHERS AND NUTS FOR FIXING OF ISA IN RCC SLAB	2 NOS.	
5	M25-40mm LONG BOLT WITH NUT AND PLAIN WASHERS	1 NO.	
6	M10-40mm LONG BOLT WITH NUT AND PLAIN WASHERS FOR MOUNTING OF LIGHTING FITTING	2 NOS.	
7	SADDLE/CLEAT ALONG WITH SUITABLE SIZE OF ANCHORING FIXING SCREWS TO SUIT FOR CIRCUIT CABLE SADDLE.	AS REQUIRED	



MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	CABLE GLAND (SIZE TO SUIT CIRCUIT CABLE)	AS REQUIRED	
2	50 x 50 x 6mm THK., 650mm LONG M.S. ANGLE	2 NOS.	
3	300 x 300 x 6mm THK. MILD STEEL PLAT	AS REQUIRED	
4	50 x 6mm THK. WELD STEEL PLAT (LENGTH TO SUIT)	AS REQUIRED	
5	M10 x 50 LONG M.S. BOLT WITH NUT & WASHER	AS REQUIRED	
6	3 mm THK. KICK PLATE (SIZE TO SUIT AT SITE)	AS REQUIRED	

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. AFTER INSTALLATION THE ASSEMBLY IS TO BE PREPARED, PRIMED AND PAINTED.

TYPICAL MOUNTING ARRANGEMENT OF
FLOOD LIGHT MOUNTED ON
STEEL/CONCRETE COLUMN

STANDARD DRAWING NO.

REV.

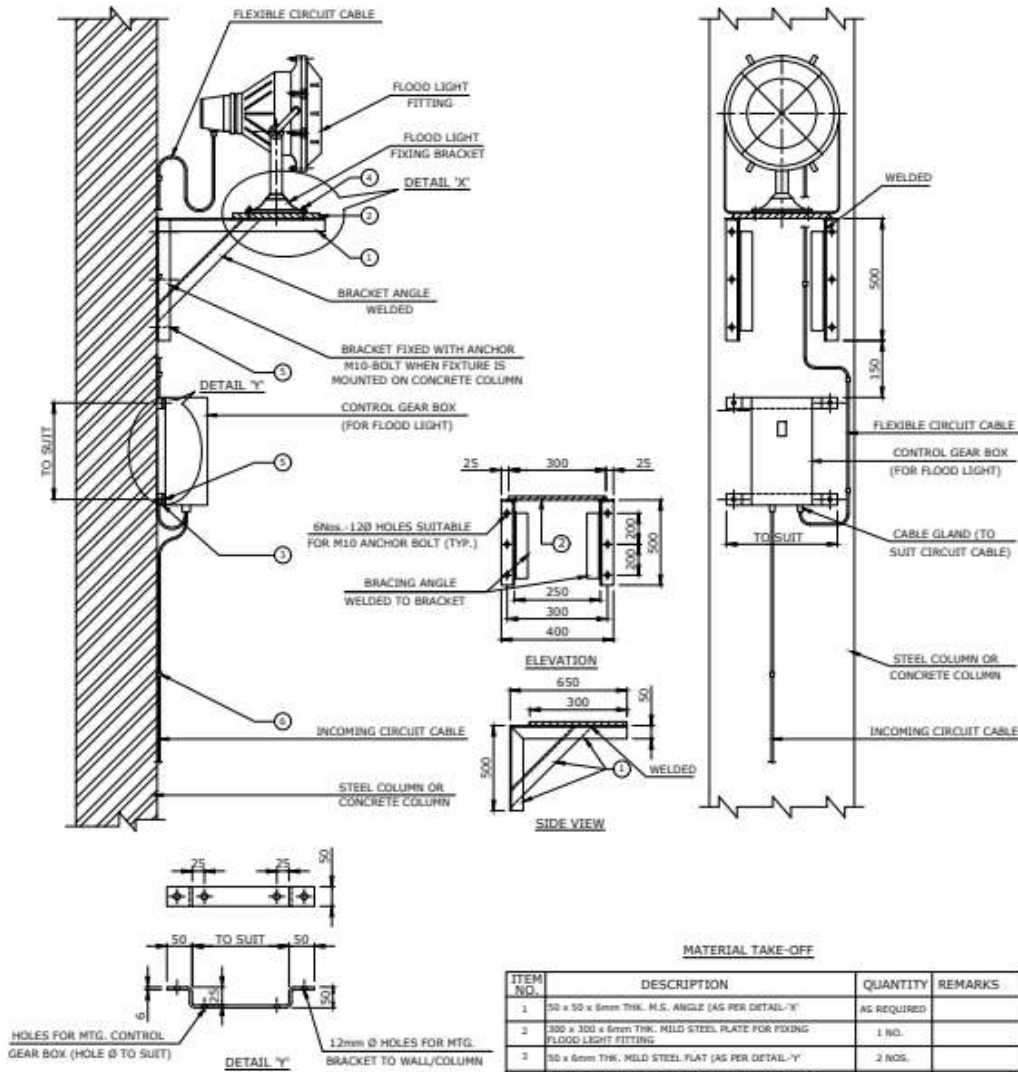
SIZE

02

A4

SHEET NO.

1 OF 1



MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	50 x 50 x 6mm THK. M.S. ANGLE (AS PER DETAIL-'Y')	AS REQUIRED	
2	300 x 300 x 6mm THK. MILD STEEL PLATE FOR FIXING FLOOD LIGHT FITTING	1 NO.	
3	50 x 6mm THK. MILD STEEL FLAT (AS PER DETAIL-'Y')	2 NOS.	
4	M10-50mm LONG BOLT WITH LOCK NUT & WASHER FOR FIXING FLOOD LIGHT FITTING	4 NOS.	
5	M10-60mm LONG STUD WITH NUT & LOCK WASHER FOR FIXING BRACKET	10 NOS.	
6	SADDLE/CLEAT (TO SUIT CABLE SIZE) WITH SUITABLE SIZE FIXING ANCHOR BOLTS LOCK WASHER 7 NUTS	AS REQUIRED	

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS.
- AFTER INSTALLATION THE ASSEMBLY IS TO BE PAINTED WITH TWO COATS OF ANTI-CORROSIVE PAINT AND TWO COATS OF EPOXY PAINTS.

TYPICAL MOUNTING DETAIL OF 1 NO.
FLOOD LIGHT FITTING

STANDARD DRAWING NO.

REV.

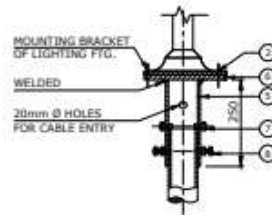
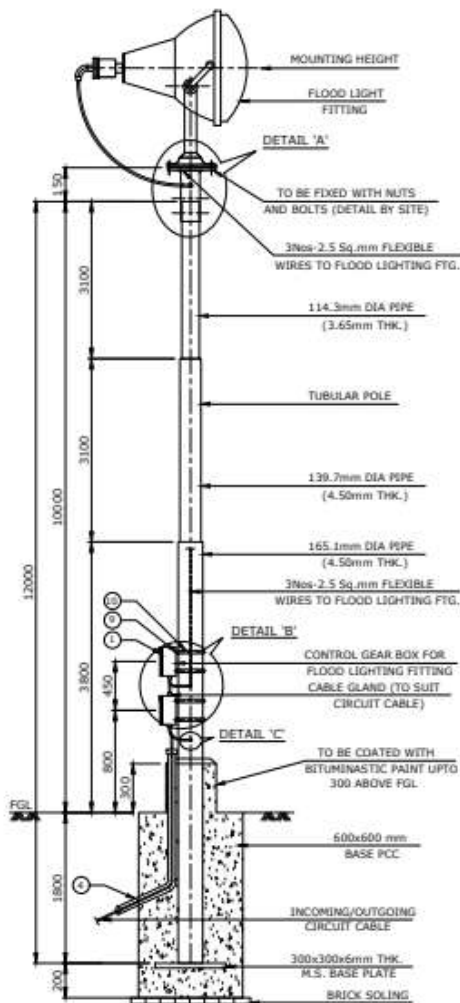
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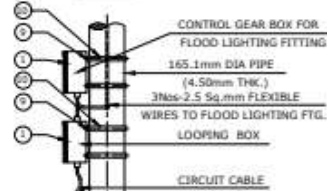
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SHEET NO.

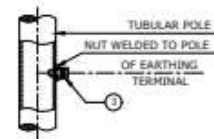
1 OF 1



DETAIL 'A'



DETAIL 'B'



DETAIL 'C'

MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	STREET LIGHTING LOOPING BOX	1 NO.	
2	M8 x 40mm LONG BOLT WITH NUTS & PLAIN WASHER FOR FIXING FLOOD LIGHT	AS REQUIRED	
3	EARTHING TERMINAL, M10-40mm LONG BOLT WITH NUTS, 2Nos. SPRING WASHERS & 2Nos. PLAIN WASHERS	1 NO.	
4	75mm NB G.I. PIPE SLEEVE	2 NOS.	
5	M.S. PIPE CAP TO SUIT 114.30mm DIA PIPE	1 NO.	
6	300 x 300 x 10mm THICK M.S. PLATE	1 NO.	
7	M10-40mm LONG BOLT TO BE USED AS STOPPER	3 NOS.	
8	M10 x 40mm LONG BOLT WITH LOCK NUT TO BE USED AS HOLDER	3 NOS.	
9	M8-40mm LONG BOLT WITH NUTS & PLAIN WASHER FOR FIXING OF CONTROL GEAR BOX & LOOPING BOX	8 NOS.	
10	BRACKET CLAMP MADE OUT FROM 25x6mm THK. M.S. PLAT FOR FIXING OF CONTROL GEAR BOX & LOOPING BOX	4 NOS.	

NOTES:

1. LIGHTING FITTING FIXING DETAILS TO BE FURNISHED BY SITE.
2. EARTHING TERMINALS ARE LOCATED DIAMETRICALLY OPPOSITE.
3. ALL NUTS, BOLTS AND WASHER SHALL BE GALVANIZED OR ZINC PASSIVATED.
4. MOUNTING DETAILS OF CONTROL GEAR BOX & LOOPING BOX REFER INSTALLATION DETAILS.
5. ALL SHARP EDGES AND BURRS SHALL BE REMOVED.
6. POLE SHALL BE MADE FROM TUBULAR STEEL PIPES SWAGED AND WELDED CONFORMING TO DESIGNATION 410TF-60 AS PER IS-2713 (PART II) - 1980.

TYPICAL MOUNTING DETAIL OF 2 NOS.
INDUSTRIAL TYPE FLOOD LIGHTING FITTING

STANDARD DRAWING NO.

REV.

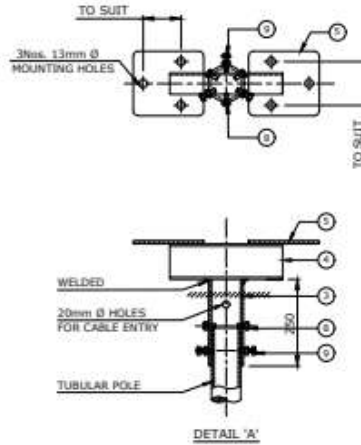
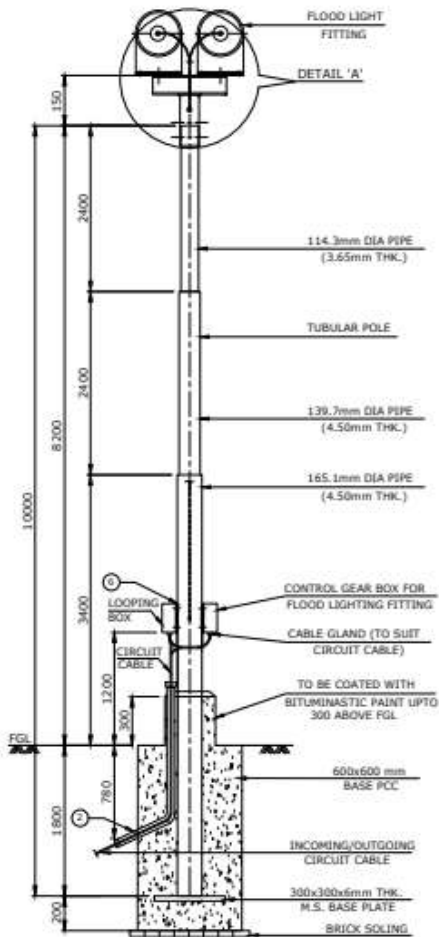
SIZE

02

A4

SHEET NO.

1 OF 1



NOTES:

1. FIXING DETAILS TO BE FURNISHED BY SITE.
2. EARTHING TERMINALS ARE LOCATED DIAMETRICALLY OPPOSITE.
3. 2 Nos. 20mm Ø HOLES LOCATED DIAMETRICALLY OPPOSITE.
4. MOUNTING DETAILS OF CONTROL GEAR BOX & LOOPING BOX TO BE FIXED BY SITE.
5. FOR INCANDESCENT LAMP, FLEXIBLE CABLE TO GO DIRECTLY TO FITTING.
6. ALL SHARP EDGES AND BURRS SHALL BE REMOVED.
7. ALL NUTS, BOLTS AND WASHER SHALL BE GALVANISED OR ZINC PASSIVATED.
8. POLE SHALL BE MADE FROM TUBULAR STEEL PIPES SWAGED AND WELDED CONFORMING TO DESIGNATION 412TP-85 AS PER IS-2713 (PART II) - 1980.

MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	STREET LIGHTING LOOPING BOX	-	
2	75mm NB G.I. PIPE SLEEVE	2 NOS.	
3	M.S PIPE CAP (TO SUIT 114.30mm DIA PIPE)	1 NO.	
4	100 x 50 x 6mm THK. M.S. CHANNEL (LENGTH TO SUIT)	AS REQUIRED	
5	300 x 300 x 6mm THICK M.S. PLATE	2 NOS.	
6	50 x 6mm THICK M.S. PLAT (LENGTH TO SUIT)	AS REQUIRED	
7	M10-30mm LONG BOLT WITH NUT, WASHER FOR FIXING FLOOD LIGHT	AS REQUIRED	
8	M10 BOLT (TO BE USED AS STOPPER)	3 NOS.	
9	M10 BOLT WITH LOCK NUT (TO BE USED AS HOLDER)	3 NOS.	

TYPICAL MOUNTING DETAIL OF 8 NOS.
FLOOD LIGHTING FITTING ON LATTICE
TYPE TOWER

STANDARD DRAWING NO.

REV.

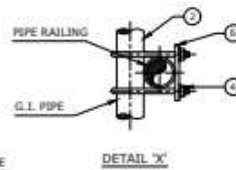
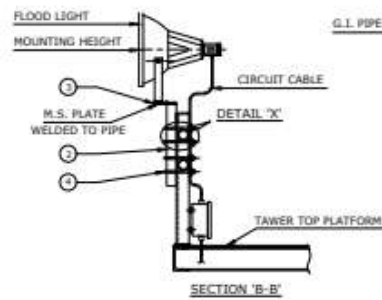
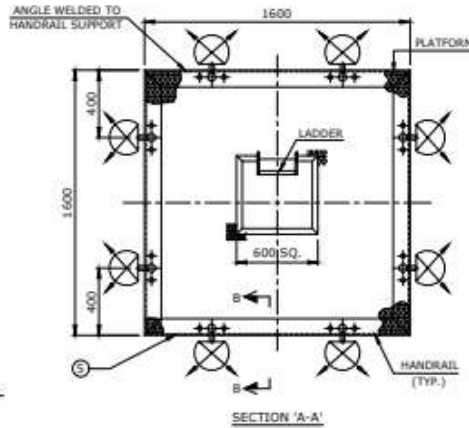
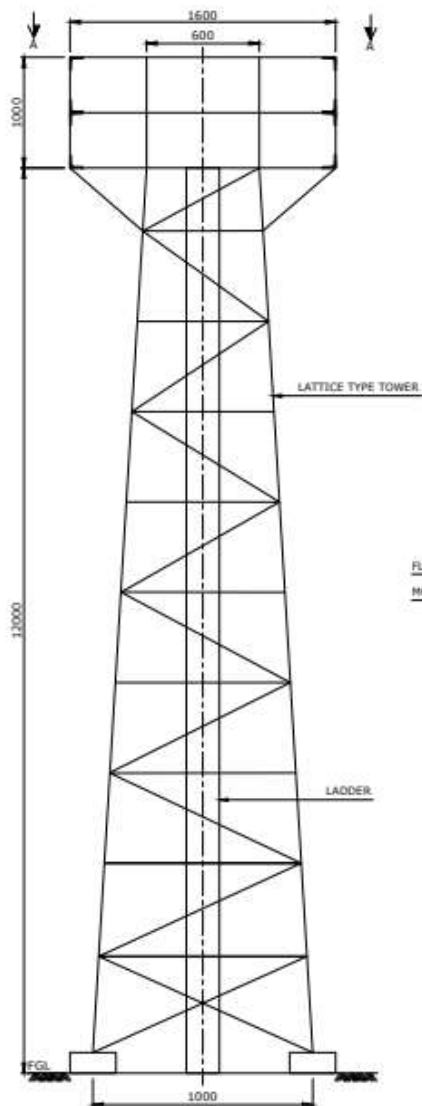
SIZE

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A4

SHEET NO.

1 OF 1



MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	CONTROL GEAR BOX	AS REQUIRED	
2	40mm Ø G.I. PIPE (CLASS HEAVY) LENGTH TO SUIT	AS REQUIRED	
3	150 x 250 x 6mm THK. M.S. PLATE	AS REQUIRED	
4	Ø16 1/2" BOLT OF SUITABLE SIZE (THREADED AT BOTH ENDS) WITH NUT AND WASHER	4 NOS.	
5	75 x 75 x 6mm THK. M.S. ANGLE (LENGTH TO SUIT)	AS REQUIRED	
6	25 x 6mm THICK M.S. PLAT (LENGTH TO SUIT)	AS REQUIRED	

NOTES:

TYPICAL MOUNTING DETAIL OF 8 NOS.
FLOOD LIGHTING FITTING ON LATTICE
TYPE TOWER

STANDARD DRAWING NO.

REV.

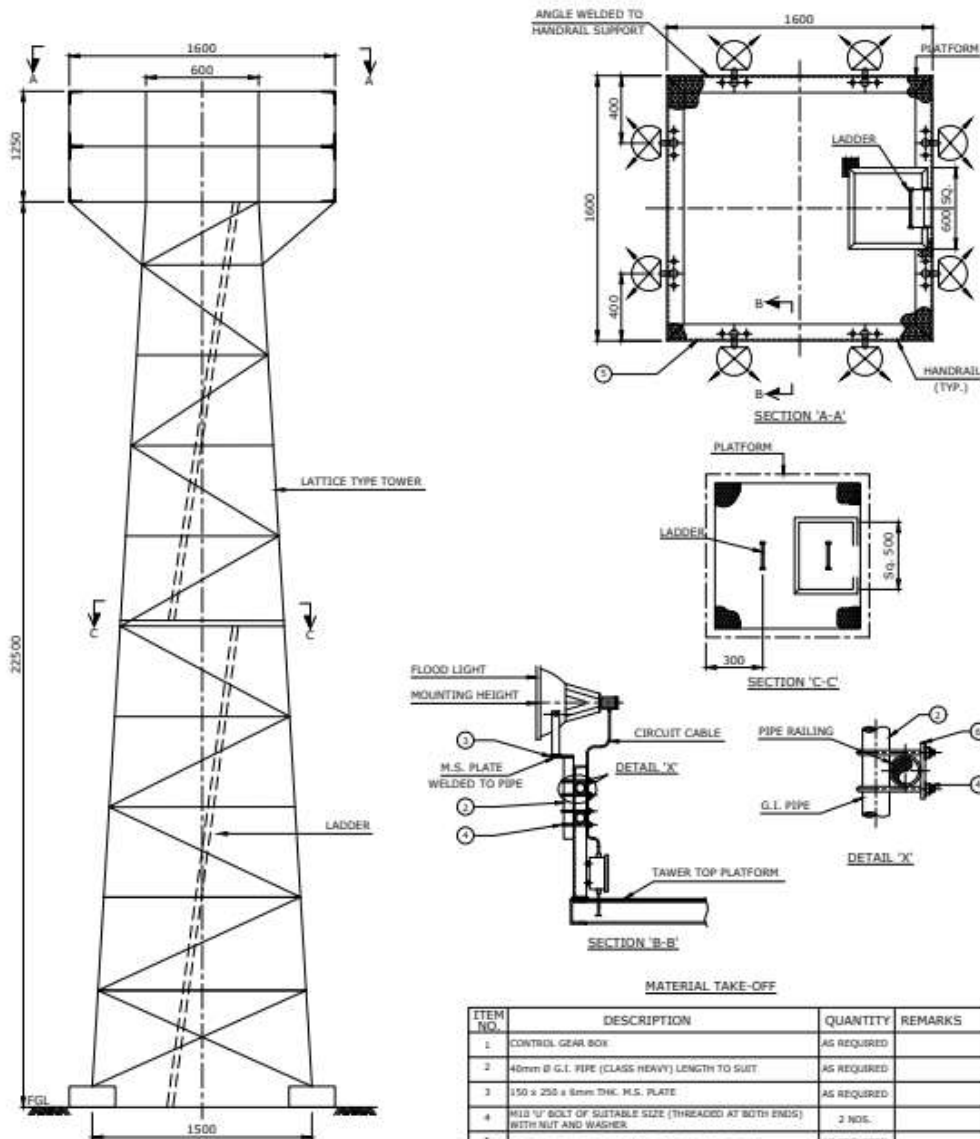
SIZE

02

A4

SHEET NO.

1 OF 1



NOTES:

TYPICAL MOUNTING DETAILS OF
FLAMEPROOF LED
LIGHTING FITTING

STANDARD DRAWING NO.

REV.

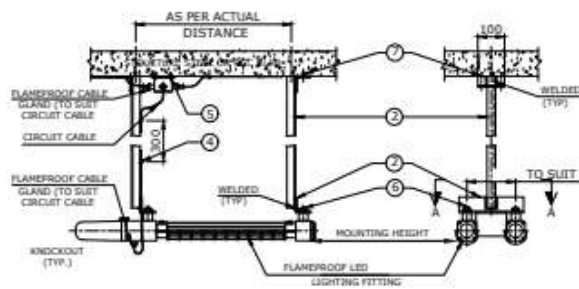
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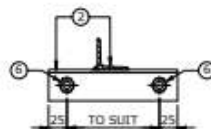
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SHEET NO.

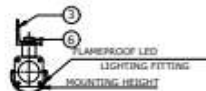
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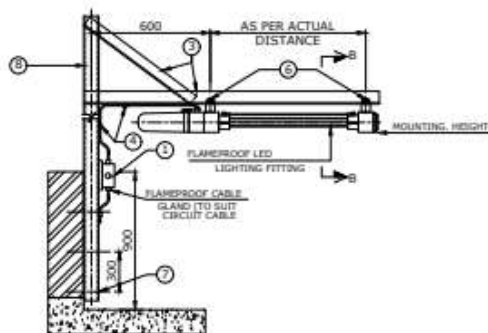
DETAIL FOR SUSPENSION MOUNTING
MOUNTING TYPE : SM9



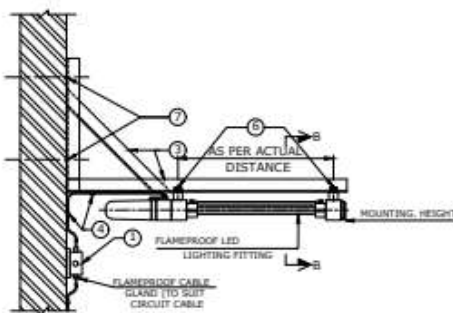
SECTION 'A-A'



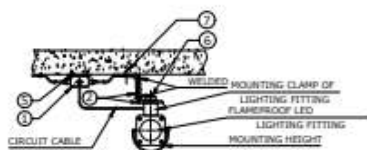
SECTION 'B-B'



DETAIL FOR ROOF/TERRACE MOUNTING
MOUNTING TYPE : BM9



DETAIL FOR BRACKET MOUNTING
MOUNTING TYPE : RM9

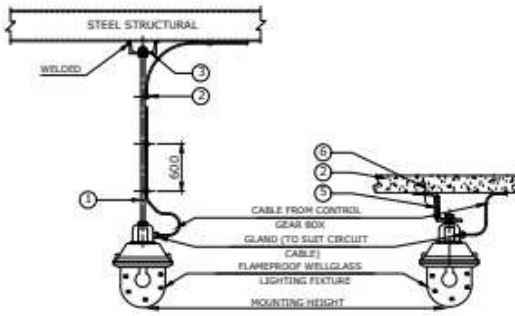


DETAIL FOR CEILING MOUNTING
MOUNTING TYPE : CM9

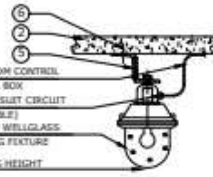
MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY			REMARKS
		CM	SM	BM	
1	FLAMEPROOF JUNCTION BOX WITH TERMINAL BLOCK	1 NO.	1 NO.	1 NO.	
2	ISA 50 x 50 x 6mm THK. (LENGTH TO SUIT)	AS REQD.	AS REQD.	-	
3	BRACKET MADE OUT FROM ISA 75 x 75 x 6mm THK.	-	-	AS REQD.	
4	SADDLE/CLIP/SLAT ALONG WITH SUITABLE SIZE OF FIXING SCREWS TO SUIT FOR CIRCUIT CABLE	AS REQD.	AS REQD.	AS REQD.	
5	M8-68mm LONG STUD ANCHOR WITH NUT & LOCK WASHER FOR JUNCTION BOX FIXING TO CEILING/WALL	2 NOS.	2 NOS.	2 NOS.	
6	M10-68mm LONG BOLT NUT & PLAIN WASHER	2 NOS.	4 NOS.	4 NOS.	
7	M10-68mm LONG STUD ANCHOR WITH NUT & LOCK WASHER FOR FIXING OF ISA TO CEILING/WALL	2 NOS.	4 NOS.	4 NOS.	
8	20GHC -150 (LENGTH TO SUIT)	-	-	AS REQD.	

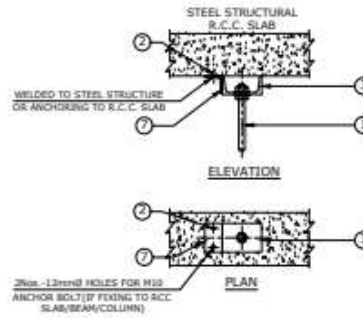
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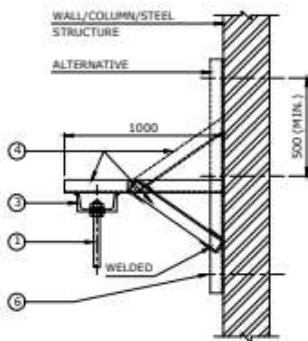
SUSPENSION MOUNTING
MOUNTING TYPE : SMB



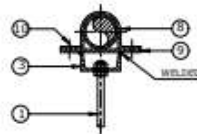
CEILING MOUNTING
MOUNTING TYPE : CMB



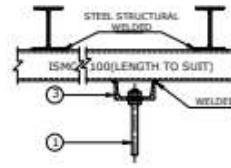
MOUNTING DETAIL ON
R.C.C. SLAB



WALL/COLUMN BRACKET
MOUNTING TYPE : BMB



TUBULAR TRUSS
MOUNTING TYPE : PMB

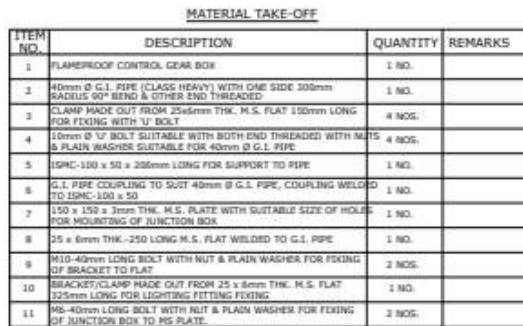


SUSPENSION FROM STEEL
STRUCTURE
MOUNTING TYPE-SMB

MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	10mm Ø P.S. ROD (LONG AS REQUIRED) THREADED WITH BOTH ENDS WITH 2 Nos. NUTS, 2Nos. PLAIN/SPRING WASHERS	2 NOS.	
2	SADDLE/CLAMP ALONG WITH SUITABLE SIZE OF FIXING SCREWS TO SUIT FOR CIRCUIT CABLE	AS REQUIRED	
3	ISMC 100 x 50 - 75mm LONG (OR MORE LONG AS REQUIRED)	1 NO.	
4	BRACKET MADE OUT FROM ISA 50 x 50 x 6mm THK.	AS REQUIRED	
5	ISMC 75 x 40 - 50mm LONG (OR MORE LONG AS REQUIRED)	1 NO.	
6	M10-45mm LONG ANCHOR BOLT FOR MOUNTING OF PLATE/ BRACKET/ISMC TO WALL/COLUMN/CEILING	AS REQUIRED	
7	ISA 50 x 50 x 6mm THK. WITH 2 Nos. -Ø12mm HOLES	AS REQUIRED	
8	CLAMP/SADDLE (TO BE MADE OUT OF 50 x 6mm P.S. PLAT) WITH FIXING SCREWS. (CLAMP TO SUIT SIZE OF TRUSS/PIPE)	1 NO.	
9	50 x 6mm THK. P.S. PLAT (FOR SADDLE/CLAMP FIXING) LENGTH TO SUIT SIZE OF TRUSS/PIPE	1 NO.	
10	M10-45mm LONG BOLT WITH NUT & WASHER FOR CLAMP/ SADDLE BOLTED	2 NOS.	

NOTES:



1. MOUNTING HEIGHT SHALL NOT BE EXCEED 4M FROM THE PLATFORM.
2. CABLE GLAND USED FOR TERMINATION OF FLEXIBLE CABLE SHALL BE DOUBLE SEAL WITH CORE GRP FOR BRACING.
3. PLUG ALL UNUSED ENTRIES OF LIGHTING FITTING AND JUNCTION BOX WITH THREADED STOPPING PLUGS.

TYPICAL CEILING/SUSPENSION MOUNTING
DETAILS OF FLAMEPROOF BULK HEAD
LIGHTING FITTING

STANDARD DRAWING NO.

REV.

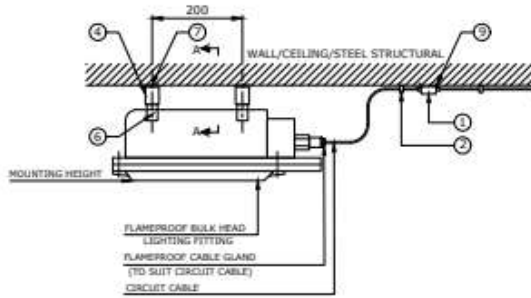
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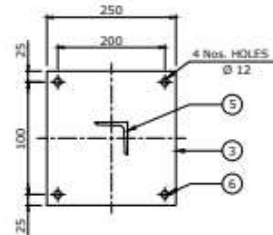
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SHEET NO.

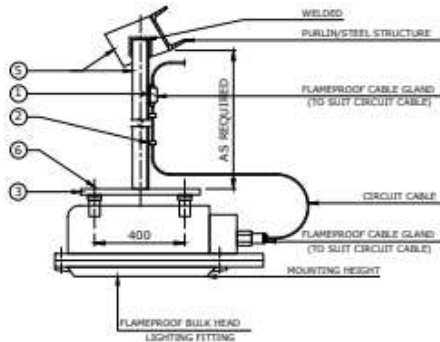
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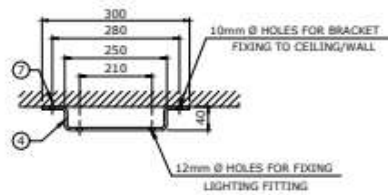
CEILING/WALL MOUNTED BULK HEAD LIGHTING
FITTING MOUNTING TYPE - CM7



MOUNTING DETAILS OF PLATE



PENDENT (SUSPENSION) MOUNTING BULK HEAD
LIGHTING FITTING (ON PURLIN)
MOUNTING TYPE - SM7



SECTION 'A-A'

MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY		REMARKS
		CM7	SM7	
1	FLAMEPROOF CONTROL GEAR BOX	1 NOS.	1 NOS.	
2	SADDLE/CLEAT WITH FIXING SCREWS/ANCHOR STUD, NUTS & LOCK WASHERS FOR CIRCUIT CABLE	AS REQD.	AS REQD.	
3	250 x 250 x 8mm THK. M.S. PLATE	-	1 NOS.	
4	MOUNTING BRACKET/CLAMP (TO MADE OUT FROM 25 x 6mm THK PLAT) FOR LIGHTING FITTING	2 NOS.	-	
5	ISA 50 x 50 x 6mm THK. (LENGTH TO SUIT)	-	AS REQD.	
6	M10-40mm LONG BOLT WITH NUT & WASHER FOR BOLTING FITTING TO BRACKET	4 NOS.	4 NOS.	
7	M10-60mm LONG STUD WITH NUT & LOCK WASHER FOR BRACKET MOUNTING TO CEILING	4 NOS.	-	
8	M8-40mm LONG BOLT WITH NUT & WASHER FOR BOLTING JUNCTION BOX TO ANGLE	-	2 NOS.	
9	M8-60mm LONG ANCHOR STUD WITH NUT & LOCK WASHER FOR JUNCTION BOX MOUNTING TO CEILING	2 NOS.	-	

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. ALL SHARP EDGES AND BURRS SHALL BE REMOVED.
3. ALL NUTS, BOLTS AND WASHERS SHALL BE GALVANIZED OR ZINC PASSIVATED.

TYPICAL DETAILS OF BULKHEAD LIGHTING
FITTING MOUNTED ON HANDRAILS

STANDARD DRAWING NO.

REV.

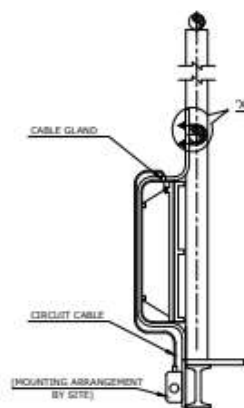
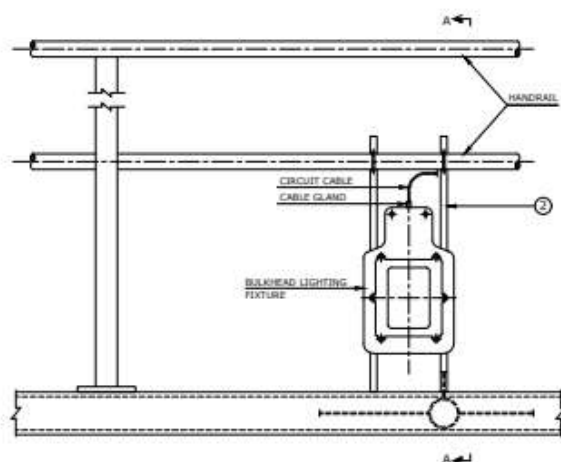
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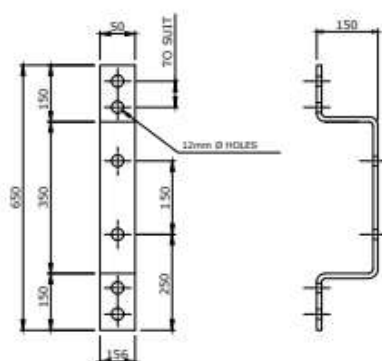
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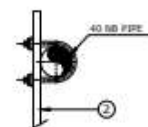
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SECTION 'A-A'



DETAIL OF FIXING BRACKET



DETAIL 'X'

MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	JUNCTION BOX	1 NO.	
2	FIXING BRACKET MADE OUT OF 32 x 6mm P.L.S. PLAT	2 NOS.	
3	12mm 'U' BOLT SUITABLE SIZE (BOTH END THREADED) WITH NUTS WASHERS	AS REQUIRED	

NOTES:

TYPICAL MOUNTING DETAILS OF VESSEL
LIGHT GLASS LIGHTING FITTING

STANDARD DRAWING NO.

REV.

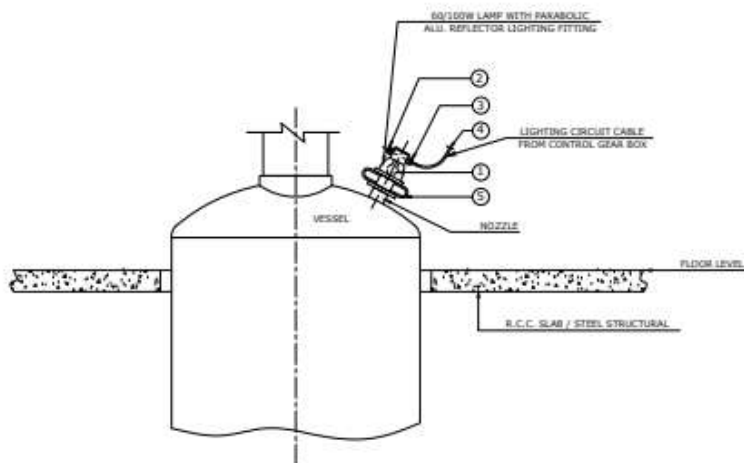
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SHEET NO.

1 OF 1



MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1	60/100 W LAMP & PARABOLIC ALUMINUM REFLECTOR	1 NO.	BY PURCHASER
2	PLUG	1 NO.	BY PURCHASER
3	CABLE GLAND (TO SUIT CIRCUIT CABLE)	AS REQUIRED	BY PURCHASER
4	CIRCUIT CABLE	AS REQUIRED	BY PURCHASER
5	6mm THK. M.S. MOUNTING BRACKET (SIZE TO SUIT)	1 NO.	BY PURCHASER

NOTES:

1. LONGER CABLE ROUTE SHALL BE SELECTED TO KEEP EXTRA LENGTH OF CABLE FOR RE-LANDING IF NECESSARY.

TYPICAL MOUNTING DETAILS OF DOUBLE
OBSTRUCTION LIGHT FOR AVIATION
LIGHTING FITTING

STANDARD DRAWING NO.

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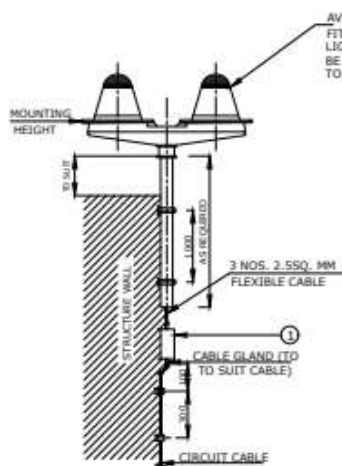
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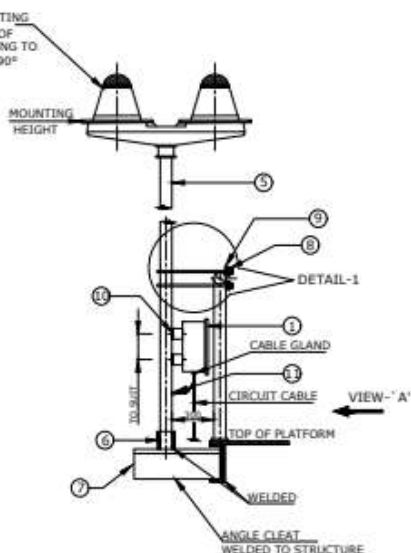
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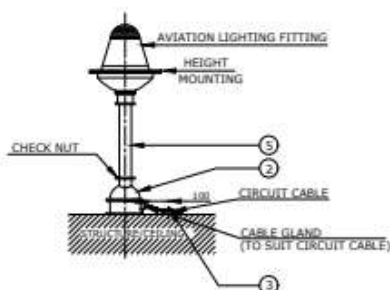
1 OF 1



**FITTING MOUNTED ON SIDE
SUPPORT TO STRUCTURE/ WALL
MOUNTING TYPE-PM11**



**FITTING MOUNTED ON PLATFORM
MOUNTING TYPE-PM11**



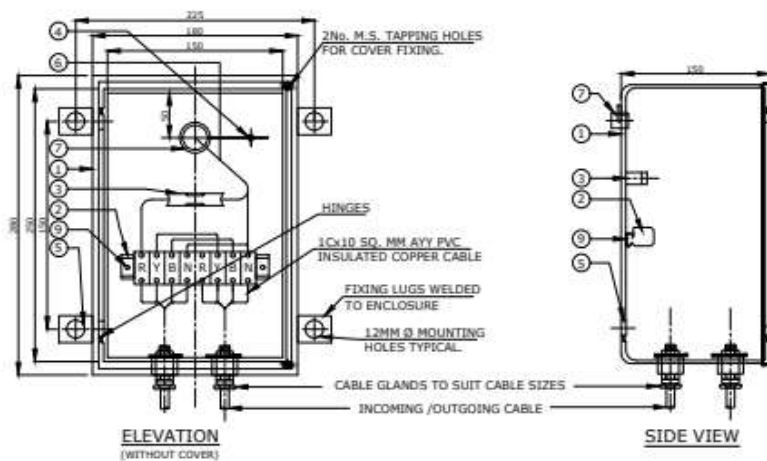
**FITTING DIRECTLY MOUNTED
ON STRUCTURE/ CEILING MOUNTING TYPE PM-11**

MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1.	JUNCTION BOX WEATHER PROOF TYPE	1 No.	
2.	JUNCTION BOX WEATHER PROOF WITH DOME COVER TO SUIT 40 MM DIA G.L. PIPE.	1 No.	
3.	SADDLE/CLEAT WITH FIXING M.S. 60MM LONG SCREWS/ STUCCS, NUTS & LOCK WASHER FOR CIRCUIT CABLE.	AS REQUIRED	
4.	SADDLE/CLEAT WITH FIXING M.S. 60MM LONG SCREWS/ STUCCS, NUTS & LOCK WASHER FOR 40 MM DIA PIPE.	AS REQUIRED	
5.	40 MM DIA G.L. PIPE (LENGTH AS REQUIRED) WITH BOTH ENDS THREADED & CHECK NUTS.	1 No.	
6.	G.L. COUPLING SUITABLE FOR 40 MM DIA G.L. PIPE.	1 No.	
7.	SPRC-180X50X350 MM LONG.	1 No.	
8.	40 MM DIA 1/2" BODY SUITABLE FOR 40 MM DIA PIPE WITH BOTH ENDS THREADED WITH NUTS 2ND. PLAIN AND 1ND. SPRING WASHERS WITH SUITABLE LENGTH.	4 No.	
9.	50MM X 150MM LONG G.L. PLATE WITH 2ND. 12 MM DIA HOLES.	4 No.	
10.	150X150X6 THICK M.S. PLATE WITH 2ND. 12MM DIA HOLES OR 50MM X 200 LONG G.L. PLATE WITH 2ND. 12MM DIA HOLES.	1 No.	
11.	RUBBER GROUNDWATER TO SUIT FLEXIBLE WIRE.	2 No.	

NOTES:

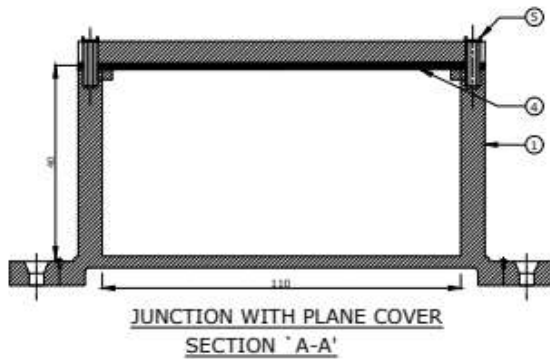
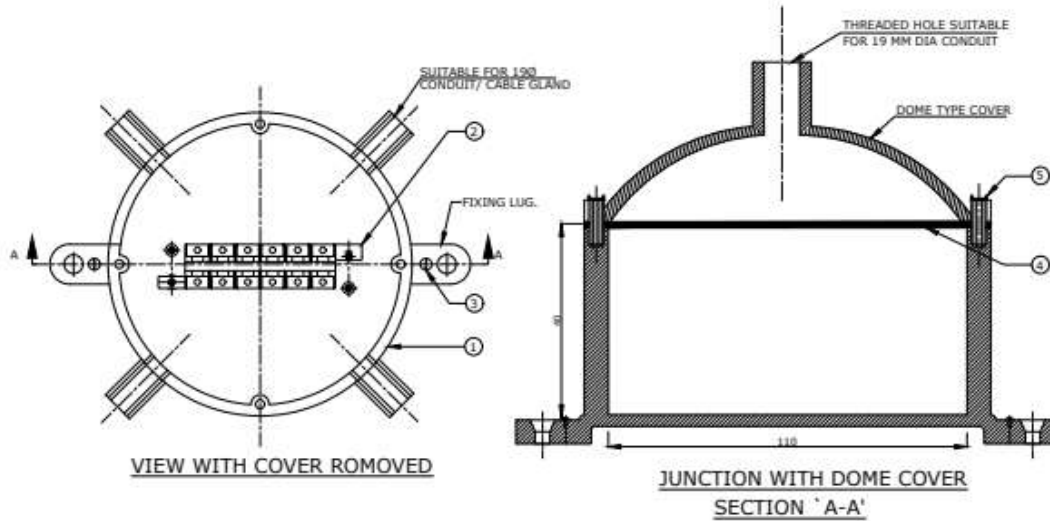
1. WEIGHT OF FITTING 5.5 KG.
2. USE FLEXIBLE WIRE FOR CONNECTION TO LIGHTING FROM JUNCTION BOX.
3. MOUNTING HEIGHT OF THE AVIATION LIGHTING FITTING SHALL BE AT HIGHER ELEVATION THAN THE STRUCTURE ON WHICH FITTING IS TO BE MOUNTED.



MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1.	2 MM THICK SHEET STEEL ENCLOSURE WITH COVER	1 No.	
2.	8 No. 30A, TERMINAL CONNECTOR SUITABLE FOR TERMINATING OF 4Core SQ. MM CABLE (CHANNEL REF.)	1 No.	
3.	4A, MRC FUSE	1 No.	
4.	PH420 MM LONG ROUND HEAD BATHING SCREW WITH 2 No. PLAIN WASHER & 1 No. SPRING WASHER	2 No.	
5.	25x2 MMx70 MM LONG MS PLAT WITH 12 MM Ø HOLE WELDED TO ENCLOSURE LOGS FOR MOUNTING	4 No.	
6.	10x2.5 SQ. MM PVC FLEXIBLE WIRES	AS REQUIRED	
7.	30 MM Ø -25 MM LONG G.I. PIPE WELDED TO ENCLOSURE	1 No.	
8.	M16x40 MM LONG BOLTS WITH NUT, LOCK NUT & PLAIN WASHERS FOR ENCLOSURE FIXING	4 No.	
9.	MOUNTING CHANNEL SUITABLE FOR 8 No. 30A, TERMINAL CONNECTOR (LENGTH AS REQUIRED)	1 No.	

NOTES:



MATERIAL TAKE-OFF

ITEM NO	DESCRIPTION	QUANTITY	REMARKS
1.	JUNCTION BOX (CAST ALUMINIUM)	AS REQUIRED	
2.	ISA, 4 WAY, TERMINAL BLOCK	1 No.	
3.	8 MM LONG BRASS SCREW WITH 2 No. PLAIN AND SPRING WASHER FOR INTERNAL AND EXTERNAL EARTHING TERMINAL	2 No.	
4.	DISC TYPE NEOPRENE GASKET.	1 No.	
5.	COVER FIXING G.I. SCREWS WITH WASHER	4 No.	

NOTES:

TYPICAL MOUNTING DETAILS OF SINGLE
PHASE SOCKET OUTLET ON HANDRAIL

STANDARD DRAWING NO.

REV.

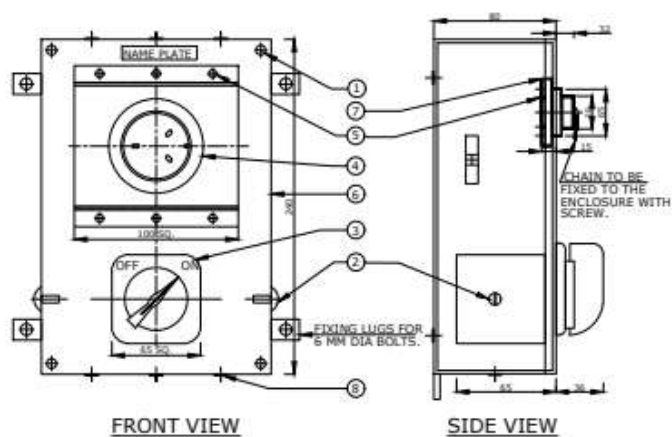
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SHEET NO.

1 OF 1



MATERIAL TAKE-OFF

ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1.	1 MM DIA M/C SCREWS.	4 No.	
2.	1 MM DIA EARTHING SCREW WITH 2 No. PLAIN 1 No. SPRING WASHER.	2 No.	
3.	16A, 2 POLE, ON-OFF ROTARY SWITCH.	1 No.	
4.	16A, 16 AND EARTH METAL CLAD SOCKET OUTLET.	1 No.	
5.	1 MM DIA M/C SCREWS.	6 No.	
6.	14 SWG M.S. BOX WITH COVER FOR MOUNTING OF SWITCH AND SOCKET OUTLET.	1 No.	
7.	14 SWG M.S. SHEET FIXED TO COVER PLATE FROM INSIDE FOR MOUNTING OF SOCKET.	1 No.	
8.	16 MM DIA KNOCKOUT.	6 No.	

NOTES:

1. SIMILAR ARRANGEMENT CAN BE EMPLOYED FOR 20A, 5P & E, 30A, TP & E, SD WITH 30A, DP & 53A, TP SWITCH RESPECTIVELY.
2. EPOXY BASED PAINT OF SPECIFIED SHADE SHALL BE APPLIED.
3. REAR ENGRAVED PERSPEX OR LAMINATED PLASTIC NAME PLATE WITH APPROPRIATE INSCRIPTION SHALL BE FIXED ON COVER WITH OR SUITABLE ADHESIVE.

	GENERAL NOTES-EARTHING	STANDARD DRAWING NO.		REV.	SIZE
				02	A4
		SHEET NO.	1 OF 2		

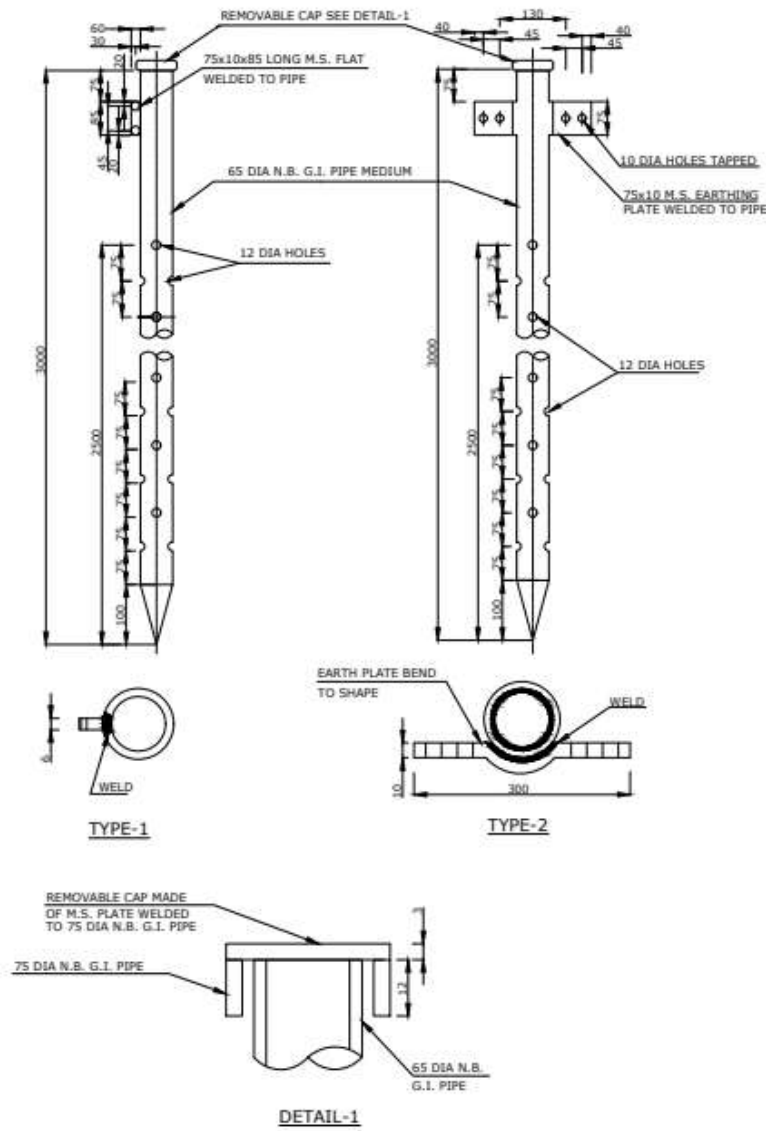
GENERAL NOTES:

1. ENTIRE EARTHING INSTALLATION SHALL COMPLY WITH THE REQUIREMENT OF IS-3043 INDIAN ELECTRICITY RULES OISD REGULATION AND OTHER APPLICABLE STATUTORY REGULATIONS AND SAFETY CODES IN THE LOCALITY OF THE INSTALLATION.
2. PIPE ELECTRODE SHALL BE USED FOR EARTH ELECTRODES. THE EARTH ELECTRODES SHALL BE KEPT SUFFICIENTLY AWAY FROM STRUCTURE TO CLEAR FOUNDATIONS, FOOTING ETC. SPACING OF MINIMUM 6 METERS SHALL BE KEPT BETWEEN ADJACENT EARTH ELECTRODES.
3. RESISTANCE OF EARTHING STATION SHALL BE MEASURED AT EACH EARTH ELECTRODE AFTER ITS INSTALLATION BY MEANS OF AN EARTH MEGGER. RESISTANCE OF EARTHING GRID SHALL BE MAINTAINED WITHIN 1 OHM (BY ADDITION OF EARTH ELECTRODE IN PARALLEL, IF NECESSARY).
4. THE MAIN EARTH LOOP (MEL) IN PLANT AREAS SHALL BE GENERALLY ROUTED UNDERGROUND. EARTH CONDUCTORS TO INDIVIDUAL EQUIPMENT SHALL BE RUN ALONG WITH POWER AND CONTROL / LIGHTING CABLES. WHEN EQUIPMENT ARE LOCATED AWAY FROM M.E.L. , SUITABLE SUB LOOPS MAY BE RUN UP TO THEM FOR DERIVING CONNECTIONS FOR INDIVIDUAL EQUIPMENT.
5. ALL ELECTRICAL EQUIPMENT SHALL BE EARTHED AT TWO DISTINCT POINTS WITH EARTH CONDUCTOR.
6. PROCESS/ UTILITY PIPE RACK COLUMN SHALL BE EARTHED AT EVERY 25 mtr. AT NEAREST AVAILABLE EARTHING NETWORK AS PER IS : 3043.
7. ALL STRUCTURE STEEL WORK TO BE CONNECTED TO EARTHING SYSTEM.
8. FOR CONDUIT WIRING OF LIGHTING CIRCUITS, FOR EARTHING OF LIGHTING FITTINGS, JUNCTION BOXES 14 SWG
9. THE LIGHTNING PROTECTION SYSTEM SHALL BE DESIGNED IN ACCORDANCE WITH IS :62305' CODE OF PRACTICE FOR PROTECTION OF BUILDING AND ALLIED STRUCTURES AGAINST LIGHTNING'.
10. EARTH SYSTEM AND LIGHTNING PROTECTION SHALL BE BONDED TO EACH OTHER TO PREVENT SIDE FLASH OVER, IF ADEQUATE CLEARANCE BETWEEN THE TWO SYSTEM CAN NOT BE MAINTAINED.
11. WHEN EQUIPMENT DO NOT HAVE EXTERNAL EARTHING TERMINAL ELECTRICAL CONTRACTOR SHALL PROVIDE THE SAME ON EQUIPMENT. SIZES OF EARTH CONDUCTORS SHALL GENERALLY AS PER REQUIREMENTS.

	GENERAL NOTES-EARTHING	STANDARD DRAWING NO.		REV.	SIZE
				02	A4
		SHEET NO.	2 OF 2		

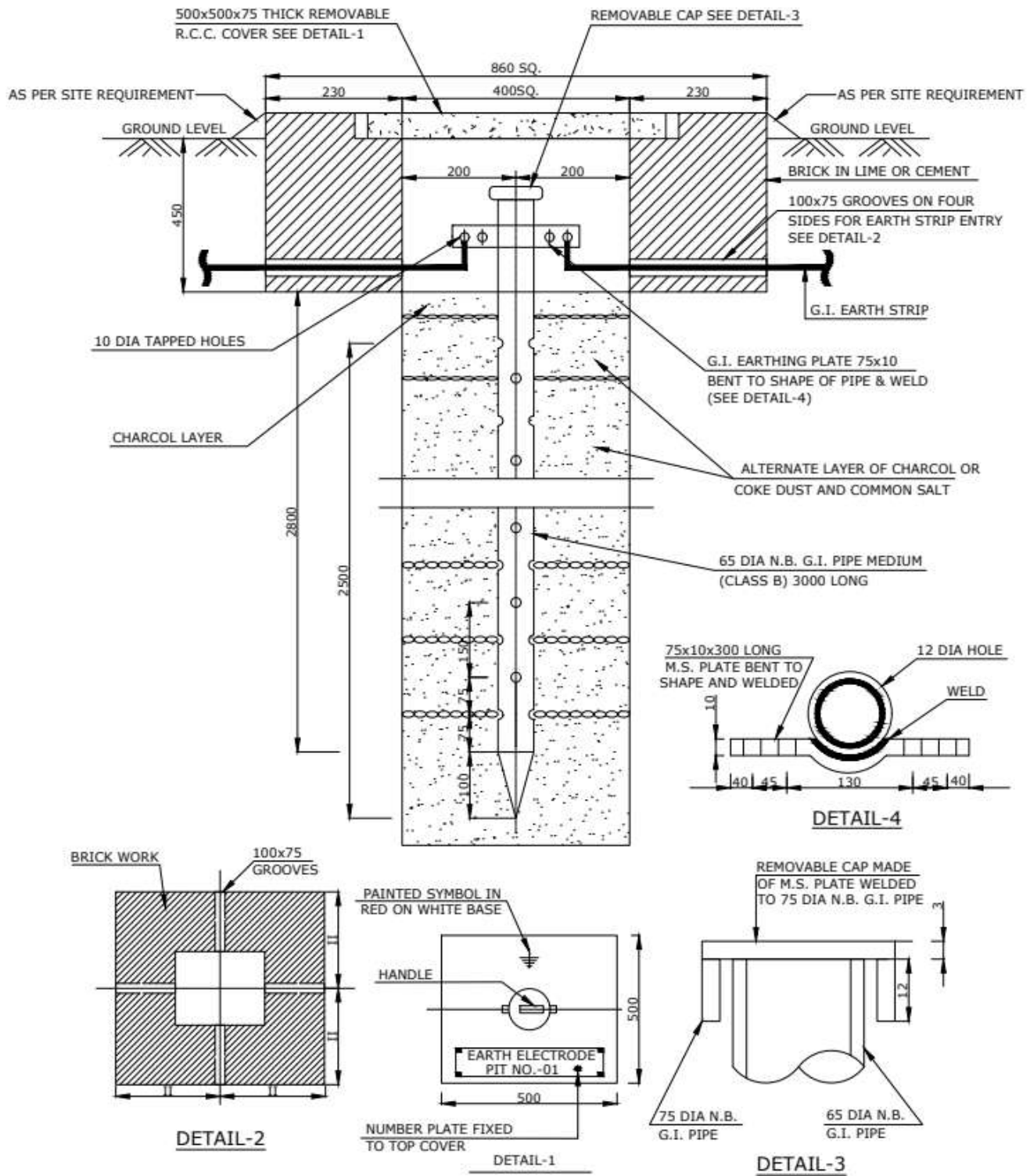
EQUIPMENT EARTHING SCHEDULE

TYPE OF EQUIPMENT	EARTHING CONDUCTOR SIZE (SEE NOTE-1)
MOTORS UPTO & 3.7 kW	8 SWG SOLID G.I. WIRE
MOTORS FROM 5.5kW TO 30kW & WELDING RECEPTACLES	10mm (3/8") DIA G.I. WIRE ROPE
MOTORS ABOVE 30kW INCLUDING HV MOTORS	16mm (5/8") DIA G.I. WIRE ROPE/ 40x5 mm G.I. STRIP
BUILDING COLUMNS	40x5 mm G.I. STRIP
STORAGE TANKS (VERTICAL & HORIZONTAL)	40x5 mm G.I. STRIP
LOADING RACKS	40x5 mm G.I. STRIP
VESSELS & HEAT EXCHANGERS	40x5 mm G.I. STRIP
SMALL EQUIPMENT & INSTRUMENTS	8 SWG SOLID G.I. WIRE
LIGHTING, POWER & INSTRUMENT PANEL	10mm (3/8") DIA G.I. WIRE ROPE
MAIN EARTH BUS / MV & HT SWITCH GEAR INTERCONNECTIONS / POWER TRANSFORMER	AS SPECIFIED
EHV & HV SUB-STATION	AS SPECIFIED
PUSH BUTTON STATION	8 SWG SOLID G.I. WIRE
STREET LIGHTING POLES	10mm (3/8") DIA G.I. WIRE ROPE
LIGHTING TRANSFORMER	16mm (5/8") DIA G.I. WIRE ROPE
PIPE RACK	40x5 mm G.I. STRIP
BONDING OF PIPE	25 SQ. mm INSULATED FLEXIBLE CU. CABLE
LIGHTNING PROTECTION	25x3 mm G.I. EARTH STRIP

**NOTES:**

1. THE PIPE ASSEMBLY SHALL BE HOT DIP GALVANISED AFTER FABRICATION.
2. UNLESS STATED OTHERWISE ON PLAN DRAWINGS, ONLY TYPE-2 SHALL BE USED.

	EARTH ELECTRODE IN TEST PIT	STANDARD DRAWING NO.		REV.	SIZE
				02	A4
		SHEET NO.	1 OF 2		



NOTES:

1. THE PIPE ASSEMBLY SHALL BE HOT DIP GALVANISED AFTER FABRICATION.
2. BRICK WORK SHALL BE DONE AFTER COMPACTING THE SOIL.

TYPICAL DETAILS OF DIRECTLY
BURIED CHEMICAL EARTHING

STANDARD DRAWING NO.

REV.

SIZE

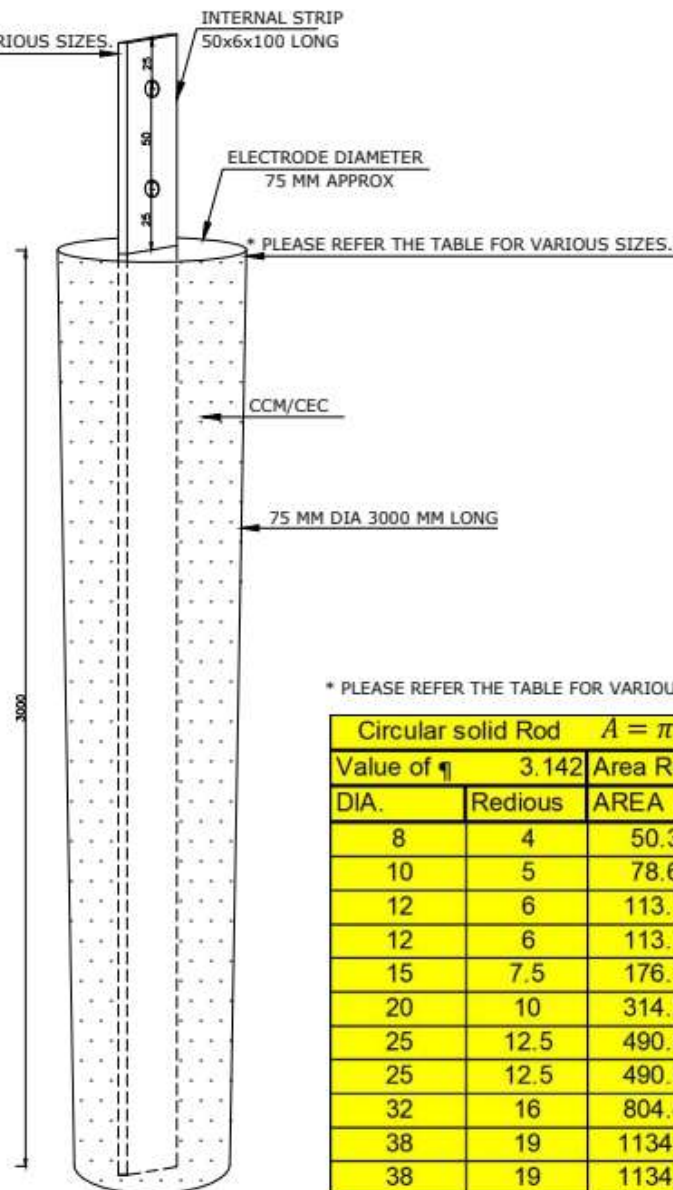
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SHEET NO.

2 OF 2

* PLEASE REFER THE TABLE FOR VARIOUS SIZES.

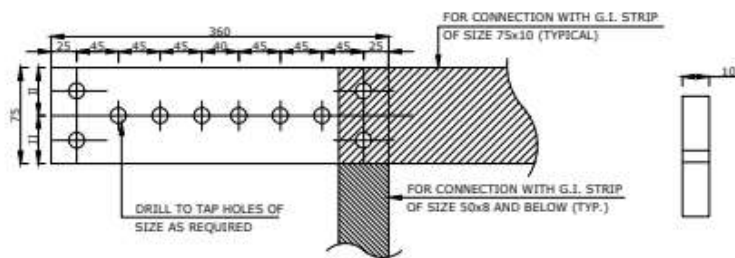


* PLEASE REFER THE TABLE FOR VARIOUS SIZES.

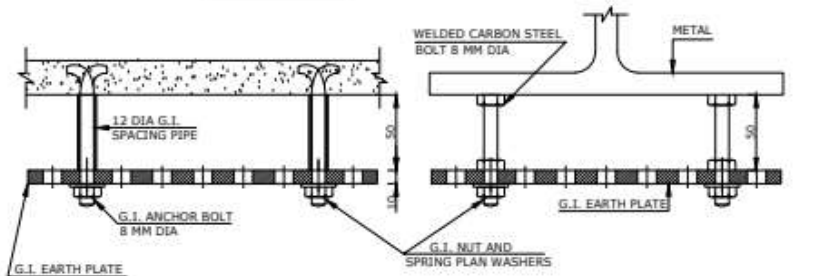
Circular solid Rod		$A = \pi r^2$	A = L X W	Earthing Strip		
Value of η		Area Rod	Area Strip	Earthing strip		
DIA.	Radius	AREA	AREA	Length	Width	Nos
8	4	50.3	50	20	2.5	1
10	5	78.6	75	25	3	1
12	6	113.1	125	25	5	1
12	6	113.1	128	32	4	1
15	7.5	176.7	192	32	6	1
20	10	314.2	300	50	6	1
25	12.5	490.9	500	50	10	1
25	12.5	490.9	520	65	8	1
32	16	804.4	750	75	10	1
38	19	1134.3	1200	100	12	1
38	19	1134.3	1200	75	8	2

NOTES:

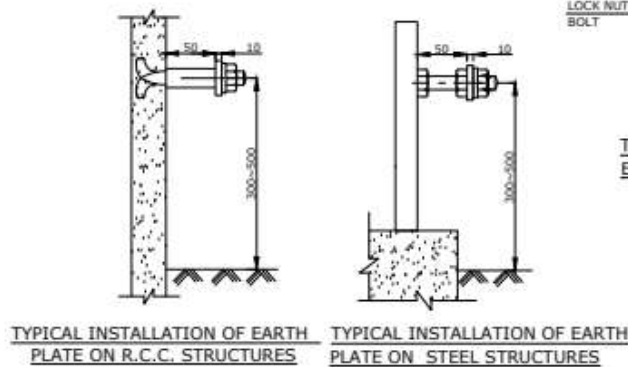
1. CCM-CRYSTALLINE CONDUCTIVE MATERIAL / CEC-CHEMICAL EARTHING COMPOUND.
2. IT'S SUPERIOR CONDUCTIVE MATERIAL THAT SOLVES TOUGHEST GROUNDING PROBLEMS & MAKES CONDUCTIVITY LAYER CONTACTING WITH A ELECTRODE CLOSELY.
3. THE CCM/CEC NATURAL FEATURES OF STRONG ABSORBENT & MOISTURE RETENTION KEEP THE SOIL MOIST FOR A LONG TIME AND REDUCE SURROUNDING SOIL RESISTANCE.
4. CCM/CEC ENHANCING COMPOUND IS ENVIRONMENT FRIENDLY AND DOES NOT HARM GROUND WATER & NO HAZARDOUS CHEMICAL.
5. CCM/CEC CONTAINS CORROSION INHIBITOR TO PROTECT THE ELECTRODES AND PIPES.
6. CCM/CEC IS HIGHLY CONDUCTIVE & HANDLE ANY CLIMATIC CONDITION.
7. GI STRIP SHALL BE HOT DEEP GALVANIZE ZINK OXIDE.
8. CCM/CEC SHALL BE GRAPHITE,ALUMINUM SILICATE,IRON OXIDE,NATURAL EARTH MINERALS.
9. EARTHING SHALL BE COMPLY TO LATEST IS-3043.



G.I. EARTH PLATE

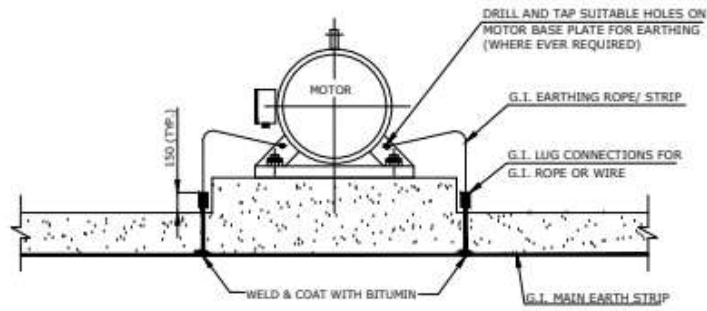


TYPICAL FIXING DETAIL OF G.I. EARTH STRIP TO EARTH PLATE

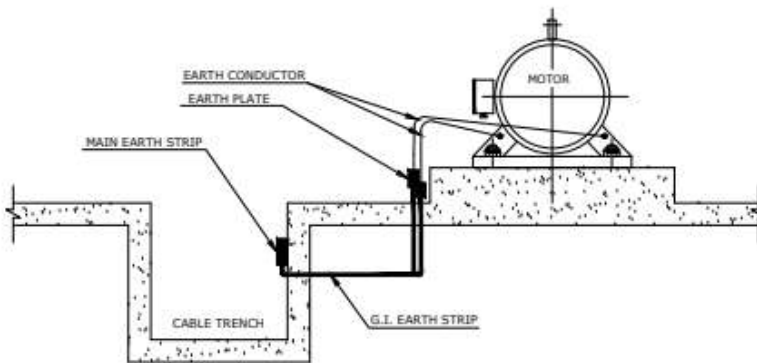


NOTES:

1. WHERE FIRE PROOFING OF STEEL STRUCTURES ARE ENCOUNTERED LENGTH OF CARBON STEEL BOLT SHALL BE INCREASED FOR FIXING OF EARTH PLATE.
2. ALL CONNECTIONS WITH EARTH PLATE SHALL BE MADE WITH G.I. BOLT, NUT, SPRING AND PLAIN WASHERS.



DETAIL-1
REMOTE EARTH PLATE



DETAIL-2
LOCAL EARTH PLATE

NOTES:

1. MOTOR FOUNDATION BOLT SHALL NOT BE USED FOR EARTHING.

TYPICAL ARRANGEMENT FOR
TRANSFORMER EARTHING
(NEUTRAL SOLIDLY EARTHED)

STANDARD DRAWING NO.

REV.

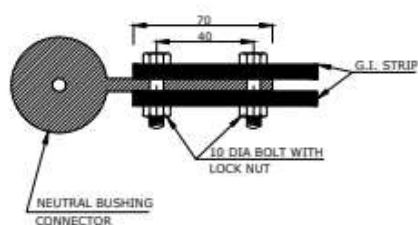
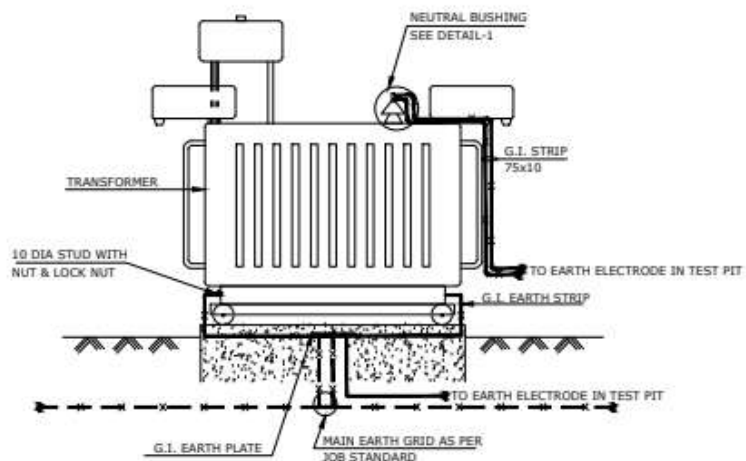
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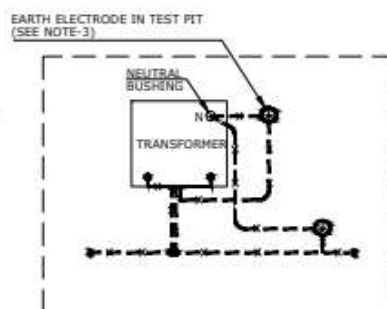
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SHEET NO.

1 OF 1



DETAIL-1

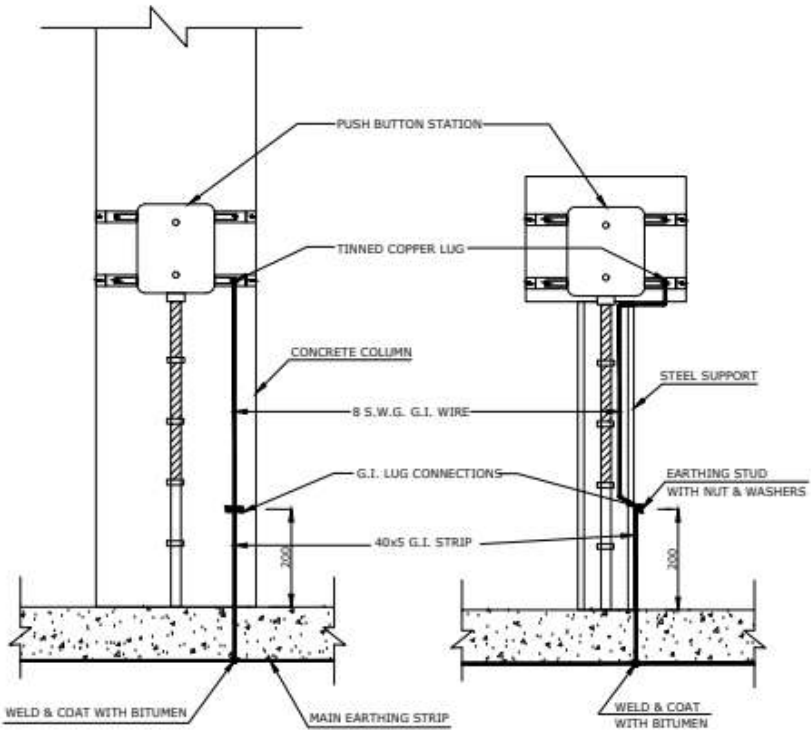


LING DIAGRAM

NOTES:

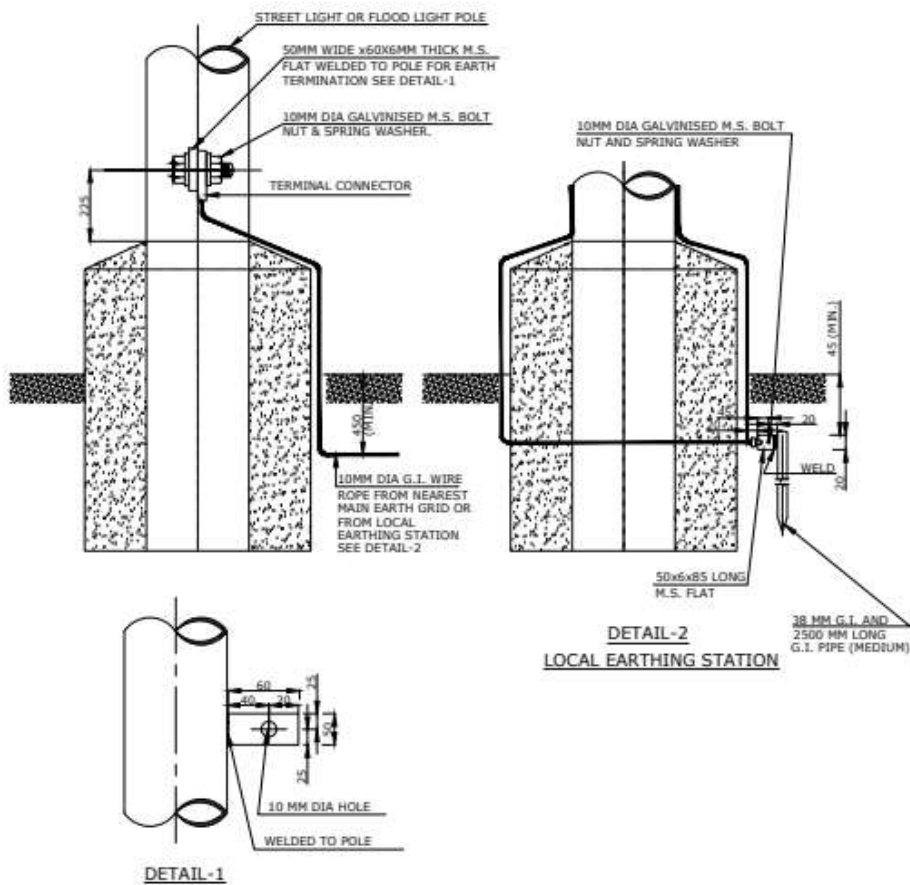
1. WHEREVER SEPERATE NEUTRAL BUSHING FOR EARTHING IS NOT PROVIDED THE NEUTRAL EARTHING SHALL BE DONE FROM BUS DUCT.
2. EARTH ELECTRODE IN TEST PITS SHALL BE SO LOCATED THAT DISTANCE BETWEEN TWO PITS SHALL BE MINIMUM 6 METER.
3. WHERE TRANSFORMERS NEUTRAL EARTHING IS DONE THROUGH N.G.R. THE CONNECTIONS BETWEEN NEUTRAL AND N.G.R. SHALL BE THROUGH CABLE. THE OTHER END END OF N.G.R. SHALL BE CONNECTED TO EARTH ELECTRODE.

