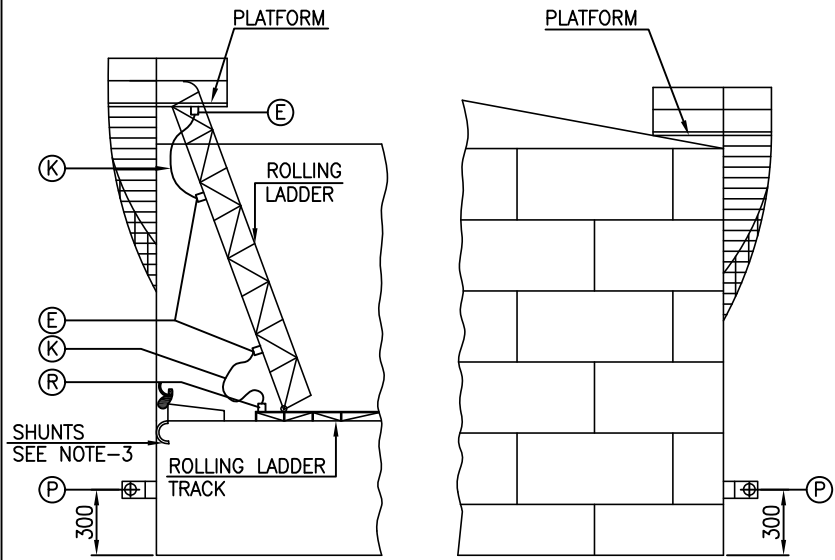


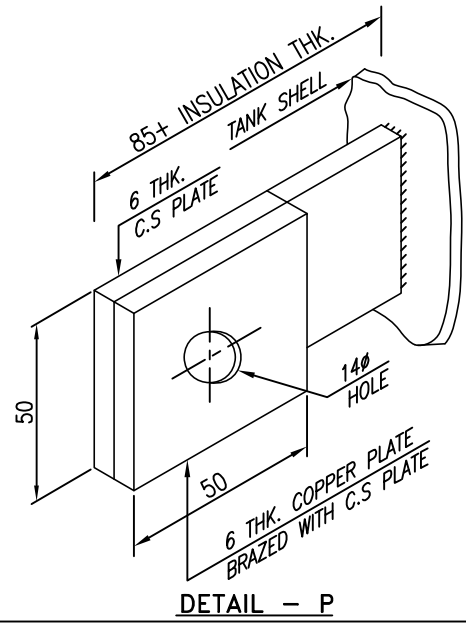
MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	12.08.2013	ISSUED AS STANDARD	IJ	KP	PD

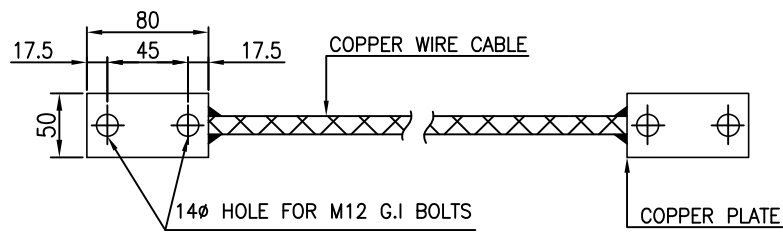


FLOATING ROOF TANK

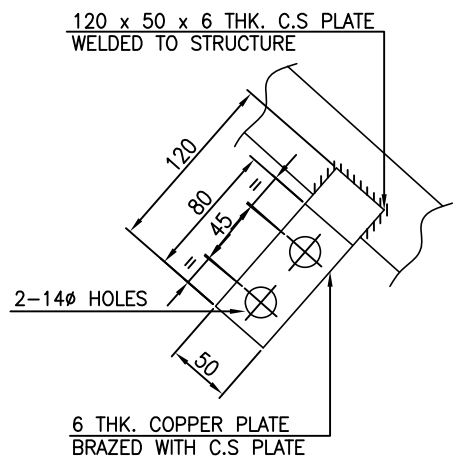
FIXED ROOF TANK



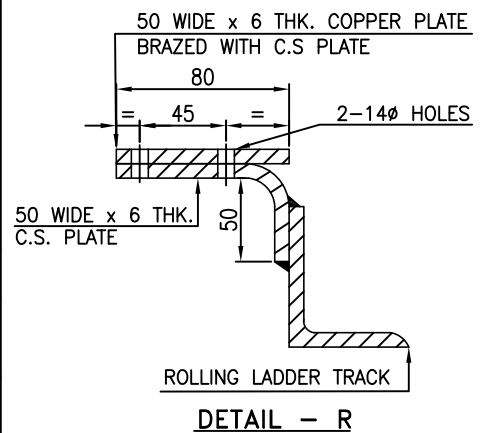
DETAIL - P



DETAIL - K



DETAIL - E



DETAIL - R

NO. OF EARTH CONNECTIONS (P) REQUIRED

TANK CAPACITY (M ³)	UPTO 300	301 TO 1000	1001 TO 5000	5001 TO 10000	10001 & ABOVE
NO. OF CONN.	2	3	5	7	10

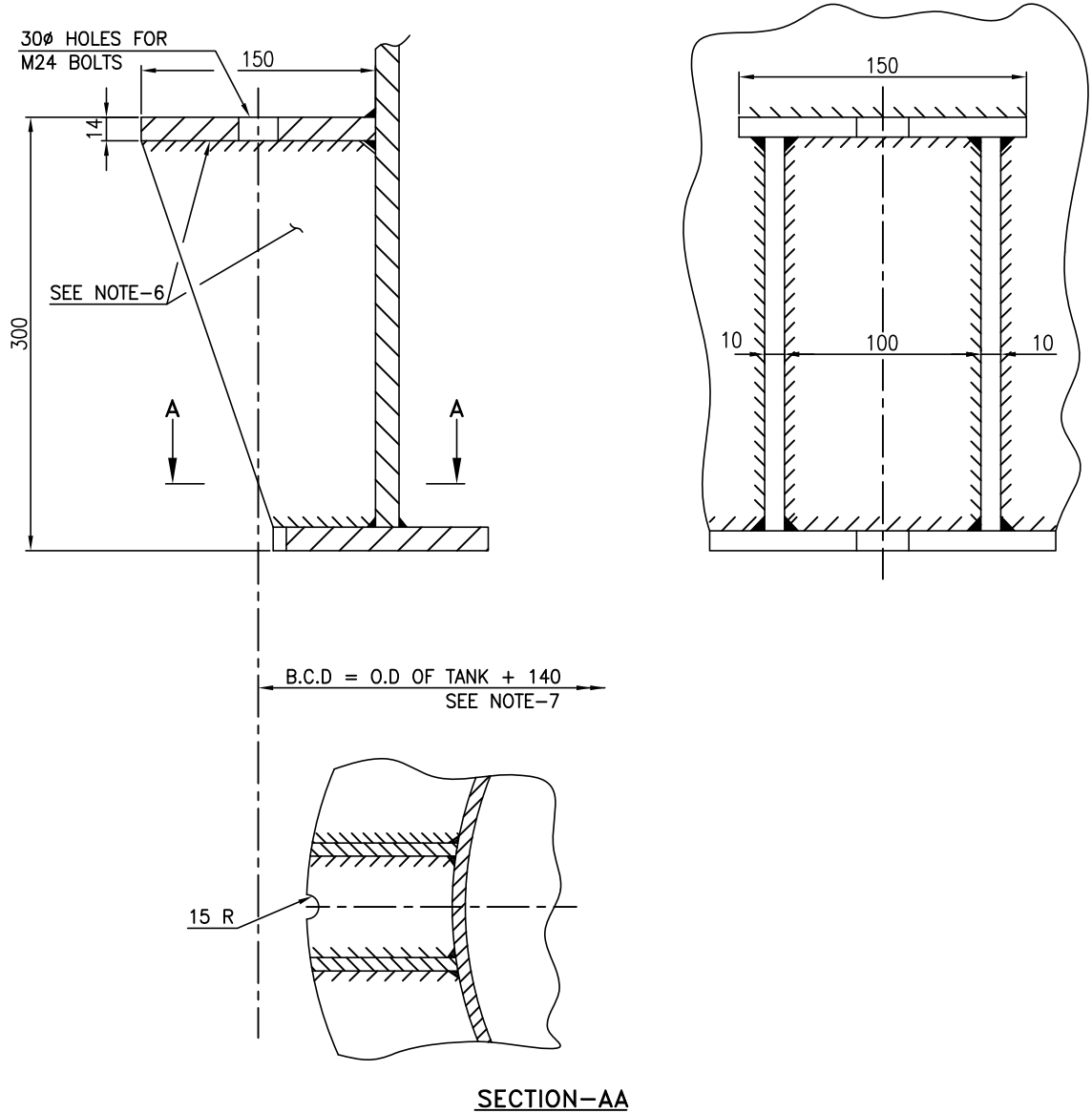
NOTES:

1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE STATED.
2. ELECTRIC WIRES SHALL BE LONG ENOUGH TO COVER THE ENTIRE MOVEMENT OF THE ROLLING LADDER AND CONTINUITY SHALL BE CHECKED AFTER INSTALLATION. QUANTITY REQUIRED PER TANK 2 SETS. TYPE OF WIRE P.V.C INSULATED COPPER WIRE CABLE, 50 mm² CROSS SECTION.
3. SPRING QUALITY STAINLESS STEEL SHUNTS OF 0.4 mm THICK x 51 mm WIDE SHALL BE PROVIDED FOR TANKS WITH NON-METALLIC SEALS AT MAXIMUM SPACING OF 3000 mm.

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	12.08.2013	ISSUED AS STANDARD	HJ	KPD	PD



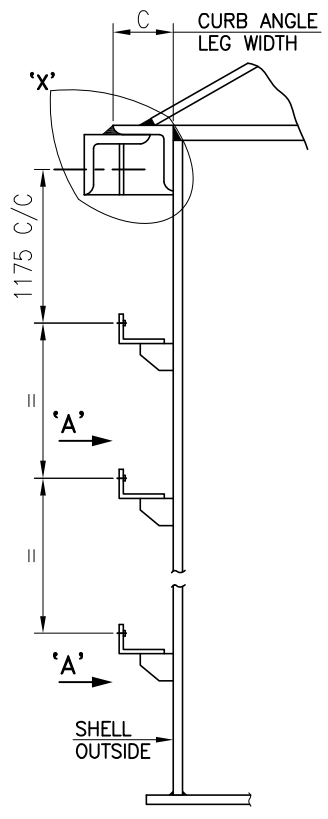
NOTES:

1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE STATED.
2. THIS STANDARD IS APPLICABLE FOR TANKS DESIGNED AS PER API 650 / IS: 803 ONLY.
3. NO. OF ANCHOR CHAIRS SHALL BE MULTIPLE OF FOUR AND STRADDLE NORTH SOUTH CENTER LINE.
4. FOR MATERIAL SPECIFICATION REFER ENGINEERING DRAWING.
5. IN CASE OF CONFLICT ENGINEERING DRAWING SHALL GOVERN.
6. ANCHOR CHAIR DESIGN SHALL BE CHECKED FOR PRESSURIZED TANKS AS PER THE PROVISIONS OF DESIGN CODE.
7. SUITABLE B.C.D. AND SLOTTED HOLES ON TOP PLATE SHALL BE SELECTED FOR STRESS RELIEVED TANKS TO TAKE CARE OF THERMAL EXPANSION.

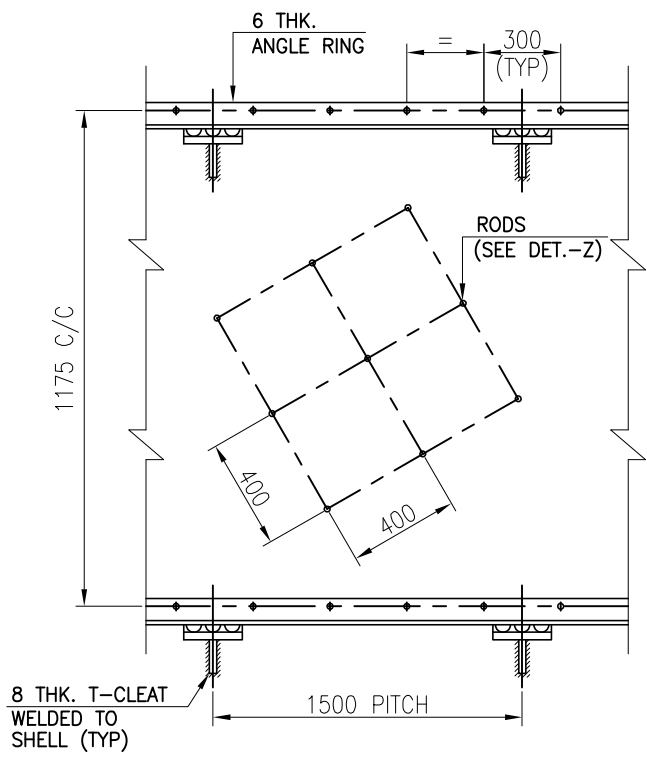
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MECHANICAL

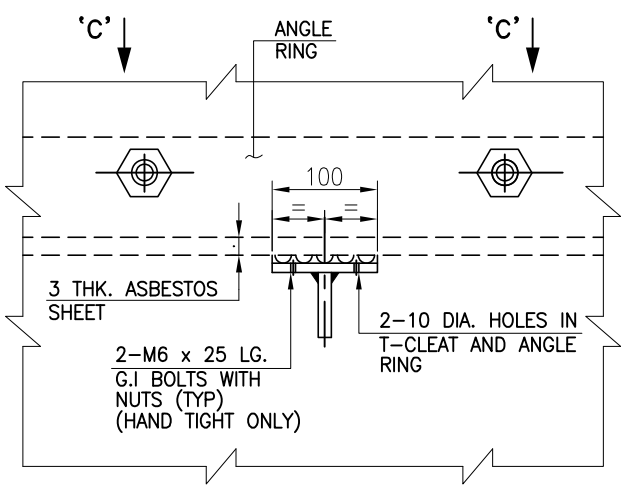
REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	16.08.2013	ISSUED AS STANDARD	IJ	KP	PD



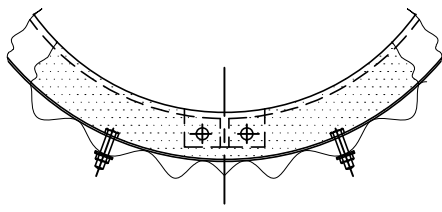
ELEVATION



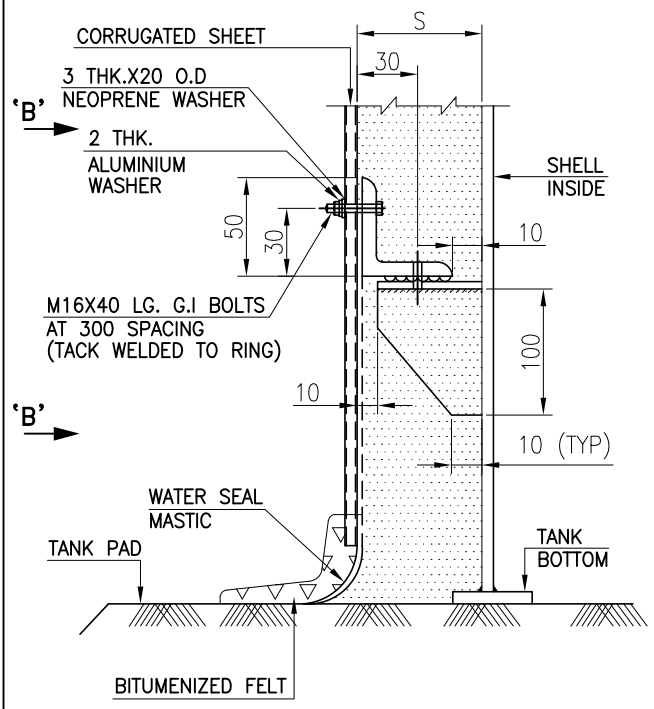
VIEW 'A-A'



VIEW - 'B-B'



VIEW - 'C-C'

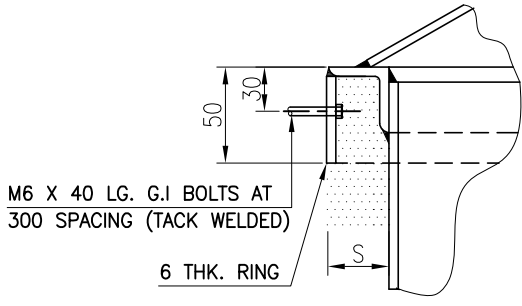


DETAIL OF INSULATION SUPPORT AND SEALING ARRANGEMENT AT BOTTOM OF THE TANK

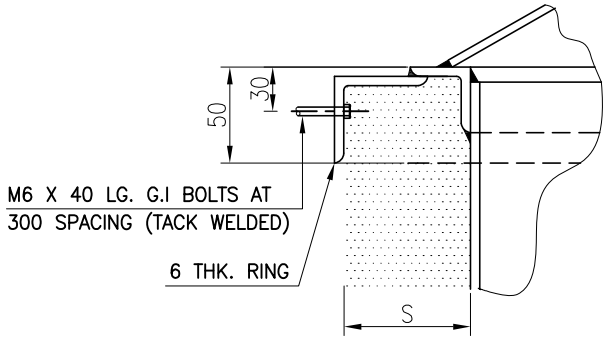
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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	16.08.2013	ISSUED AS STANDARD	IJ	KP	PD

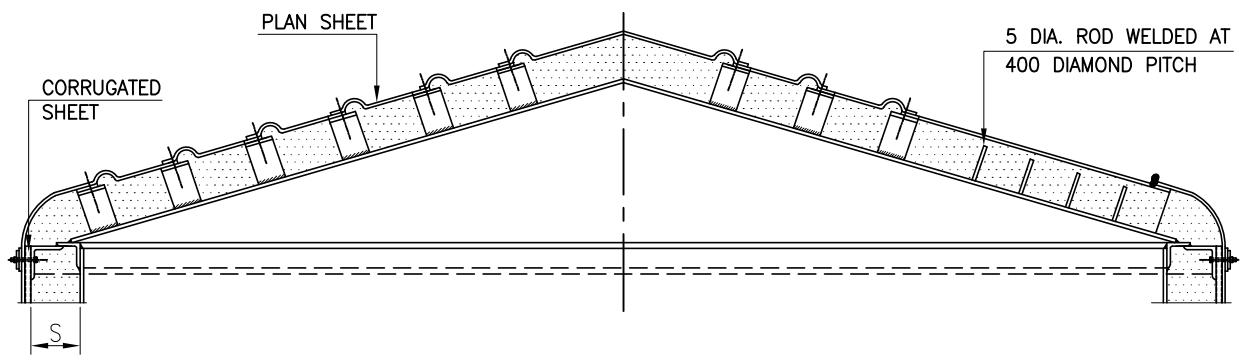


(i) WHEN INSULATION THK. IS LESS OR EQUAL TO CURB ANGLE LEG WIDTH

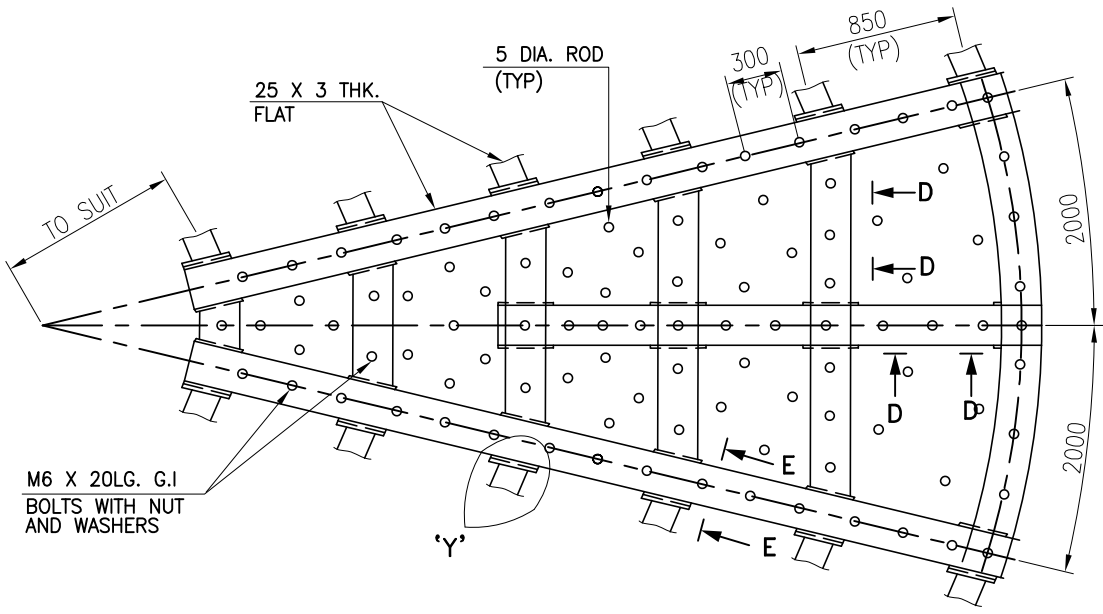


(ii) WHEN INSULATION THK. IS MORE THAN THE CURB ANGLE LEG WIDTH

VIEW 'X'



ARRANGEMENT OF BLANKET AND PLAIN SHEETING ON ROOF

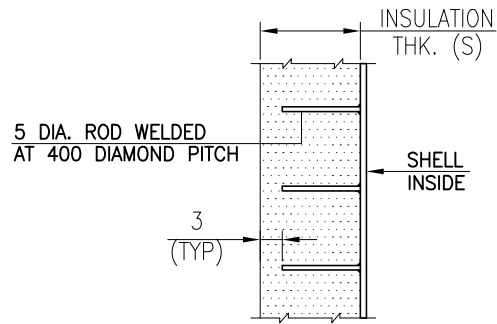
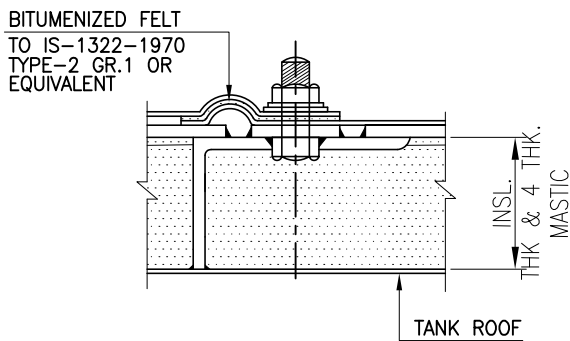
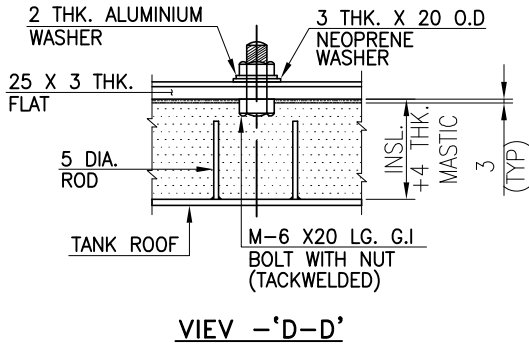
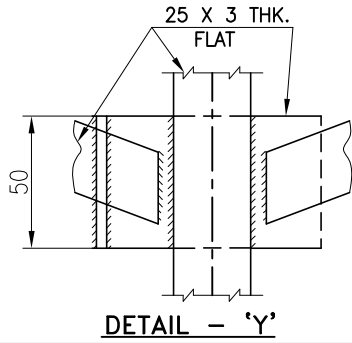
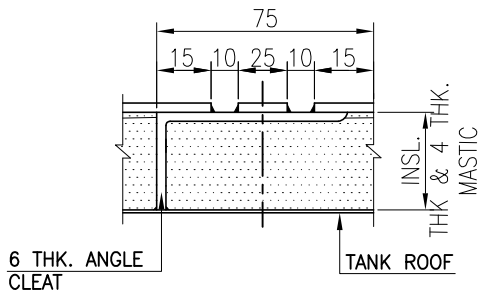


DETAIL OF SUPPORTS ON TANK ROOF

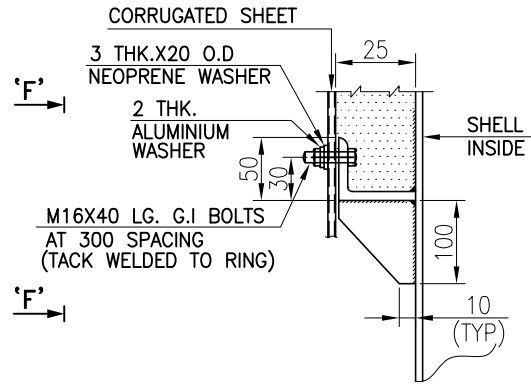
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MECHANICAL

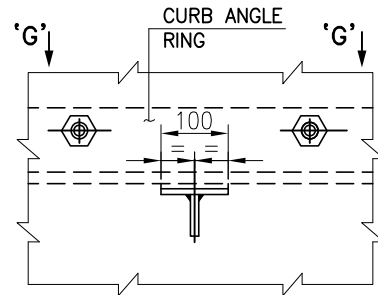
REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	16.08.2013	ISSUED AS STANDARD	IJ	KP	PD



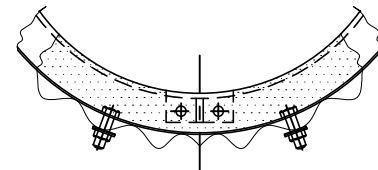
DETAIL - 'Z'
DETAIL OF ROAD ON SHELL



DETAIL OF INSULATION SUPPORT FOR 25 THK. INSULATION



VIEW - 'F-F'



VIEW - 'G-G'

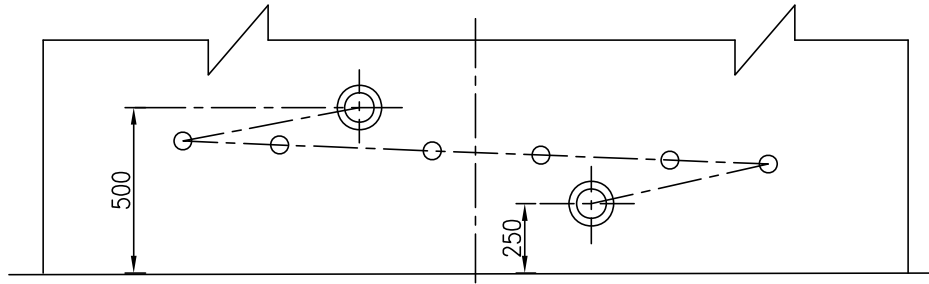
NOTES :-

1. ALL DIMENSIONS ARE IN mm
2. FOR MATERIAL SPECIFICATION REFER ENGINEERING DRAWING.
3. ONLY T-CLEATS WITH ASBESTOS SHEET AND G.I BOLTING, ANGLE / FLAT RINGS ALONG WITH TACK WELDED G.I BOLTS, 5 DIA. RODS, ROOF ANGLE CLEATS AND FLATS WITH TACK WELDED G.I BOLTS SHALL BE SUPPLIED BY TANK FABRICATOR.
4. ALL ATTACHMENTS SHALL CLEAR WELD SEAMS AS PER REQUIREMENT OF CODE.

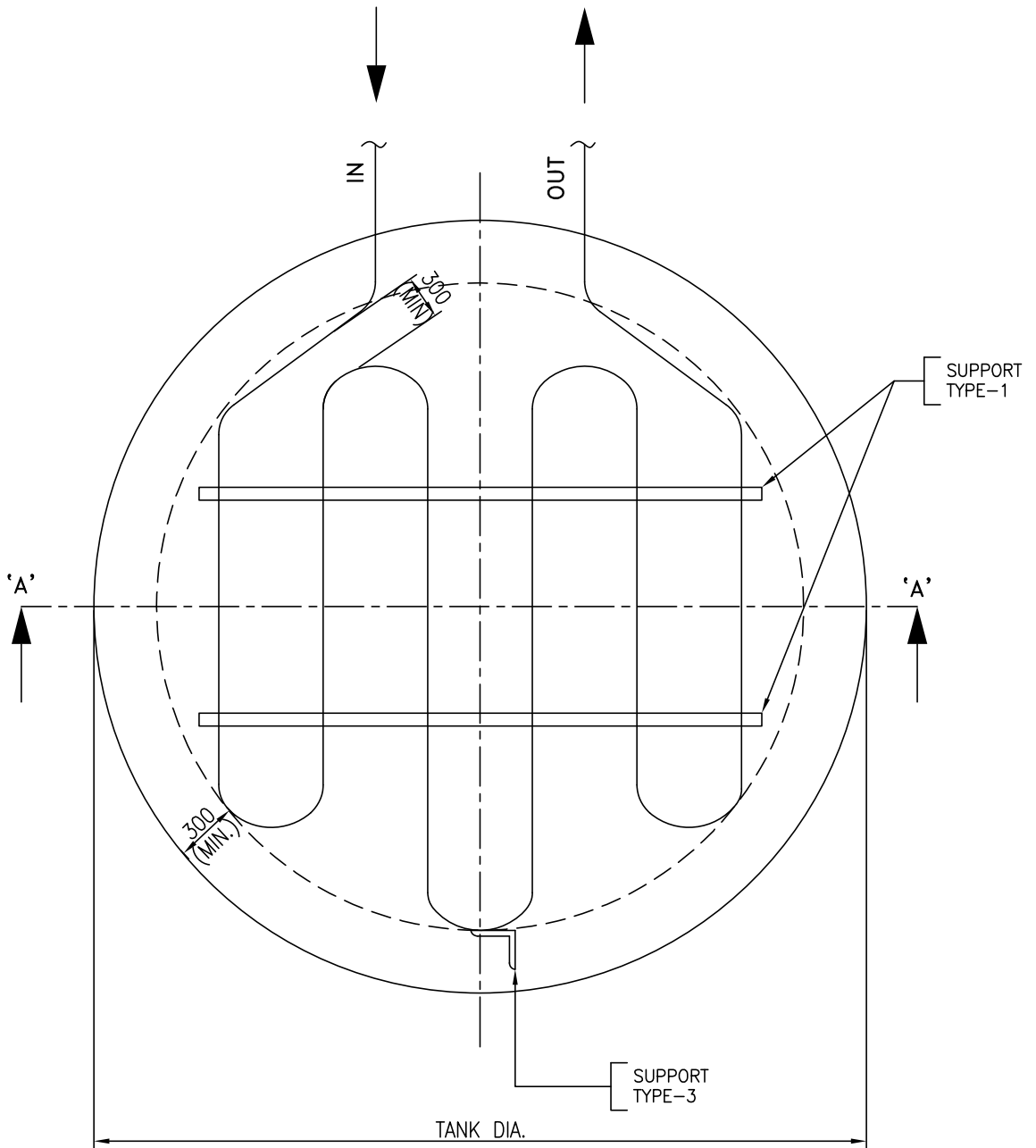
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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	20.08.2013	ISSUED AS STANDARD	IJ	KP	PD



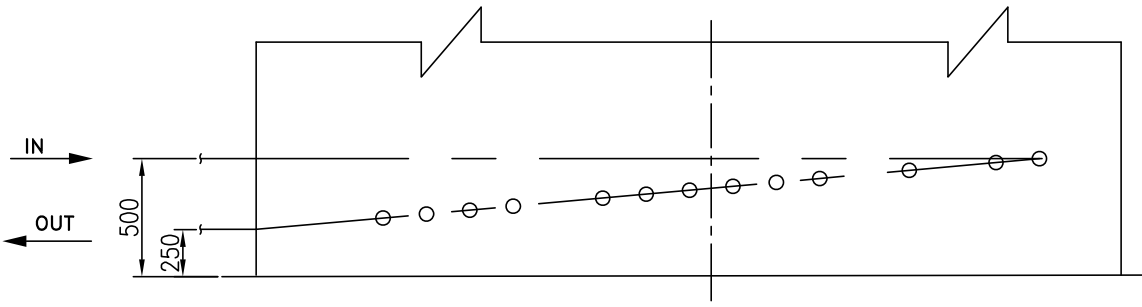
SECTION A-A



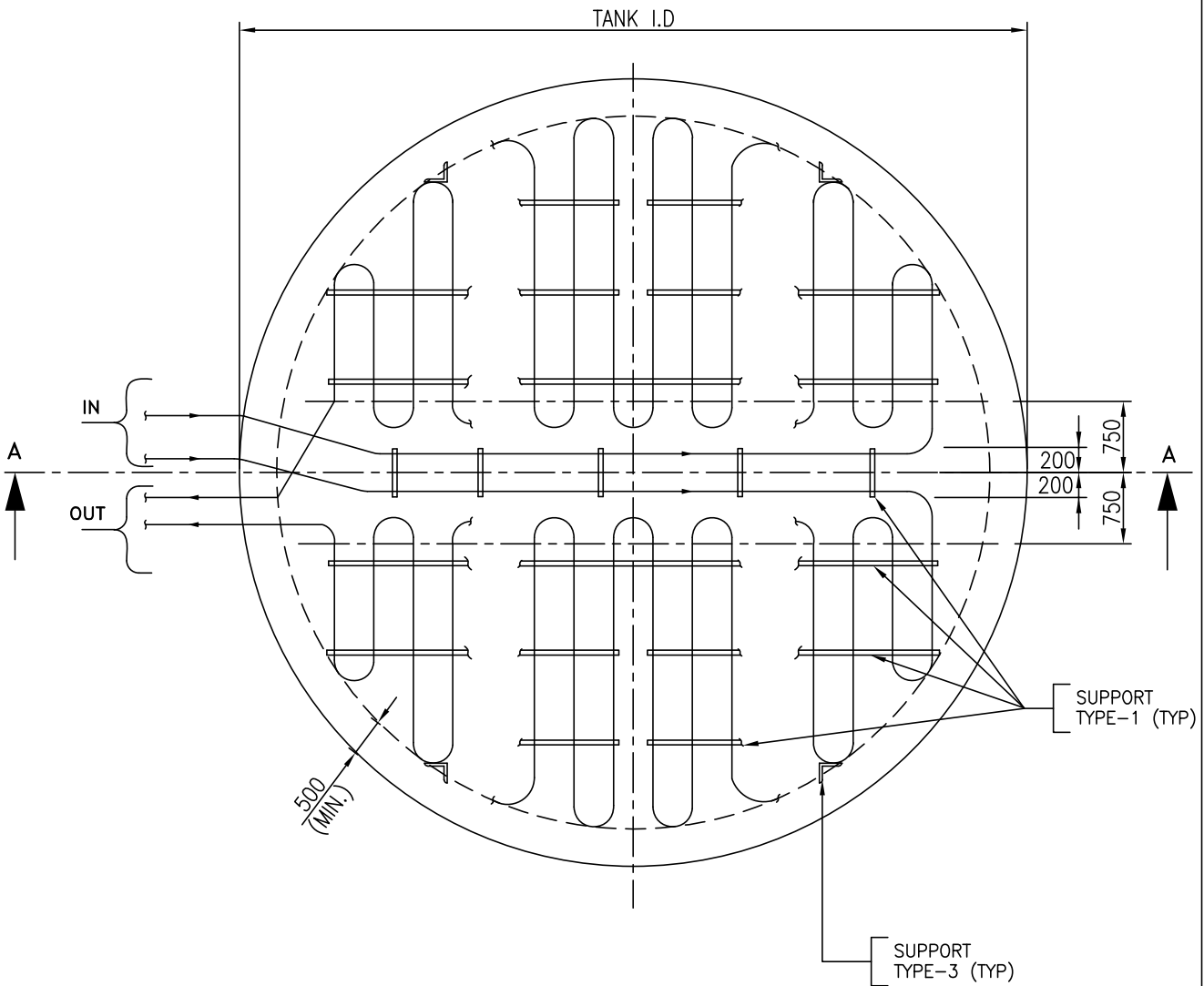
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REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	20.08.2013	ISSUED AS STANDARD	IJ	KP	PD



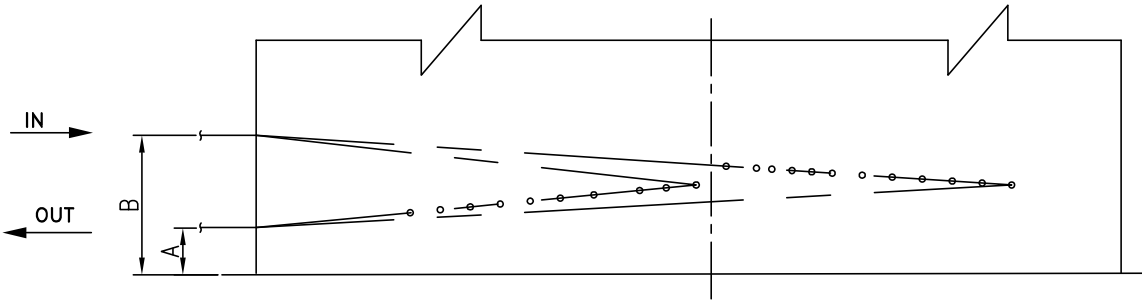
SECTION A-A



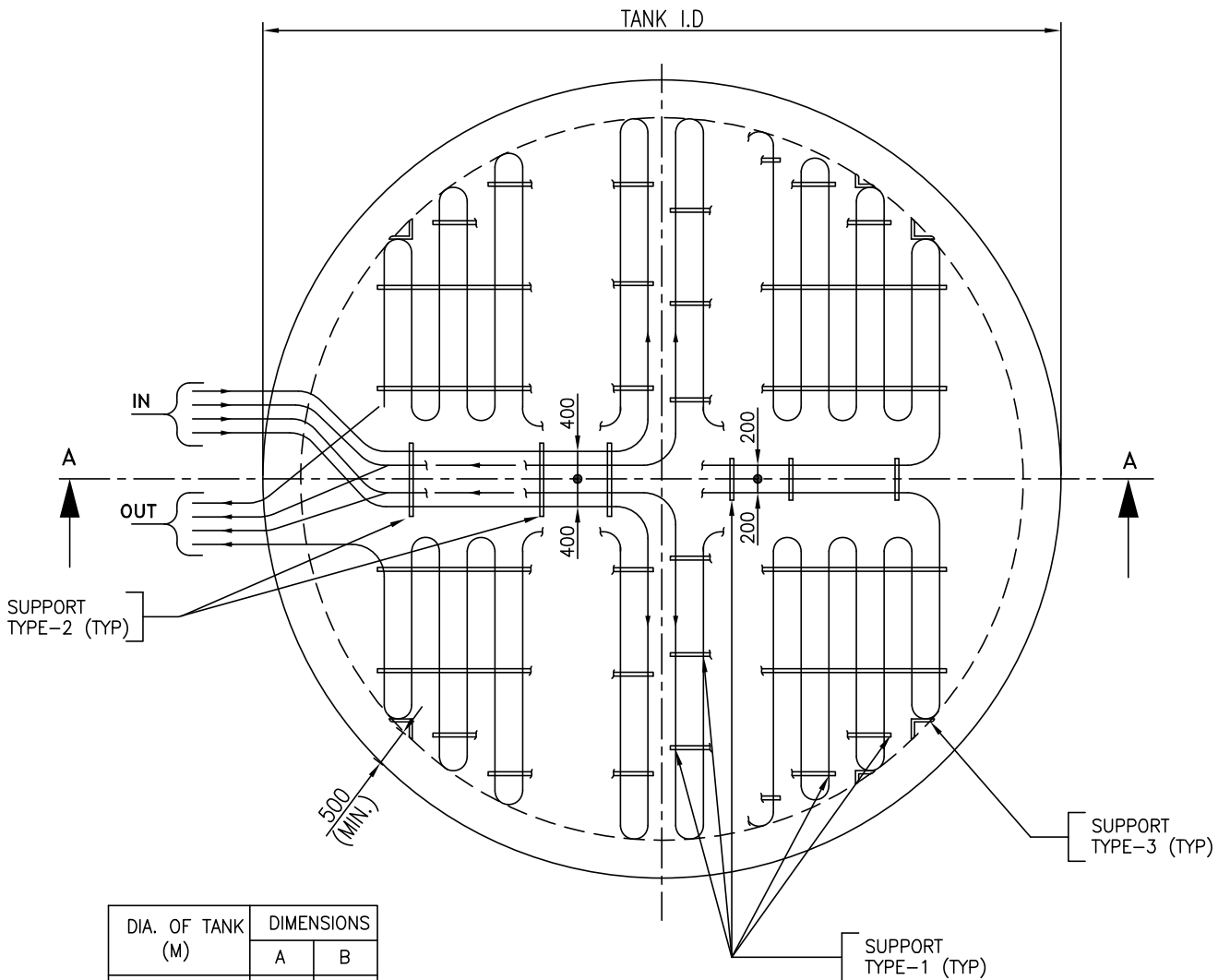
THIS DRAWING IS THE PROPERTY OF QUANTA PROCESS SOLUTIONS PVT. LTD. DISCLOSURE TO ANY THIRD PARTY OR DUPLICATION IS NOT PERMITTED.

MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	20.08.2013	ISSUED AS STANDARD	IJ	KP	PD



SECTION A-A

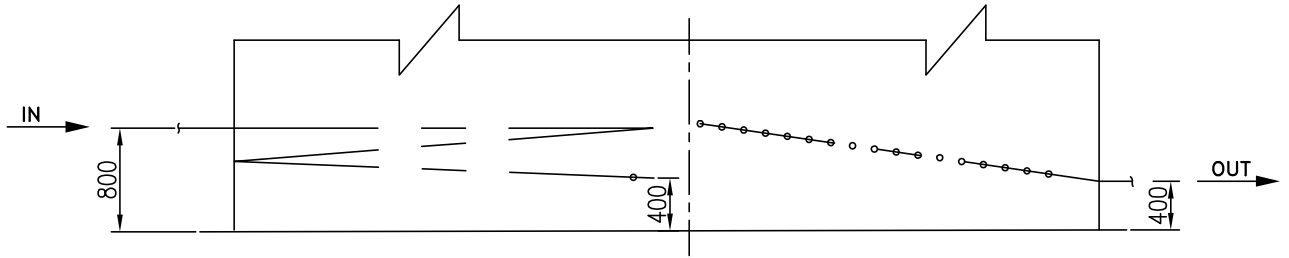


DIA. OF TANK (M)	DIMENSIONS	
	A	B
15.1 TO 20	250	500
20.1 TO 35	300	600
35.1 TO 50	550	700

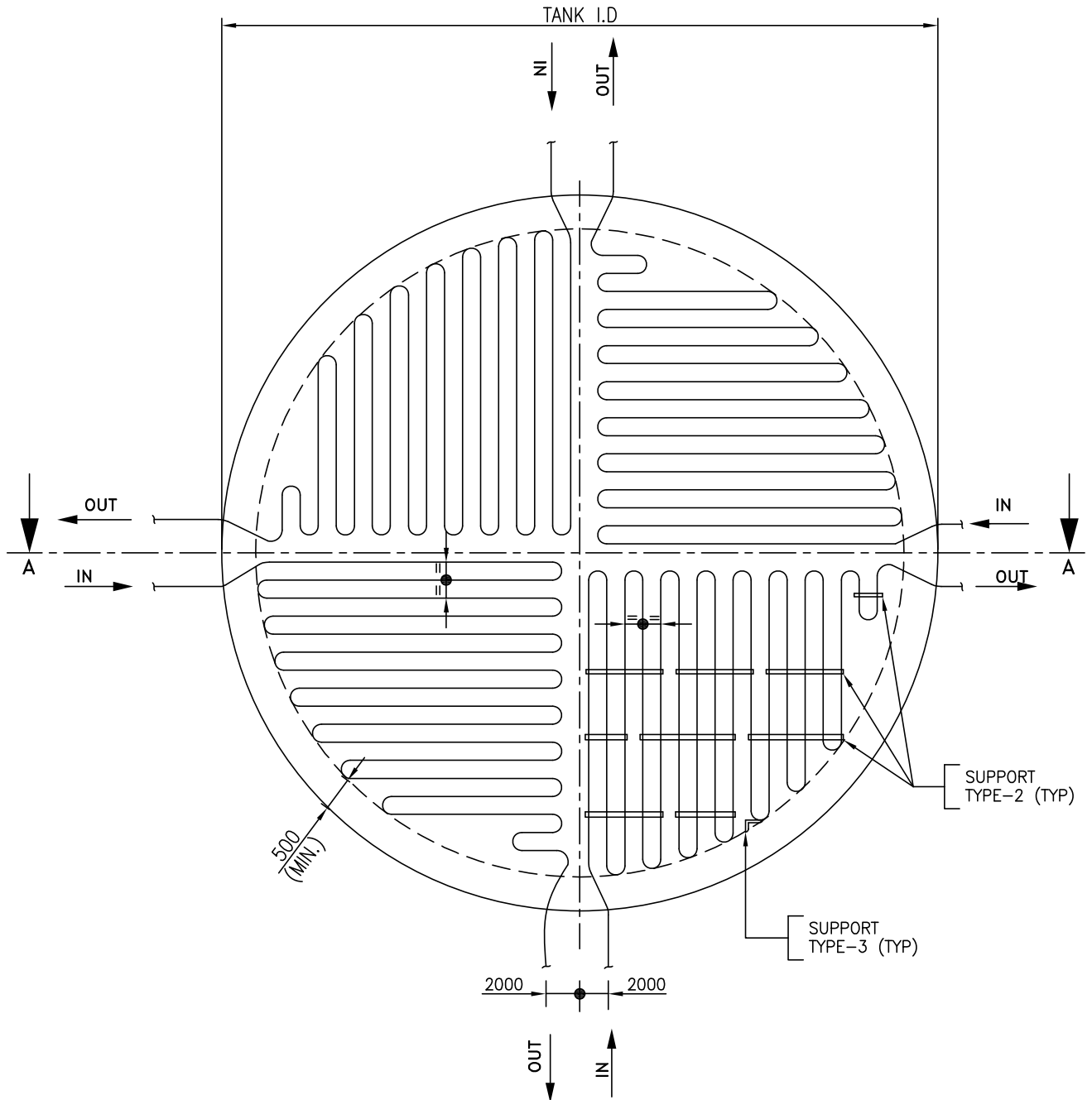
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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	20.08.2013	ISSUED AS STANDARD	IJ	KP	PD



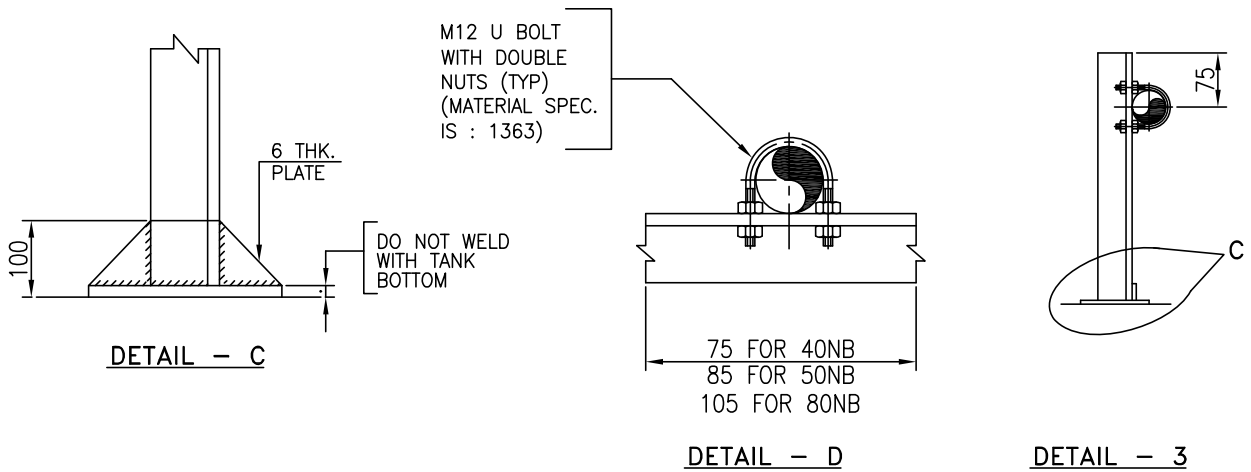
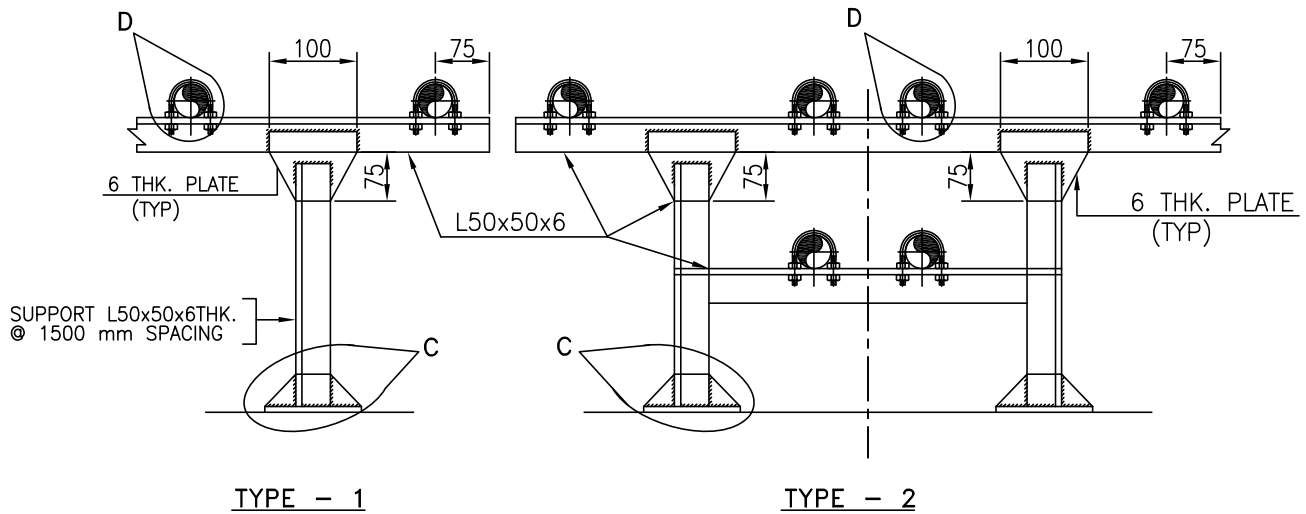
SECTION A-A



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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	20.08.2013	ISSUED AS STANDARD	IJ	KP	PD



NOTES:

- ALL DIMENSION ARE IN MM UNLESS OTHERWISE STATED.
- ALL FILLET WELDS SHALL BE 6mm UNLESS OTHERWISE SHOWN.
- STEAM INLET AND OUTLET NOZZLES SHALL PREFERABLY BE LOCATED NEAR THE LIQUID OUTLET NOZZLE.
- TANK FABRICATOR TO ENSURE THAT THE STEAM COIL AND COIL SUPPORT DO NOT FOUL WITH INTERNALS LIKE
 - GAUGE HATCH AND LEVEL INDICATOR DIPPING AREA (APPROX. 500mm DIA.)
 - FLOATING ROOF LEG SUPPORTS (APPROX. 500mm DIA.)
 - ROOF DRAIN/EMERGENCY GRAIN/SIPHON DRAIN.
 - AGITATOR MIXER
 - SKIMMING DEVICE.
- AFTER HYDROTEST OF THE TANK THE HEIGHT OF ALL SUPPORT SHALL BE READJUSTED TO TAKE CARE OF UNEVEN SETTLEMENT OF TANK BOTTOM BY USING PACKING PLATE FULLY WELDED TO SUPPORT BASE PLATE OR BY READJUSTING THE SUPPORTS HEIGHT.
- FOR MATERIAL SPECIFICATION, DESIGN DATA AND ACTUAL LENGTH OF COIL REQUIRED REFER ENGINEERING DRAWING.
- THIS STANDARD IS FOR GENERAL GUIDANCE . BASED ON REQUIRED LENGTH OF COIL SHOWN ON ENGINEERING DRAWING. SELECT AND WORK OUT A SUITABLE LAYOUT ENSURING UNIFORM HEATING OF PRODUCT STORED.
- PIPE MAY BE BENT TO MINIMUM RADIUS EQUAL TO THREE TIMES THE DIAMETER. BEND SHALL BE FREE OF CRACKS AND BUCKLES. FLATTENING OF A BEND, AS MEASURED BY THE DIFFERENCE BETWEEN THE MAXIMUM AND MINIMUM DIAMETER AT ANY CROSS SECTION SHALL NOT EXCEED 8% OF THE NOMINAL OUTSIDE DIAMETER.
- HEATING COIL SHALL SLOPE TOWARDS OUTLET NOZZLE FOR SELF DRAINAGE.
- MAXIMUM UNSUPPORTED LENGTH OF STEAM COIL SHALL BE AS PER THE FOLLOWING TABLE.

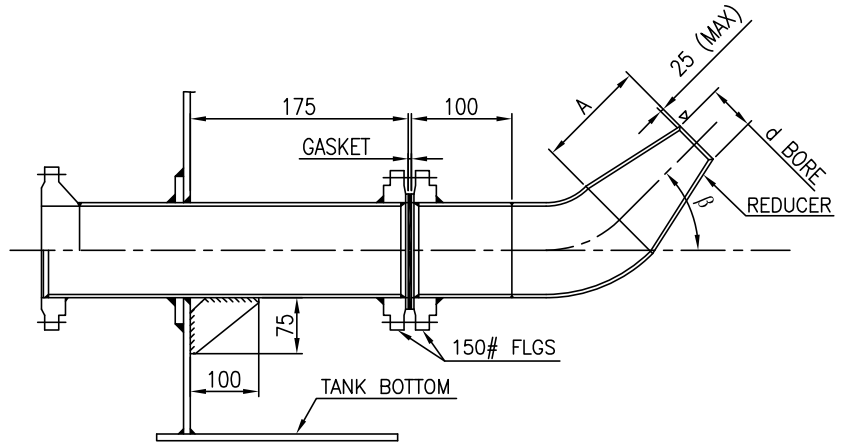
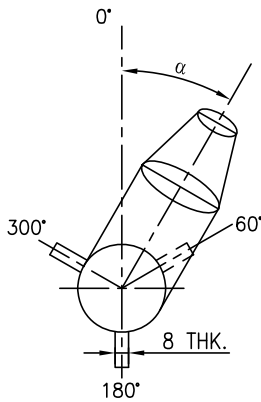
NOMINAL DIA. OF PIPE	40	50	80
MAXIMUM UNSUPPORTED LENGTH	4000	5000	6500

11.UNLESS OTHERWISE STATED IN ENGINEERING DRAWING ALL INTERNAL BOLTS SHALL BE STAINLESS STEEL.