	TYPICAL EARTH CONNECTION FOR PUSH BUTTON STATION	STANDARD DRAWING NO.		REV.	SIZE
		1		02	A4
		SHEET NO.	1 OF 1		



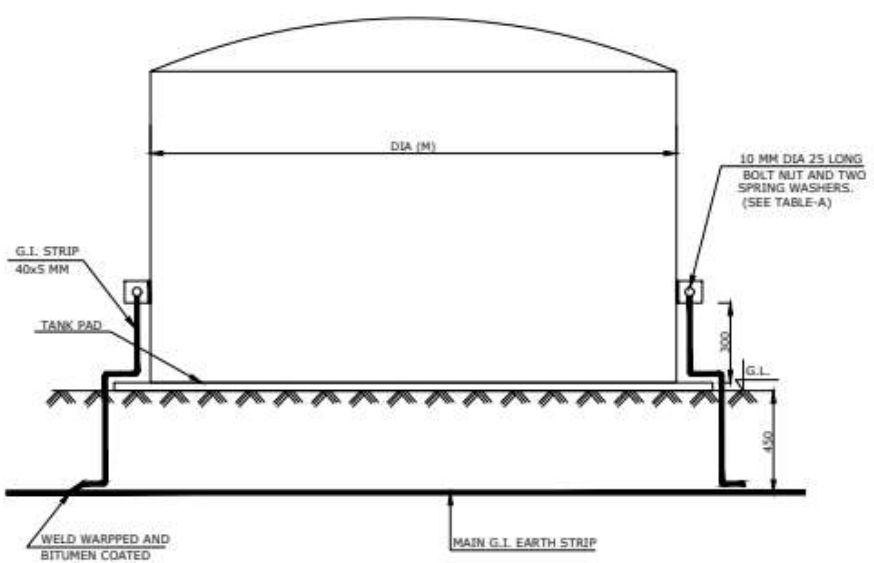
NOTES:

1. ALTERNATIVELY CONNECTION SHALL BE TAKEN FROM THE NEAREST AVAILABLE EARTH PLATE.



NOTES:

1. USE TWO EARTH WIRES IF VOLTAGE IN THE POLE JUNCTION BOX IS 415 VOLTS.



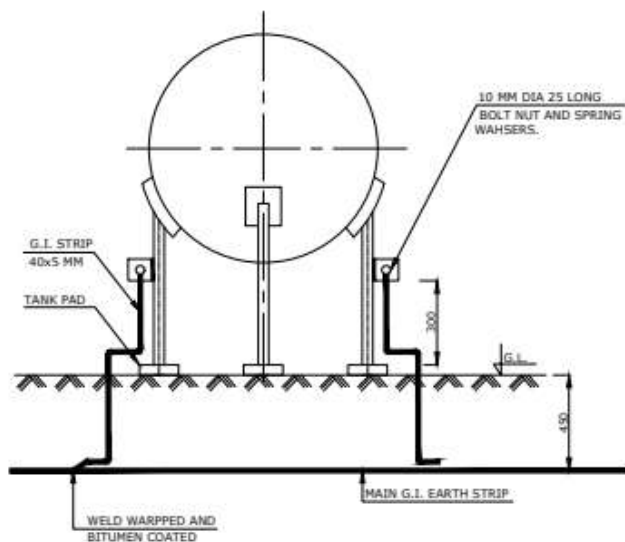
DETAIL-1 (TANK)

TABLE-A

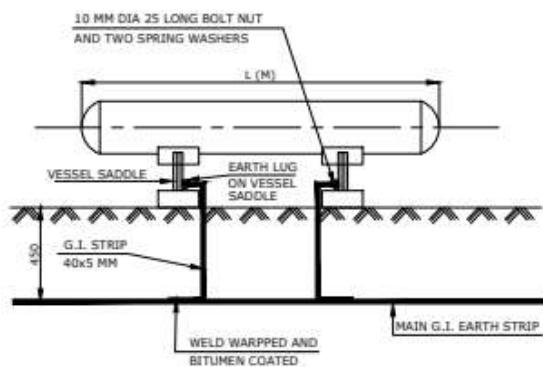
TANK DIAMETER (M)	EARTHING CONNECTION
<5	1
<20	2 AT 180°
<30	3 AT 120°
>40	4 AT 90°
>50	5 AT 72°
>60	6 AT 60°
>70	7 AT 51.43°
>80	8 AT 45°
>90	9 AT 40°



EARTH LUG ON TANK



DETAIL-3 (SPHERE)



DETAIL-2 (HORIZONTAL VESSEL)

NOTES:

1. TWO NOS. OF EARTHING LUGS WILL BE AVAILABLE ON LEG SUPPORTS (DIAMETRICALLY OPPOSITE) OF EQUIPMENT FOR PROVIDING EARTH CONNECTION.
2. ALL VESSELS, SPHERES AND COLUMNS SHALL HAVE TWO EARTH CONNECTIONS IN GENERAL.
3. HORIZONTAL VESSEL OF LENGTH MORE THAN 20 METERS:-
TWO EARTH LUGS ARE PROVIDED ON EACH SADDLE OF HORIZONTAL VESSELS.
AS SUCH THERE SHALL BE TWO EARTH CONNECTIONS TO THE EARTH GRID FROM EACH SADDLE.

TYPICAL EARTHING OF CABLE TRAY
AND ELECTRIC MOTOR

STANDARD DRAWING NO.

REV.

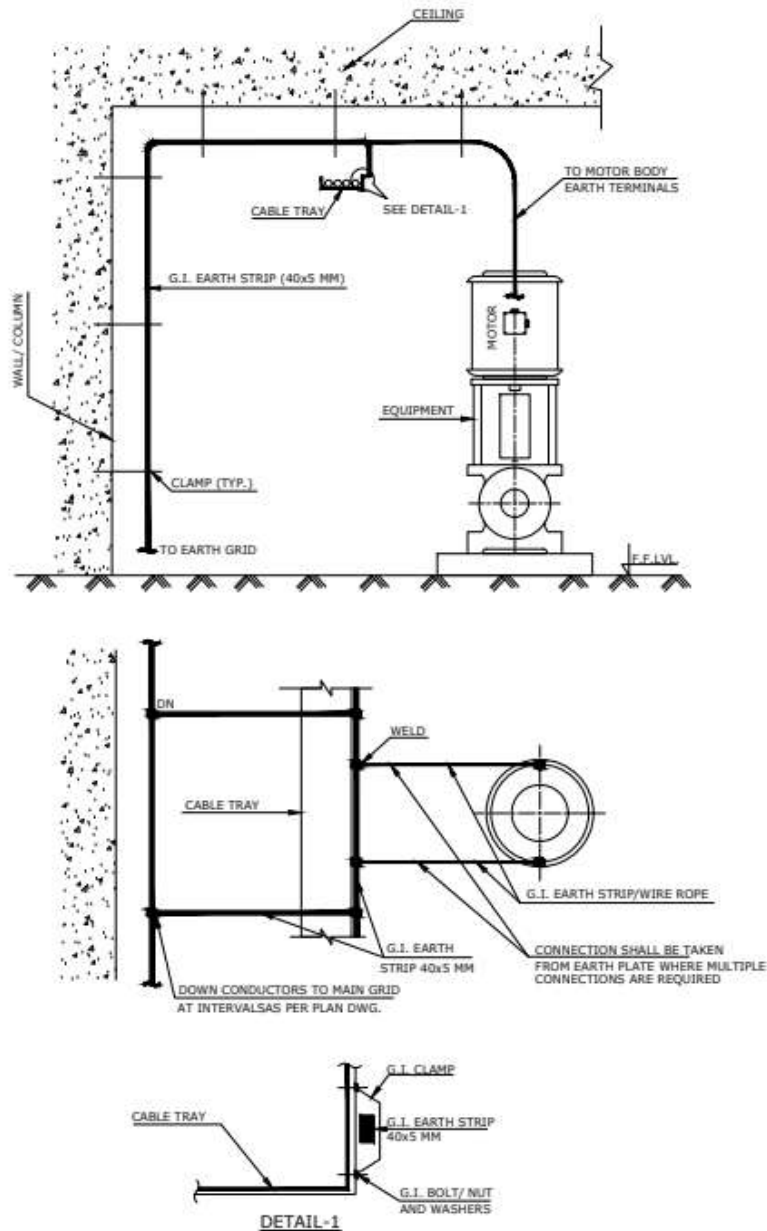
SIZE

02

A4

SHEET NO.

1 OF 1



TYPICAL EARTHING ARRANGEMENT
FOR PROCESS EQUIPMENT

STANDARD DRAWING NO.

REV.

SIZE

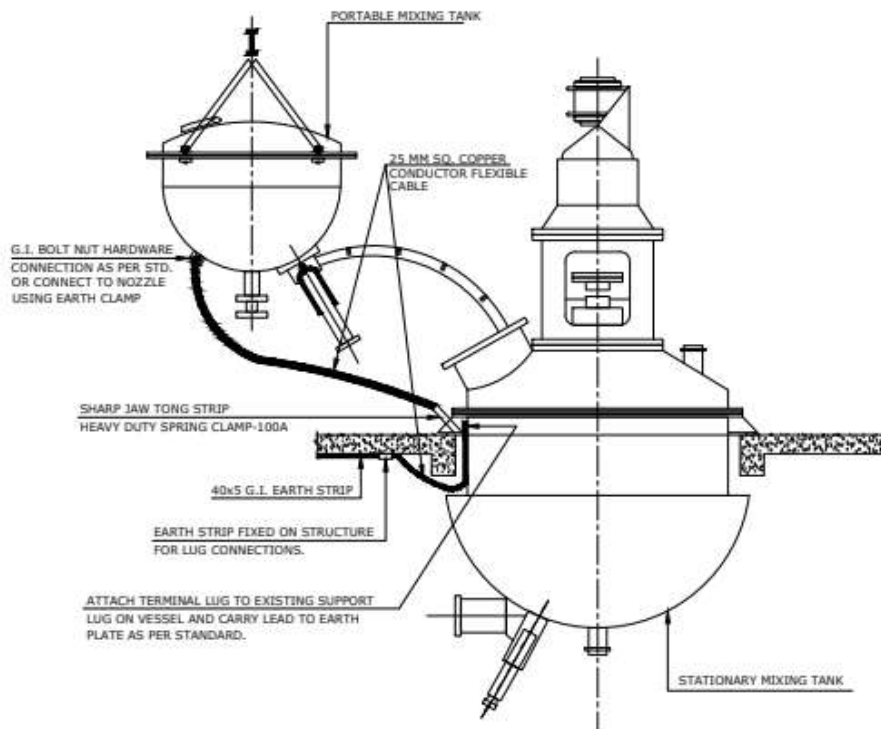
1

02

A4

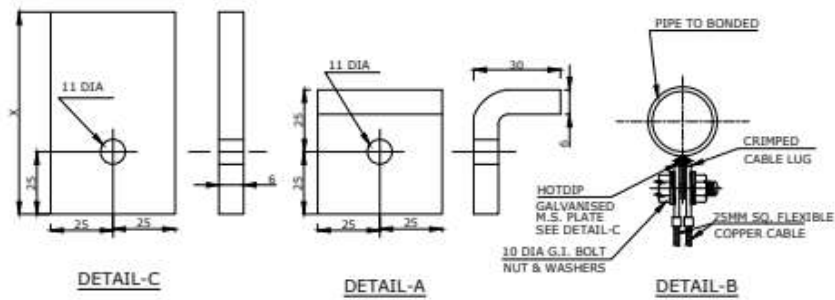
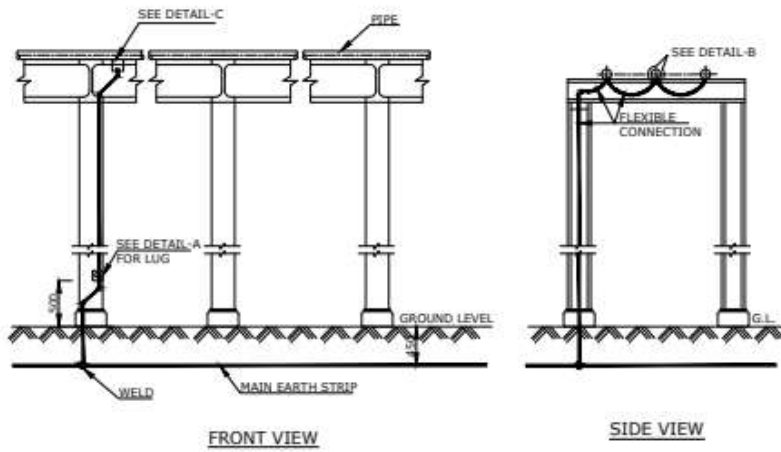
SHEET NO.

1 OF 1

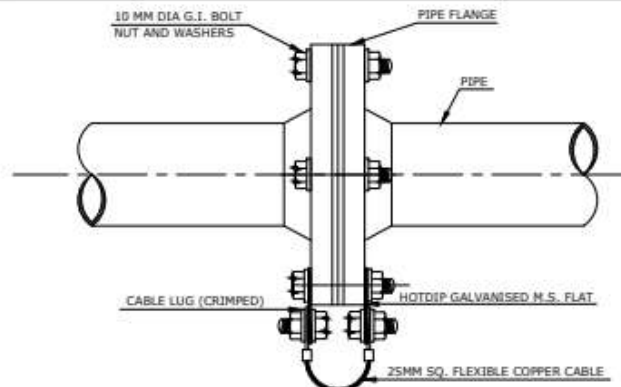
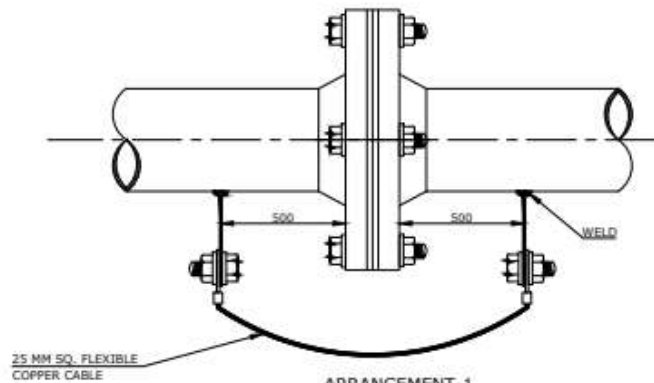
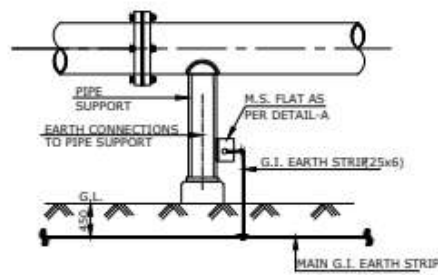


NOTES:

1. ALL PROCESSING EQUIPMENT SUCH AS MIXTURES, CHURNS, AUTOCLAVES, COLUMNS, CENTRIFUGES, FILTER PRESS PUMPS ETC. SHALL BE EARTHED IF NOT INDIRECT CONTACT WITH PROPERLY EARTHED STEEL MEMBERS.
2. ALL TEMPORARY EARTH CONNECTIONS SHALL BE MADE BEFORE OPENING THE VESSEL.

**NOTES:**

1. UNLESS MENTIONED OTHERWISE ON PLANS OR JOB SPECIFICATIONS, THE PIPELINES SHALL BE BONDED AND EARTHED AT THE ENTRY AND EXITS POINTS OF BATTERY LIMIT.
2. STEEL PIPE RACKS IN THE PROCESS UNIT AND OFFSITE AREA SHALL BE EARTHED AT EVERY 24 METRES.

ARRANGEMENT-2ARRANGEMENT-1ARRANGEMENT-3NOTES:

1. HOT DIP GALVANISHED M.S. FLAT (50x 10x (x+50) WHERE x IS THE INSULATION THICKNESS) SHALL BE PROVIDED BY THE PIPING CONTACTOR.
2. SUPPLY OF FLEXIBLE COPPER CABLE, LUGS, BOLTS, NUTS, WASHERS HARDWARE AND MAKING CONNECTIONS, SHALL BE DONE BY ELECTRICAL CONTACTOR.

TYPICAL EARTHING
ARRANGEMENT-WAGON

STANDARD DRAWING NO.

REV.

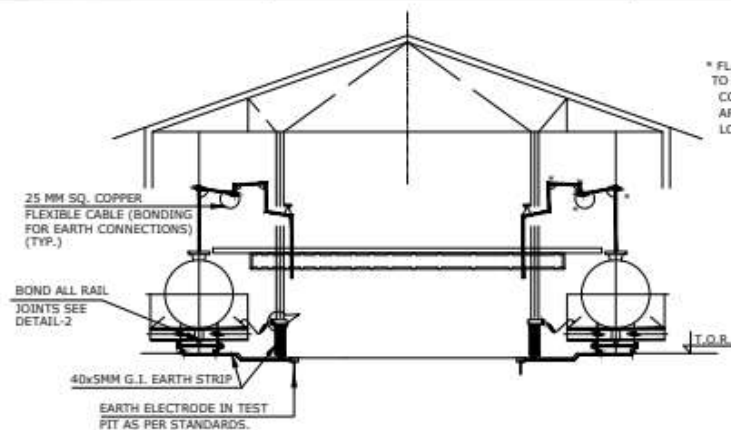
SIZE

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A4

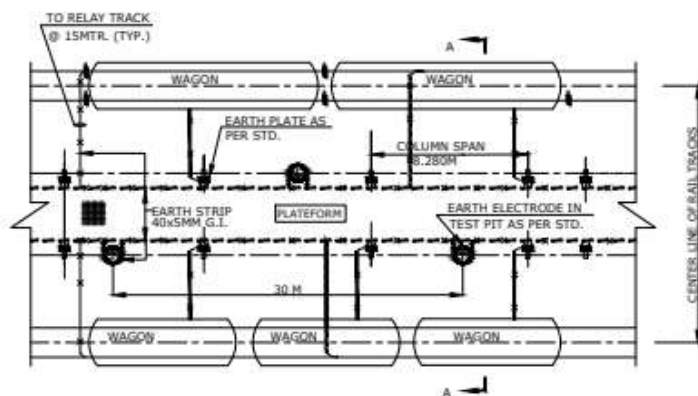
SHEET NO.

1 OF 2



SECTION A-A

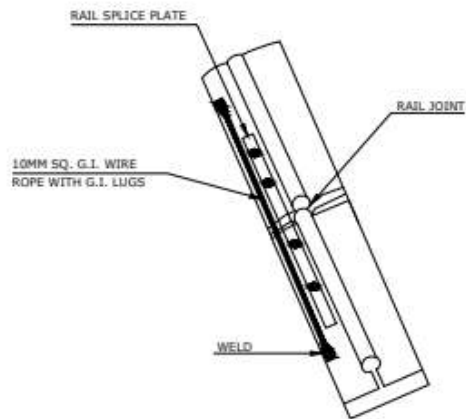
* FLEXIBLE JUMPER CONNECTIONS ARE
TO BE PROVIDED BY ELECTRICAL
CONTRACTOR ONLY WHEN THE SAME
ARE NOT SUPPLIED AS A PART OF
LOADING ARM PACKAGES.



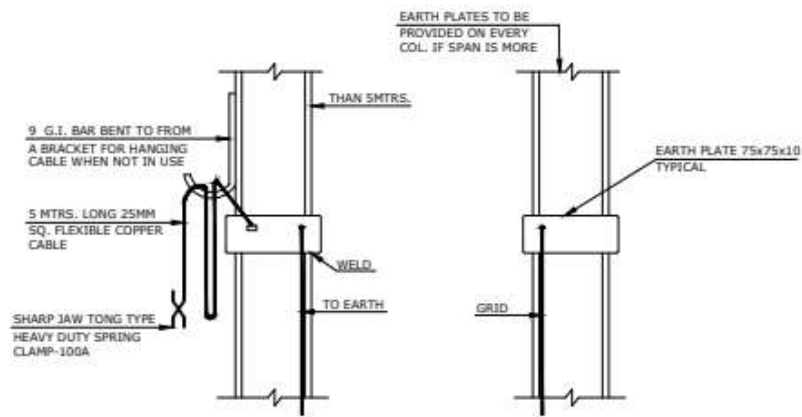
TYPICAL PART PLAN

NOTES:

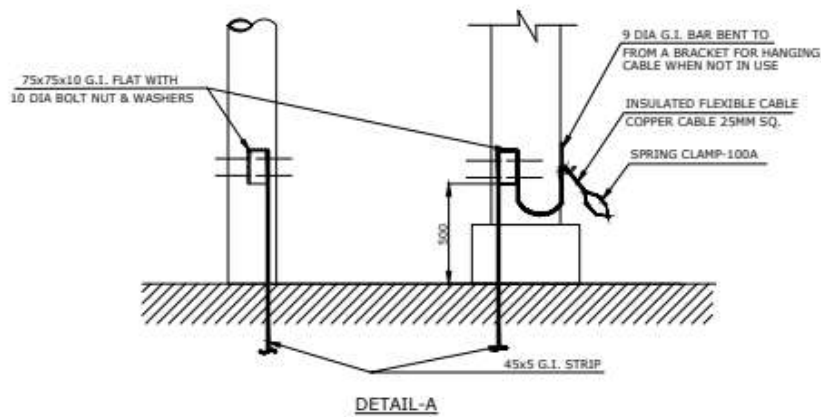
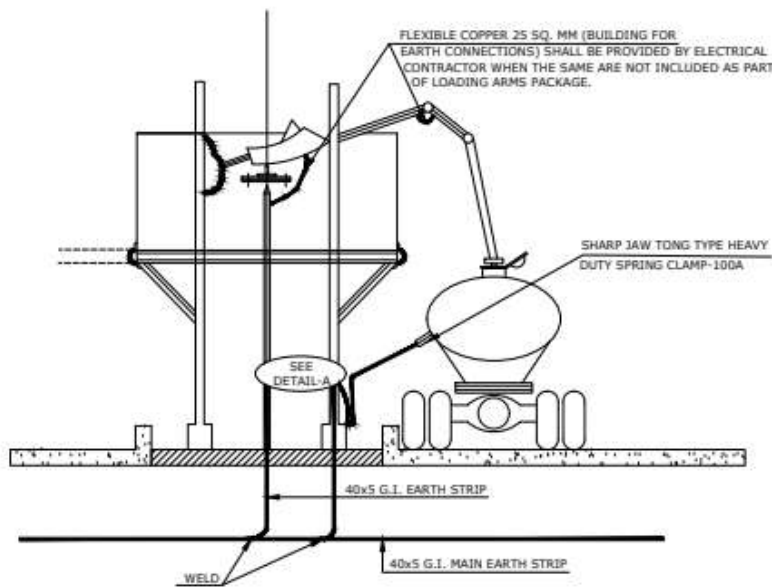
1. SUPPLY OF FLEXIBLE CABLE AND SPRING CLAMPS BY ELECTRICAL CONTRACTOR ARE NOT REQUIRED WHEN MONITORING OF EARTH SCHEME AND THE ABOVE MATERIAL ARE INCLUDED AS PART OF PLANT AUTOMATION PACKAGE.



BONDING OF SINGLE RAIL
DETAIL-2

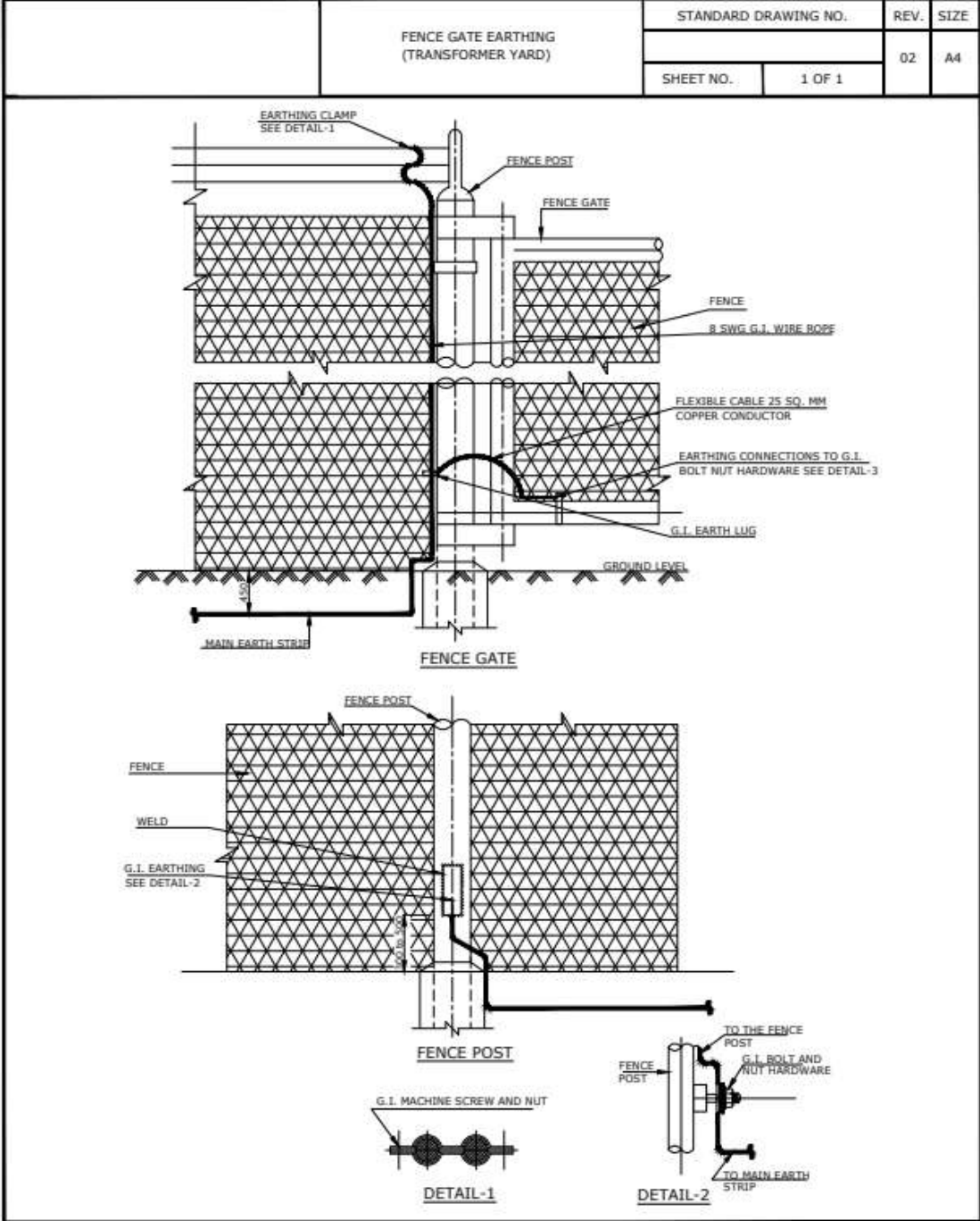


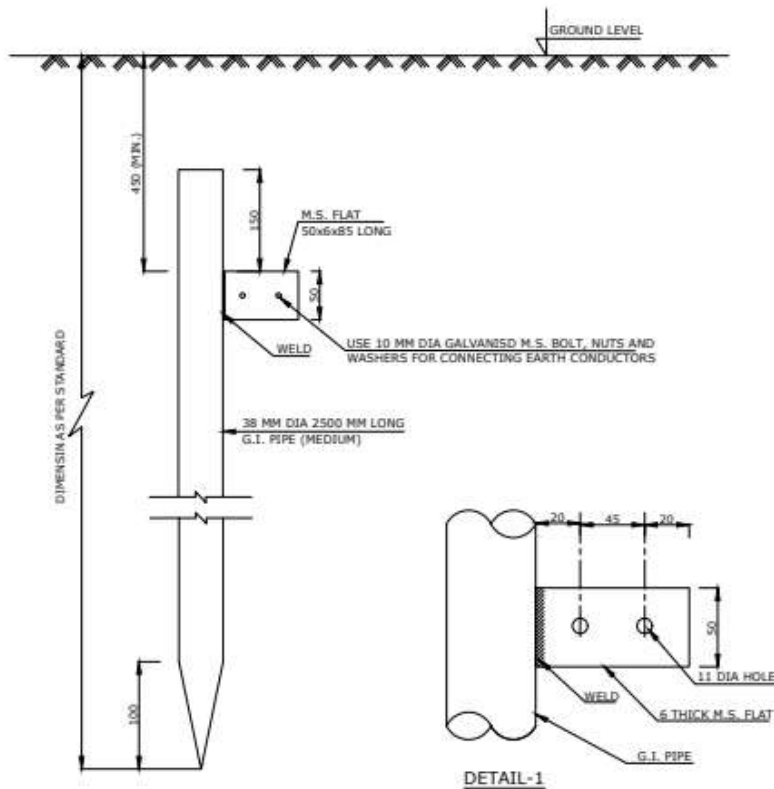
DETAIL-1



NOTES:

1. SUPPLY OF FLEXIBLE CABLE AND SPRING CLAMPS BY ELECTRICAL CONTRACTOR ARE NOT REQUIRED WHEN MONITORING OF EARTH SCHEME AND THE ABOVE MATERIAL ARE INCLUDED AS PART OF PLANT AUTOMATION PACKAGE.



**NOTES:**

1. ASSEMBLY SHALL BE HOT DIP GALVANISED AFTER FABRICATION.
2. THE ELECTRODE SHALL BE DRIVEN TO A DEPTH TO REACH PERMANENT MOIST SOIL.

TYPICAL DETAILS OF PLATE
EARTH ELECTRODE

STANDARD DRAWING NO.

REV.

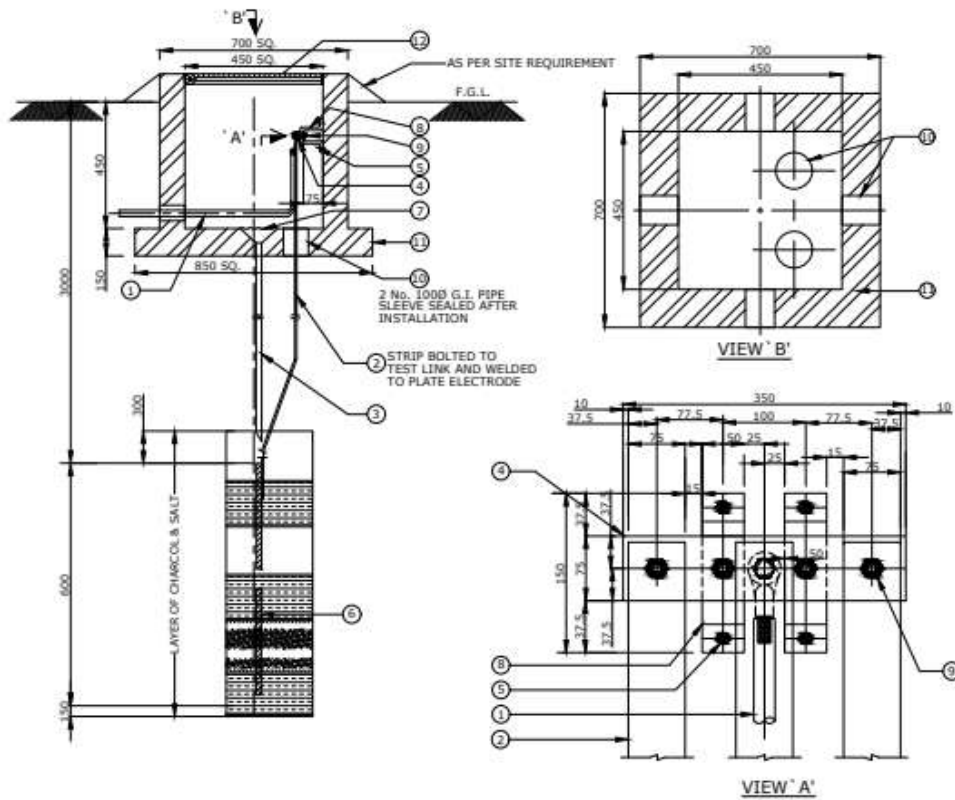
SIZE

02

A4

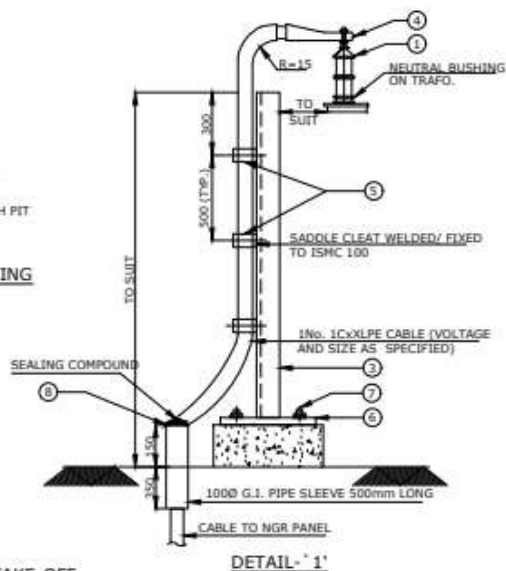
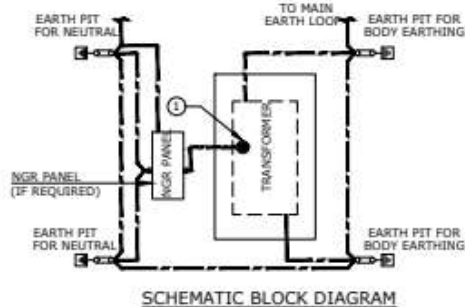
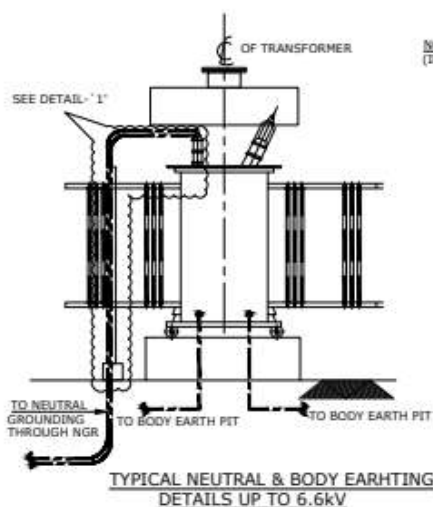
SHEET NO.

1 OF 1



MATERIAL TAKE-OFF

ITEM No.	DESCRIPTION	QUANTITY	REMARKS
1.	75x10mm G.I. STRIP/ 25x3mm COPPER STRIP/ 1" PVC INSULATED CABLES AS SPECIFIED IN CONTRACT DOCUMENTS.	AS REQUIRED	
2.	75x8mm G.I. STRIP/ 25x3mm COPPER STRIPS	2 No.	
3.	250 G.I. PERFORATED PIPE FOR WATERING.	1 No.	
4.	350x75x10 mm THICK G.I. TEST LINK	1 No.	
5.	MB STAINLESS STEEL ANCHOR STUD WITH BOLT AND WASHER	4 No.	
6.	600x600x10 mm THICK G.I./3mm THICK COPPER EARTH ELECTRODE.	1 No.	
7.	WIRE MESH	1 No.	
8.	50x6 mm THICK 350 LONG G.I. SADDLE.	2 No.	
9.	M10 STAINLESS STEEL BOLT WITH 2 No. PLAIN & 1 No. SPRING WASHERS	5 No.	
10.	1000 G.I. PIPE SLEEVE SEALED AFTER INSTALLATION.	6 No.	
11.	BRICK WATERING CHAMBER WITH PLASTER FINISH INSIDE & OUTSIDE	1 No.	
12.	C.I. REMOVABLE COVER HINGED TO CAST IRON FRAME.	1 No.	

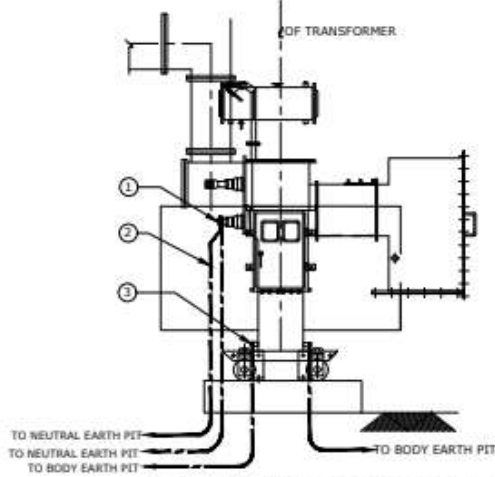


MATERIAL TAKE-OFF

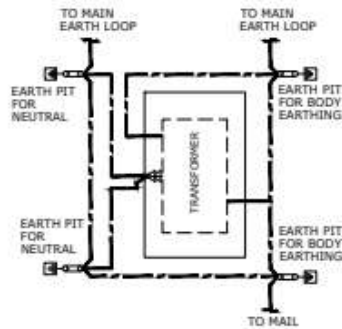
ITEM No.	DESCRIPTION	QUANTITY	REMARKS
1.	NEUTRAL BUSHING	1 No.	
2.	NUT & SPRING WASHERS TO SUIT TRANSFORMER BODY EARTHING	2 No.	
3.	ISMC 100-LENGTH TO SUIT	1 No.	
4.	CABLE LUG SUITABLE FOR CABLE SIZE	1 No.	
5.	MS SADDLE/ CLEAT TO SUIT CABLE DIA.	AS REQUIRED	
6.	150x150x6mm THICK PLATE WITH 4 No. 12Ø HOLES.	1 No.	
7.	M10 ANCHOR STUD WITH PLAIN AND SPRING WASHERS.	4 No.	
8.	SEALING COMPOUND	AS REQUIRED	

NOTES :-

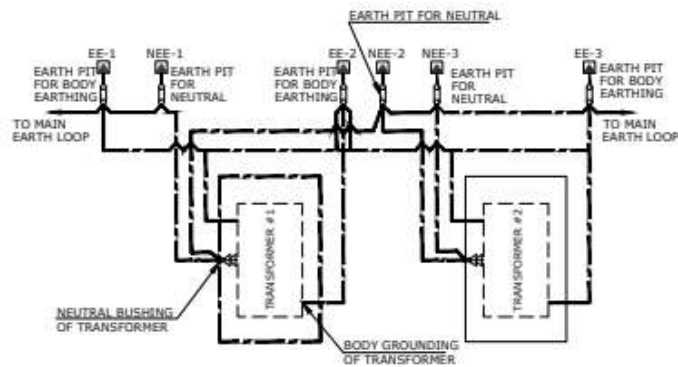
1. ALL HARDWARE SHALL BE OF STAINLESS STEEL.
2. ALL STEEL STRUCTURE USED FOR ELECTRICAL INSTALLATION SHALL BE APPLIED TWO COATS OF ANTI CORROSIVE PRIMER AND EPOXY PAINT OF APPROVED SHADE.



TYPICAL NEUTRAL & BODY EARTHING
DETAILS UP TO 0.433kV



SCHEMATIC DIAGRAM
FOR SINGLE TRANSFORMER



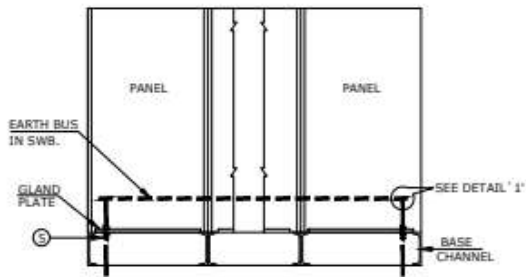
SCHEMATIC DIAGRAM
FOR TWO TRANSFORMER

MATERIAL TAKE-OFF

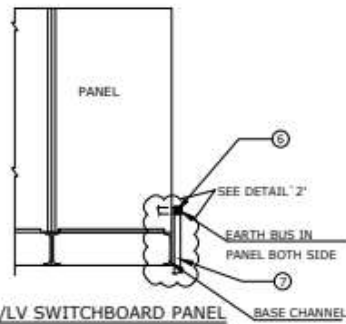
ITEM NO.	DESCRIPTION	QUANTITY	REMARKS
1.	NEUTRAL BUSHING BY TRANSFORMER VENDOR	-	
2.	G.I. EARTH STRIP	AS PER DRG.	
3.	EARTHING PAD WITH BOLT NUT & SPRING WASHERS BY TRANSFORMER VENDOR	-	

NOTES :-

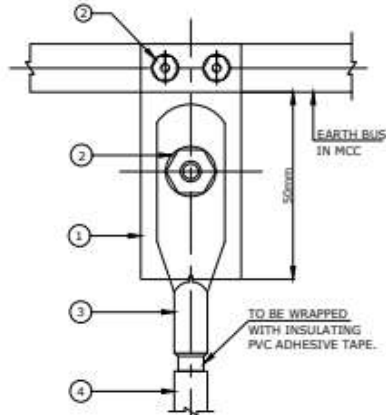
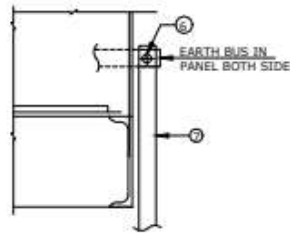
- ALL HARDWARE SHALL BE OF STAINLESS STEEL.
- ALL DAMAGE TO GALVANISED FINISHES SHALL BE PAINTED WITH ZINC RICH PAINT.
- ALL STEEL STRUCTURE USED FOR ELECTRICAL INSTALLATION SHALL BE APPLIED TWO COATS OF ANTI CORROSIVE PRIMER AND EPOXY PAINT OF APPROVED SHADE.



HV/LV SWITCHBOARD PANEL



HV/LV SWITCHBOARD PANEL

DETAIL '1'
EARTHING BY CABLE
ALTERNATIVE-1DETAIL '2'
EARTHING BY G.I. STRIP
ALTERNATIVE-2

MATERIAL TAKE-OFF

ITEM No.	DESCRIPTION	QUANTITY	REMARKS
1.	COPPER/ALUMINUM ADAPTER PLATE.	2 No.	ALT.-1
2.	M10 STAINLESS STEEL BOLT WITH 2No. PLAIN & 1No. SPRING WASHERS.	6 No.	ALT.-1
3.	CABLE LUG AND SOLDER	2 No.	ALT.-1
4.	1C ALUMINUM PVC INSULATED CABLE, CABLE SIZE AS SPECIFIED IN CABLE SCHEDULE	AS REQUIRED	ALT.-1
5.	CABLE GLAND SUITABLE FOR ITEM No. 4	2 No.	ALT.-1
6.	M10 BOLTS WITH 2No. PLAIN & 1No. SPRING WASHERS.	2 No.	ALT.-2
7.	G.I. STRIP.	AS REQUIRED	ALT.-2

NOTES :-

- PETROLEUM CONDUCTING JELLY SHALL BE APPLIED TO ALL SURFACES TO BE JOINED.
- ALL STEEL STRUCTURE USED FOR ELECTRICAL INSTALLATION SHALL BE APPLIED TWO COATS OF ANTI CORROSIVE PRIMER AND EPOXY PAINT OF APPROVED SHADE.
- ALL HARDWARE SHALL BE OF STAINLESS STEEL.

STANDARD DRAWING
LADDER TYPE CABLE TRAY

STANDARD DRAWING NO.

REV.

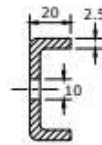
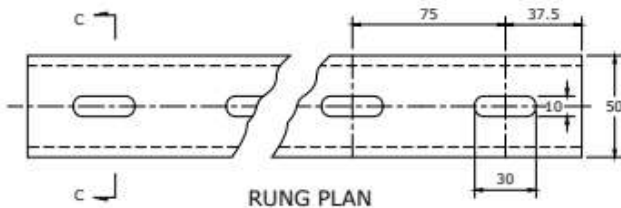
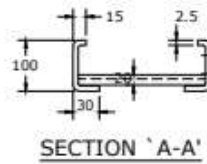
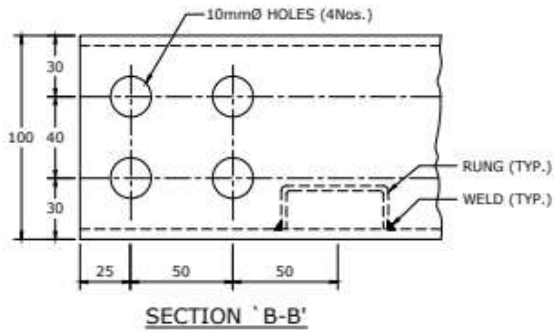
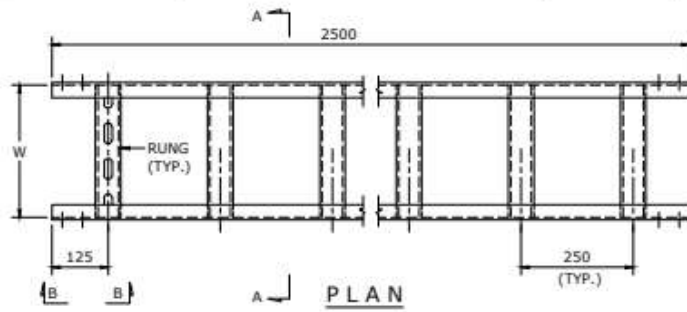
SIZE

02

A4

SHEET NO.

1 OF 1

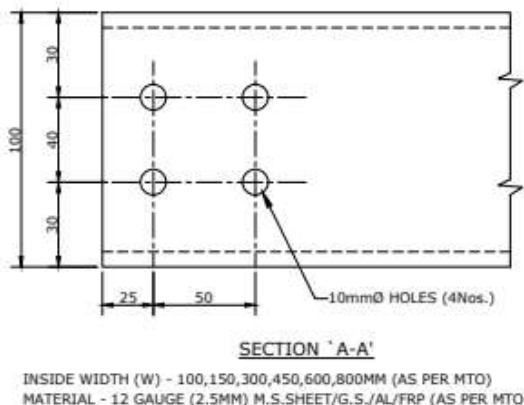
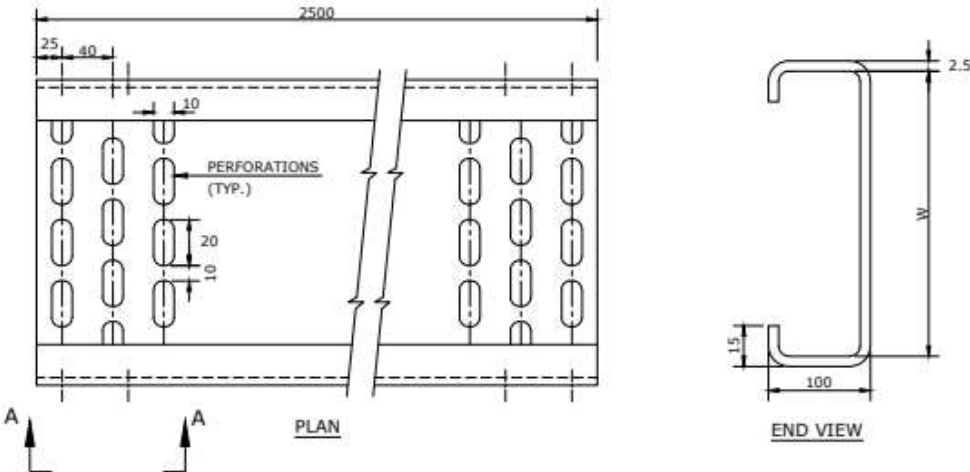


INSIDE TRAY WIDTH (W) - 150,300,450,600,800MM (AS PER MTO)
MATERIAL - 12 GAUGE (2.5MM) M.S.SHEET/G.S./AL/FRP (AS PER MTO)

NOTES:

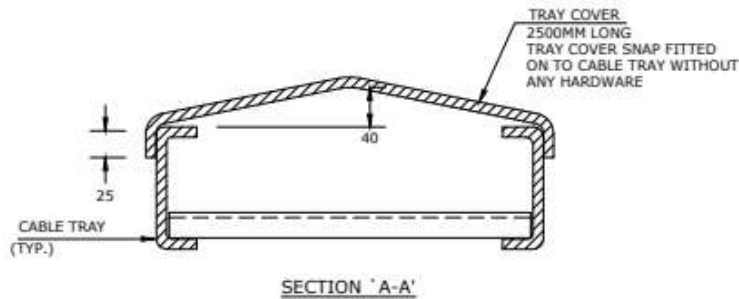
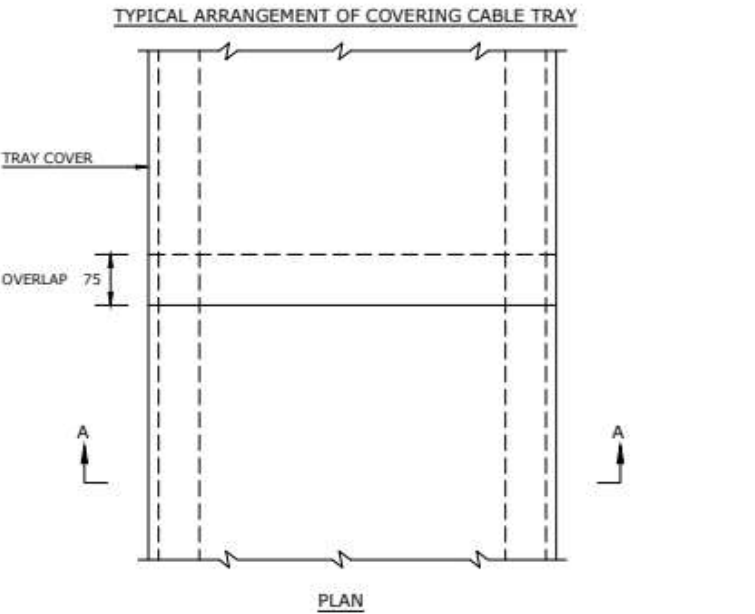
1. ALL DIMENSIONS ARE IN MM.
2. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFIRMED TO RELEVANT IS/INTERNATIONAL STANDARDS.
3. THE MATERIAL DIMENSIONAL DETAILS SHOWN ARE TYPICAL FOR GS STRESS.
4. EACH CABLE TRAY SHALL BE SUPPLIED COMPLETE WITH MATCHING COUPLER PLATES WITH REQUIRE HARDWARE AS PER DRG. No. SD-75-6706.
5. CABLE TRAYS SHALL DESIGN FOR 3000mm SUPPORT SPAN UNLESS NOTED OTHERWISE FOR SPECIFIED TRAY LOADING.

1	STANDARD DRAWING PERFORATED TYPE CABLE TRAY	STANDARD DRAWING NO.		REV.	SIZE
				02	A4
		SHEET NO.	1 OF 1		



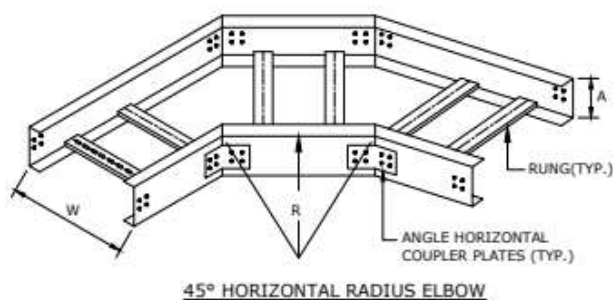
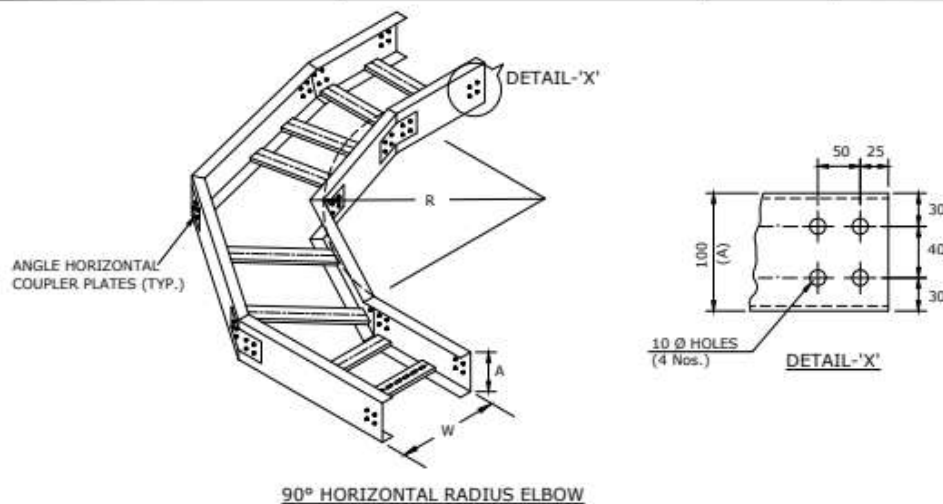
- NOTES:**
1. ALL DIMENSIONS ARE IN MM.
 2. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFIRMED TO RELEVANT IS/INTERNATIONAL STANDARDS.
 3. THE MATERIAL DIMENSIONAL DETAILS SHOWN ARE TYPICAL FOR GS STRESS.
 4. EACH CABLE TRAYS SHALL BE SUPPLIED COMPLETE WITH MATCHING COUPLER PLATES WITH REQUIRED HARDWARE AS PER DRG. No. SD-75-6706.
 5. CABLE TRAYS SHALL BE DESIGNED FOR 3000mm SUPPORT SPAN UNLESS NOTED OTHERWISE FOR SPECIFIED TRAY LOADING.

	STANDARD DRAWING CABLE TRAY COVER	STANDARD DRAWING NO.		REV.	SIZE
				02	A4
		SHEET NO.	1 OF 1		



MATERIAL-16 GAUGE(1.7MM) M.S. SHEET/G.S./AL/FRP (AS PER MTO)
 TRAY COVER MATERIAL SAME AS OF TRAY & TRAY WIDTH AS PER MTO

- NOTES:**
1. ALL DIMENSIONS ARE IN MM.
 2. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFORMED TO RELEVANT IS/INTERNATIONAL STANDARDS.



(W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER MTO)

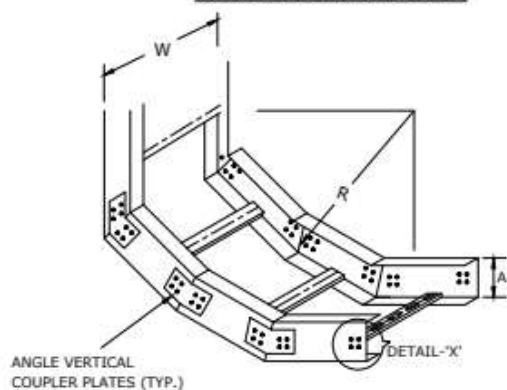
(A) DEPTH OF TRAY - 100MM UNLESS NOTED

(R) BENDING RADIUS (AS PER MTO)

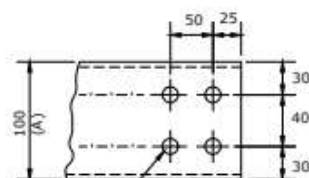
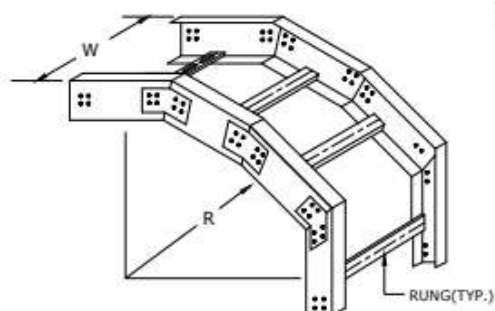
NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL - 12 GAUGE(2.5MM) M.S. SHEET/G.S/AL/FRP (AS PER MTO).
3. M.S. SHEET SHALL CONFORM TO IS 2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS 4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. TRAY FITTINGS SUPPLIED WITH OTHER MATERIAL SHALL CONFORM TO RELEVANT IS/INTERNATIONAL STANDARDS.
4. EACH CABLE TRAY SHALL BE SUPPLIED COMPLETE WITH MATCHING COUPLER PLATES WITH REQUIRE HARDWARE AS PER DRG. No. SD-75-6706.
5. ALL TRAY FITTINGS SHALL BE SUPPLIED COMPLETE WITH MATCHING ANGLE HORIZONTAL COUPLER PLATES & HARDWARE. ALTERNATIVELY WELDED ASSEMBLY MAY BE SUPPLIED FOR G.S. CABLE TRAY FITTINGS.

90° VERTICAL RADIUS ELBOW



INSIDE

10 Ø HOLES
(4Nos.)
DETAIL-'X'

OUTSIDE

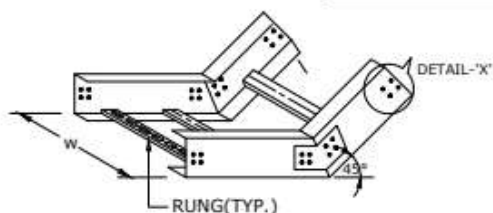
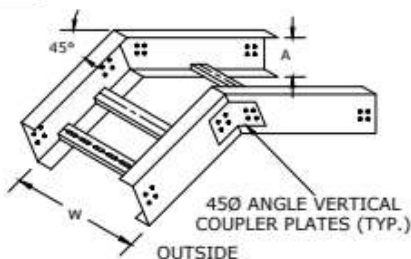
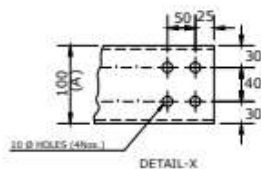
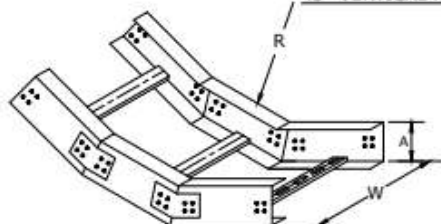
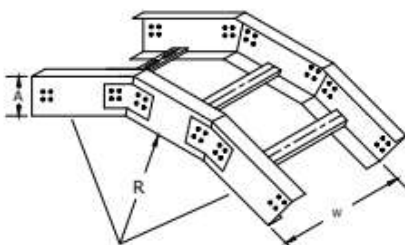
(W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER MTO).

(A) DEPTH OF TRAY - 100MM UNLESS NOTED.

(R) BENDING RADIUS (AS PER MTO).

NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL - 12 GAUGE(2.5MM) M.S. SHEET/G.S./AL/FRP (AS PER MTO).
3. M.S. SHEET SHALL CONFORM TO IS 2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS 4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. TRAY FITTINGS SUPPLIED WITH OTHER MATERIAL SHALL CONFORM TO RELEVANT IS/INTERNATIONAL STANDARDS.
4. EACH CABLE TRAY SHALL BE SUPPLIED COMPLETE WITH MATCHING COUPLER PLATES WITH REQUIRE HARDWARE AS PER DRG. No. SD-75-6706.
5. ALL TRAY FITTINGS SHALL BE SUPPLIED COMPLETE WITH MATCHING ANGLE HORIZONTAL COUPLER PLATES AND HARDWARE. ALTERNATIVELY WELDED ASSEMBLY MAY BE SUPPLIED FOR G.S. CABLE TRAY FITTINGS.

45° DIRECT VERTICAL ELBOWINSIDEOUTSIDEDETAIL-X45° VERTICAL RADIUS ELBOWOUTSIDEINSIDE

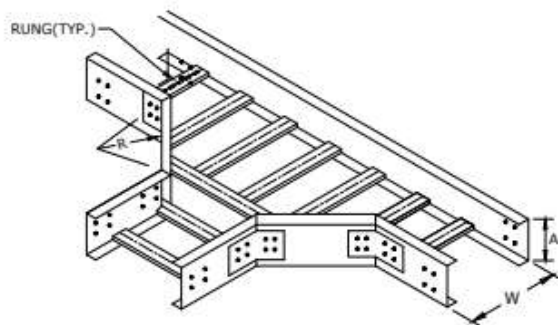
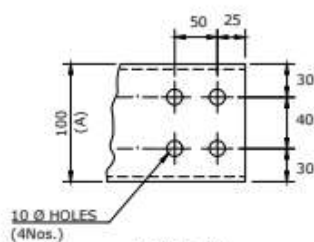
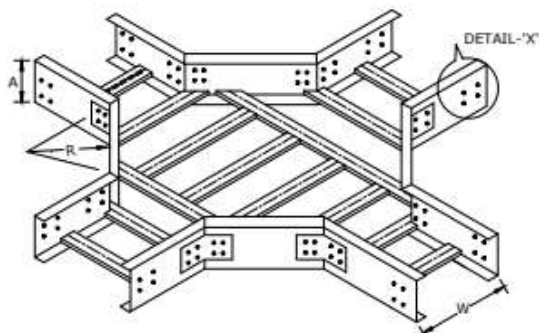
(W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER MTO)

(A) DEPTH OF TRAY - 100MM UNLESS NOTED

(R) BENDING RADIUS (AS PER MTO)

NOTES:

1. ALL DIMENSIONS ARE IN MM.
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HORIZONTAL RADIUS TEEDETAIL-'X'HORIZONTAL RADIUS CROSS

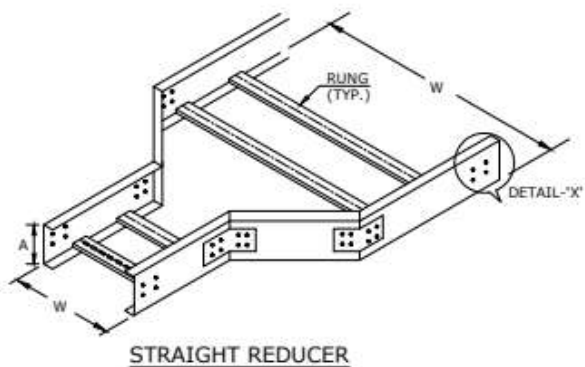
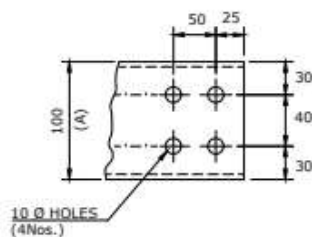
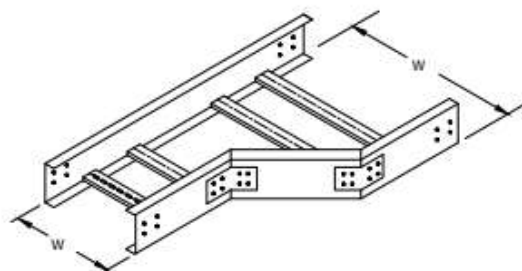
(W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER MTO)

(A) DEPTH OF TRAY - 100MM UNLESS NOTED

(R) BENDING RADIUS (AS PER MTO)

NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL - 12 GAUGE(2.5MM) M.S. SHEET/G.S/AL/FRP (AS PER MTO).
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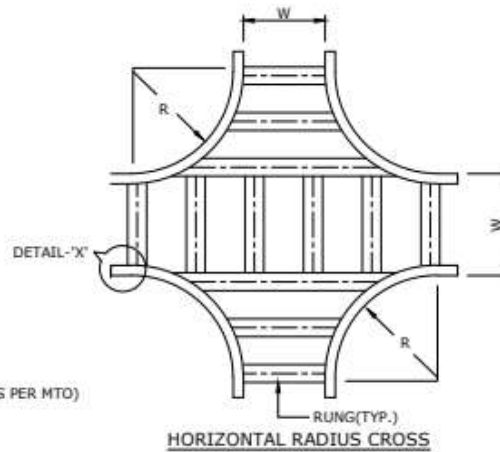
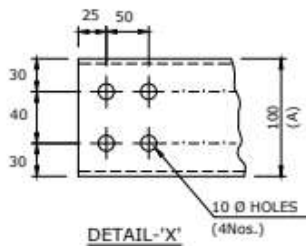
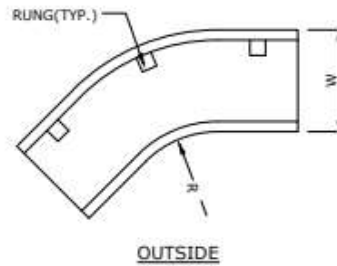
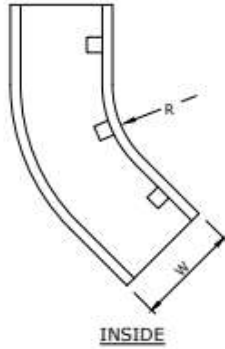
STRAIGHT REDUCERDETAIL-'X'RIGHT TO LEFT HAND REDUCER

(W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER MTO)

(A) DEPTH OF TRAY - 100MM UNLESS NOTED

NOTES:

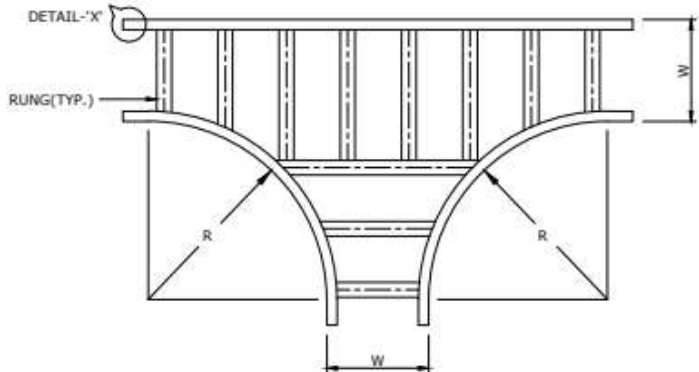
1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL - 12 GAUGE(2.5MM) M.S. SHEET/G.S/AL/FRP (AS PER MTO).
3. M.S. SHEET SHALL CONFORM TO IS 2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS 4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. TRAY FITTINGS SUPPLIED WITH OTHER MATERIAL SHALL CONFORM TO RELEVANT IS/INTERNATIONAL STANDARDS.
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45° VERTICAL RADIUS ELBOW

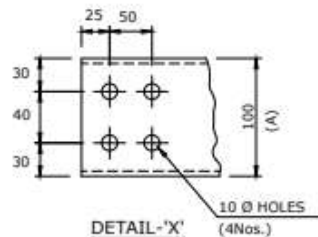
(W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER MTO)
(A) DEPTH OF TRAY - 100MM UNLESS NOTED
(R) BENDING RADIUS (AS PER MTO)

NOTES:

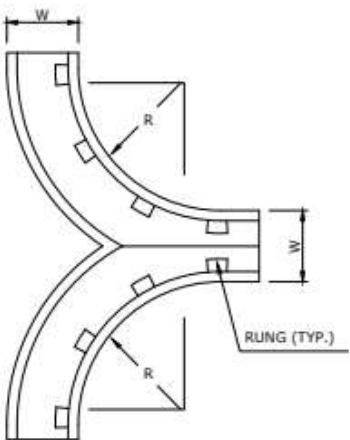
1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL - 12 GAUGE(2.5MM) M.S. SHEET/G.S./AL/FRP (AS PER MTO).
3. M.S. SHEET SHALL CONFORM TO IS 2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS 4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. TRAY FITTINGS SUPPLIED WITH OTHER MATERIAL SHALL CONFORM TO RELEVANT IS/INTERNATIONAL STANDARDS.
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HORIZONTAL RADIUS TEE

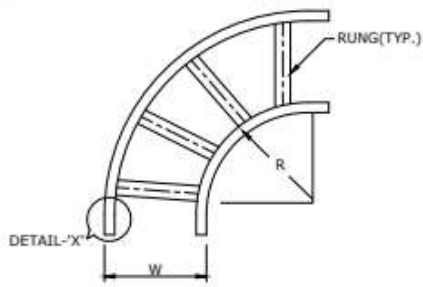


(W) - INSIDE WIDTH OF TRAY-150,300,450,600,800MM (AS PER MTO)
 (A) - DEPTH OF TRAY-100MM UNLESS NOTED
 (R) - BENDING RADIUS (AS PER MTO)

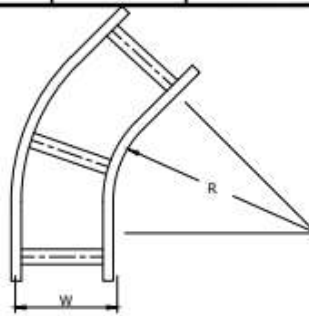


90° VERTICAL RADIUS TEE

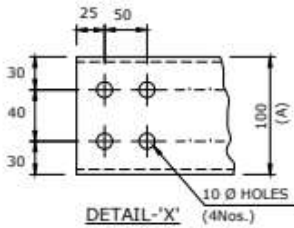
- NOTES:**
- ALL DIMENSIONS ARE IN MM.
 - MATERIAL - 12 GAUGE(2.5MM) M.S. SHEET/G.S/AL/FRP (AS PER MTO).
 - M.S. SHEET SHALL CONFORM TO IS 2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS 4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. TRAY FITTINGS SUPPLIED WITH OTHER MATERIAL SHALL CONFORM TO RELEVANT IS/INTERNATIONAL STANDARDS.
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90° HORIZONTAL RADIUS ELBOW



45° HORIZONTAL RADIUS ELBOW



(W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER MTO)

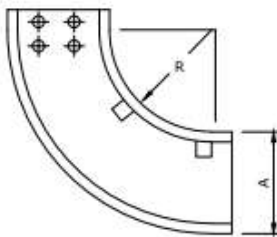
(A) DEPTH OF TRAY - 100MM UNLESS NOTED

(R) BENDING RADIUS (AS PER MTO)

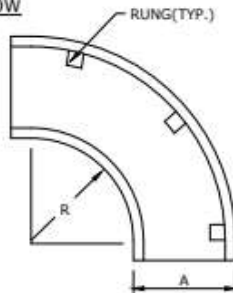
DETAIL-X

(4Nos.)

90° VERTICAL MOULDED RADIUS ELBOW



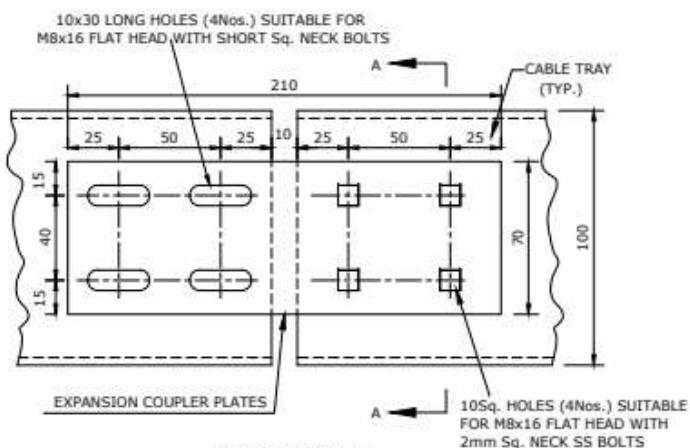
INSIDE



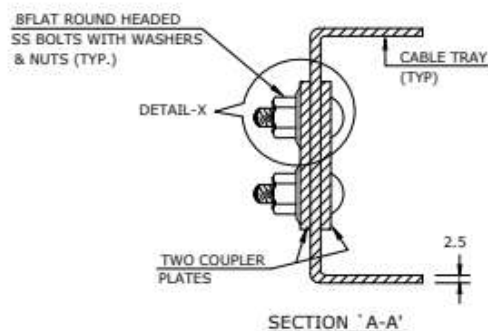
OUTSIDE

NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL - 12 GAUGE(2.5MM) M.S. SHEET/G.S./AL/FRP (AS PER MTO).
3. M.S. SHEET SHALL CONFORM TO IS 2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS 4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. TRAY FITTINGS SUPPLIED WITH OTHER MATERIAL SHALL CONFORM TO RELEVANT IS/INTERNATIONAL STANDARDS.
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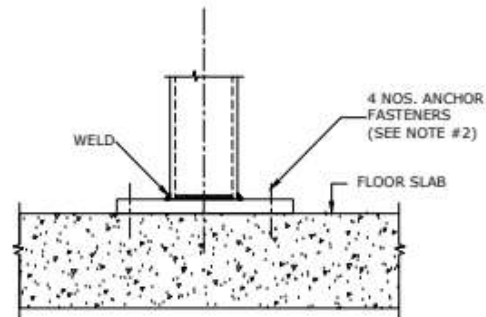
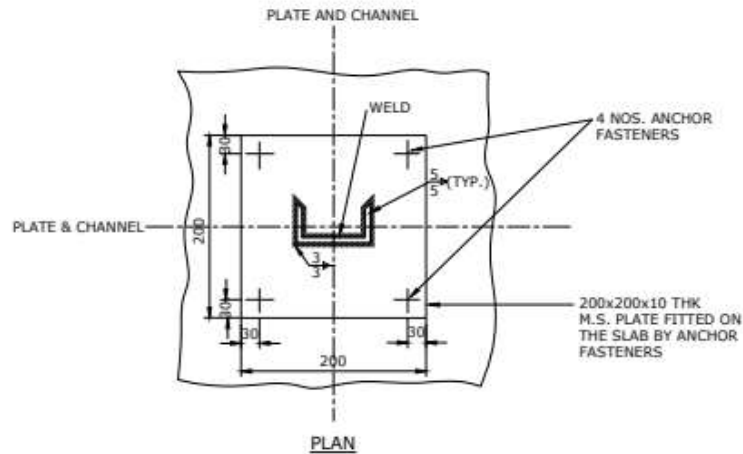


COUPLER PLATE
TYPICAL FOR LADDER TYPE
AND PERFORATED TYPE TRAYS



NOTES:

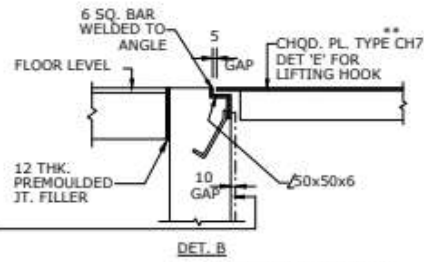
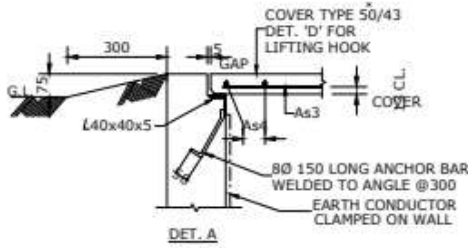
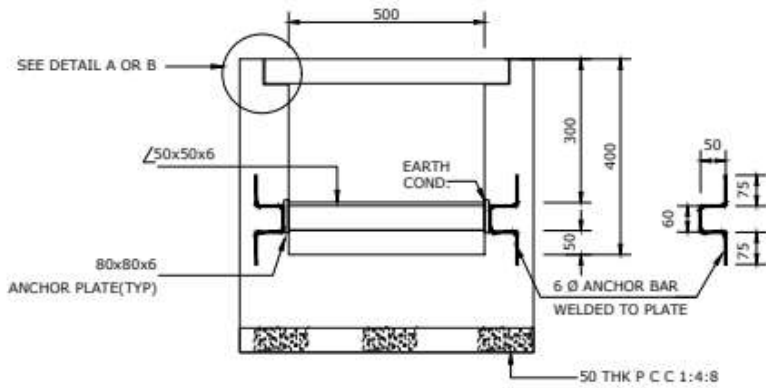
1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL - 3MM M.S. SHEET/G.S/AL/FRP (AS PER MTO).
3. M.S. SHEET SHALL CONFORM TO IS 2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS 4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. TRAY FITTINGS OF OTHER MATERIALS SHALL CONFORM TO RELEVANT IS/INTERNATIONAL STANDARDS.
4. NUTS/BOLTS/LOCKNUTS SHALL BE AS PER IS 1363(PART-1,2,3) : 1992/IS 1367(PART-5) : 1980 OR EQUIVALENT INTERNATIONAL STANDARDS.
5. WASHERS SHALL BE AS PER IS 2016 : 1967 OR EQUIVALENT INTERNATIONAL STANDARDS.



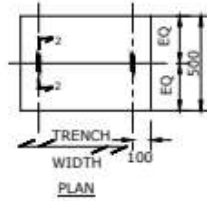
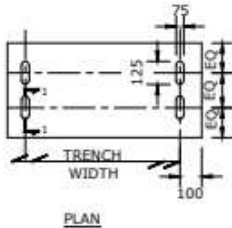
TYPICAL DETAIL OF FIXING M.S. PLATE TO FLOOR BY ANCHOR FASTENER
FOR WELDING TRAY SUPPORT. (WHEREVER EMBEDDED PLATES OR STRUCTURAL
BEAMS ARE NOT AVAILABLE).

NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. THE ANCHOR FASTENER SHALL BE OF HEAVY DUTY TYPE. THE AXIAL HOLDING STRENGTH SHALL BE AS FOLLOWS
BOLT DIAMETER, 16mm -- 5000Kg
FOR ADEQUATE SAFETY FACTOR 25% OF THE ABOVE VALUE SHALL BE USED.
3. SAME DETAILS HOLD GOOD IF THE PLATE ARE FASTENED TO THE UNDERSIDE OF THE FLOOR SLAB.
4. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992.
5. WELDING SHALL BE DONE AS PER IS 816:1969.