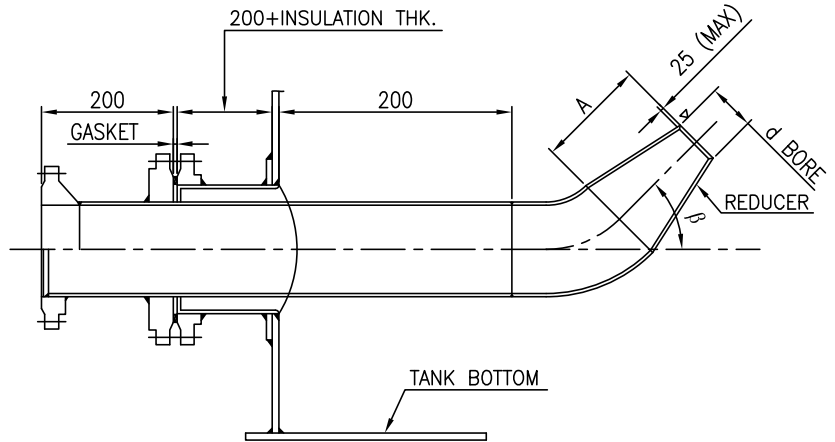
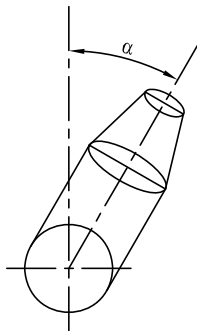
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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	13.08.2013	ISSUED AS STANDARD	HJ	KPD	PD



TYPE - 1



TYPE - 2

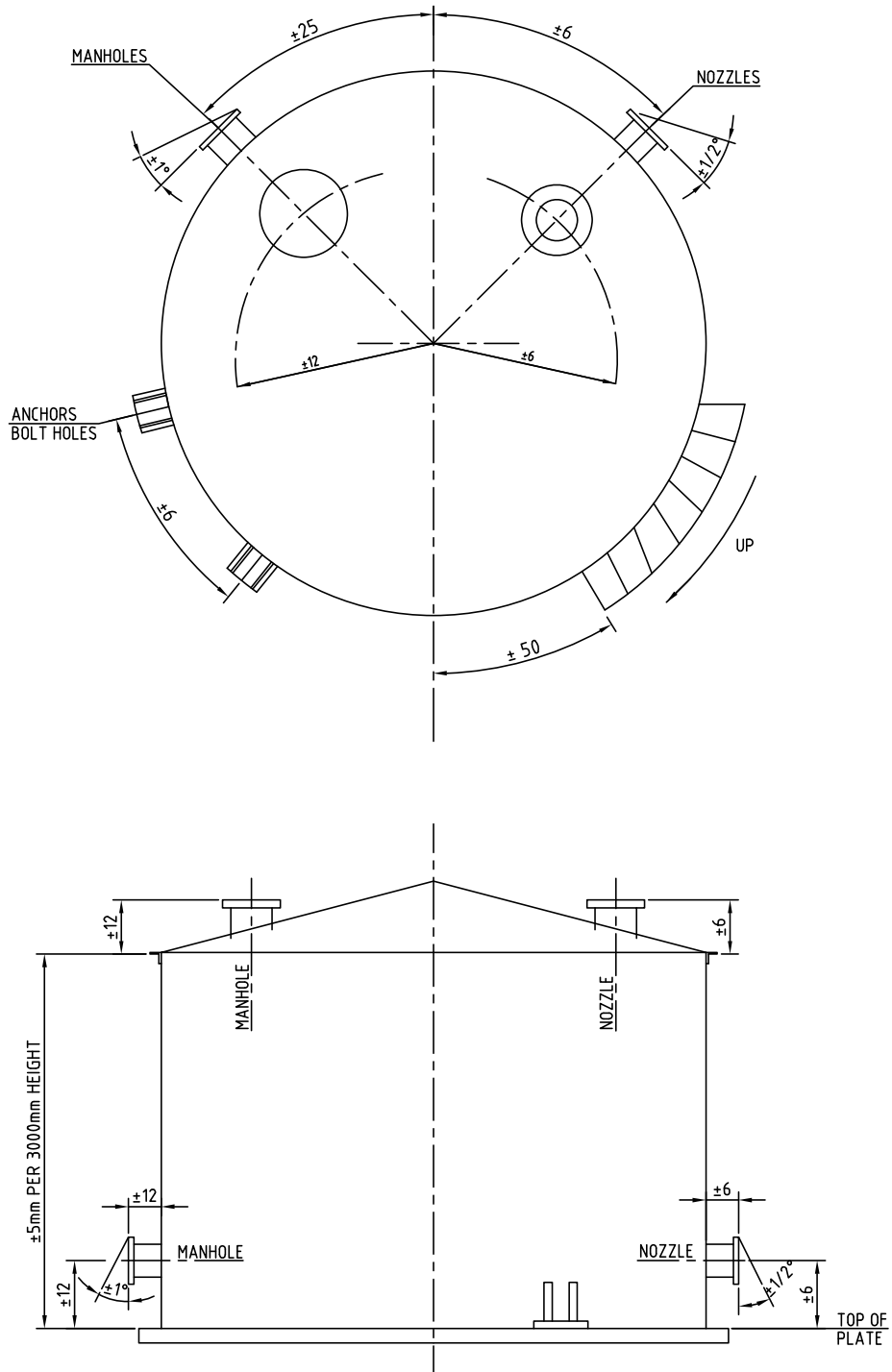
NOTES:

1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE STATED.
2. FOR MATERIAL SPECIFICATION AND DIMENSIONS MARKED α, β, A & d REFER ENGINEERING DRAWING.
3. FOR LINED TANKS TYPE-2 SHALL BE USED.
4. IN CASE OF CONFLICT ENGINEERING DRAWING SHALL GOVERN.

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	23.09.2013	ISSUED AS STANDARD	IJ	KP	PD



NOTES :-

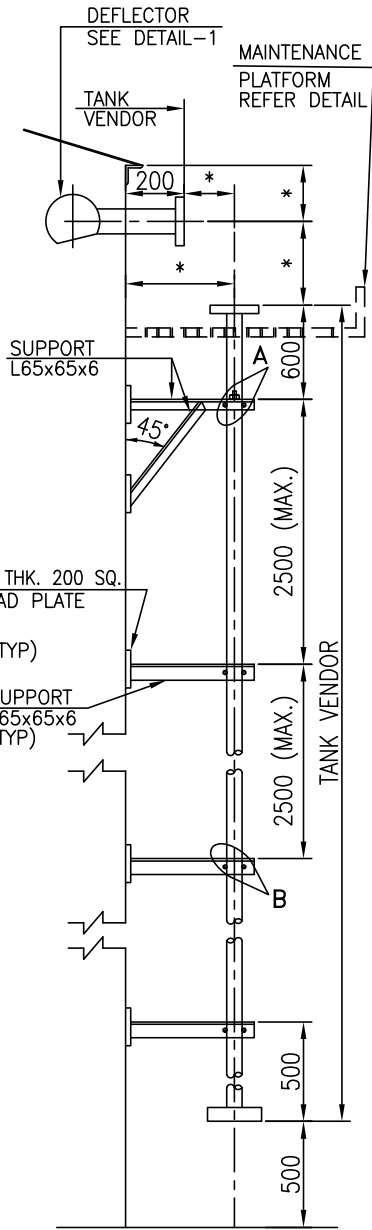
1. FOR TOLERANCES NOT SPECIFIED ON THIS STANDARD, REFER TO APPLICABLE CODES.
2. TOLERANCES SPECIFIED IN APPLICABLE CODES SHALL GOVERN IF THEY ARE MORE STRINGENT.
3. USE SELLER STANDARD FOR HOLD DOWN BOLTS WHEN REQUIRED.
4. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE NOTED.

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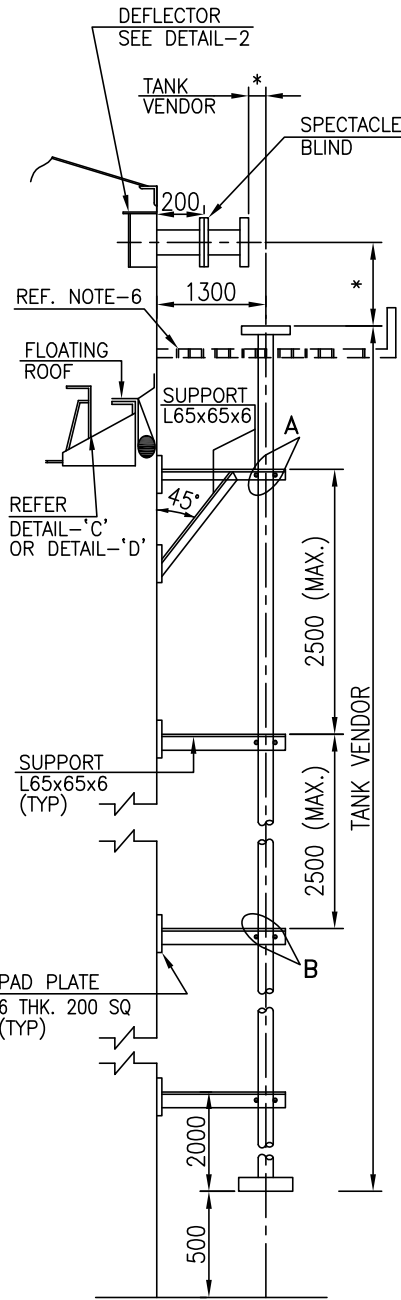
SHEET 1 OF 1

MECHANICAL

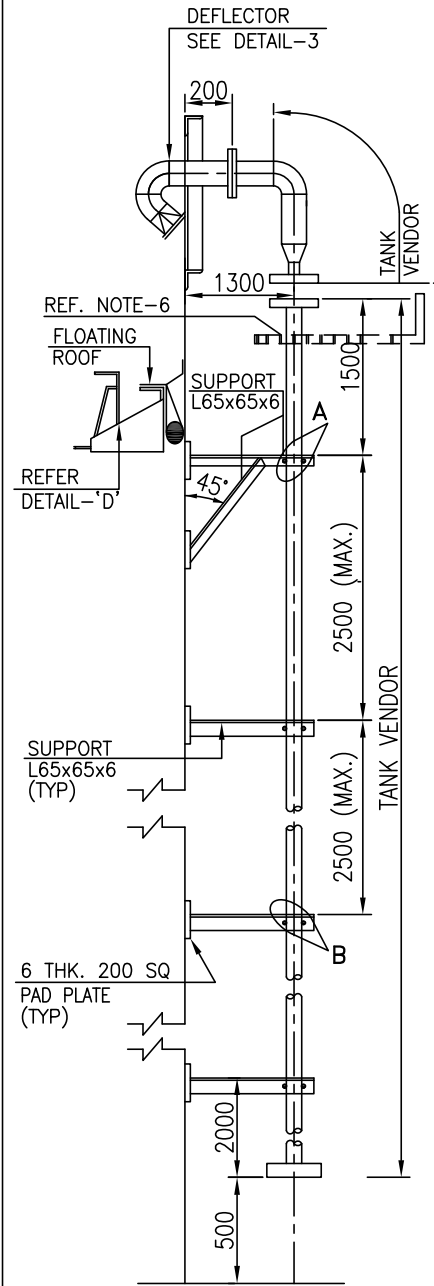
REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	22.08.2013	ISSUED AS STANDARD	IJ	KP	PD



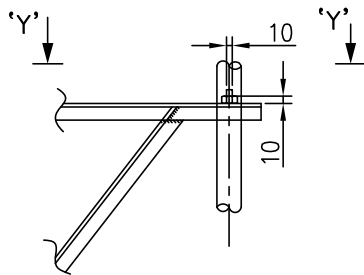
FOR FIXED ROOF TANK



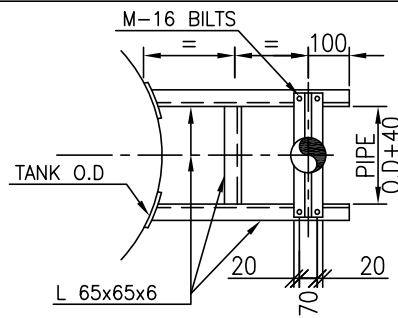
**FOR FLOATING CUM
FIXED ROOF TANK**



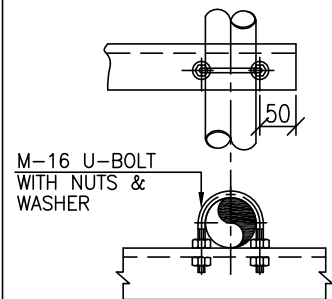
FOR FLOATING ROOF TANK



DETAIL - 'A'



VIEW - 'YY'

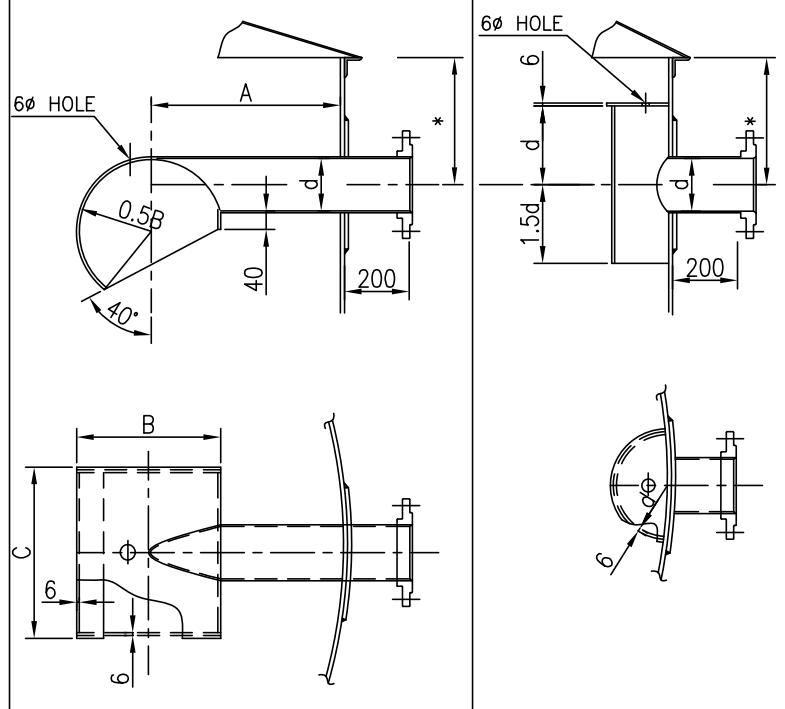


DETAIL - 'B'

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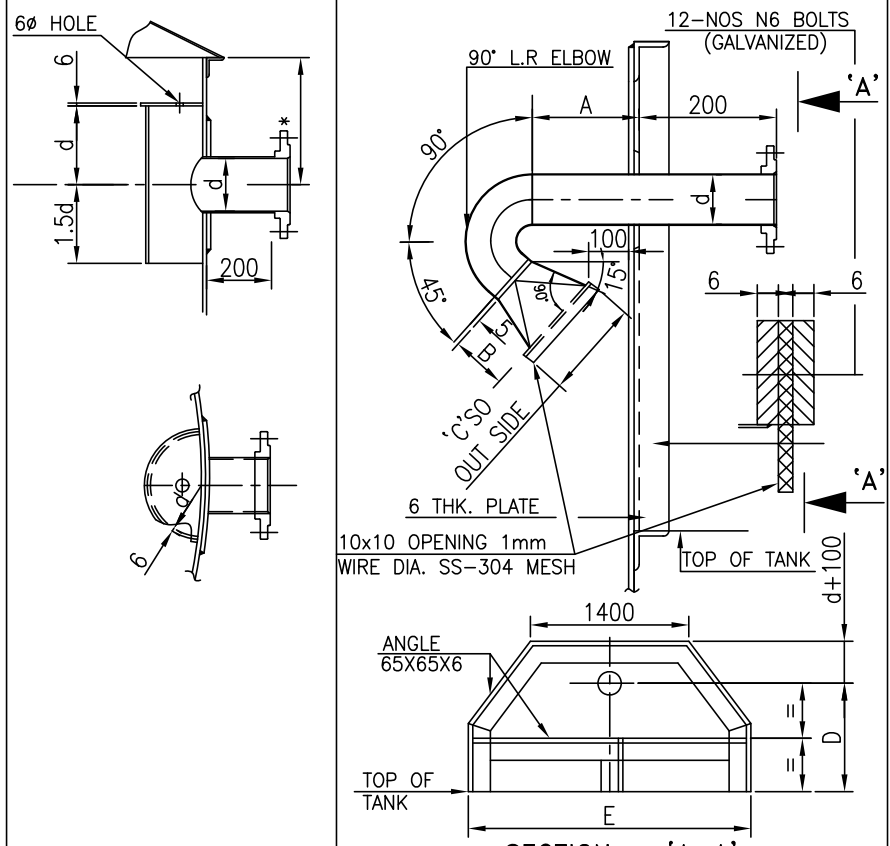
MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	22.08.2013	ISSUED AS STANDARD	IJ	KP	PD



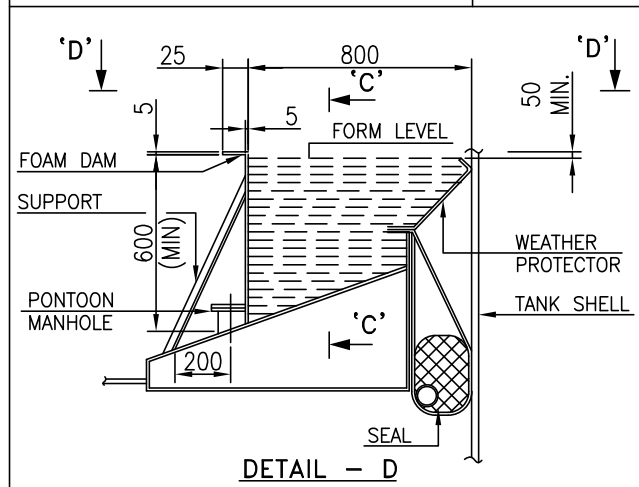
NOM. DIA. OF NOZZLE (d)	A	B	C
100	250	300	500
150	300	350	550
200	350	400	600
250	400	450	650

DETAIL - 1

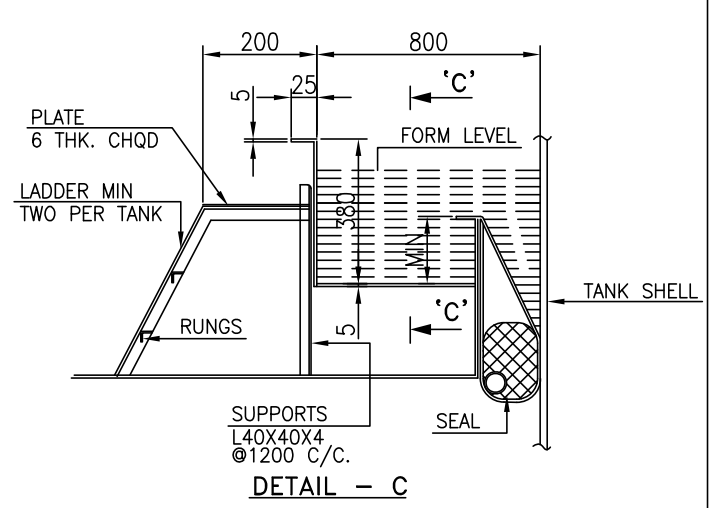


NOM. DIA. OF NOZZLE (d)	A	B	C	D	E
100	146	202	200	1200	2900
150	175	308	300	1425	3350
200	208	421	400	1650	3800
250	236	527	500	1875	4250

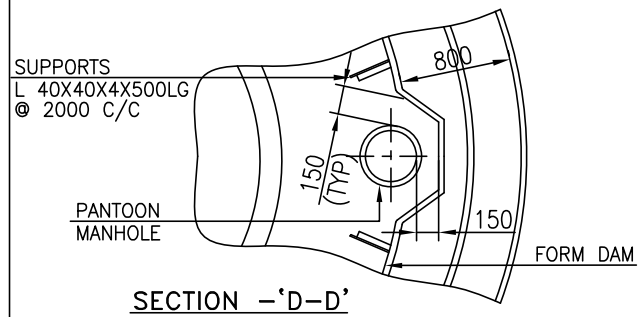
DETAIL - 3



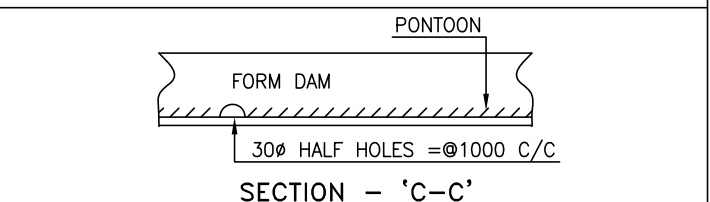
DETAIL - D



DETAIL - C



SECTION - 'D-D'

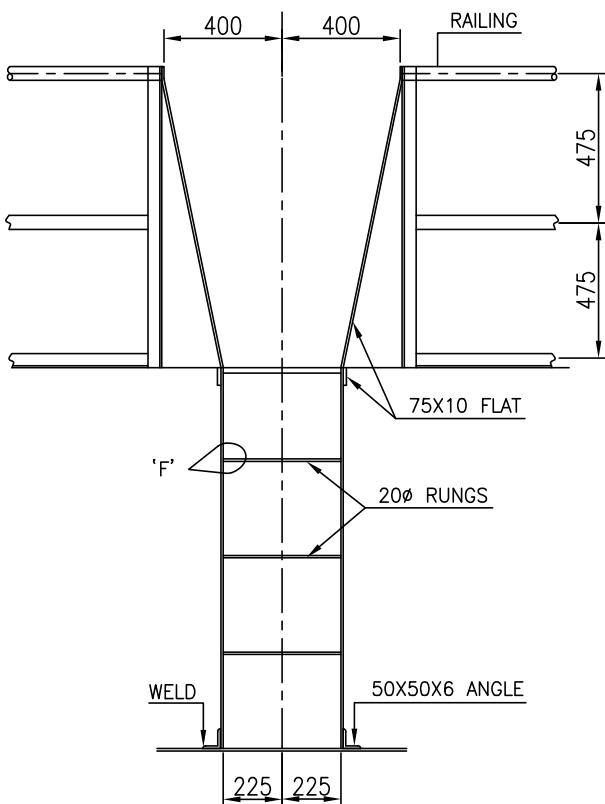


SECTION - 'C-C'

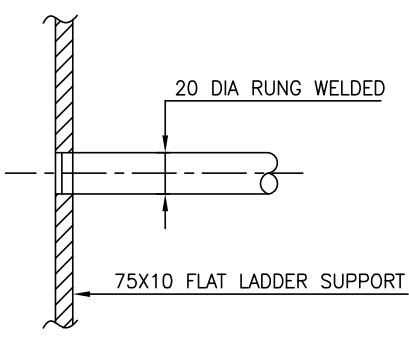
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MECHANICAL

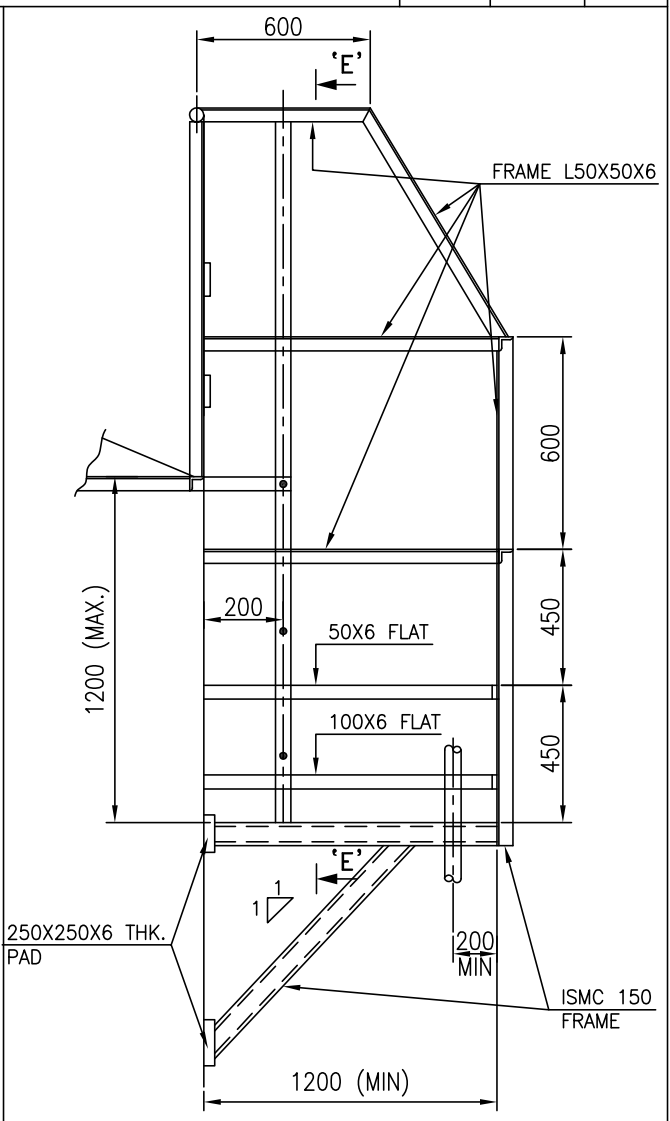
REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	22.08.2013	ISSUED AS STANDARD	IJ	KP	PD



VIEW - 'E-E'

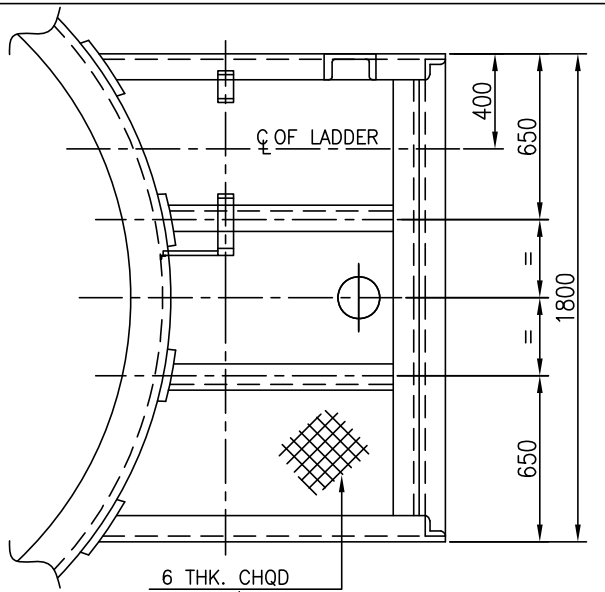


DETAIL - 'F'



250X250X6 THK. PAD

ISMC 150 FRAME



DETAIL OF MAINTENANCE PLATFORM

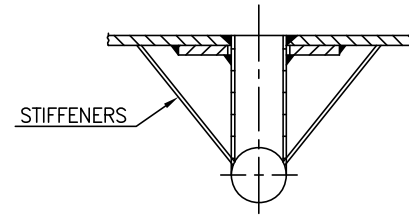
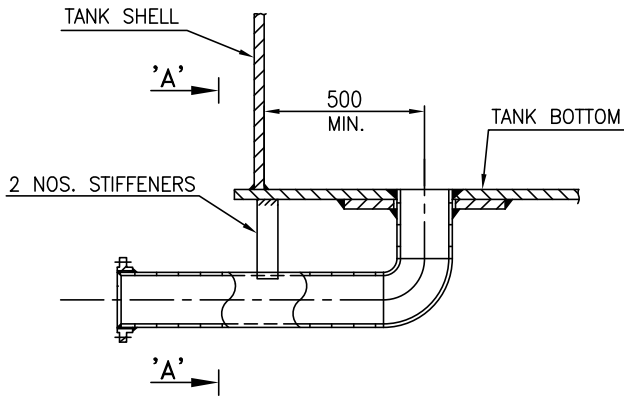
NOTES :-

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE STATED.
2. SIZE AND NOS. OF FOAM RISER SHALL BE DECIDED BY GENERAL CIVIL DEPARTMENT.
3. FOAM SYSTEM SHALL BE HYDROSTATIC TESTED @16 Kg/Cm2g.
4. ALL FLANGE SHALL BE AS PER ANSI B16.5 #150 SO RF.
5. IN CASE OF CONFLICT ENGINEERING DRAWING SHALL GOVERN.
6. FOR MATERIAL SPECIFICATION & DIMENSIONS MARKED (*) SHALL BE AS PER MANUFACTURER STANDARD BASED ON SPECIFICATION AND CAPACITY OF THE FOAM MAKER. FOAM MAKER TO BE PROVIDED FOR FLOATING ROOF TANKS FOAM MAKER AND TO BE PROVIDED FOR CONE ROOF TANKS VAPOR SEAL CHAMBER / FLOATING CUM FIXED ROOF TANKS THESE SHALL BE SUPPLIED BY TANK FABRICATOR AS PER SPECIFICATIONS ATTACHED WITH TENDER DOCUMENT.
7. PROVIDE MAINTENANCE PLATFORM WITH APPROACH LADDER FOR FOAM MAKER IN FLOATING ROOF TANK WHERE WIND GIRDER IS NOT USED AS A WALKWAY.
8. FOR EXACT ORIENTATION OF FOAM RISER REFER PIPING ORIENTATION PLAN.