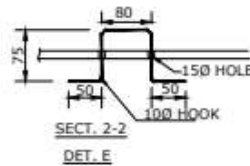
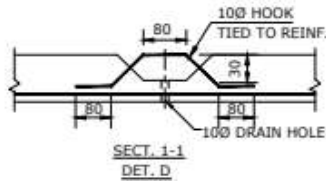


**CH7 = 7 THK. CHQD. PL



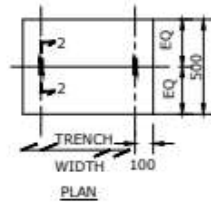
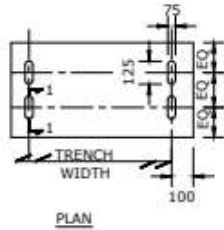
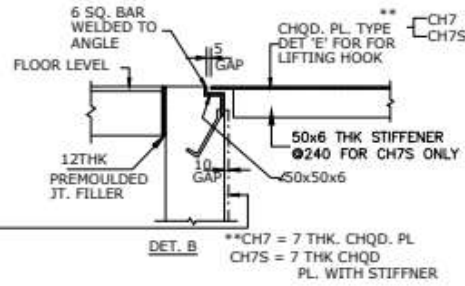
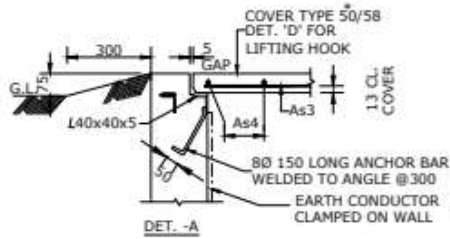
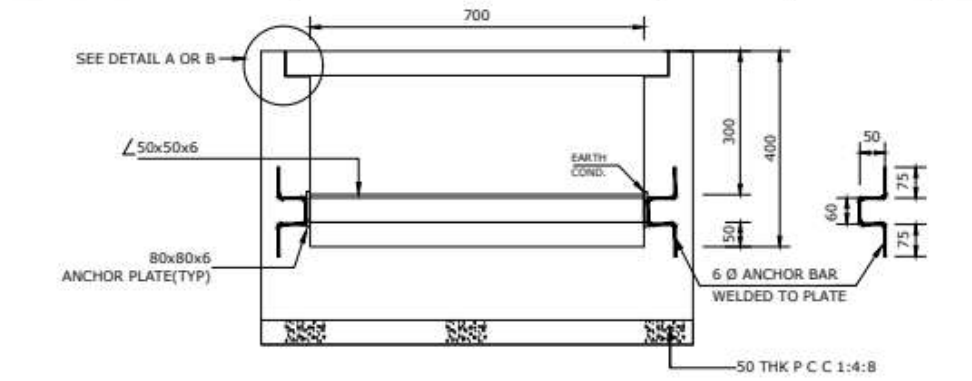
R C COVER TYPE	THICKNESS mm.	As3	As4
50/72	50	7-6Ø	7-6Ø
50/36	50	7-6Ø	4-6Ø

50/36 MEANS 50mm. THK.x36 Kg.
COVER WEIGHT OF 600mm COVER WIDTH.
PROVIDE TWO COVERS OF 300mm WIDTH
FOR EVERY 10m LENGTH OF TRENCH.



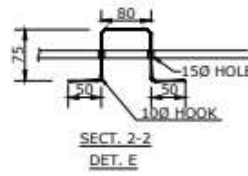
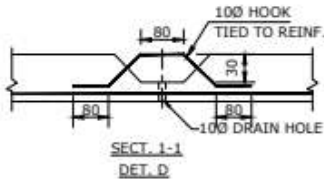
NOTES:

1. ALL DIMENSIONS ARE IN MM
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



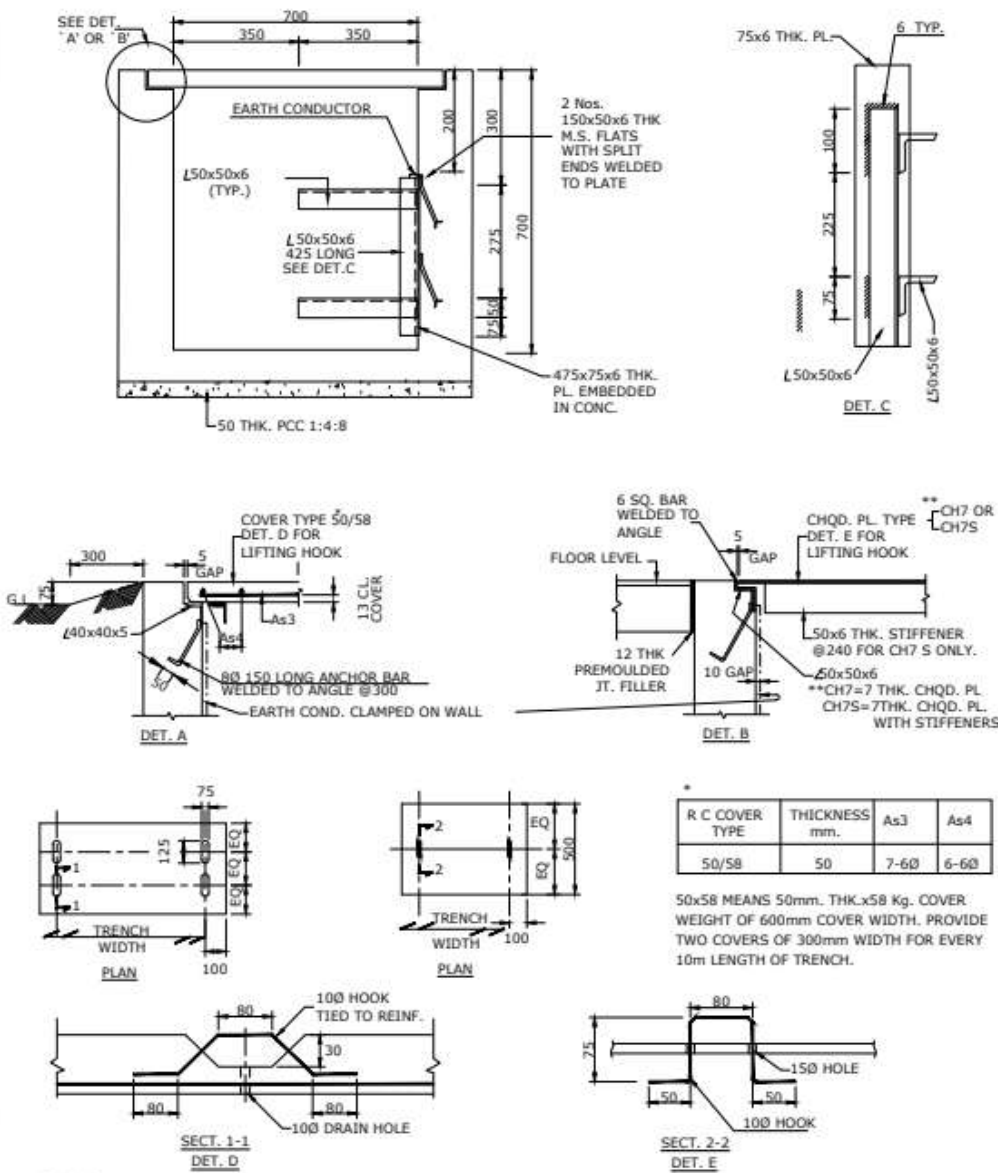
R C COVER TYPE	THICKNESS mm.	As3	As4
50/58	50	7-60	7-60

50/58 MEANS 50mm. THK.x58 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.



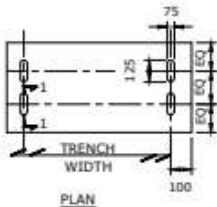
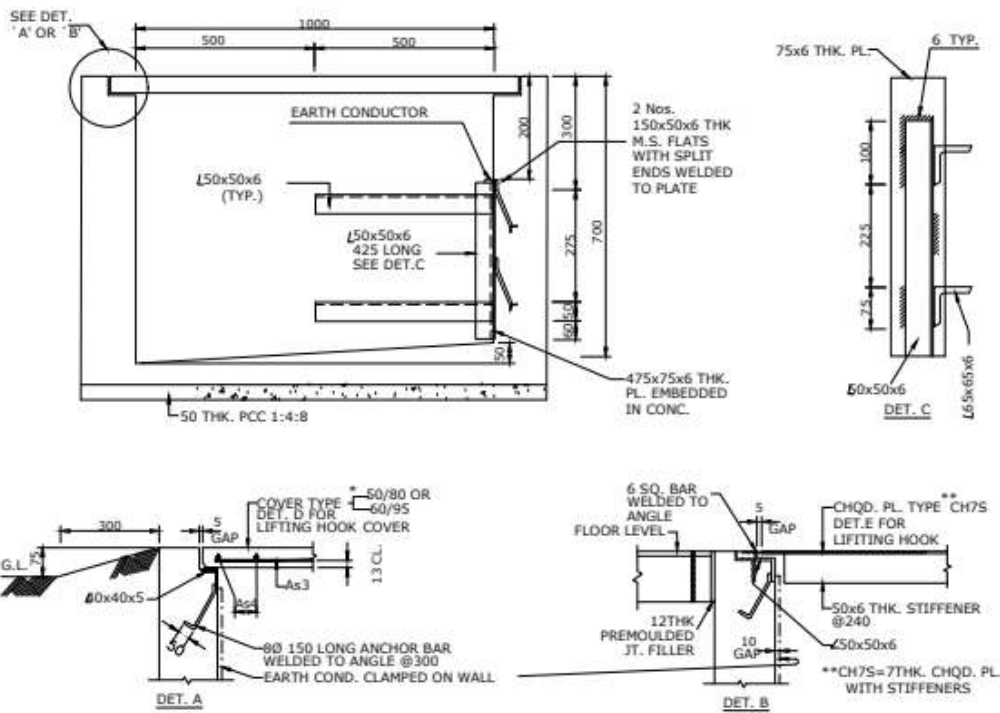
NOTES:

1. ALL DIMENSIONS ARE IN MM
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992

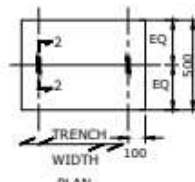


NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



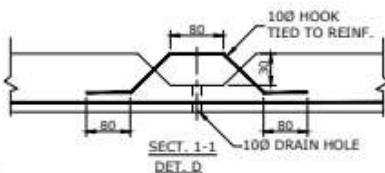
PLAN



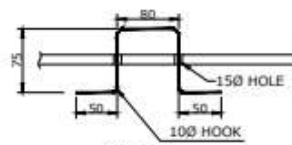
PLAN

R C COVER TYPE	THICKNESS mm.	As3	As4
50/80	50	7-60	6-60
60/95	60	7-80	6-80

60x95 MEANS 60mm. THK.x95 Kg. COVER
WEIGHT OF 600mm COVER WIDTH. PROVIDE
TWO COVERS OF 300mm WIDTH FOR EVERY
10m LENGTH OF TRENCH.



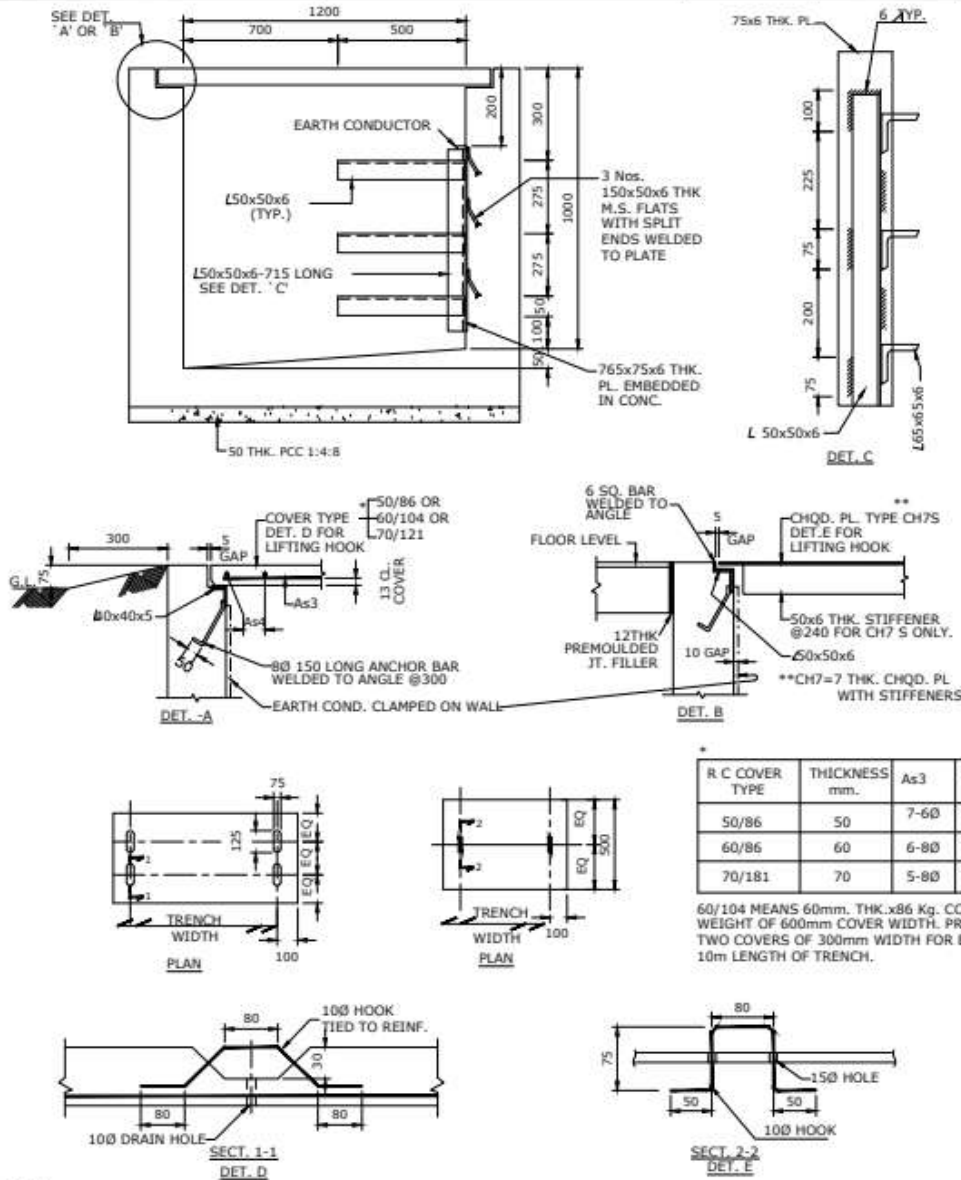
SECT. 1.
DET. 0.



SECT. 2
DET. E

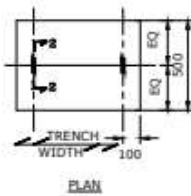
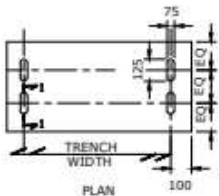
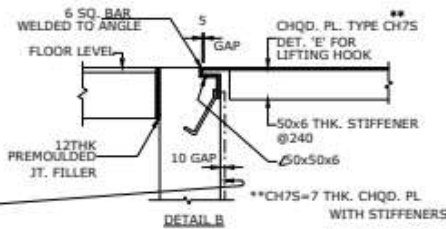
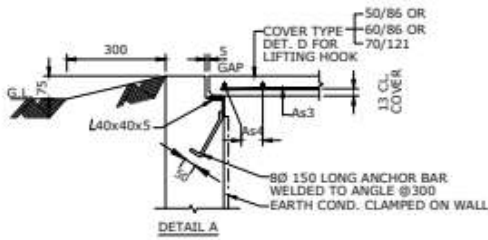
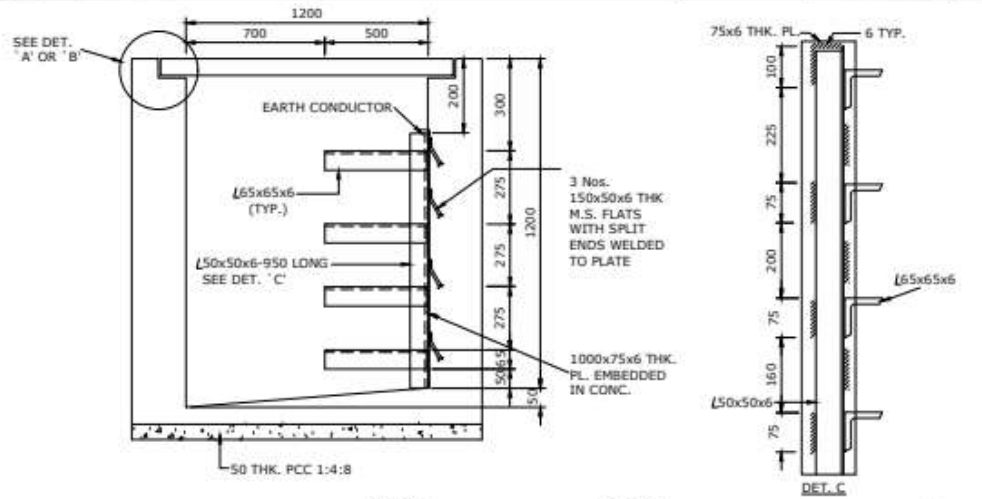
NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



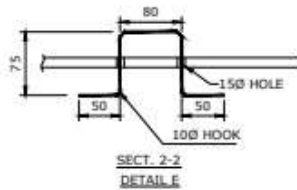
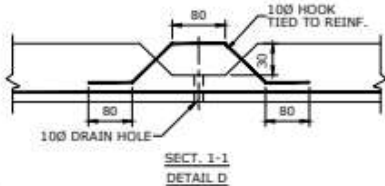
NOTES:

1. ALL DIMENSIONS ARE IN MM
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



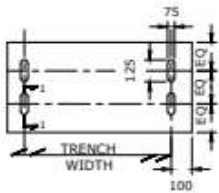
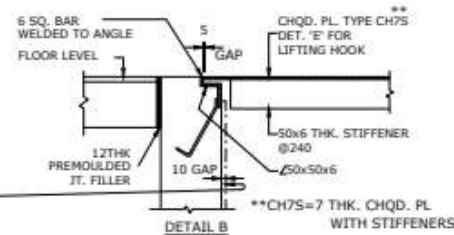
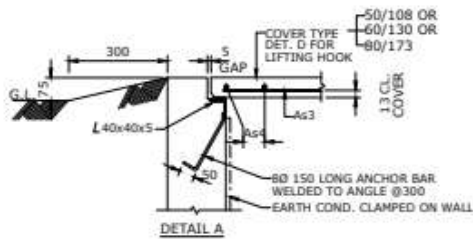
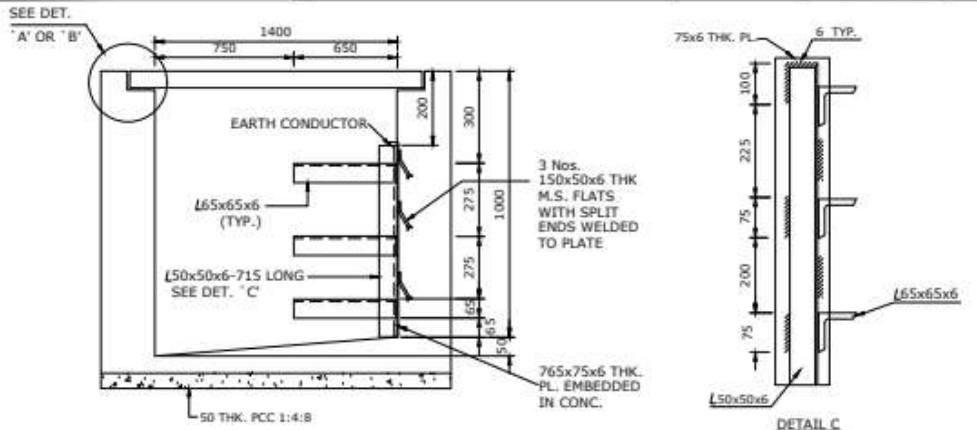
R C COVER TYPE	THICKNESS mm.	As3	As4
50/86	50	7-60	9-60
60/104	60	6-80	7-80
70/121	70	5-80	7-80

60x104 MEANS 60mm. THK.x104 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.

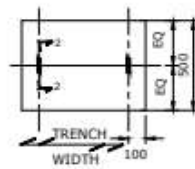


NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



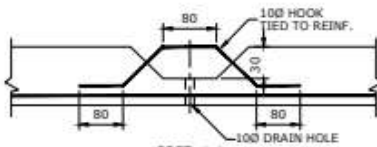
PLAN



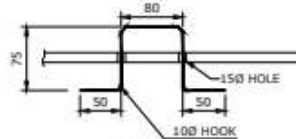
PLAN

R C COVER TYPE	THICKNESS mm.	As3	As4
50/108	50	7-60	9-60
60/130	60	6-80	7-80
80/173	80	5-80	7-80

60x130 MEANS 60mm. THK.x130 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.



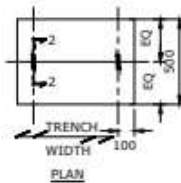
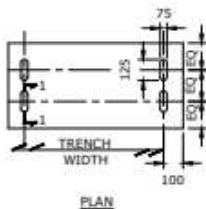
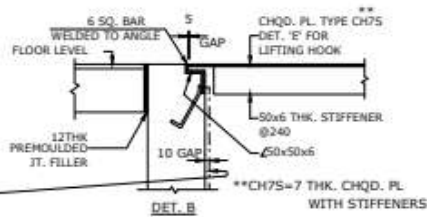
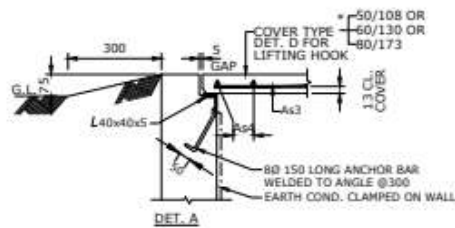
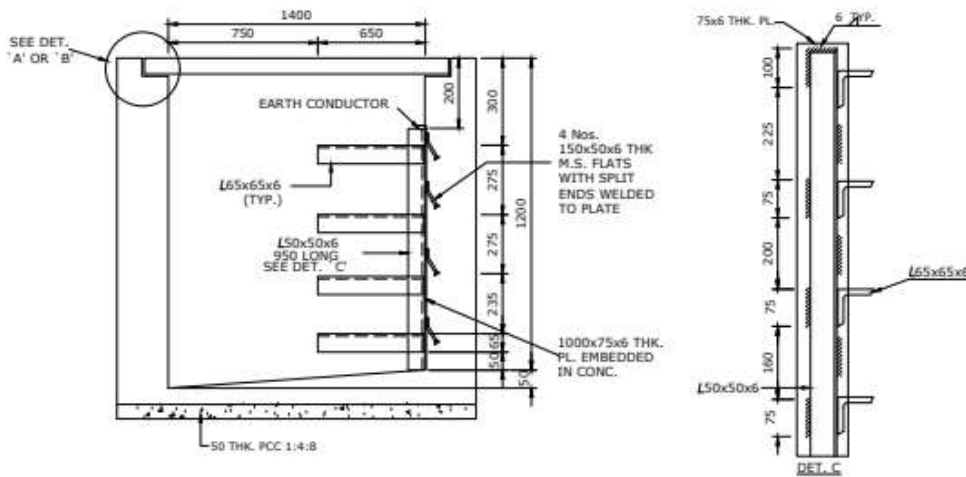
SECT. 1-1
DETAIL D



SECT. 2-2
DETAIL E

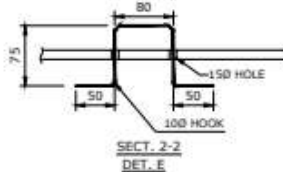
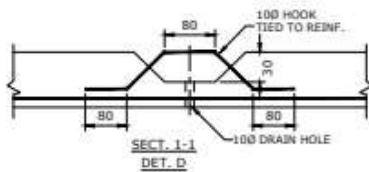
NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992

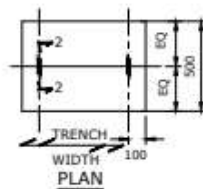
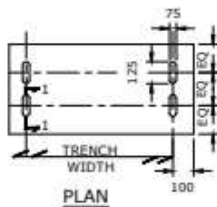
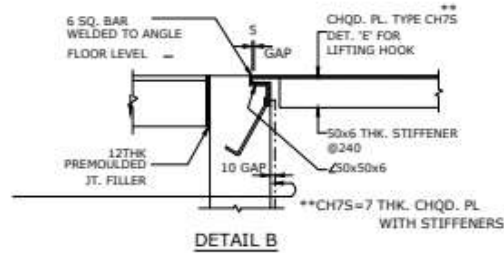
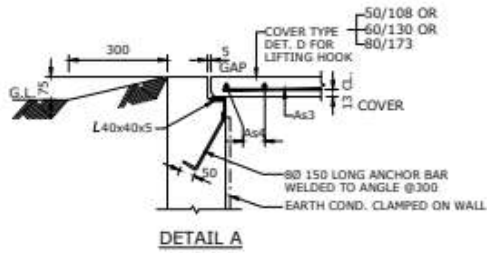
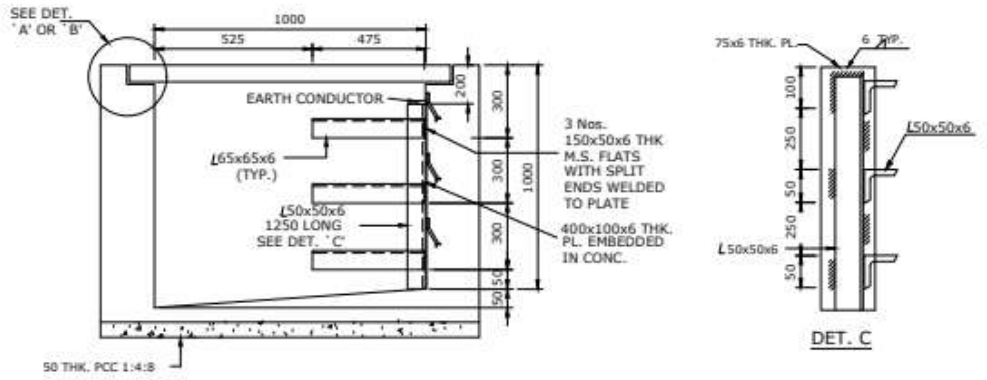


R C COVER TYPE	THICKNESS mm.	As3	As4
50/108	50	7-60	9-60
60/130	60	6-80	8-80
80/173	80	5-80	8-80

60x130 MEANS 60mm. THK.x130 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.

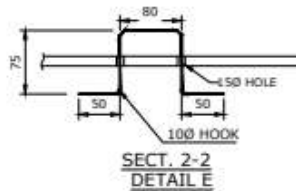
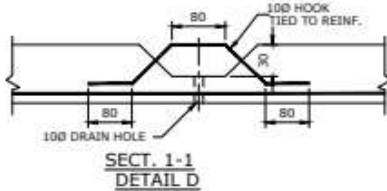


- NOTES:
- ALL DIMENSIONS ARE IN MM.
 - STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



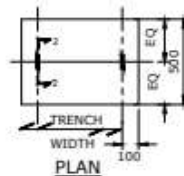
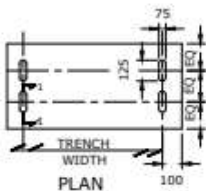
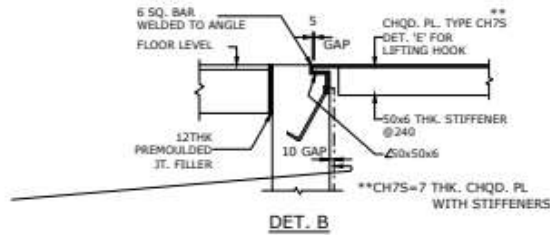
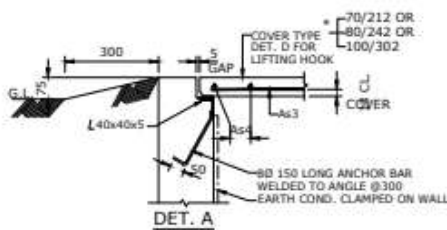
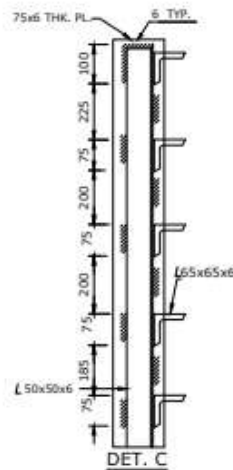
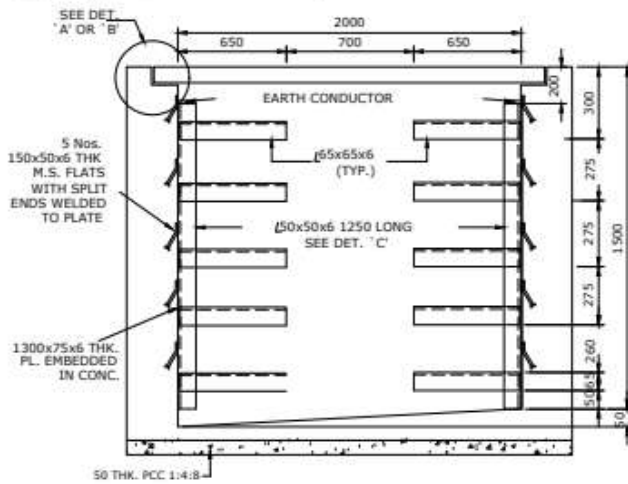
R C COVER TYPE	THICKNESS mm.	As3	As4
50/108	50	7-60	10-60
60/130	60	6-80	8-80
80/173	80	5-80	8-80

60x130 MEANS 60mm. THK.x130 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.



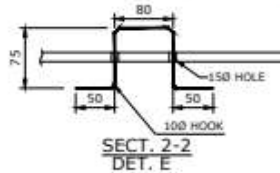
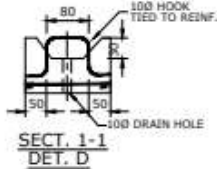
NOTES:

- ALL DIMENSIONS ARE IN MM.
- STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



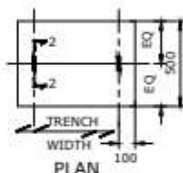
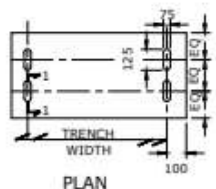
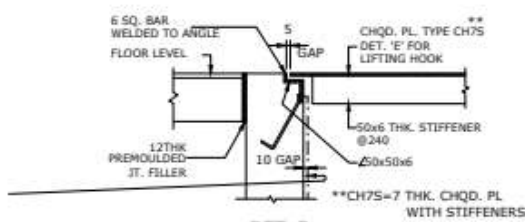
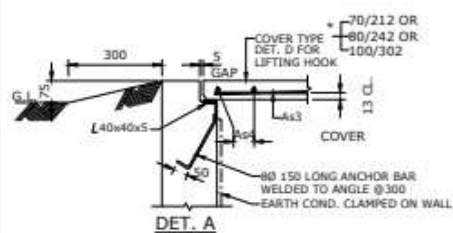
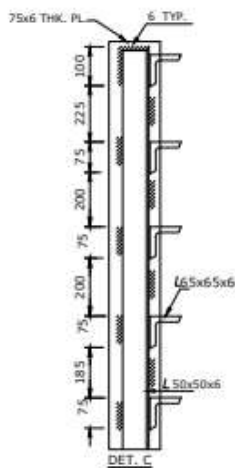
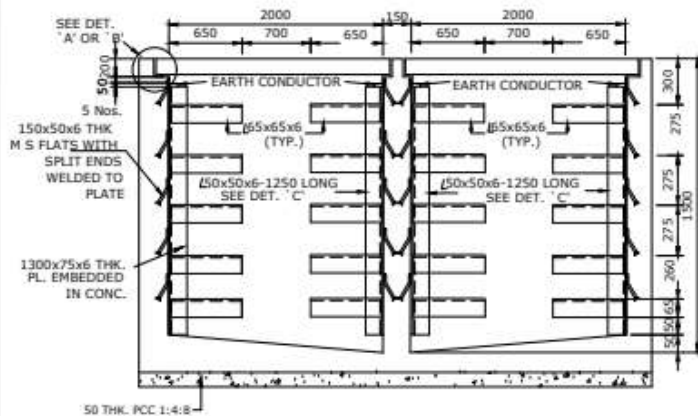
R C COVER TYPE	THICKNESS mm.	As3	As4
70/212	70	5-8Ø	11-8Ø
80/242	80	5-8Ø	11-8Ø
100/302	100	6-8Ø	11-8Ø

70x130 MEANS 70mm. THK.x212 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10.0m LENGTH OF TRENCH.



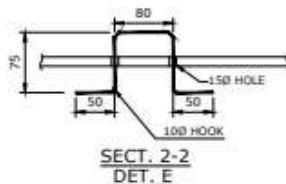
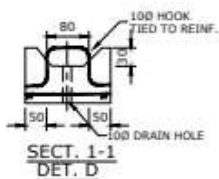
NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



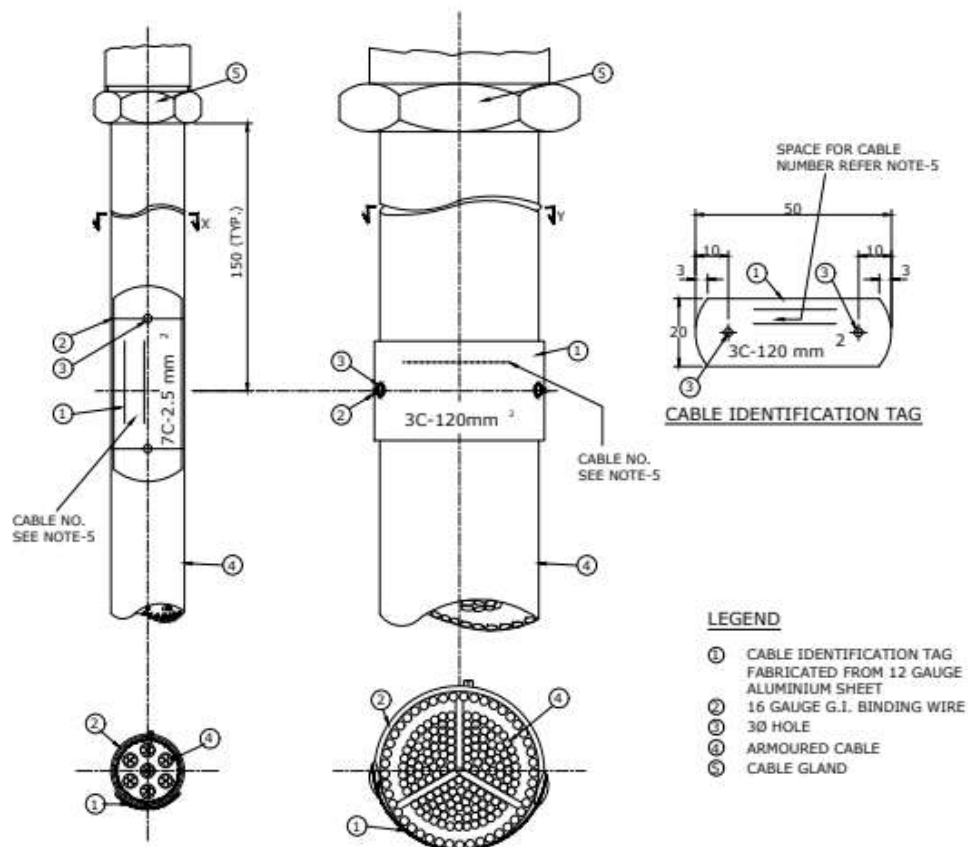
R C COVER TYPE	THICKNESS mm.	As3	As4
70/212	70	5-8Ø	11-8Ø
80/242	80	5-8Ø	11-8Ø
100/302	100	6-8Ø	11-8Ø

70x212 MEANS 70mm. THK.x212 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.



NOTES:

- ALL DIMENSIONS ARE IN MM.
- STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



LEGEND

- ① CABLE IDENTIFICATION TAG
FABRICATED FROM 12 GAUGE
ALUMINIUM SHEET
- ② 16 GAUGE G.I. BINDING WIRE
- ③ 3Ø HOLE
- ④ ARMoured CABLE
- ⑤ CABLE GLAND

TYPE-A (SECTION X-X)

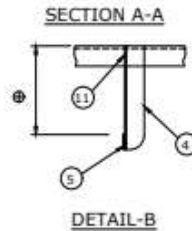
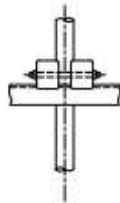
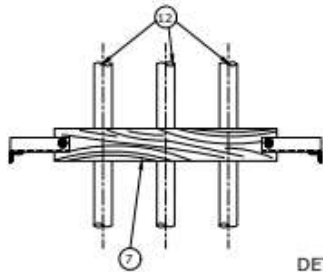
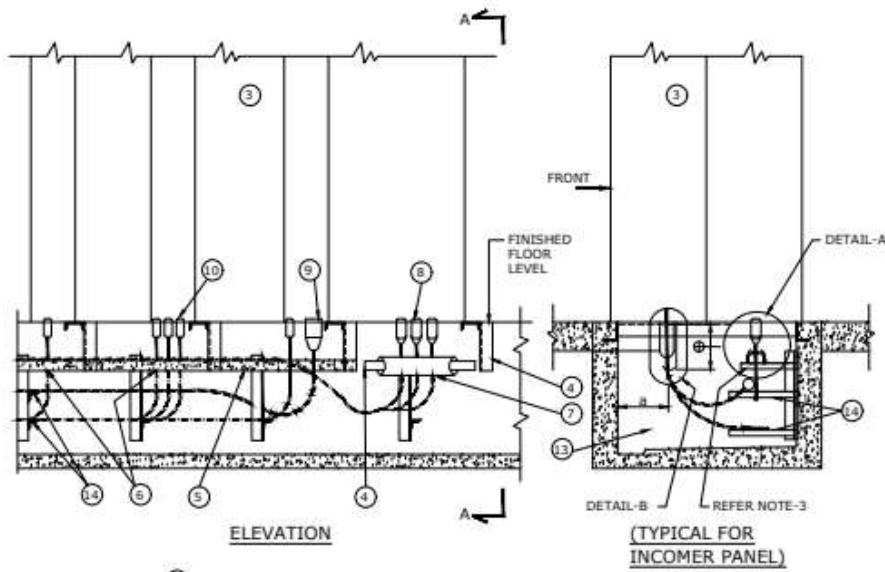
TYPICAL METHOD OF TYING
THE TAG FOR CABLES WITH
OVERALL DIA. <25 (ONLY FOR
MULTICORE CABLES)

TYPE-B (SECTION Y-Y)

TYPICAL METHOD OF TYING THE TAG
FOR CABLES WITH OVERALL DIA. >25

NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. THE CABLE IDENTIFICATION NUMBER, NUMBER OF CORES AND SIZE SHALL BE EMBOSSED ON THE TAG.
3. THE TAG SHALL BE SUITABLY TIED APPROXIMATELY 150mm AWAY FROM THE CABLE GLAND AT BOTH ENDS OF THE CABLE.
4. THE TAG SHALL BE FREE FROM SHARP EDGES.
5. CABLE NUMBER SHALL BE EMBOSSED AS PER CABLE SCHEDULE.



LEGEND

- ① TO ⑫ REFER SH. 1 OF 2
- ⑬ CABLE TRENCH
- ⑭ CABLE SUPPORTING ARM

NOTES:

1. FOR NOTES REFER SHEET 1 OF 2.
2. CONTROL AND POWER CABLES IN TRENCH SHALL BE TIED TO THE SUPPORTING ARM WITH 3Ø NYLON CORD, IF CABLE TRAY IS NOT USED.
3. 5/8x50x6 FOR CLAMPING 1/C CABLES TO BE SUITABLY GROUTED AT SITE.

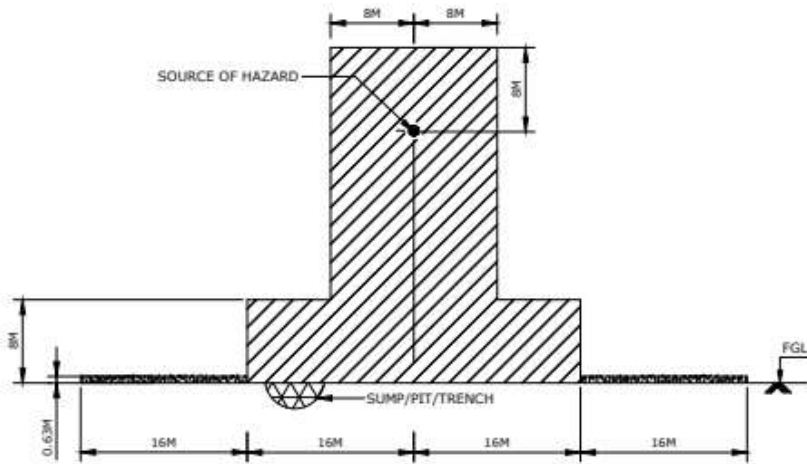
	GENERAL NOTES & LEGENDS FOR AREA CLASSIFICATION (OIL/GAS INSTALLATION)	STANDARD DRAWING NO.		REV.	SIZE
				02	A4
		SHEET NO.	1 OF 1		

NOTES:-

- 1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE MENTIONED.
- 2. THE AREA CLASSIFICATION CONFORM TO THE LATEST ISSUE OF IS : 5572, INDIAN PETROLEUM RULES OISO-STD-113, O&L MINES REGULATIONS/DGMS GUIDELINES (FOR PROJECTS UNDER DGMS JURISDICTION) & RECOMMENDATIONS OF PROCESS LICENSOR AND PROJECT DESIGN BASIS.
- 3. THE AREA WITHIN 1.5M (EXTENDING IN ALL DIRECTIONS) OF SAFETY VENTS, PRODUCT SAMPLING LOCATIONS,PROCESS WATER DRAINS, ONLY SEWERS VENTS, INSPECTION HATCHES, DISCHARGE ORIFICE OF FIXED LIQUID LEVEL GAUGES, ROTARY OR DIP GAUGES, FILLER OPENINGS SHALL BE CLASSIFIED AS ZONE-1. FURTHER AN AREA FROM 1.5M TO 3.0M (EXTENDING IN ALL DIRECTIONS) FROM VENTS SHALL BE CLASSIFIED AS ZONE-2. HOWEVER THE VENTS OR DRAINS BLANKED DURING NORMAL OPERATION AND USED ONLY WHEN THE PLANTIS DEPRESSURISED OR UNDER SHUTDOWN, SHOULD NOT BE REGARDED AS AN OPERATIONAL VENT OR DRAIN OR SOURCE OF HAZARD.
- 4. OPEN TRENCHES, PITTS OR SUMP BELOW GRADE WITHIN ZONE-2 AREA SHALL BE CLASSIFIED AS ZONE-1 AREA.
- 5. IN CASE OF PIPELINE HANDLING FLAMMABLE MATERIAL, WHERE WELL MAINTAINED VALVES, FITTINGS AND METERS ARE INSTALLED IN WELL VENTILATED AREAS OR PIT, THE EXTENT OF ZONE-2 AREA ABOVE THE GROUND SHALL BE CONSIDERED AS 4.0M IN ALL DIRECTIONS FROM THE POSSIBLE SOURCE OF HAZARD, ALTHOUGH THE PIT ITSELF SHALL BE CLASSIFIED AS ZONE-1 AREA.
- 6. GAS GROUPS ARE AS PER IS: 9570.
- 7. ROADS FULLY/PARTLY COVERED UNDER HAZARDOUS AREA CLASSIFICATION SHALL BE BARRICADED FOR VEHICULAR MOVEMENT.

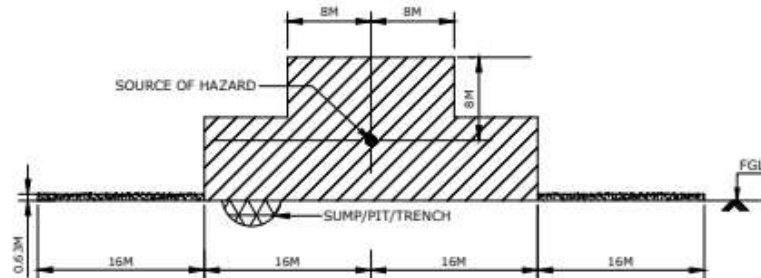
LEGENDS:-

-  - ZONE-1, GAS GROUP IIA/IIB HAZAROUS AREA
-  - ZONE-2, GAS GROUP IIA/IIB HAZAROUS AREA
-  - ADDITIONAL ZONE-2, GAS GROUP IIA/IIB AREA
(AREA SUGGESTED WHERE LARGE RELEASE OF VOLTAGE PRODUCTS MAY OCCUR)
-  - ZONE-1, GAS GROUP IIC HAZAROUS AREA
-  - ZONE-2, GAS GROUP IIC HAZAROUS AREA
-  - SAFE AREA (NON HAZARDOUS)



DETAIL-1

FREELY VENTILATED PROCESS AREA
(HEAVIER THAN AIR GASES OR VAPOURS)
(SOURCE OF HAZARD LOCATED ABOVE GROUND LEVEL)

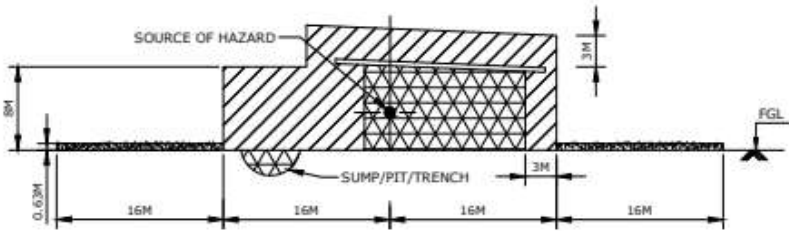


DETAIL-2

FREELY VENTILATED PROCESS AREA
(HEAVIER THAN AIR GASES OR VAPOURS)
(SOURCE OF HAZARD LOCATED NEAR GROUND LEVEL)

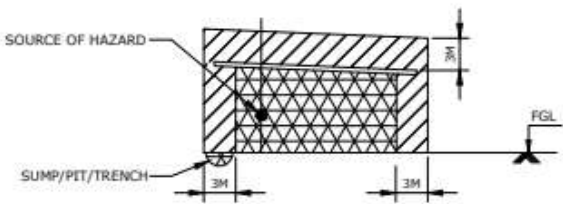
NOTES:

	DETAILS FOR AREA CLASSIFICATION (OIL/GAS INSTALLATION)	STANDARD DRAWING NO.		REV.	SIZE
				02	A4
		SHEET NO.	1 OF 1		



DETAIL-3

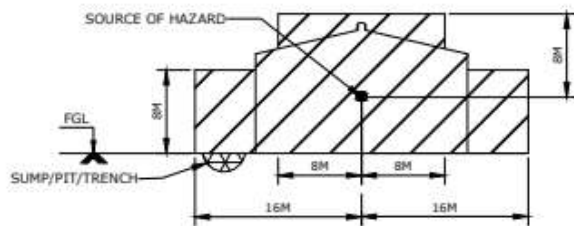
PROCESS AREA WITH RESTRICTED VENTILATION
(HEAVIER THAN AIR GASES OR VAPOURS)



DETAIL-4

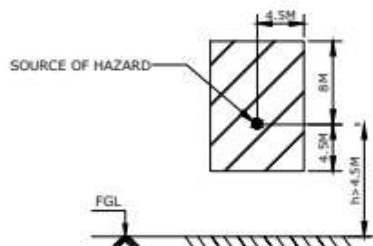
PROCESS AREA WITH RESTRICTED VENTILATION
(HEAVIER THAN AIR GASES OR VAPOURS)

NOTES:

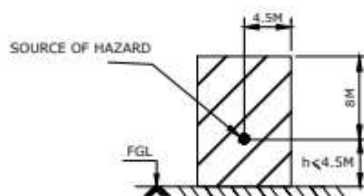


DETAIL-5

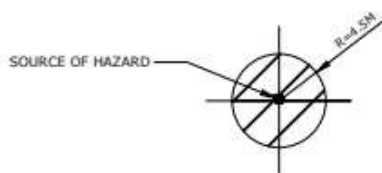
WELL VENTILATED INDOOR AREA
(HEAVIER THAN AIR GASES OR VAPOURS)



ELEVATION



ELEVATION

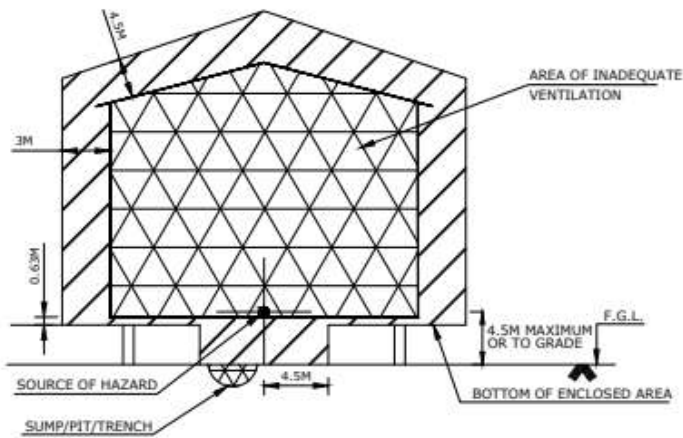


PLAN

DETAIL-6

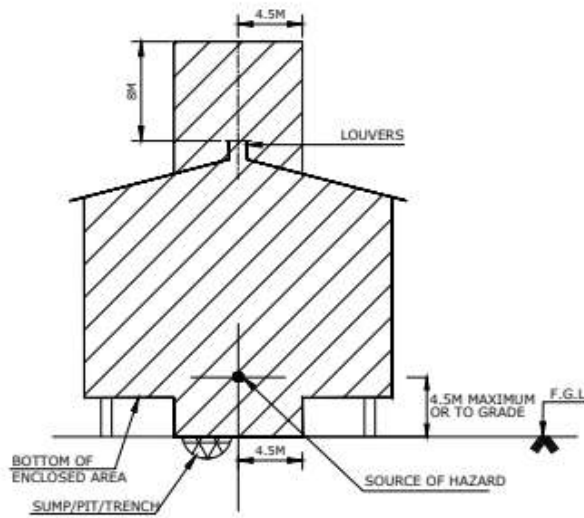
(FREELY VENTILATED PROCESS AREA)
(FOR LIGHTER THAN AIR GASES OR VAPOURS)

NOTES:



DETAIL-7

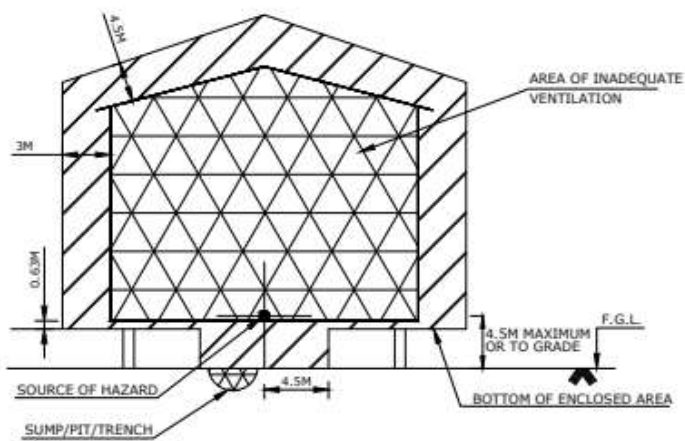
INADEQUATELY VENTILATED COMPRESSOR SHELTER
(LIGHTER THAN AIR GASES OR VAPOURS)



DETAIL-8

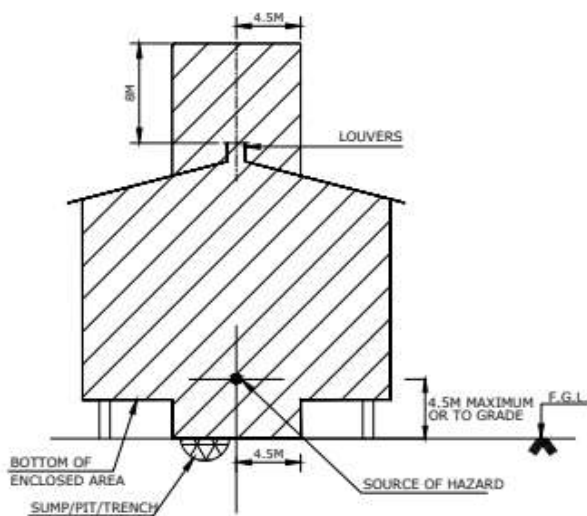
ADEQUATELY VENTILATED COMPRESSOR SHELTER
(LIGHTER THAN AIR GASES OR VAPOURS)

NOTES:



DETAIL-7

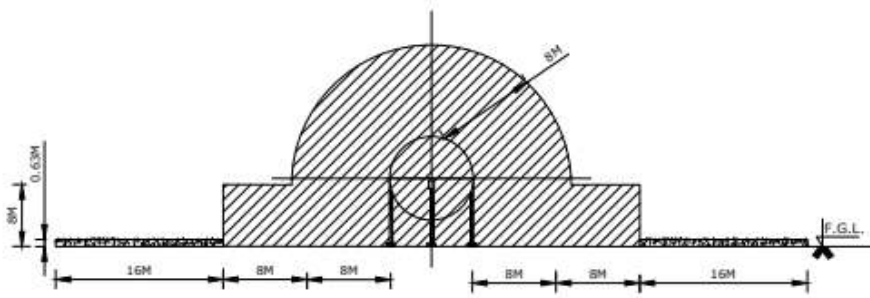
INADEQUATELY VENTILATED COMPRESSOR SHELTER
(LIGHTER THAN AIR GASES OR VAPOURS)



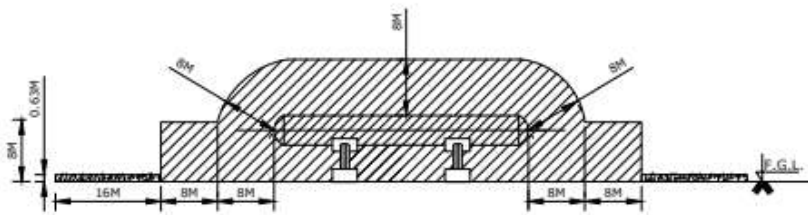
DETAIL-8

ADEQUATELY VENTILATED COMPRESSOR SHELTER
(LIGHTER THAN AIR GASES OR VAPOURS)

NOTES:

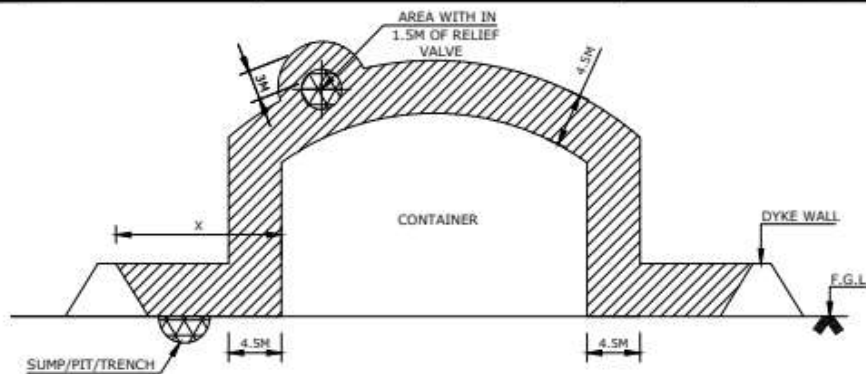


DETAIL-12 (SPHERE)
(HEAVIER THAN AIR GASES OR VAPOUR)



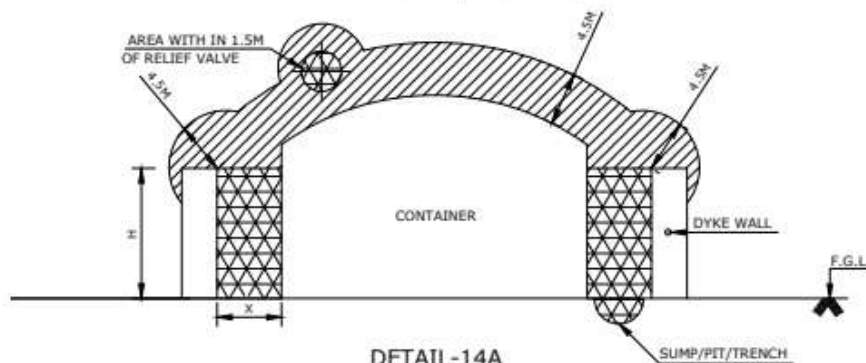
DETAIL-13 (BULLET)
(HEAVIER THAN AIR GASES OR VAPOUR)

NOTES:



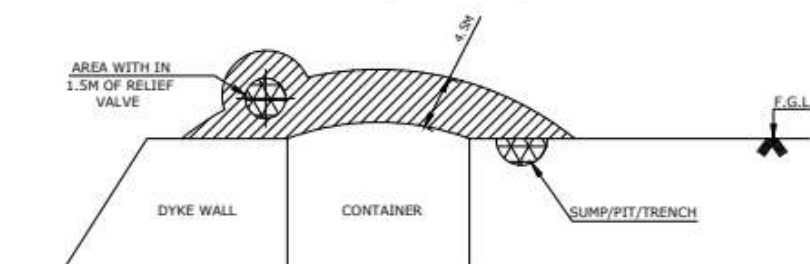
DETAIL-14A

DYKE HEIGHT LESS THAN DISTANCE FROM
CONTAINER TO DYKE (H LESS THAN X)



DETAIL-14A

DYKE HEIGHT LESS THAN DISTANCE FROM
CONTAINER TO DYKE (H GREATER THAN X)

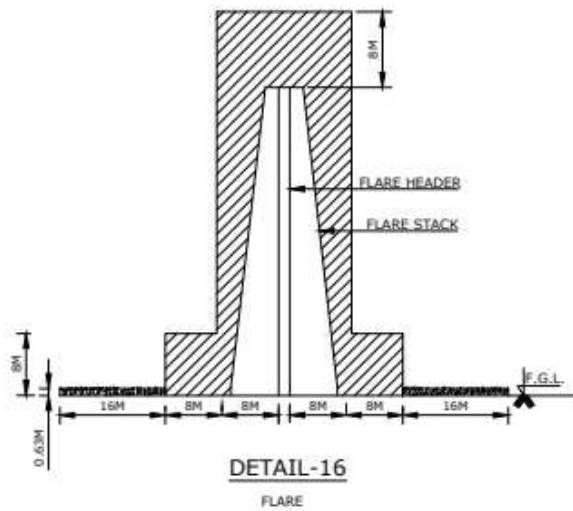


DETAIL-14C (STORAGE BELOW GRADE)

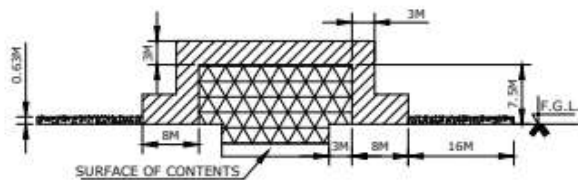
STORAGE TANKS FOR CRYOGENIC LIQUIDS

NOTES:

STANDARD DRAWING NO.		REV.	SIZE
		02	A4
SHEET NO.	1 OF 1		

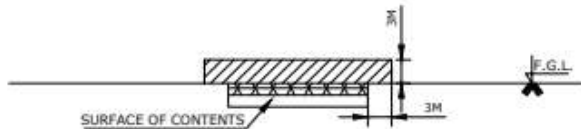


NOTES:



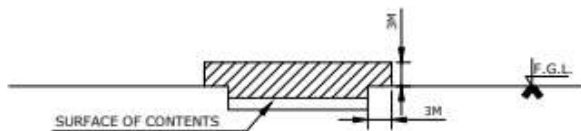
DETAIL-17

UNIT SEPARATORS, PRE-SEPARATORS AND SEPARATORS
(APPLICABLE FOR OPEN TANKS OR BASINS)



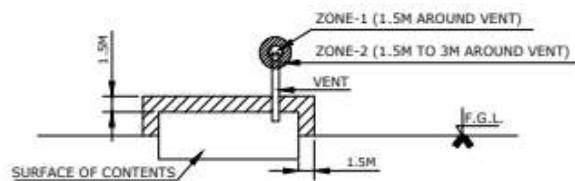
DETAIL-18

DISSOLVED AIR FLOATATION (DAF) UNITS
(APPLICABLE FOR OPEN TANKS OR BASINS)



DETAIL-19

BIOLOGICAL OXIDATION (BIOX) UNITS

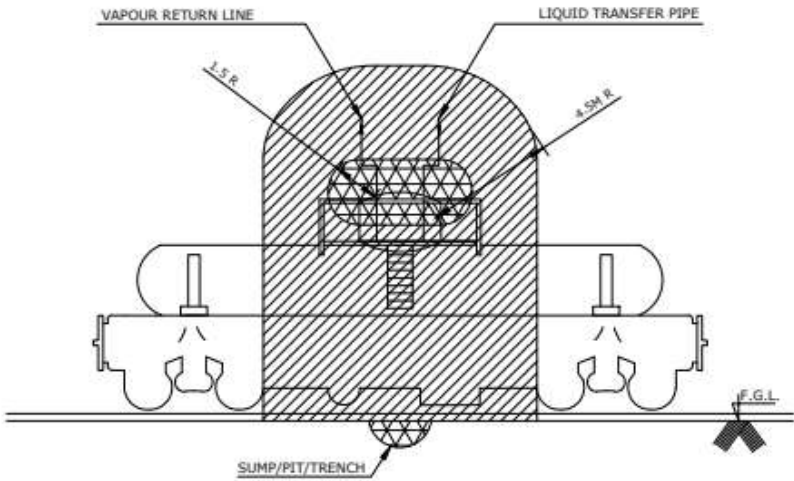


DETAIL-20

UNDERGROUND COVERED SUMP OR OILY WATER SEPARATOR

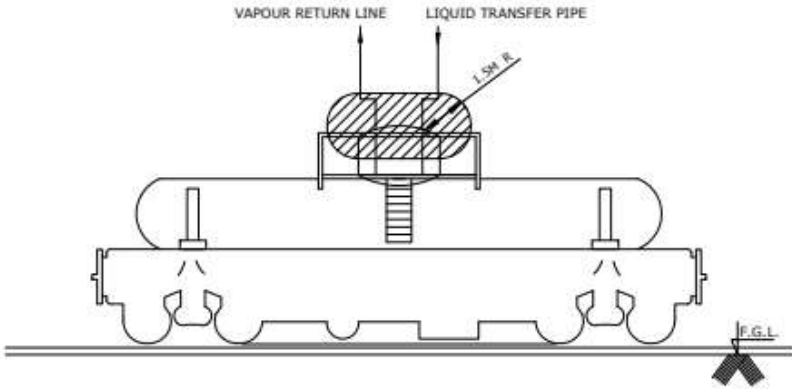
NOTES:

	DETAILS FOR AREA CLASSIFICATION (OIL/GAS INSTALLATION)	STANDARD DRAWING NO.		REV.	SIZE
				02	A4
		SHEET NO.	1 OF 1		



DETAIL-21

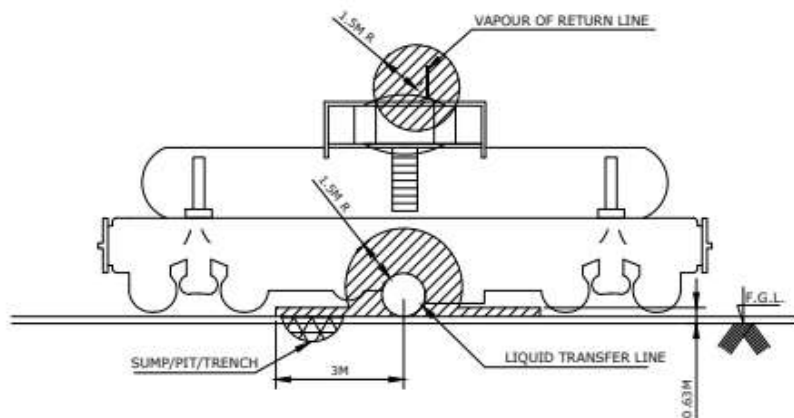
(MATERIAL: LIQUIFIED GAS/ COMPRESSED GAS/ CRYOGENIC LIQUID)
WAGON/TANK TRUCK LOADING AND UNLOADING VIA CLOSED SYSTEM.
PRODUCT TRANSFER THROUGH DOME ONLY



DETAIL-22

(MATERIAL: FLAMMABLE LIQUID)
WAGON/ TANK TRUCK LOADING AND UNLOADING VIA CLOSED SYSTEM.
PRODUCT TRANSFER THROUGH DOME ONLY

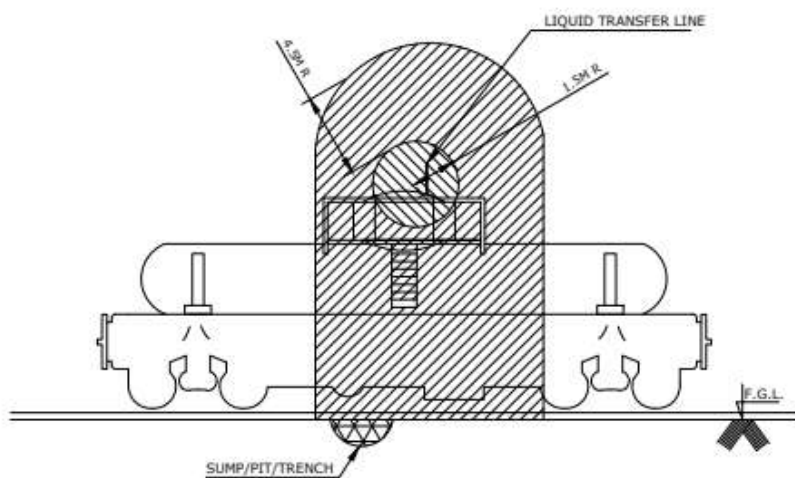
NOTES:



DETAIL-23

(MATERIAL: FLAMMABLE LIQUID)

WAGON/TANK TRUCK LOADING AND UNLOADING VIA CLOSED SYSTEM.
BOTTOM PRODUCT TRANSFER ONLY

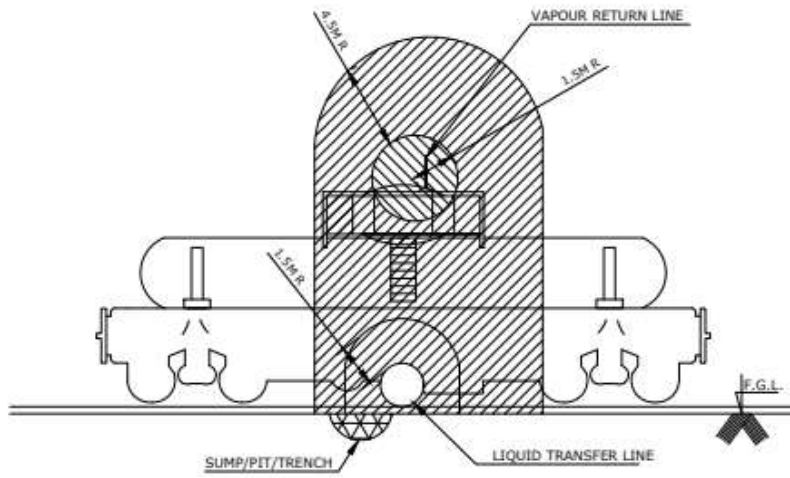


DETAIL-24

(MATERIAL: FLAMMABLE LIQUID)

WAGON/TANK TRUCK LOADING AND UNLOADING VIA OPEN SYSTEM.
TOP OR BOTTOM PRODUCT TRANSFER ONLY

NOTES:

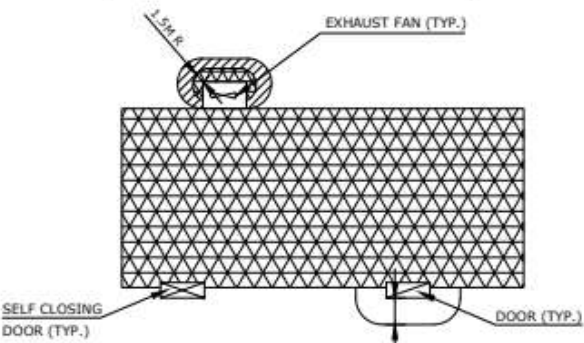


DETAIL-25

(MATERIAL: LIQUIFIED GAS/ COMPRESSED GAS/ CRYOGENIC GAS)
WAGON/TANK TRUCK LOADING AND UNLOADING VIA CLOSED SYSTEM.
PRODUCT TRANSFER THROUGH BOTTOM ONLY

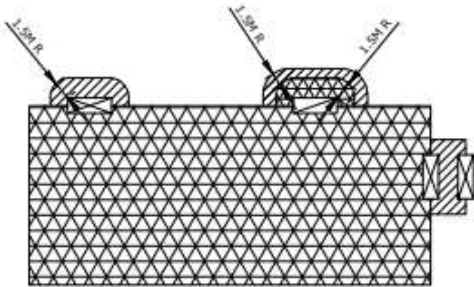
NOTES:

	DETAILS FOR AREA CLASSIFICATION (OIL/GAS INSTALLATION)	STANDARD DRAWING NO.		REV.	SIZE
				02	A4
		SHEET NO.	1 OF 1		



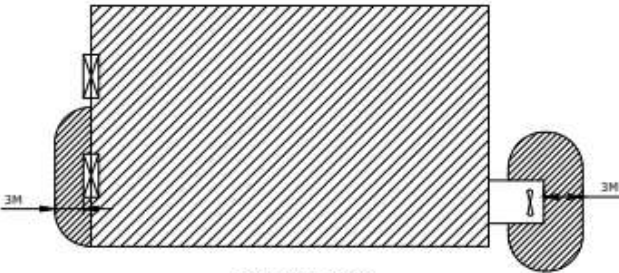
DETAIL-26A

FLAMMABLE SUBSTANCE RELEASED DURING NORMAL OPERATION WITH INADEQUATE VENTILATION



DETAIL-26B

FLAMMABLE SUBSTANCE RELEASED DURING ABNORMAL SITUATION OR INFREQUENT OPERATIONS WITH INADEQUATE VENTILATION

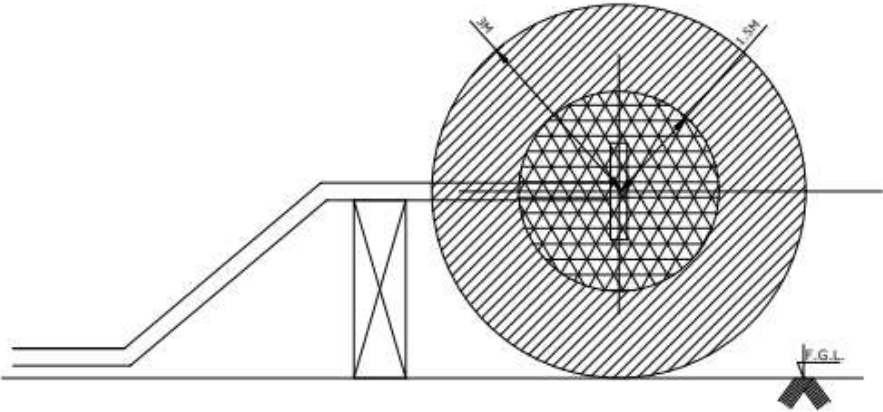


DETAIL-26C

FLAMMABLE SUBSTANCE RELEASED DURING ABNORMAL SITUATION OR INFREQUENT OPERATIONS WITH ADEQUATE VENTILATION

NOTES:

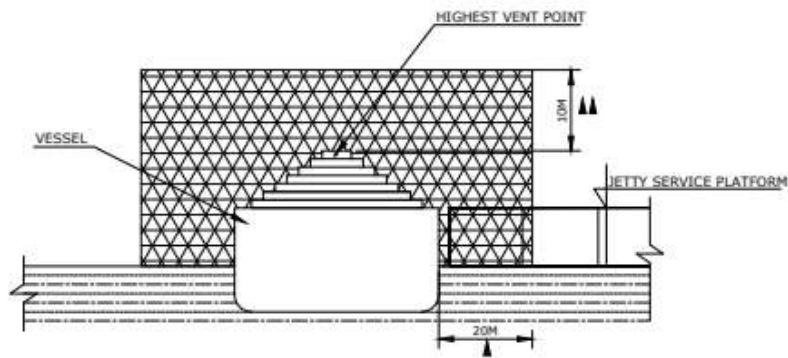
	DETAILS FOR AREA CLASSIFICATION (OIL/GAS INSTALLATION)	STANDARD DRAWING NO.		REV.	SIZE
				02	A4
		SHEET NO.	1 OF 1		



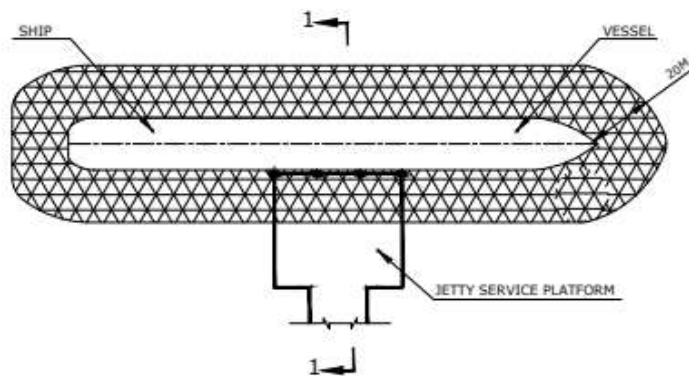
DETAIL-27

BALL OR PIG LAUNCHING OR RECEIVING INSTALLATION
IN A NON-ENCLOSED, ADEQUATELY VENTILATED AREA

NOTES:



SECTION 1-1



PLAN
DETAIL-28
JETTIES OR MARINE FACILITIES

NOTES:

- ▲▲ SHALL BE REDUCED TO 10M IN CASE OF VESSELS WITH LOADING OR DISCHARGES RATES $\leq 10M^3/MIN$.
- ▲▲▲ SHALL BE REDUCED TO 5M FOR LOADING RATES $\leq 10M^3/MIN$.

2 POLE STRUCTURAL

STANDARD DRAWING NO.

REV.

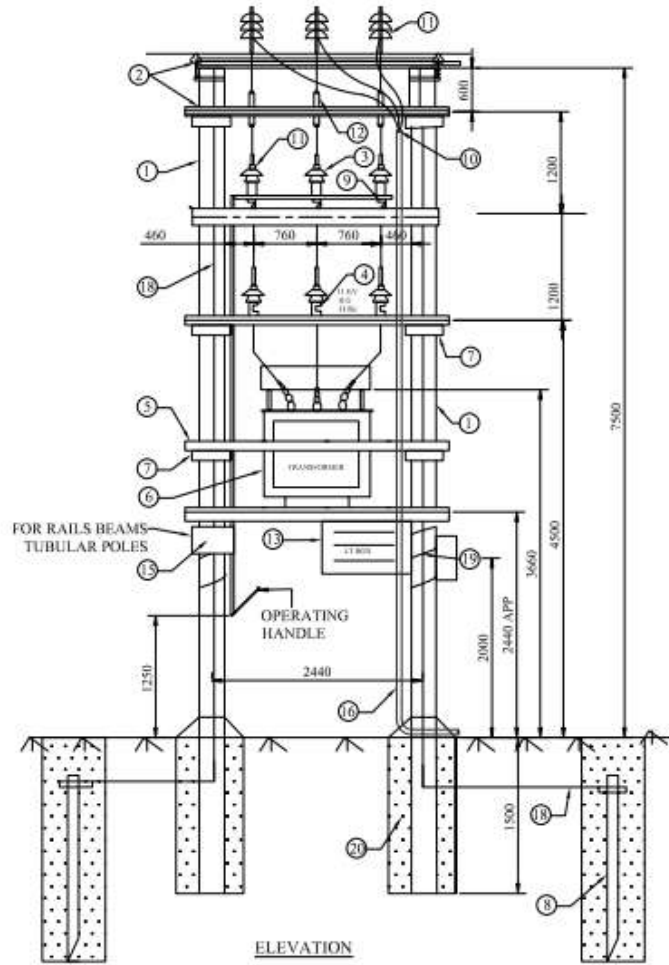
SIZE

SHEET NO.

1 OF 1

02

A4



BILL OF MATERIAL (APRX. QTY.)