THIS DRAWING IS THE PROPERTY OF QUANTA PROCESS SOLUTIONS PVT. LTD. DISCLOSURE TO ANY THIRD PARTY OR DUPLICATION IS NOT PERMITTED.

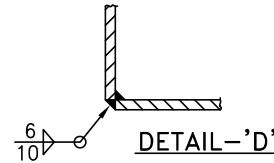
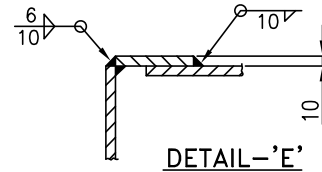
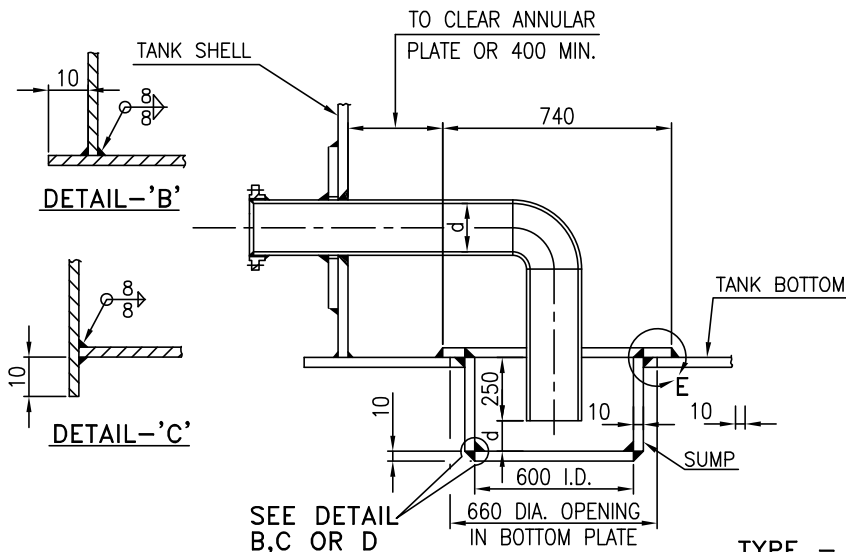
MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	17.08.2013	ISSUED AS STANDARD	HJ	KPD	PD

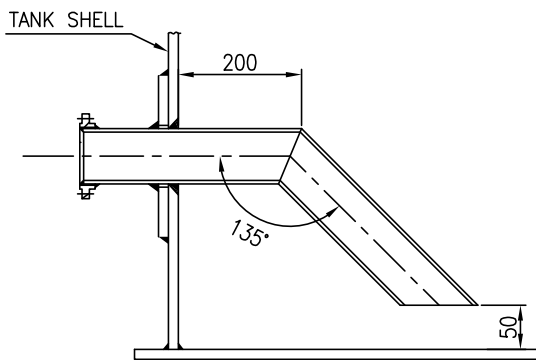


TYPE - 1

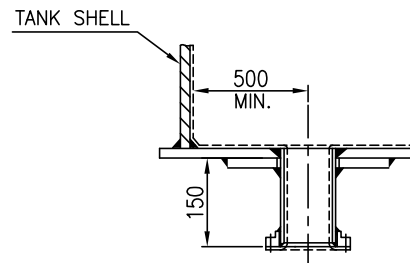
(FOR TANKS WHERE BOTTOM IS ACCESSIBLE FROM BELOW)



TYPE - 2
(NOTE-5)



TYPE - 3



FOR RUBBER LINED TANKS WHERE BOTTOM IS ACCESSIBLE FROM BELOW

TYPE - 4

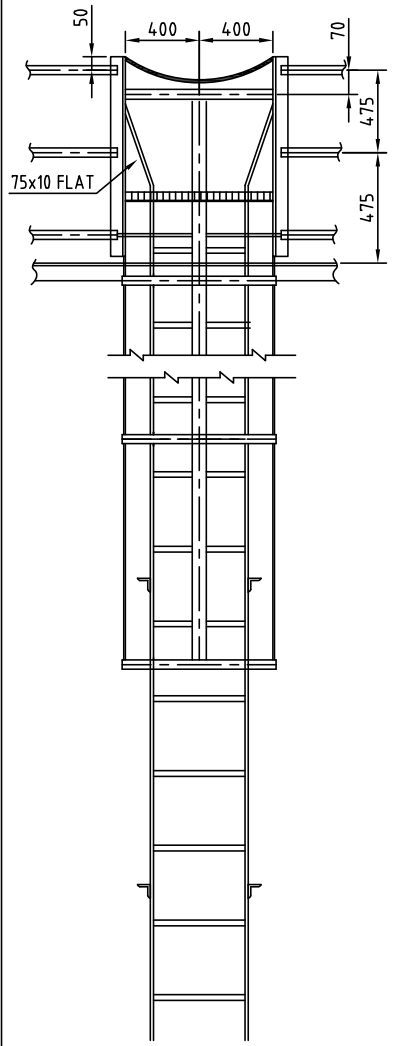
NOTES:

1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE STATED.
2. THIS STANDARD IS APPLICABLE UPTO 150NB NOZZLE.
3. FOR MATERIAL SPECIFICATION REFER ENGINEERING DRAWING.
4. IN CASE OF CONFLICT ENGINEERING DRAWING SHALL GOVERN.
5. FOR TANK DIAMETER GREATER THAN 6M. SUMP AND DRAIN OUTLET DETAILS SHALL BE AS PER API-650.

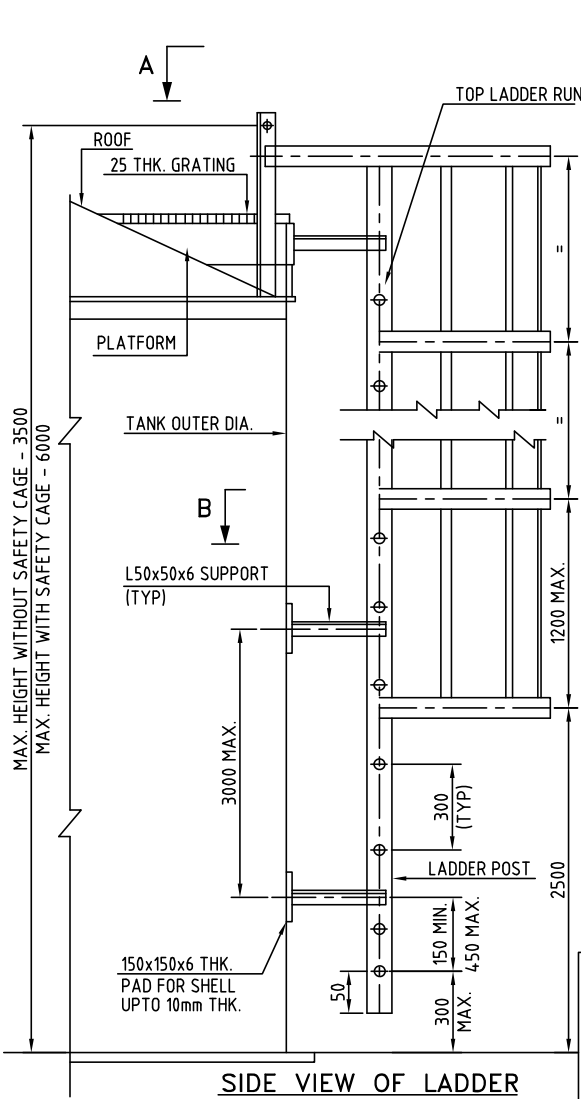
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MECHANICAL

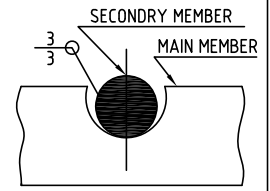
REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	04.09.2013	ISSUED AS STANDARD	IJ	KP	PD



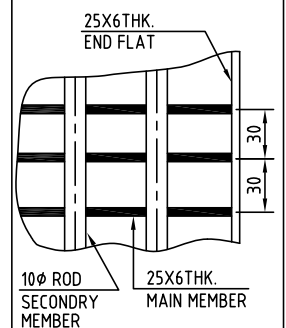
FRONT VIEW OF LADDER



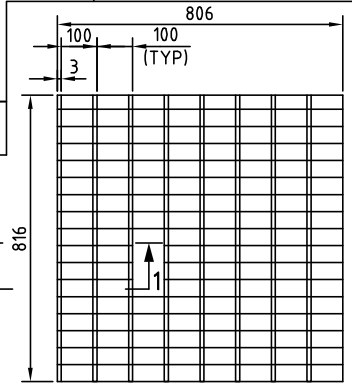
SIDE VIEW OF LADDER



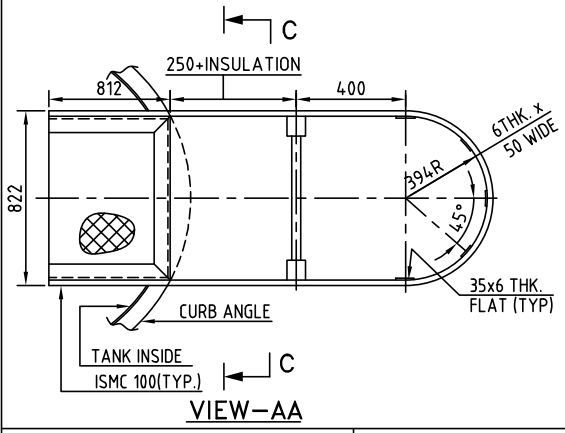
DETAIL -- D



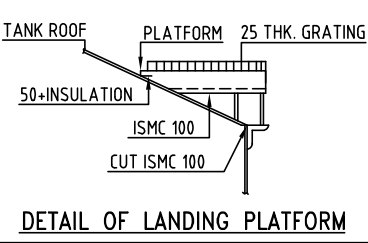
GRATING



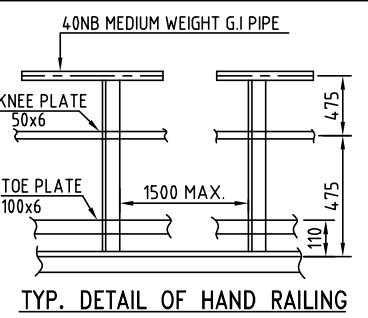
DETAIL OF GRATING



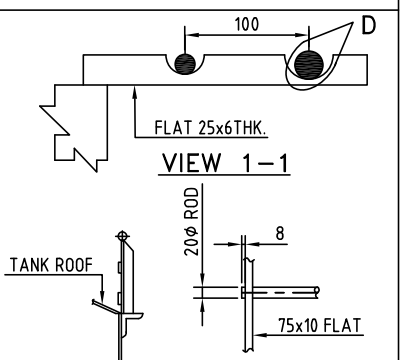
VIEW-AA



DETAIL OF LANDING PLATFORM

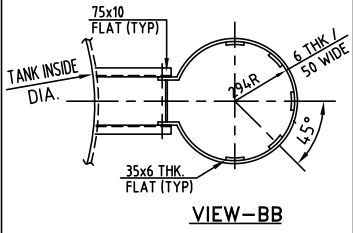


TYP. DETAIL OF HAND RAILING

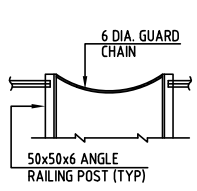


VIEW 1-1

ATTACHMENT OF LADDER RUNG TO LADDER POST



VIEW-BB



VIEW-CC

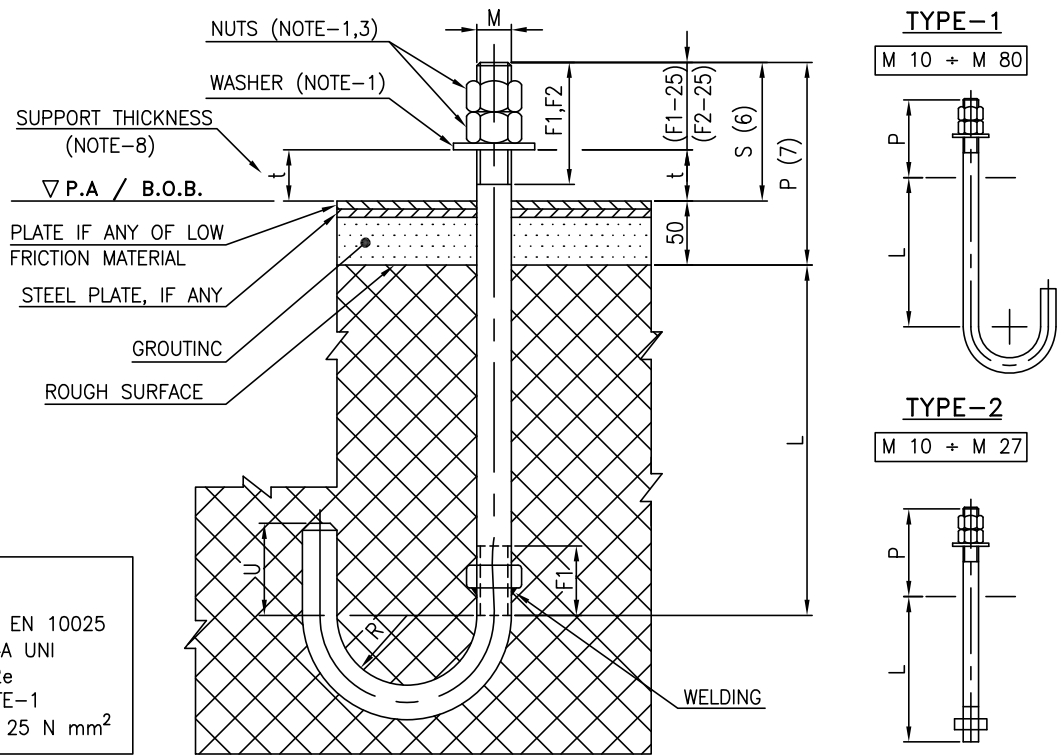
NOTES :-

1. ALL DIMENSIONS ARE IN MM.
2. FOR MATERIAL SPECIFICATION REFER ENGINEERING DRAWING.
3. IN CASE OF CONFLICT, ENGINEERING DRAWING SHALL GOVERN.

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	16.09.2013	ISSUED AS STANDARD	HJ	KPD	PD



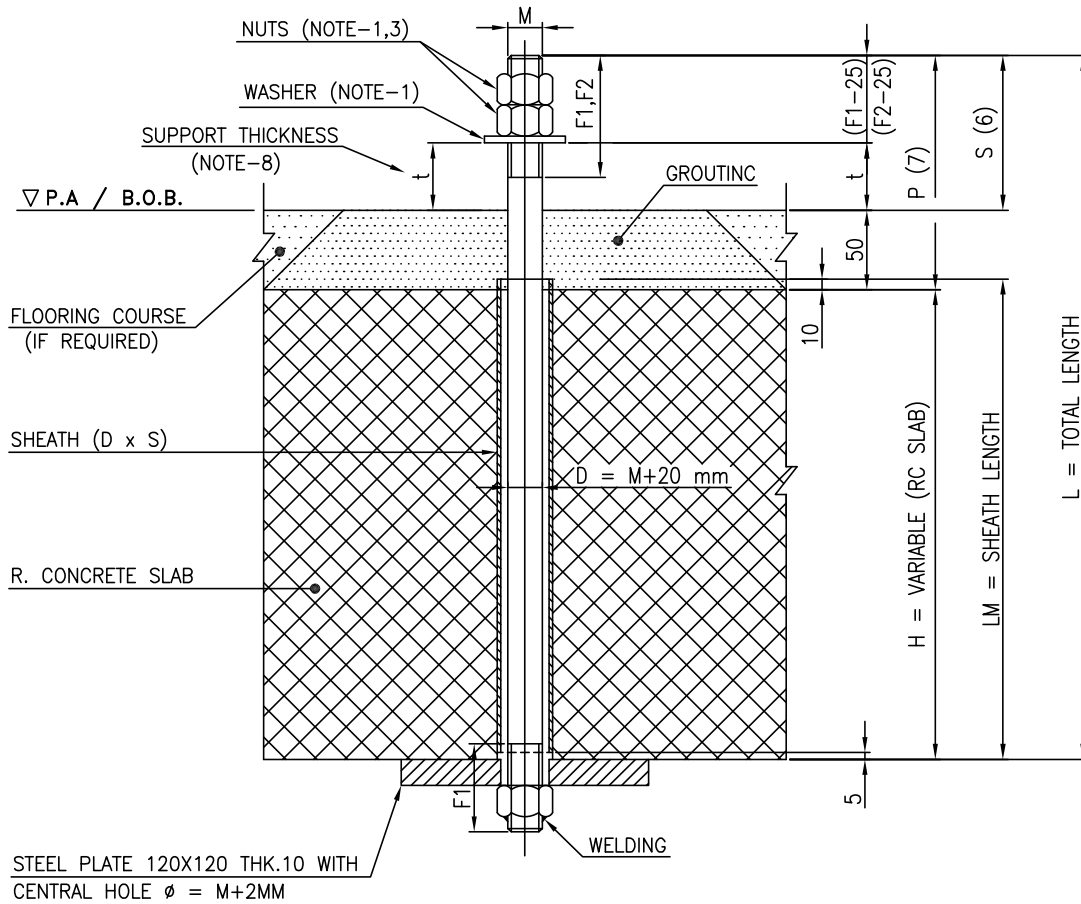
MATERIALS:
 ROD : Fe430B UNI EN 10025
 NUTS : CLASS MIN.4A UNI EN 20898/2e
 WASHERS : SEE NOTE-1
 CONCRETE : RCK ≥ 25 N mm²

DIMENSIONS							ALLOWABLE STRESSES IN kN (2)				MASS IN kg (5)	
BOLTS					WASHERS		SHEAR	TENSION		BOLTS TYPE-1	BOLTS TYPE-2	
M (1)	RESIST. SEC.AREA (4) CM ²	L (=20M)	R (=2.5M)	U (=4M)	(3) F1 (=1.5M+25)	(3) F2 (=2.5M+25)		øi x øe (1)	BOLTS TYPE-1			BOLTS TYPE-2
M10	0.58	200	25	40	40	50	11x21	6.5	9.2	5.0	0.29	0.23
M12	0.843	240	30	48	43	55	14x24	9.5	13.4	7.2	0.5	0.4
M14	1.15	280	35	56	46	60	16x28	12.9	18.4	9.8	0.7	0.6
M16	1.57	320	40	64	49	65	18x30	17.7	25.1	12.8000	1.1	0.8
M18	1.92	360	45	72	52	70	20x34	21.6	30.7	16.2000	1.5	1.2
M20	2.45	400	50	80	55	75	22x37	27.6	39.2	20.0	2.1	1.5
M22	3.03	440	55	88	58	80	24x39	34.2	48.4000	24.2	2.7	2.0
M24	3.53	480	60	96	61	85	26x44	39.8	56.4	28.8	3.5	2.6
M27	4.59	540	67.5	108	66	93	30x50	51.8	72.9	36.4	4.9	3.6
M30	5.61	600	75	120	70	100	33x56	63.3000	89.7	-	6.7	-
M33	6.94	660	82.5	132	75	108	36x60	78.4	108.9	-	8.8	-
M36	8.17	720	90	144	79	115	39x66	92.3	129.6	-	11.4	-
M39	9.76	780	97.5	156	84	123	42x72	110.2	152.1	-	14.4	-
M42	11.20	840	105	168	88	130	45x78	126.5	176.4	-	18.0	-
M45	13.10	900	112.5	180	93	138	48x84	148.0	202.5	-	22.0	-
M48	14.70	960	120	192	97	145	52x92	166.1	230.4	-	26.7	-
M52	17.60	1040	130	208	103	155	56x98	198.8	270.4	-	33.8	-
M56	20.30	1120	140	224	109	165	62x105	229.3	313.6	-	41.9	-
M60	23.60	1200	150	240	115	175	66x110	266.6	360.0	-	51.2	-
M64	26.80	1280	160	256	121	185	70x115	302.8	409.6	-	61.8	-
M68	30.60	1360	170	272	127	195	74x120	345.7	462.4	-	73.8	-
M72X6	34.80	1440	180	288	133	205	74x125	390.9	518.4	-	87.4	-
M80X6	43.40	1600	200	320	145	225	82x140	490.4	640.0	-	119.2	-

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	16.09.2013	ISSUED AS STANDARD	HJ	KPD	PD



TYPE-3

NOTES:

- LENGTH AND DIAMETER OF BOLT AND SHEATH SHALL BE DEFINED RESPECTIVELY ON THE BASIS OF THE SLAB THICKNESS AND STRESSES.
- SHEATH SHALL BE FABRICATED AS INDICATED ON DRAWING AND SUPPLIE BY CIVIL WORKS CONTRACTOR.

MATERIALS:

- STEEL SHEATH OR PLASTIC SHEATH

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	16.09.2013	ISSUED AS STANDARD	HJ	KPD	PD

NOTES:

- STANDARD CHARACTERISTICS:
PLAIN WASHERS : M12 TO M68 ACCORDING TO UNI 6593, M72 TO M80 ACCORDING TO UNI 6592.
THREADS : ACCORDING TO UNI 4534.
STANDARD NUTS : M12 TO M68 ACCORDING TO UNI 5592, M72 TO M80 ACCORDING TO UNI 5588.

EQUIVALENT MATERIALS AND SIZES STANDARDIZED BY ANY OTHER RECOGNIZED BUREAU MAY ALSO BE ACCEPTED.

- THE INDICATED VALUES REFER TO SHEAR OR TENSION STRESSES WITH ALLOWABLE UNIT STRESSES
 $\sigma_{am}=160 \text{ N/mm}^2$ and $\tau_{am} =113 \text{ N/mm}^2$.
IN CASE OF COMBINED STRESS, THE VERIFICATION SHALL BE CARRIED OUT USING THE FORMULA BELOW:

$$\left(\frac{\tau}{\tau_{am}}\right)^2 + \left(\frac{\sigma}{\sigma_{am}}\right)^2 \leq 1$$

- F1 AND F2 ARE THE THREADED LENGTHS RESPECTIVELY USED FOR 1 OR 2 NUTS. TWO NUTS SHALL ALWAYS BE PROVIDED, EXCEPT WHERE OTHERWISE INDICATED.
- FOR RESISTANT SECTION AREA SEE UNI 4534.
- WEIGHT CALCULATED ON THE BASIS OF P = 50 + F2 (2NUTS + WASHER FOR TYPE 1 AND 3 NUTS + WASHER FOR TYPE 2)

DESIGN BASIS:

- NUMBER AND DIAMETER OF BOLTS
 - TYPE OF BOLTS
 - "P" PROJECTION OF BOLTS OR "S" PROTRUSION OF BOLTS (*)
 - NUMBER OF NUTS (ONE OR TWO)
- (*) S = BOLT PROTRUSION FROM P.A. / B.O.B.
P.A. = EQUIPMENT SUPPORTING PLANE.
B.O.B. = BOTTOM ELEVATION OF SUPPORT (COLUMN) BASE PLATE.
- $S = t + (F1 \text{ OR } F2) - 25$
 - $P = 50 + S$
 - t = SUPPORT THICKNESS COMPREHENSIVE OF THE PLATE THICKNESS AND THAT OF THE CENTERING PLATE.
(WHEN IT IS PROVIDED)

RULES FOR ANCHOR BOLT INSTALLATION:

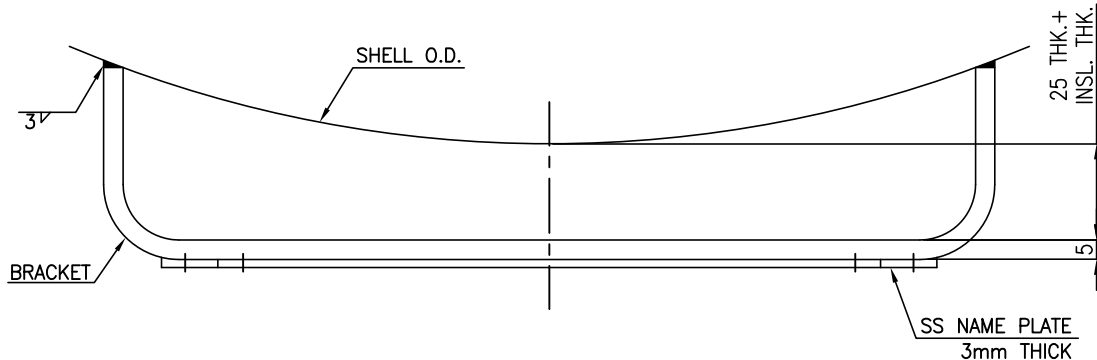
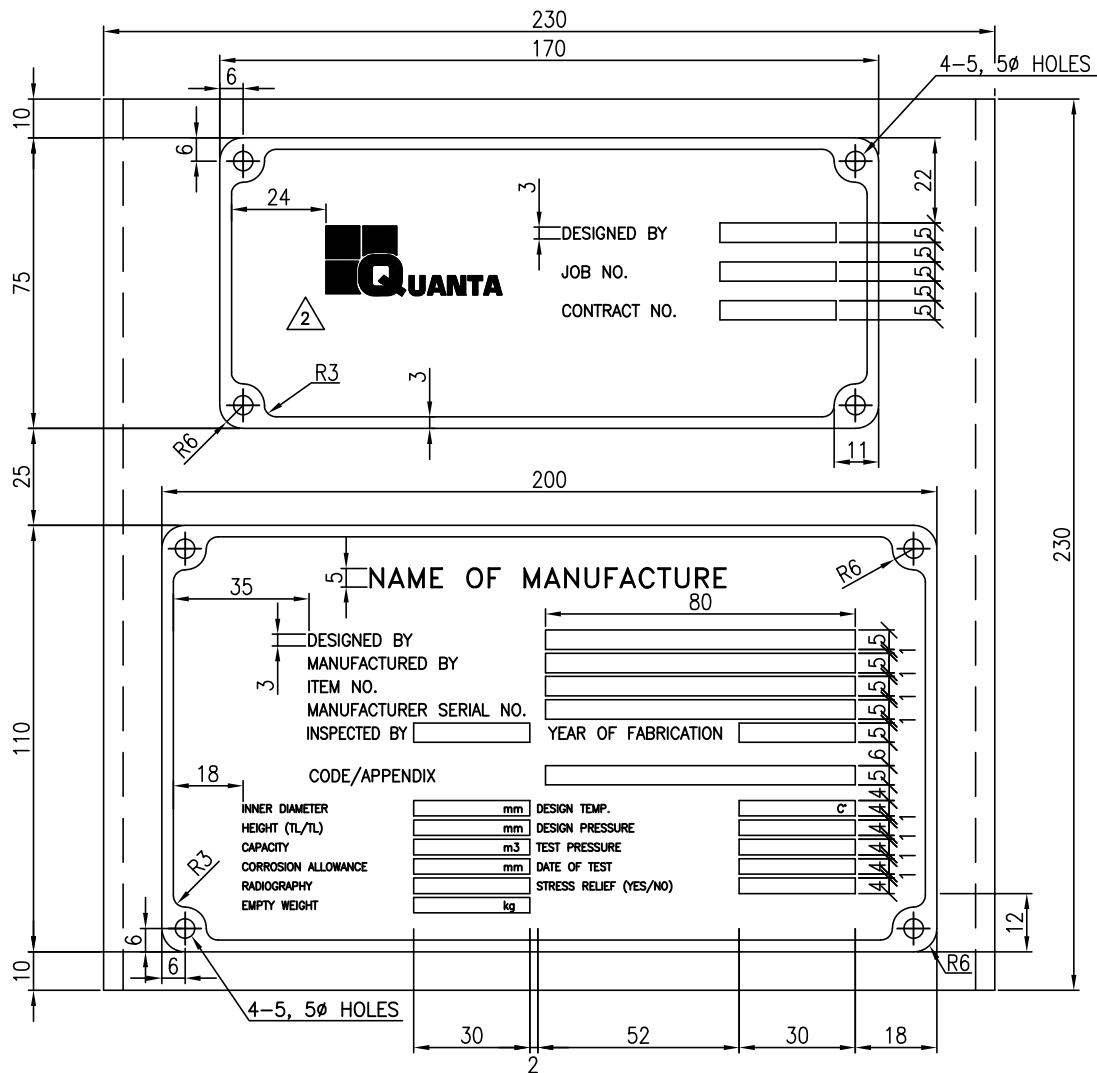
- BOLTS SHALL BE CAST IN PLACE WHEN PERFORMING CASTING. IN SPECIAL CASES, POSITION TEMPLATES WITH SET HOLES SHALL BE USED AT THE ANCHOR BOLTS.
- WHEN BOLT BOXES ARE PROVIDED IN THE CASTING, THE BOLTS SHALL BE INSTALLED AT THE SAME TIME AS THE EQUIPMENT.