S.No		
1	POLE (RCC/MS) - 9m	2
2	CHANNEL 100X50	2
3	AB ISOLATOR / G.O. SWITCH	2
4	H.G. FUSE	3
5	ANGLE 50X50X6 - 2800 (APP.)	3
6	TRANSFORMER	1
7	CLAMP	1
8	EARTHING PIT	2
9	G.O. AB SWITCH	1
10	HT CABLE	1 SET
11	11 KV INSULATOR	1 SET
12	11 KV LIGHTING ARREST'S	3
13	DISTRIBUTION BOX	1
14	LT CABLE	2
15	DANGER BOARD	1
16	HT CABLE PIPE	AS REQD
17	LT CABLE PIPE	AS REQD
18	EARTHING STRIP	AS REQD
19	BARBED WIRE	AS REQD
20	POLE FOUNDATION	2

4

E

TYPICAL CABLE TRAY INSTALLATION DETAILS

0	07.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS

Size	Scale	Sheet
A3	NTS	01 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

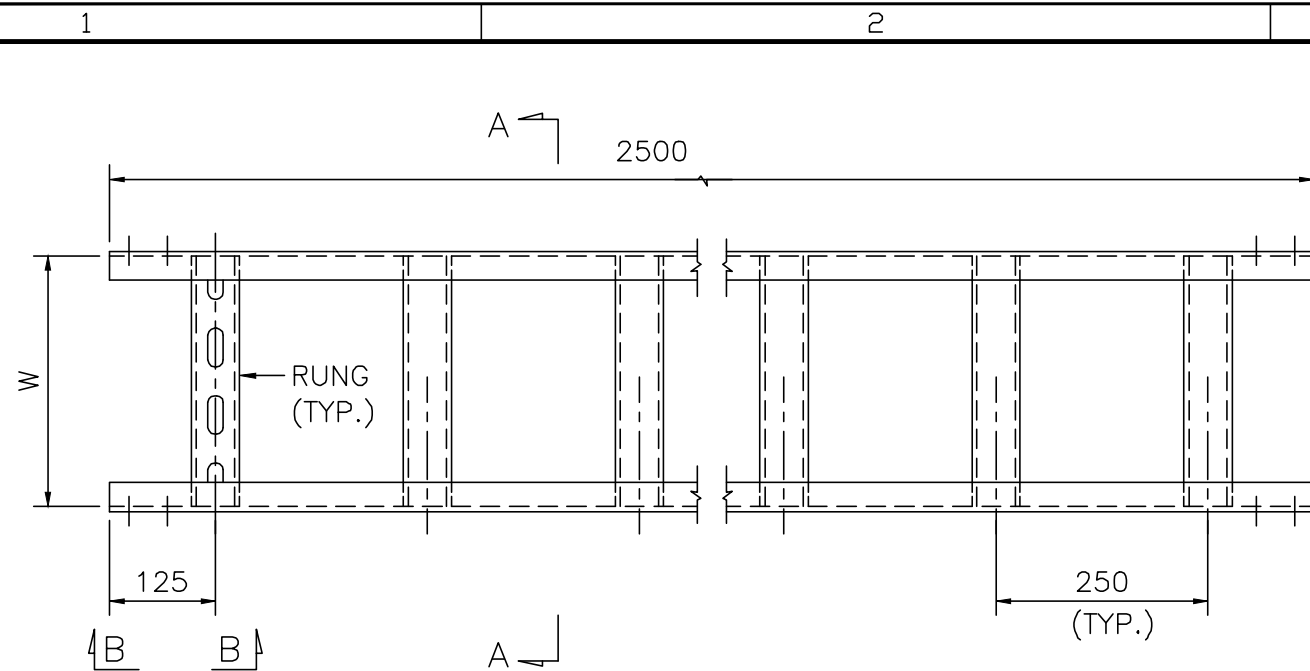
NOTES :

- 1- IN THE FOLLOWING SHEETS, EXACT DIMENSIONS X, Y, Z FOR CABLE SUPPORTS SHOULD BE DETERMINED ON SITE ACCORDING TO THE LOCATION, INSTALLATION DRAWING DONE FOR BUILDINGS AND AREAS.
- 2- THESE ERECTION DETAILS COULD BE ADAPTED ACCORDING TO NEEDS ON SITE.
- 3- THIS DOCUMENT IS A GUIDE LINE FOR CABLE TRAY INSTALLATION CONTRACTOR TO HELP HIM IN THE DEFINITION OF ITS SCOPE OF DESIGN AND SUPPLY.
- 4- MATERIAL SHOWN IN THIS DOCUMENT CAN BE ADAPTED BY CABLE TRAY INSTALLATION CONTRACTOR

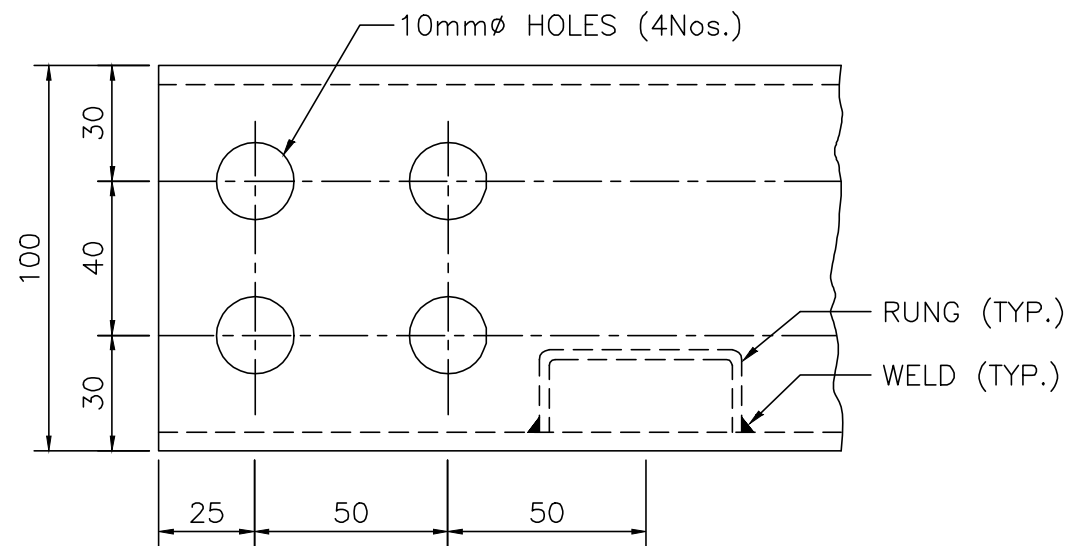
07.10.16	APPROVED	RKS	PR	KJ	SKH		
Rev. D M Y	Modifications	Drawn	Checked	Approved	Validated		

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS

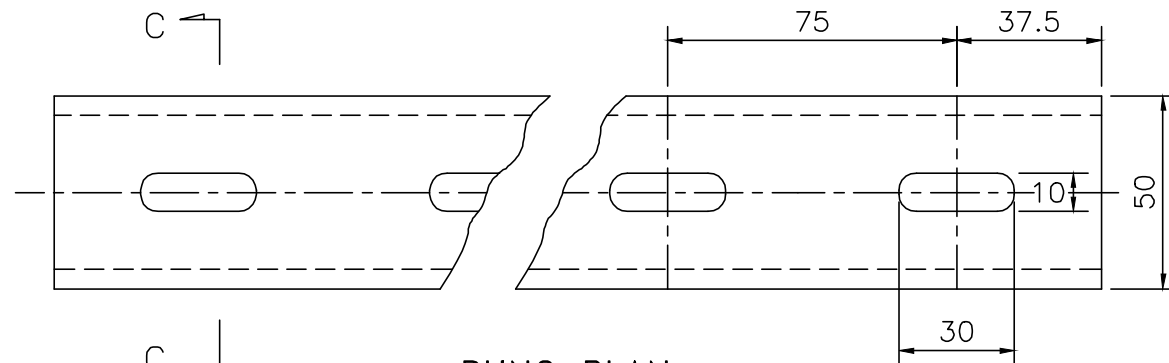
Size	Scale	Sheet
A3	NTS	02 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0



P L A N

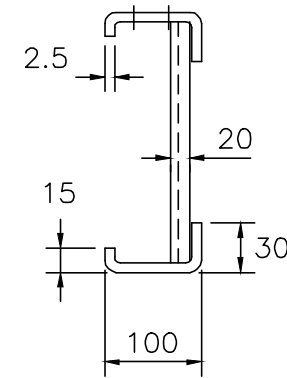


SECTION 'B-B'

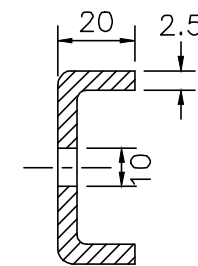


RUNG PLAN

MATERIAL - 12 GAUGE (2.5MM) M.S.SHEET/G.S/AL/FRP (AS PER BOQ)
INSIDE TRAY WIDTH (W) - 150,300,450,600,800MM (AS PER BOQ)



SECTION 'A-A'



SECTION 'C-C'

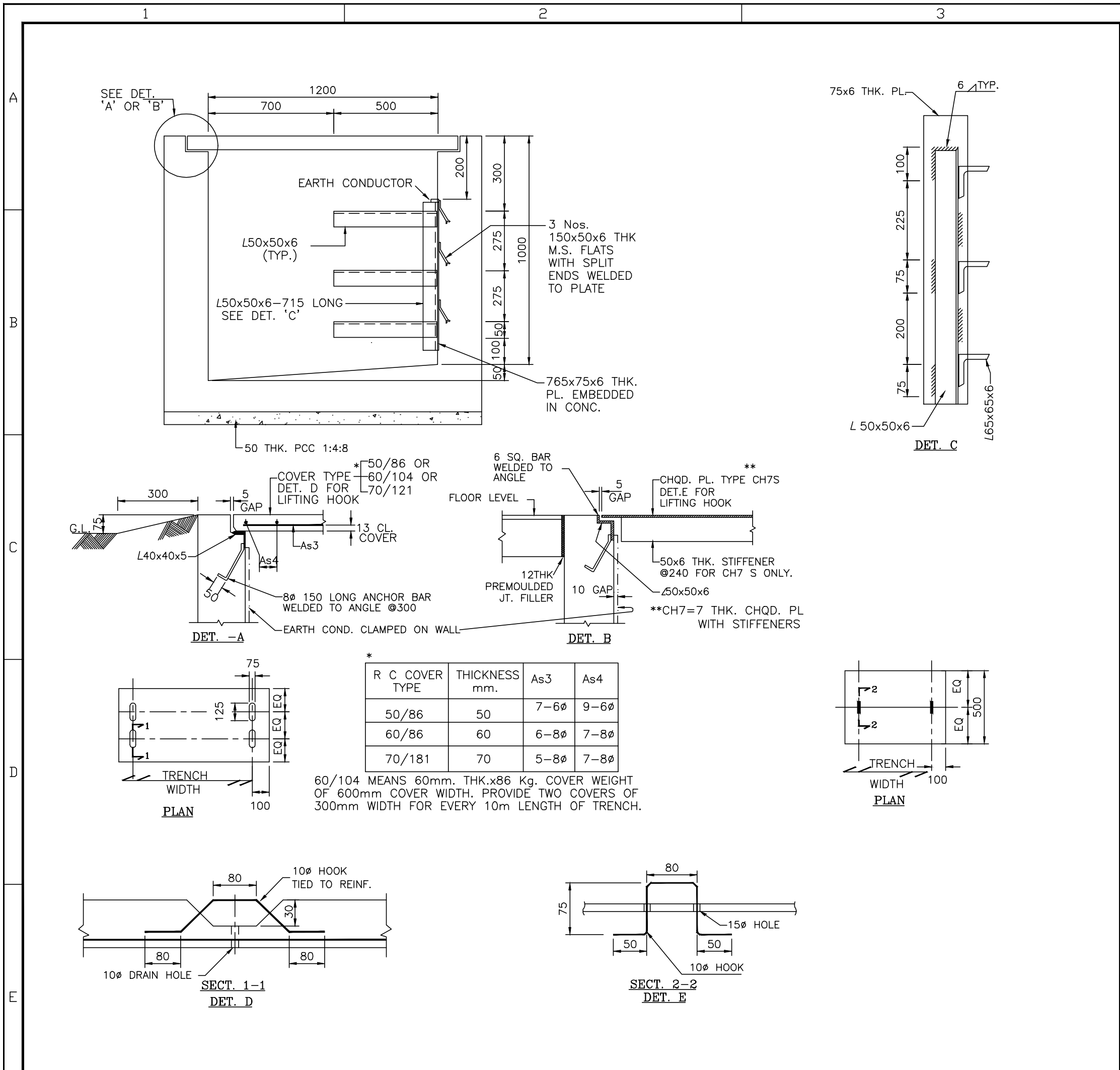
NOTES

1. ALL DIMENSIONS ARE IN MM.
2. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFIRMED TO RELEVANT IS/INTERNATIONAL STANDARDS.
3. THE MATERIAL DIMENSIONAL DETAILS SHOWN ARE TYPICAL FOR GS STRESS.
4. EACH CABLE TRAY SHALL BE SUPPLIED COMPLETE WITH MATCHING COUPLER PLATES WITH REQUIRED HARDWARE.
5. CABLE TRAYS SHALL DESIGN FOR 3000mm SUPPORT SPAN UNLESS NOTED OTHERWISE FOR SPECIFIED TRAY LOADING.

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
LADDER TYPE CABLE TRAY

Size	Scale	Sheet
A3	NTS	03 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	



4

NOTES

1. ALL DIMENSIONS ARE IN MM.

2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992

75x6 THK. PL.

6 TYP.

100

225

75

200

75

L 50x50x6

L65x65x6

DET. C

2

2

EQ

EQ

500

100

TRENCH WIDTH

PLAN

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

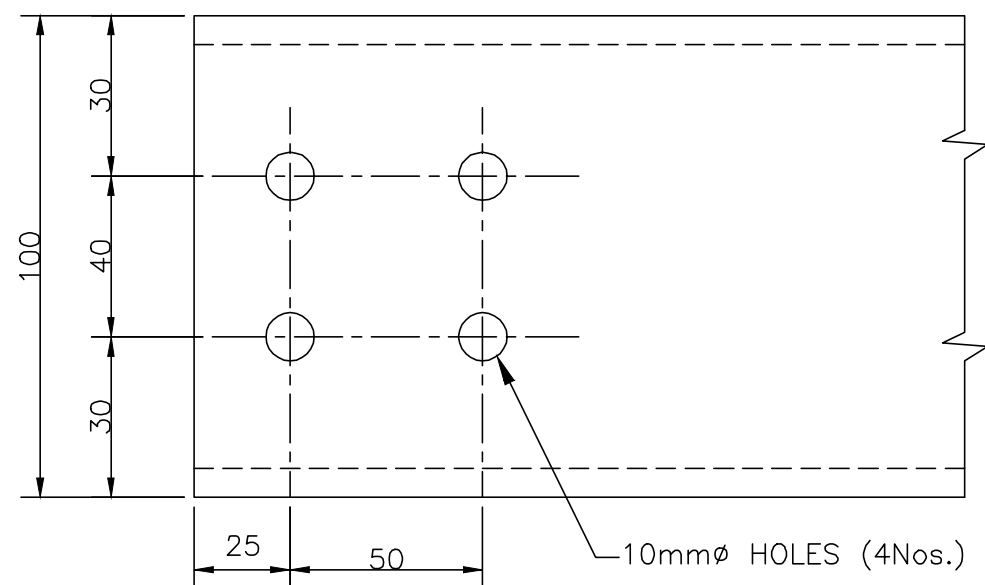
SUBJECT

TYPICAL CABLE TRAY INSTALLATION DETAILS

CABLE TRENCH TYPE

Size	Scale	Sheet
A3	NTS	04 of 62
Drawing No.	GGNG-E-20714-3010	
Rev.	0	

1. ALL DIMENSIONS ARE IN MM.
2. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFIRMED TO RELEVANT IS/INTERNATIONAL STANDARDS.
3. THE MATERIAL DIMENSIONAL DETAILS SHOWN ARE TYPICAL FOR GS STRESS.
4. EACH CABLE TRAY SHALL BE SUPPLIED COMPLETE WITH MATCHING COUPLER PLATES WITH REQUIRED HARDWARE.
5. CABLE TRAYS SHALL DESIGN FOR 3000mm SUPPORT SPAN UNLESS NOTED OTHERWISE FOR SPECIFIED TRAY LOADING.



SECTION 'A-A'

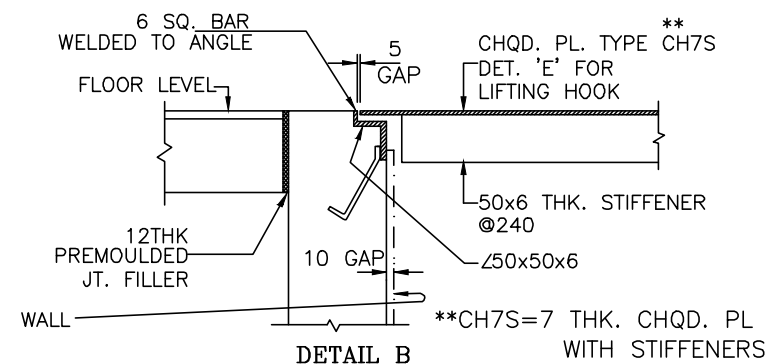
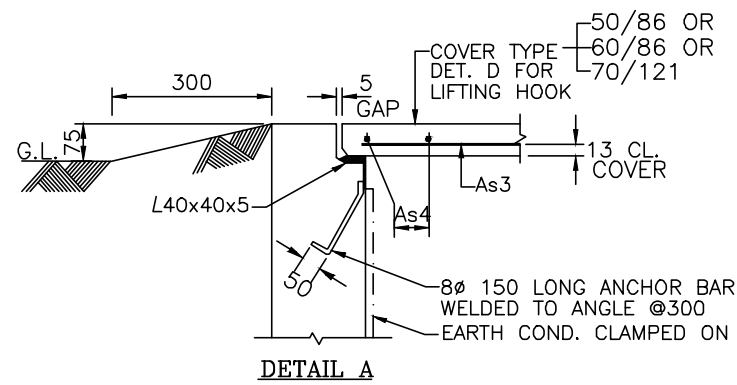
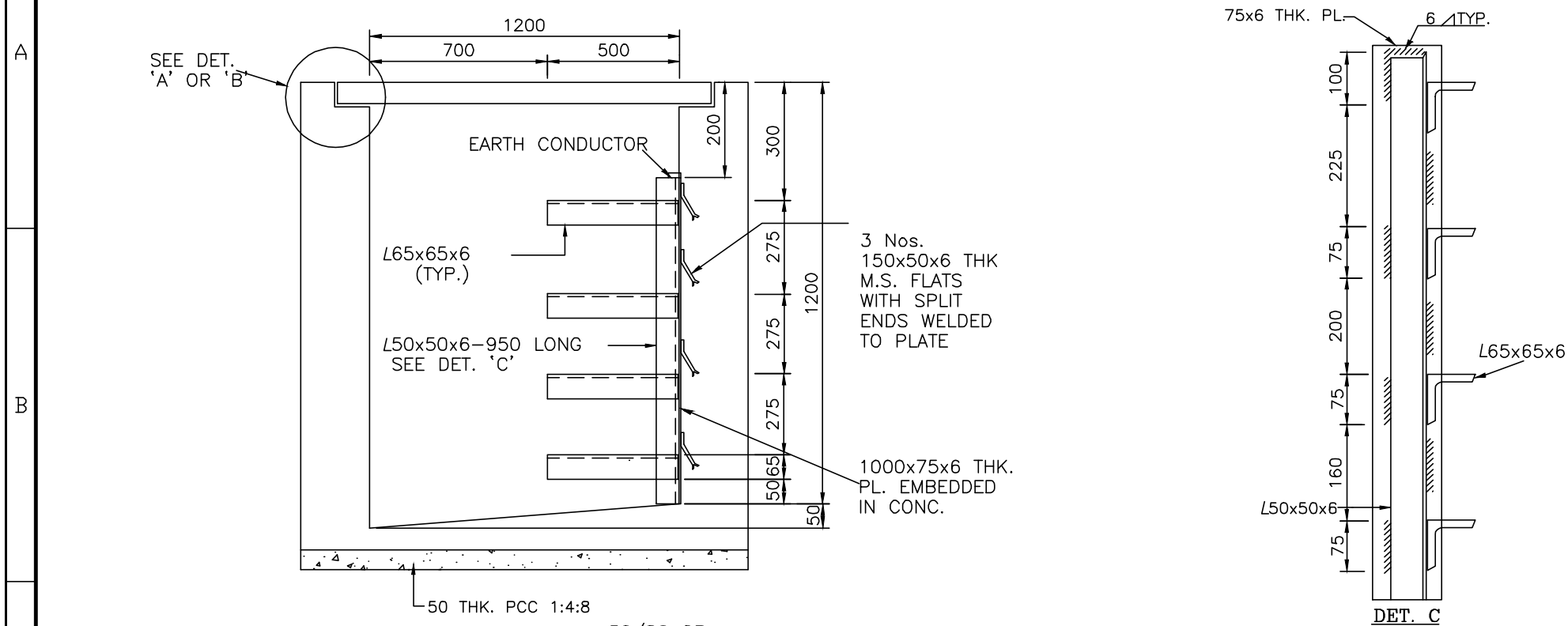
INSIDE WIDTH (W) – 100,150,300,450,600,800MM (AS PER BOQ)
MATERIAL – 12 GAUGE (2.5MM) M.S.SHEET/G.S./AL/FRP (AS PER BOQ)

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
PERFORATED TYPE CABLE TRAY

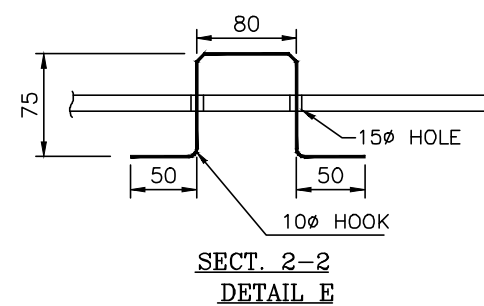
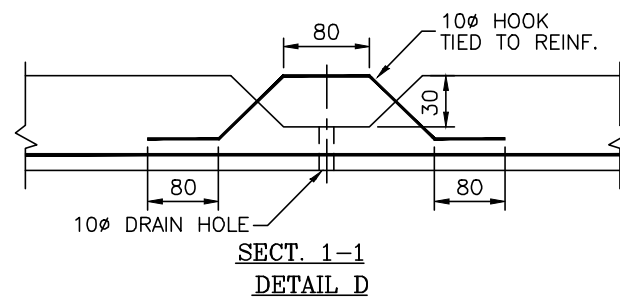
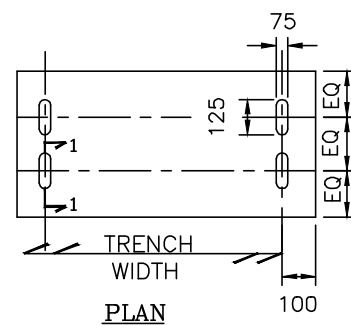
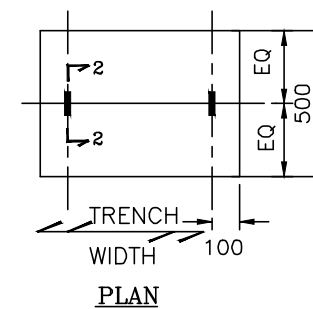
Size	Scale	Sheet
A3	NTS	05 of 62
Drawing No. GGNG-E-20714-3010		

1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



R C COVER TYPE	THICKNESS mm.	As3	As4
50/86	50	7-6ø	9-6ø
60/104	60	6-8ø	7-8ø
70/121	70	5-8ø	7-8ø

60x104 MEANS 60mm. THK.x104 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.



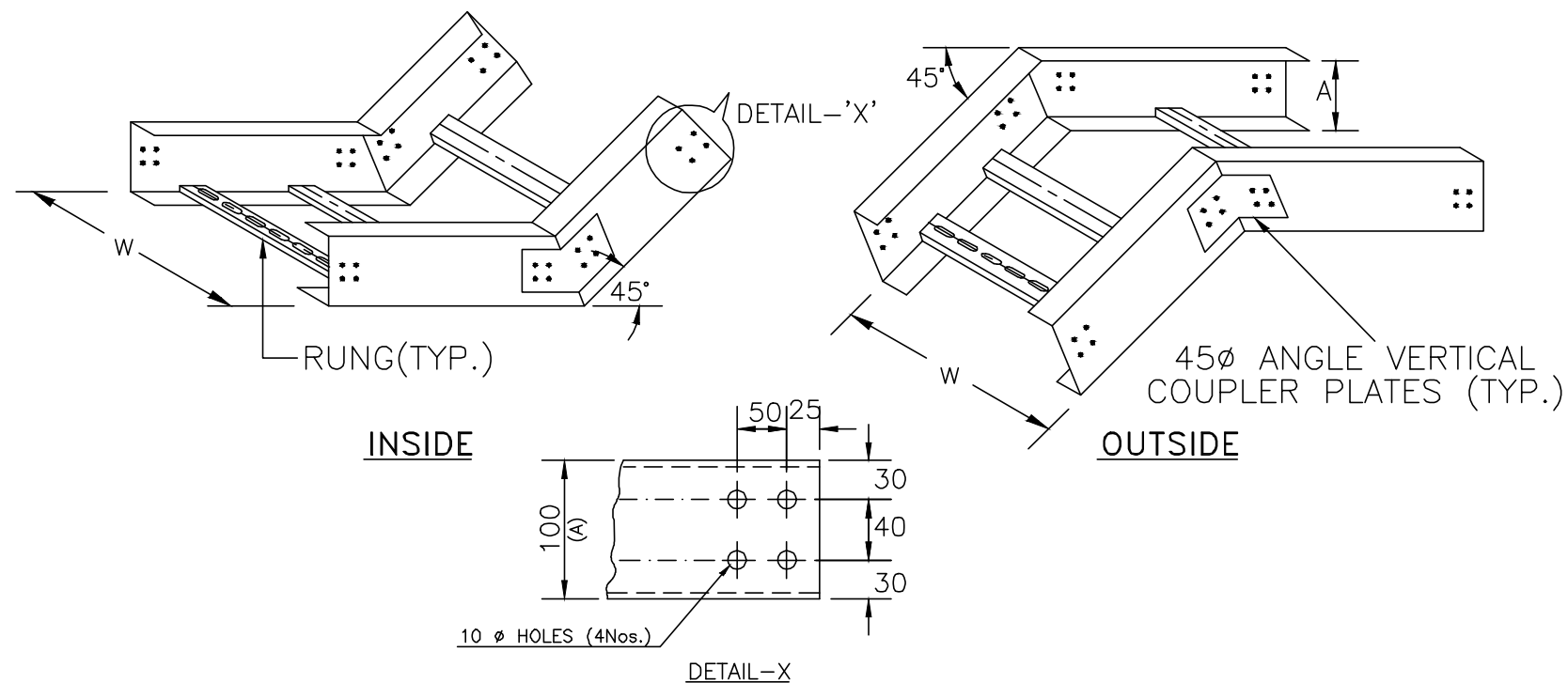
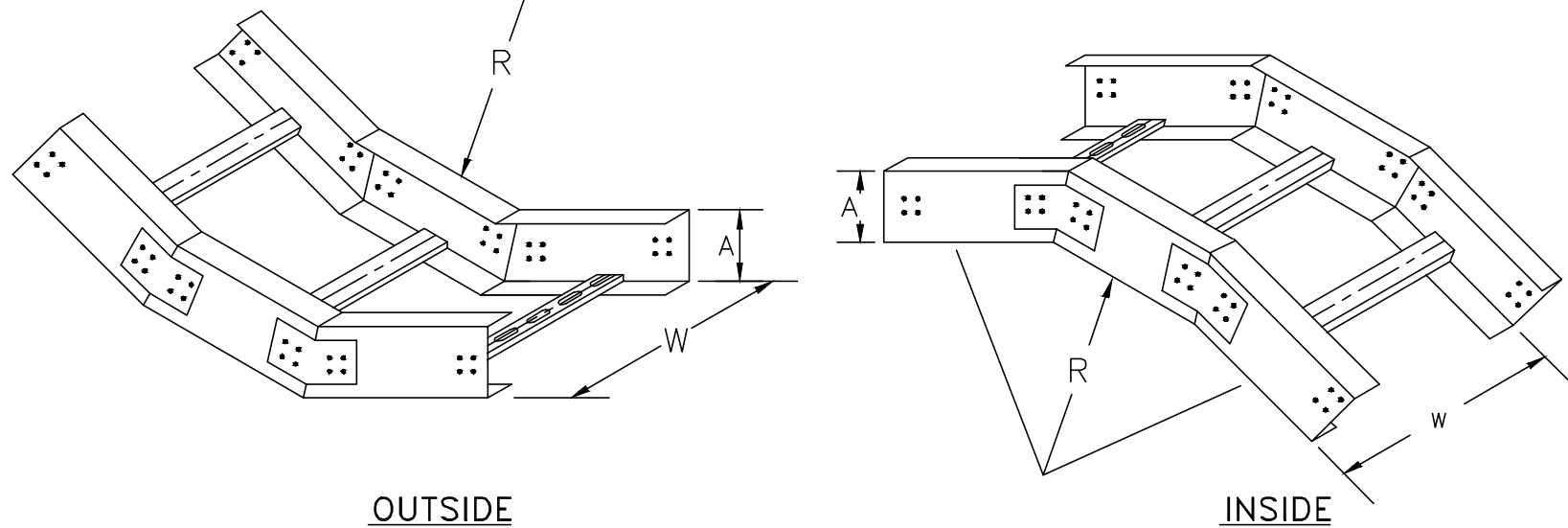
0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRENCH TYPE

Size	Scale	Sheet
A3	NTS	06 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

NOTES

1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL - 12 GAUGE(2.5MM) M.S. SHEET/G.S/AL/FRP (AS PER BOQ)
3. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFIRMED TO RELEVANT IS/INTERNATIONAL STANDARDS.
4. EACH CABLE TRAY SHALL BE SUPPLIED COMPLETE WITH MATCHING COUPLER PLATES WITH REQUIRED HARDWARE.
5. ALL TRAY FITTINGS SHALL BE SUPPLIED COMPLETE WITH MATCHING ANGLE HORIZONTAL COUPLER PLATES & HARDWARE. ALTERNATIVELY WELDED ASSEMBLY MAY BE SUPPLIED FOR G.S. CABLE TRAY FITTINGS.

45° DIRECT VERTICAL ELBOW45° VERTICAL RADIUS ELBOW

- (W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER BOQ)
(A) DEPTH OF TRAY - 100MM UNLESS NOTED
(R) BENDING RADIUS (AS PER BOQ)

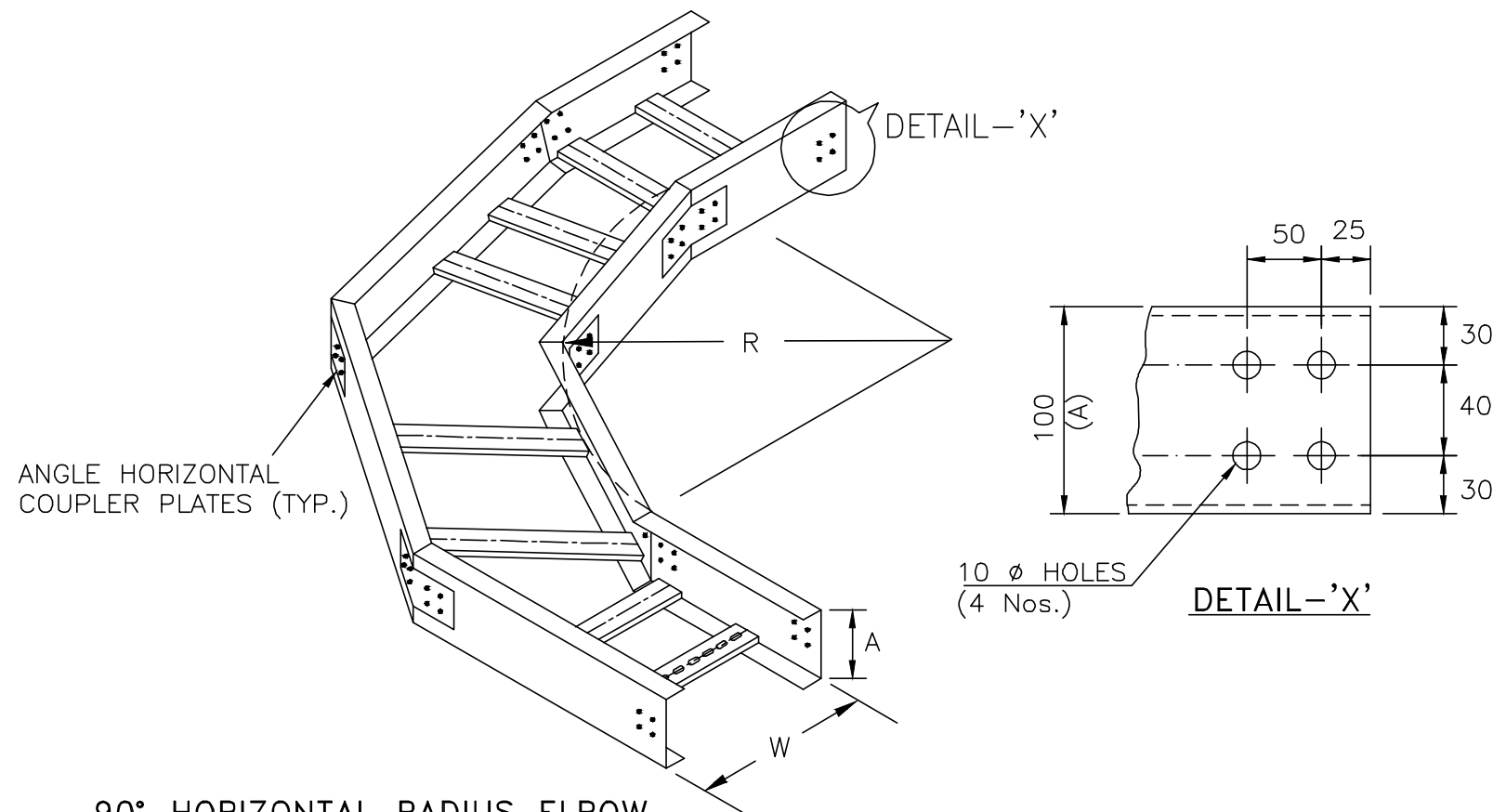
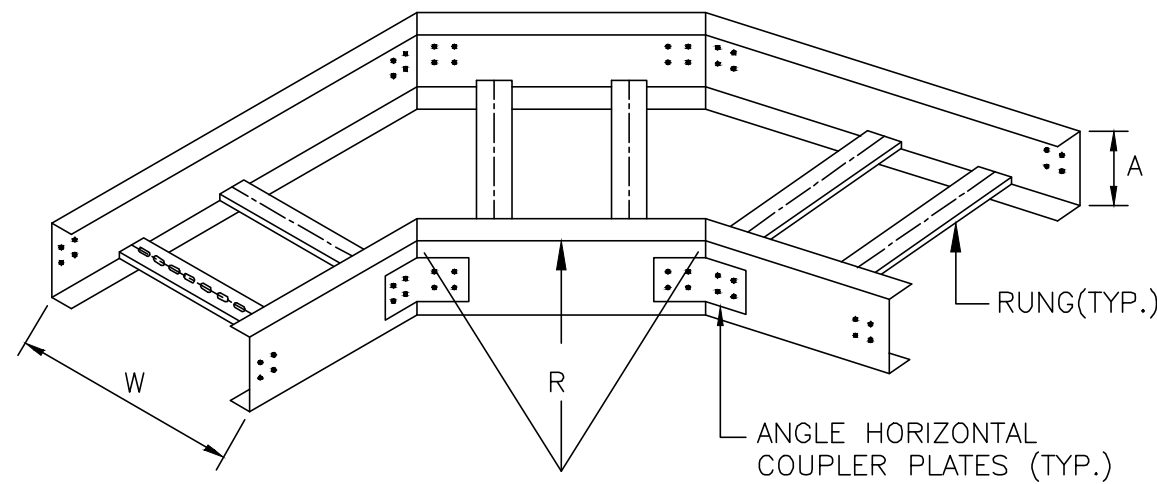
0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRAY ACCESSORIES

Size	Scale	Sheet
A3	NTS	07 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	

NOTES

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90° HORIZONTAL RADIUS ELBOW45° HORIZONTAL RADIUS ELBOW

(W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER BOQ)

(A) DEPTH OF TRAY - 100MM UNLESS NOTED

(R) BENDING RADIUS (AS PER BOQ)

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

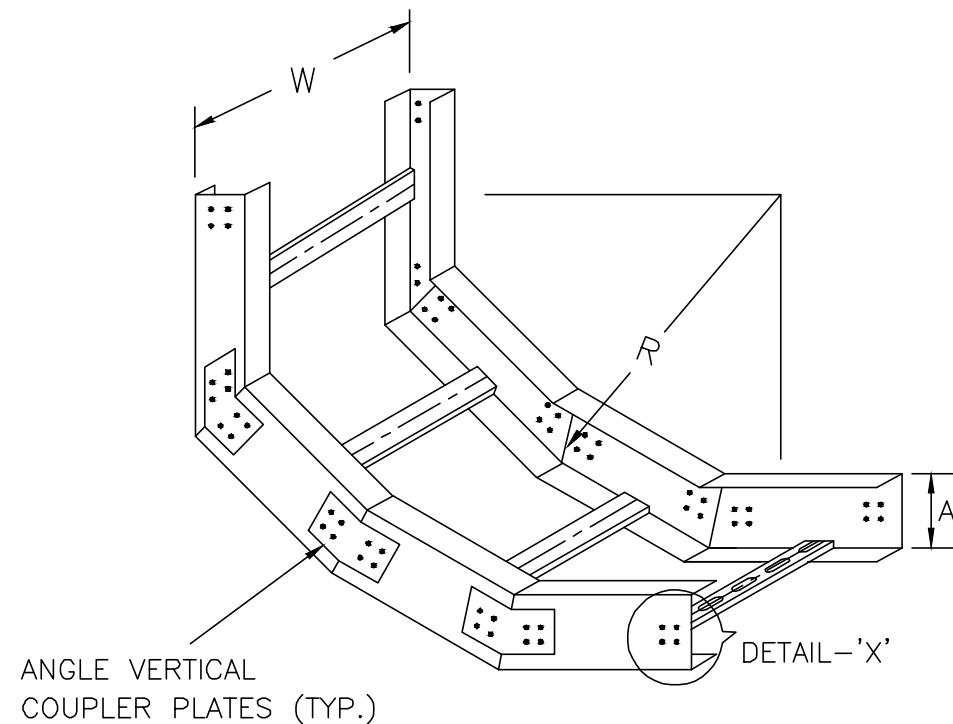
SUBJECT **TYPICAL CABLE TRAY INSTALLATION DETAILS**
CABLE TRAY ACCESSORIES

Size	Scale	Sheet
A3	NTS	08 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	

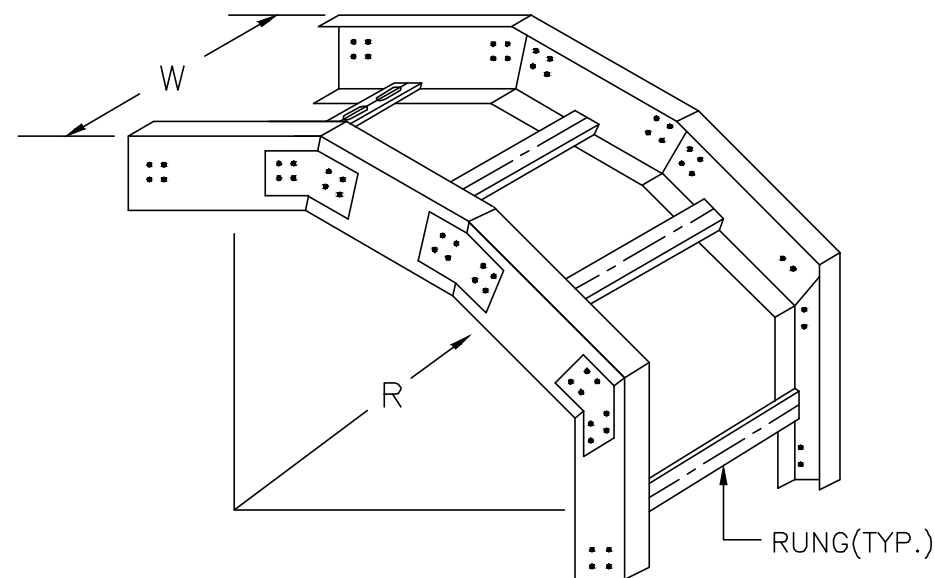
NOTES

1. ALL DIMENSIONS ARE IN MM.
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3. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFIRMED TO RELEVANT IS/INTERNATIONAL STANDARDS.
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90° VERTICAL RADIUS ELBOW

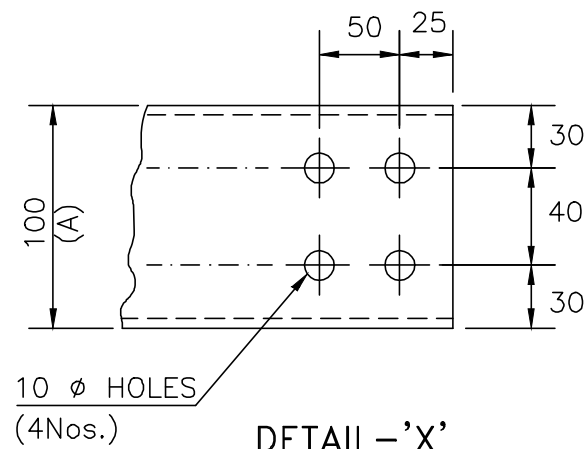


INSIDE



OUTSIDE

- (W) INSIDE WIDTH OF TRAY – 150,300,450,600,800MM (AS PER BOQ).
(A) DEPTH OF TRAY – 100MM UNLESS NOTED.
(R) BENDING RADIUS (AS PER BOQ).



DETAIL – 'X'

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRAY ACCESSORIES

Size	Scale	Sheet
A3	NTS	09 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	

1

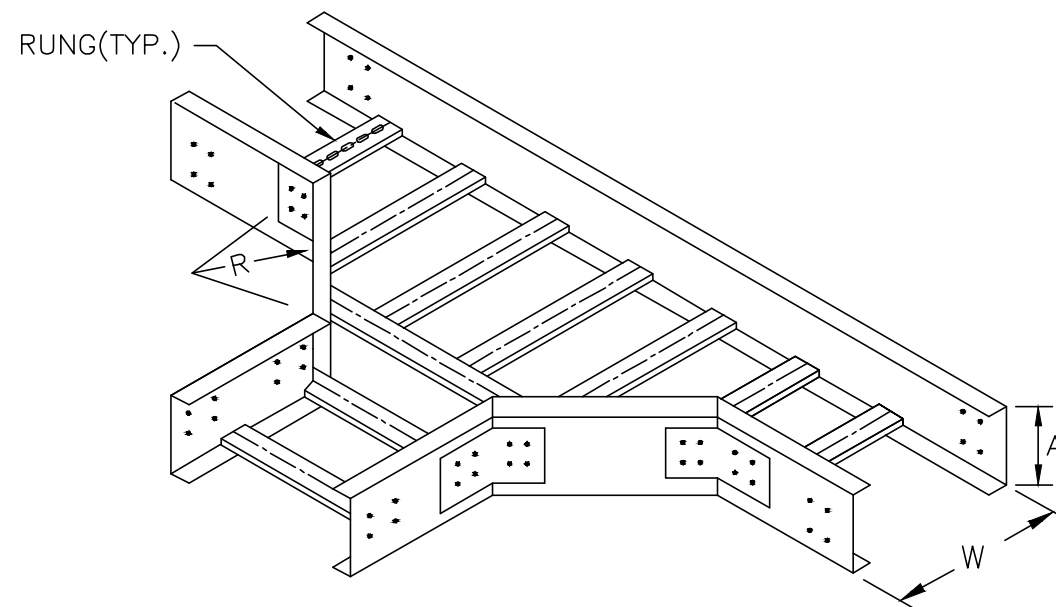
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3

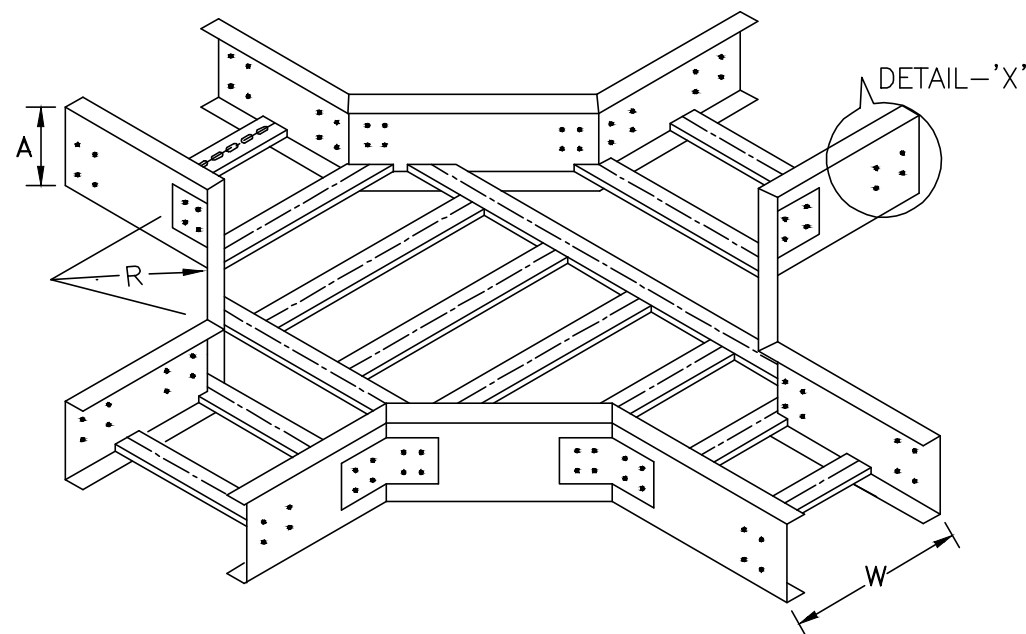
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NOTES

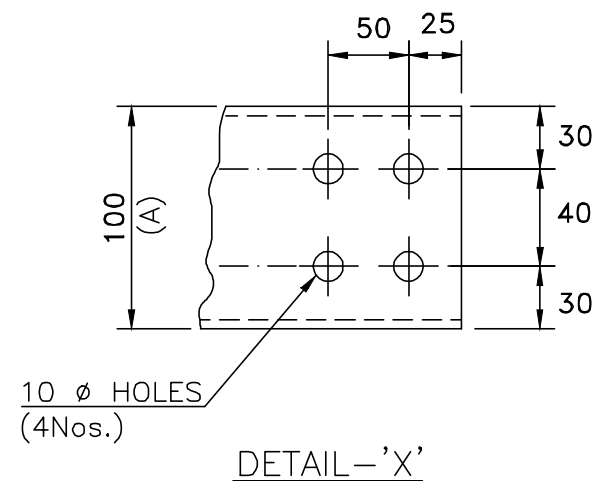
1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL - 12 GAUGE(2.5MM) M.S. SHEET/G.S/AL/FRP (AS PER BOQ)
3. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFIRMED TO RELEVANT IS/INTERNATIONAL STANDARDS.
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HORIZONTAL RADIUS TEE



HORIZONTAL RADIUS CROSS



- (W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER BOQ)
- (A) DEPTH OF TRAY - 100MM UNLESS NOTED
- (R) BENDING RADIUS (AS PER BOQ)

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRAY ACCESSORIES

Size	Scale	Sheet
A3	NTS	10 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	

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1

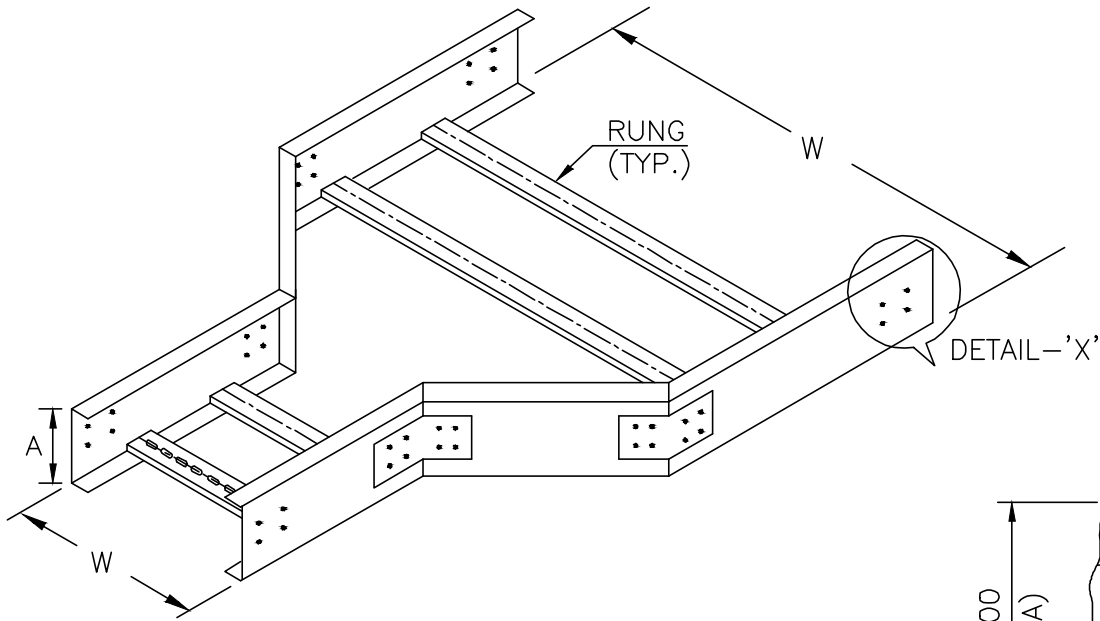
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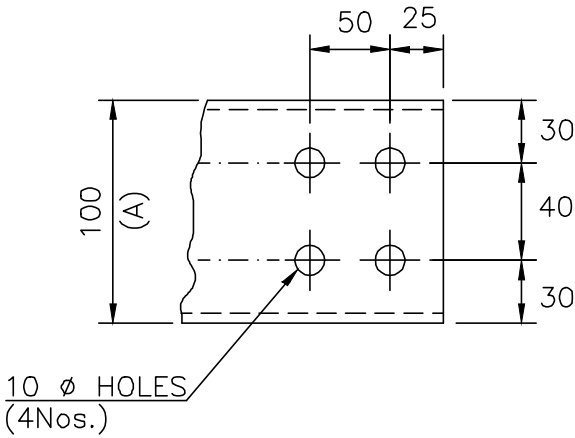
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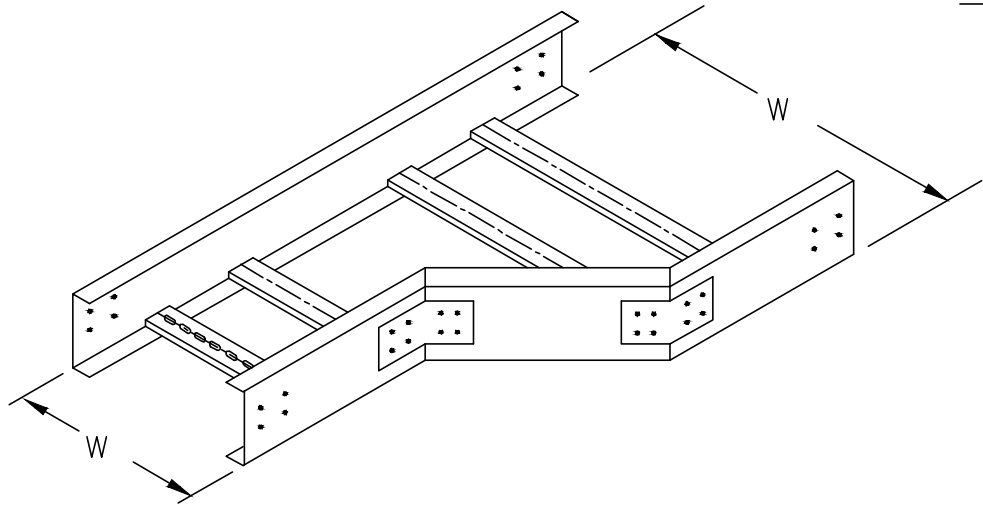
1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL – 12 GAUGE(2.5MM) M.S. SHEET/G.S/AL/FRP (AS PER BOQ)
3. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFIRMED TO RELEVANT IS/INTERNATIONAL STANDARDS.
4. EACH CABLE TRAY SHALL BE SUPPLIED COMPLETE WITH MATCHING COUPLER PLATES WITH REQUIRED HARDWARE.
5. ALL TRAY FITTINGS SHALL BE SUPPLIED COMPLETE WITH MATCHING ANGLE HORIZONTAL COUPLER PLATES & HARDWARE. ALTERNATIVELY WELDED ASSEMBLY MAY BE SUPPLIED FOR G.S. CABLE TRAY FITTINGS.



STRAIGHT REDUCER



DETAIL - 'X'



RIGHT TO LEFT HAND REDUCER

(W) INSIDE WIDTH OF TRAY – 150,300,450,600,800MM (AS PER BOQ)

(A) DEPTH OF TRAY – 100MM UNLESS NOTED

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D	M	Y	Modifications	Drawn	Checked
					Approved	Validated

SUBJECT				TYPICAL CABLE TRAY INSTALLATION DETAILS		
				CABLE TRAY ACCESSORIES		
		Size	Scale	Sheet		
		A3	NTS	11 of 62		
		Drawing No.		Rev.		
		GGNG-E-20714-3010		0		

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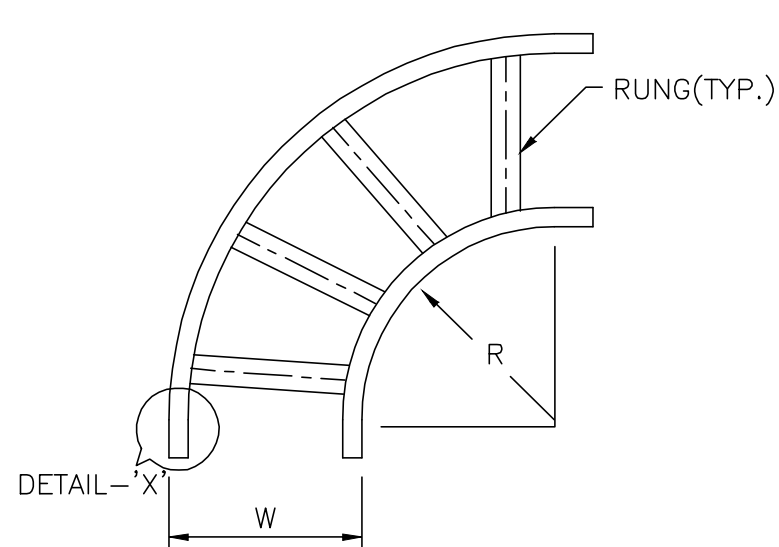
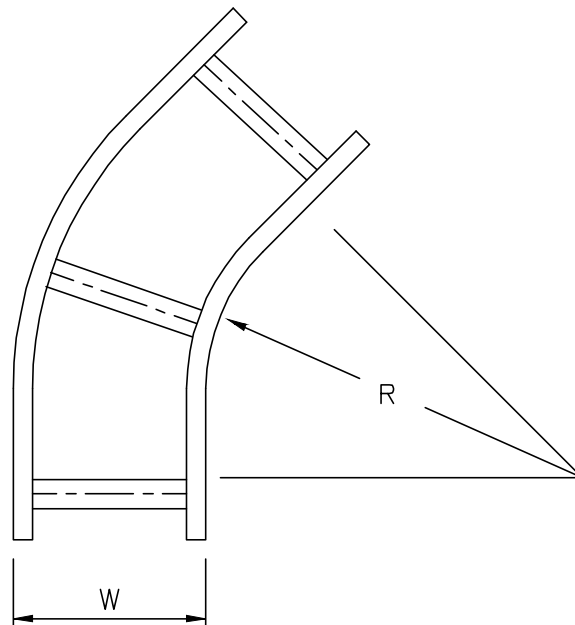
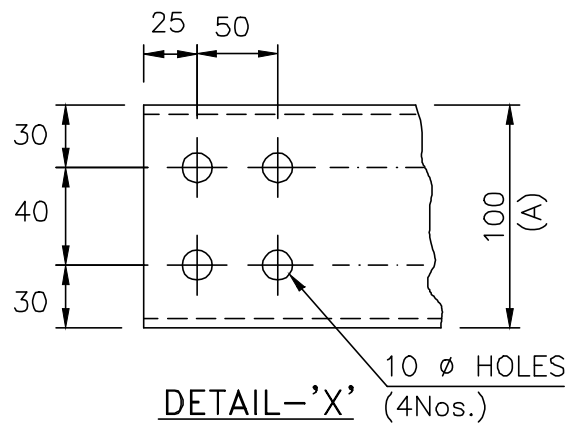
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NOTES

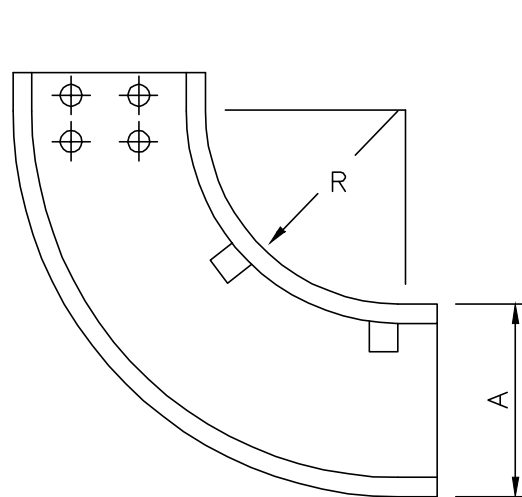
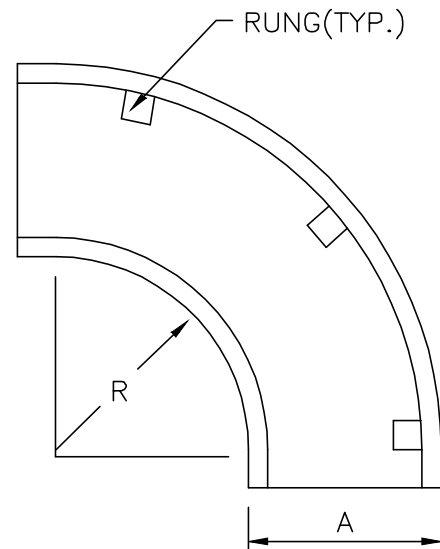
1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL - 12 GAUGE(2.5MM) M.S. SHEET/G.S/AL/FRP (AS PER BOQ)
3. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFIRMED TO RELEVANT IS/INTERNATIONAL STANDARDS.
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5. ALL TRAY FITTINGS SHALL BE SUPPLIED COMPLETE WITH MATCHING ANGLE HORIZONTAL COUPLER PLATES & HARDWARE. ALTERNATIVELY WELDED ASSEMBLY MAY BE SUPPLIED FOR G.S. CABLE TRAY FITTINGS.

90° HORIZONTAL RADIUS ELBOW45° HORIZONTAL RADIUS ELBOW

(W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER BOQ)

(A) DEPTH OF TRAY - 100MM UNLESS NOTED

(R) BENDING RADIUS (AS PER BOQ)

90° VERTICAL MOULDED RADIUS ELBOWINSIDEOUTSIDE

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D	M	Y	Modifications	Drawn	Checked
					Approved	Validated

SUBJECT **TYPICAL CABLE TRAY INSTALLATION DETAILS**
CABLE TRAY ACCESSORIES (FRP)

Size	Scale	Sheet
A3	NTS	13 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	

1

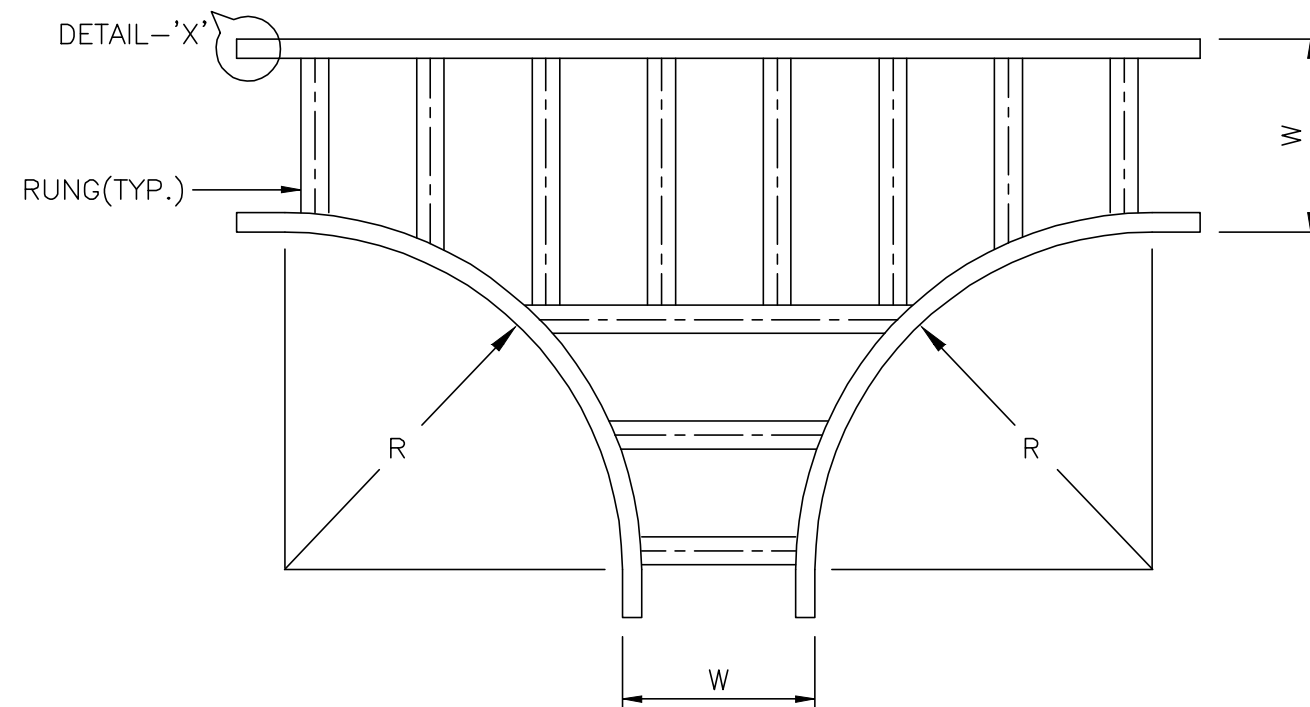
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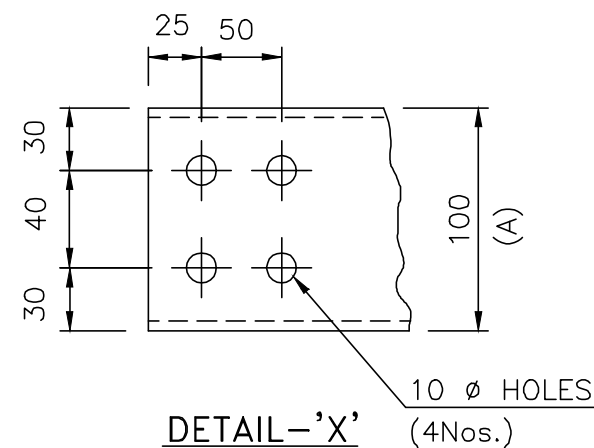
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NOTES

1. ALL DIMENSIONS ARE IN MM.
2. MATERIAL - 12 GAUGE(2.5MM) M.S. SHEET/G.S/AL/FRP (AS PER BOQ)
3. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFIRMED TO RELEVANT IS/INTERNATIONAL STANDARDS.
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HORIZONTAL RADIUS TEE



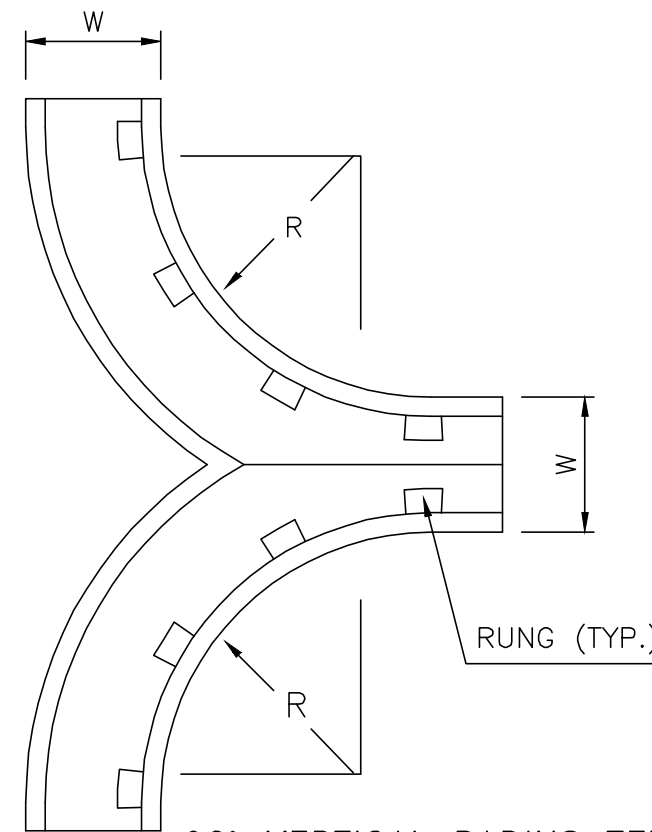
DETAIL-'X'

10 Ø HOLES
(4Nos.)

(W) - INSIDE WIDTH OF TRAY-150,300,450,600,800MM (AS PER BOQ)

(A) - DEPTH OF TRAY-100MM UNLESS NOTED

(R) - BENDING RADIUS (AS PER BOQ)



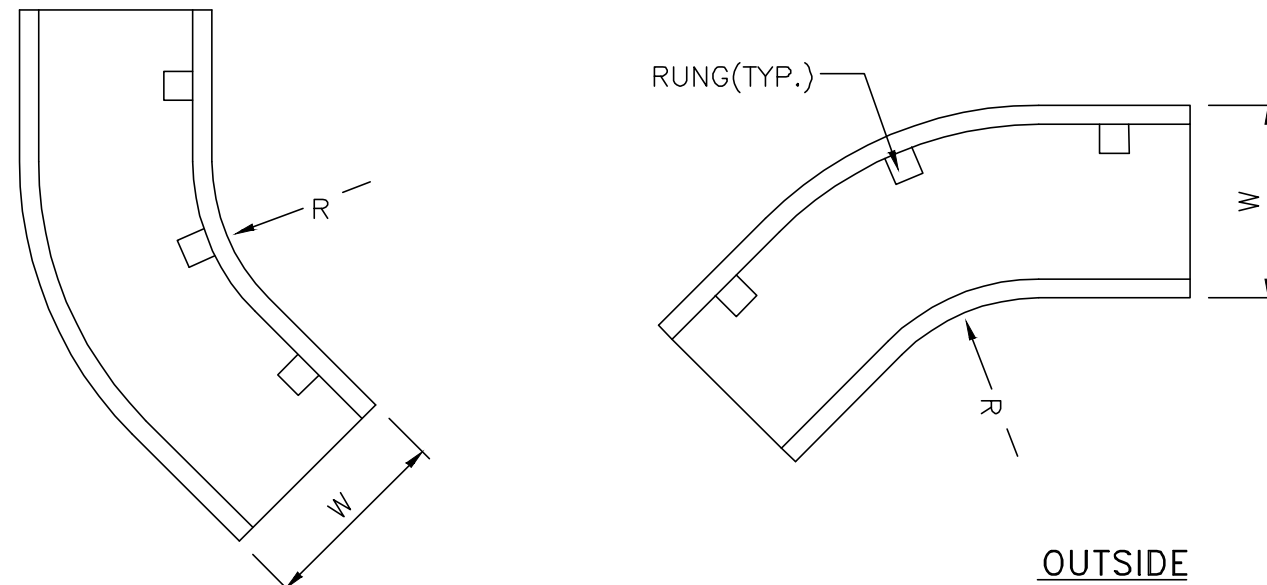
90° VERTICAL RADIUS TEE

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D	M	Y	Modifications	Drawn	Checked
					Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRAY ACCESSORIES

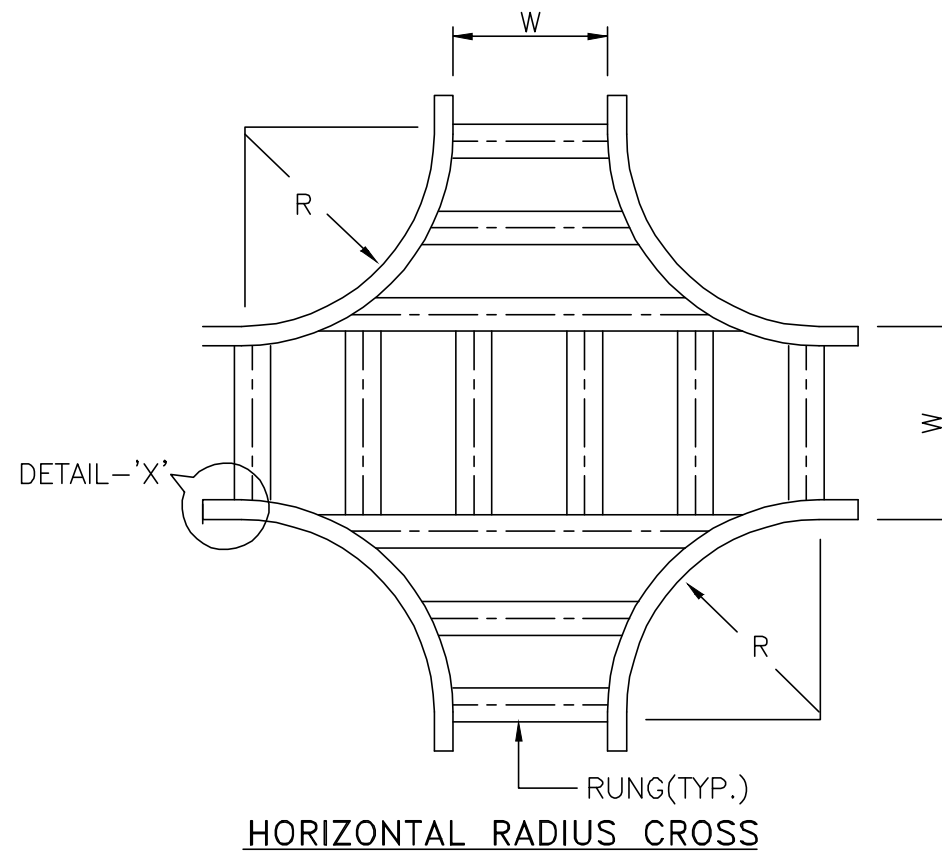
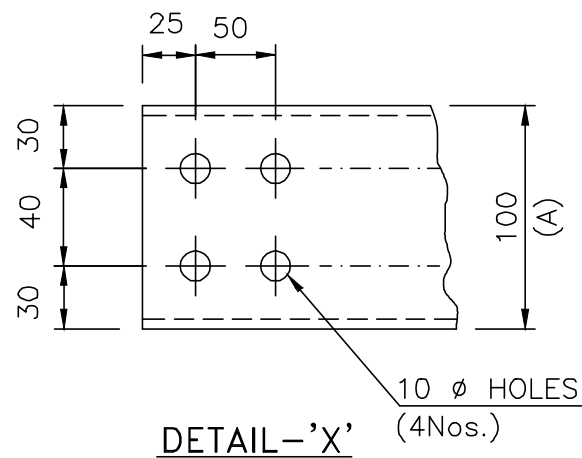
Size	Scale	Sheet
A3	NTS	14 of 62
Drawing No.	GGNG-E-20714-3010	Rev.
		0

45° VERTICAL RADIUS ELBOW



INSIDE

OUTSIDE

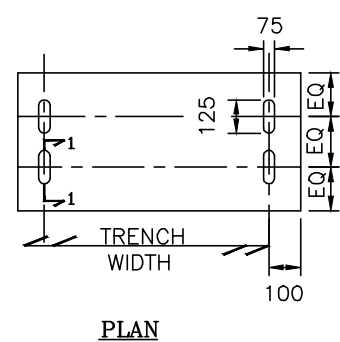
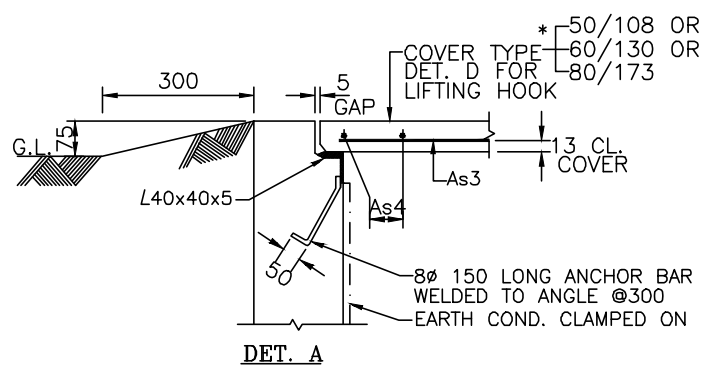
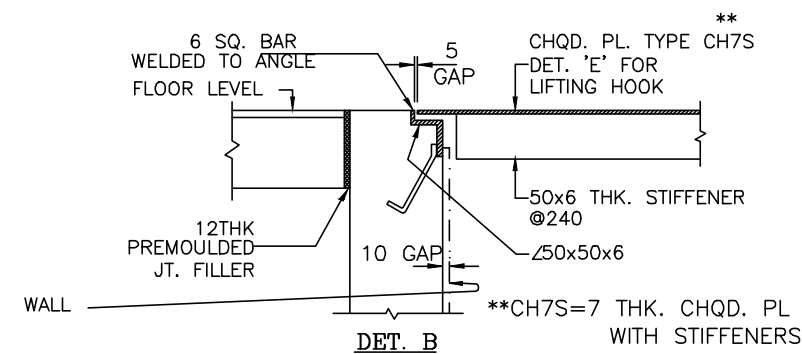
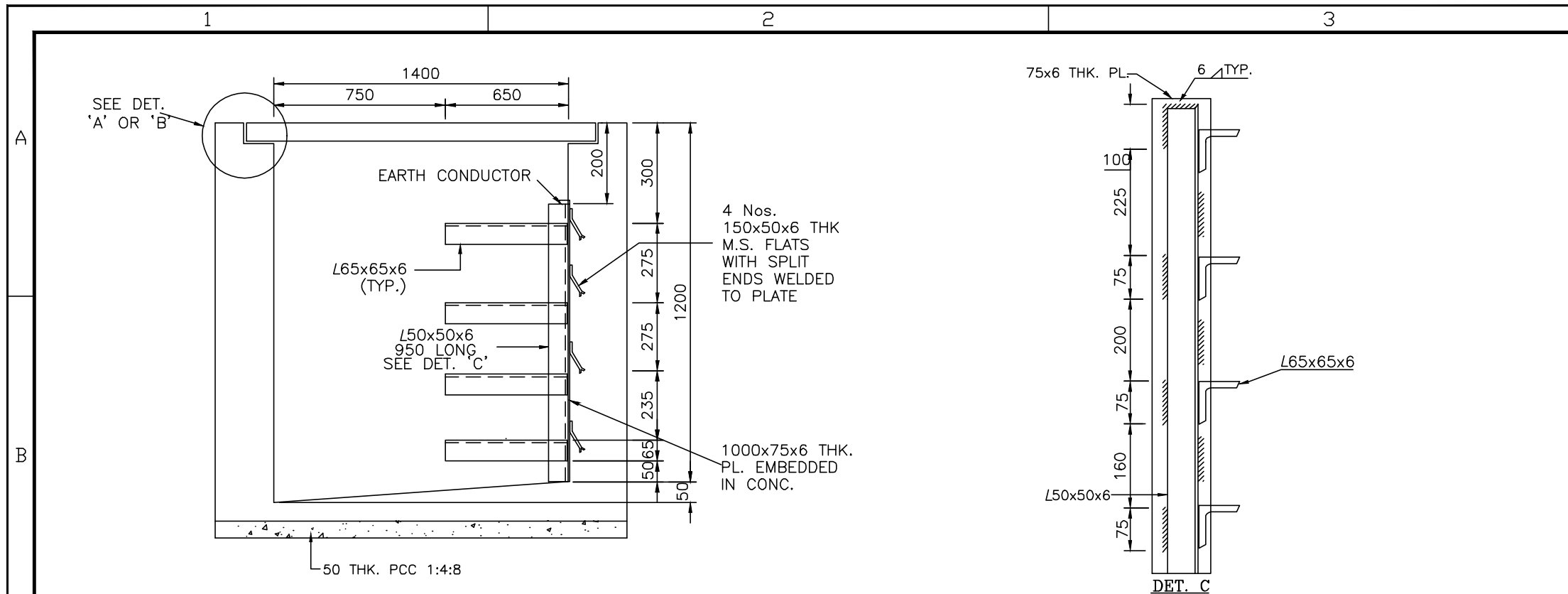


NOTES

1. ALL DIMENSIONS ARE IN MM.
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3. M.S. SHEET SHALL CONFORM TO IS2062: 1992 OR EQUIVALENT INTERNATIONAL STANDARDS AND HOT DIP GALVANIZING SHALL BE DONE AS PER IS4759: 1996 OR EQUIVALENT INTERNATIONAL STANDARDS. CABLE TRAY SUPPLIED WITH OTHER MATERIALS SHALL CONFIRMED TO RELEVANT IS/INTERNATIONAL STANDARDS.
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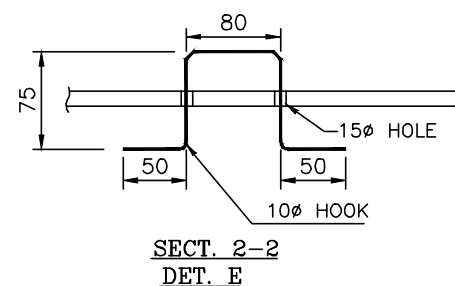
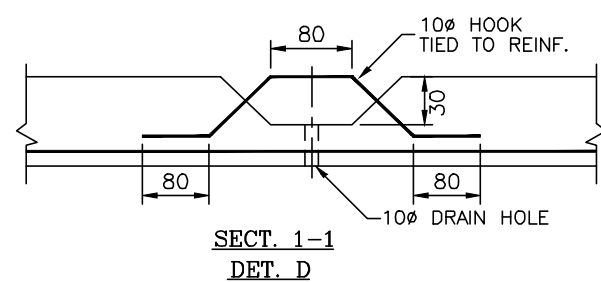
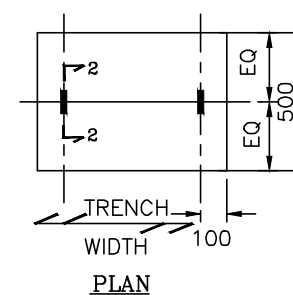
- (W) INSIDE WIDTH OF TRAY - 150,300,450,600,800MM (AS PER BOQ)
(A) DEPTH OF TRAY - 100MM UNLESS NOTED
(R) BENDING RADIUS (AS PER BOQ)

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D	M	Y	Modifications	Drawn	Checked
SUBJECT				TYPICAL CABLE TRAY INSTALLATION DETAILS		
				CABLE TRAY ACCESSORIES		
		Size	Scale	Sheet		
		A3	NTS	15 of 62		
		Drawing No.		Rev.		
		GGNG-E-20714-3010		0		



R C COVER TYPE	THICKNESS mm.	As3	As4
50/108	50	7-6ø	9-6ø
60/130	60	6-8ø	8-8ø
80/173	80	5-8ø	8-8ø

60x130 MEANS 60mm. THK.x130 Kg. COVER WEIGHT
OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF
300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.



NOTES

1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992.

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRENCH TYPE

Size	Scale	Sheet
A3	NTS	16 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

1. ALL DIMENSIONS ARE IN MM.
2. FULL LENGTH FILLET WELD WITH RETURNED ENDS TO BE MINIMUM 4MM.
3. ISMC 75 SHALL BE AS PER IS 2062: 1992.
4. WELDING SHALL BE DONE AS PER IS 816: 1969.
5. DIMENSION 'D' TO SUIT ELEVATION OF TRAY AS GIVEN ON CABLE TRAY LAYOUT DRAWING.



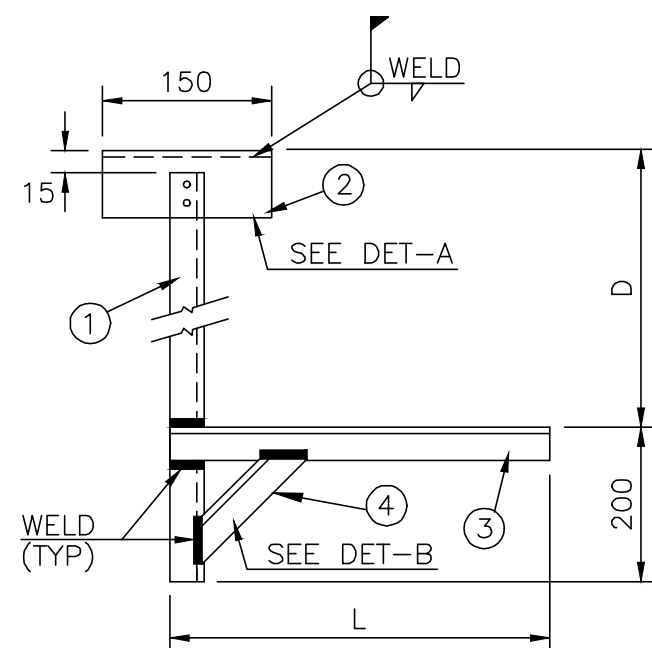
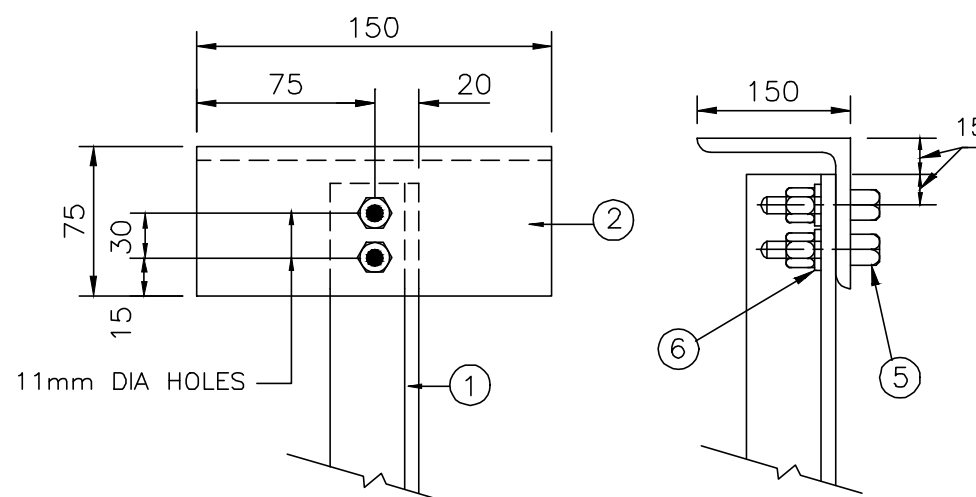
TRAY WIDTH	L	REMARKS
100	250	
150	300	

ITEM NO	DESCRIPTION	LENGTH	QTY No.	REMARKS
①	ISM C 75	D + L	1	FOR 'L' REF.TABLE-1

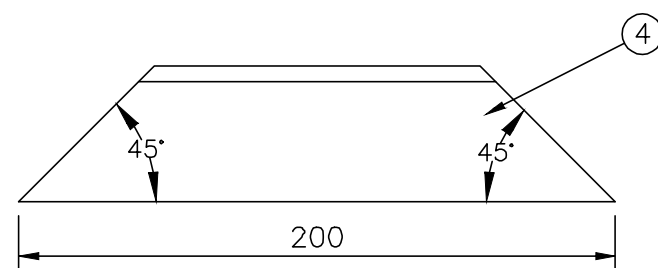
0	07.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRAY CEILING MOUNTED SINGLE SUPPORT

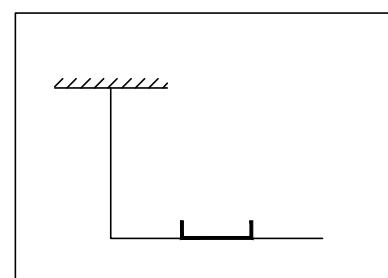
Size	Scale	Sheet
A3	NTS	17 of 62
Drawing No.		F
GGNG-E-20714-3010		

ELEVATION

DETAIL-A



DETAIL-B



TYPE-2B

TABLE-1

TRAY WIDTH	L	REMARKS
100	200	
150	250	
300	400	
450	550	
600	700	

TABLE-2

ITEM NO	DESCRIPTION	LENGTH MM	QTY No.	REMARKS
①	ISA 50x50x6	D+200	1	FOR 'D' REF.NOTE.4
②	ISA 75x50x6	150	1	
③	ISA 50x50x6	L	1	FOR 'L' REF.TABLE-1
④	ISA 50x50x6	200	1	ONLY FOR 600MM TRAY
⑤	BOLT/NUT(M10)	30	2	
⑥	SPRING WASHER (M10)	—	2	

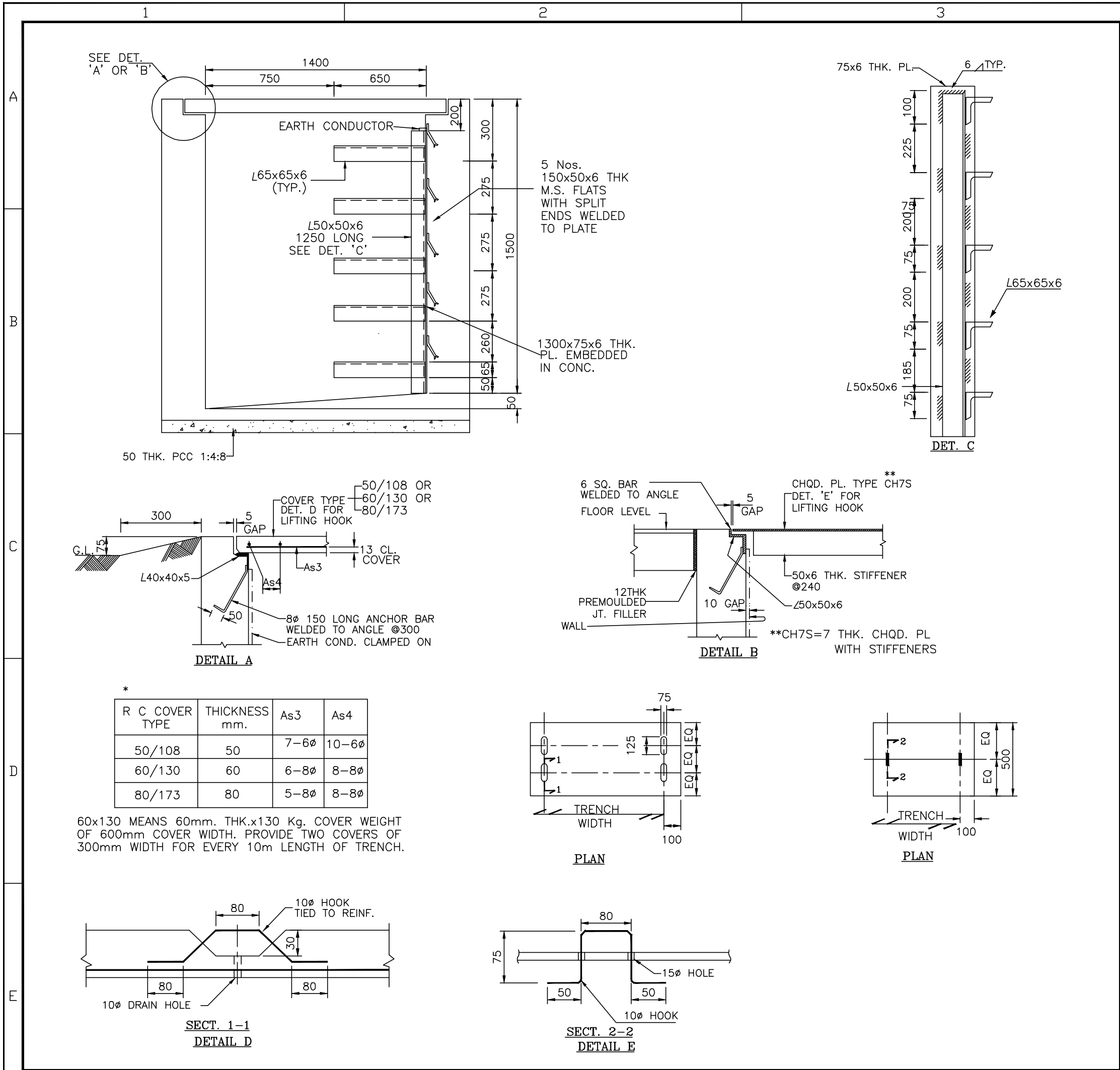
NOTES

1. ALL DIMENSIONS ARE IN MM.
2. FULL LENGTH FILLET WELD WITH RETURNED ENDS TO BE MINIMUM 4MM.
3. DIMENSION 'D' TO SUIT ELEVATION OF THE TRAY AS GIVEN ON CABLE TRAY LAYOUT DRAWING.
4. STRUCTURAL STEEL SHALL BE AS PER IS 2062: 1992.
5. NUTS AND BOLTS SHALL BE AS PER IS 1363 (PART-1,2,3): 1992/IS 1367(PART-5): 1980.
6. WASHERS SHALL BE AS PER IS 2016: 1967.

0	07.10.16	APPROVED	RKS	PR	KJ	SKH	
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated	

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRAY CEILING MOUNTED SINGLE SUPPORT

Size	Scale	Sheet
A3	NTS	18 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

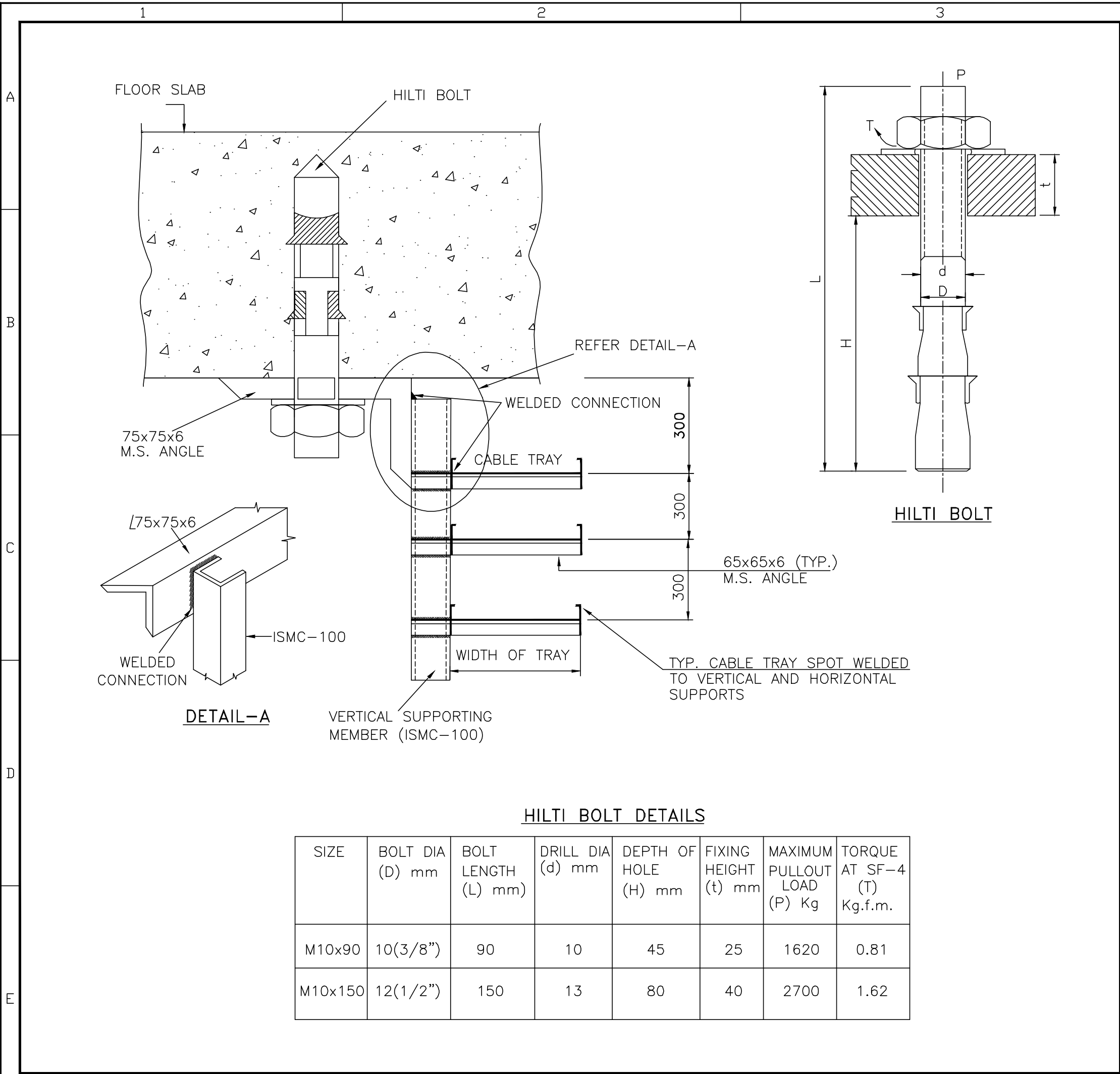


NOTES

- 1. ALL DIMENSIONS ARE IN MM.
- 2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS CABLE TRENCH TYPE - 1415						
Size Scale Sheet			19 of 62			
A3 NTS			Drawing No. GGNG-E-20714-3010			
Rev.						0

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NOTES

1. ALL DIMENSIONS ARE IN MM.

2. BOLT SIZE M10x90 SHALL BE USED FOR TOTAL WEIGHT (INCLUDING CABLES, CABLE TRAY ACCESSORIES) UP TO 200 Kgs/METER AND M10x150 SHALL BE USED FOR TOTAL WEIGHT ABOVE 200 Kgs/METER AND UP TO 500 Kgs/METER.

3. STRUCTURAL STEEL SHALL BE AS PER IS 2062: 1992.

4. WELDING SHALL BE DONE AS PER IS 816: 1969.

0	07.10.16	APPROVED	RKS	PR	KJ	SKH		
Rev.	D	M	Y	Modifications	Drawn	Checked	Approved	Validated

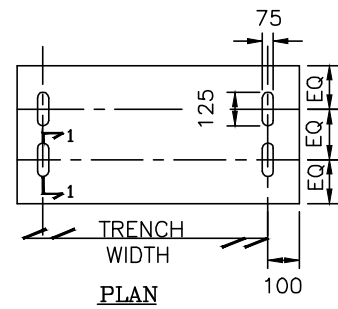
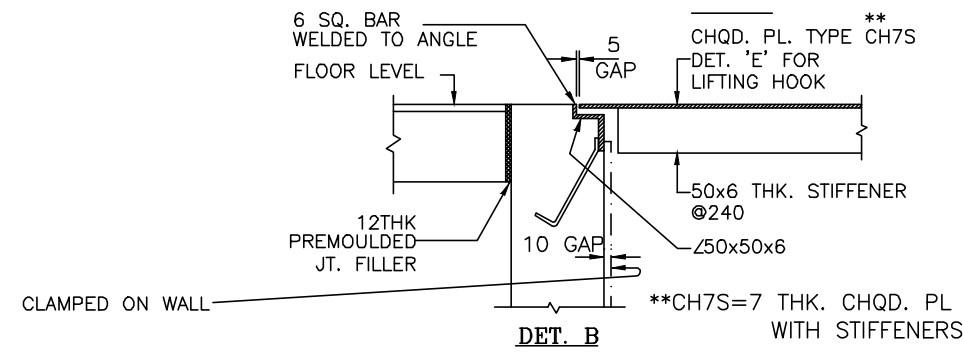
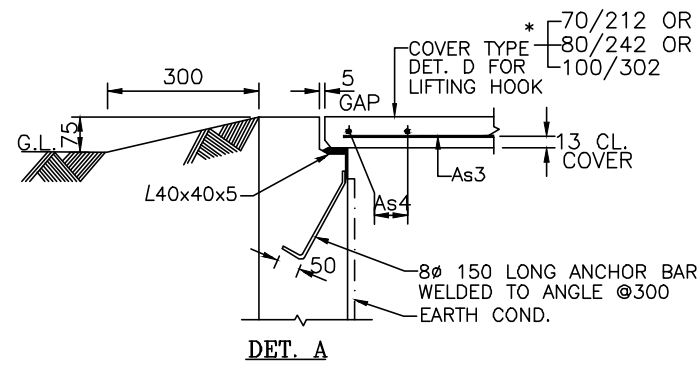
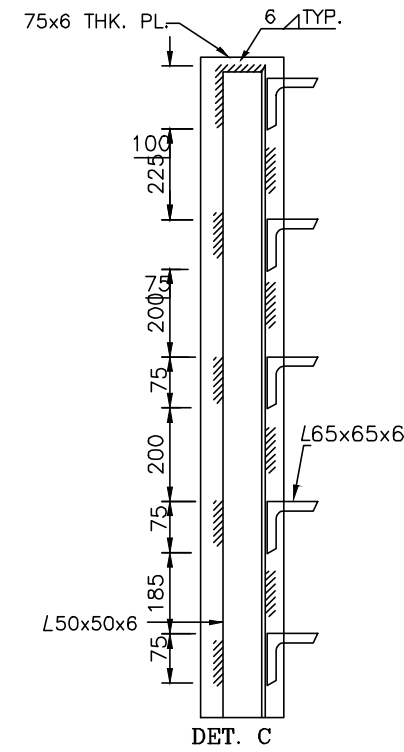
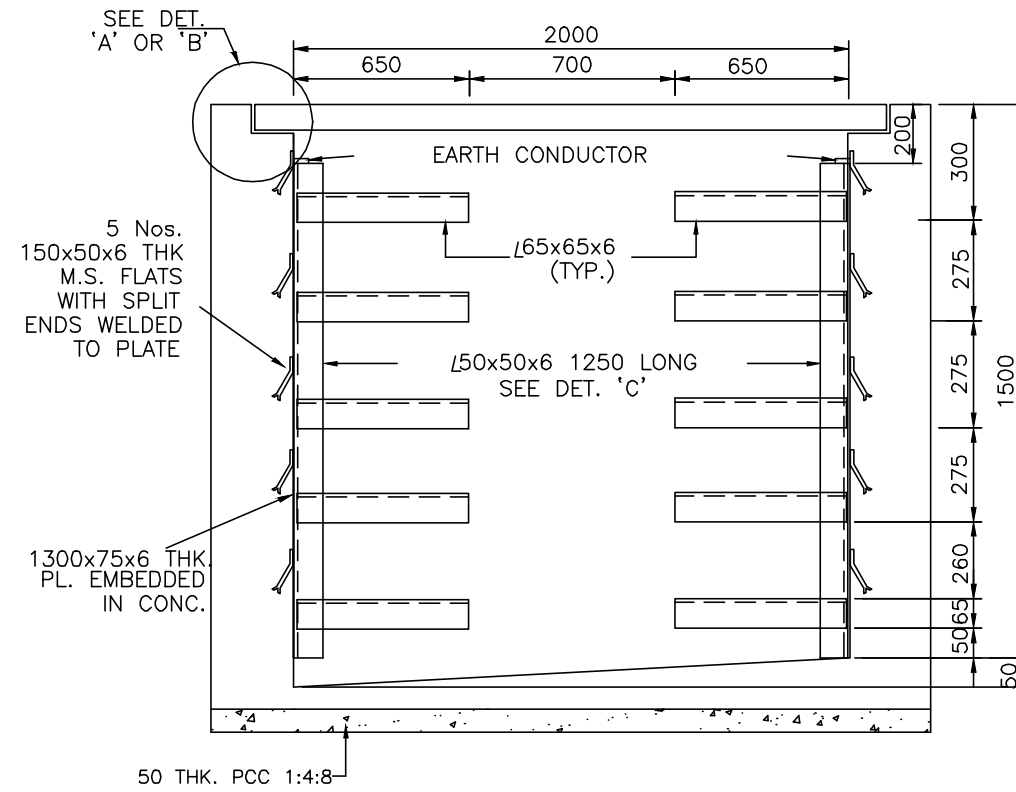
SUBJECT

TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRAY MOUNTING ARRANGEMENT CTMH (TYPE-A2)

Size	Scale	Sheet
A3	NTS	20 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

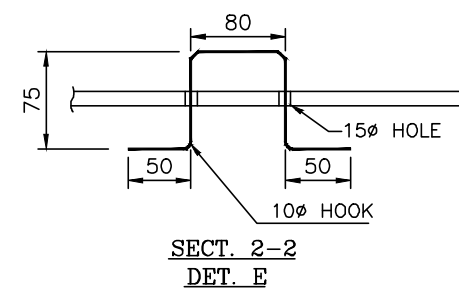
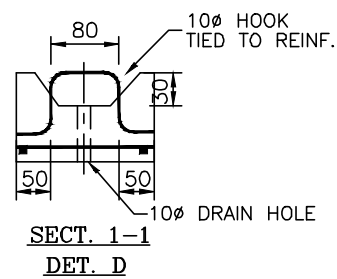
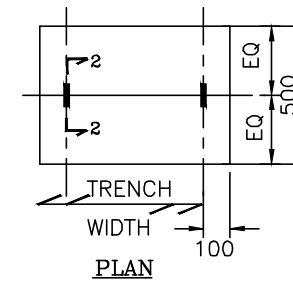
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1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992.



R C COVER TYPE	THICKNESS mm.	As3	As4
70/212	70	5-8ø	11-8ø
80/242	80	5-8ø	11-8ø
100/302	100	6-8ø	11-8ø

70x130 MEANS 70mm. THK.x212 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10.0m LENGTH OF TRENCH.

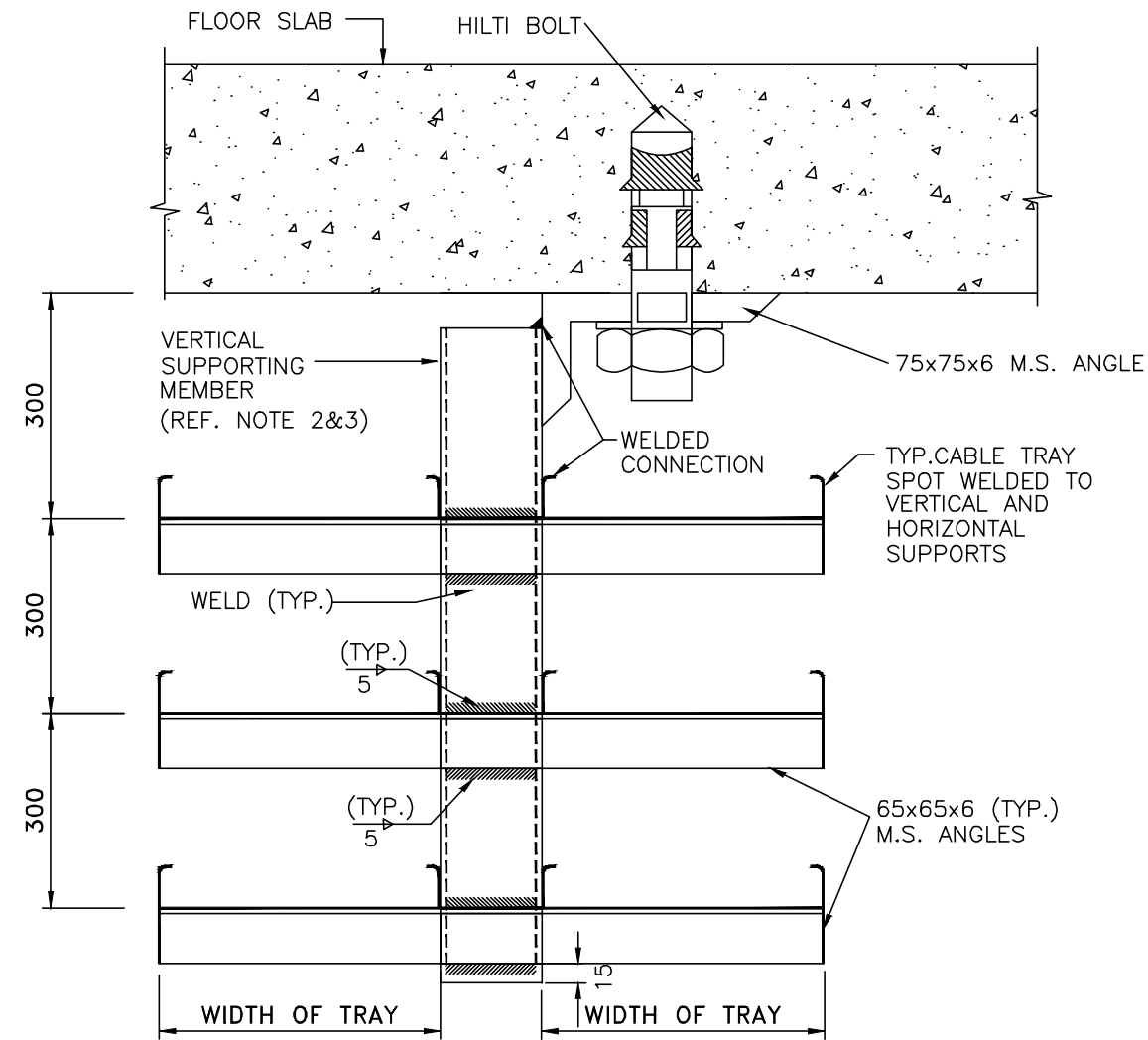


0	07.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRENCH TYPE - 2015

Size	Scale	Sheet
A3	NTS	21 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

1. ALL DIMENSIONS ARE IN MM.
2. ISMC 75 UP TO TWO TIERS.
3. ISMC 100 FOR MORE THAN TWO TIERS.
4. BOLT SIZE M10x90 SHALL BE USED FOR TOTAL WEIGHT (INCLUDING CABLES, CABLE TRAY ACCESSORIES) UP TO 200 Kgs/METER AND M10x150 SHALL BE USED FOR TOTAL WEIGHT ABOVE 200 Kgs/METER AND UP TO 500 Kgs/METER.
5. STRUCTURAL STEEL SHALL BE AS PER IS 2062: 1992.
6. WELDING SHALL BE DONE AS PER IS 816: 1969.



DRAWING TYPICAL FOR CTMH-T3

HILTI BOLT DETAILS

SIZE	BOLT DIA (D) mm	BOLT LENGTH (L) mm)	DRILL DIA (d) mm	DEPTH OF HOLE (H) mm	FIXING HEIGHT (t) mm	MAXIMUM PULLOUT LOAD (P) Kg	TORQUE AT SF-4 (T) Kg.f.m.
M10x90	10(3/8")	90	10	45	25	1620	0.81
M10x150	12(1/2")	150	13	80	40	2700	1.62

SL.NO.	TYPE OF MOUNTING	NO. OF TIERS
1	CTMH-T1	1
2	CTMH-T2	2
3	CTMH-T3	3
4	CTMH-T4	4

0	07.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

SUBJECT	TYPICAL CABLE TRAY INSTALLATION DETAILS CABLE TRAY MOUNTING ARRANGEMENT CTMH (TYPE-B2)
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1

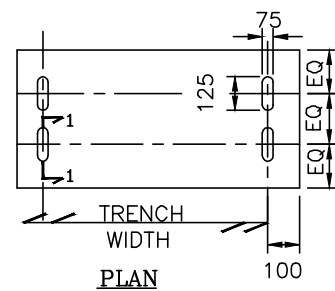
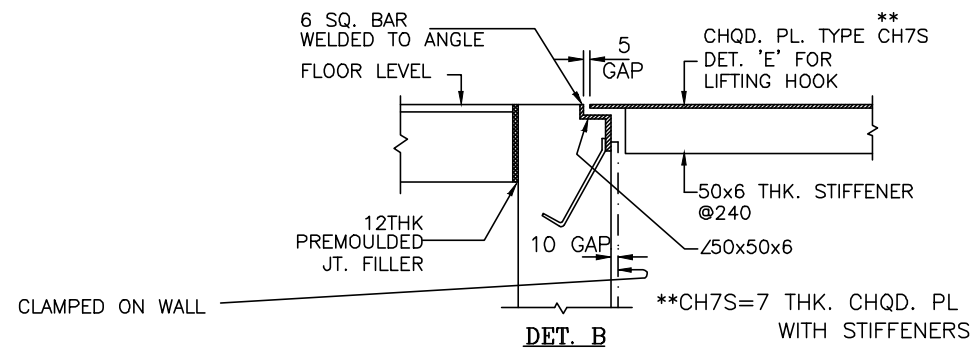
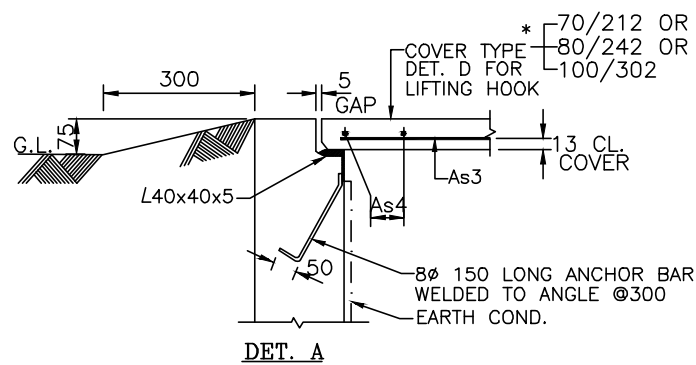
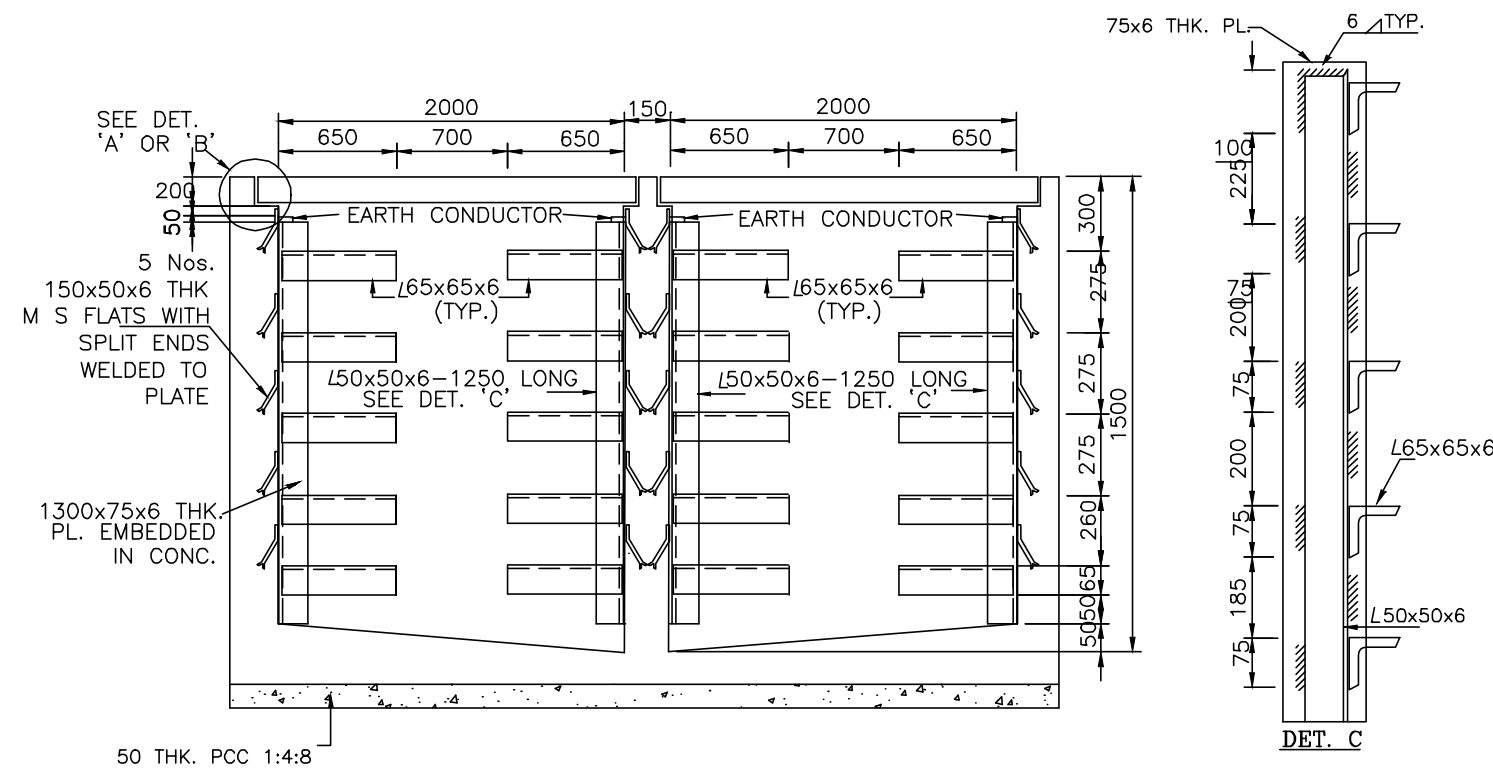
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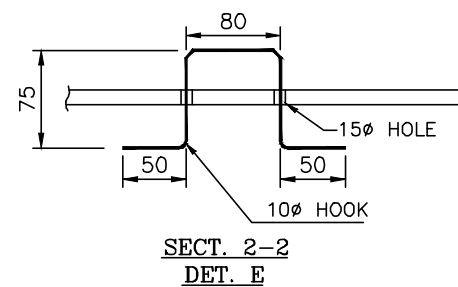
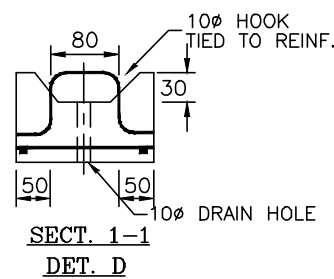
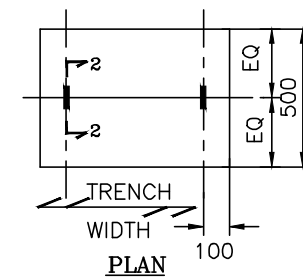
NOTES

1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992.



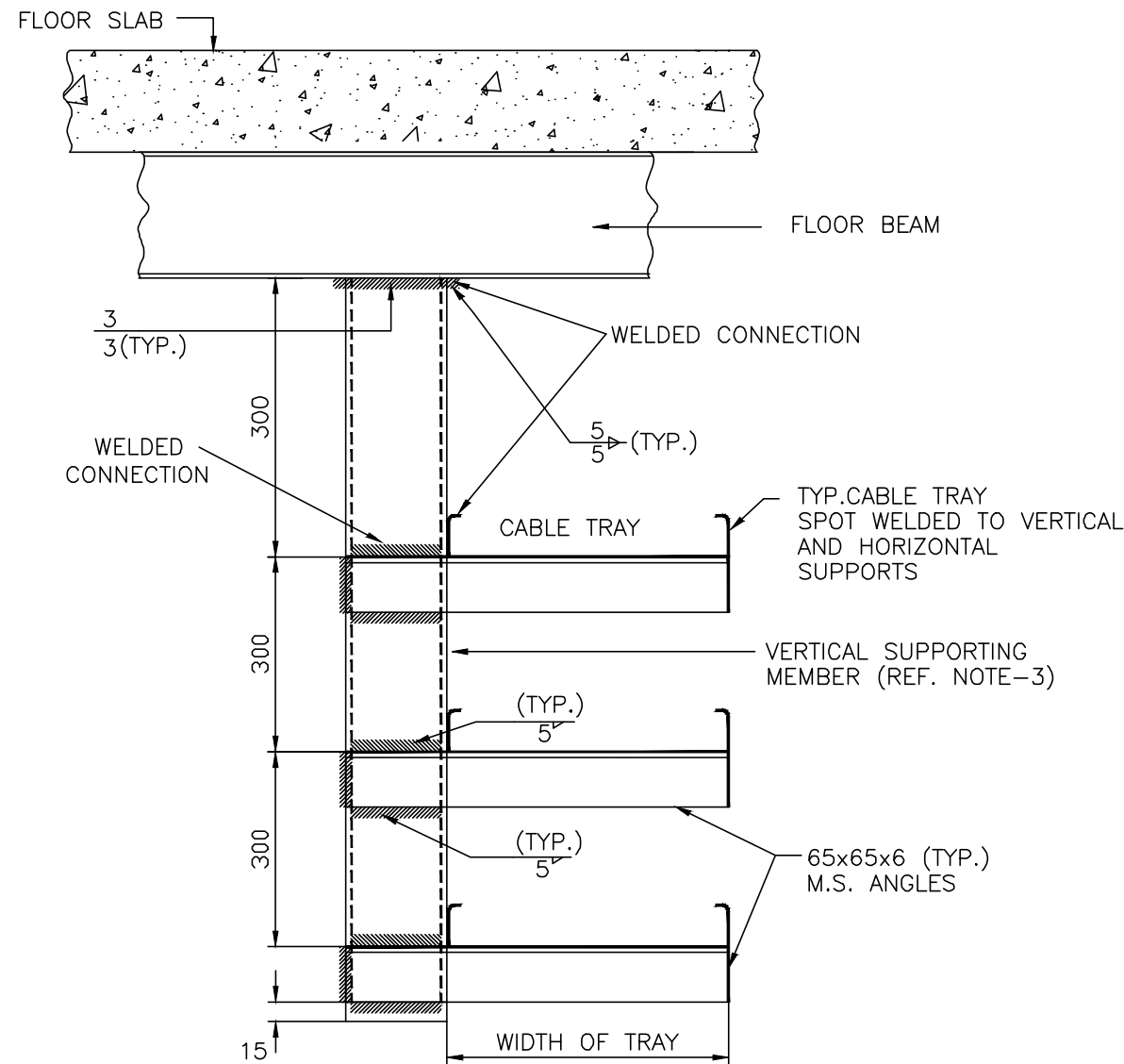
R C COVER TYPE	THICKNESS mm.	As3	As4
70/212	70	5-8φ	11-8φ
80/242	80	5-8φ	11-8φ
100/302	100	6-8φ	11-8φ

70x212 MEANS 70mm. THK.x212 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.



0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS CABLE TRENCH TYPE 2/2013						
Size Scale Sheet			23 of 62			
Drawing No.			Rev.			
GGNG-E-20714-3010			0			

1. ALL DIMENSIONS ARE IN MM.
2. 75x75x6 M.S. ANGLE FOR ONE TIER.
3. ISMC 100 FOR MORE THAN ONE TIER.
4. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992.
5. WELDING SHALL BE DONE AS PER IS 816: 1969.



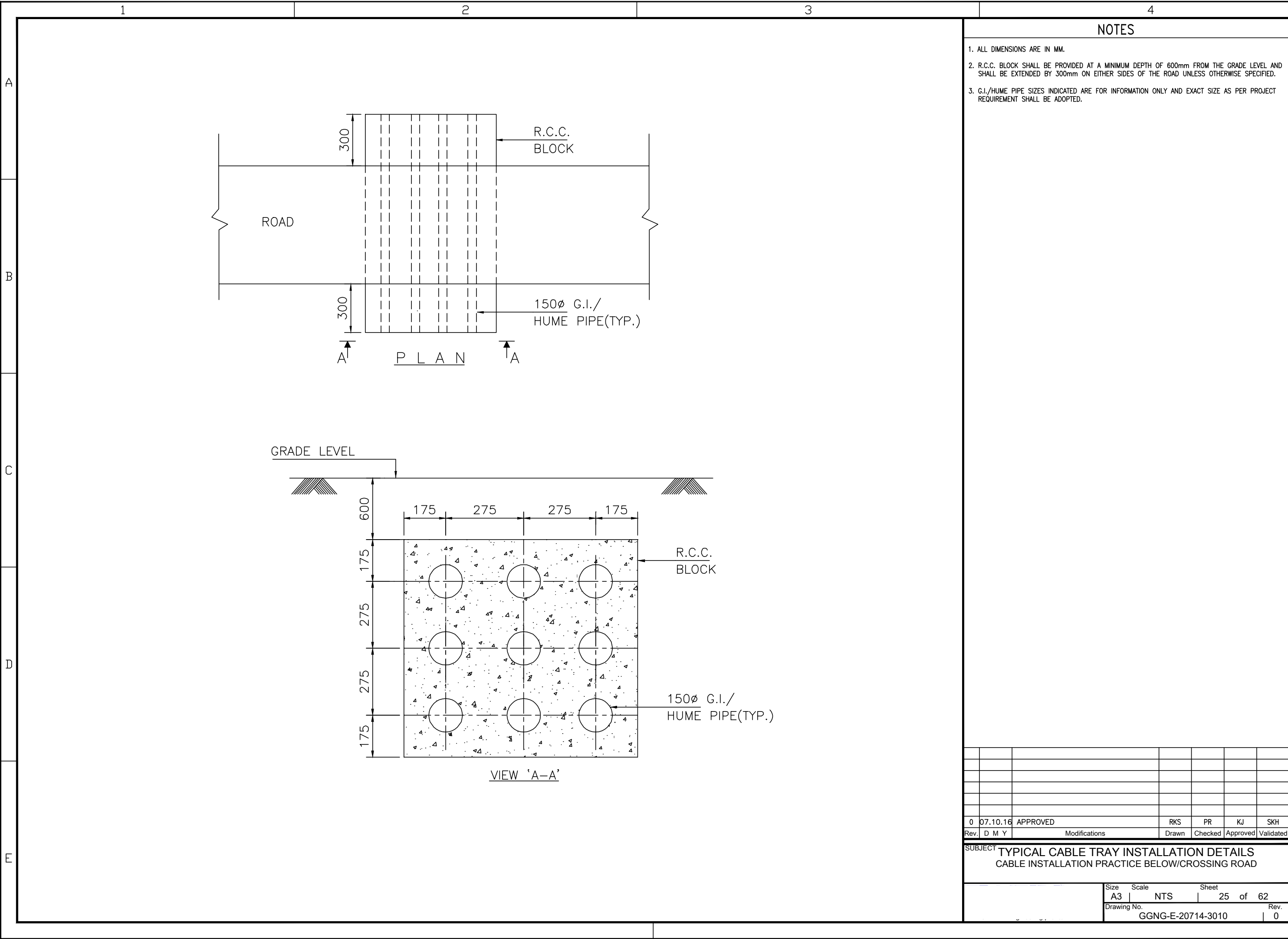
DRAWING TYPICAL FOR CTMH-T3

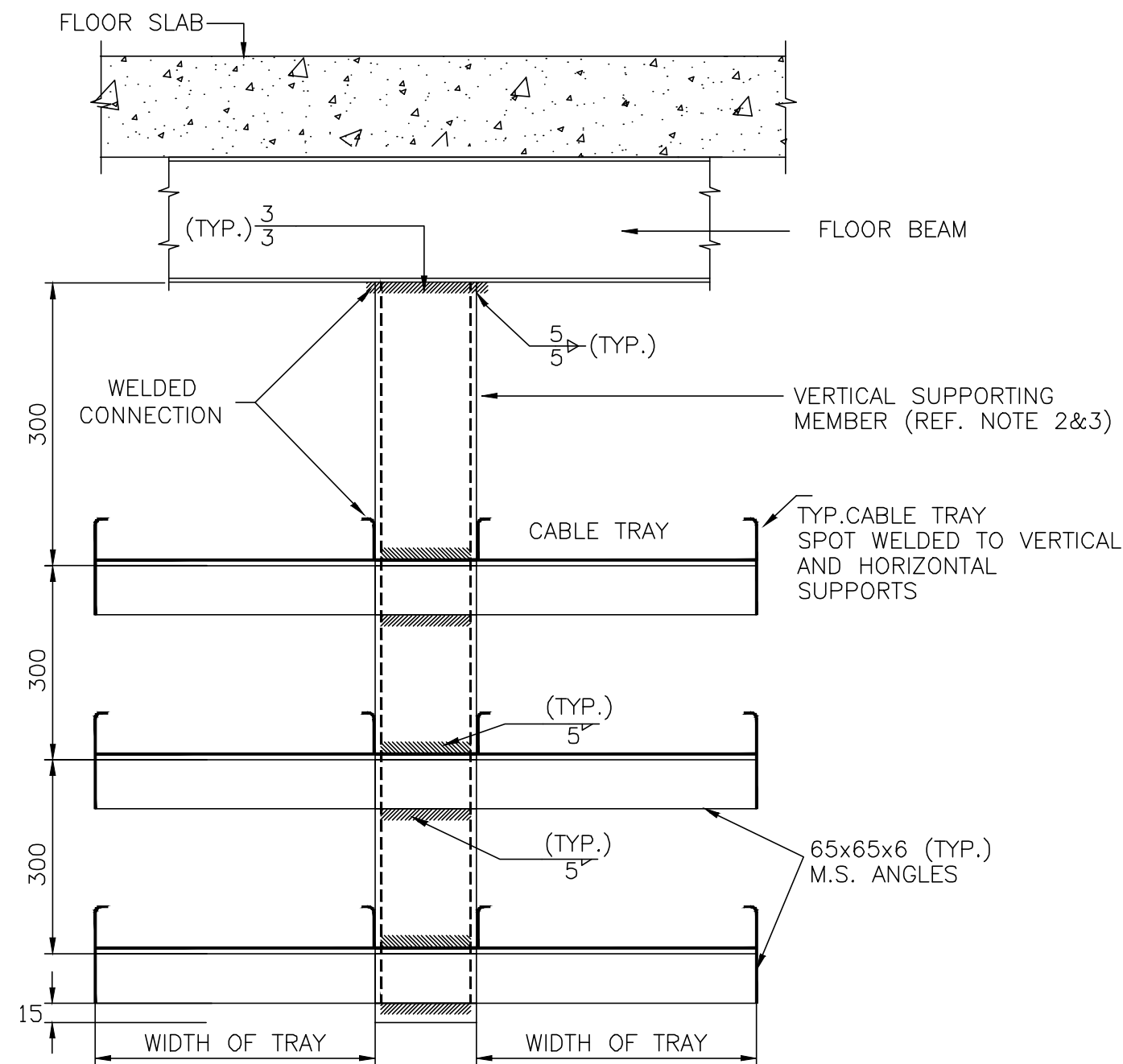
SL.NO.	TYPE OF MOUNTING	NO. OF TIERS
1	CTMH-T1	1
2	CTMH-T2	2
3	CTMH-T3	3
4	CTMH-T4	4

0	07.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRAY MOUNTING ARRANGEMENT CTMH (TYPE-C)

Size	Scale	Sheet
A3	NTS	24 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0





DRAWING TYPICAL FOR CTMH-T3

SR.NO.	TYPE OF MOUNTING	NO. OF TIERS
1	CTMH-T1	1
2	CTMH-T2	2
3	CTMH-T3	3
4	CTMH-T4	4

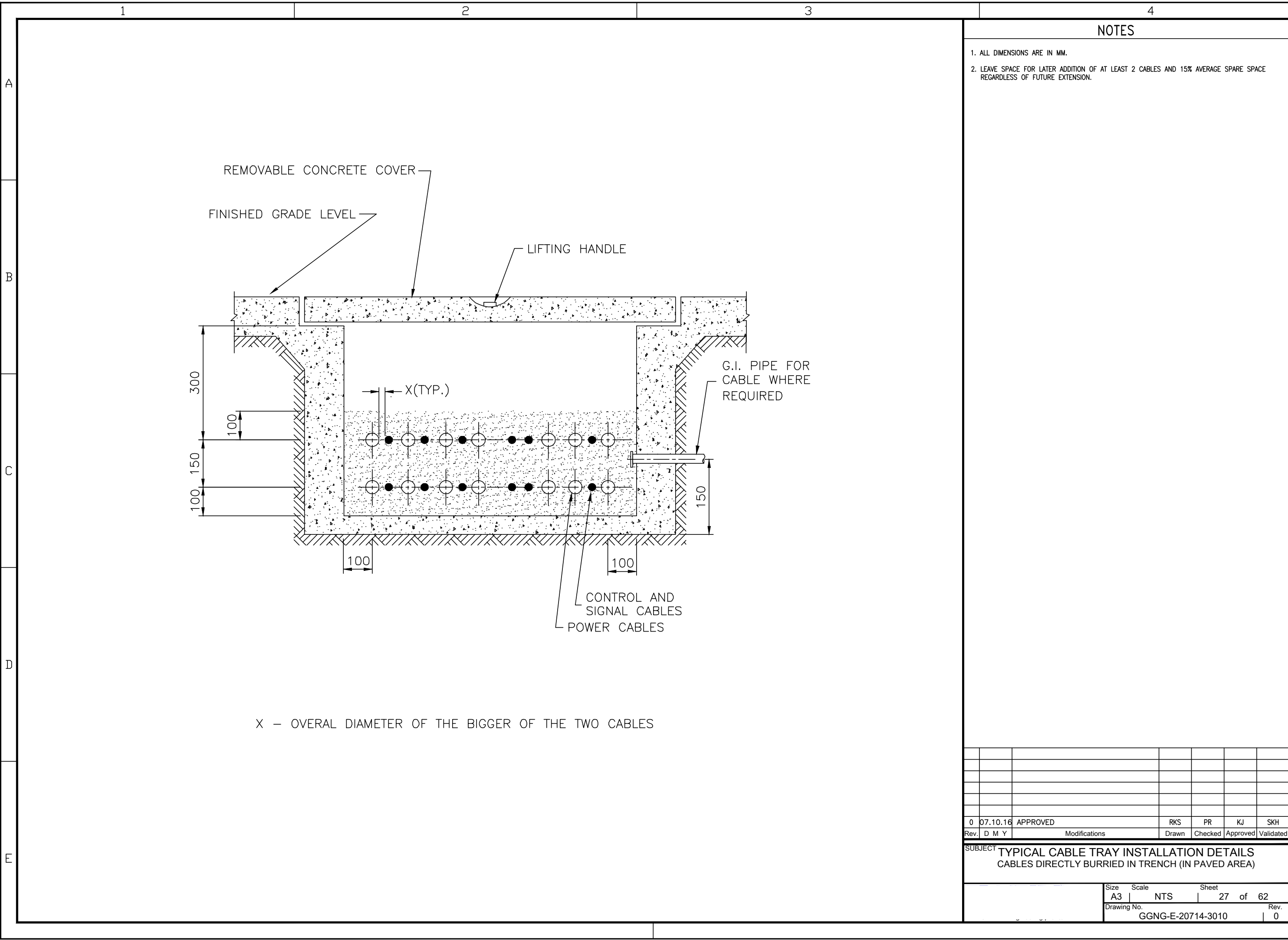
NOTES

1. ALL DIMENSIONS ARE IN MM.
2. 75x75x6 M.S. ANGLE FOR ONE TIER.
3. ISMC 100 FOR MORE THAN TWO TIERS.
4. STRUCTURAL STEEL SHALL BE AS PER IS 2062: 1992.
5. WELDING SHALL BE DONE AS PER IS 816: 1969.

0	07.10.16	APPROVED	RKS	PR	KJ	SKH	
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated	

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRAY MOUNTING ARRANGEMENT CTMH (TYPE-D)

Size	Scale	Sheet
A3	NTS	26 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0



1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062: 1992.
3. WELDING SHALL BE DONE AS PER IS 816: 1969.

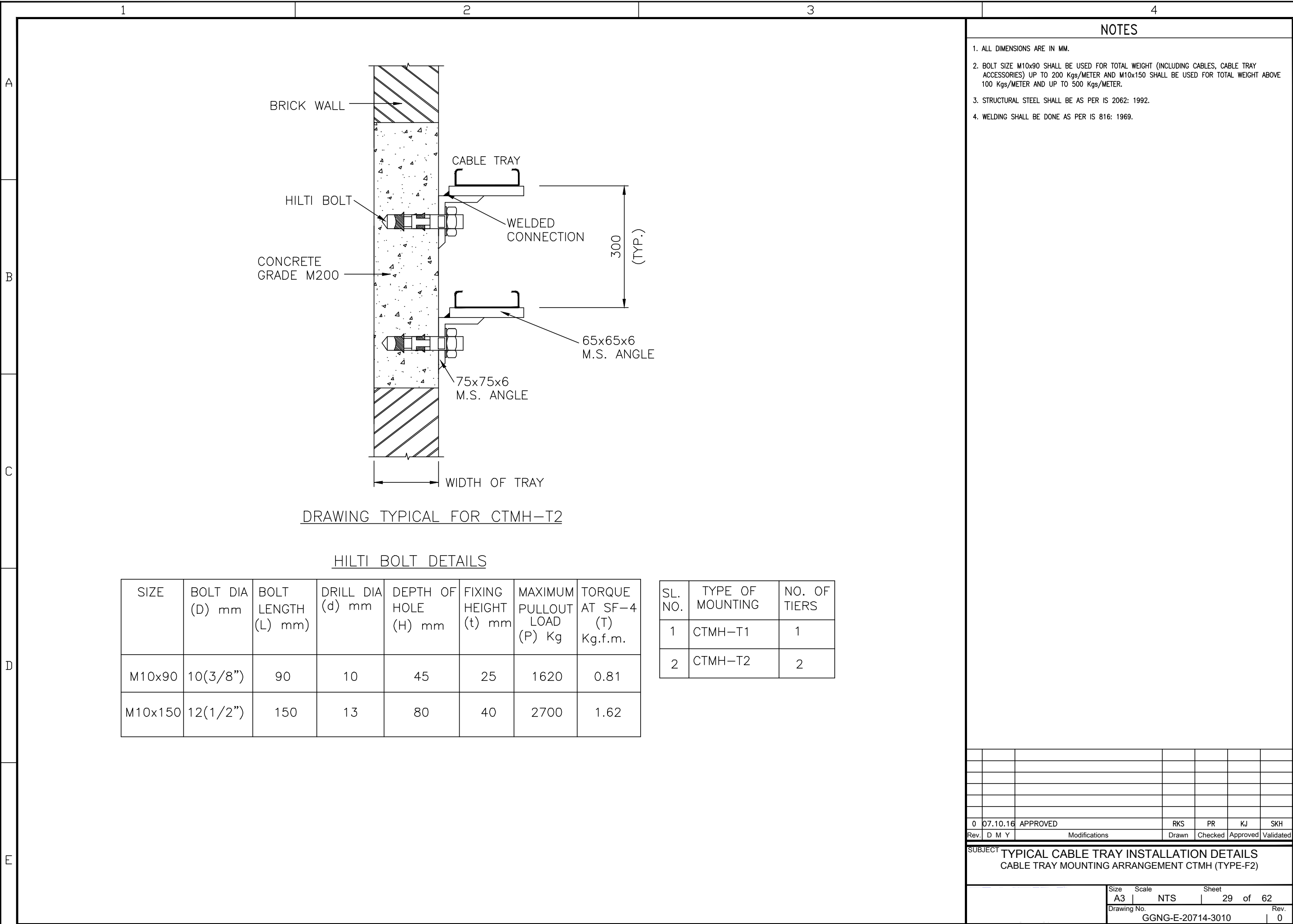


SR.NO.	TYPE OF MOUNTING	NO. OF TIERS
1	CTMH-T1	1
2	CTMH-T2	2
3	CTMH-T3	3
4	CTMH-T4	4

0	07.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

SUBJECT	TYPICAL CABLE TRAY INSTALLATION DETAILS CABLE TRAY MOUNTING ARRANGEMENT CTMH (TYPE-E)
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Size	Scale	Sheet
A3	NTS	28 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0



1

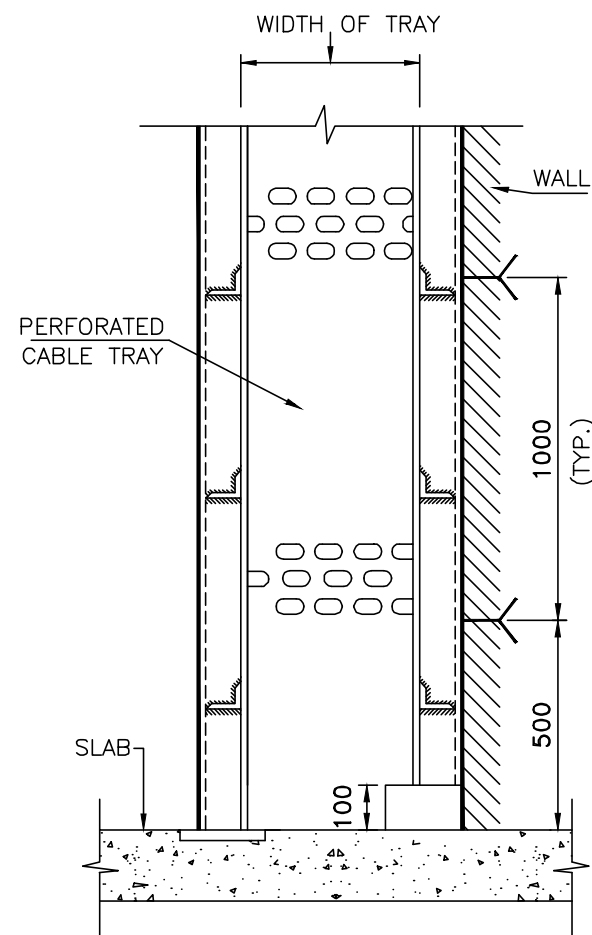
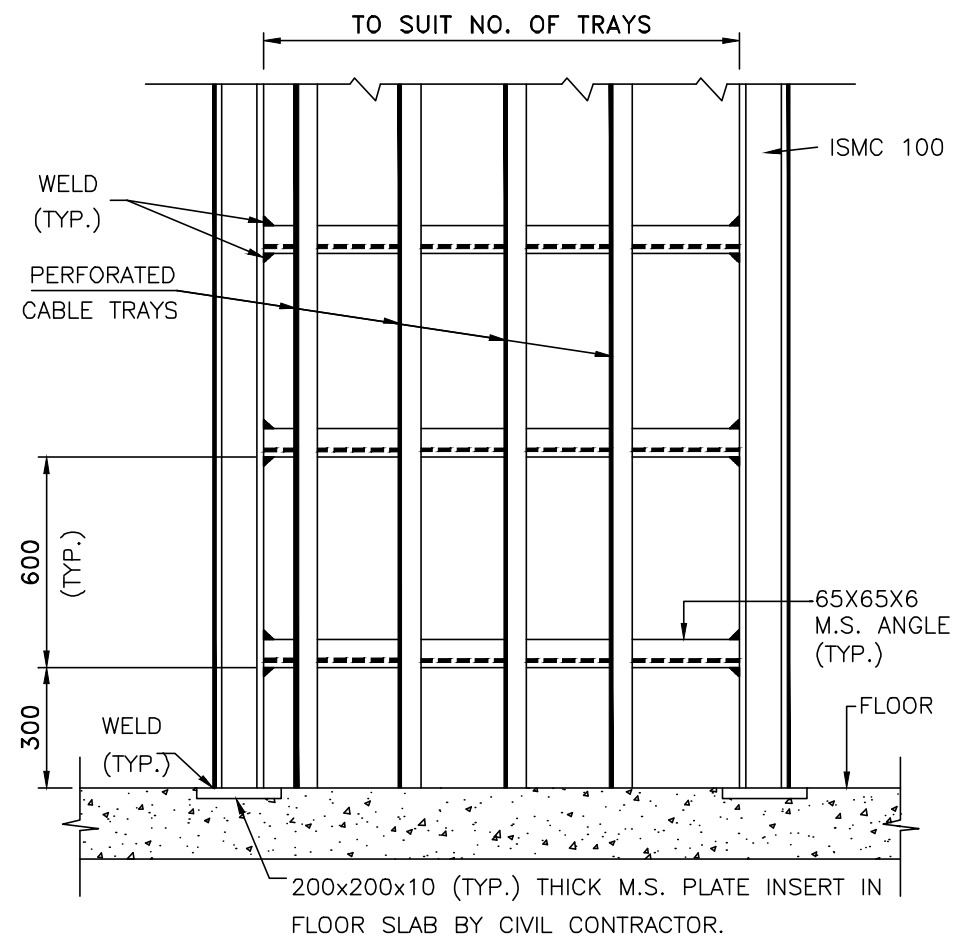
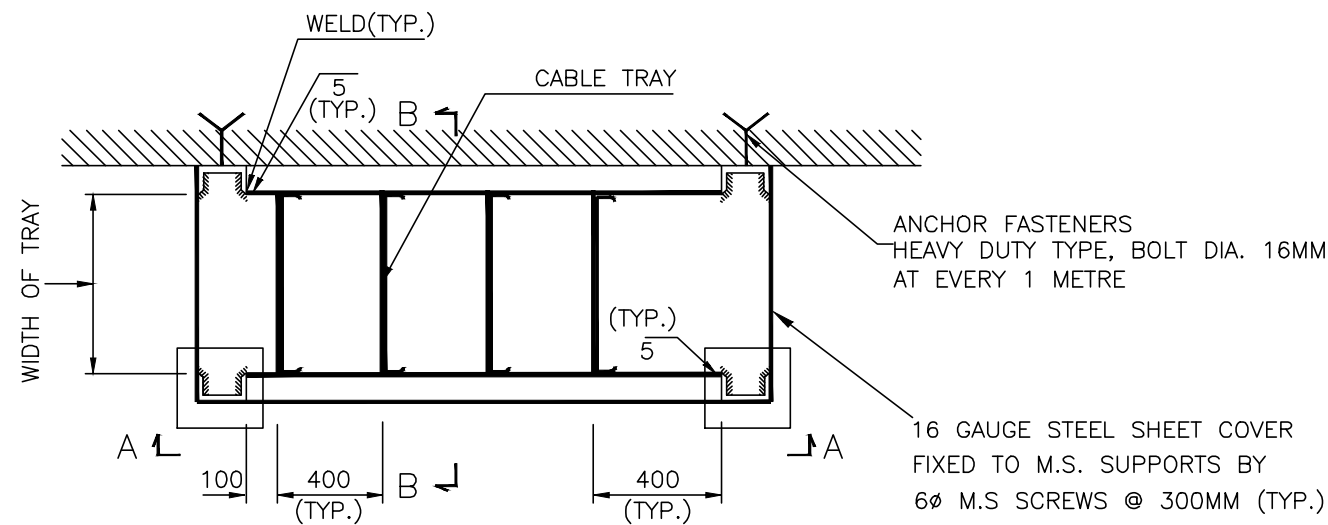
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3

4

NOTES

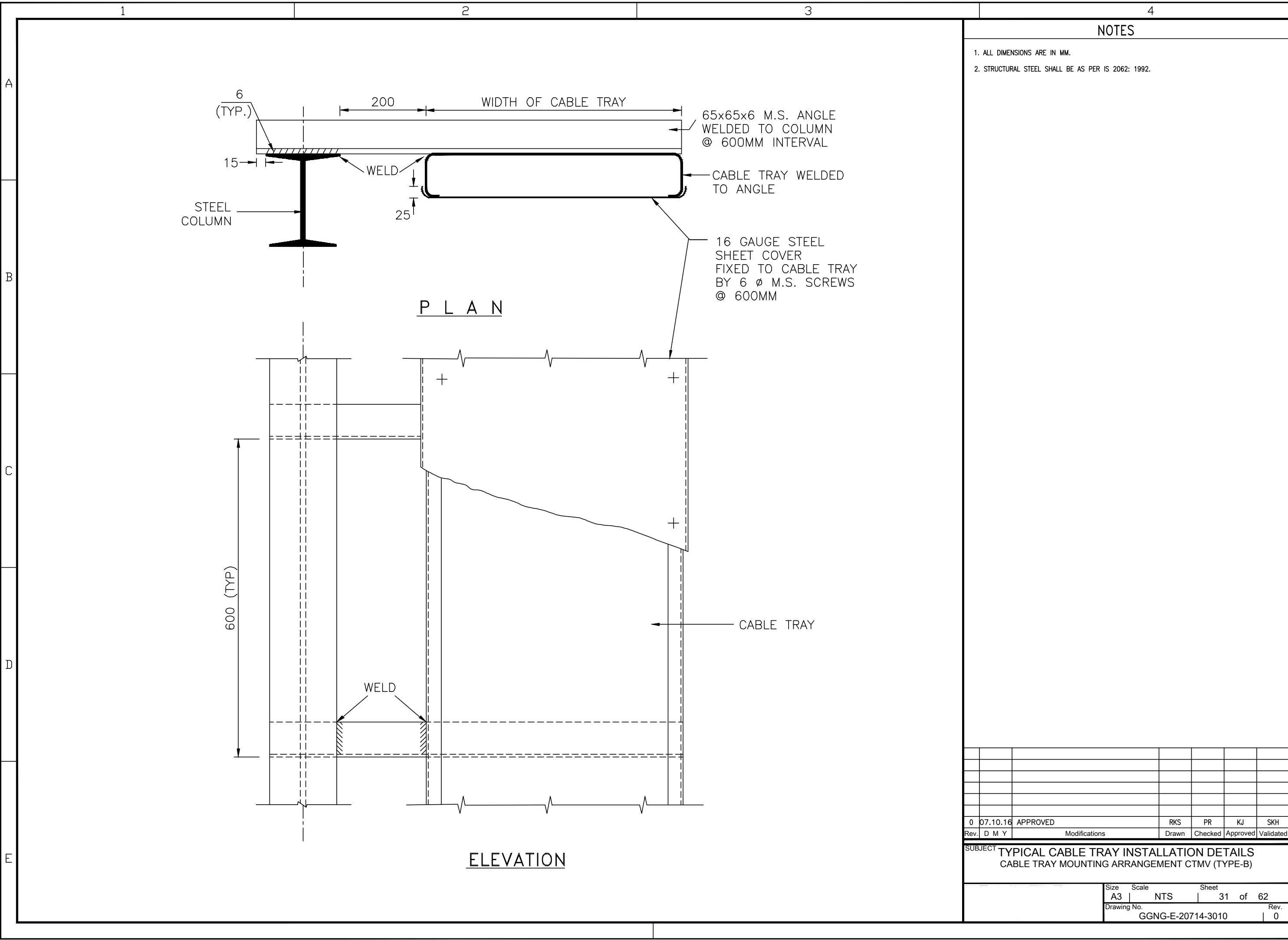
1. ALL DIMENSIONS ARE IN MM.
2. NUMBER OF TRAYS WILL BE AS PER REQUIREMENT.
3. FOR OUTDOOR USE, THE VERTICAL SUPPORTS TO BE SUITABLY GROUTED IN CONCRETE FOUNDATION OR WELDED TO AVAILABLE STEEL STRUCTURES.
4. STRUCTURAL STEEL SHALL BE AS PER IS 2062: 1992.
5. WELDING SHALL BE DONE AS PER IS 816: 1969.



0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRAY MOUNTING ARRANGEMENT CTMV (TYPE-A)

Size	Scale	Sheet
A3	NTS	30 of 62
Drawing No.	GGNG-E-20714-3010	
Rev.	0	



1

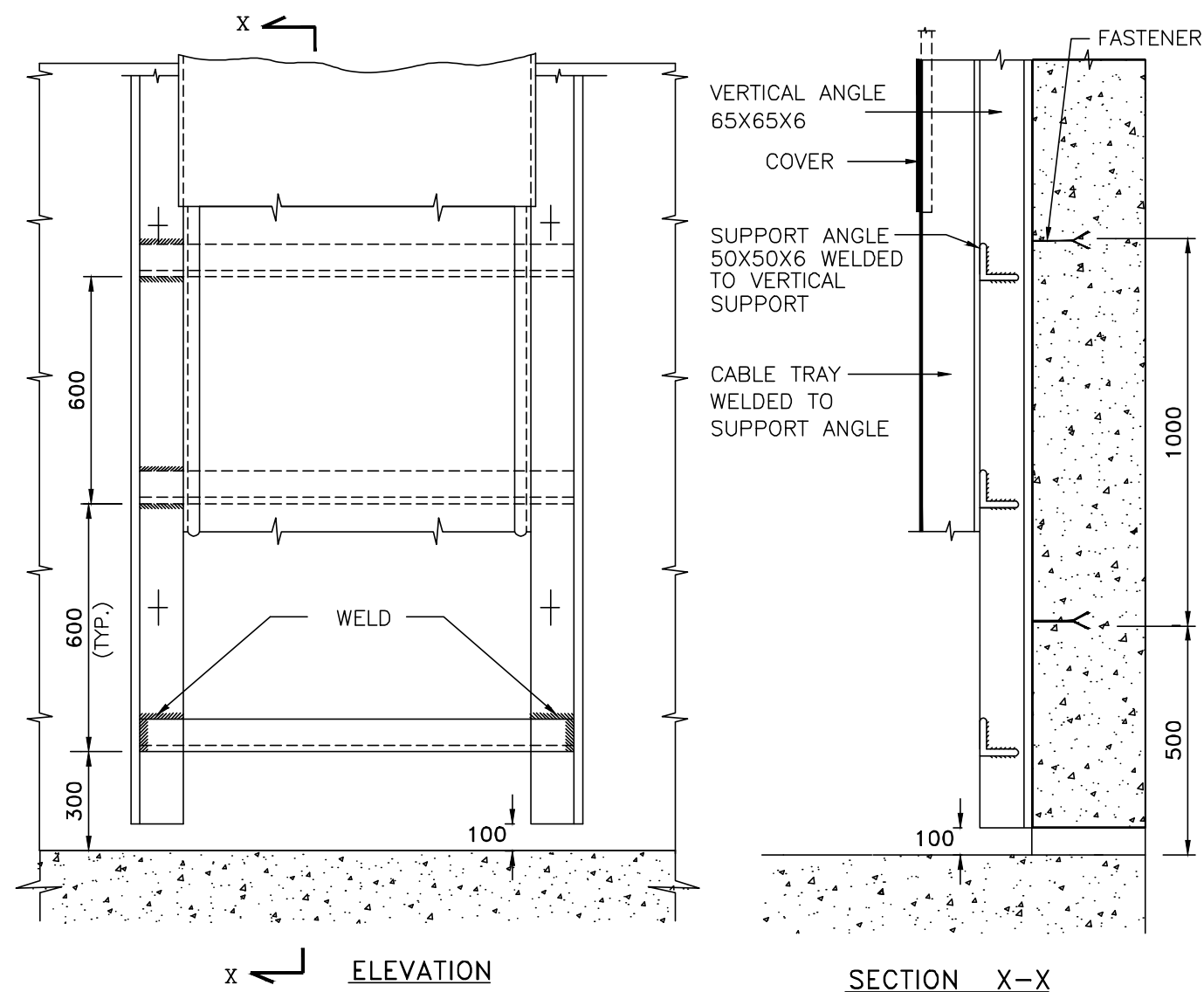
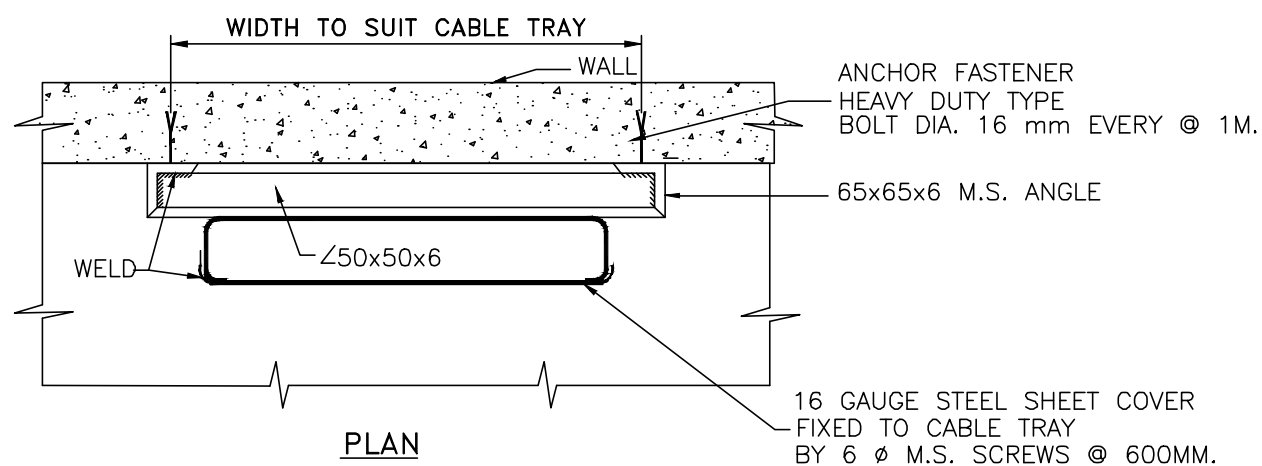
2

3

4

NOTES

1. ALL DIMENSIONS ARE IN MM.
2. NUMBER OF TRAYS WILL BE AS PER REQUIREMENT.
3. FOR OUTDOOR USE, THE VERTICAL SUPPORTS TO BE SUITABLY GROUTED IN CONCRETE FOUNDATION OR WELDED TO AVAILABLE STEEL STRUCTURES.
4. STRUCTURAL STEEL SHALL BE AS PER IS 2062: 1992.
5. WELDING SHALL BE DONE AS PER IS 816: 1969.



0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT **TYPICAL CABLE TRAY INSTALLATION DETAILS**
CABLE TRAY MOUNTING ARRANGEMENT CTMV (TYPE-C)

Size	Scale	Sheet
A3	NTS	32 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	

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1

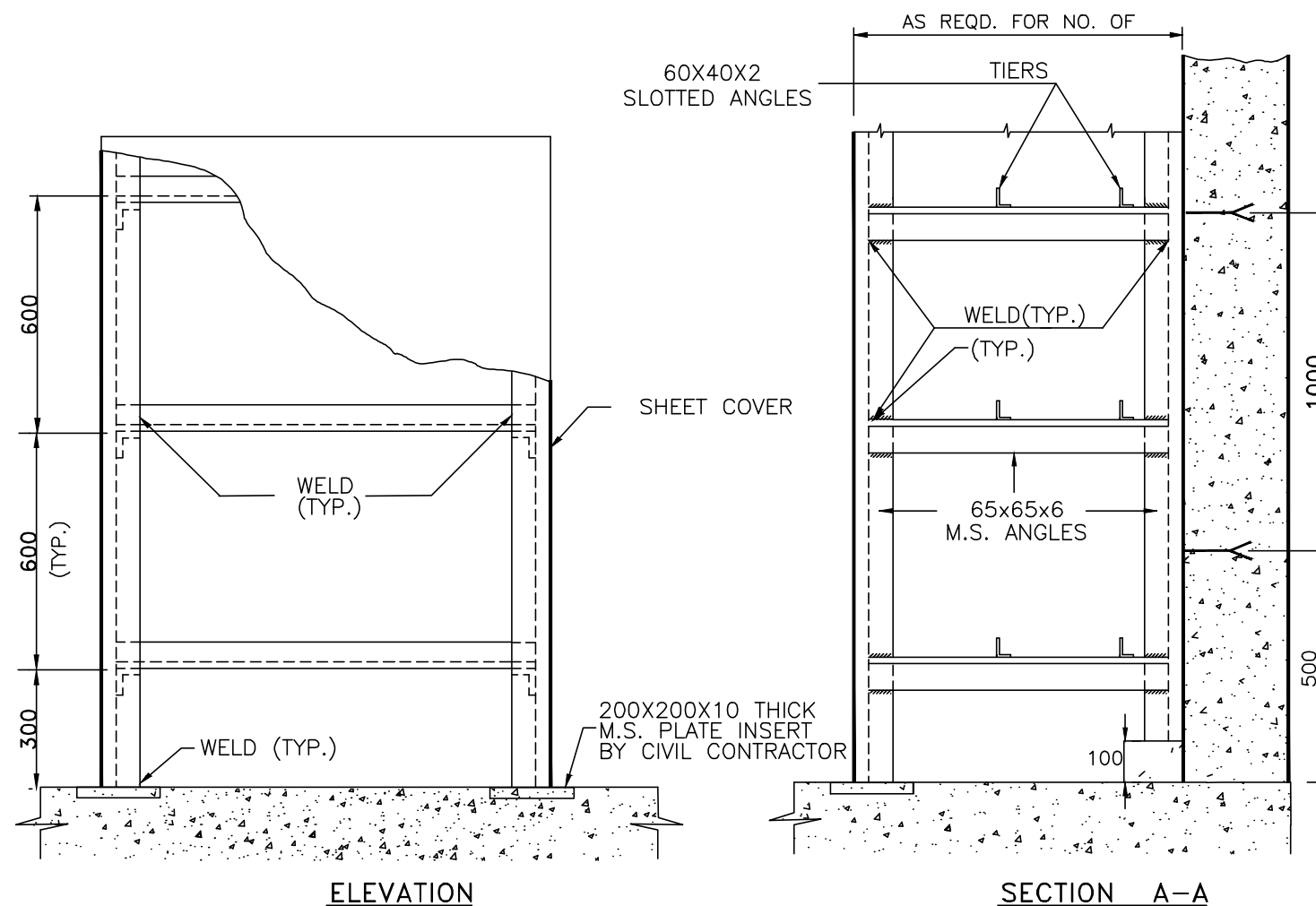
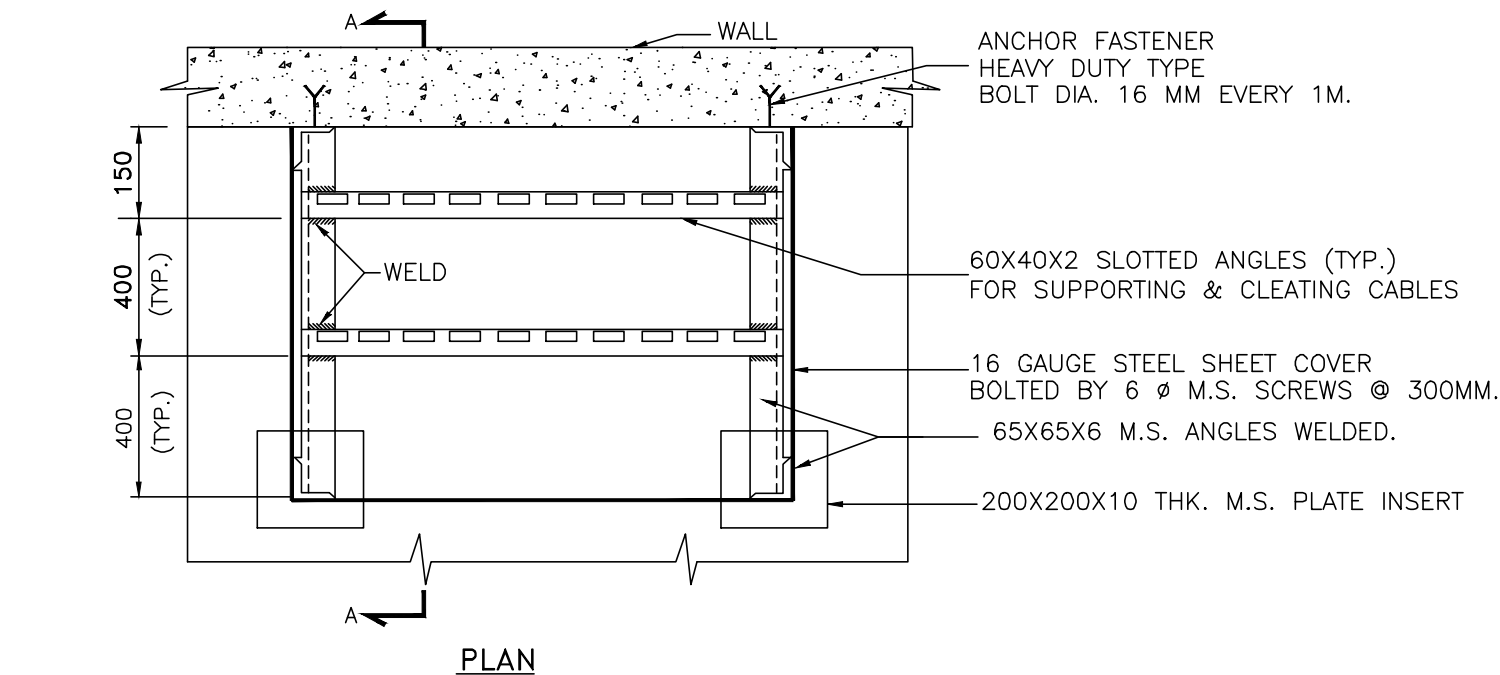
2

3

4

NOTES

1. ALL DIMENSIONS ARE IN MM.
2. NUMBER OF TRAYS WILL BE AS PER REQUIREMENT.
3. FOR OUTDOOR USE, THE VERTICAL SUPPORTS TO BE SUITABLY GROUTED IN CONCRETE FOUNDATION OR WELDED TO AVAILABLE STEEL STRUCTURES.
4. STRUCTURAL STEEL SHALL BE AS PER IS 2062: 1992.
5. WELDING SHALL BE DONE AS PER IS 816: 1969.