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SHEET 3 OF 3

MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
1	15.02.2016	ISSUED AS STANDARD	AD	AD	PD
2	24.01.2018	REVISED AS MARKED	AD	AB	AB



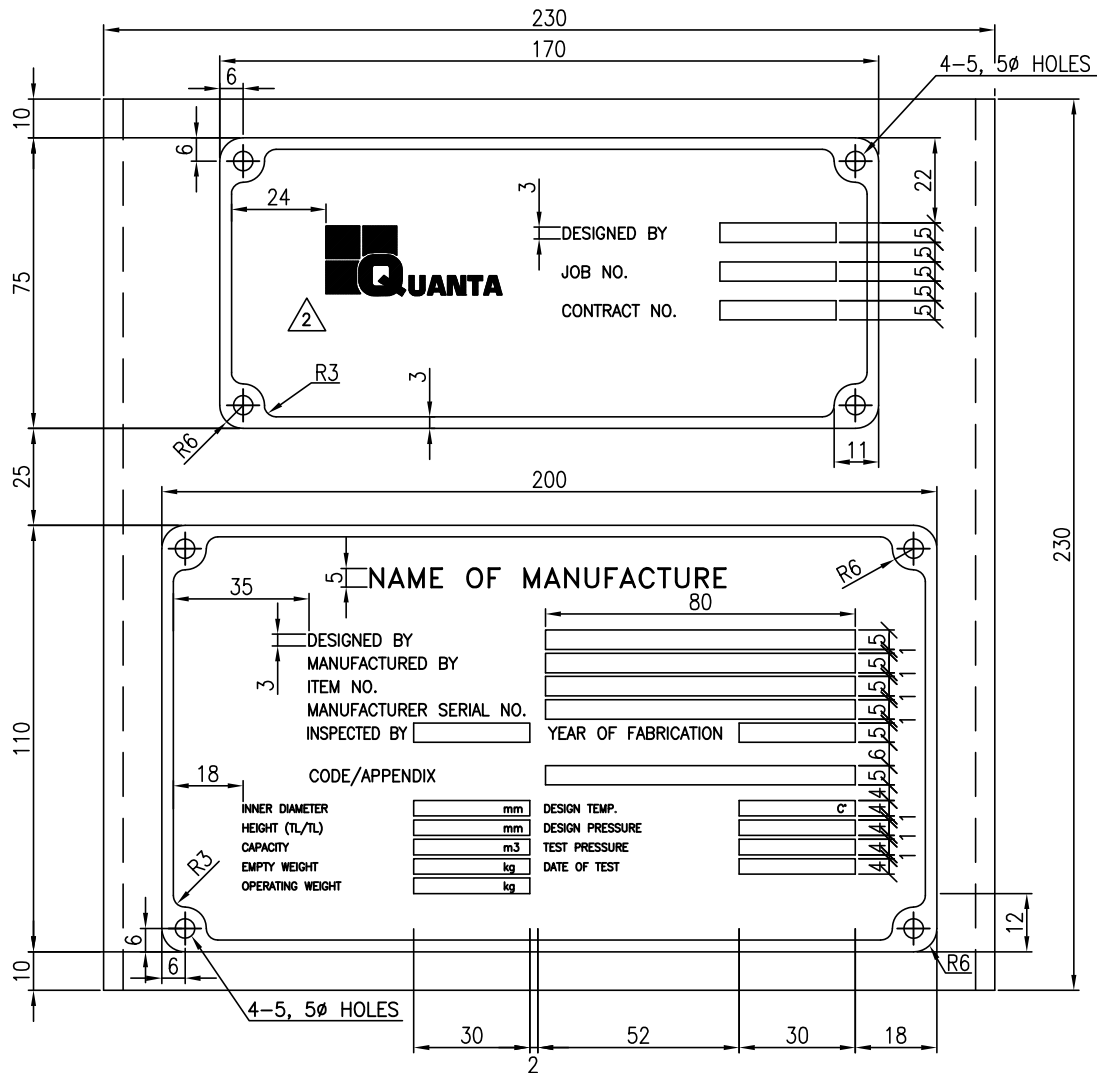
NOTES:

1. ALL LETTERS, BLOCKS AND BORDER SHALL BE RAISED POLISHED FACE.
2. BACKGROUND TO BE BLACK.
3. ALL DIMENSION ARE IN MM UNLESS OTHERWISE STATED.
4. NAME PLATES MAY BE RIVED WITH S.S. RIVETS OR TACK WELDED TO BRACKET.
5. BRACKET MATERIAL SHALL BE SAME AS SHELL MATERIAL.
6. THE NAME PLATE MATERIAL SHALL BE SS304.
7. THE NAME PLATE BRACKET SHALL BE LOCATED ON THE TANK SHELL NEAR TO STAIRWAY ENTRANCE AT 0.5/0.75 Mtr. FROM BOTTOM OF TANK.

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
1	15.02.2016	ISSUED AS STANDARD	AD	AD	PD
2	24.01.2018	REVISED AS MARKED	AD	AB	AB



NOTES:

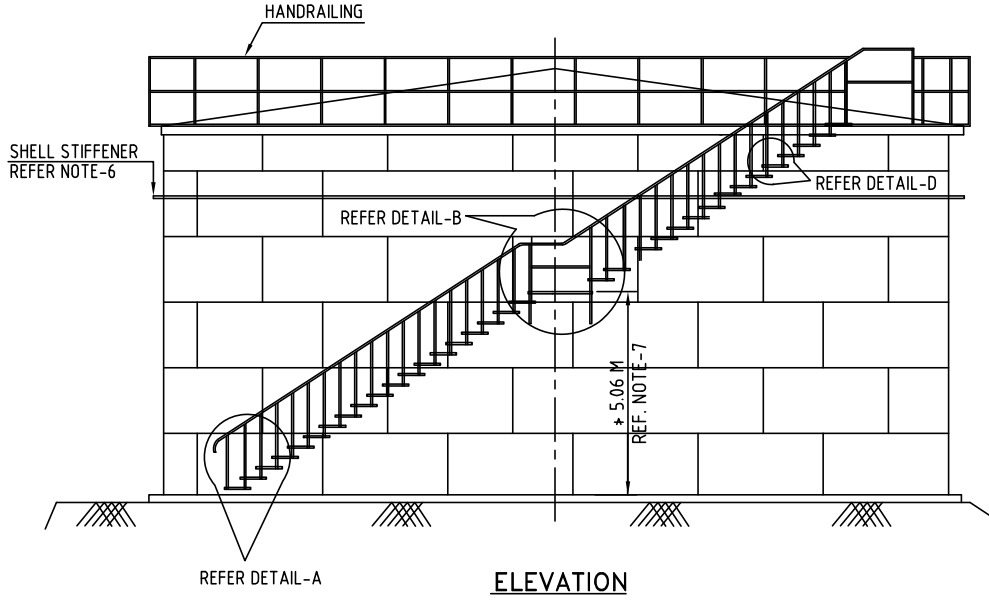
1. ALL LETTERS, BLOCKS AND BORDER SHALL BE RAISED POLISHED FACE.
2. BACKGROUND TO BE BLACK.
3. ALL DIMENSION ARE IN MM UNLESS OTHERWISE STATED.
4. NAME PLATES MAY BE RIVED WITH S.S. RIVETS OR TACK WELDED TO BRACKET.
5. BRACKET MATERIAL SHALL BE SAME AS SHELL MATERIAL.
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7. THE NAME PLATE BRACKET SHALL BE LOCATED ON THE TANK SHELL NEAR TO STAIRWAY ENTRANCE AT 0.5/0.75 M FROM BOTTOM OF TANK.

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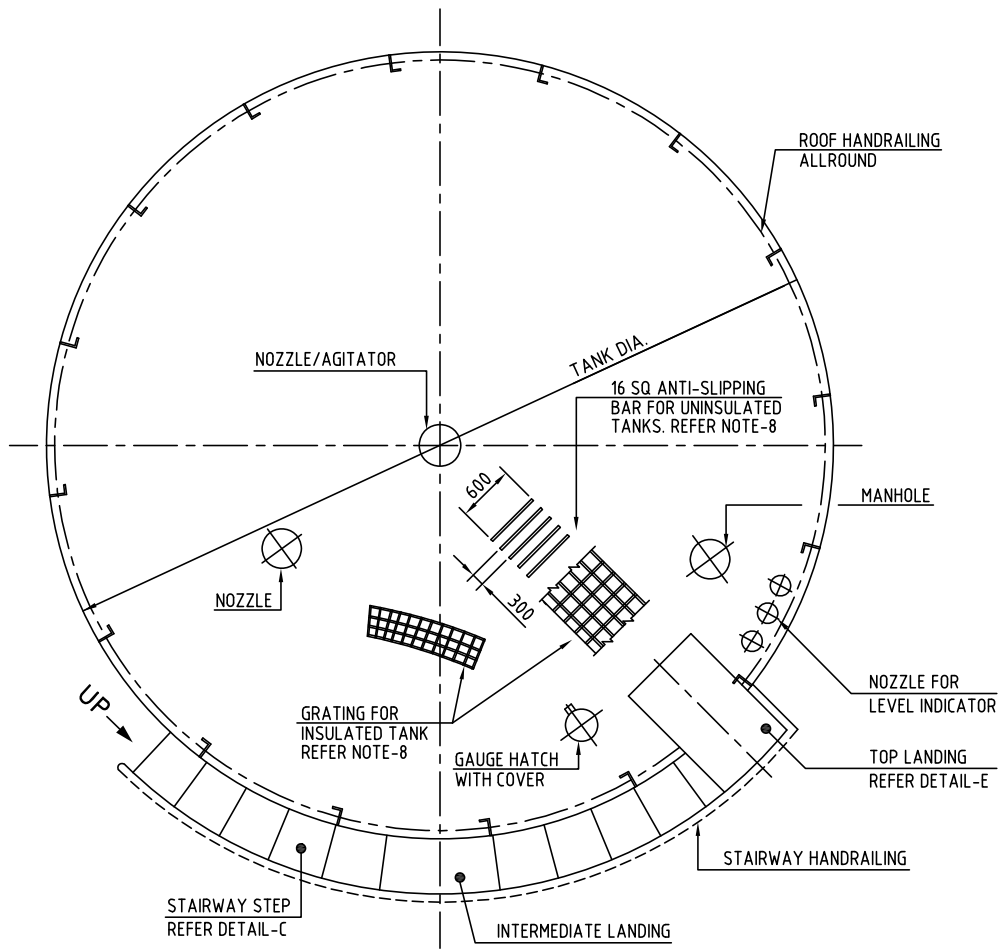
	TITLE: NAME PLATES (FOR FRP TANKS)	STANDARD NO.	REV.
		MC - STD - 412	2

MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	19.09.2013	ISSUED AS STANDARD	IJ	KP	PD



ELEVATION

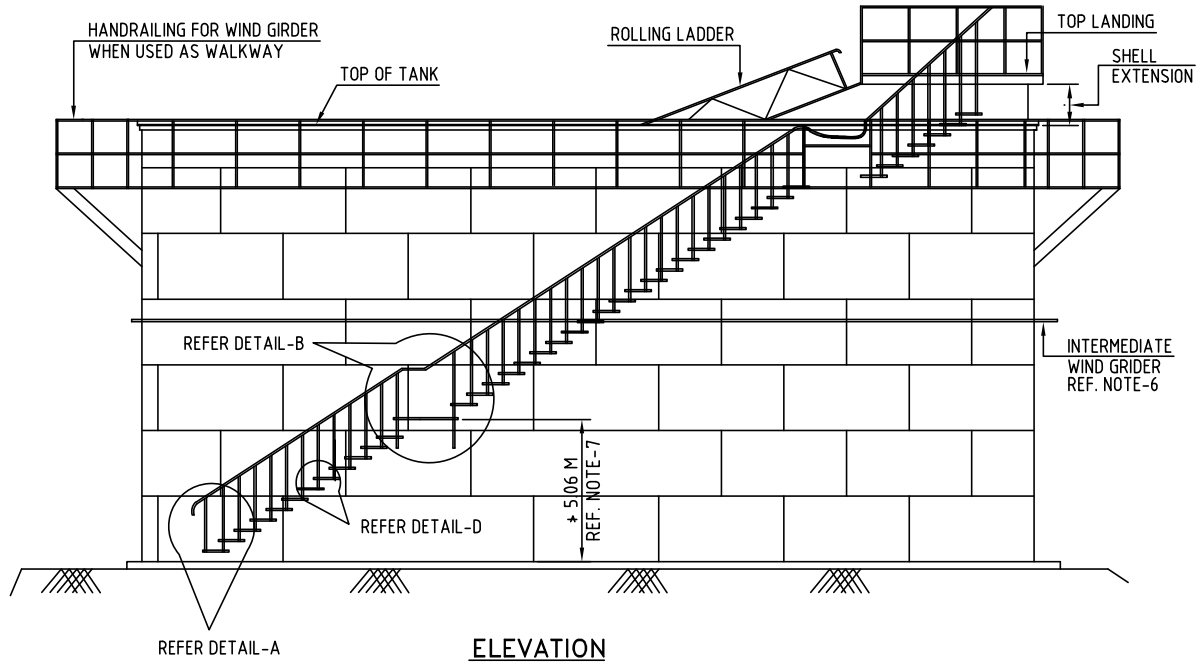


PLAN
(FIXED ROOF TANKS)

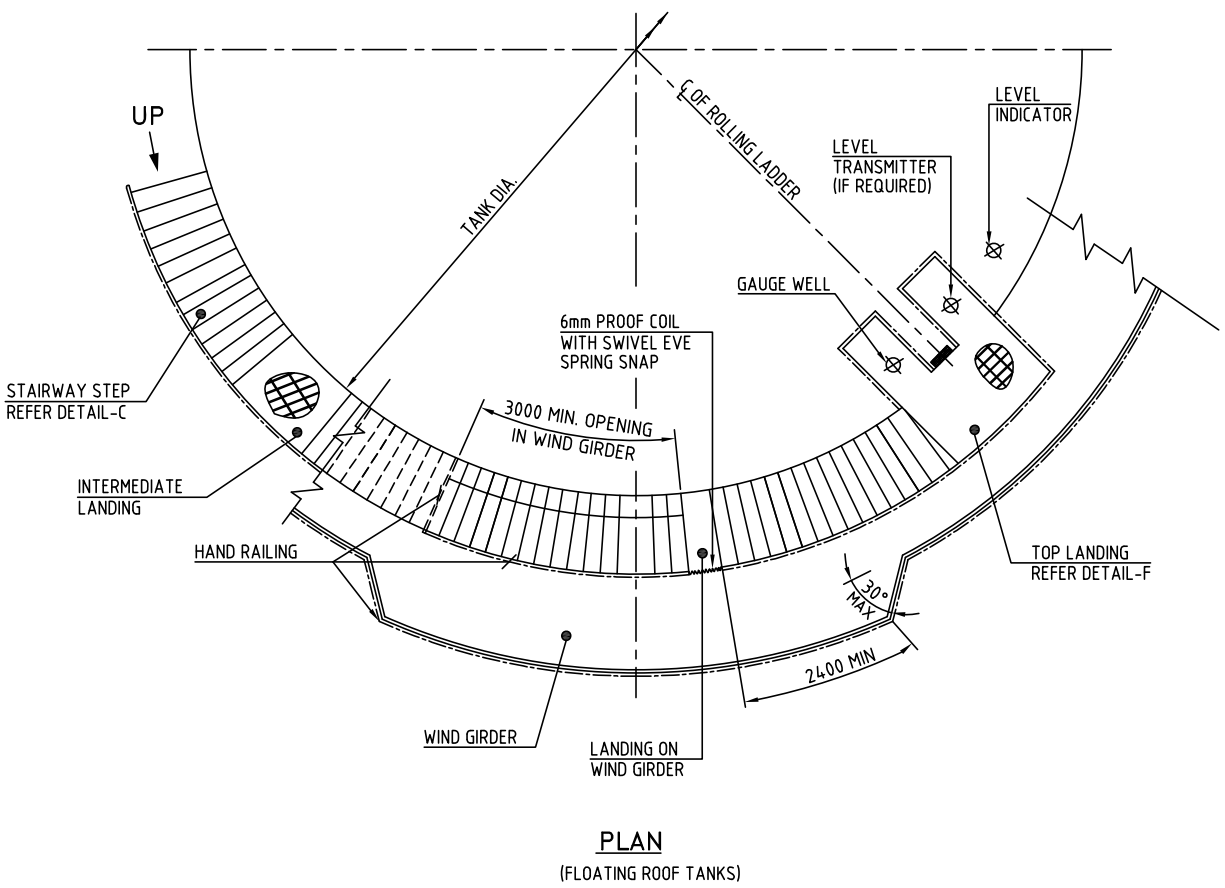
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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	19.09.2013	ISSUED AS STANDARD	IJ	KP	PD



ELEVATION

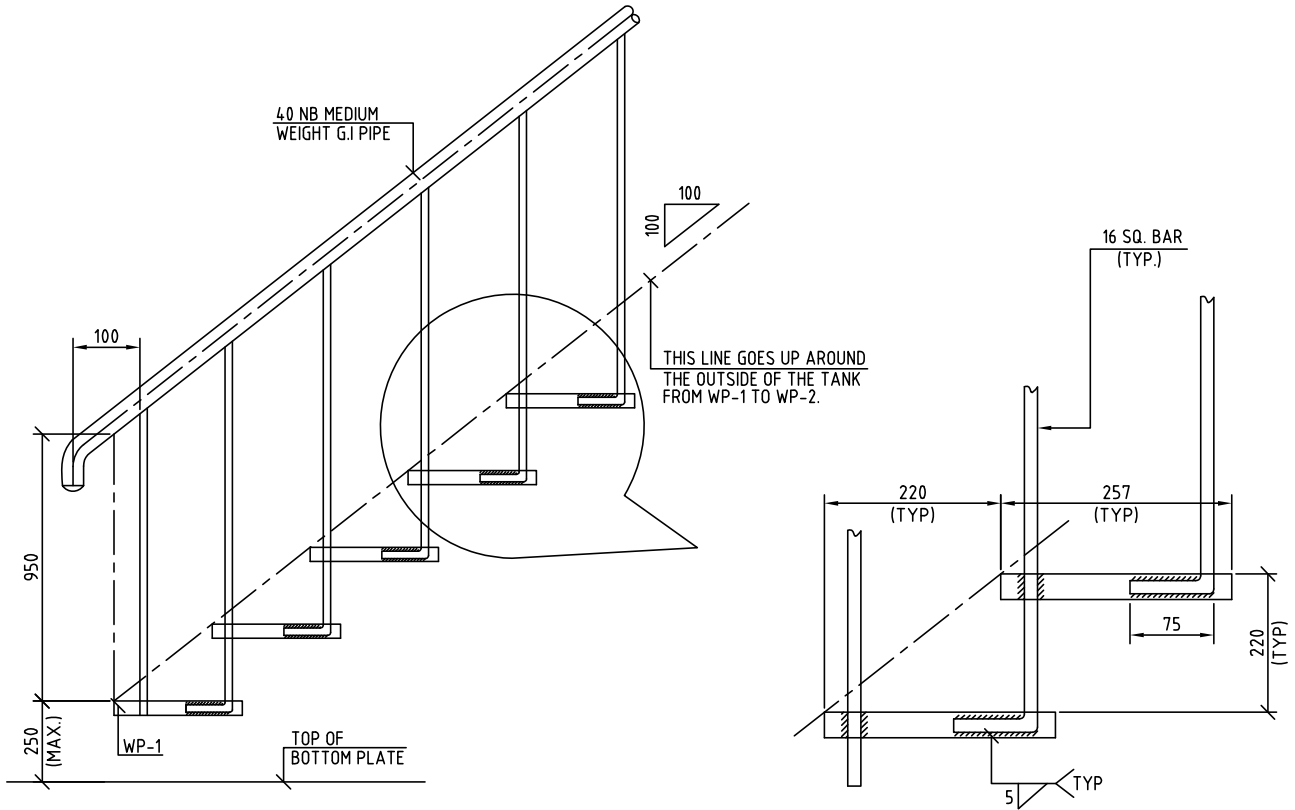


PLAN
(FLOATING ROOF TANKS)

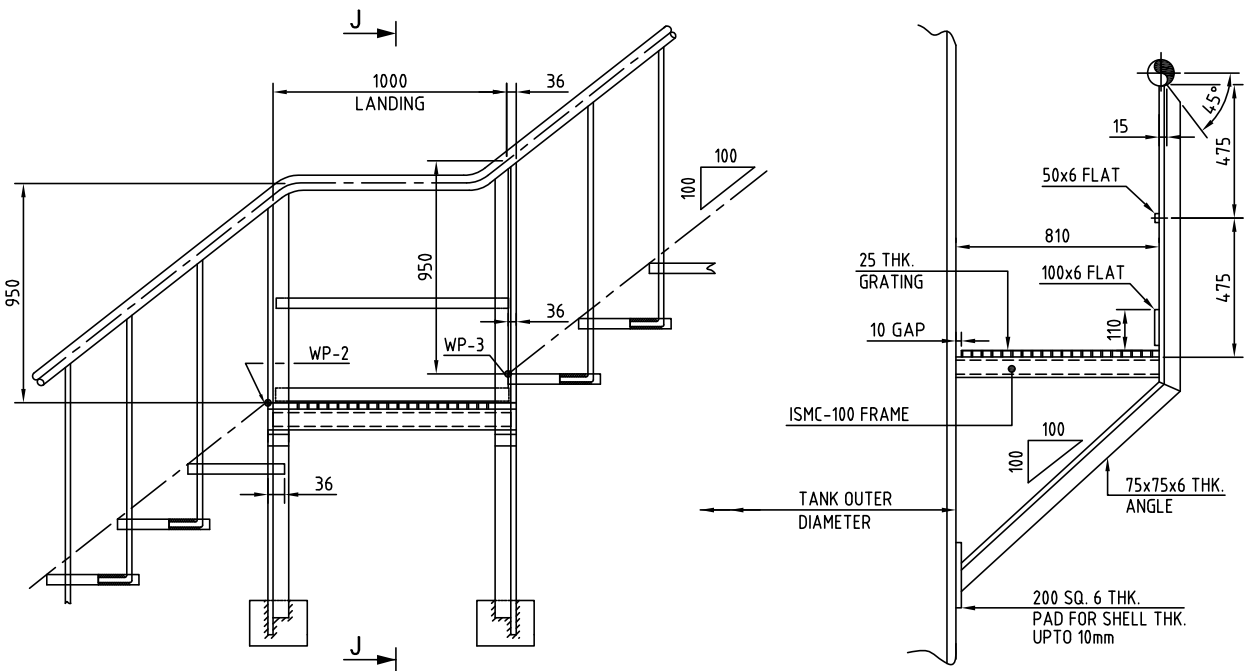
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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	19.09.2013	ISSUED AS STANDARD	IJ	KP	PD



DETAIL - A



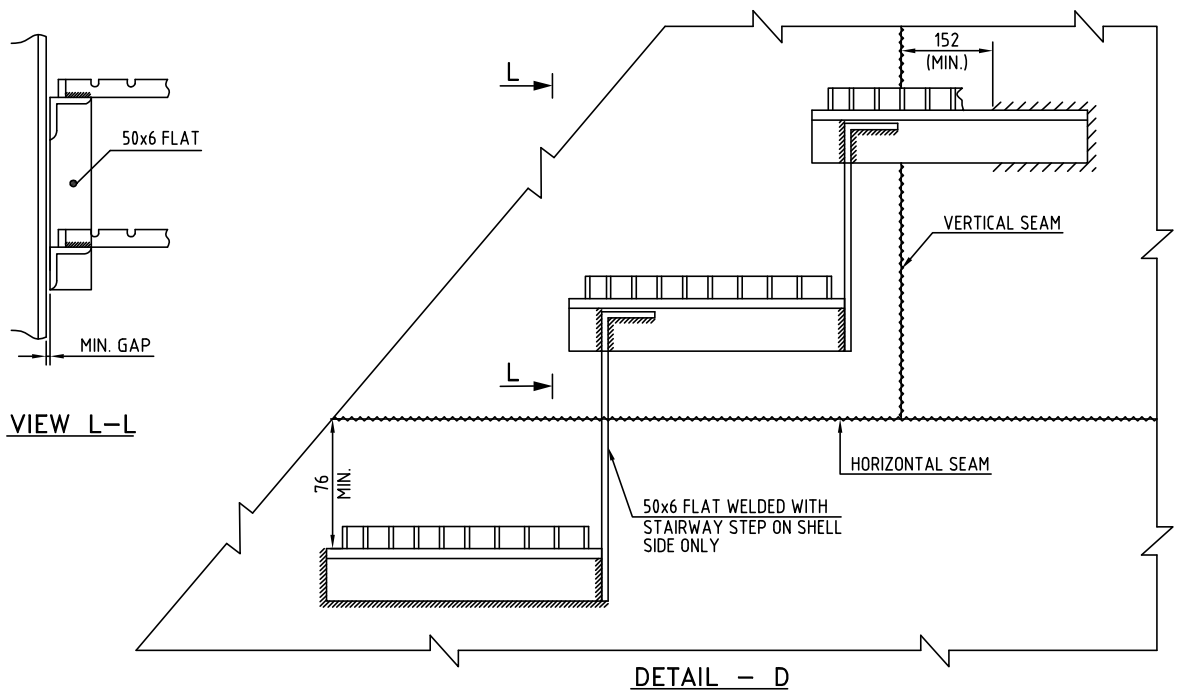
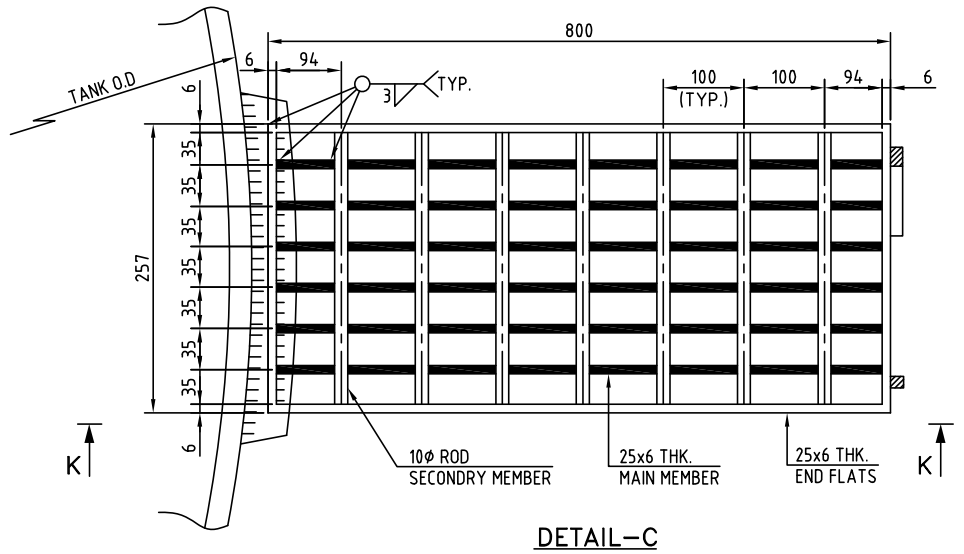
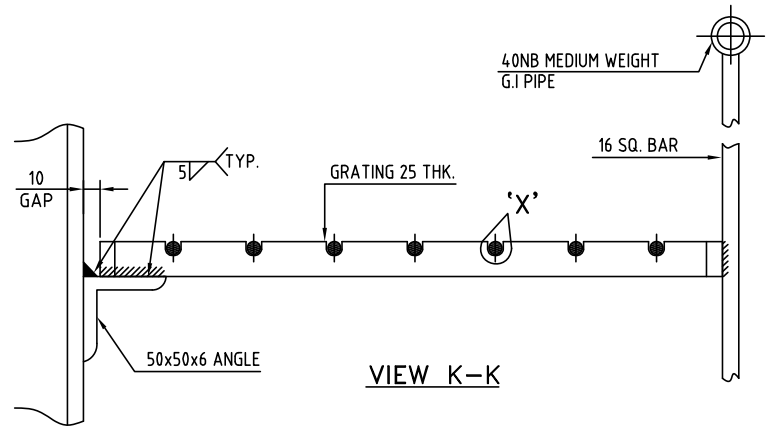
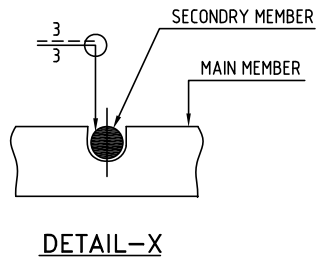
DETAIL - B
INTERMEDIATE LANDING