0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRAY MOUNTING ARRANGEMENT CTMV (TYPE-D)

Size	Scale	Sheet
A3	NTS	33 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	

1

2

3

4

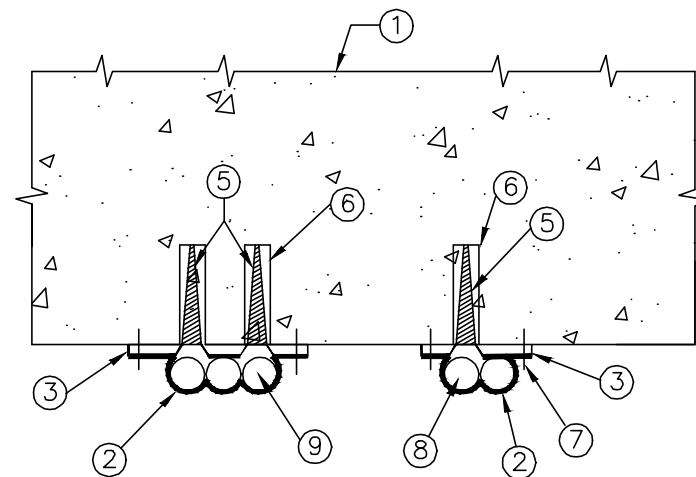
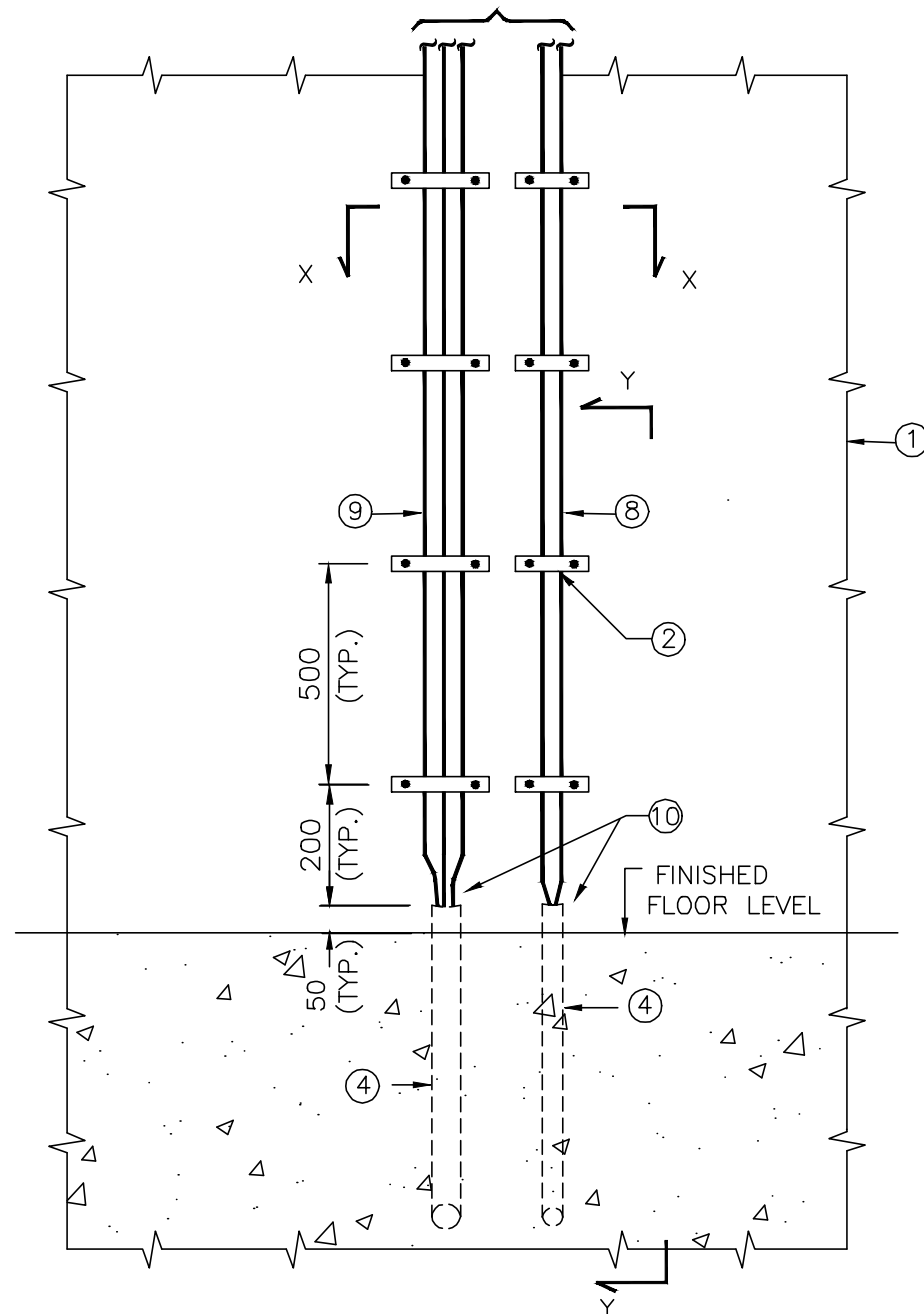
NOTES

1. ALL DIMENSIONS ARE IN MM.
2. MAXIMUM 3 No. CABLES SHALL BE CLAMPED WITH ONE SADDLE. SEPARATE SADDLE SHALL BE USED FOR MORE THAN 3 CABLES.
3. POWER AND CONTROL CABLES SHALL BE CLAMPED SEPARATELY.
4. THE CONDUIT SHALL BE EXTENDED UP TO 2500 ABOVE THE FLOOR LEVEL IN CASE OF UNARMORED CABLES.

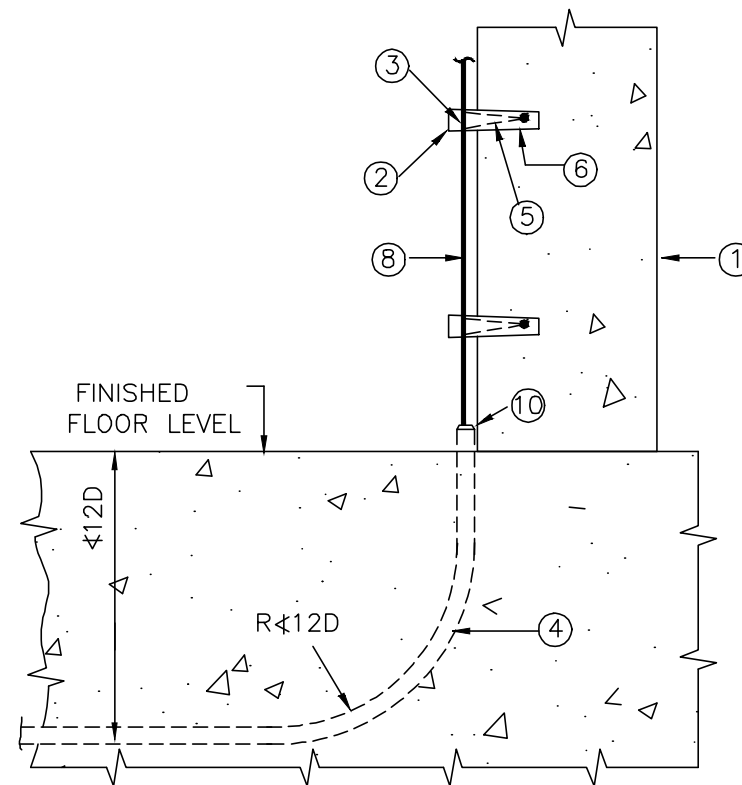
LEGEND

- ① WALL/RCC STRUCTURE
- ② G.I. SADDLE
- ③ G.I. SPACER
- ④ G.I. CONDUIT
- ⑤ 6 ϕ , 35 LONG G.I. SCREW
- ⑥ RAWL PLUG
- ⑦ 3 ϕ , 5 LONG G.I. M/C SCREW
- ⑧ CONTROL CABLE
- ⑨ POWER CABLE (LESS THAN 3C $\times$ 70MM²)
- ⑩ WATER PROOF SEALING
- D - NORMAL DIAMETER OF CONDUIT

TO CABLE TRAY/EQUIPMENT



SECTION X-X



SECTION Y-Y

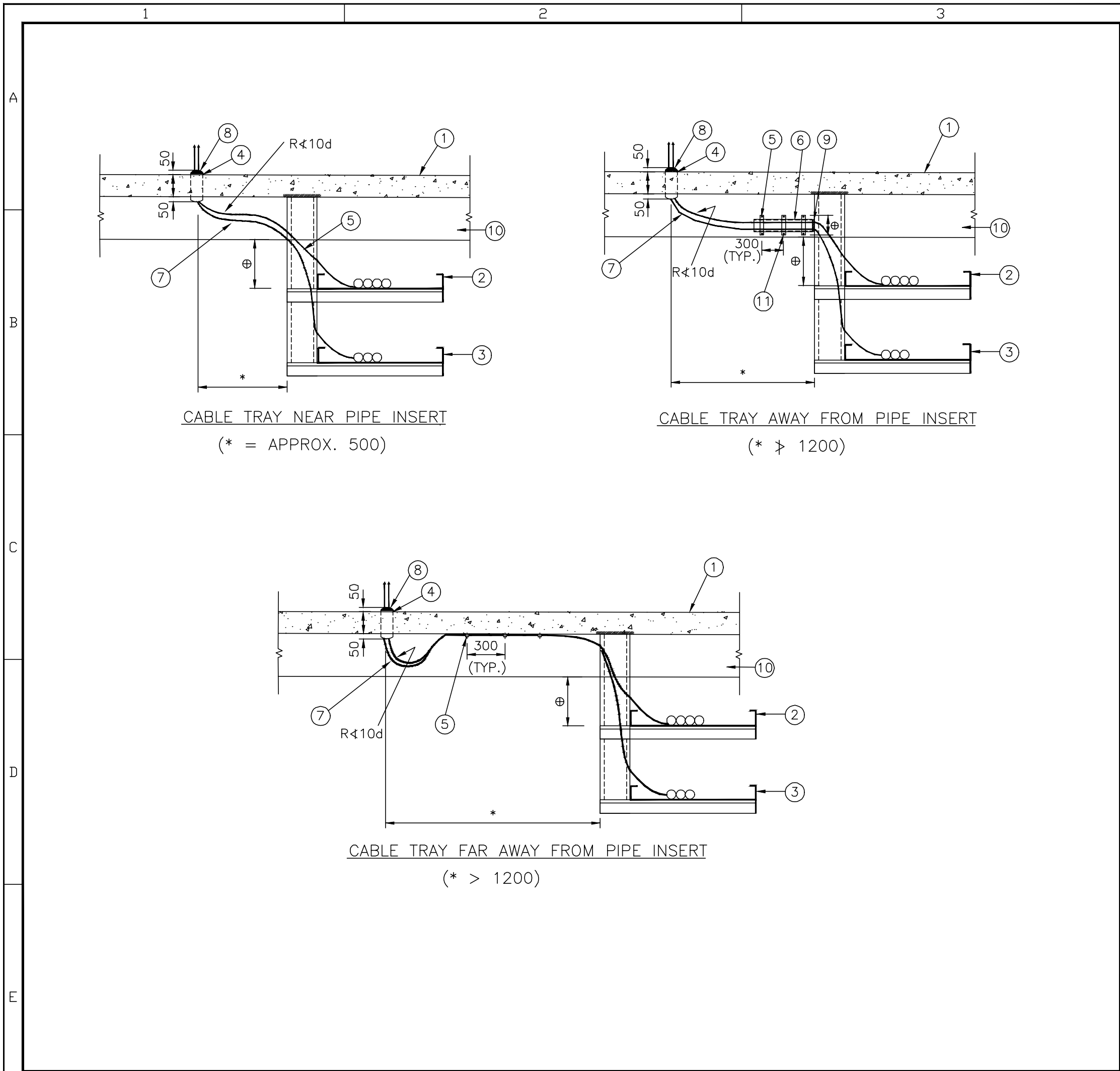
0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D	M	Y	Modifications	Drawn	Checked

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE INSTALLATION PRACTICE ALONG WALL/RCC
STRUCTURE (CABLE SIZE <3C $\times$ 70mm)

Size	Scale	Sheet
A3	NTS	34 of 62
Drawing No.	GGNG-E-20714-3010	Rev.
		0

Size	Scale	Sheet
A3	NTS	35 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

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NOTES

1. ALL DIMENSIONS ARE IN MM.
2. POWER AND CONTROL CABLES SHALL BE CLAMPED SEPERATELY.
3. G.I. PIPE INSERT SHALL BE INSTALLED NEAR THE EQUIPMENT SUCH THAT THE CABLE COULD BE RAISED STRAIGHT TO THE EQUIPMENT CABLE GLAND /BOX WITHOUT ANT OFFSET.
4. ALL EMBEDDED PIPE INSERTS SHALL HAVE MINIMUM 50 LONG THREADED PROJECTION BEYOND THE EMBEDDED PART.
5. THE DIMENSION MARKED THUS $\oplus$ SHALL BE DECIDED AT SITE. (PREFERABLY THIS SHALL NOT EXCEED 500mm).
7. CABLE SHALL BE CLAMPED SUBJECT TO MINIMUM BENDING RADIUS.
8. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992.
9. WELDING SHALL BE DONE AS PER IS 816:1969.

LEGEND

- ① FLOOR SLAB
 - ② POWER CABLE TRAY
 - ③ CONTROL CABLE TRAY
 - ④ G.I. PIPE INSERT
 - ⑤ SADDLE AND SPACER
 - ⑥ 50x50x6 M.S. ANGLE
 - ⑦ CABLE
 - ⑧ FIRE PROOF/WATER PROOF SEALING
 - ⑨ WELD
 - ⑩ BEAM
 - ⑪ 25 WIDE x 3 THICK M.S. FLAT WELDED TO ITEM-6
- d – OVERALL DIA. OF CABLE

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D	M	Y	Modifications	Drawn	Checked
SUBJECT				Approved	Validated	
TYPICAL CABLE TRAY INSTALLATION DETAILS						
CABLE INSTALLATION PRACTICE TO						
EQUIPMENTS INSTALLED ON UPPER FLOOR						
		Size	Scale	Sheet		
		A3	NTS	36 of 62		
		Drawing No.		Rev.		
		GGNG-E-20714-3010		0		

LEGEND

1. ALL DIMENSIONS ARE IN MM.
2. POWER AND CONTROL CABLES SHALL BE CLAMPED SEPARATELY.
3. THE CONDUIT/PIPE INSERT SHALL BE INSTALLED SUCH THAT CABLE CAN BE RAISED STRAIGHT TO THE EQUIPMENT CABLE GLAND/BOX WITHOUT ANY OFFSET.
4. CABLE SHALL BE CLAMPED/BENT SUBJECT TO MINIMUM BENDING RADIUS.
5. SEPARATE SPACE HEATER CABLE WHERE REQUIRED, SHALL BE LAID ALONG WITH THE POWER CABLE IN THE SAME CONDUIT, IF THE VOLTAGE GRADES OF THE TWO CABLES ARE SAME. OTHERWISE SEPARATE CONDUIT SHALL BE PROVIDED.
6. UNARMoured CABLES SHALL HAVE MECHANICAL PROTECTION UPTO 2500 ABOVE FLOOR LEVEL.
7. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992.
8. CONDUITS AND ACCESSORIES SHALL CONFORM TO IS 1653:1972/IS 3837:1976.

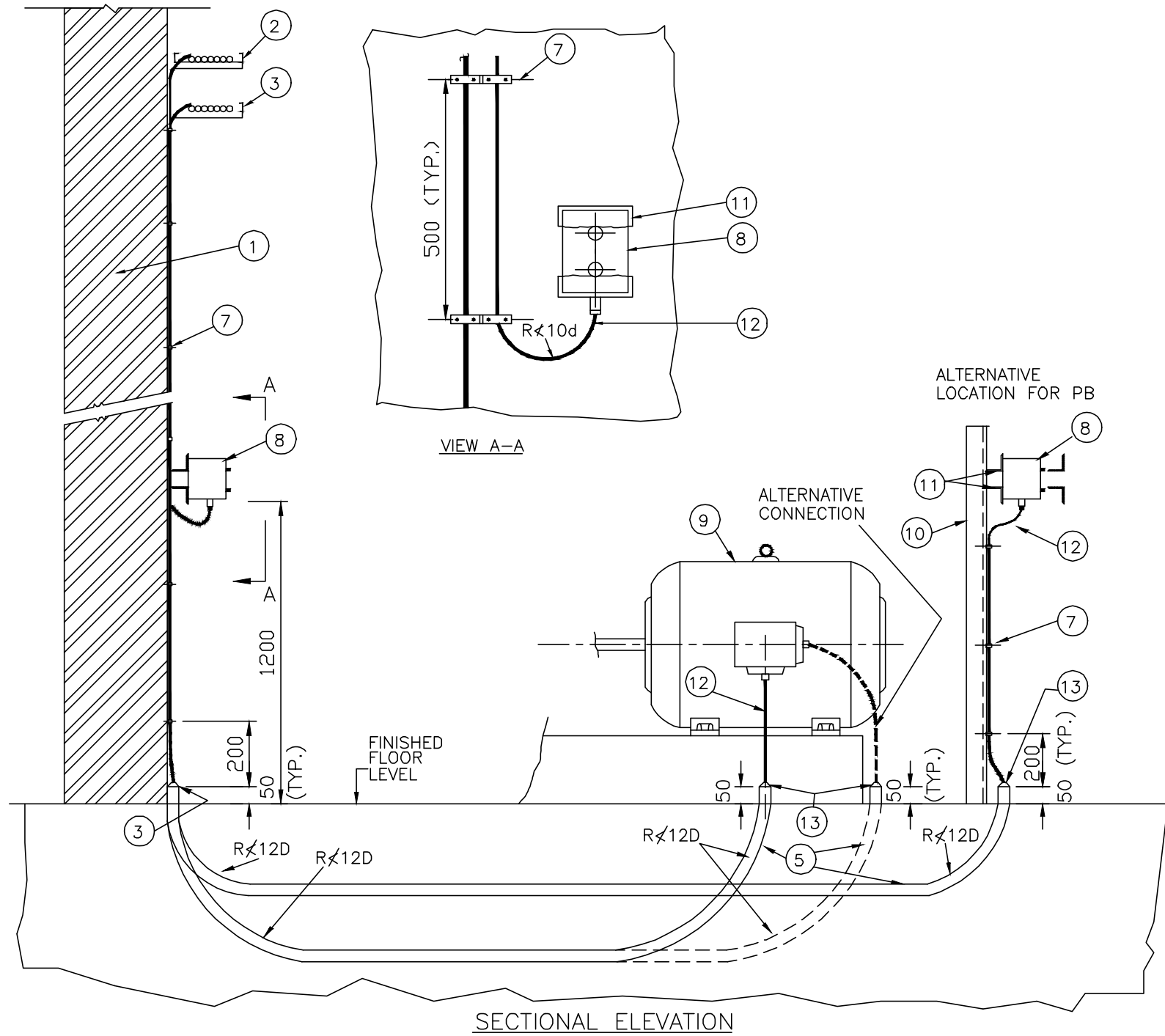
- ① WALL/STEEL COLUMN
 - ② POWER CABLE TRAY/RACK
 - ③ CONTROL CABLE TRAY/RACK
 - ④ CABLE TRENCH
 - ⑤ G.I. CONDUIT
 - ⑥ G.I. PIPE INSERT
 - ⑦ SADDLE AND SPACER
 - ⑧ P.B. STATION
 - ⑨ MOTOR
 - ⑩ ISMC-100
 - ⑪ 50x50x6 M.S. ANGLE
 - ⑫ CABLE IDENTIFICATION TAG
 - ⑬ WATER PROOF/FIRE PROOF SEALING
- d OVERALL DIA. OF CABLE
D NOMINAL DIA. OF CONDUIT

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE INSTALLATION PRACTICE TO MOTOR AND P.B.

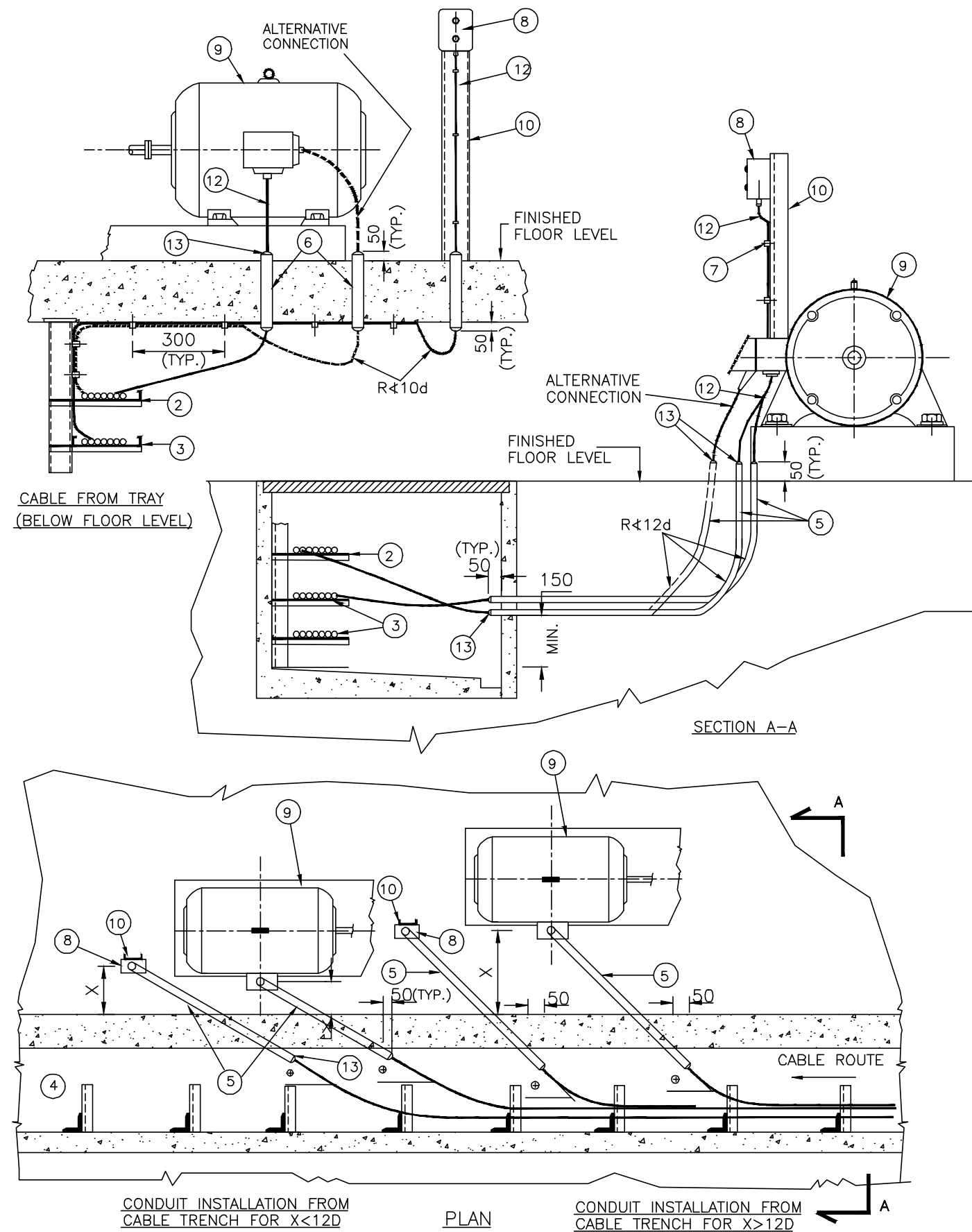
Size	Scale	Sheet
A3	NTS	37 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	

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NOTES

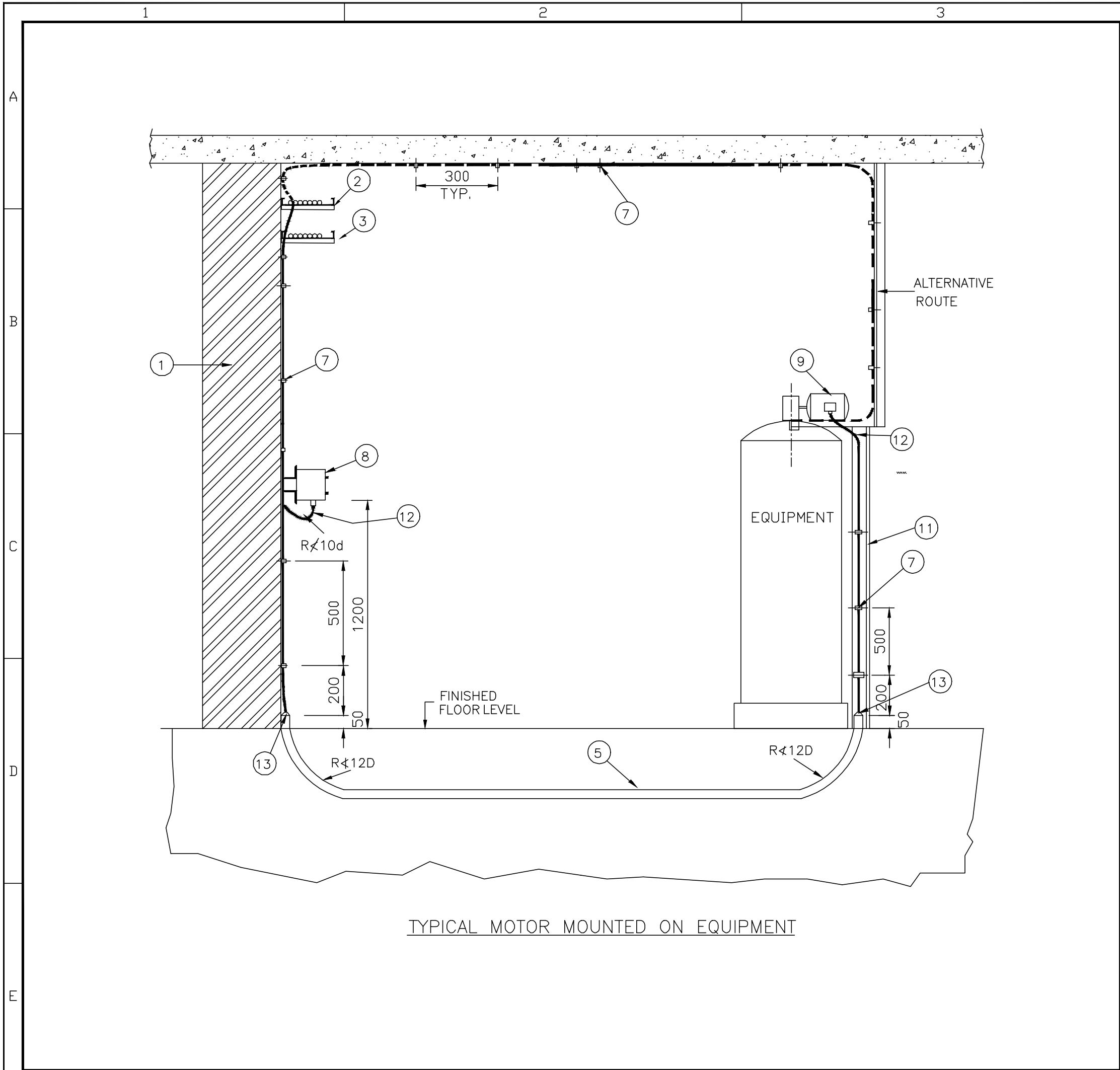
- FOR NOTES AND LEGEND REFER SHEET 37 OF 62.
- THE ANGLE MARKED THUS $\oplus$ SHALL BE DECIDED BY SITE ENGINEER/INSTALLATION CONTRACTOR TO SUIT SITE CONDITION.



0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT: TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE INSTALLATION PRACTICE TO MOTOR AND P.B.

Size	Scale	Sheet
A3	NTS	38 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	



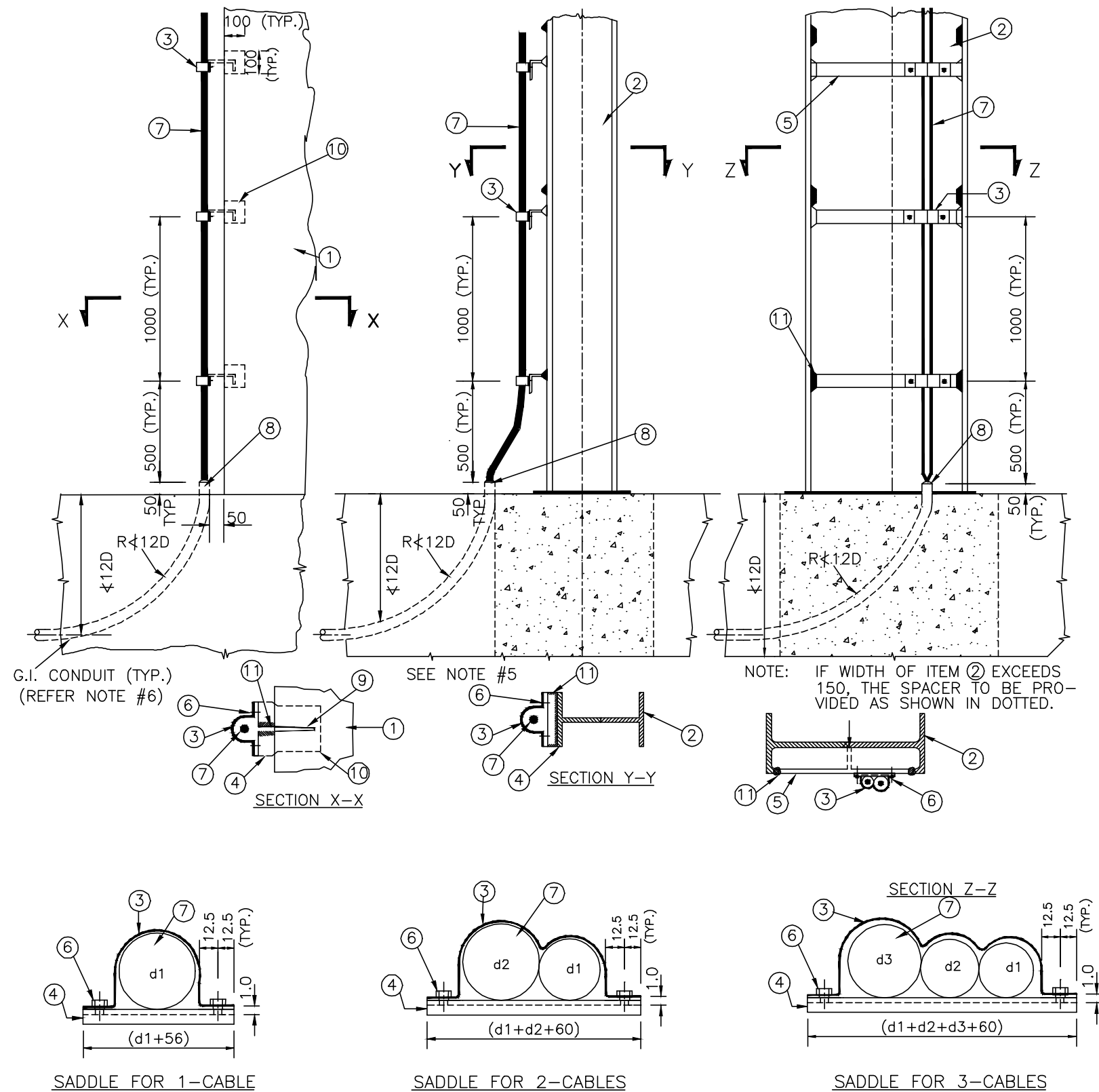
NOTES

1. FOR NOTES AND LEGEND REFER SHEET 37 OF 62.
2. 50x50x6 M.S. ANGLE SUPPORT FOR CABLE CLAMPING SHALL BE INSTALLED WITHOUT OBSTRUCTING THE PASSAGE AND ACCESSIBILITY, FOR MAINTENANCE OF EQUIPMENT. PREFERABLY THE SUPPORT SHALL BE REMOVABLE TYPE.

0	07.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE INSTALLATION PRACTICE TO MOTOR AND P.B.

Size	Scale	Sheet
A3	NTS	39 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	



NOTES

- ALL DIMENSIONS ARE IN MM.
- MAXIMUM 3NO. POWER CABLES SHALL BE CLAMPED TOGETHER.
- CABLES OF DIFFERENT VOLTAGES SHALL BE CLAMPED SEPARATELY.
- SINGLE CORE POWER CABLES SHALL BE CLAMPED IN TREFOIL FORMATION.
- 2Nos. ANCHOR BARS SHALL BE USED FOR EACH ANGLE SPACER HAVING LENGTH MORE THAN 100.
- THE CONDUIT SHALL BE EXTENDED UPTO 2500 ABOVE THE FLOOR LEVEL IN CASE OF UNARMORED CABLES.
- STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992.
- NUTS AND BOLTS SHALL BE AS PER IS 1363(PART-1,2,3):1992/ IS 1367(PART-5):1980.
- WASHERS SHALL BE AS PER IS 2016:1967.
- WELDING SHALL BE DONE AS PER IS 816:1969.

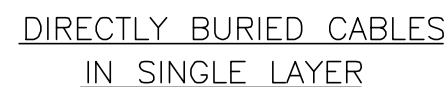
LEGEND

- WALL
 - STEEL COLUMN
 - SADDLE FABRICATED FROM 25x3 G.I. FLAT (50x50x6 M.S. ANGLE)
 - SPACER (25x6 M.S. FLAT)
 - 8 ϕ , 25 LONG G.I. BOLT, NUT AND WASHER.
 - POWER CABLE (3Cx70mm AND ABOVE)
 - WATER PROOF SEALING
 - 8 ϕ , 150 LONG M.S. ANCHOR BAR
 - M 150 CONCRETE
 - WELD
- d1, d2... OVERALL DIAMETER OF CABLES.
- D-NOMINAL DIAMETER OF CONDUIT.

0	07.10.16	APPROVED		RKS	PR	KJ	SKH								
Rev.	D	M	Y	Modifications	Drawn	Checked	Approved	Validated							
SUBJECT															
TYPICAL CABLE TRAY INSTALLATION DETAILS															
CABLE INSTALLATION PRACTICE FOR															
POWER CABLES (3CX70mm AND ABOVE)															
				Size				Scale				Sheet			
				A3				NTS				40 of 62			
				Drawing No.				GGNG-E-20714-3010				Rev.			
								0							

1. ALL DIMENSIONS ARE IN MM.
2. SINGLE CORE CABLES SHALL BE RUN IN TREFOIL FORMATION AND SHALL BE BOUND BY PLASTIC TAPES OR 3 DIA NYLON CORD EVERY 750MM.
3. CABLE IDENTIFICATION TAG SHALL BE TIED AT BOTH ENDS OF THE CABLE AND ALSO AT AN INTERVAL OF 15 METRES.
4. IF THE MINIMUM CLEARANCE AS INDICATED IN THE ABOVE TABLE FOR CABLES OF DIFFERENT CLASSES ARE NOT FEASIBLE, BRICK BARRIERS SHALL BE USED BETWEEN ADJACENT CABLES.
5. G.I./HUME PIPE SHALL BE PROVIDED FOR ROAD CROSSING AT A MINIMUM DEPTH OF 600 FROM THE GRADE LEVEL UNLESS OTHERWISE SPECIFIED.

- ① CABLE ROUTE MARKER
- ② EARTH BACK FILLED & RAMMED
- ③ PROTECTIVE COVERS, AS PER
APPENDIX-C OF IS:1255
 - a) EARTHENWARE FOR LOW
VOLTAGE CABLES.
 - b) RCC FOR HIGH VOLTAGE CABLES,
WITH HOLE AT EACH END TO TIE THEM
TO EACH OTHER WITH G.I. WIRE.
- ④ POWER CABLE
- ⑤ CONTROL CABLE
- ⑥ FINE SAND/RIDDLLED SOIL COMPACTED.



DIMENSIONS (MIN.)	1100V GRADE CABLES	FOR 3.3KV TO 11KV	22KV & 33KV
D1	750	900	1050
S	⊗ d — BETWEEN CABLES OF SAME CLASS *300mm — BETWEEN CABLES OF DIFFERENT CLASS *400mm — BETWEEN 1/C POWER CABLE AND COMMUNICATION CABLE *300mm — BETWEEN MULTICORE POWER CABLE AND COMMUNICATION CABLE		

⊗ d — OVERALL DIAMETER OF THE BIGGER OF THE TWO CABLES
* — SPACING SHALL BE KEPT BOTH HORIZONTALLY & VERTICALLY

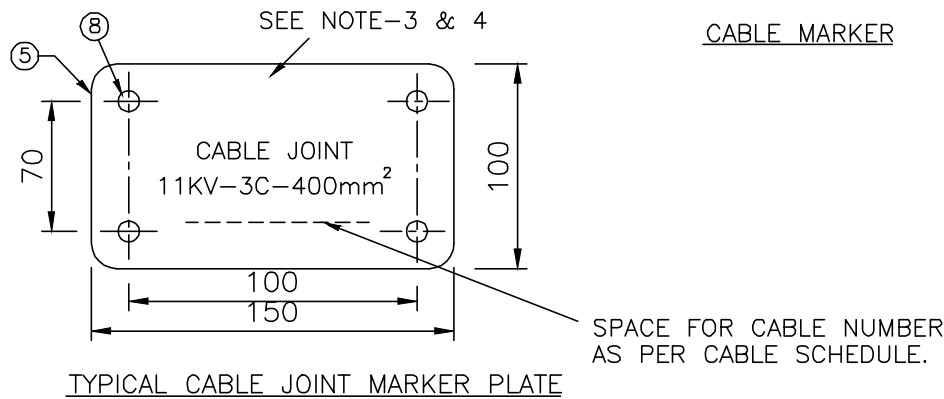
0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
INSTALLATION PRACTICE FOR DIRECTLY BURIED CABLES

Size	Scale	Sheet
A3	NTS	41 of 62
Drawing No.		Rev
GGNG-E-20714-3010		0

1. ALL DIMENSIONS ARE IN MM.
2. FOR NOTES AND OTHER DETAILS REFER SHEET 41 OF 62.
3. a) VOLTAGE OF HIGHEST GRADE CABLE SHALL BE CAST ON THE CABLE ROUTE MARKER PLATE.
- b) VOLTAGE, NUMBER OF CORES, SIZE AND IDENTIFICATION NUMBER OF THE CABLE SHALL BE CAST ON THE CABLE JOINT MARKER PLATE.
4. RAISED LETTERS AND ARROWS SHALL BE CAST ON 10 THICK CAST IRON PLATE (ARROW INDICATES THE ROUTE OF CABLES).
5. CABLE MARKER AS ABOVE SHALL BE AVOIDED ON ROADS. ONLY A TILE SHOWING DETAILS, SHALL BE USED AS MARKER.
6. TYPICAL CABLE ROUTE MARKER AS ABOVE IS SHOWN FOR BEND. ACTUAL PLACEMENT OF ROUTE MARKER SHALL BE DECIDED AT SITE BY SITE ENGINEER/CABLE INSTALLATION CONTRACTOR.
7. THE CABLE MARKER PLATE SHALL BE FIXED BY 4NO. SUITABLE G.I. NUTS.

- ① CABLE ROUTE
- ② CABLE ROUTE MARKER
- ③ CABLE JOINT MARKER
- ④ CABLE ROUTE MARKER PLATE (C.I.)
- ⑤ CABLE JOINT MARKER PLATE (C.I.)
- ⑥ M-150 CONCRETE BLOCK
- ⑦ 10 ϕ , 25 PROJ. G.I. STUD
- ⑧ 12 ϕ HOLE

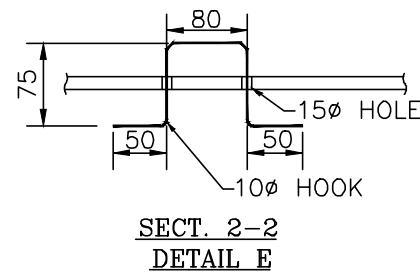


0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT	TYPICAL CABLE TRAY INSTALLATION DETAILS INSTALLATION PRACTICE FOR DIRECTLY BURRIED CABLES
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Size	Scale	Sheet
A3	NTS	42 of 62
Drawing No.		F
GGNG-E-20714-3010		

1. ALL DIMENSIONS ARE IN MM
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRENCH TYPE - 0404

Size	Scale	Sheet
A3	NTS	43 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

1

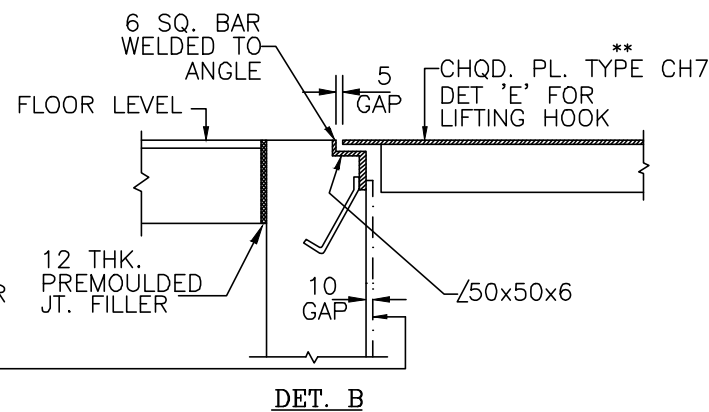
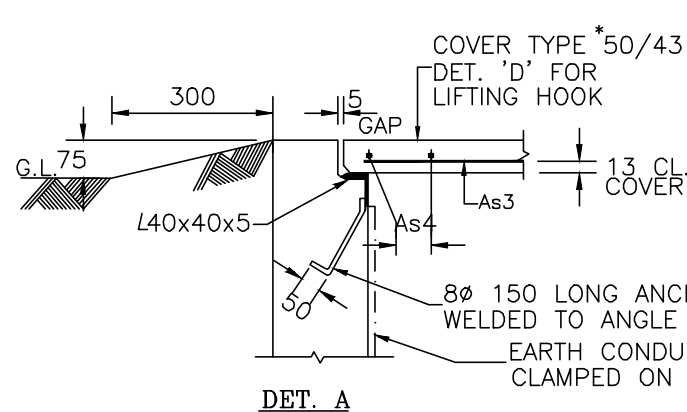
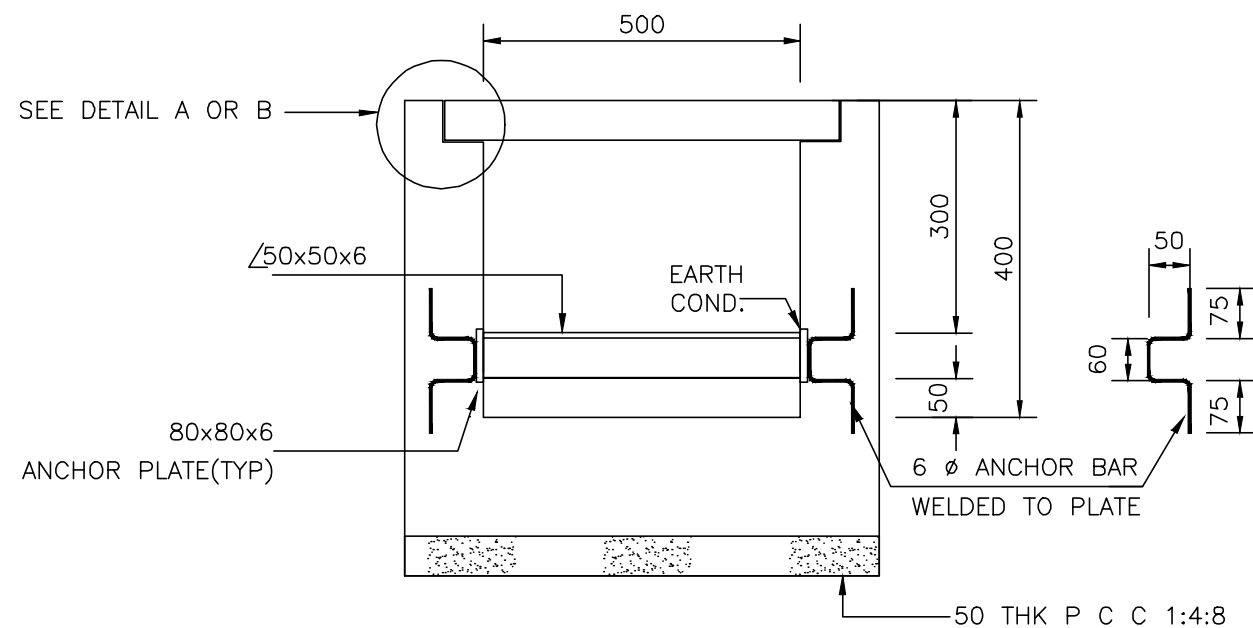
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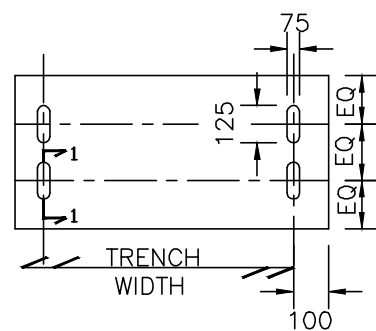
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NOTES

1. ALL DIMENSIONS ARE IN MM
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



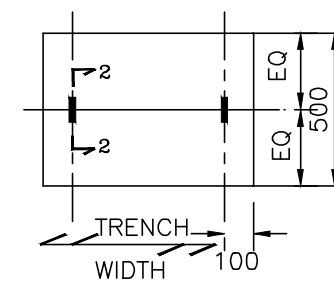
**CH7 = 7 THK. CHQD. PL



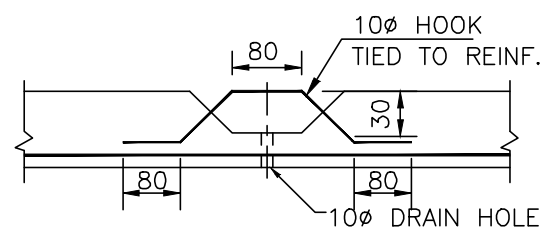
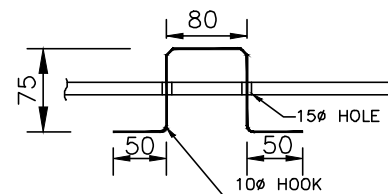
PLAN

R C COVER TYPE	THICKNESS mm.	As3	As4
50/72	50	7-6∅	7-6∅
50/36	50	7-6∅	4-6∅

* 50/36 MEANS 50mm. THK.x36 Kg. COVER WEIGHT
OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF
300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.



PLAN

SECT. 1-1
DET. DSECT. 2-2
DET. E

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated
SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS CABLE TRENCH TYPE - 0504						
Size Scale Sheet			44 of 62			
A3 NTS			Drawing No. GGNG-E-20714-3010			
Rev.						0

1

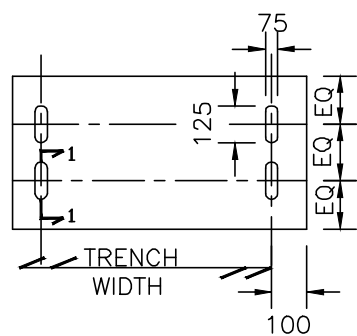
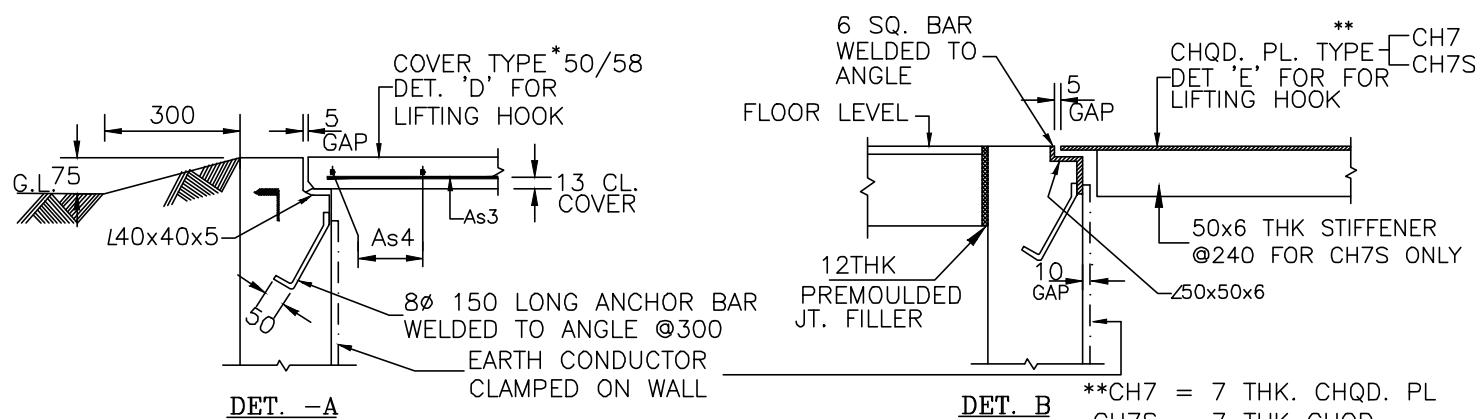
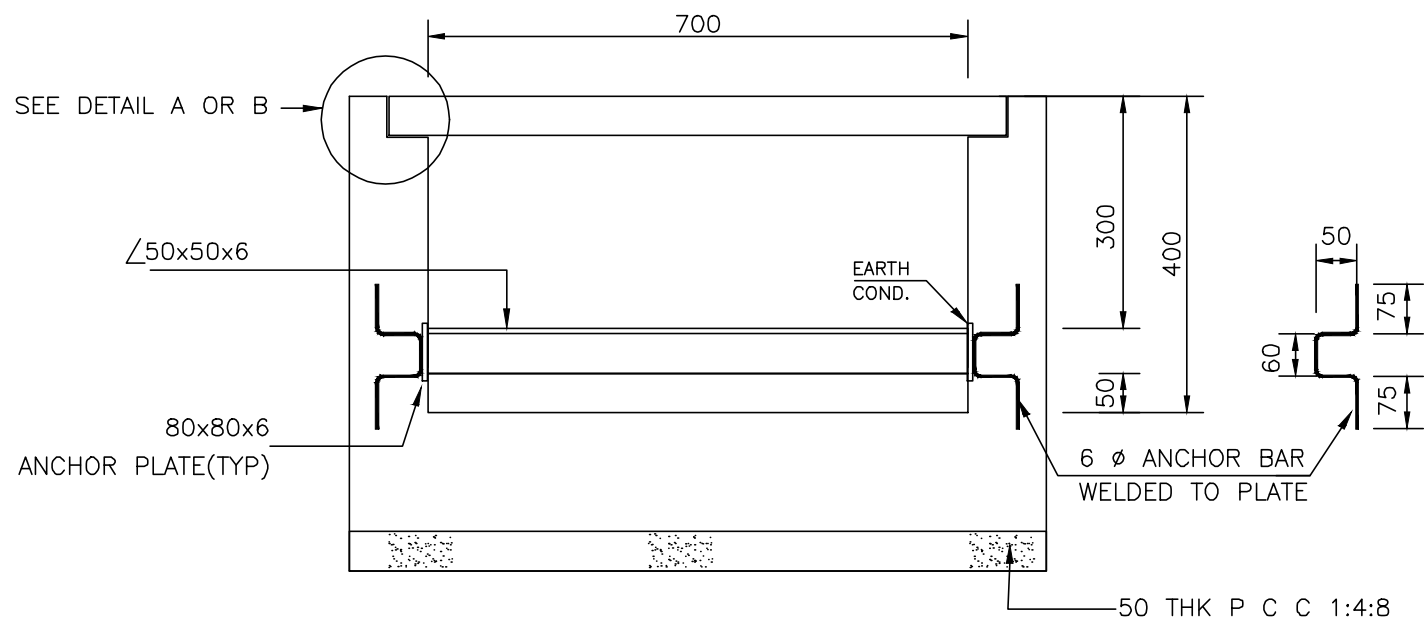
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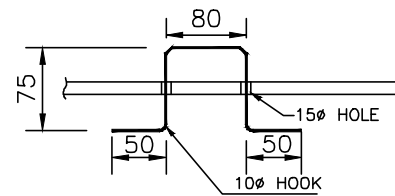
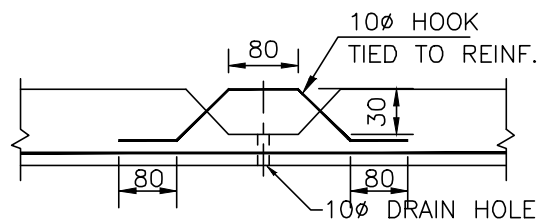
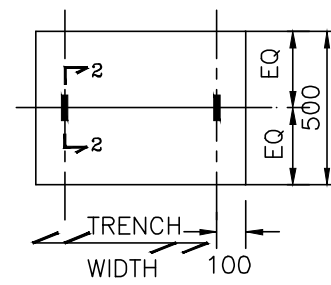
NOTES

1. ALL DIMENSIONS ARE IN MM
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



R C COVER TYPE	THICKNESS mm.	As3	As4
50/58	50	7-6∅	7-6∅

* 50/58 MEANS 50mm. THK.x58 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.

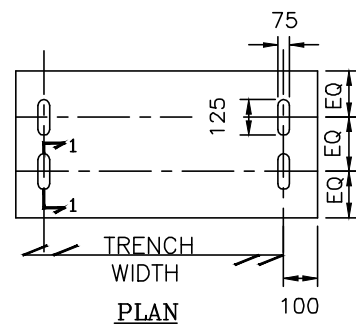
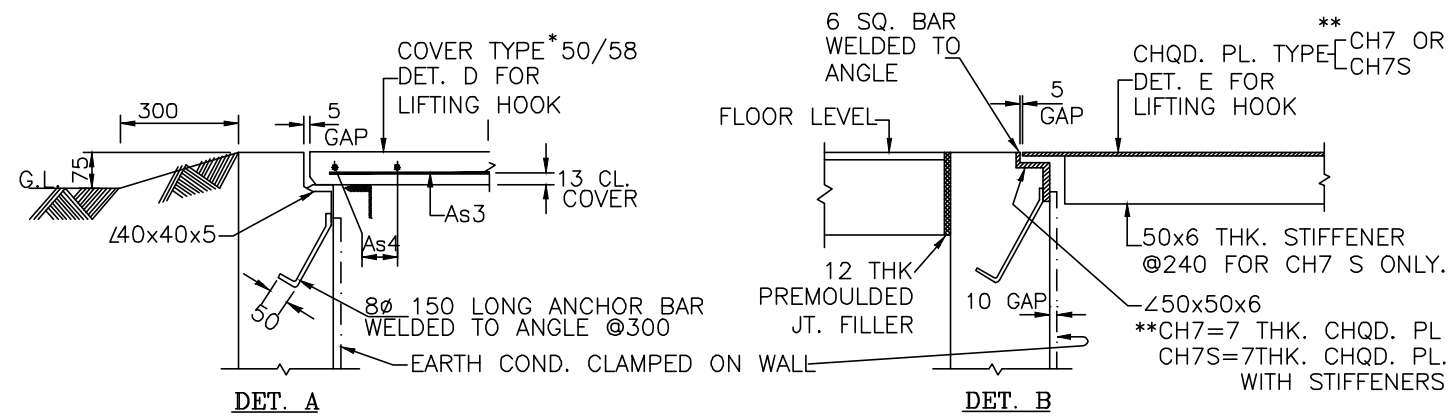
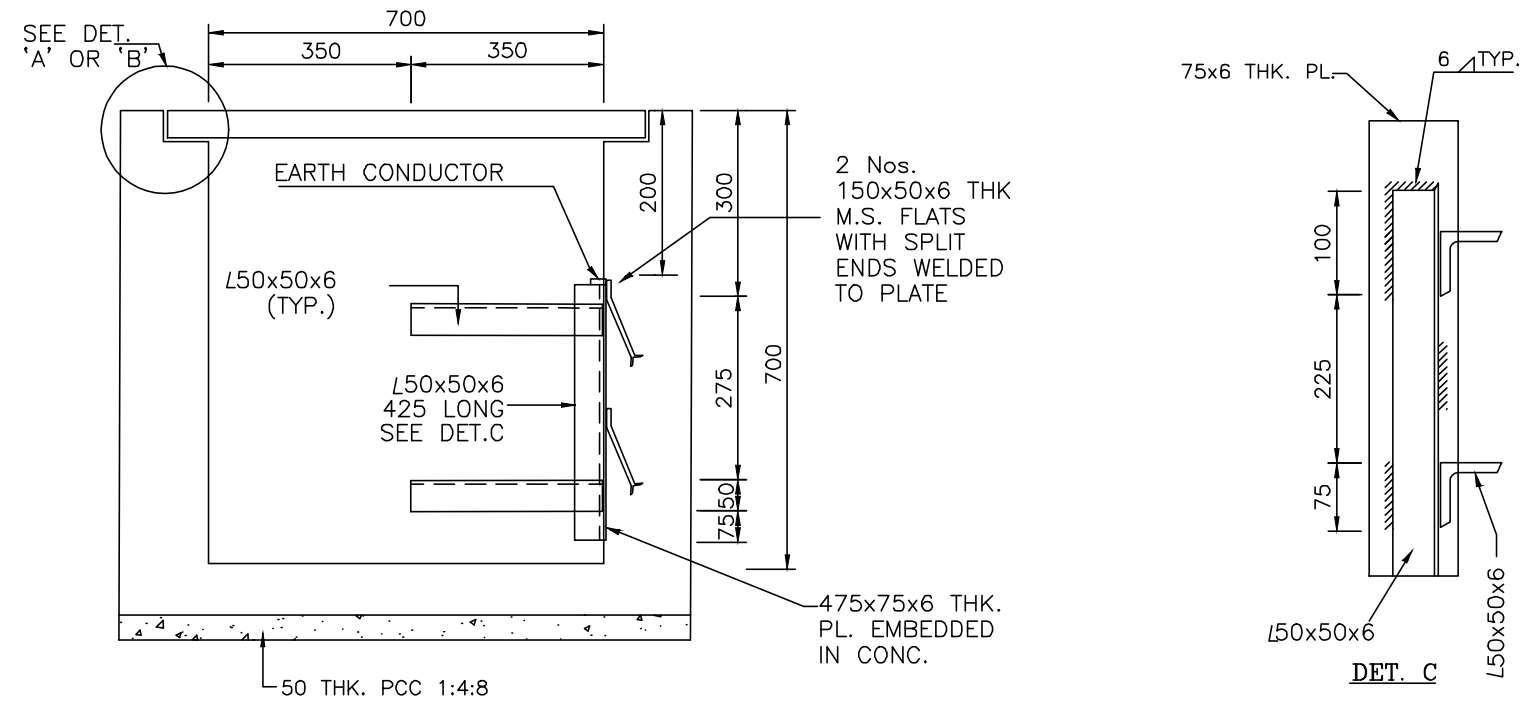


0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRENCH TYPE - 0704

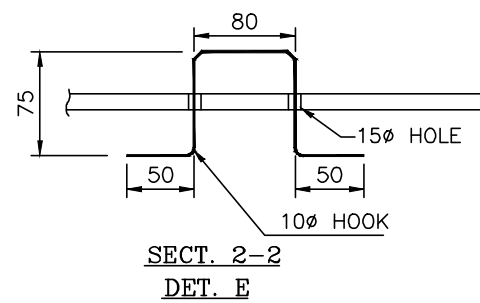
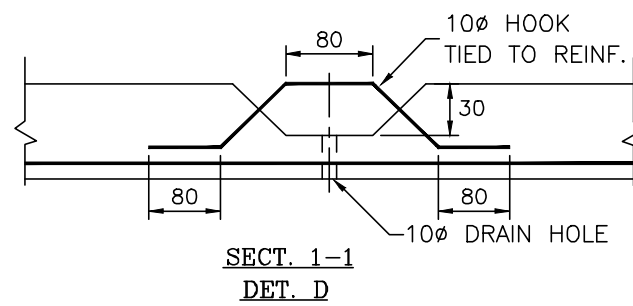
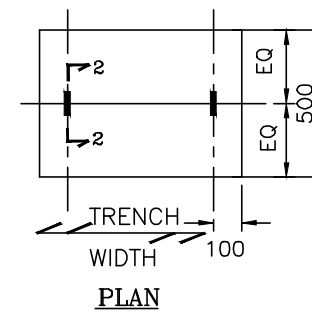
Size	Scale	Sheet
A3	NTS	45 of 62
Drawing No.	Rev.	
GGNG-E-20714-3010	0	

1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



R C COVER TYPE	THICKNESS mm.	As3	As4
50/58	50	7-6ø	6-6ø

50x58 MEANS 50mm. THK.x58 Kg. COVER WEIGHT
OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF
300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.

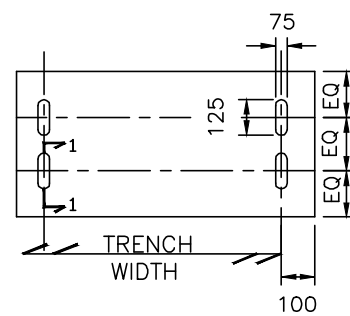
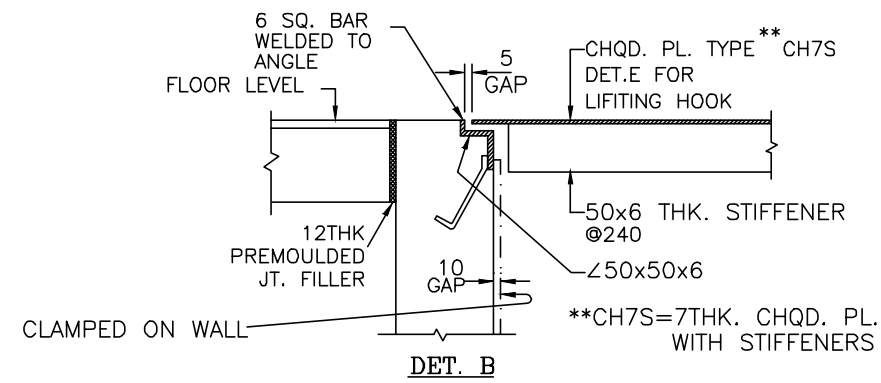
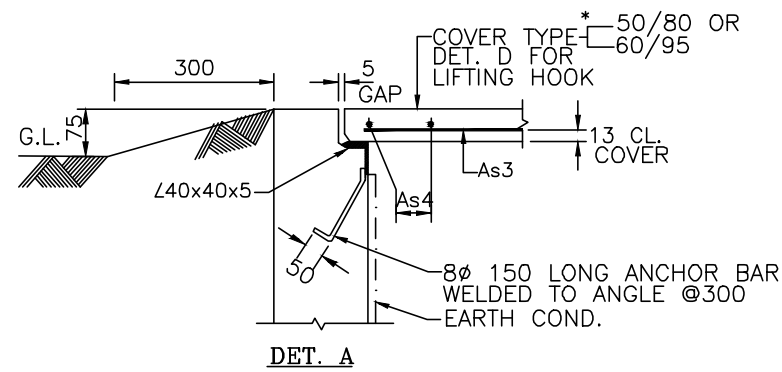
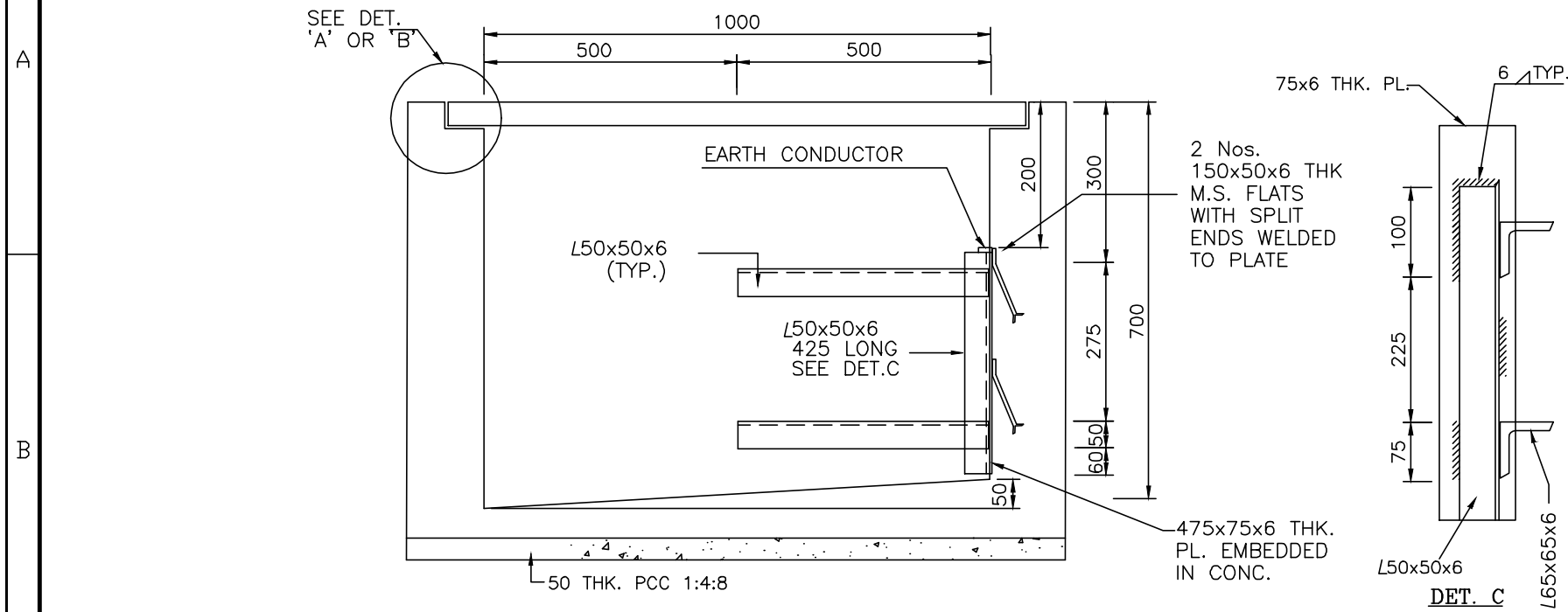


0	07.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRENCH TYPE - 0707

Size	Scale	Sheet
A3	NTS	46 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

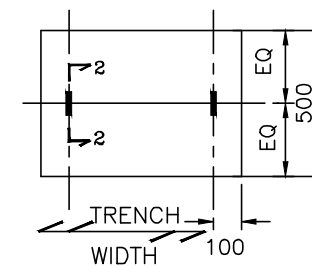
1. ALL DIMENSIONS ARE IN MM.
2. STRUCTURAL STEEL SHALL BE AS PER IS 2062:1992



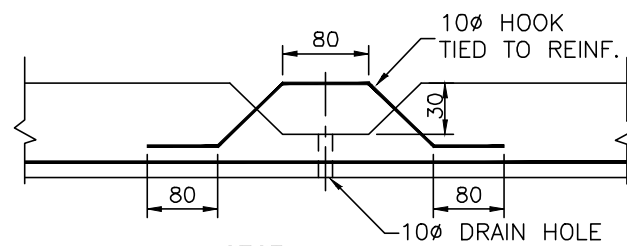
PLAN

R C COVER TYPE	THICKNESS mm.	As3	As4
50/80	50	7-6ø	6-6ø
60/95	60	7-8ø	6-8ø

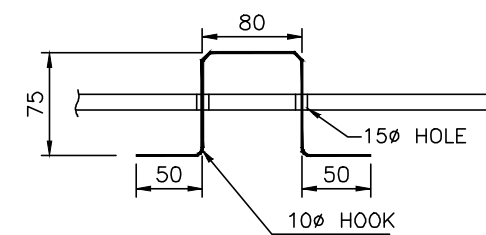
60x95 MEANS 60mm. THK.x95 Kg. COVER WEIGHT OF 600mm COVER WIDTH. PROVIDE TWO COVERS OF 300mm WIDTH FOR EVERY 10m LENGTH OF TRENCH.



PLAN



SECT. 1-1
DET. D



SECT. 2-2
DET. E

0	07.10.16	APPROVED	RKS	PR	KJ	SKH	
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated	

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
CABLE TRENCH TYPE - 1007

Size	Scale	Sheet
A3	NTS	47 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

	1	2	3	4
A				NOTES
B				
C				
D				
E				

THE FOLLOWING TIGHTENING TORQUES SHALL BE USED FOR NUTS AND BOLTS USED FOR SUPPORTS, CABLE TRAY OR ACCESSORIES ASSEMBLY.

Metric size (mm)	Recommended Torque (Nm)
M8	12 Nm.
M10	25 Nm.
M12	45 Nm.
M16	100 Nm.

AS THE ABOVE VALUES CAN SLIGHTLY CHANGE FROM ONE CABLE TRAY MANUFACTURER TO ANOTHER, CABLE TRAY INSTALLATION CONTRACTOR TO CHECK THESE VALUES WITH MANUFACTURER DATA.

TIGHTENING TORQUES

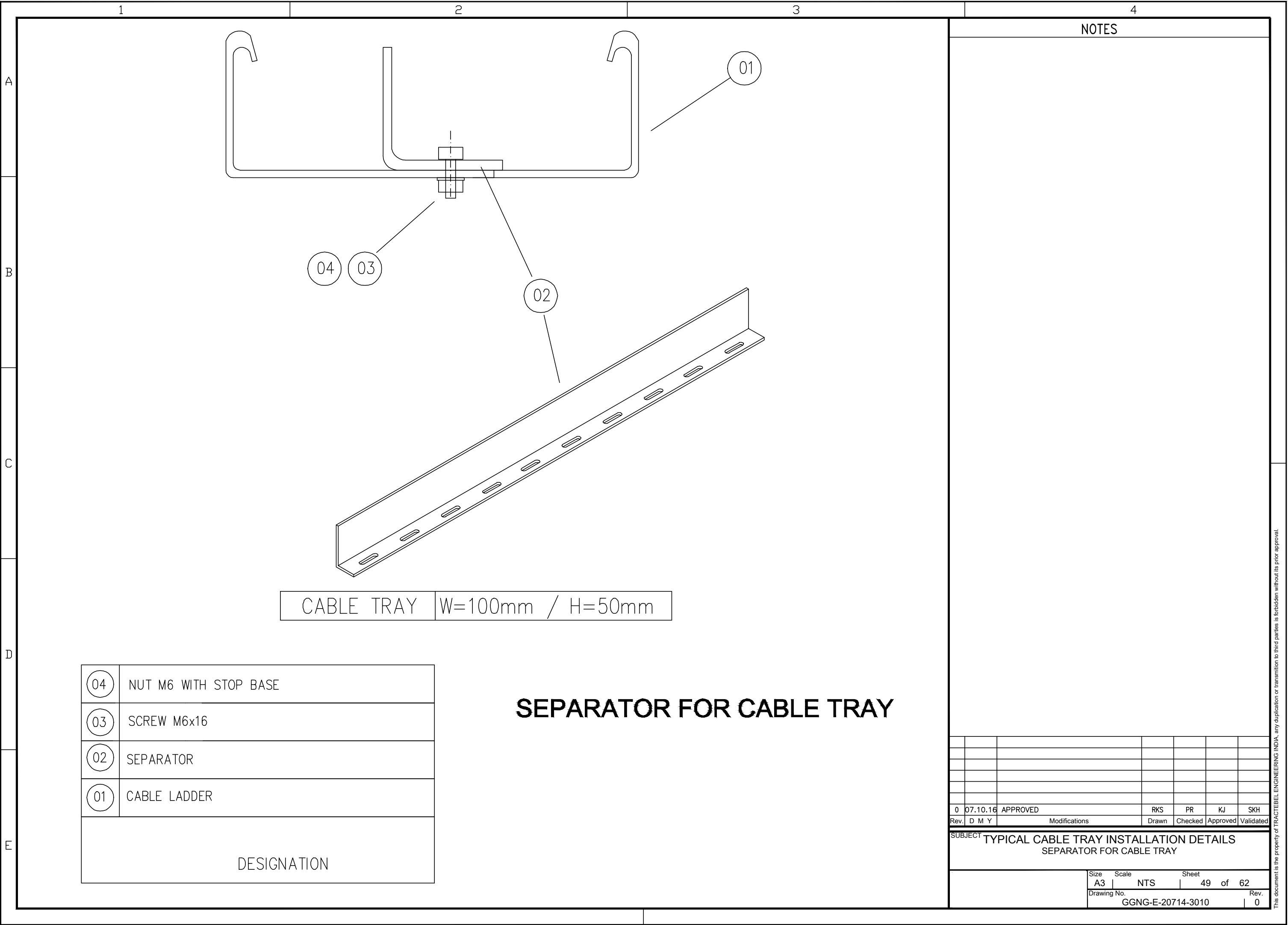
0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D	M	Y	Modifications	Drawn	Checked

SUBJECT

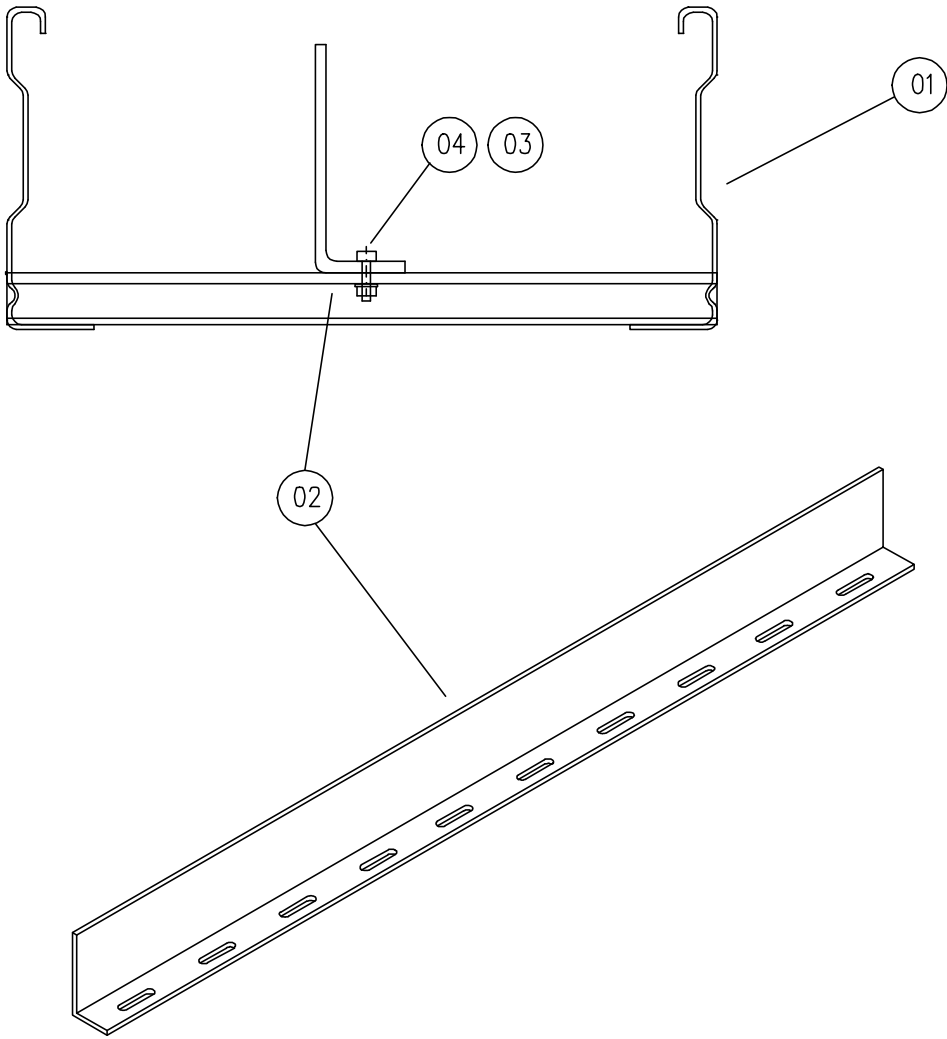
TYPICAL CABLE TRAY INSTALLATION DETAILS
TIGHTENING TORQUES

	Size	Scale	Sheet
	A3	NTS	48 of 62
	Drawing No.		Rev.
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CABLES LADDER	W=300mm / H=100mm
CABLES LADDER	W=600mm / H=100mm

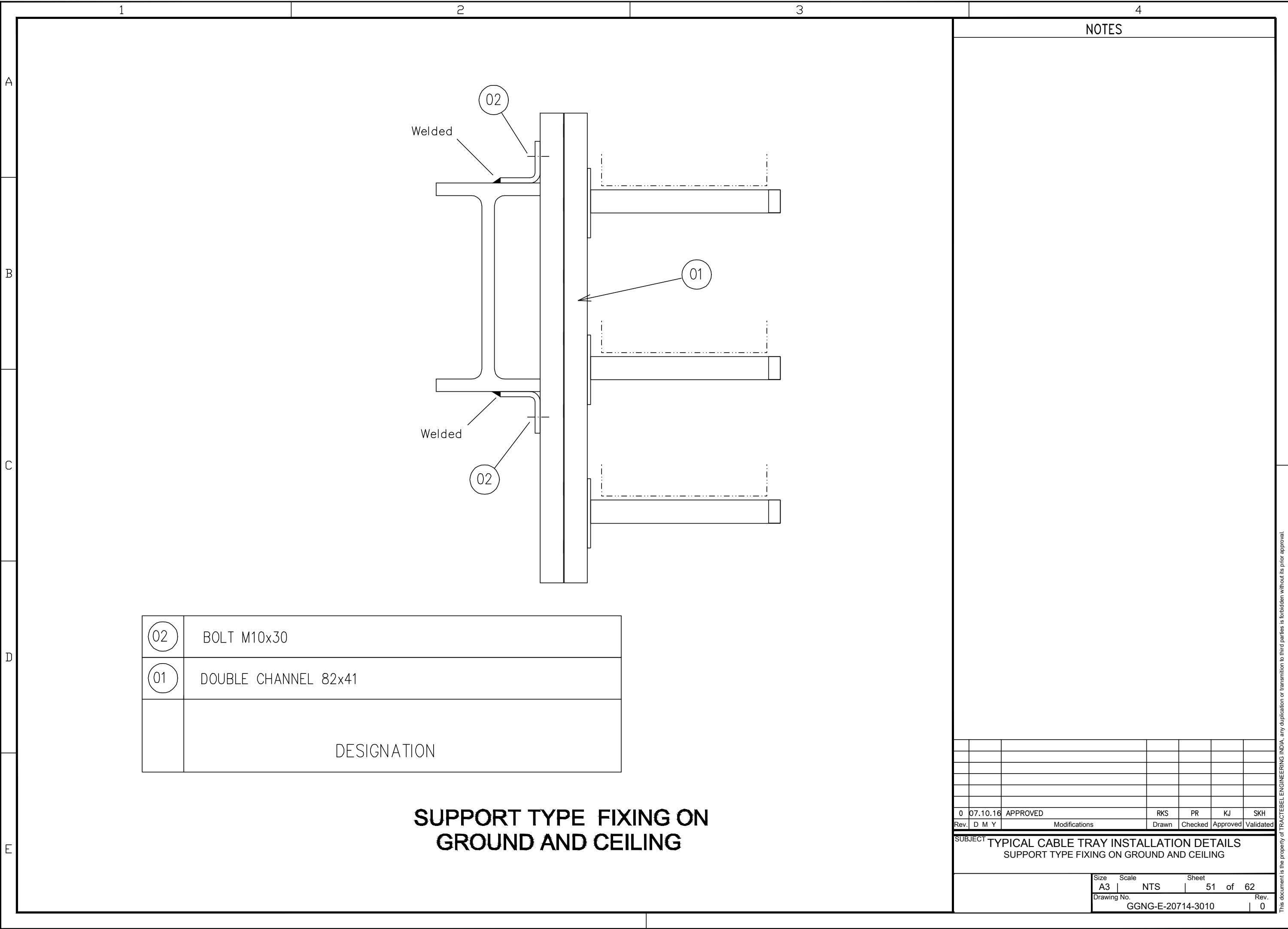
04	NUT M6 WITH STOP BASE
03	SCREW M6x16
02	SEPARATOR H 68mm
01	CABLE LADDER H 100mm
DESIGNATION	

CABLES LADDER SEPARATOR

NOTES

0	07.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D	M	Y	Modifications	Drawn	Checked
SUBJECT				TYPICAL CABLE TRAY INSTALLATION DETAILS		
				CABLES LADDER SEPARATOR		
		Size	Scale	Sheet		
		A3	NTS	50 of 62		
		Drawing No.		Rev.		
		GGNG-E-20714-3010		0		

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E

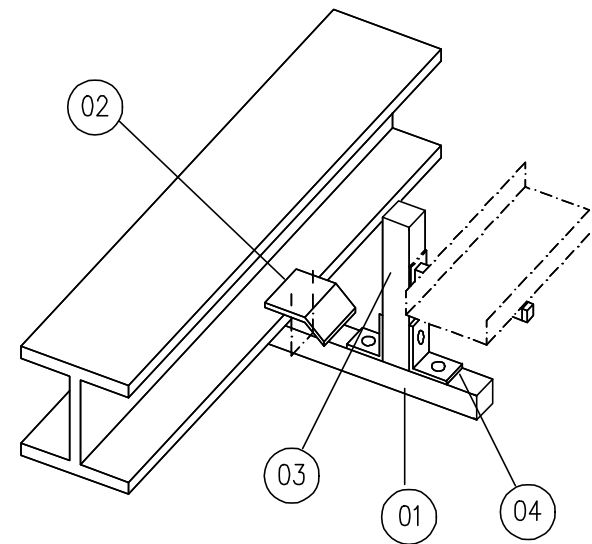


SUPPORT TYPE FIXING ON GROUND AND CEILING

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
SUPPORT TYPE FIXING ON GROUND AND CEILING

Size	Scale	Sheet
A3	NTS	52 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

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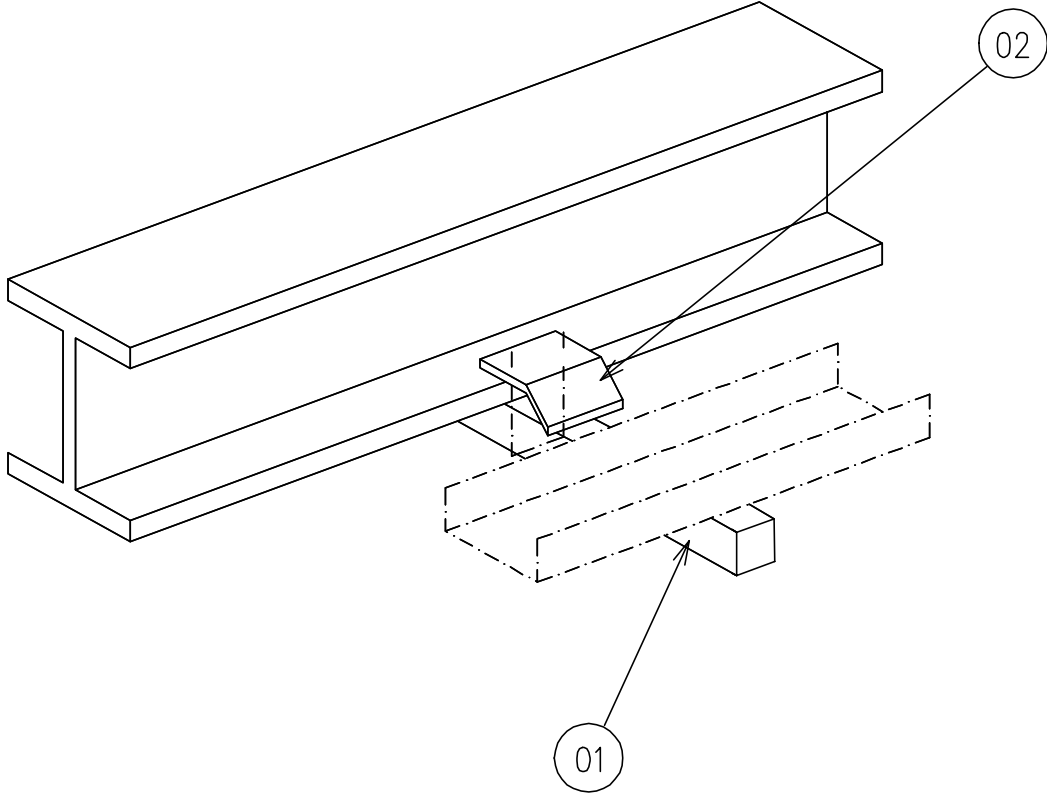
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03	SIMPLE CHANNEL U 41x41	
02	BEAM CLAMPS FOR U 41x41	SUPPLIED WITH 1 U BOLT
01	SIMPLE CHANNEL U 41x41	
	DESIGNATION	REMARKS

SUPPORT TYPE MOUNTING UNDER BEAM

0	07.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
SUPPORT TYPE MOUNTING UNDER BEAM

Size	Scale	Sheet
A3	NTS	53 of 62
Drawing No.		Rev.
GGNG-E-20714-3010		0

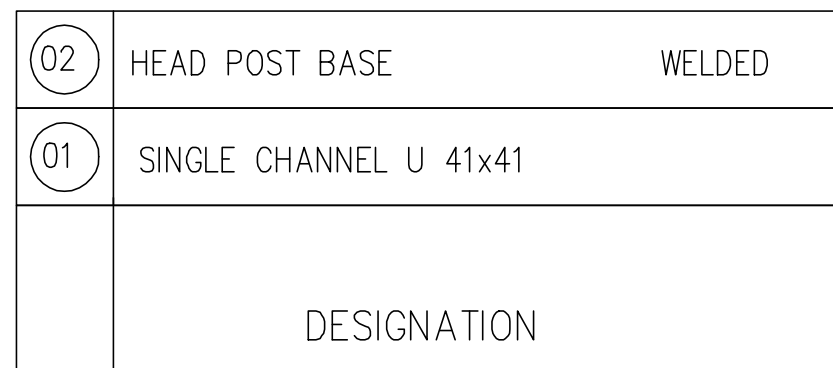
1		2		3		4													
						NOTES													
A	 VERTICAL OR HORIZONTAL MOUNTING ACCORDING TO DRAWING. <table><tr><td>02</td><td>BEAM CLAMPS FOR U 41x41</td><td>SUPPLIED WITH</td><td>1 U BOLT</td></tr><tr><td>01</td><td>SIMPLE CHANNEL U 41x41</td><td></td><td></td></tr><tr><td></td><td>DESIGNATION</td><td colspan="2">REMARKS</td></tr></table> SUPPORT TYPE MOUNTING ON BEAM						02	BEAM CLAMPS FOR U 41x41	SUPPLIED WITH	1 U BOLT	01	SIMPLE CHANNEL U 41x41				DESIGNATION	REMARKS		
02							BEAM CLAMPS FOR U 41x41	SUPPLIED WITH	1 U BOLT										
01							SIMPLE CHANNEL U 41x41												
							DESIGNATION	REMARKS											
B																			
C																			
D																			
E																			

0	07.10.16	APPROVED		RKS	PR	KJ	SKH	
Rev.	D	M	Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT			
TYPICAL CABLE TRAY INSTALLATION DETAILS			
SUPPORT TYPE MOUNTING ON BEAM			

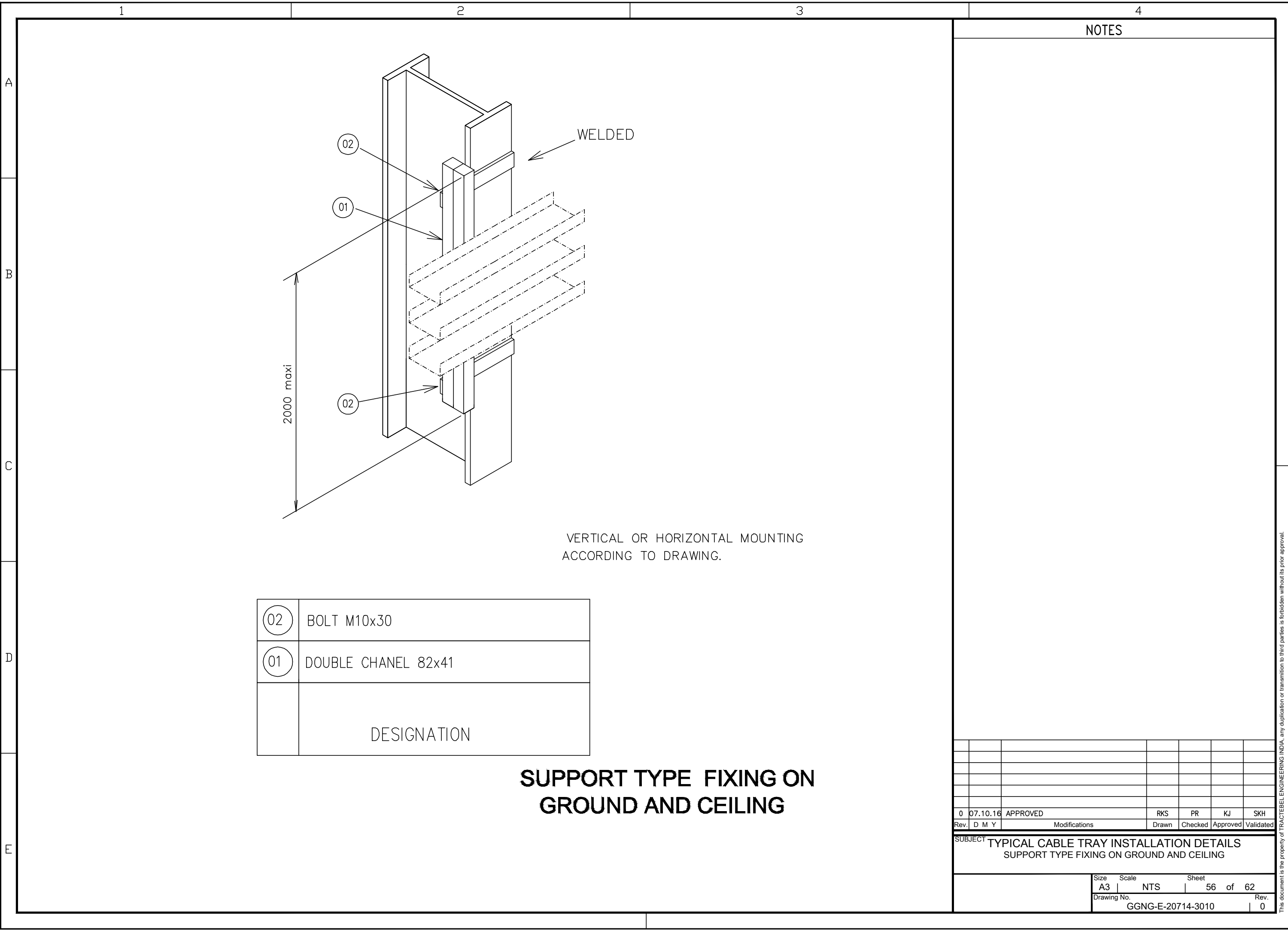
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	Drawing No.		Rev.
	GGNG-E-20714-3010		0

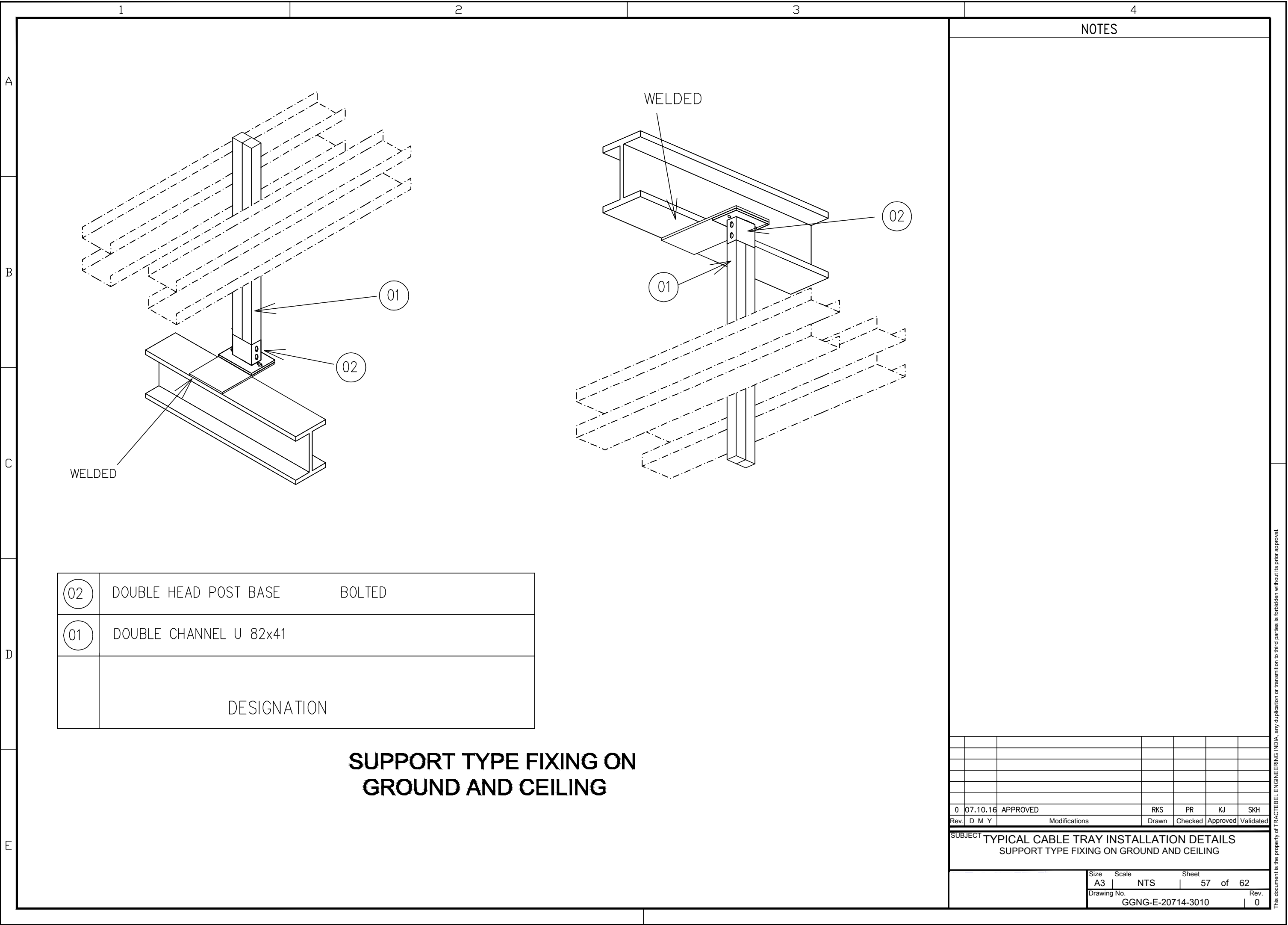
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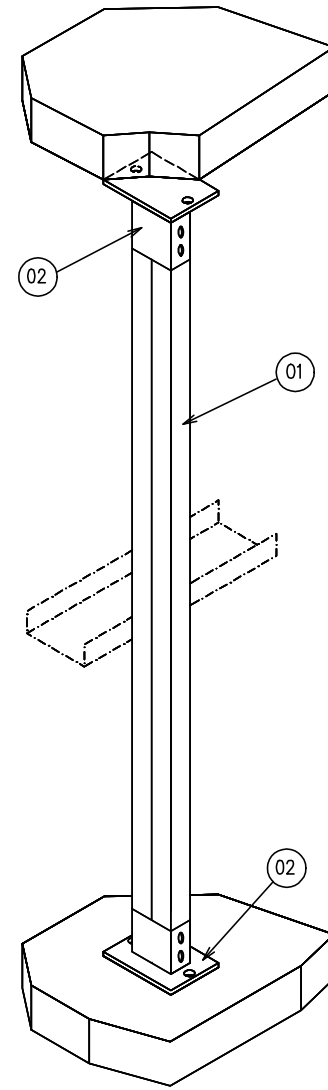
0	07.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

Size	Scale	Sheet
A3	NTS	55 of 62
Drawing No.		Rev.
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E



02	DOUBLE HEAD POST BASE	BOLTED
01	DOUBLE CHANNEL U 82x41	
	DESIGNATION	

SUPPORT TYPE 65 FIXING ON GROUND AND CEILING

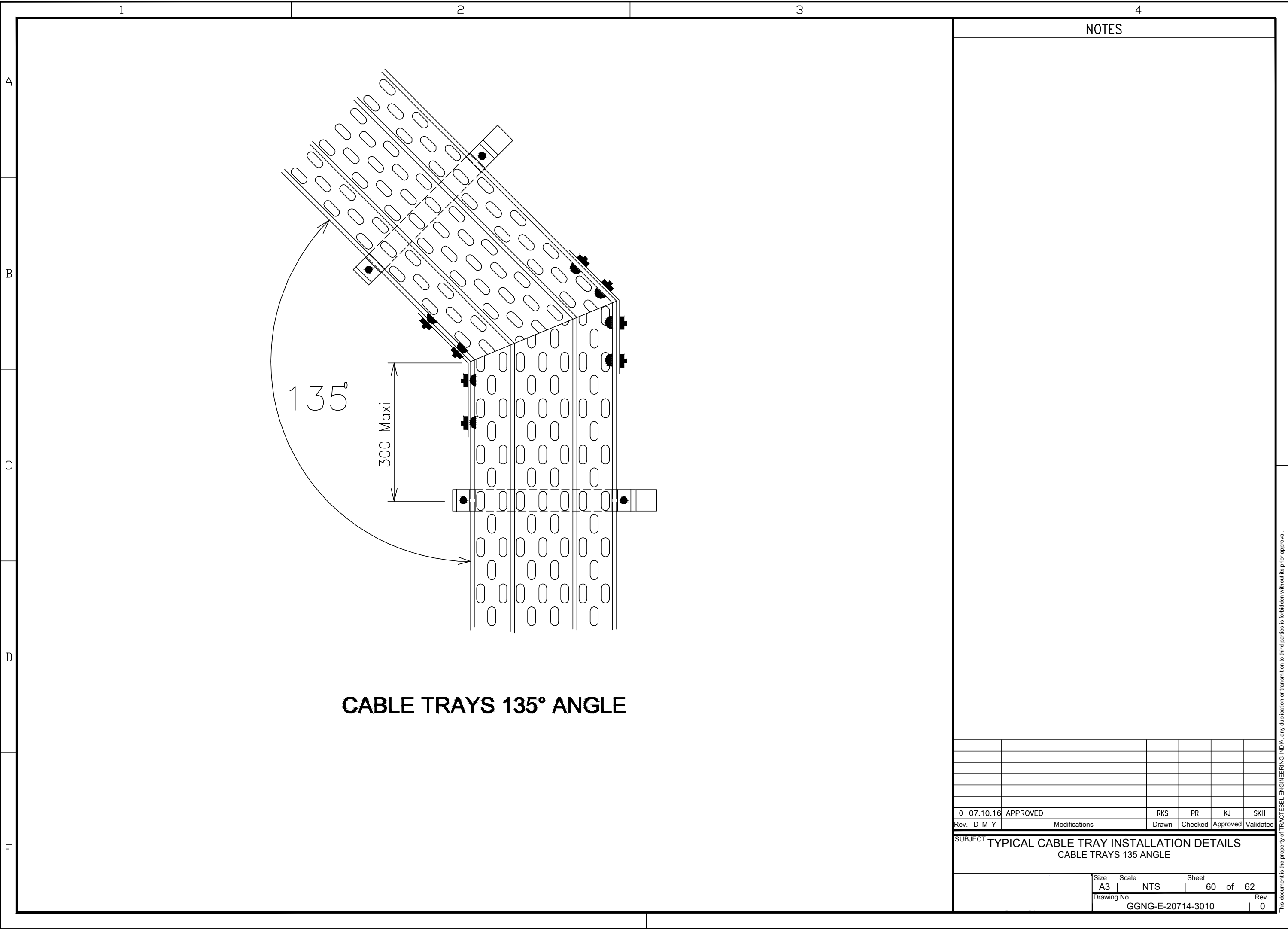
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Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

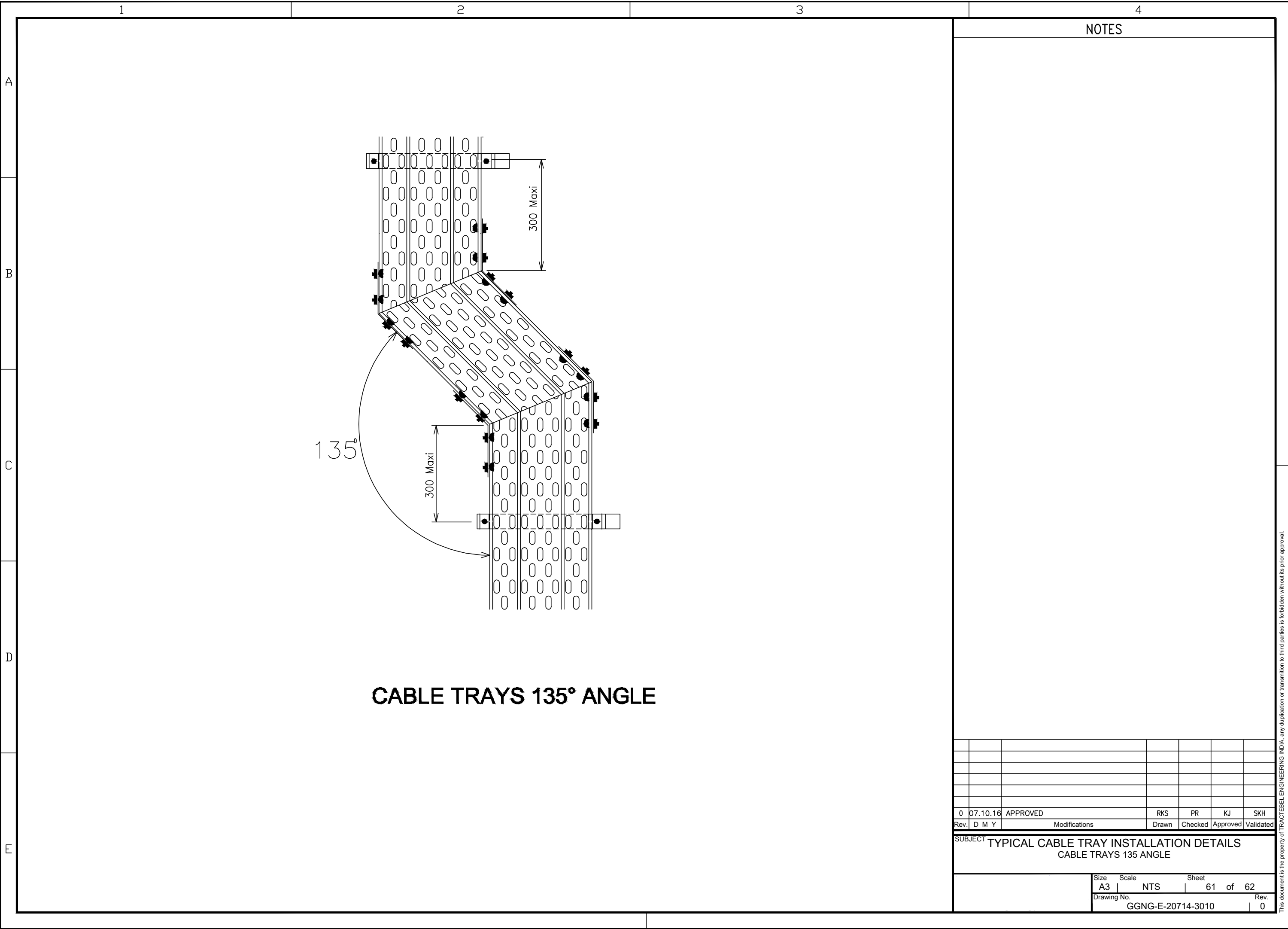
SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS
SUPPORT TYPE 65 FIXING ON GROUND AND CEILING

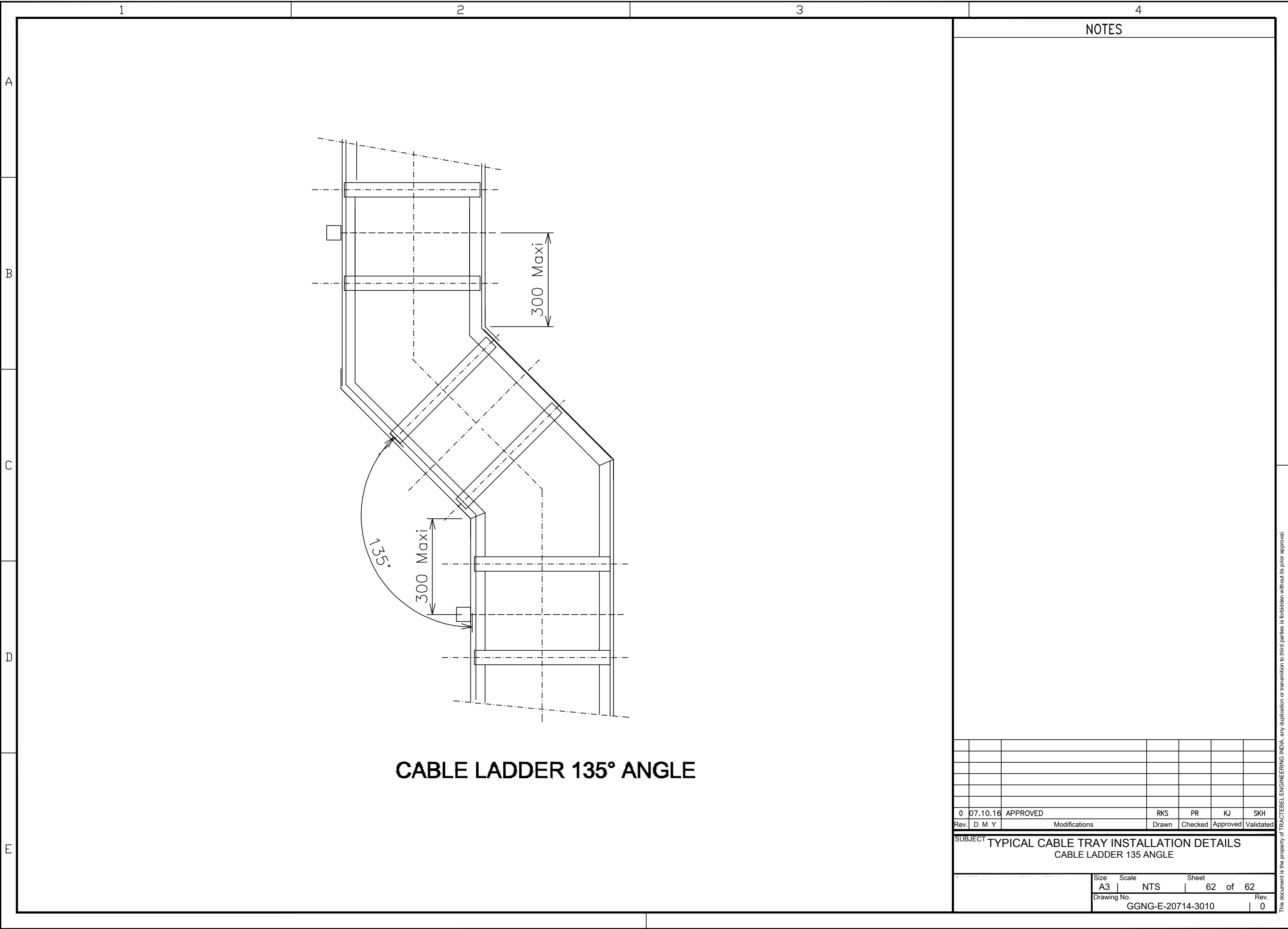
	Size	Scale	Sheet
	A3	NTS	58 of 62
Drawing No.			Rev.
GGNG-E-20714-3010			0

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D	<table><tr><td>03</td><td>OMEGA SHAPE FITTING FOR U 42 x41</td></tr><tr><td>02</td><td>EXPANSION STUD ANCHOR</td></tr><tr><td>01</td><td>SINGLE CHANNEL U 41x41</td></tr><tr><td></td><td>DESIGNATION</td></tr></table>						03	OMEGA SHAPE FITTING FOR U 42 x41	02	EXPANSION STUD ANCHOR	01	SINGLE CHANNEL U 41x41		DESIGNATION																																																																																										
03	OMEGA SHAPE FITTING FOR U 42 x41																																																																																																							
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E	SUPPORT TYPE FIXING ON SINGLE CHANNEL U 41x41 ON CONCRETE <table><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>0</td><td>07.10.16</td><td>APPROVED</td><td></td><td>RKS</td><td>PR</td><td>KJ</td><td>SKH</td></tr><tr><td>Rev.</td><td>D M Y</td><td>Modifications</td><td></td><td>Drawn</td><td>Checked</td><td>Approved</td><td>Validated</td></tr><tr><td colspan="8">SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS SUPPORT TYPE FIXING ON SINGLE CHANNEL U41x41 ON CONCRETE</td></tr><tr><td colspan="4"></td><td>Size</td><td>Scale</td><td colspan="2">Sheet</td></tr><tr><td colspan="4"></td><td>A3</td><td>NTS</td><td colspan="2">59 of 62</td></tr><tr><td colspan="4"></td><td colspan="3">Drawing No.</td><td>Rev.</td></tr><tr><td colspan="4"></td><td colspan="3">GGNG-E-20714-3010</td><td>0</td></tr></table>																																														0	07.10.16	APPROVED		RKS	PR	KJ	SKH	Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated	SUBJECT TYPICAL CABLE TRAY INSTALLATION DETAILS SUPPORT TYPE FIXING ON SINGLE CHANNEL U41x41 ON CONCRETE												Size	Scale	Sheet						A3	NTS	59 of 62						Drawing No.			Rev.					GGNG-E-20714-3010			0		
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0	13.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

	Size	Scale	Sheet
	A3	NTS	01 of 23
Drawing No.	GGNG-E-20715-0812		Rev.
			0

GENERAL NOTES

1. ALL DIMENSIONS ARE GIVEN IN MM.(UNLESS OTHERWISE SPECIFIED).
2. ALL GROUNDING CONDUCTORS SURROUNDING THE BUILDINGS SHALL BE LOCATED ABOUT 1.5M(1500MM) FROM WALLS, COLUMN PEDESTALS AND FENCES.
3. ALL JOINTS UNDERGROUND SHALL BE PROTECTED AGAINST CORROSION BY DENSO TAPE(OR EQUIVALENT).
4. TIGHTENING TORQUES ARE GIVEN IN THE FOLLOWING TABLE:

Tightening torques (in m.kg)	
Diameter of screw	Class 5.8 steel screw
M 10	2.86
M 12	4.94
M 14	7.8
M 16	11.83
M 20	26

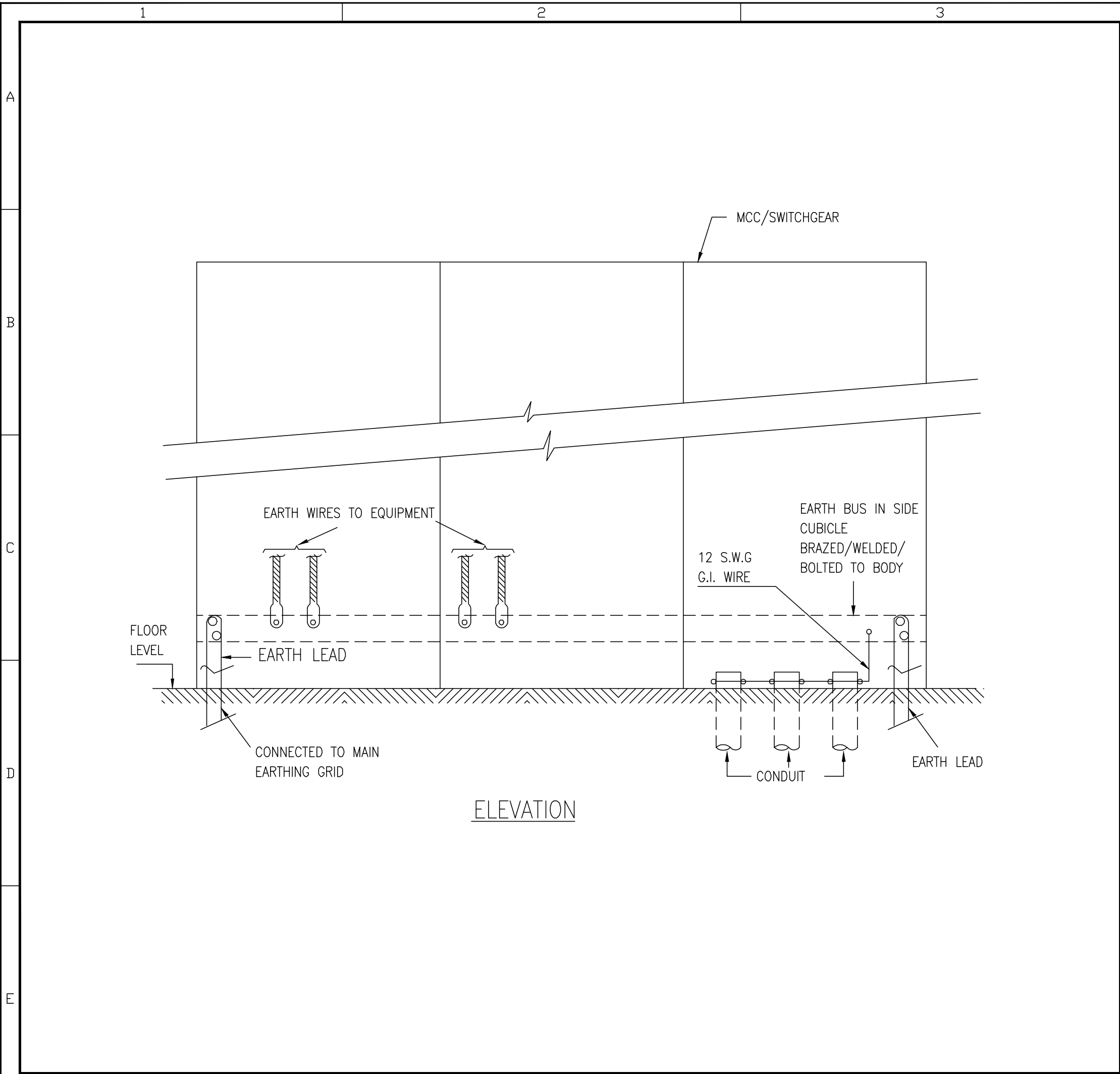
5. METALLIC FENCES AROUND TRANSFORMER AREA AND LONG METALLIC OBJECTS SHALL BE CONNECTED TO THE GROUNDING SYSTEM IN AT LEAST TWO INTERVALS NOT EXCEEDING 50 METERS.
- PLASTIC COVERED CHAIN LINK FENCES SHALL BE CONSIDERED IN THE SAME WAY AS BARE METALLIC FENCES, SO THAT SUPPORT POSTS, STAYS AND ANTI-CLIMBING FITTINGS SHALL BE BANDED ACCORDING TO ABOVE TWO METHODS.
6. PVC PIPES SHALL BE SET IN CONCRETE CASING UNLESS OTHERWISE SPECIFIED.
7. PVC PIPES ARE HEAVY DUTY TYPE.
8. ALL ARC WELDS SHALL BE PROTECTED AGAINST CORROSION.
9. ELECTRICAL EQUIPMENT LIKE MV/LV SWITCHGEAR, DB, CONTROL PANEL WILL BE EARTHED TO THE EARTHING CONDUCTOR RUNNING ALONG THE EDGE OF THE NEARBY CABLE TRAY, WHETHER AVAILABLE.
10. ALL NON CURRENT CARRYING METALLIC EQUIPMENT SUCH AS TANKS, METAL STRUCTURE SUCH HAS HAND RAIL, STRUCTURAL COLUMNS SHALL BE GROUNDED WITH MIN ON GROUND CONDUCTOR. AND TWO NUMBERS IN CASE LOCATED IN HAZARDOUS AREA.
11. A TEST LINK SHALL BE PROVIDED IN EACH EARTH PIT.
12. EARTH PIT FOR LIGHTNING PROTECTION DOWN CONDUCTOR SHALL BE SEPARATE DOWN CONDUCTORS FROM LIGHTNING ARRESTOR TO EARTH PIT SHALL BE RUN BY SHORTEST ROUTE LENGTH.
13. AL ELECTRICAL EQUIPMENT WITH 3-PHASE SUPPLY EG. SWITCHGEAR, POWER AND MOTOR CONTROL CENTERS, INVERTER PANEL, POWER LIGHTING DB, MOTOR WELDING RECEPTACLES. ETC SHALL BE GROUNDED BY TWO SEPARATE GROUND CONNECTIONS.
14. NEUTRAL POINT OF TRANSFORMER SECONDARY SHALL BE GROUNDED WITH TWO SEPARATE AND DISTINCT EARTH PIT. TRANSFORMER BODY SHALL BE GROUNDED BY TWO SEPARATE AND DIAGONALLY OPPOSITE CONNECTIONS TO MAIN GROUND GRID.
15. STATIC GROUND CONNECTIONS SHALL BE MADE ACROSS FLANGED JOINTS OF PIPELINES IDENTIFIED FOR STATIC CHARGE IN ALL AREAS.
16. DCS/PLC GROUND BUS BAR SHALL BE CONNECTED TO DCS GROUNDING ELECTRODE BY TWO SEPARATE PVC INSULATED COPPER CONDUCTORS.
17. ALL FLAME PROOF ELECTRICAL EQUIPMENT INCLUDING LIGHTING FIXTURES AND PUSH BUTTON STATION SHALL BE GROUNDED AT TWO POINTS.

NOTES

0	13.10.16	APPROVED	RKS	PR	KJ	SKH
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SUBJECT TYPICAL EARTHING INSTALLATION DETAILS

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NOTES

1. CONNECTION BETWEEN EARTH BUS IN MCC/SWITCHGEAR AND EARTH LEAD SHALL BE WITH MINIMUM TWO BOLTS.

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Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

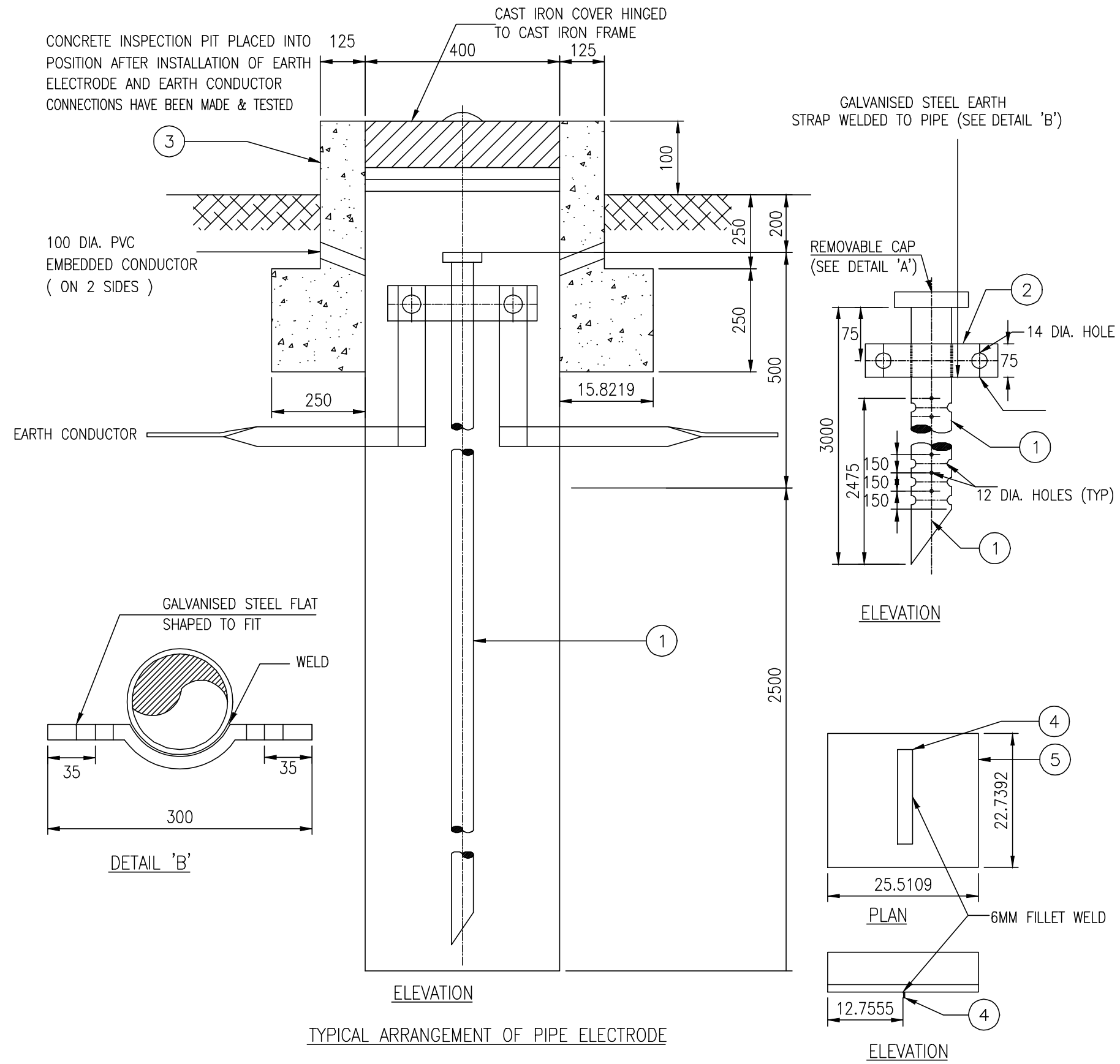
SUBJECT

TYPICAL EARTHING INSTALLATION DETAILS
M.C.C. & METAL CLAD SWITCHGEAR

Size	Scale	Sheet
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1. ALL DIMENSION AREA IN MILLIMETER (mm).
2. ALL STEEL WORK SHALL BE HOT DIP GALVANISED.
3. INSPECTION PITS SHALL BE INSTALLED FLASH WITH SURROUNDING GRADE WITHIN PAVED AREAS.
4. UNLESS OTHERWISE SPECIFIED, ALL THE MATERIALS ARE IN CONTRACTORS SCOPE OF SUPPLY.



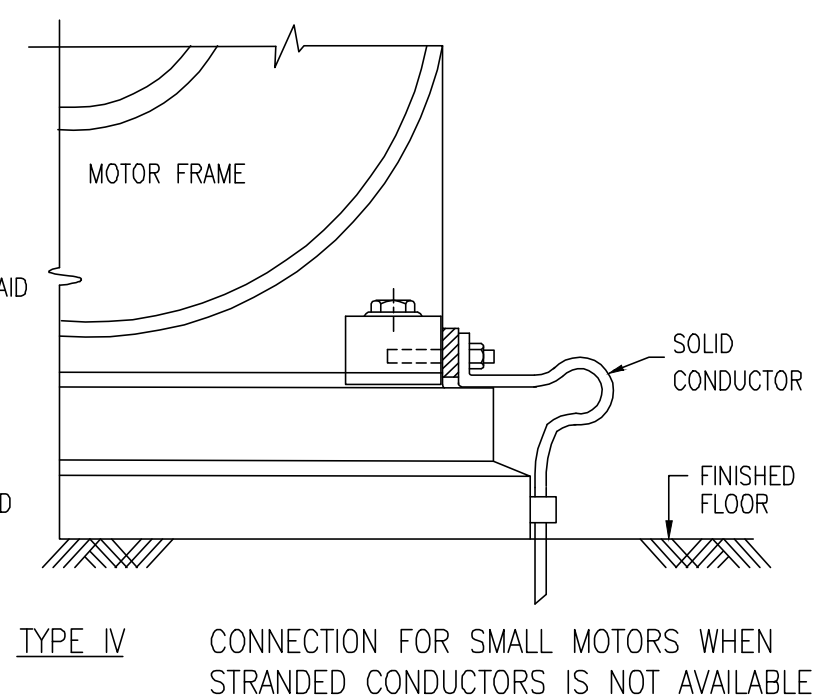
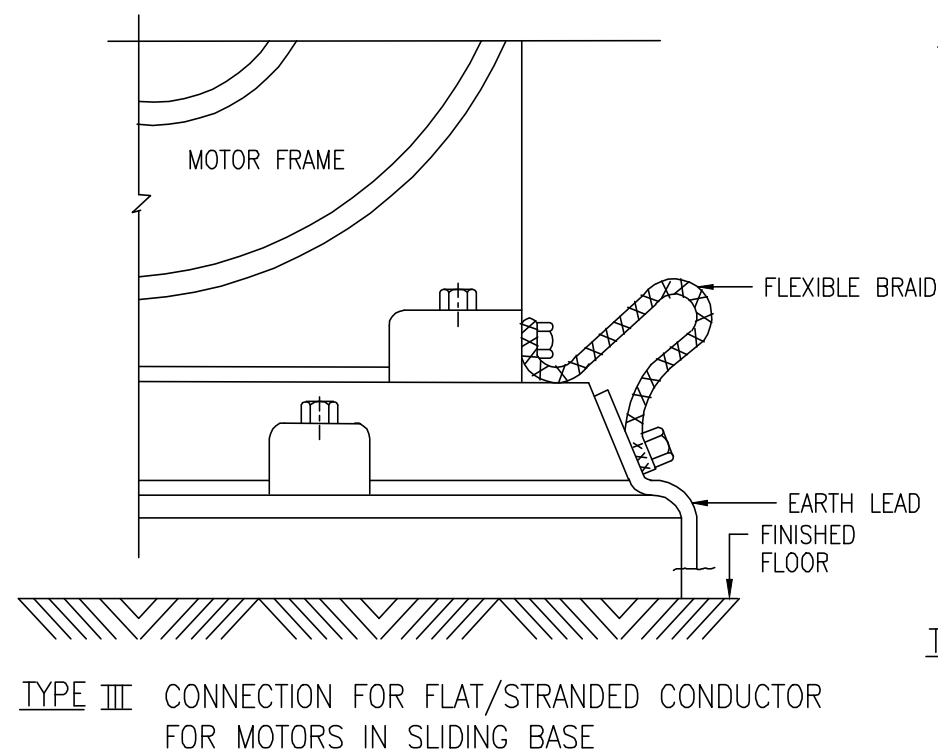
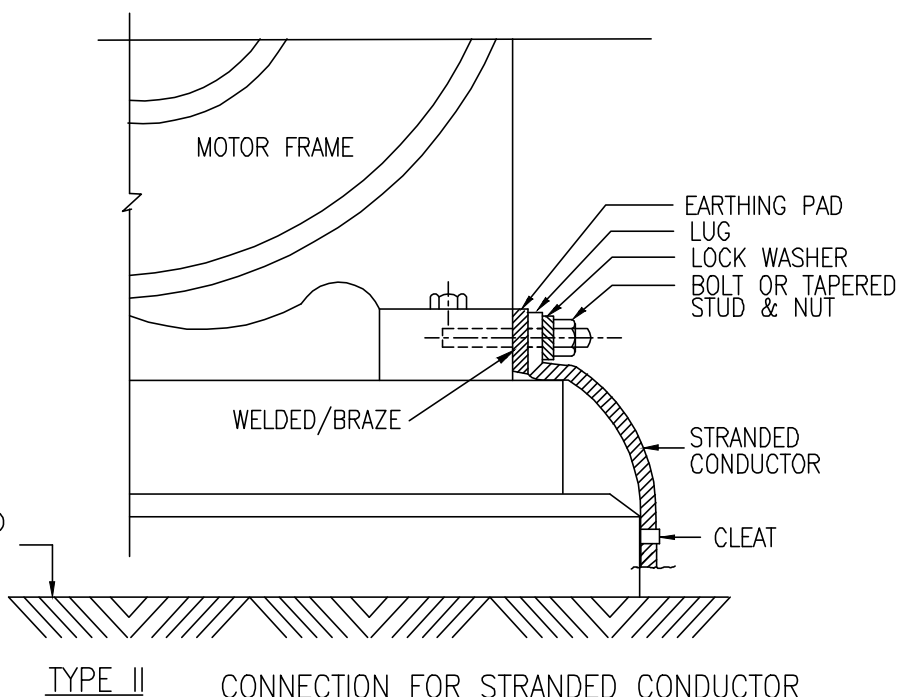
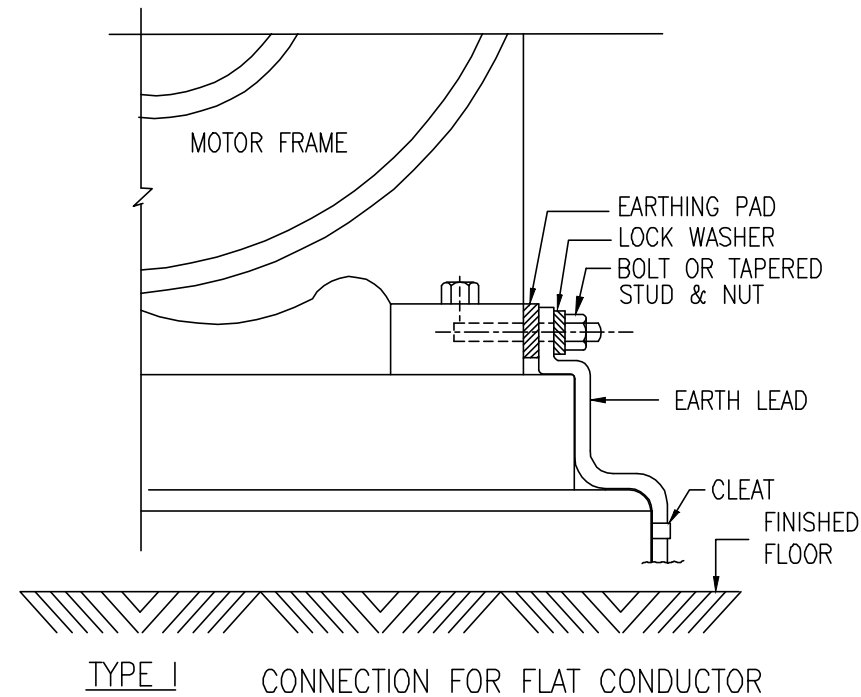
LEGEND

- ① 100mm DIAMETER MEDIUM DUTY GALVANISED STEEL PIPE (CLASS 'B')
- ② GALVANISED MS FLAT (DETAIL 'B')
- ③ CONCRETE INSPECTION COVER
- ④ 90x50x6 GALVANISED MS ANGLE (DETAIL 'A')
- ⑤ 130x130x6 GALVANISED MS PLATE (DETAIL 'A')

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SUBJECT	TYPICAL EARTHING INSTALLATION DETAILS PIPE/ROD ELECTRODE
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Size	Scale	Sheet
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NOTES

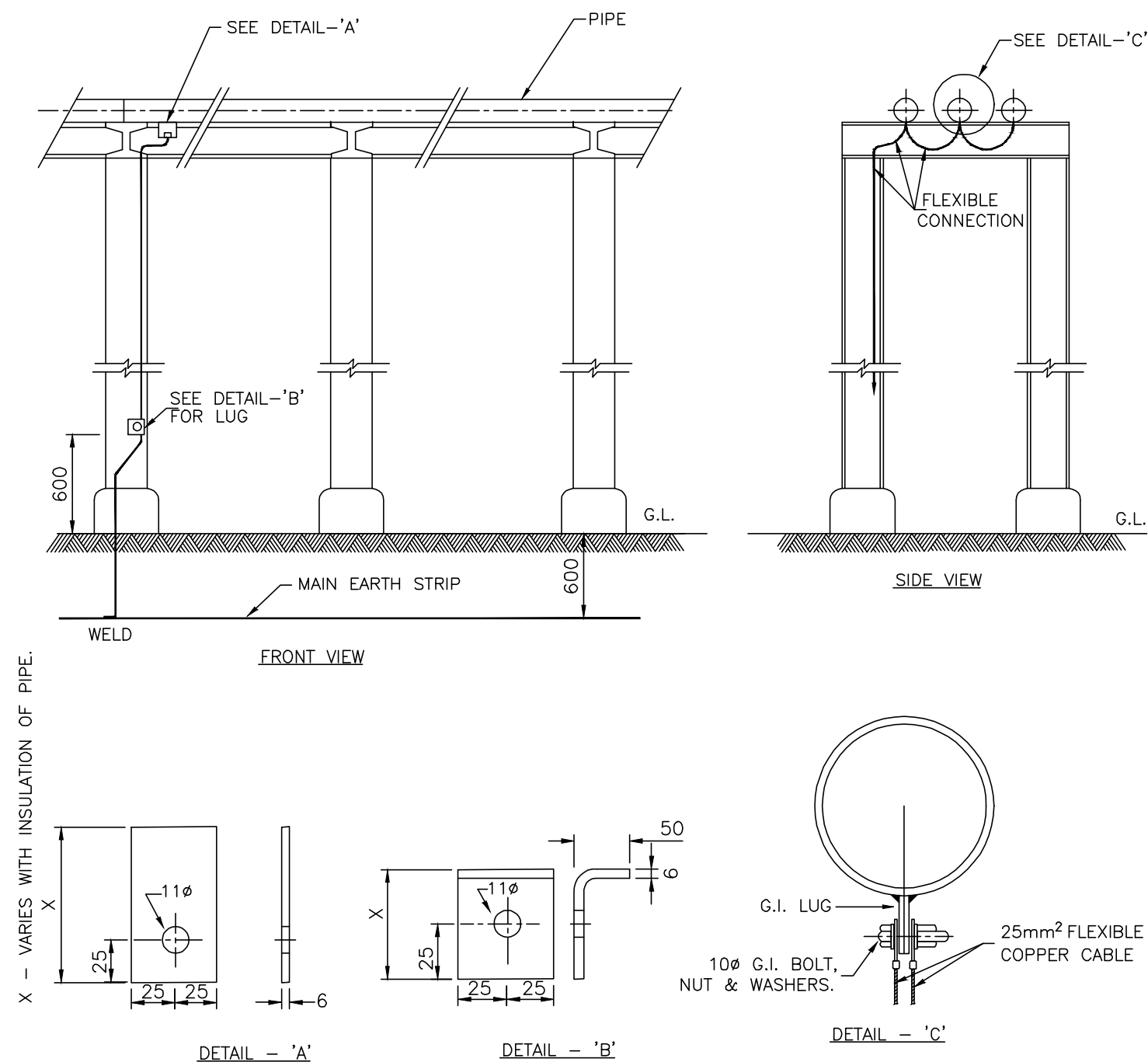
1. NUTS AND BOLTS SHALL BE AS PER IS: 1363(PART-1,2,3):1992/ IS 1367(PART-5):1980.
2. WASHERS SHALL BE AS PER IS 2016:1967.

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SUBJECT TYPICAL EARTHING INSTALLATION DETAILS
MOTOR FRAME EARTHING

Size Scale Sheet
A3 NTS 05 of 23
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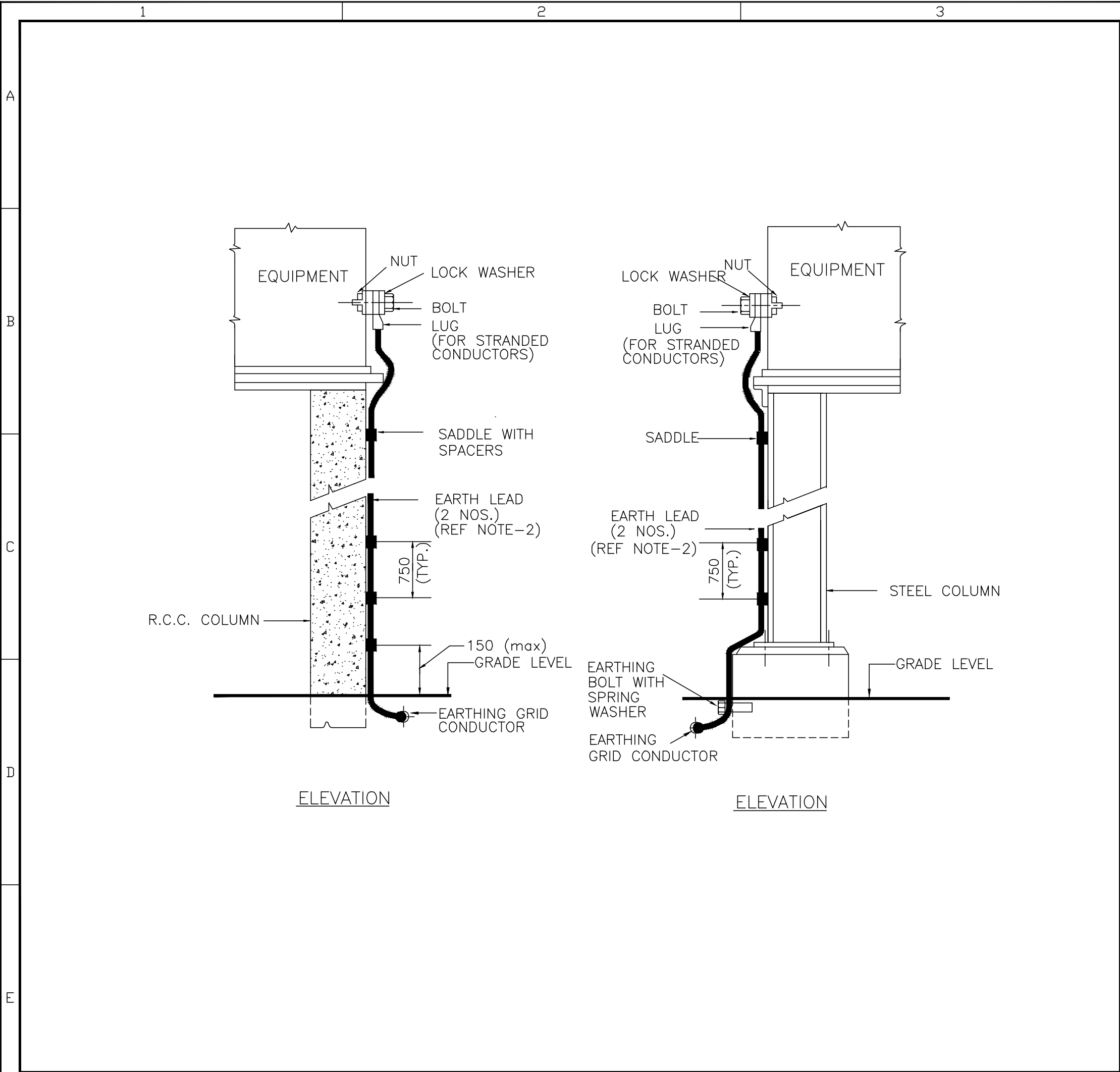
1. ALL DIMENSIONS ARE IN MM.
2. THE PIPE LINES SHALL BE BONDED AND EARTHED AT THE ENTRY AND EXIT POINTS OF BATTERY LIMIT UNLESS OTHERWISE SPECIFIED.
3. NUTS/BOLTS SHALL BE AS PER IS 1363(PART-1,2,3):1992/IS 1367(PART5):1980.
4. WASHERS SHALL BE AS PER IS 2016:1967.



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Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT	TYPICAL EARTHING INSTALLATION DETAILS EARTHING OF PIPES ON RACK
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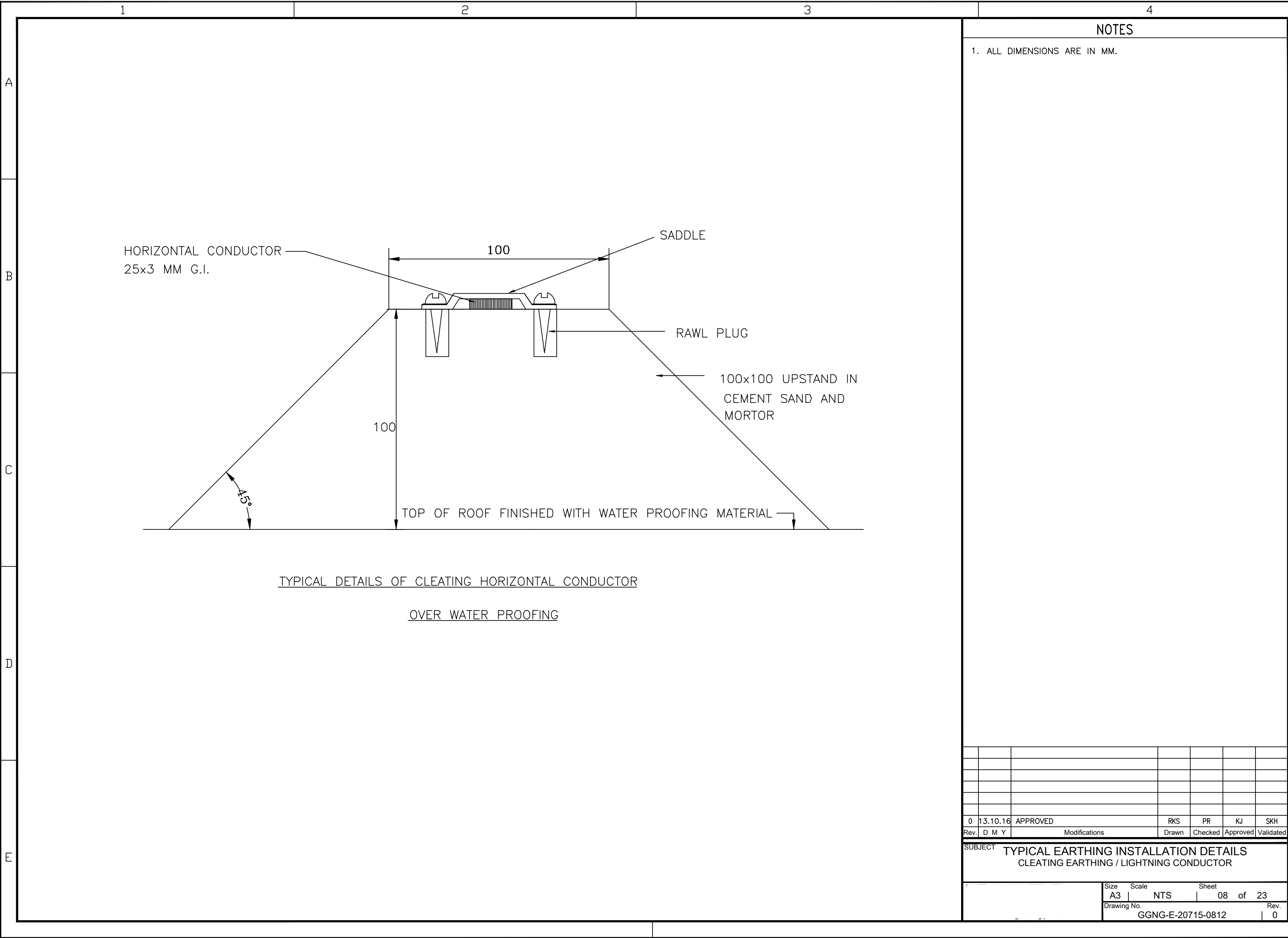
Size	Scale	Sheet
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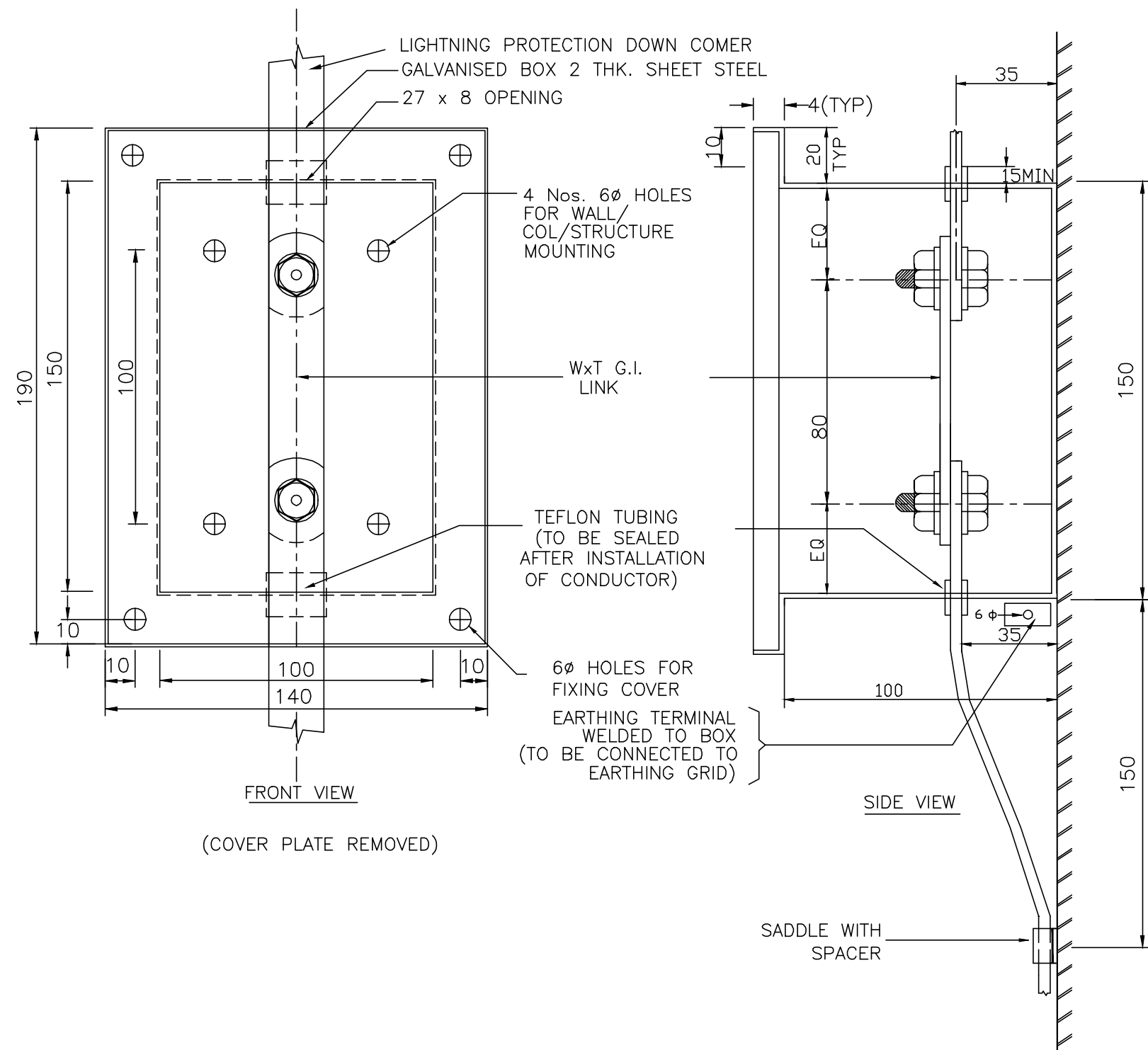
NOTES

1. ALL DIMENSIONS ARE IN MM.
2. THE EARTH LEADS FOR THE SAME EQUIPMENT SHALL BE LAID ON TWO DIFFERENT COLUMNS, HOWEVER, IF THE EQUIPMENT IS SUPPORTED ON ONLY ONE COLUMN THE LEADS TO BE RUN ON OPPOSITE FACES OF THE SAME.
3. IF FLAT CONDUCTOR IS USED THE SAME TO BE SUITABLY DRILLED FOR CONNECTION TO THE EQUIPMENT EARTHING TERMINAL STUD.
4. THE CONDUCTOR CAN ALTERNATIVELY BE WELDED TO STEEL STRUCTURE AT 1000MM INTERVAL.
5. THE CONNECTION BETWEEN CONDUCTOR AND LUG SHALL BE CRIMPED TYPE.
6. NUTS AND BOLTS SHALL BE AS PER IS: 1363(PART-1,2,3):1992/ IS 1367(PART-5):1980.
7. WASHERS SHALL BE AS PER IS 2016:1967.

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SUBJECT TYPICAL EARTHING INSTALLATION DETAILS EQUIPMENT ON R C C / STEEL COLUMN						
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NOTES

1. ALL DIMENSIONS ARE IN MM.
2. THE DOWN COMER ENTRY AND EXIT POINTS IN THE BOX TO BE MADE WATER TIGHT AFTER LAYING OF CONDUCTOR.
3. THE TEST LINK SHALL BE OF SAME WIDTH AND THICKNESS AS THE DOWN COMER. THE NUTS BOLTS AND WASHERS TO BE OF G.I.
4. NUTS AND BOLTS SHALL BE AS PER IS: 1363(PART-1,2,3):1992/ IS 1367(PART-5):1980.
5. WASHERS SHALL BE AS PER IS 2016:1967.

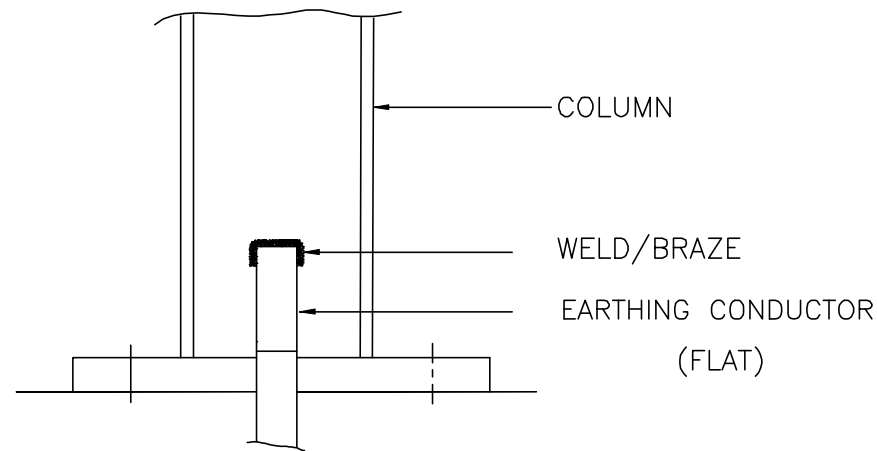
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Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT TYPICAL EARTHING INSTALLATION DETAILS
LIGHTNING PROTECTION DOWN COMER TEST LINK

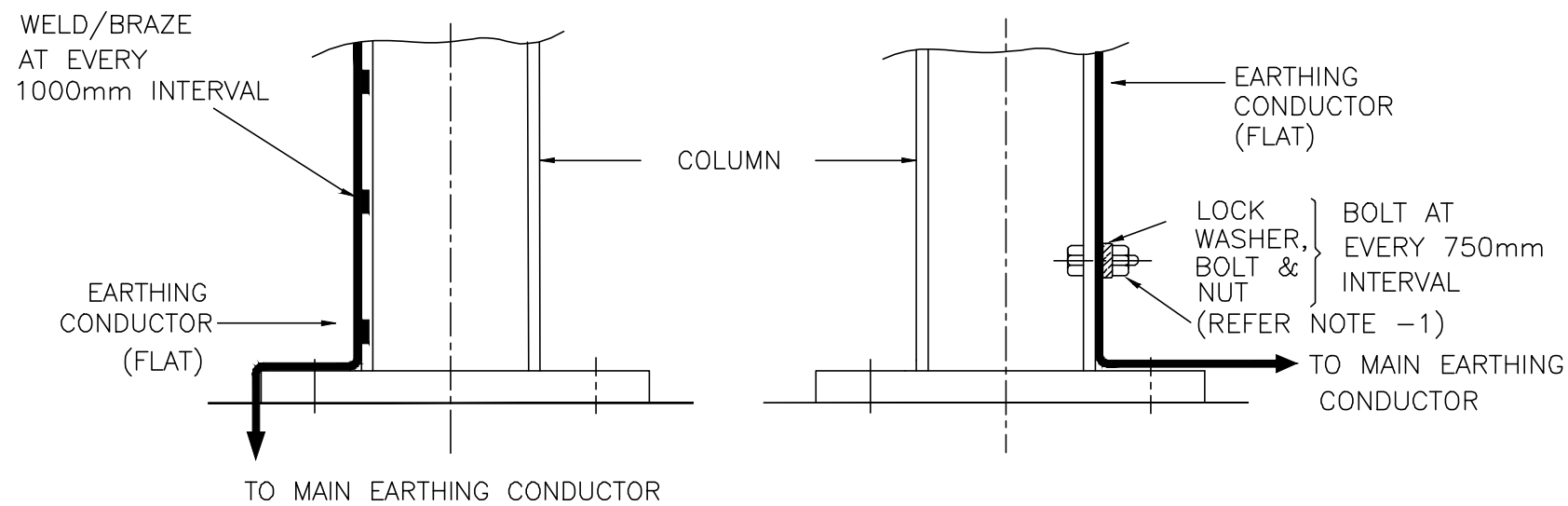
Size	Scale	Sheet
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NOTES

1. IT IS PREFERABLE TO HAVE A RUN ON WEB SO THAT PROJECTIONS OF NUT/BOLTS ARE AVOIDED.
2. NUTS AND BOLTS SHALL BE AS PER IS: 1363(PART-1,2,3):1992/ IS 1367(PART-5):1980.
3. WASHERS SHALL BE AS PER IS 2016:1967.



(i) STEEL COLUMN EARTHING



(ii) FLAT EARTHING CONDUCTOR RUNNING ALONG STEEL COLUMN

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SUBJECT TYPICAL EARTHING INSTALLATION DETAILS
EARTHING DETAILS STEEL COLUMNS

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1. ALL DIMENSIONS ARE IN MM.
2. LUG DIMENSIONS TO SUIT VARIOUS CONDUCTOR SIZES USED.
3. FIELD TO ENCASE BUS IN BOX WHEN IN CORROSIVE ATMOSPHERE.
4. NUTS AND BOLTS SHALL BE AS PER IS: 1363(PART-1,2,3):1992/ IS 1367(PART-5):1980.
5. WASHERS SHALL BE AS PER IS 2016:1967.