SECTION J-J

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
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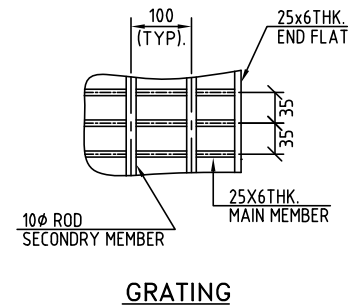
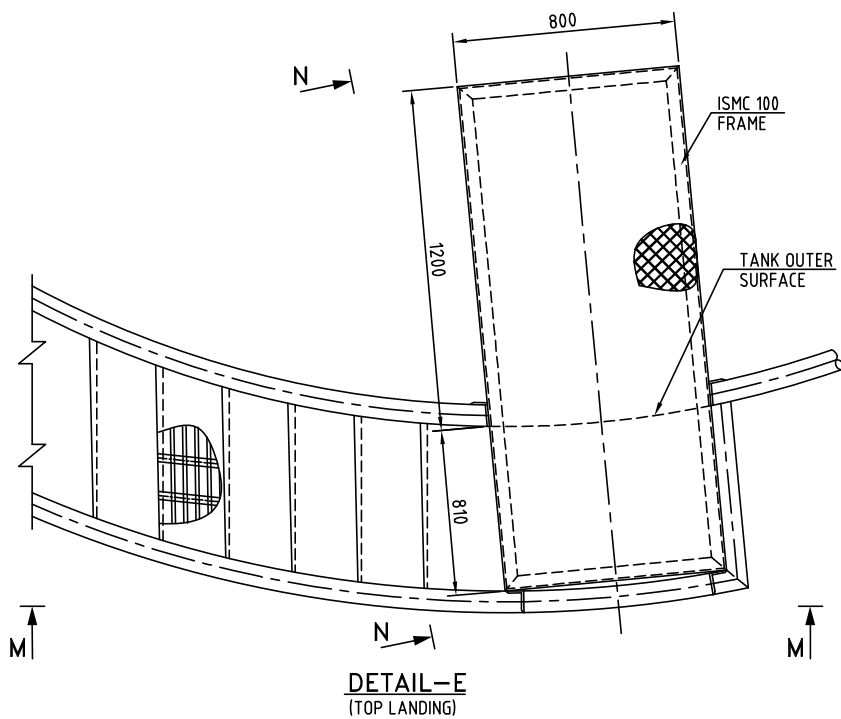
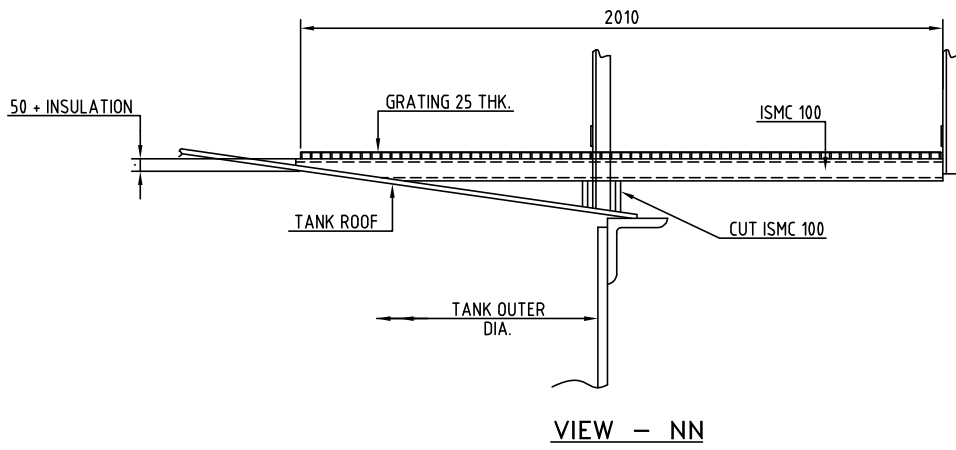
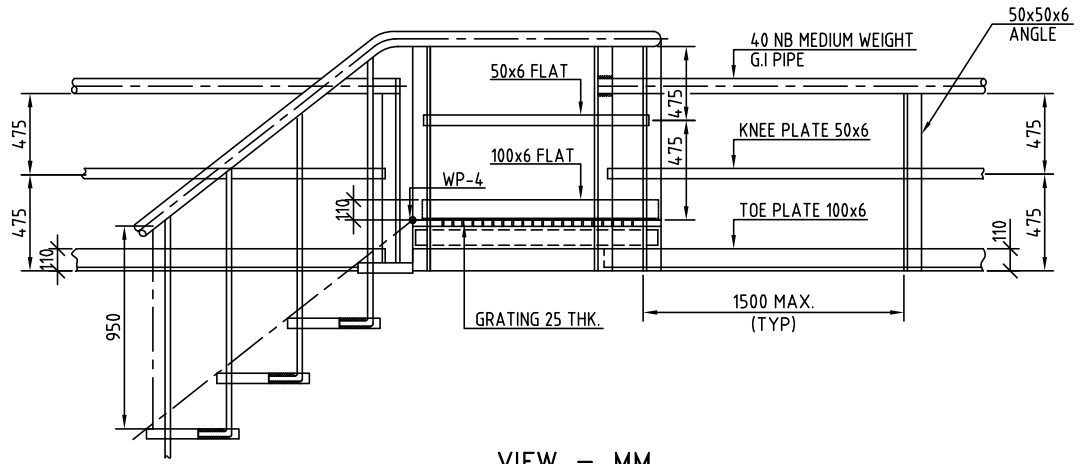
(TYP. VIEW SHOWING STAIRWAY STEPS TO SHELL ATTACHMENT NEAR WELD SEAMS)

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SHEET 4 OF 7

MECHANICAL

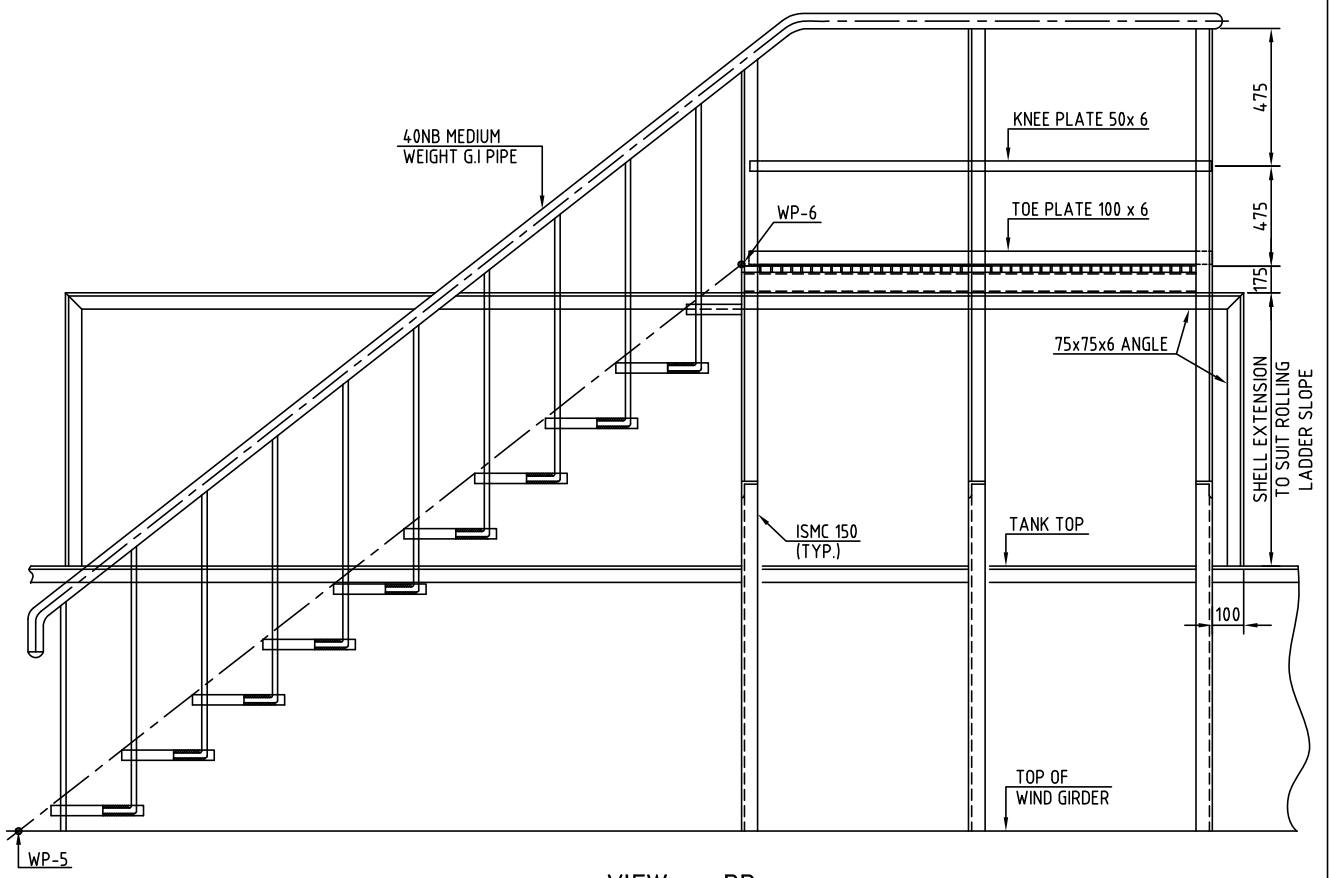
REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	19.09.2013	ISSUED AS STANDARD	IJ	KP	PD



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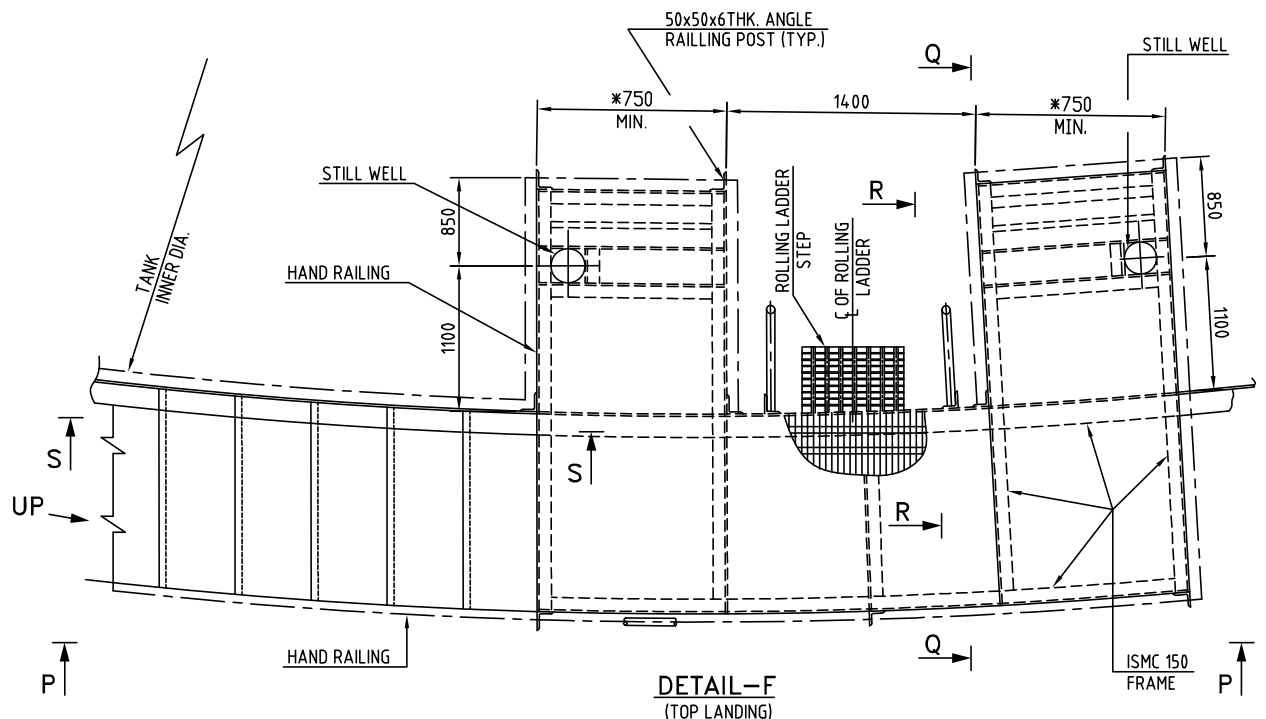
MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	19.09.2013	ISSUED AS STANDARD	IJ	KP	PD



VIEW - PP

FOR SEC. QQ, RR, & SS
REFER SHEET 7 OF 7



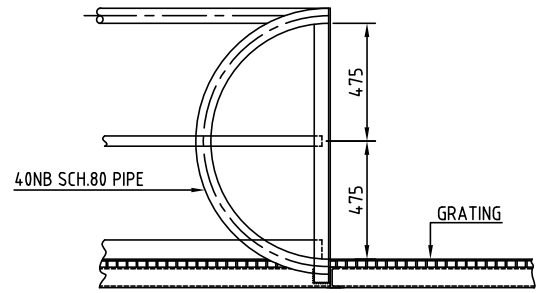
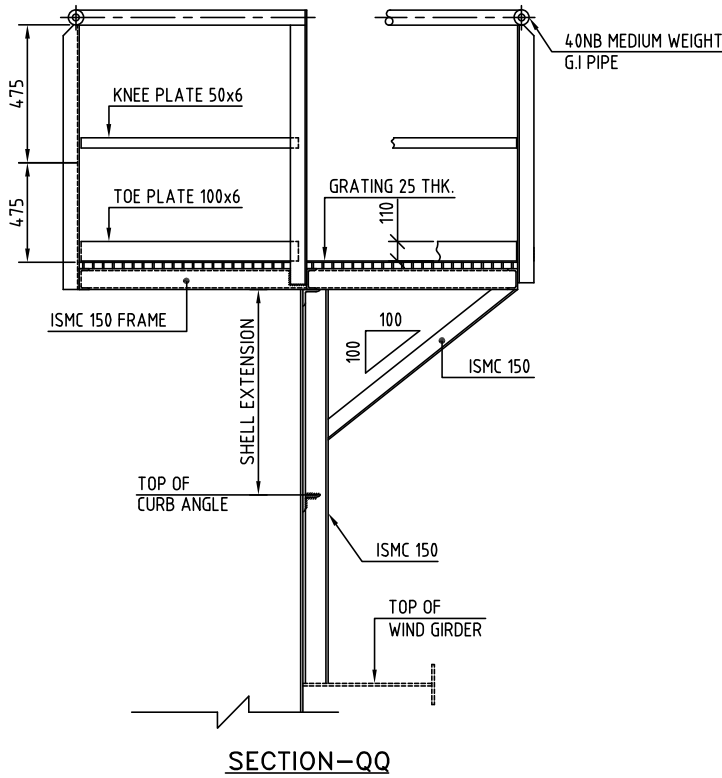
DETAIL-F
(TOP LANDING)

* : STILL WELL PIPE/FLANGE DD.
+500 (750 MIN.)

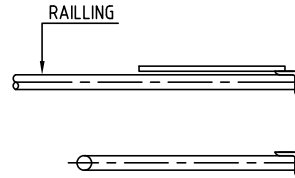
THIS DRAWING IS THE PROPERTY OF QUANTA PROCESS SOLUTIONS PVT. LTD. DISCLOSURE TO ANY THIRD PARTY OR DUPLICATION IS NOT PERMITTED.

MECHANICAL

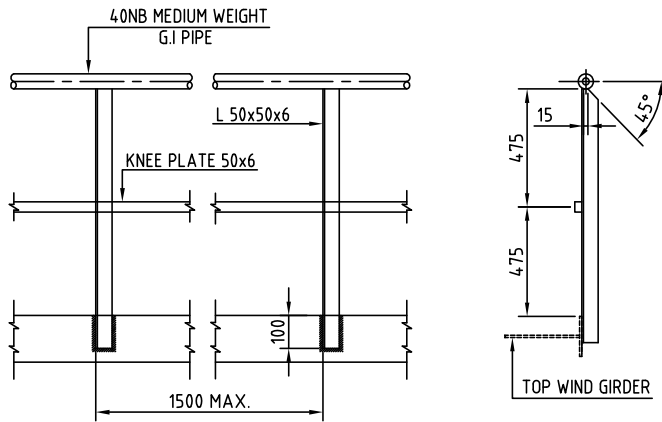
REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	19.09.2013	ISSUED AS STANDARD	IJ	KP	PD



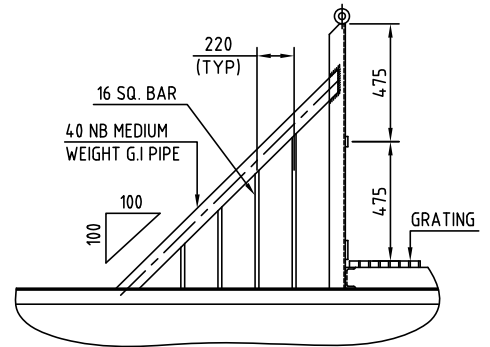
SECTION-RR



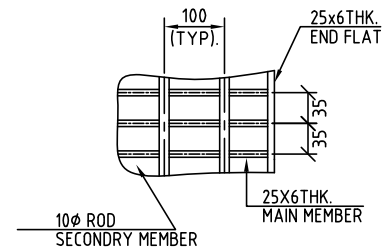
PLAN



TYP. HANDRAILING DETAIL FOR WIND GIRDER



SECTION-SS



TYP. DETAIL OF PLATFORM GRATING

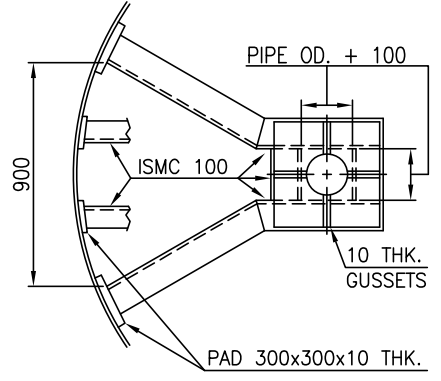
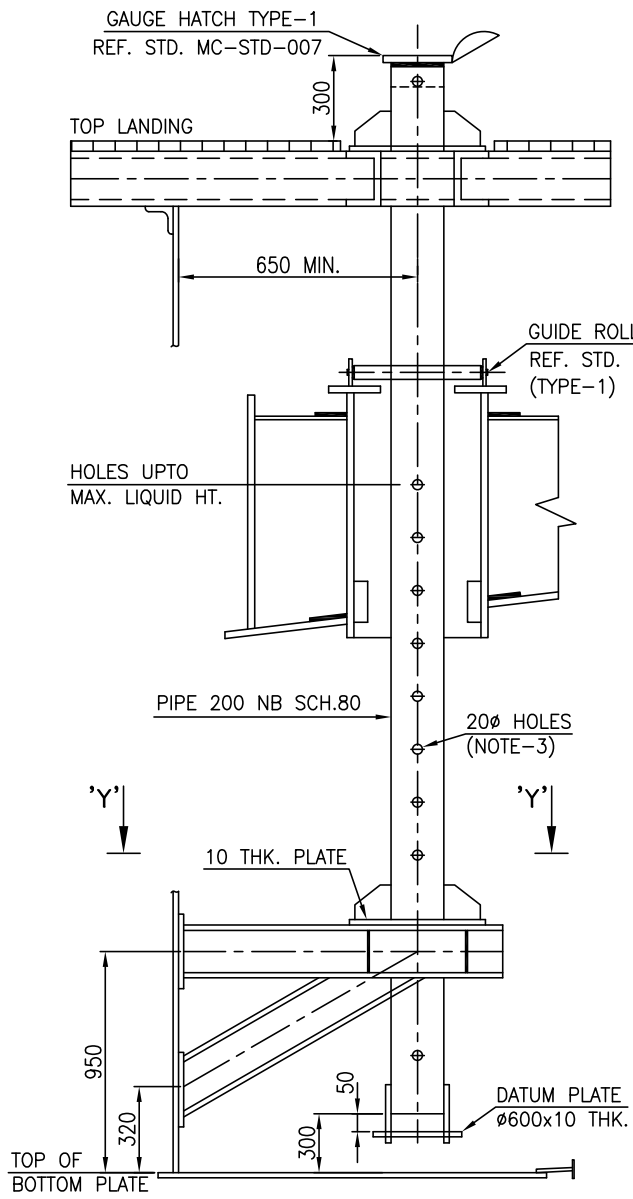
NOTE :-

1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE STATED.
2. FOR MATERIAL SPECIFICATION REFER ENGINEERING DRAWING/TENDER.
3. ALL FILLET WELDS SHALL BE 6mm CONTINUOUS UNLESS OTHERWISE SHOWN.
4. IN CASE OF CONFLICT, ENGINEERING DRAWING SHALL GOVERN.
5. SUITABLE OPENING SHALL BE MADE IN RAILING ON CONE ROOF TANKS IF MAINTENANCE PLATFORM FOR FORM SYSTEM IS PROVIDED.
6. WIND GIRDER/STIFFENERS EXTENDING UP TO 152 FROM OUTSIDE OF SHELL DO NOT REQUIRED ANY OPENING IN WIND GIRDER/STIFFENER.
7. INTER LANDING PLATFORM SHALL BE LOCATED IN SUCH A WAY THAT THEY ARE EQUISPACED, HOWEVER THE HEIGHT BETWEEN THEM SHALL NOT EXCEED THE LIMIT GIVEN IN THIS STANDARD.
8. ANTI-SLIPPING BARS/GRATING TO BE PROVIDED FOR APPROACH TO NOZZLES ON THE ROOF.

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	27.08.2013	ISSUED AS STANDARD	HJ	KPD	PD



VIEW Y-Y

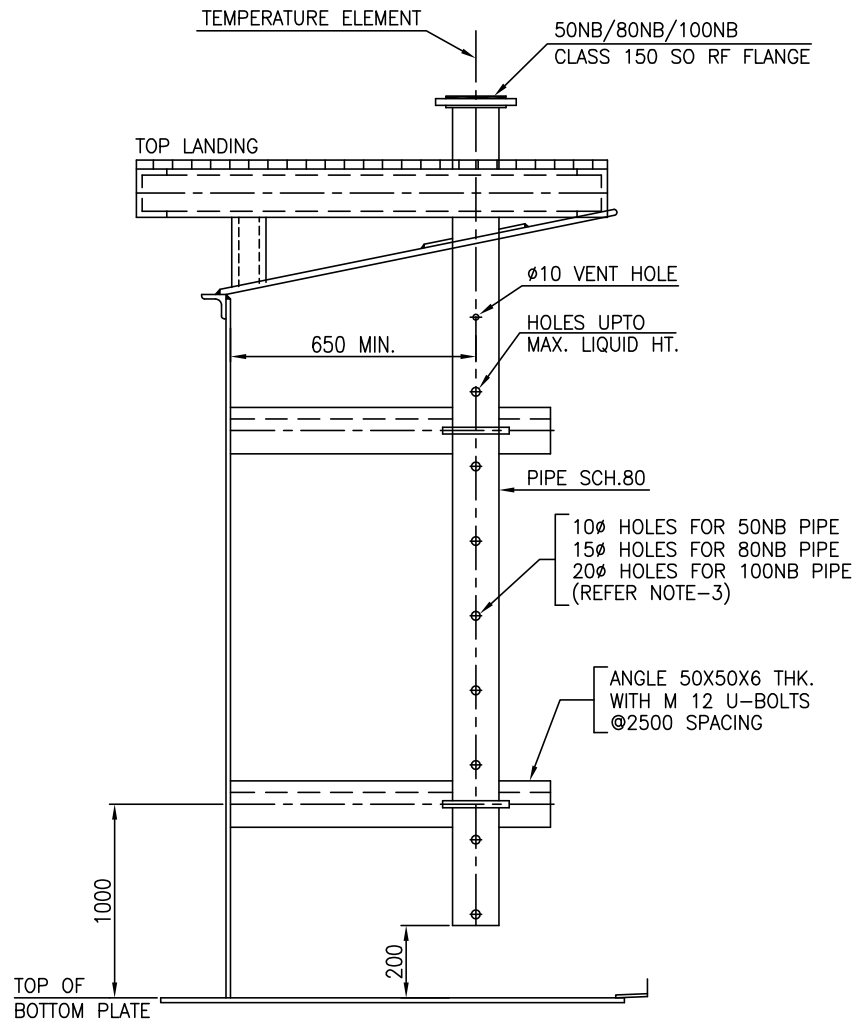
NOTES:

1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE STATED.
2. STILLWELL SHALL BE IN TRUE VERTICAL POSITION AFTER HYDROTESTING.
3. ALL HOLES @ 500 ALTERNATE VERTICAL SPACING.
4. ALL MATERIALS SHALL BE AS PER ENGINEERING DRAWING.
5. STILL - WELL TOLERANCES :-
 - a) OUTSIDE SURFACES OF THE PIPE MAY BE OUT OF ALIGNMENT / STRAIGHTNESS NOT MORE THAN 1 mm PER METER LENGTH, BUT NOT MORE THAN 15 mm FOR ANY LENGTH.
 - b) STILL-WELL VERTICALITY SHALL BE WITHIN 1 mm PER METER OF STILL-WELL HEIGHT BUT NOT MORE THAN 15 mm FOR ANY HEIGHT.
6. GUIDE ROLLER ASSEMBLY MUST BE IN POSITION DURING HYDROTEST.