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1

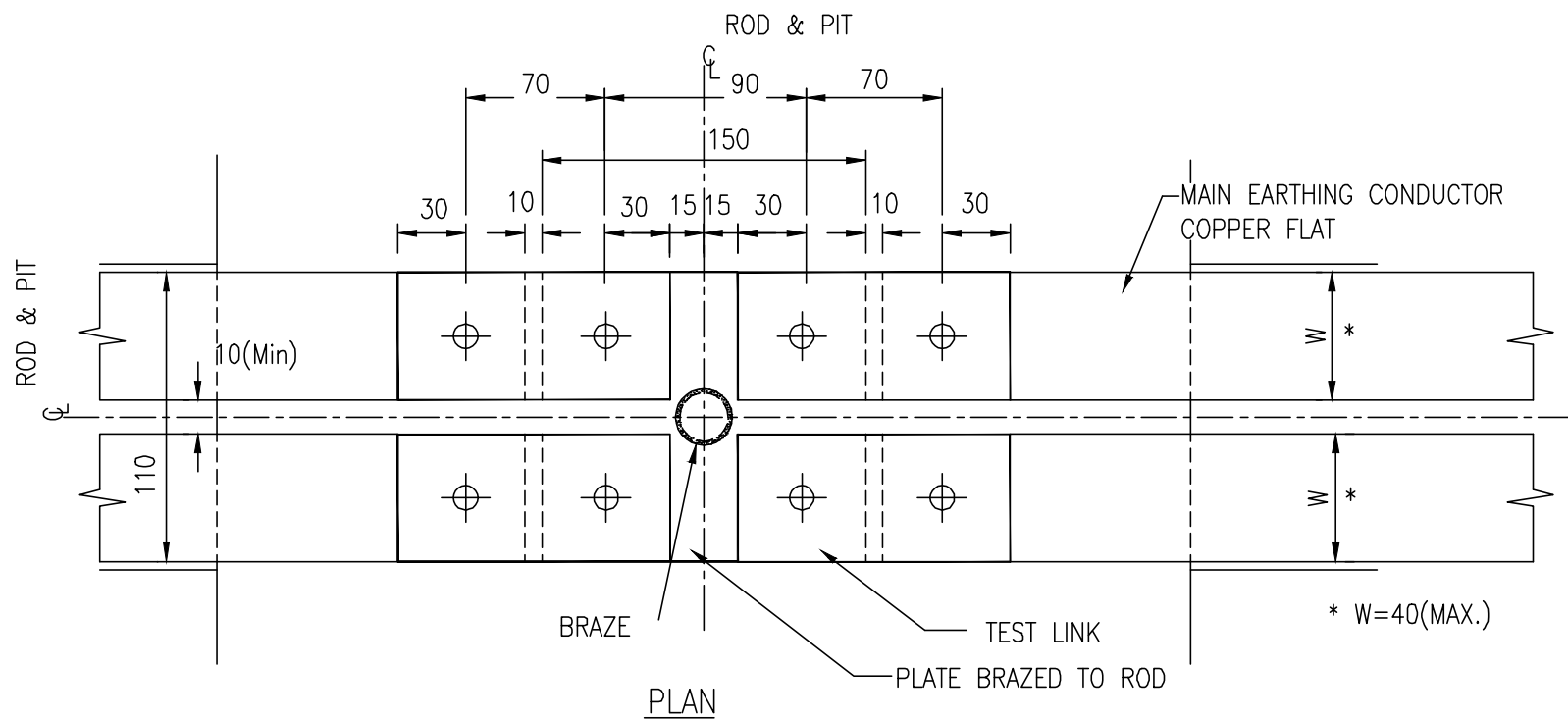
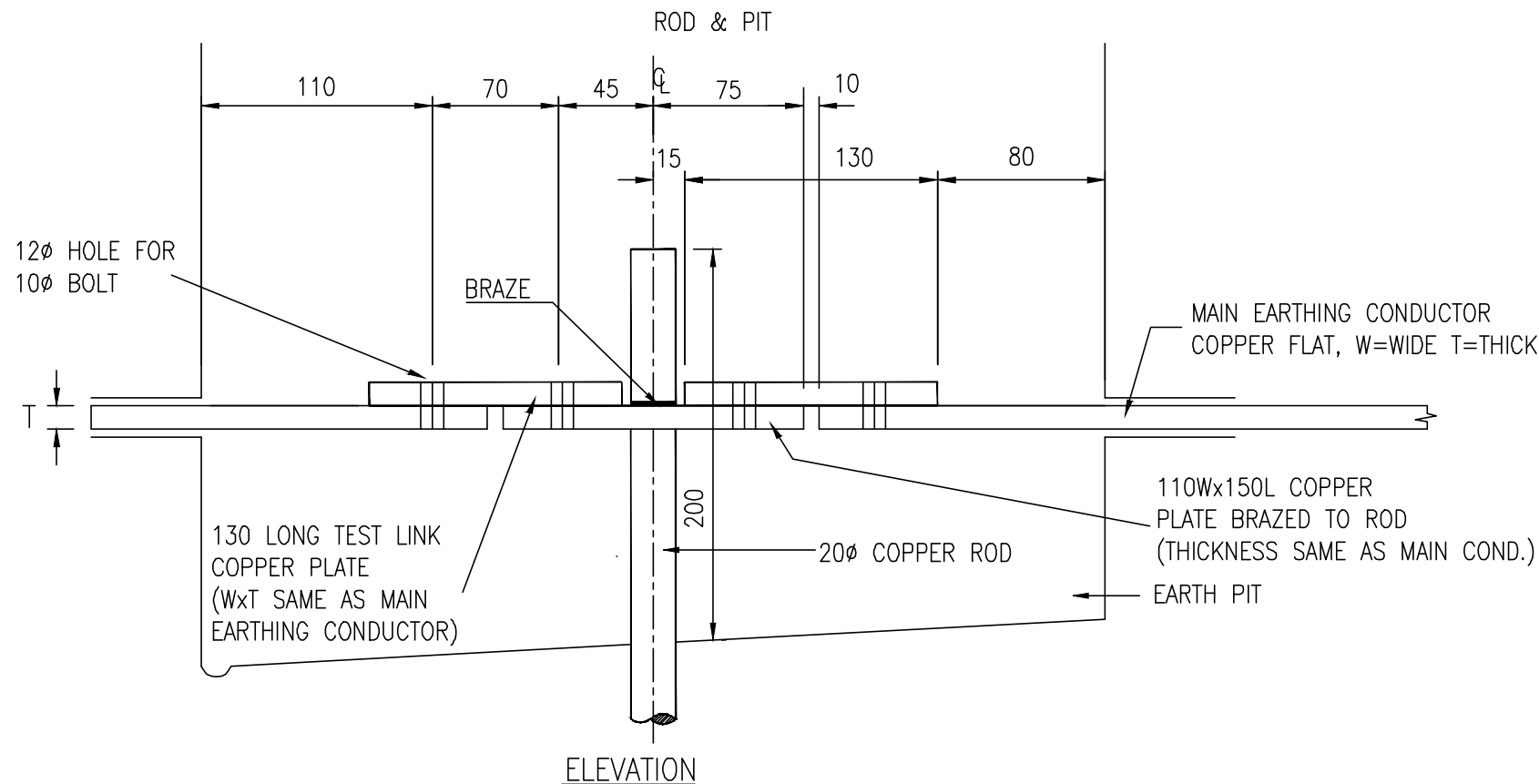
2

3

4

NOTES

1. ALL DIMENSIONS ARE IN MM.
2. ALL NUTS, BOLTS & WASHERS SHALL BE OF HIGH SILICON BRONZE ALLOY.
3. EXCEPT DIMENSIONS OF MAIN EARTHING CONDUCTOR, ALL OTHER DIMENSIONS SHALL REMAIN FIRM.
4. THE ARRANGEMENT IS TYPICAL FOR CONNECTING FOUR CONDUCTORS ON COPPER ROD ELECTRODE. ACTUAL NO. OF CONNECTIONS TO BE DECIDED AT SITE.
5. NUTS AND BOLTS SHALL BE AS PER IS: 1363(PART-1,2,3):1992/ IS 1367(PART-5):1980.
6. WASHERS SHALL BE AS PER IS 2016:1967.



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SUBJECT TYPICAL EARTHING INSTALLATION DETAILS
ROD ELECTRODE CONNECTION DETAILS (FLAT CONDUCTOR)

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1

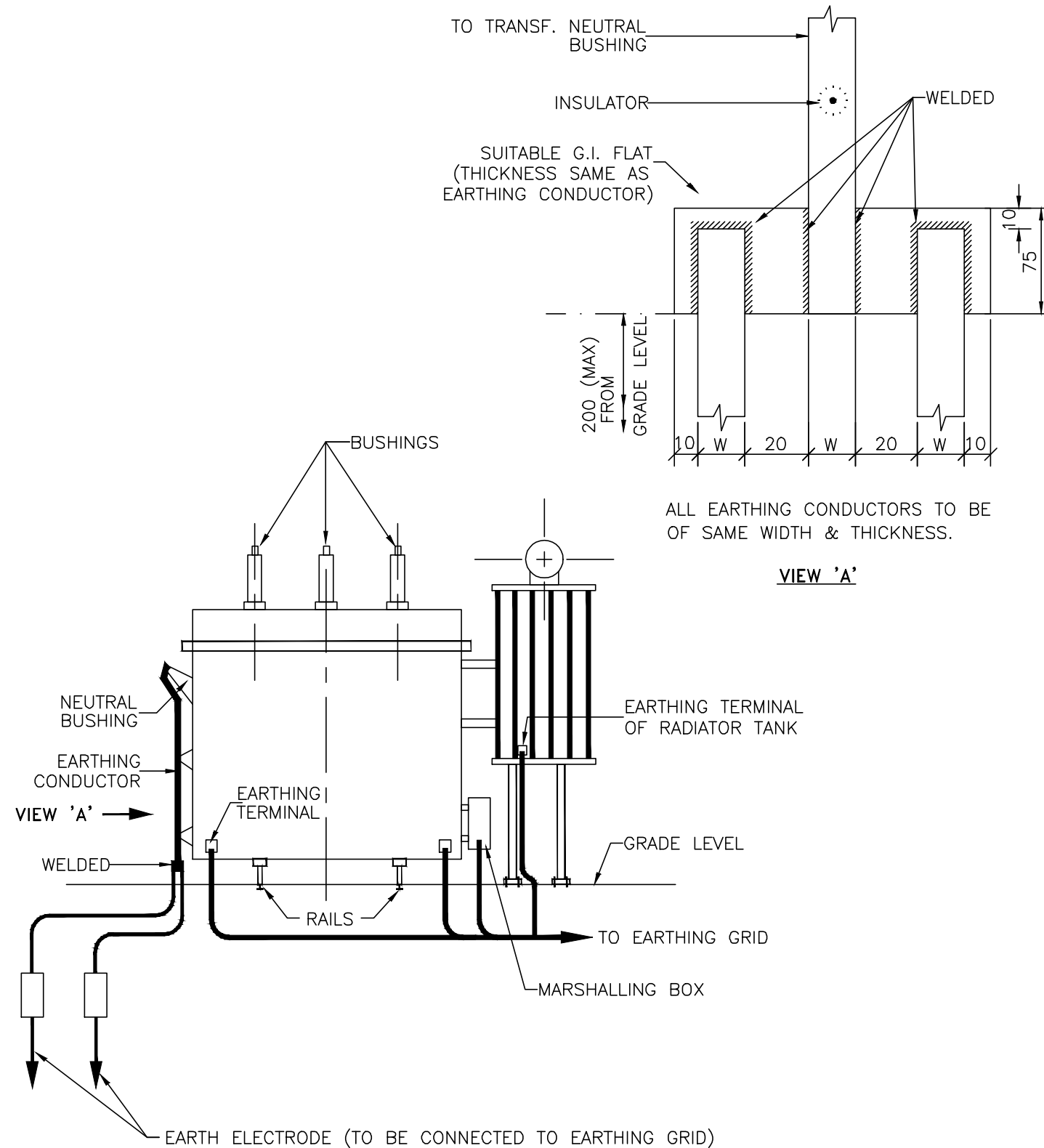
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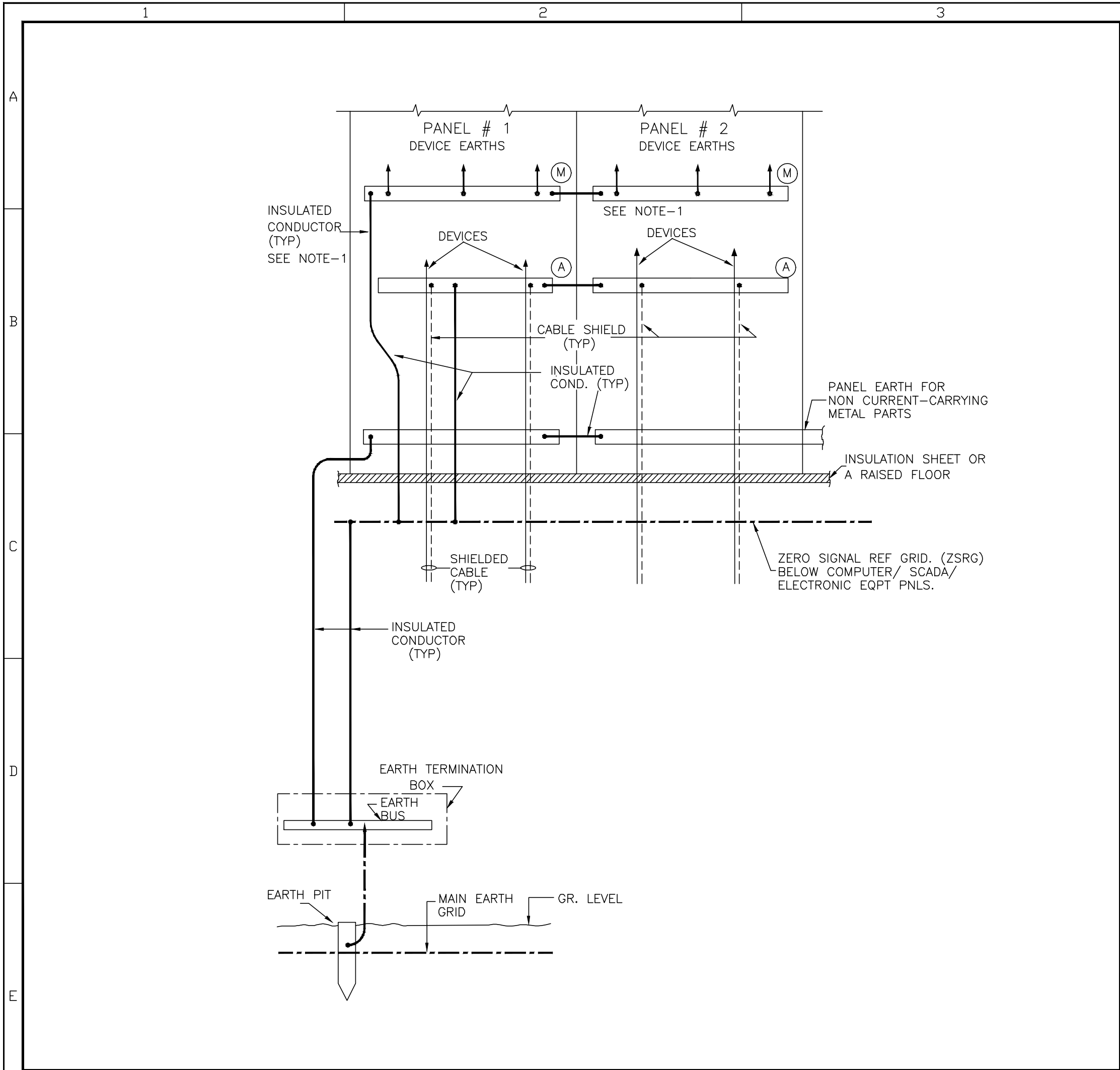
1. ALL DIMENSIONS ARE IN MM.
2. WELDING SHALL BE DONE AS PER IS 816:1969.
3. THE TRANSFORMER NEUTRAL SHALL BE CONNECTED TO TWO ELECTRODES LOCATED APPROX 6M APART IN EARTH TEST PIT. THE CONNECTION BETWEEN TRANSFORMER NEUTRAL AND EACH ELECTRODE SHALL BE MADE BY SEPARATE CONDUCTORS.



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SUBJECT TYPICAL EARTHING INSTALLATION DETAILS
TRANSFORMER EARTHING

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NOTES

- 1 EARTH BUSES Ⓐ & Ⓜ MAY BE COMBINED INTO ONE BUS IF TWO SEPARATE BUSES ARE NOT SPECIFIED BY VENDORS
- 2 IF ZSRG IS NOT PROVIDED THE Ⓐ & Ⓜ BUSES ARE BROUGHT BY INSULATED CONDUCTORS TO THE EARTHBUS IN THE EARTH TERMINATION BOX. ONLY ONE EARTHING CONNECTION SHOULD BE PROVIDED FROM THIS EARTH BUS TO EARTH PIT PROVIDED IN THE MAIN EARTHING GRID.

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SUBJECT TYPICAL EARTHING INSTALLATION DETAILS COMPUTER/INSTRUMENTATION EQUIPMENT						
			Size	Scale	Sheet	
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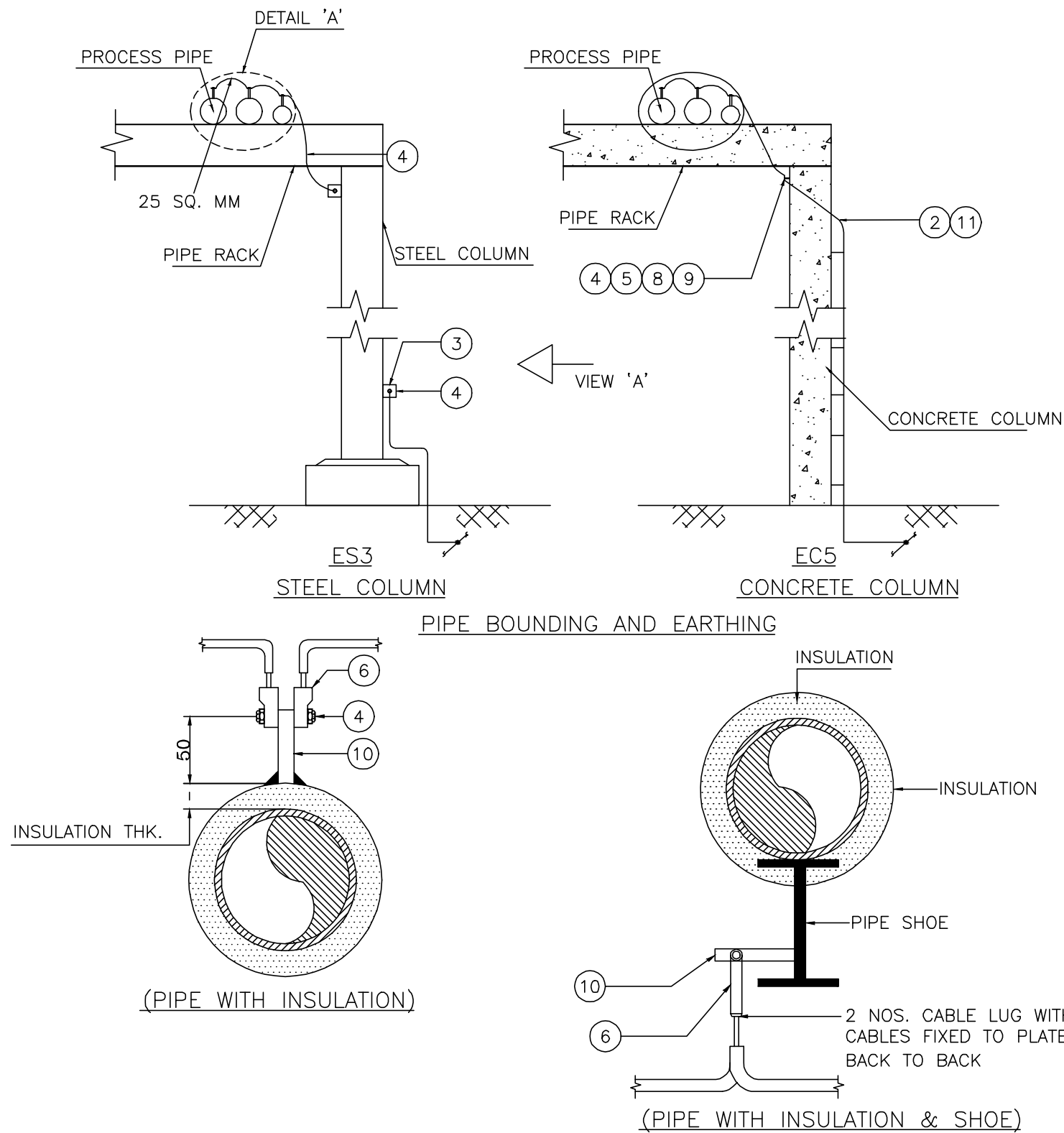
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NOTES

1. ALL DIMENSION INDICATED ARE IN MM UNLESS OTHERWISE SPECIFIED

LEGEND

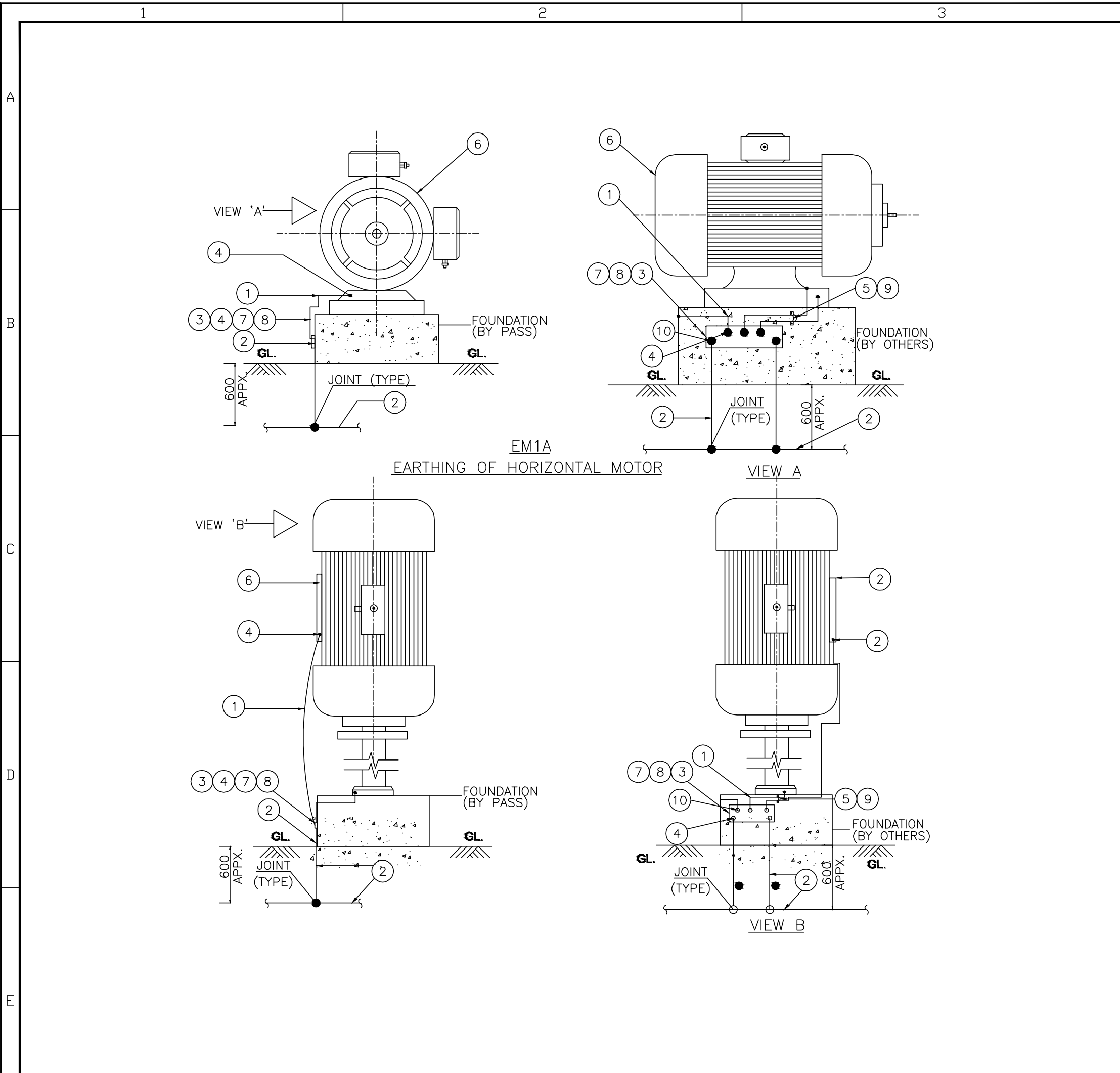
- ① EARTHING STRIP GI
② SADDLE WITH CLAMP (HOT DIP GALV.)
③ EARTHING LUG (100x75x5mm THK.)
④ NUT, BOLT & SPRING WASHER
⑤ EARTH BUS 75x10mm, 400mm LONG
⑥ TERMINAL LUG (25 SQ.MM)
⑦ EARTHING CONDUCTOR (25AQ.MM)
⑧ 12mm DIA. SPACING PIPE(50mm LONG)
⑨ ANCHOR BOLT M8x100mm LONG WITH NUT WASHER & SPRING WASHER
⑩ 50 X 8 G.I STRIP WITH 1 NO. 10 DIA HOLE, LENGHT TO SUIT INSULATION
⑪ EXPANSION ANCHOR BOLT WITH FLATE WASHER (M6x40mm)



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SUBJECT TYPICAL EARTHING INSTALLATION DETAILS
EQUIPMENT ON R C C / STEEL COLUMN

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NOTES

1. ALL DIMENSION INDICATED ARE IN MM UNLESS OTHERWISE SPECIFIED.

LEGEND

- ① EARTHING CONDUCTOR
- ② EARTHING STRIP
- ③ EARTH BUS
- ④ TERMINAL LUG WITH NUT , BOLT & SPRING WASHER
- ⑤ SADDLE WITH CLAMP
- ⑥ MOTOR
- ⑦ 12mm DIA. SPACING PIPE (50mm LONG)
- ⑧ ANCHOR BOLT DIA 8mm, 100mm LONG WITH NUT,SPRNG WASHER & PLAIN WASHER
- ⑨ EXPANSION ANCHOR NBOLT WITH FLATWASHER (M6x40mm)
- ⑩ NUT, BOLT & SPRING WASHER (M8)

0	13.10.16	APPROVED	RKS	PR	KJ	SKH
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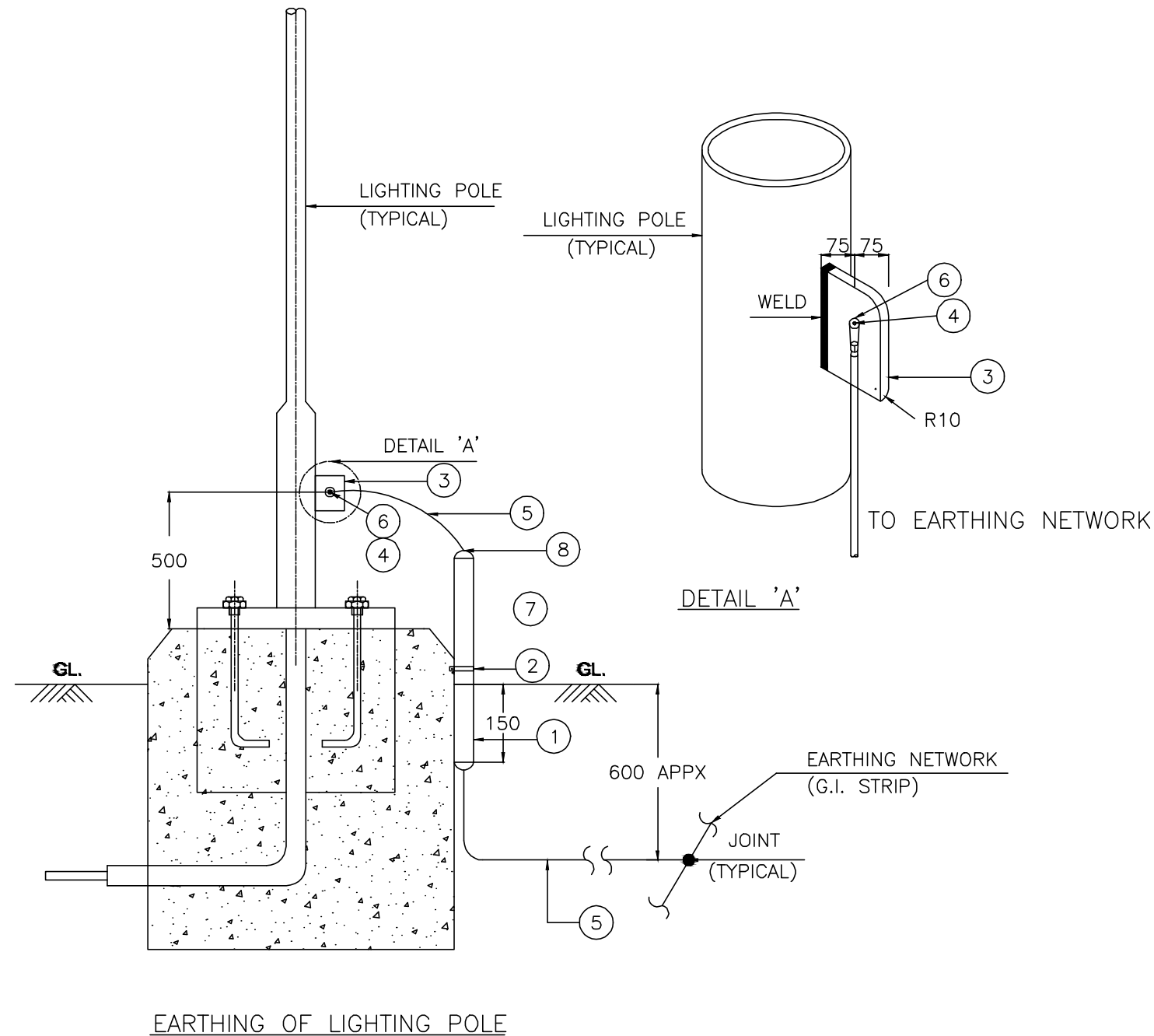
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EARTHING OF HORIZONTAL MOTOR

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1. ALL DIMENSION INDICATED ARE IN MM UNLESS OTHERWISE SPECIFIED.

LEGEND

- ① CONDUIT (GI)
- ② CONDUIT CLAMP (HOT DIP GALV)
- ③ EARTHING LUG (100x75x5mm THK)
- ④ NUT, BOLT & SPRING WASHER (M8)
- ⑤ EARTHING CONDUCTOR (25 sq.mm)
- ⑥ TERMINAL LUG (25 sq.mm)
- ⑦ EXPANSION ANCHOR BOLT WITH FLATEWASHER (M6x400mm)
- ⑧ SEALING MATERIAL



0	13.10.16	APPROVED		RKS	PR	KJ	SKH
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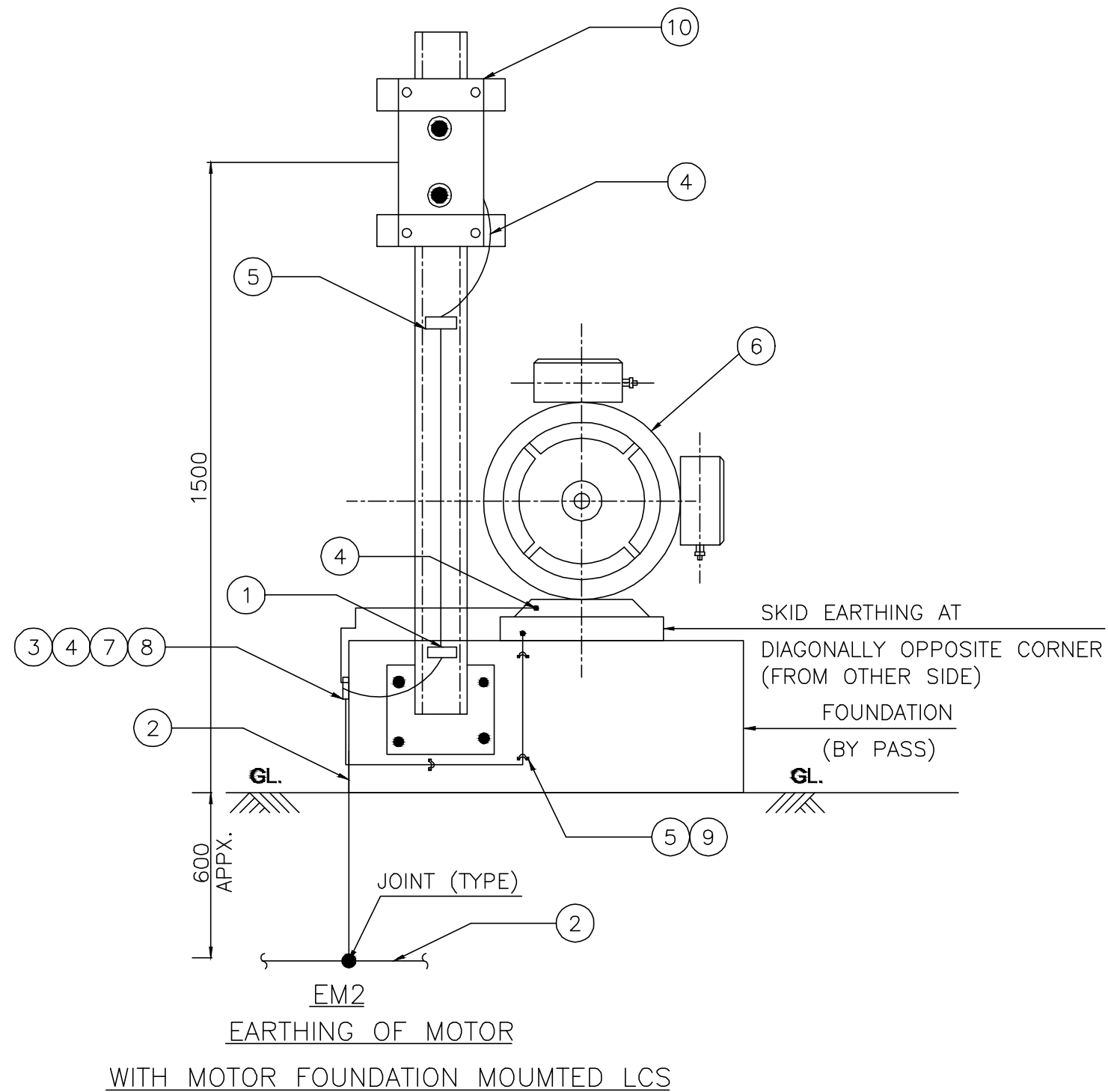
SUBJECT	TYPICAL EARTHING INSTALLATION DETAILS STANDARD EARTHING DETAILS FOR LIGHTING POLE
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Size	Scale	Sheet
A3	NTS	17 of 23
Drawing No.		Rev.
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1. ALL DIMENSION INDICATED ARE IN MM UNLESS OTHERWISE SPECIFIED.

LEGEND

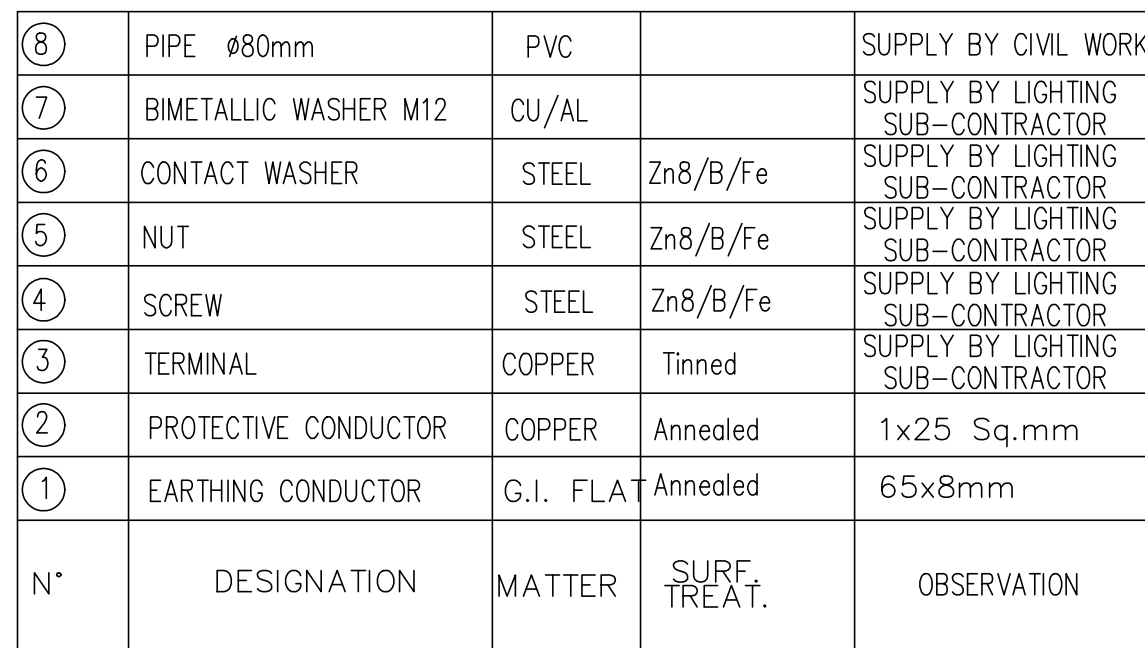
- ① EARTHING CONDUCTOR
- ② EARTHING STRIP GI
- ③ EARTH BUS GI
- ④ TERMINAL LUG WITH NUT , BOLT & SPRING WASHER
- ⑤ SADDLE WITH CLAMP
- ⑥ MOTOR
- ⑦ 12mm DIA. SPACING PIPE (50mm LONG)
- ⑧ ANCHOR BOLT DIA 8mm, 100mm LONG WITH NUT,SPRING WASHER & PLAIN WASHER
- ⑨ EXPANSION ANCHOR NBOLT WITH FLATWASHER (M6x40mm)
- ⑩ LOCAL CONTROL STATION



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SUBJECT TYPICAL EARTHING INSTALLATION DETAILS
EARTHING OF MOTOR WITH MOTOR FOUNDATION MOUNTED LCS

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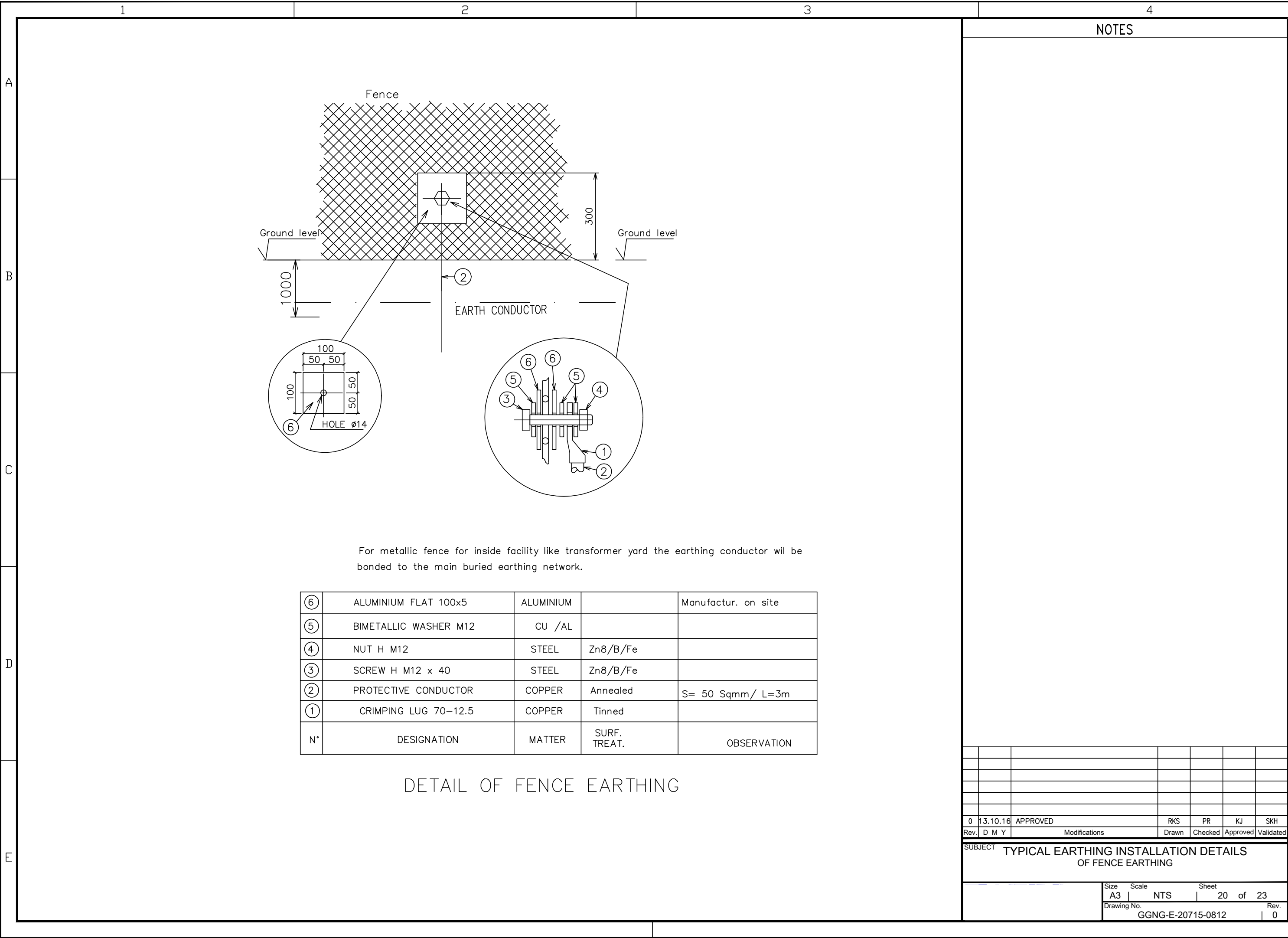


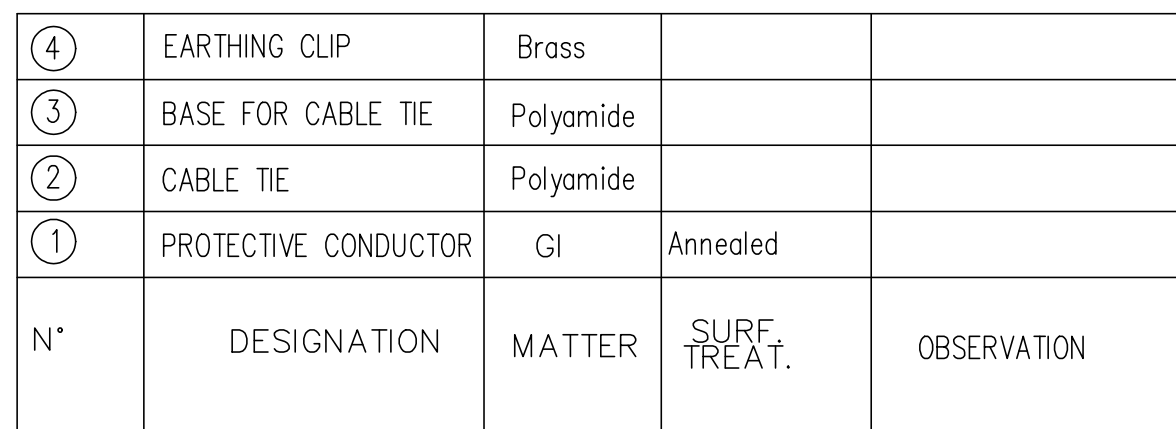
TYPICAL DETAIL OF LIGHTING MAST EARTHING

0	13.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

SUBJECT	TYPICAL EARTHING INSTALLATION DETAILS LIGHTING MAST EARTHING
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Size	Scale	Sheet
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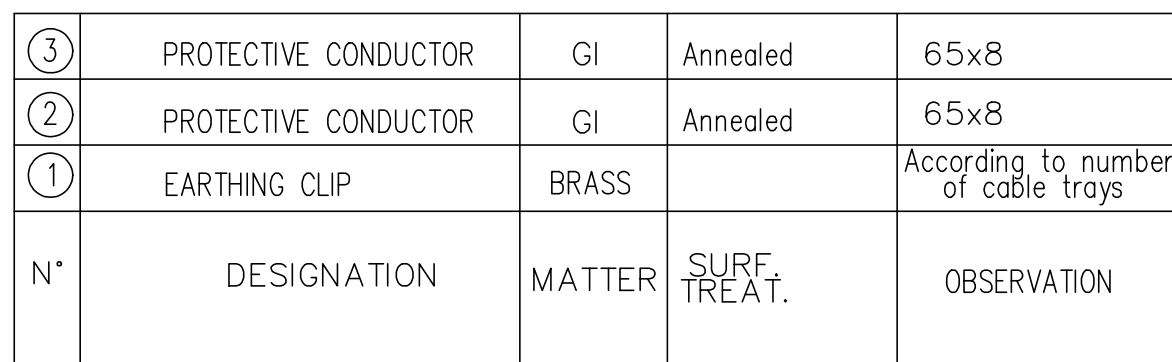


TYPICAL DETAIL OF SINGLE ROW CABLE TRAY EARTHING

0	13.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

SUBJECT	TYPICAL EARTHING INSTALLATION DETAILS OF CABLE TRAY EARTHING
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TYPICAL DETAIL OF MULTIPLE ROW CABLE TRAY EARTHING

0	13.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

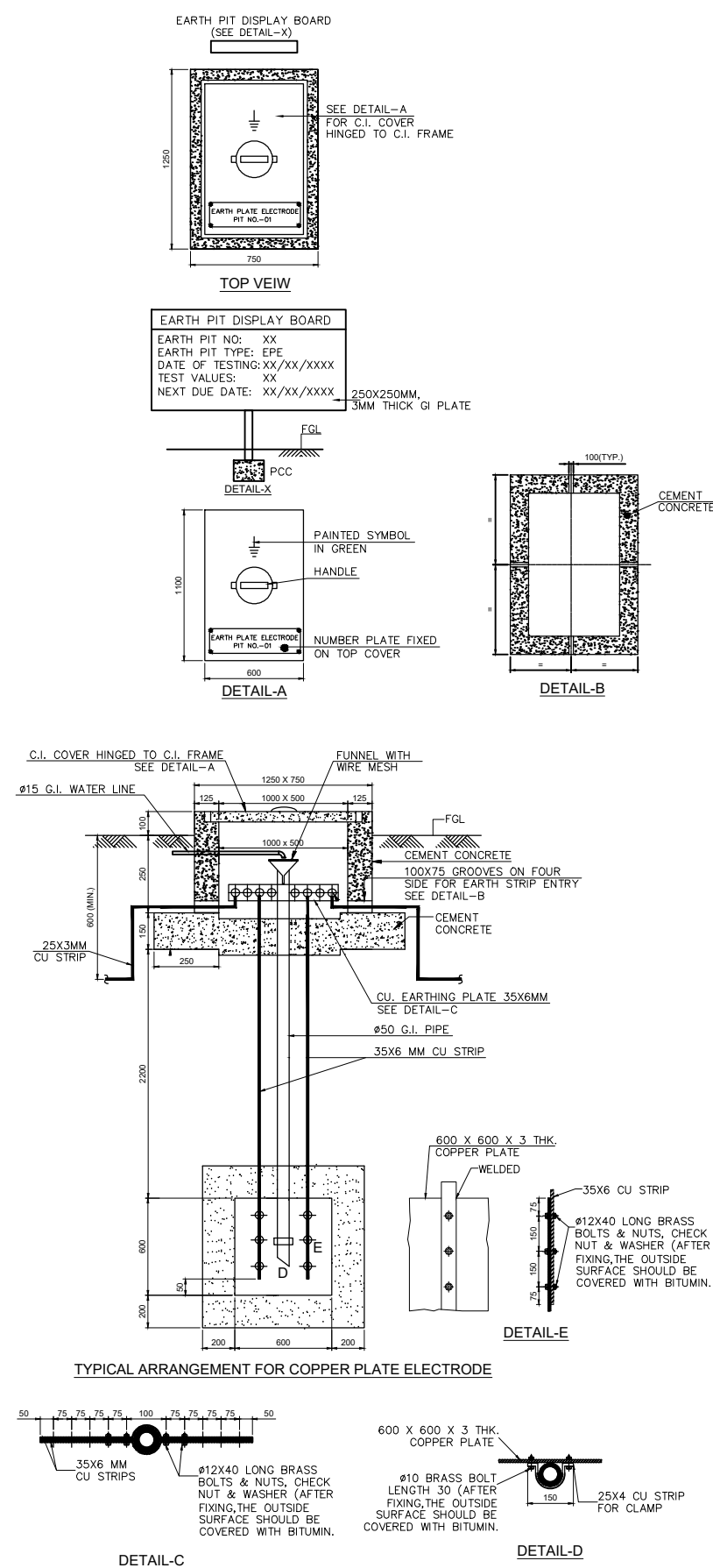
SUBJECT	TYPICAL EARTHING INSTALLATION DETAILS OF MULTIPLE ROW CABLE TRAY EARTHING
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1	Size	Scale	Sheet	
	A3	NTS	22	of 23
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A	Bonding jumper			NOTES																																																																																
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<table><tr><td>6</td><td>CRIMPING LUG 50-12</td><td>COPPER</td><td>Tinned</td><td>S= 50 Sqmm</td></tr><tr><td>5</td><td>BIMETALLIC PLATE</td><td>CU/AL</td><td></td><td></td></tr><tr><td>4</td><td>BIMETALLIC WASHER M12</td><td>CU/AL</td><td></td><td></td></tr><tr><td>3</td><td>SCREW H M12-40</td><td>STEEL</td><td>Zn8/ B/ Fe</td><td></td></tr><tr><td>2</td><td>NUT H M12</td><td>STEEL</td><td>Zn8/ B/ Fe</td><td></td></tr><tr><td>1</td><td>PROTECTIVE CONDUCTOR</td><td>COPPER</td><td>Annealed</td><td>S=50 Sqmm</td></tr><tr><td>N°</td><td>DESIGNATION</td><td>MATTER</td><td>SURF. TREAT.</td><td>OBSERVATION</td></tr></table>					6	CRIMPING LUG 50-12	COPPER	Tinned	S= 50 Sqmm	5	BIMETALLIC PLATE	CU/AL			4	BIMETALLIC WASHER M12	CU/AL			3	SCREW H M12-40	STEEL	Zn8/ B/ Fe		2	NUT H M12	STEEL	Zn8/ B/ Fe		1	PROTECTIVE CONDUCTOR	COPPER	Annealed	S=50 Sqmm	N°	DESIGNATION	MATTER	SURF. TREAT.	OBSERVATION																																													
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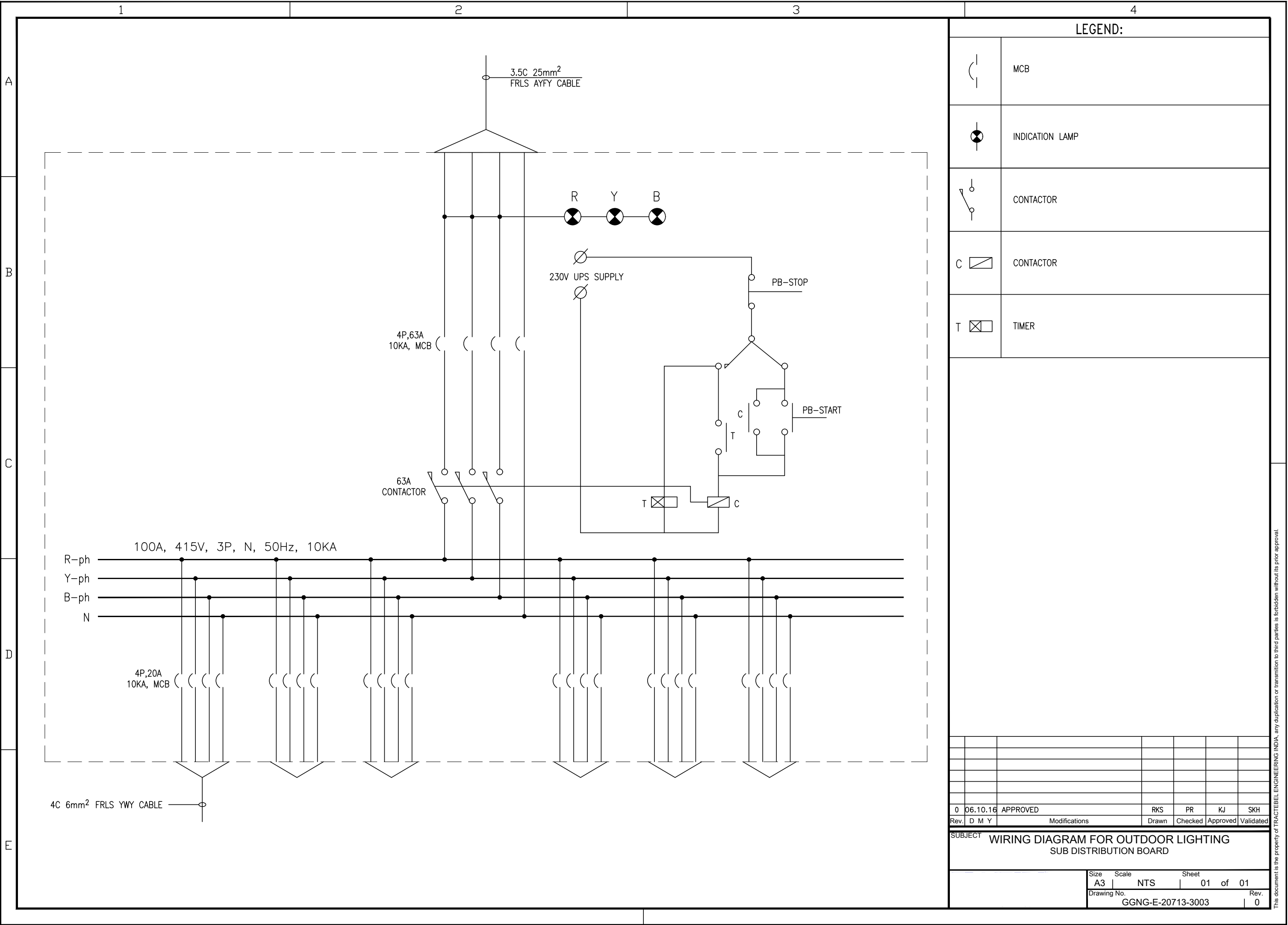
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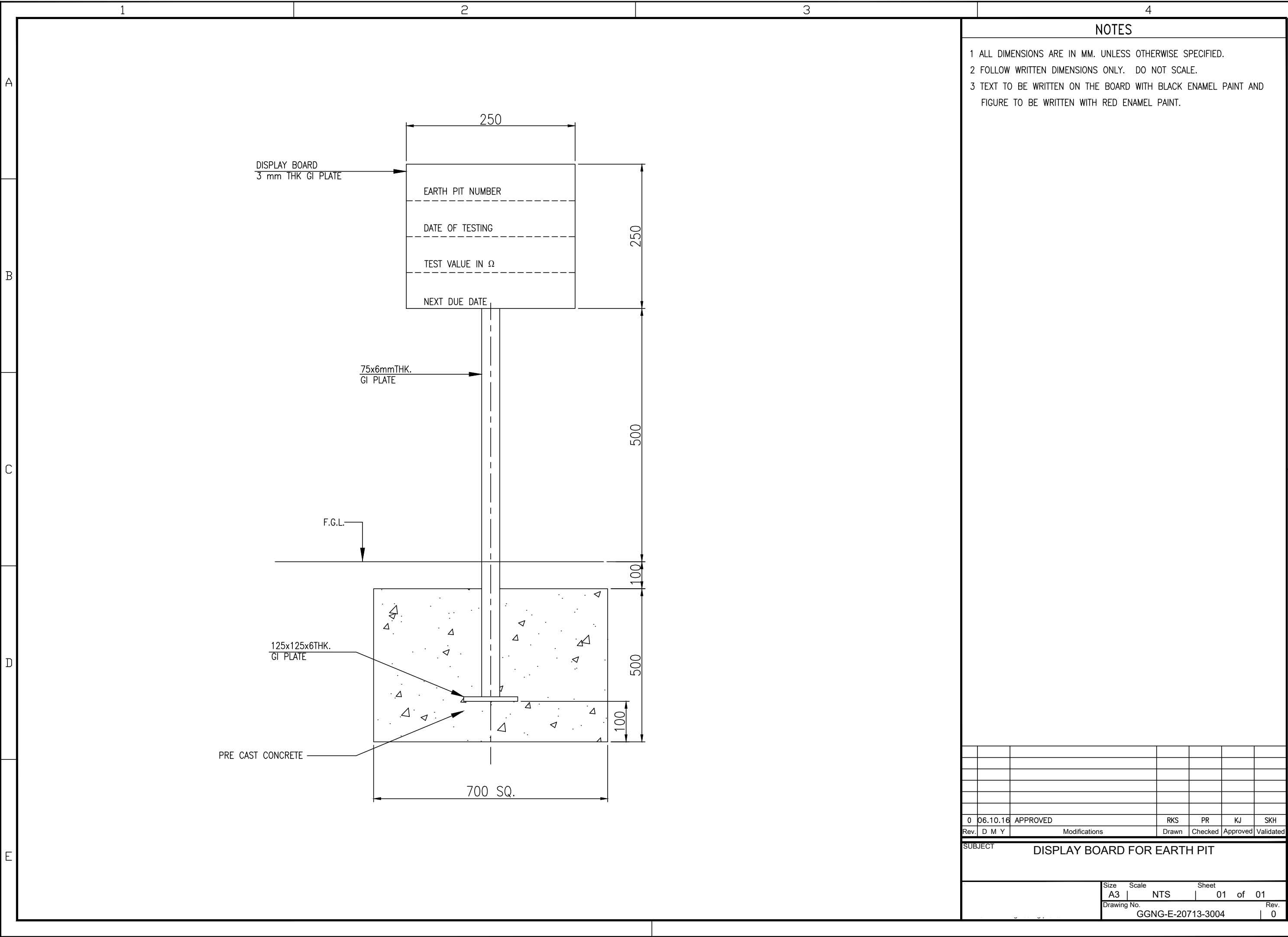
- 1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
- 2 FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3. THE PIPE ASSEMBLY SHALL BE HOT DIP GALVANISED AFTER FABRICATION.



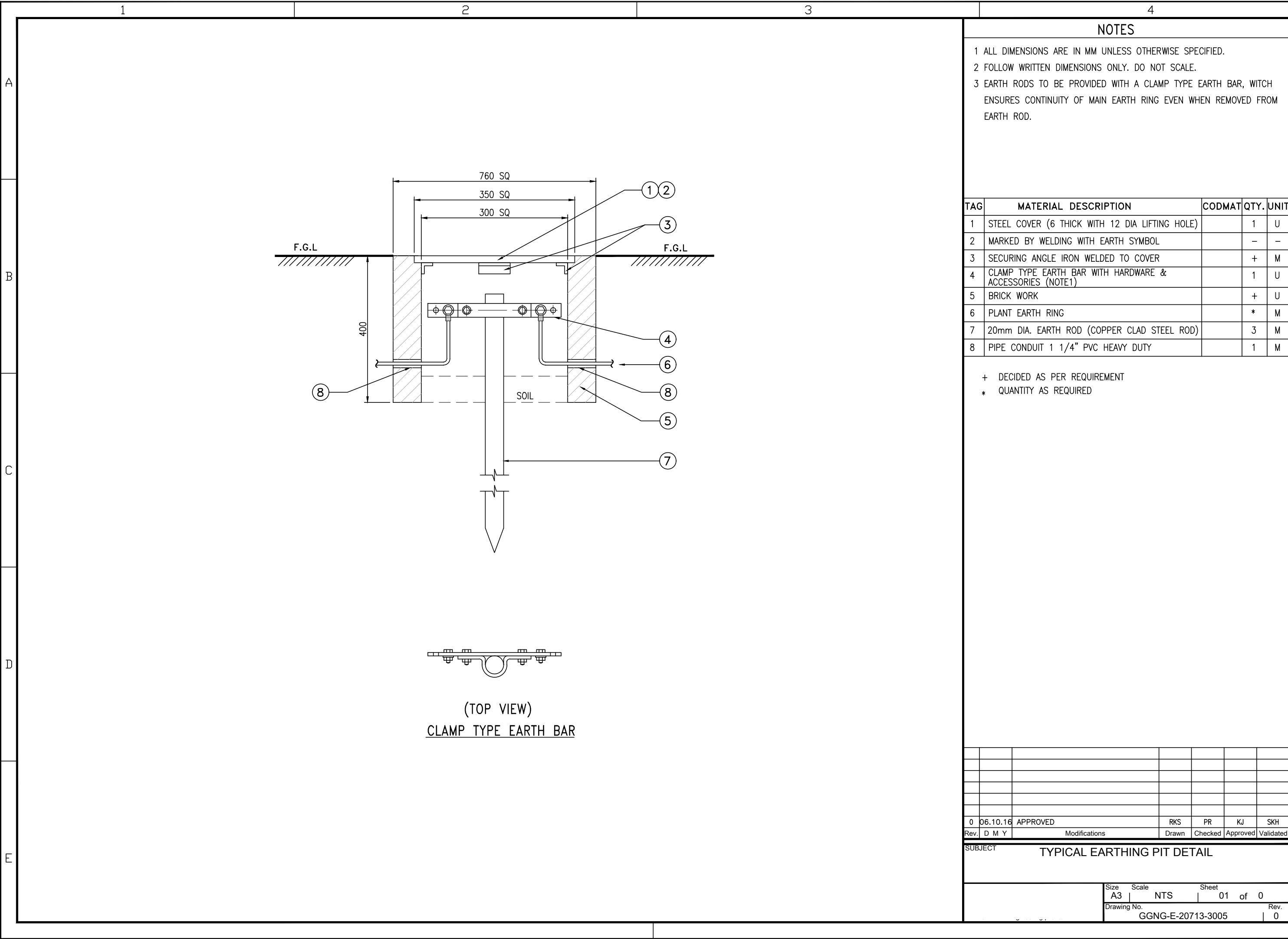
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SUBJECT				
TYPICAL EARTH PIT DETAILS				
	Size	Scale	Sheet	
	A3	NTS	01	of 01
	Drawing No.			Rev.
	GGNG-E-20713-3001			0

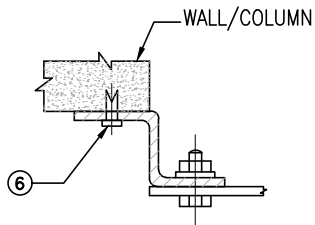
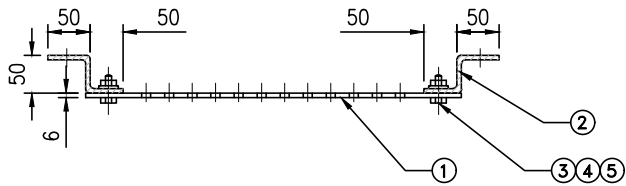
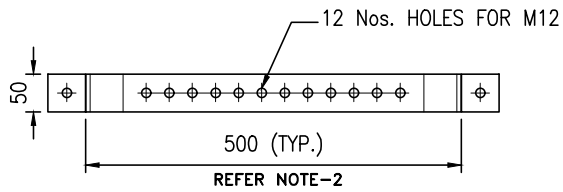




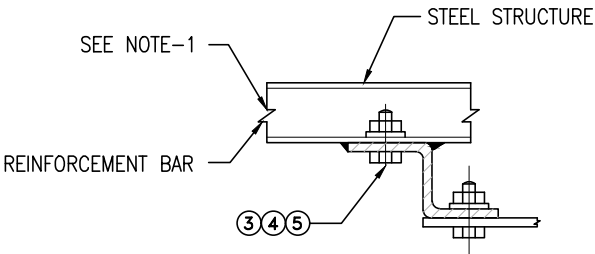
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MOUNTING TYPE-1



MOUNTING TYPE-2

NOTES

- 1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
- 2 FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
- 3 EARTH BUS SHALL BE INSTALLED AT CONVENIENT LOCATION NEAR GROUP OF EQUIPMENT PRECISE LOCATION OF GROUND BUS SHALL BE DECIDED BY AS PER SITE CONDITION.
- 4 LENGHT OF BUS TO SUIT AT SITE CONDITION.

TAG	MATERIAL DESCRIPTION	CODMAT	QTY.	UNIT
1	EARTH BUS 50x6 mm THK. COPPER		*	U
2	MOUNTING BRACKET		1	U
3	BOLT M12 – MS GALVANISED		2	U
4	NUTS (HEXAGONAL HEAD) – GALVANISED		2	U
5	PLAIN WASHER – GALVANISED		1	U
6	ANCHOR BOLT		4	U

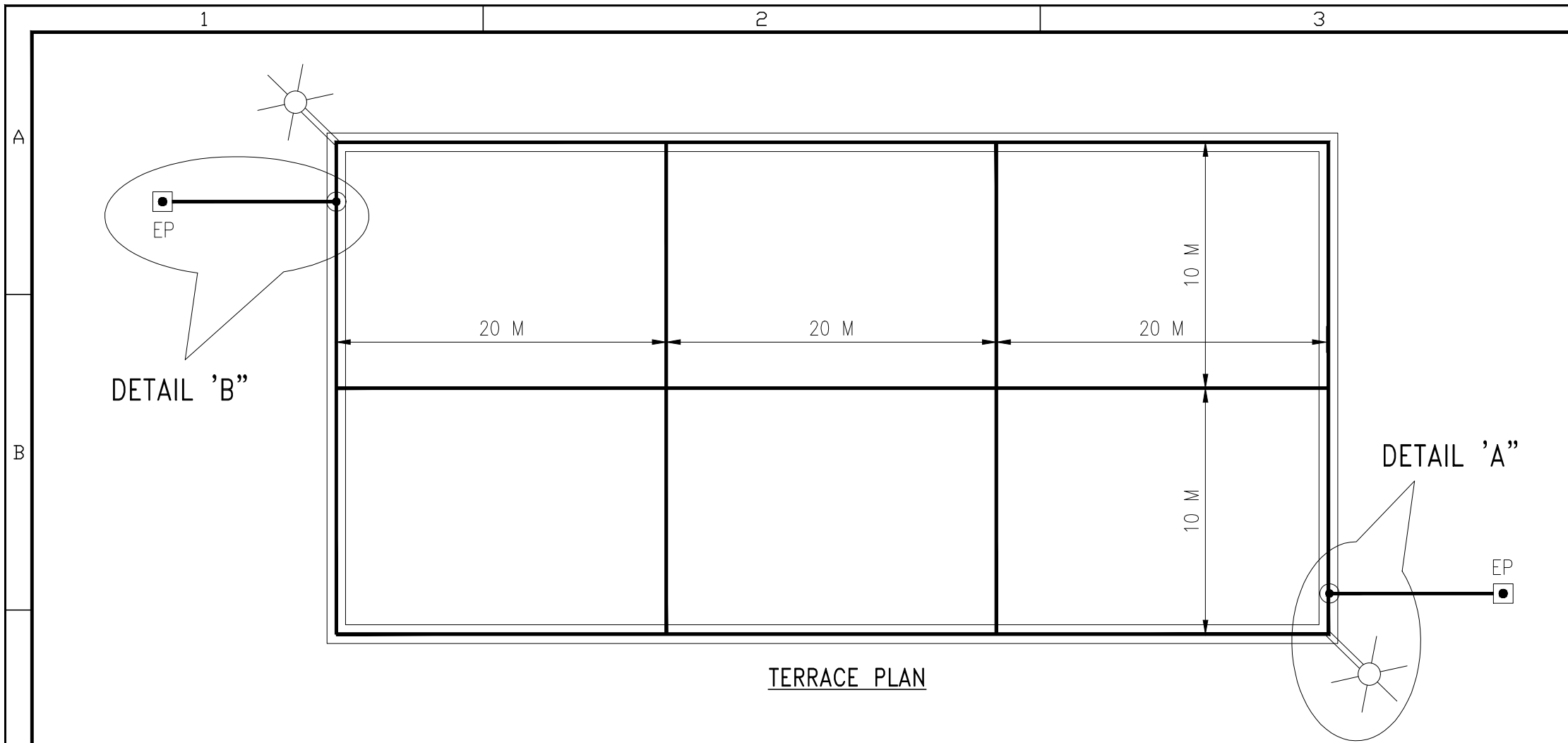
* QUANTITY AS REQUIRED

0	06.10.16	APPROVED	RKS	PR	KJ	SKH
Rev.	D M Y	Modifications	Drawn	Checked	Approved	Validated

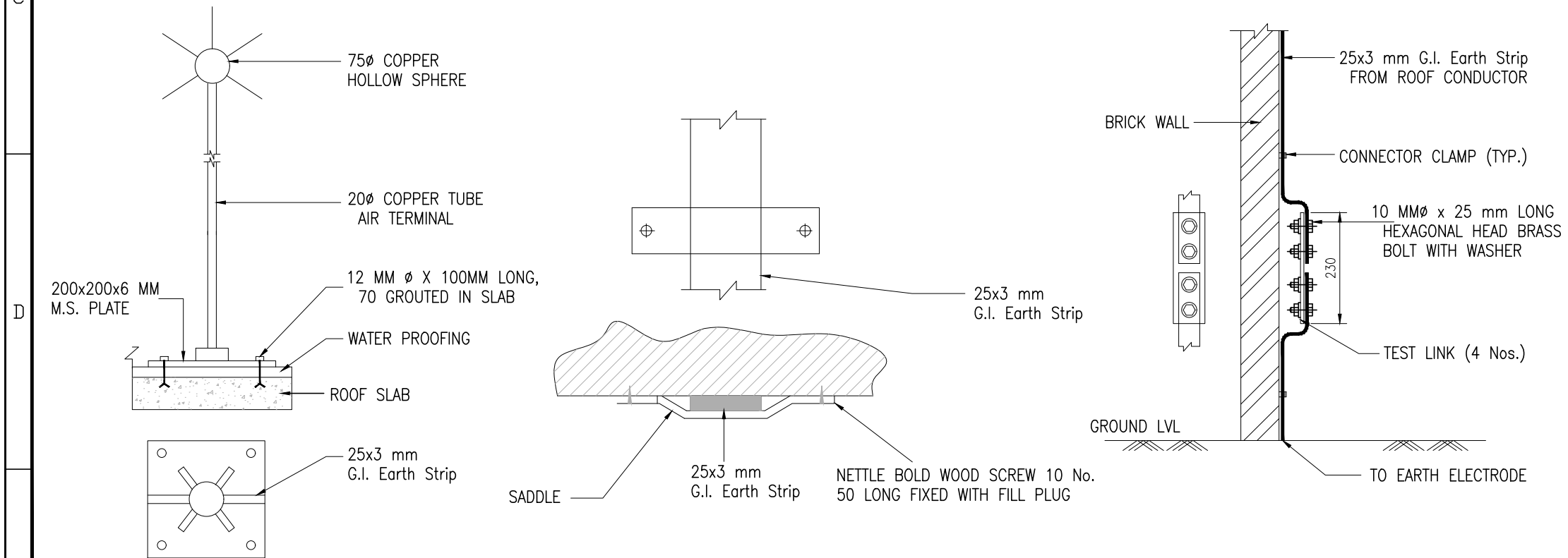
SUBJECT TYPICAL EARTHING BUS DETAILS

Size	Scale	Sheet
A3	NTS	01 of 01
Drawing No.	GGNG-E-20713-3006	Rev. 0

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TERRACE PLAN



FIXING ARRANGEMENT FOR HORIZONTAL DOWN CONDUCTORS

DETAIL 'A'

TEST LINK FOR LIGHTNING PROTECTION

DETAIL 'B'

NOTES

- 1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
- 2 FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
- 3 G.I. SADDLE TO BE FIXED FOR HORIZONTAL DOWN CONDUCTOR AT THE INTERVAL OF 750mm.

LEGEND

S.No.	SYMBOL DESCRIPTION	SYMBOL
1	25x3 mm G.I. EARTH STRIP	—
2	25x3 mm DOWN CONDUCTOR	●
3	LIGHTNING ARRESTOR (VERTICAL AIR TERMINAL)	⚡
4	EARTH PIT	EP ●

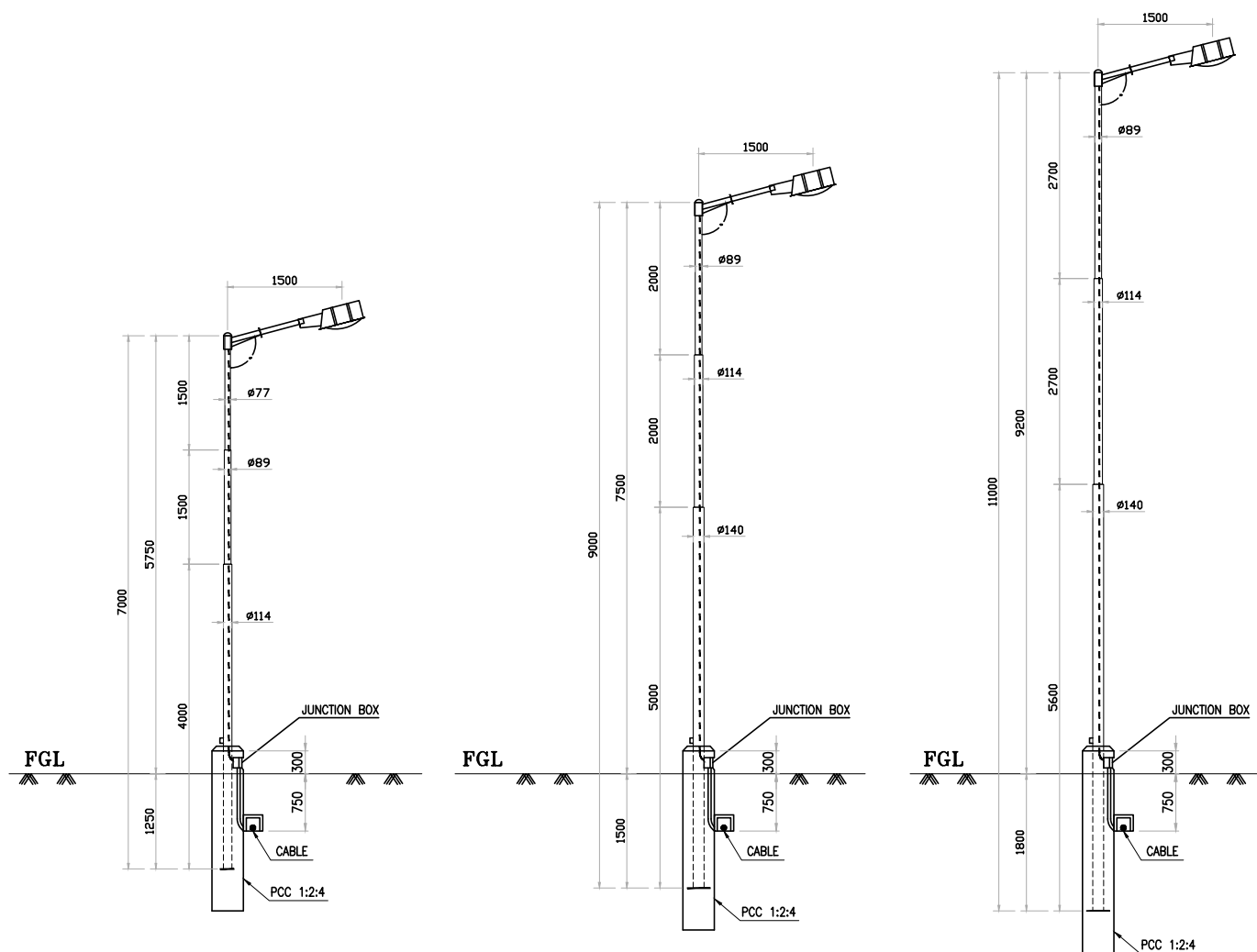
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Rev.	D	M	Y	Drawn	Checked	Approved	Validated

SUBJECT TYP. LIGHTNING PROTECTION DETAIL FOR CONTROL ROOM BUILDING

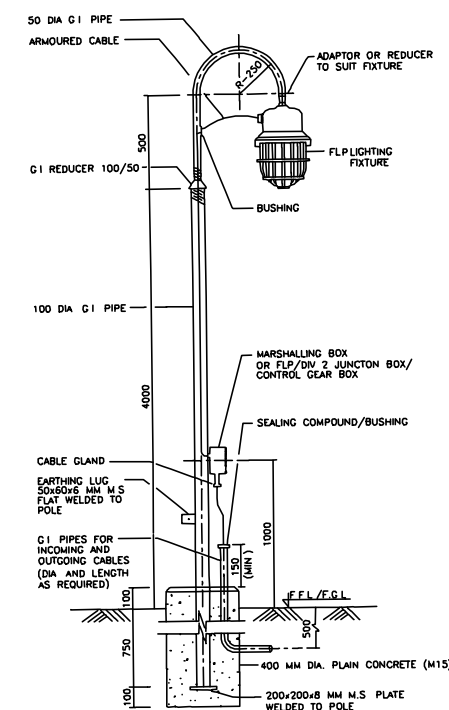
Size	Scale	Sheet
A3	NTS	01 of 01
Drawing No.	GGNG-E-20713-3007	Rev. 0

$\angle$

1 ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2 FOLLOW WRITTEN DIMENSIONS ONLY. DO NOT SCALE.
3 THE LIGHTING POLE SHALL BE ACCORDING TO IS:2713.



7M HEIGH POLE TYPE-(410 SP-3) 9M HEIGH POLE TYPE-(410 SP-30) 11M HEIGH POLE TYPE-(410 SP-50)



4.5M HEIGH FLP WELL GLASS LIGHTING FIXTURE
SUITABLE FOR HAZARDOUS AREA (ZONE 1/ZONE 2)

0	06.10.16	APPROVED		RKS	PR	KJ	SKH
Rev.	D M Y	Modifications		Drawn	Checked	Approved	Validated

SUBJECT	LIGHTING POLES DETAILS
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Size	Scale	Sheet
A3	NTS	01 of 01
Drawing No.		Rev.
GGNG-E-20713-3009		0

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