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	31.08.2013	ISSUED AS STANDARD	HJ	KPD	PD



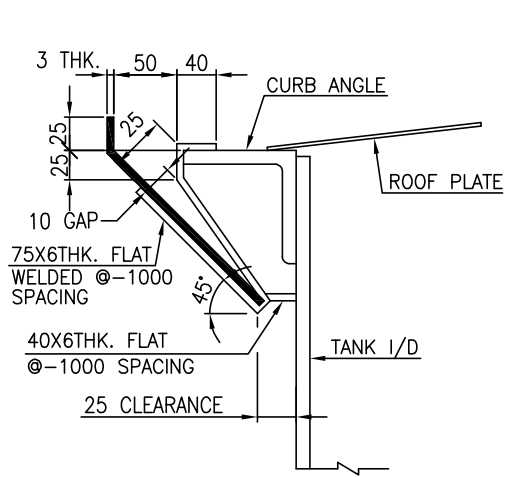
NOTES:

1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE STATED.
2. STILLWELL SHALL BE IN TRUE VERTICAL POSITION AFTER HYDROTESTING.
3. ALL HOLES @ 500 ALTERNATE VERTICAL SPACING.
4. ALL MATERIALS SHALL BE AS PER ENGINEERING DRAWING.
5. STILL - WELL TOLERANCES :-
 - a) OUTSIDE SURFACES OF THE PIPE MAY BE OUT OF ALIGNMENT / STRAIGHTNESS NOT MORE THAN 1 mm PER METER LENGTH, BUT NOT MORE THAN 15 mm FOR ANY LENGTH.
 - b) STILL-WELL VERTICALITY SHALL BE WITHIN 1 mm PER METER OF STILL-WELL HEIGHT BUT NOT MORE THAN 15 mm FOR ANY HEIGHT.

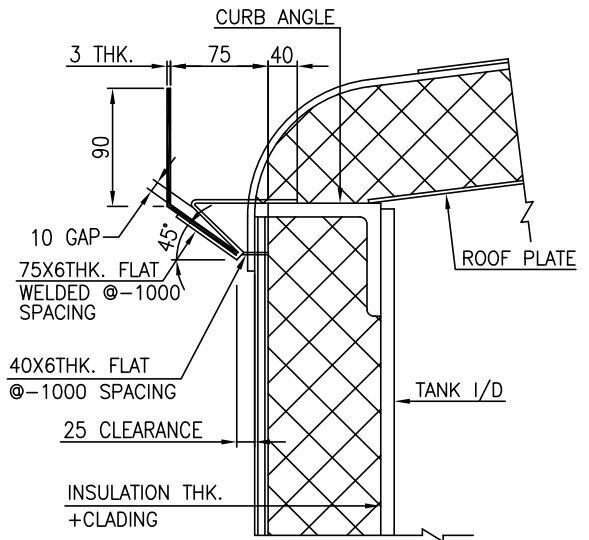
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MECHANICAL

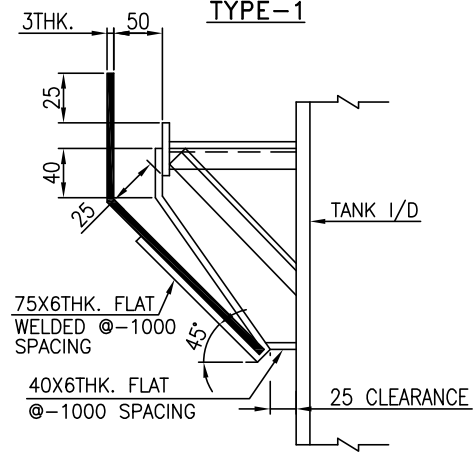
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0	05.09.2013	ISSUED AS STANDARD	HJ	KPD	PD



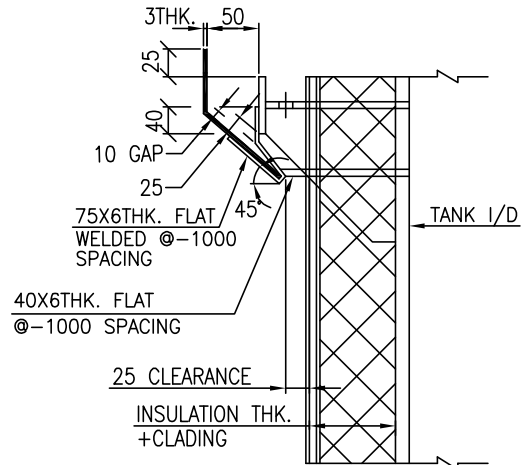
TYPE-1



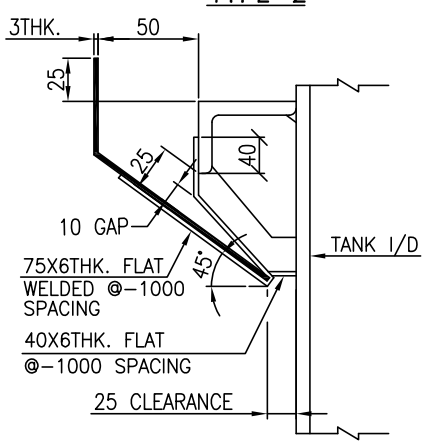
TYPE-1A



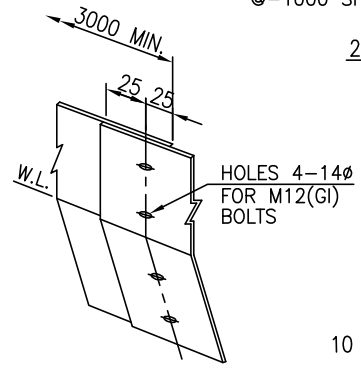
TYPE-2



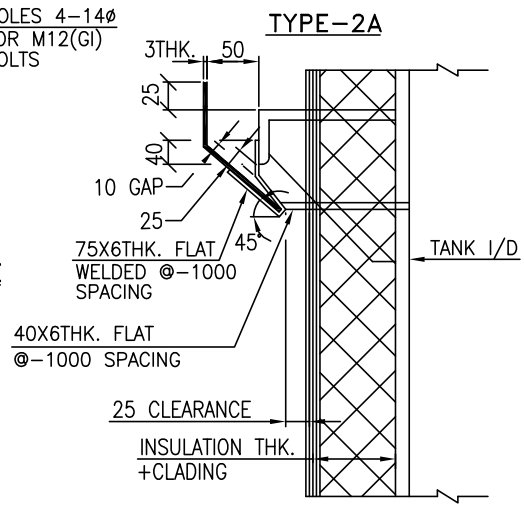
TYPE-2A



TYPE-3



TYP. DETAIL OF DEFLECTOR PLATE LAP JOINT



TYPE-3A

NOTES:

1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE STATED.
2. DEFLECTOR PLATE TO BE NOTCHED AT SITE TO CLEAR WATER SPRAY RISER PIPE/FOAM NOZZLE.
3. DEFLECTOR PLATES TO BE DISCONTINUED WHERE IT INTERFERES WITH STAIRWAY.
4. MATERIAL SHALL BE IS-2062 GR. A/B (GALVANIZED).
5. DEFLECTOR PLATE SHALL BE FABRICATED TO SUIT CURVATURE OF SHELL O.D. BEFORE GALVANIZING.
6. WELDING IF ANY ON DEFLECTOR PLATE SHALL BE CARRIED OUT BEFORE GALVANIZING.

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	11-07-19	ISSUED AS STANDARD	MV	MV	RP

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SPECIFIED OTHERWISE.
2. GENERAL NOTES ARE PART OF THE STANDARDS NO. (MC-STD-440) SH. 1 TO 11. FOR CONE ROOF OF NON-PRESSURISED STORAGE TANKS.
3. FOLLOWING LOADS HAVE BEEN CONSIDERED FOR DESIGN OF ROOF SUPPORTING STRUCTURE.
 - a] LIVE LOAD @125 kg/m² AS PER IS:803 (INCLUDES PARTIAL NEGATIVE PRESSURE OF 50 kg/m²)
 - b] WEIGHT OF 8MM THICK ROOF PLATES
 - c] SELF WEIGHT OF SUPPORTING STRUCTURE.
4. TEMPERATURE DIFFERENCE UPTO ±20°C FROM THE CYLINDRICAL SHELL TEMPERATURE HAS BEEN CONSIDERED FOR THE DESIGN OF ROOF STRUCTURE.
5. ROOF PLATES ARE CONSIDERED TO BE FREELY RESTING OVER THE RAFTERS AND WELDED TO THE TOP RING OF THE TANK.
6. ALL STRUCTURE STEEL SHALL CONFIRM TO IS:2062 GRB.
7. ROOF PLATES FOR TANKS WITH DIAMETER LESS THAN 2.5m SHALL BE SELF SUPPORTING. (NO RAFTERS REQUIRED)
8. ALL CONNECTIONS SHALL HAVE STRENGTH NOT LESS THAN 75% OF THE FULL MEMBER STRENGTH.
9. WELDING OF ROOF STRUCTURE TO BE COMPLETED BEFORE INSULATION OF ROOF PLATE.
10. CURB ANGLE TO BE PROVIDED INSIDE OR OUTSIDE THE TANK SHALL BE AS PER MECHANICAL DATA SHEET (MDS)
11. OVERALL ORIENTATION OF THE ROOF STRUCTURE TO BE DECIDED BY FABRICATOR AVOIDING FOULING BETWEEN NOZZLES AND RADIAL RAFTERS.
12. GUSSET PLATES SHALL BE 10MM THICK FOR TANKS WITH DIA >10 MM.
13. WHEREVER THREE SECONDARY RAFTERS ARE SUPPORTED ON A CROSS GIRDER, SUITABLE PACK PLATE SHALL BE PROVIDED UNDER THE MIDDLE RAFTER.

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DISCLOSURE TO ANY THIRD PARTY OR DUPLICATION IS NOT PERMITTED.

SHEET 1 OF 11



MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	11.07.2019	ISSUED AS STANDARD	MV	MV	RP

TABLE FOR FORCES

SR. No.	TANK DIA. (m)	MAIN RAFTER REACTIONS		CURB ANGLE			REMARKS
		VERT. (T)	HORZ. (T)	AXIAL FORCE(T)	B.M. IN HORZ. PLANE (Tcm)	B.M. IN HORZ. PLANE (Tcm)	
1	2.5 < DIA ≤ 4.50	0.30	0.60	2.0	--	2.38	DRG. SH. 3 OF 11
2	4.5 < DIA ≤ 6.00	0.43	0.84	2.6	--	3.20	
3	6.0 < DIA ≤ 8.00	0.77	2.14	5.3	0.83	3.91	DRG. SH. 4 OF 11
4	8.0 < DIA ≤ 10.00	0.98	3.30	6.3	0.88	4.41	DRG. SH. 5 OF 11
5	10.0 < DIA ≤ 12.00	1.90	1.20	3.4	0.69	0.79	DRG. SH. 6 OF 11
6	12.0 < DIA ≤ 15.00	3.20	1.20	3.9	2.43	1.91	DRG. SH. 7 OF 11
7	15.0 < DIA ≤ 17.00	4.70	1.20	4.4	1.34	0.83	DRG. SH. 8 OF 11 9 OF 11
8	17.0 < DIA ≤ 20.00	--	--	--	--	--	DRG. SH. 10 OF 11 11 OF 11

NOTES:

1. MAIN RAFTER SUPPORTS TO BE SUITABLY DESIGNED FOR THE FORCES LISTED ABOVE.
2. CURB ANGLE FORCES LISTED ABOVE ARE BASED ON THE ANALYSIS OF ROOF SUPPORTING STRUCTURE. MECHANICAL DEPT. TO CONSIDER THESE FORCES FOR FINALIZING THE CURB ANGLE SIZE.

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SHEET 2 OF 11



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TITLE:

STRUCTURAL
ARRANGMENT OF CONE ROOF

STANDARD NO.

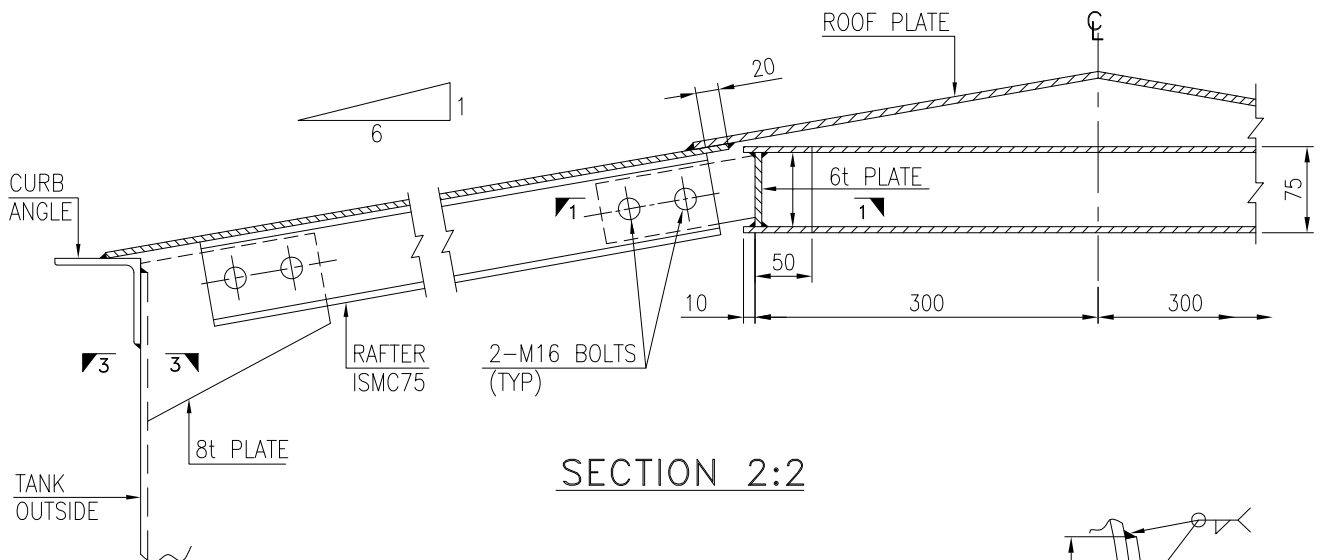
MC – STD – 440

REV.

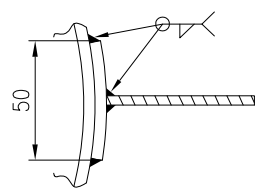
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MECHANICAL

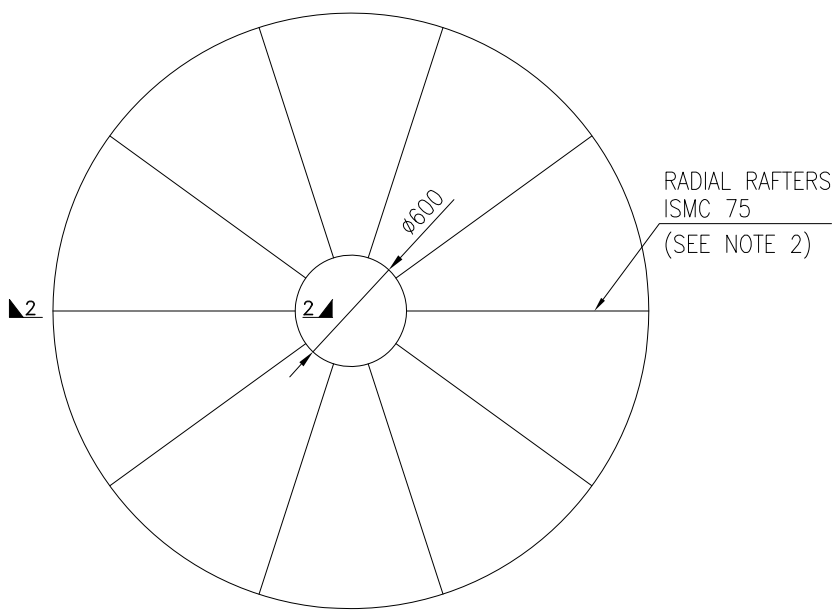
REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	11-07-19	ISSUED AS STANDARD	MV	MV	RP



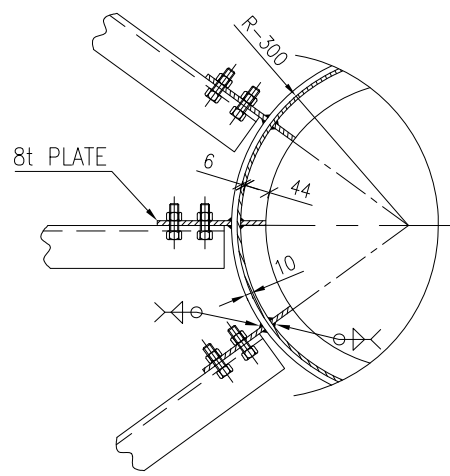
SECTION 2:2



SECTION 3:3



PLAN



SECTION 1:1

WT. OF ROOF STR. FOR
6.0 m DIA TANK = 0.3T

2.5m ≤ DIA ≤ 6.00m

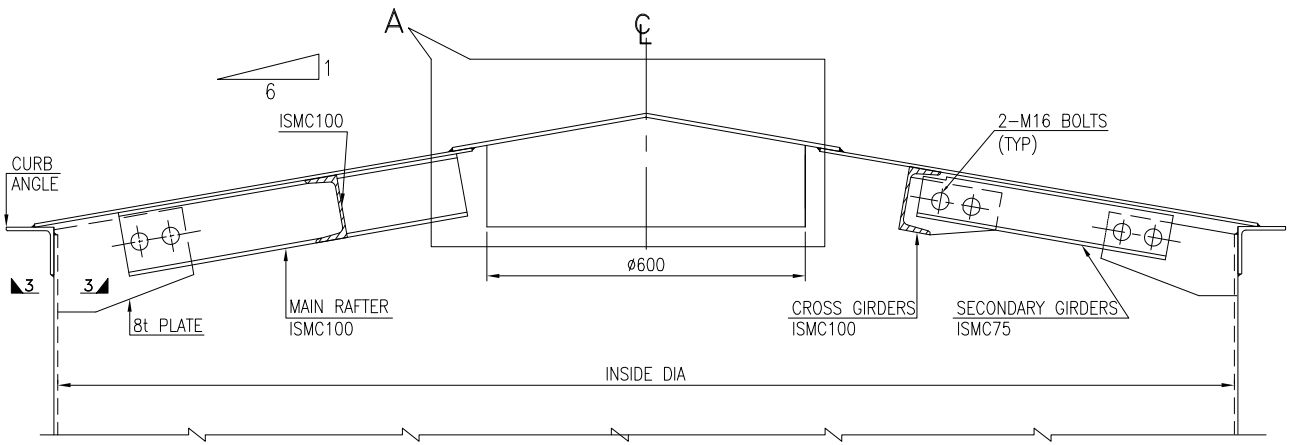
NOTES:

1. FOR GENERAL NOTES REFER SH. 1 OF 11.
2. FOR 2.5 Mtr. DIA 6Nos. RAFTERS & 6.0m DIA 12 Nos. RAFTERS SHALL BE PROVIDED; FOR TANKS OF INTERMEDIATE DIAMETERS. THE NO. OF RAFTERS SHALL BE WORKED OUT BY LINER INTERPOLATION.
3. FOR CURB ANGLE SIZE REFER FABRICATION DRAWING OF TANK.

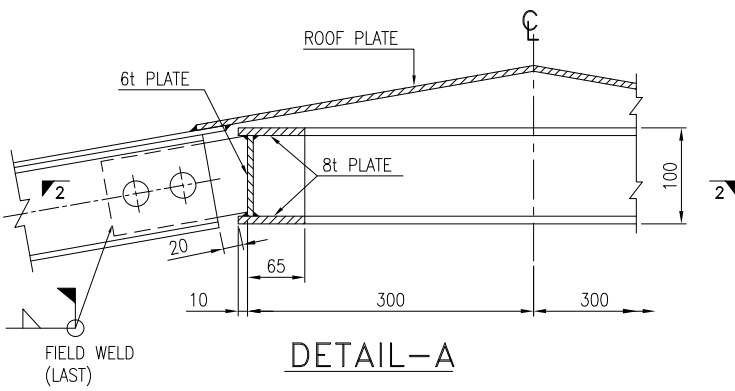
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MECHANICAL

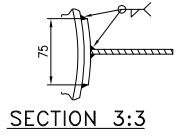
REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	11.07.2019	ISSUED AS STANDARD	MV	MV	RP



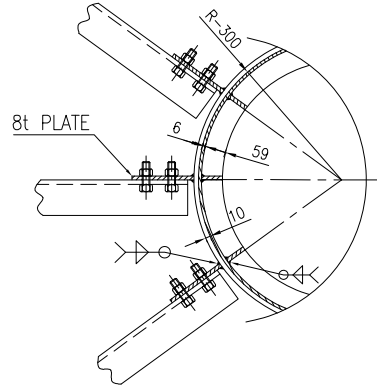
SECTION 1:1



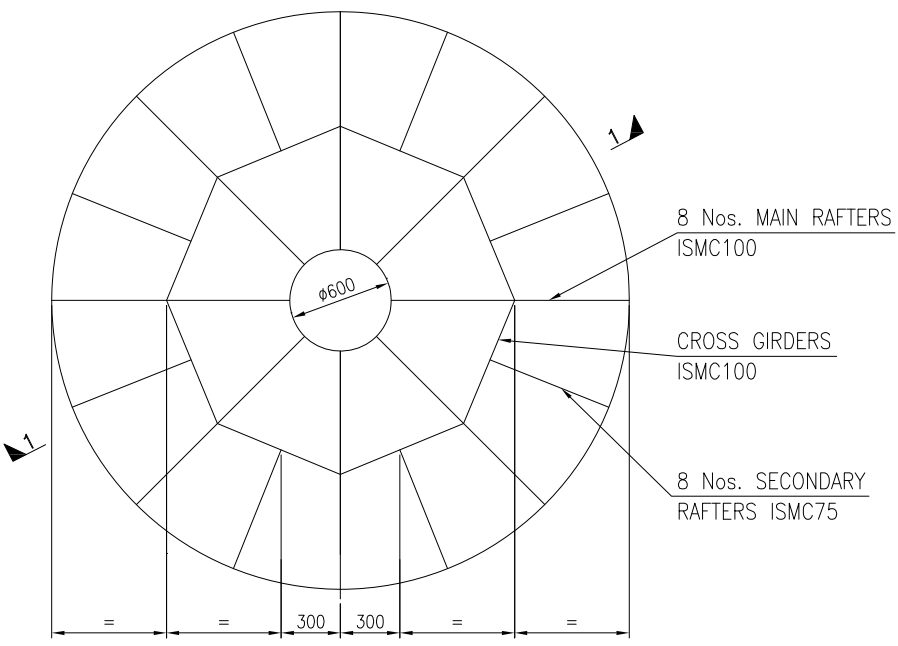
DETAIL-A



SECTION 3:3



SECTION 2:2



PLAN

WT. OF ROOF STR. FOR
8.0 m DIA TANK = 0.63T

6.0m < DIA < 8.00m

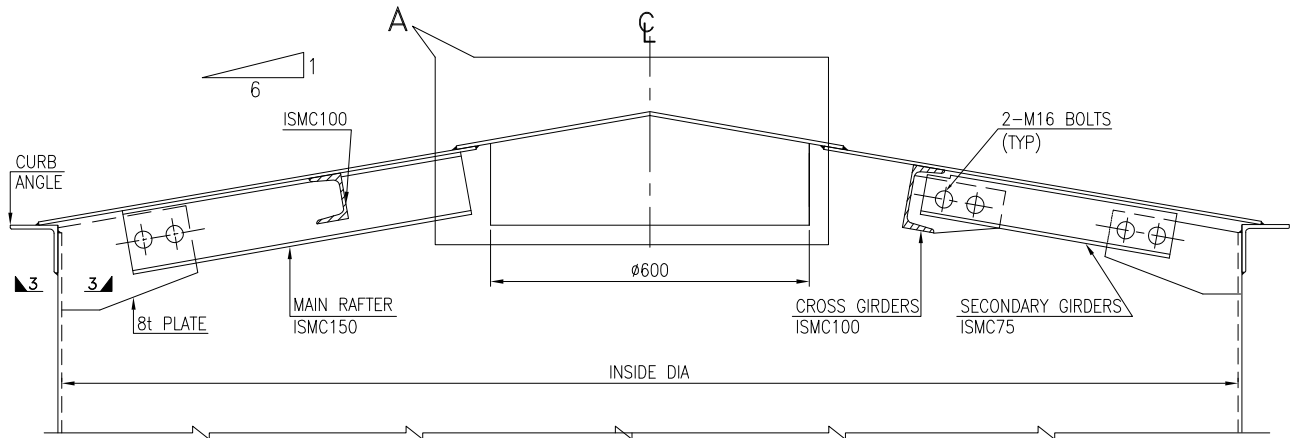
NOTES:

1. FOR GENERAL NOTES REFER SH. 1 OF 11.
2. FOR CURB ANGLE SIZE REFER FABRICATION DRAWING OF TANK.

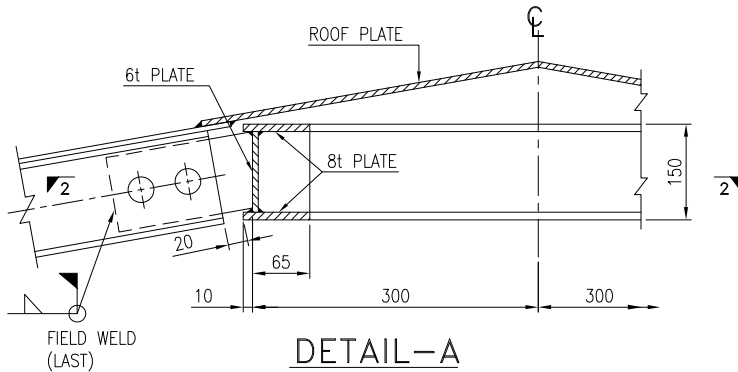
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MECHANICAL

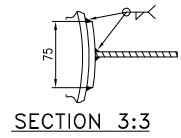
REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	11.07.2019	ISSUED AS STANDARD	MV	MV	RP



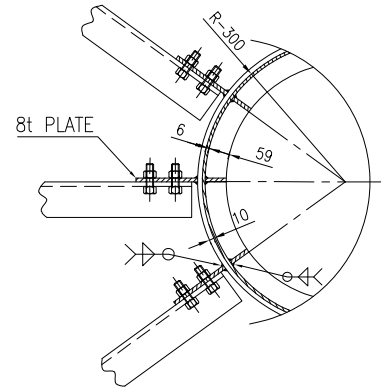
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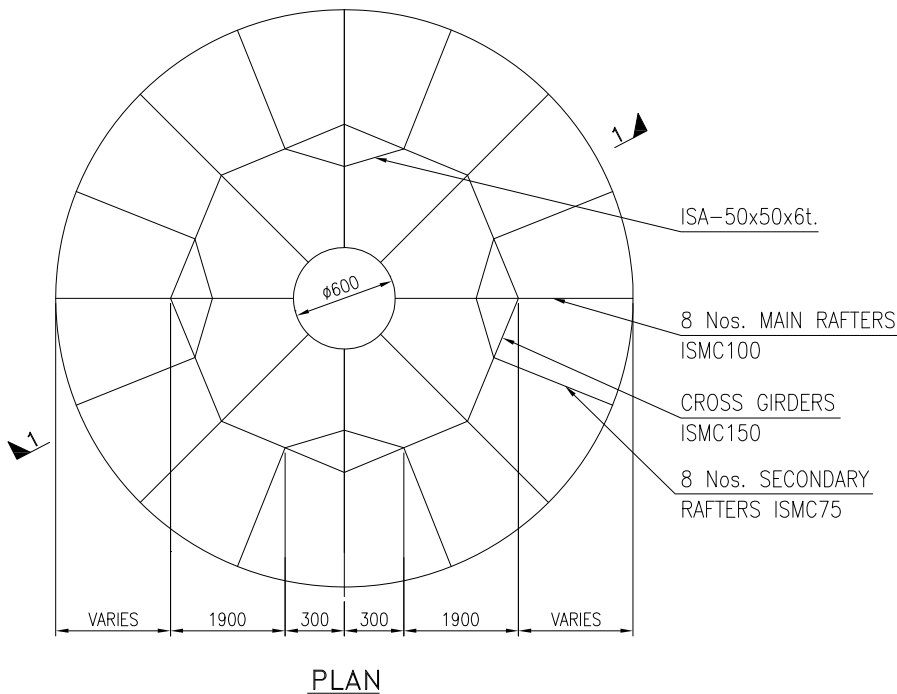
DETAIL-A



SECTION 3:3



SECTION 2:2



PLAN

- ISA-50x50x6t.
- 8 Nos. MAIN RAFTERS ISMC100
- CROSS GIRDERS ISMC150
- 8 Nos. SECONDARY RAFTERS ISMC75

WT. OF ROOF STR. FOR
10.0 m DIA TANK = 1.03 T

8.0m < DIA ≤ 10.0m

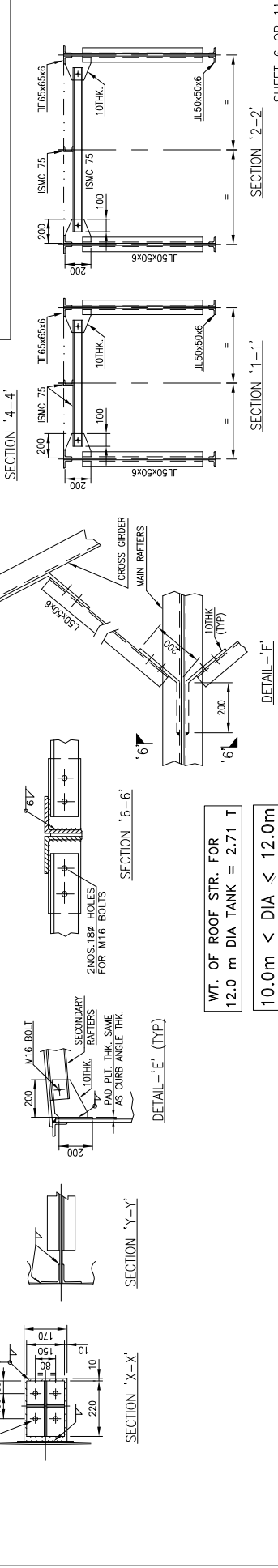
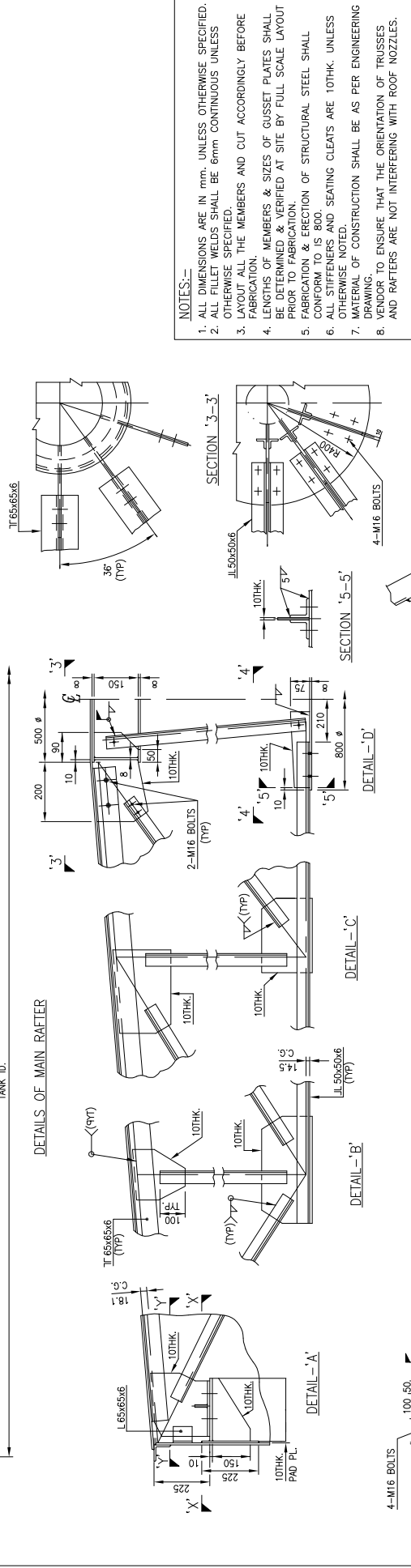
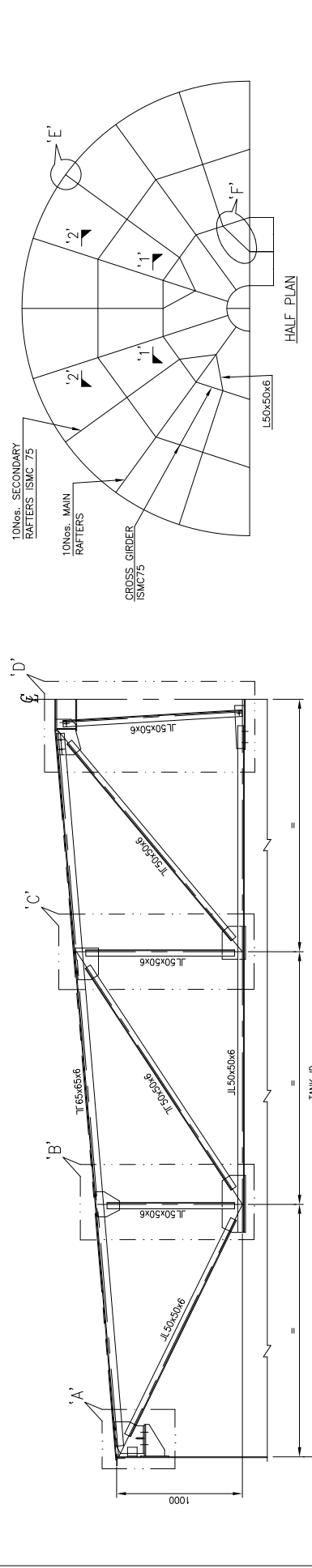
NOTES:

1. FOR GENERAL NOTES REFER SH. 1 OF 11.
2. FOR CURB ANGLE SIZE REFER FABRICATION DRAWING OF TANK.

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	11.07.19	ISSUED FOR STANDARD	MV	MV	RP

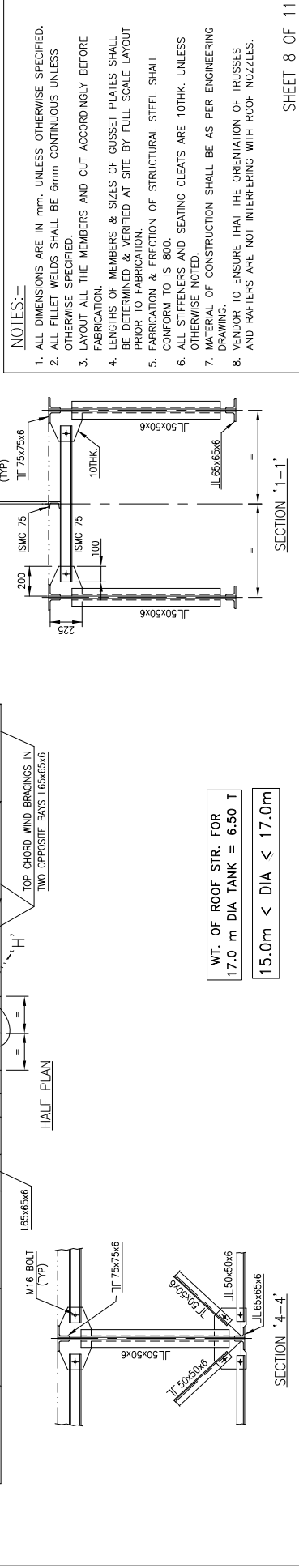
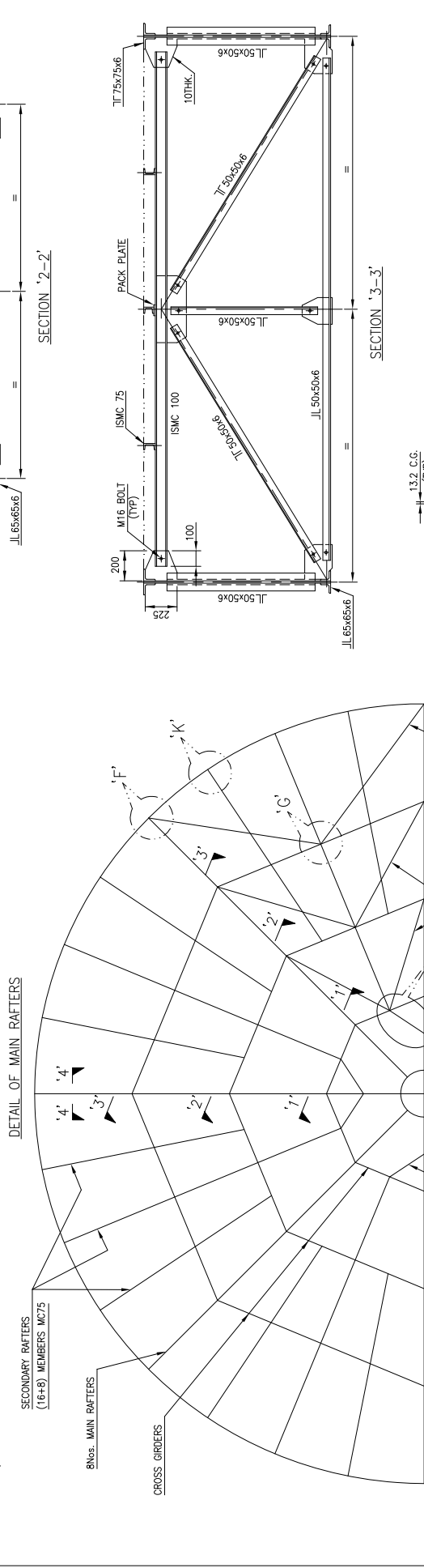
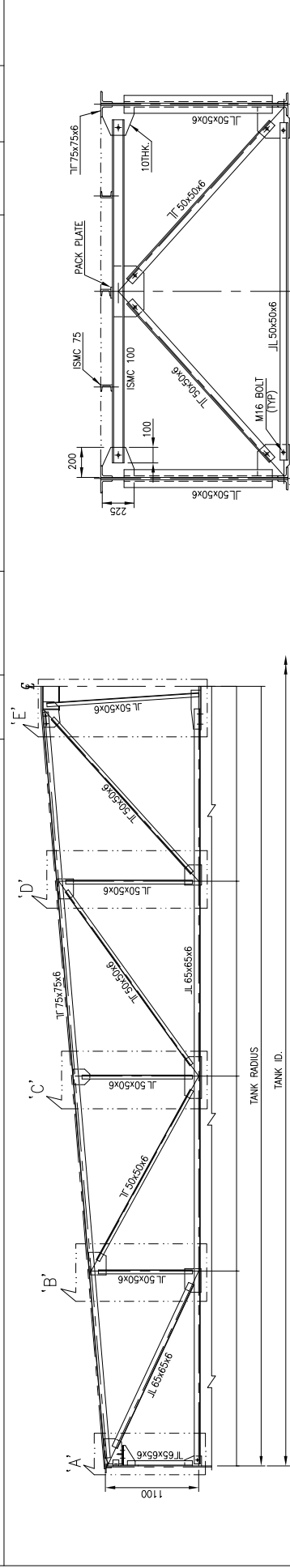


WT. OF ROOF STR. FOR
12.0 m DIA TANK = 2.71 T
10.0m < DIA < 12.0m

- NOTES:-**
1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE SPECIFIED.
 2. ALL FILLET WELDS SHALL BE 6mm CONTINUOUS UNLESS OTHERWISE SPECIFIED.
 3. LAYOUT ALL THE MEMBERS AND CUT ACCORDINGLY BEFORE FABRICATION.
 4. LENGTHS OF MEMBERS & SIZES OF GUSSET PLATES SHALL BE DETERMINED & VERIFIED AT SITE BY FULL SCALE LAYOUT PRIOR TO FABRICATION.
 5. FABRICATION & ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO IS 800.
 6. ALL STIFFENERS AND SEATING CLEATS ARE 10THK. UNLESS OTHERWISE NOTED.
 7. THE SEQUENCE OF CONSTRUCTION SHALL BE AS PER ENGINEERING DRAWINGS.
 8. VENDORS TO ENSURE THAT THE ORIENTATION OF TRUSSES AND RAFTERS ARE NOT INTERFERING WITH ROOF NOZZLES.

MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	11.07.19	ISSUED FOR STANDARD	MV	MV	RP

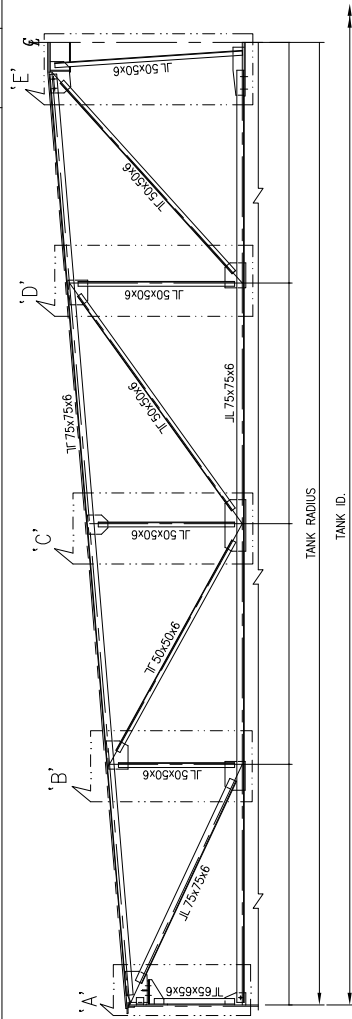


TITLE: DETAIL OF STRUCTURAL ARRANGEMENT OF CONE ROOF		STANDARD NO. MC-STD-440	REV. 0
SHEET 8 OF 11			

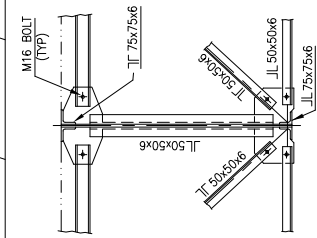
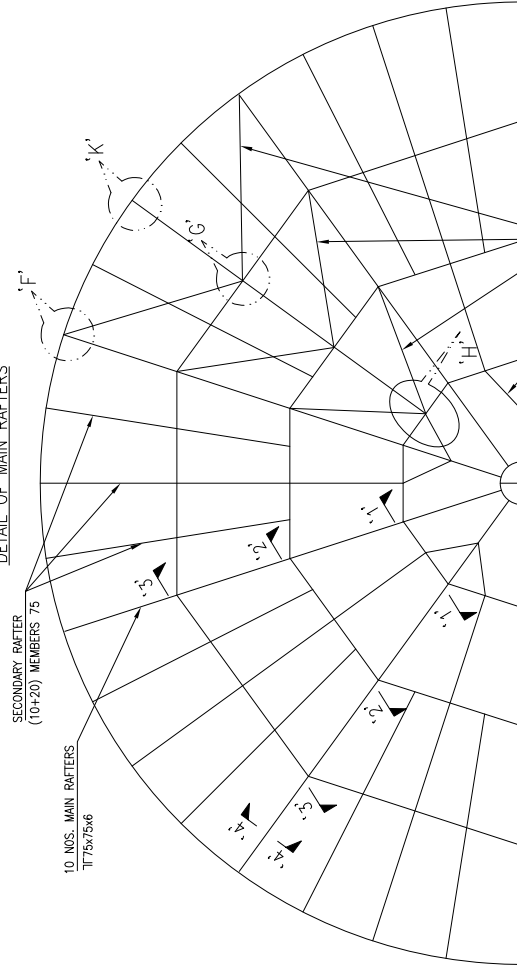
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MECHANICAL

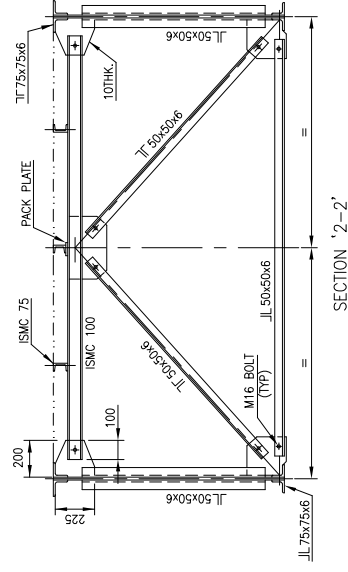
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0	11.07.19	ISSUED FOR STANDARD	MV	MV	RP



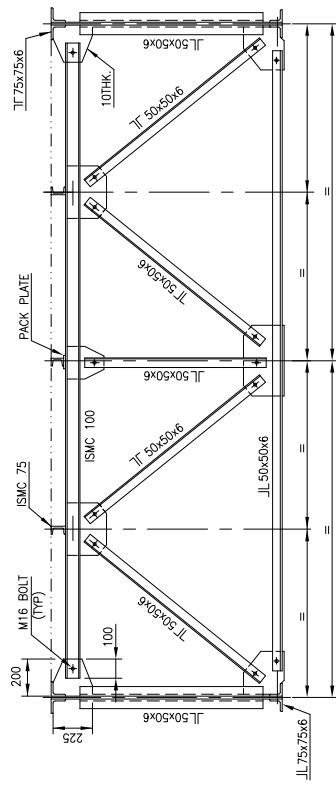
DETAIL OF MAIN RAFTERS



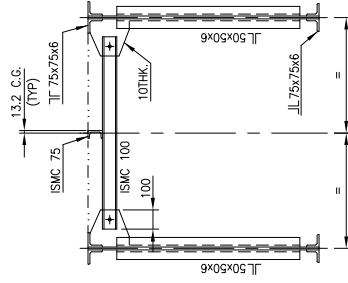
SECTION '4-4'



SECTION '2-2'



SECTION '3-3'



SECTION '1-1'

NOTES:—

1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE SPECIFIED.
2. ALL FILLET WELDS SHALL BE 6mm CONTINUOUS UNLESS OTHERWISE SPECIFIED.
3. LAYOUT ALL THE MEMBERS AND CUT ACCORDINGLY BEFORE FABRICATION.
4. LENGTHS OF MEMBERS & SIZES OF GUSSET PLATES SHALL BE DETERMINED & VERIFIED AT SITE BY FULL SCALE LAYOUT PRIOR TO FABRICATION.
5. FABRICATION & ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO IS 800.
6. ALL STIFFENERS AND SEATING CLEATS ARE 10THK. UNLESS OTHERWISE NOTED.
7. MATERIAL OF CONSTRUCTION SHALL BE AS PER ENGINEERING DRAWING.
8. VENDOR TO ENSURE THAT THE ORIENTATION OF TRUSSES AND RAFTERS ARE NOT INTERFERING WITH ROOF NOZZLES.

WT. OF ROOF STR. FOR
20.0 m DIA TANK = 8.78 T
17.0m < DIA < 20.0m

SHEET 10 OF 11

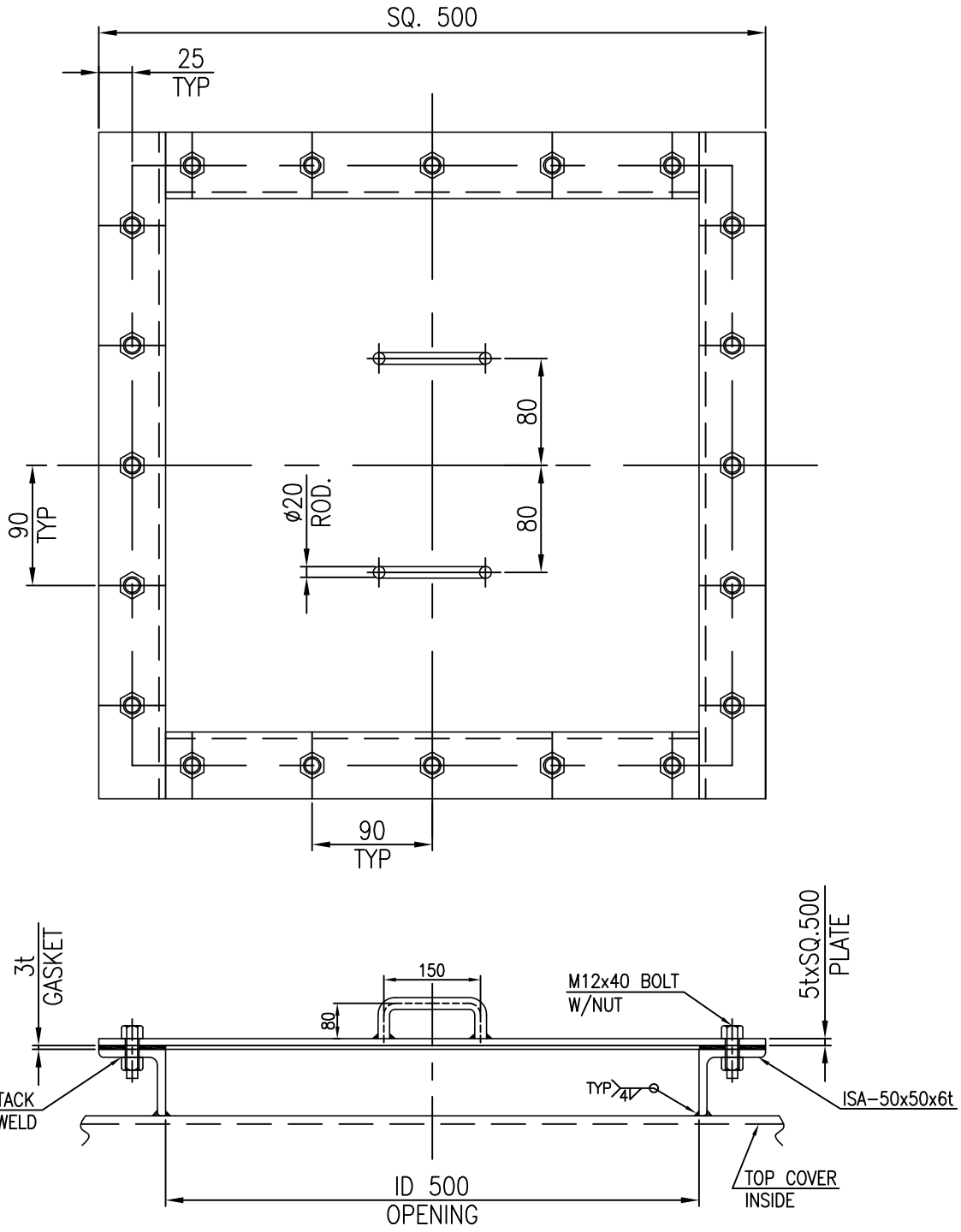
TITLE: **DETAIL OF STRUCTURAL ARRANGEMENT OF CONE ROOF**

STANDARD NO.	REV.
MC-STD-440	0

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	06.02.2016	ISSUED AS STANDARD	AD	AD	PD



NOTES:

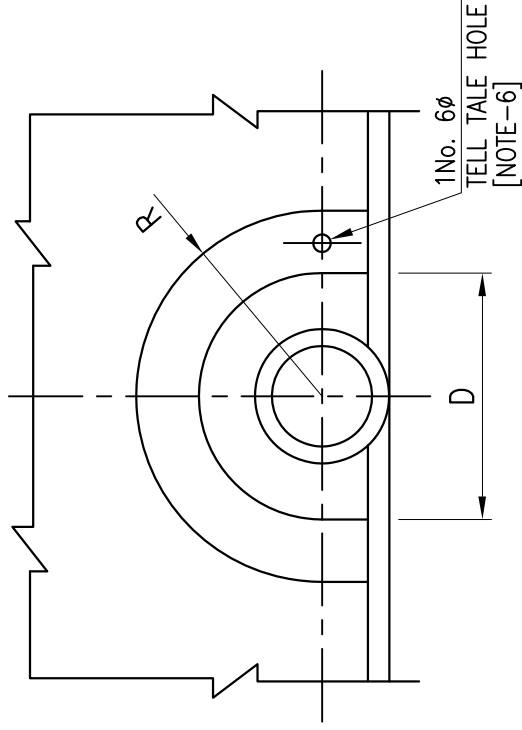
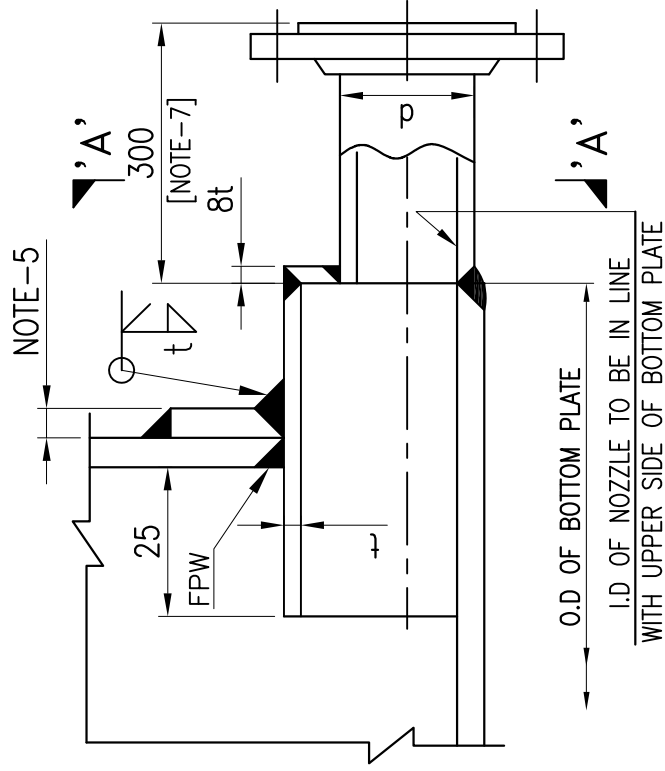
1. ALL DIMENSION ARE IN MM UNLESS OTHERWISE STATED.
2. MATERIAL SPECIFICATION & TYPE SHALL BE AS PER ENGINEERING DRAWING.
3. ALL PARTS SHALL BE PROVIDED BY VESSEL FABRICATION.
4. FABRICATOR TO ENSURE THAT TOP FLANGE SURFACE LEVEL IS FLAT & UNIFORM.

SHEET 1 OF 1

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MECHANICAL

REV.	DATE	GENERAL REVISIONS	BY	CHK.	APP.
0	24.01.2018	ISSUED FOR STANDARD	AD	AB	AB



SECTION-A-A

NOTES:-

1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE SPECIFIED.
2. ALL FILLET WELDS SHALL BE 6MM MINIMUM CONTINUOUS UNLESS OTHERWISE SPECIFIED.
3. MATERIAL SHALL BE AS PER ENGINEERING DRAWING.
4. IN CASE OF ANY CONFLICT THE ENGINEERING DRAWING SHALL GOVERN.
5. R.F. PAD THICKNESS SHALL BE SAME AS SHELL THICKNESS.
6. TELL-TALE HOLE SHALL NOT BE PLUGGED AND SHALL BE FILLED WITH HARD GREASE ONLY.
7. NOZZLE PROJECTION TO EXCEED CIVIL FOUNDATION ADEQUATELY TO ALLOW ACCESS TO NOZZLE FASTENERS. REFER ENGINEERING DRAWING.

NOZZLE SIZE(NB) (d)	D	R
50 NB	100 NB. SCH80 PIPE	180
NOZZLE SIZE(NB) (d)	D	R
80 NB	150 NB. SCH 40 PIPE	250
NOZZLE SIZE(NB) (d)	D	R
100 NB	200 NB. SCH 40 PIPE	300

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TITLE: DETAIL OF DRAIN NOZZLE
FOR TANK DIA ≥2000 MM

STANDARD NO.	REV.
MC-STD-442	0