



Exploration & Production

GENERAL SPECIFICATION

PIPING VALVES VESSELS

GS PVV 202

**Standard drawings for accessories
and equipment of vessels**

01	10/03	Change of Group name and logo
00	06/02	First issue
Rev.	Date	Notes

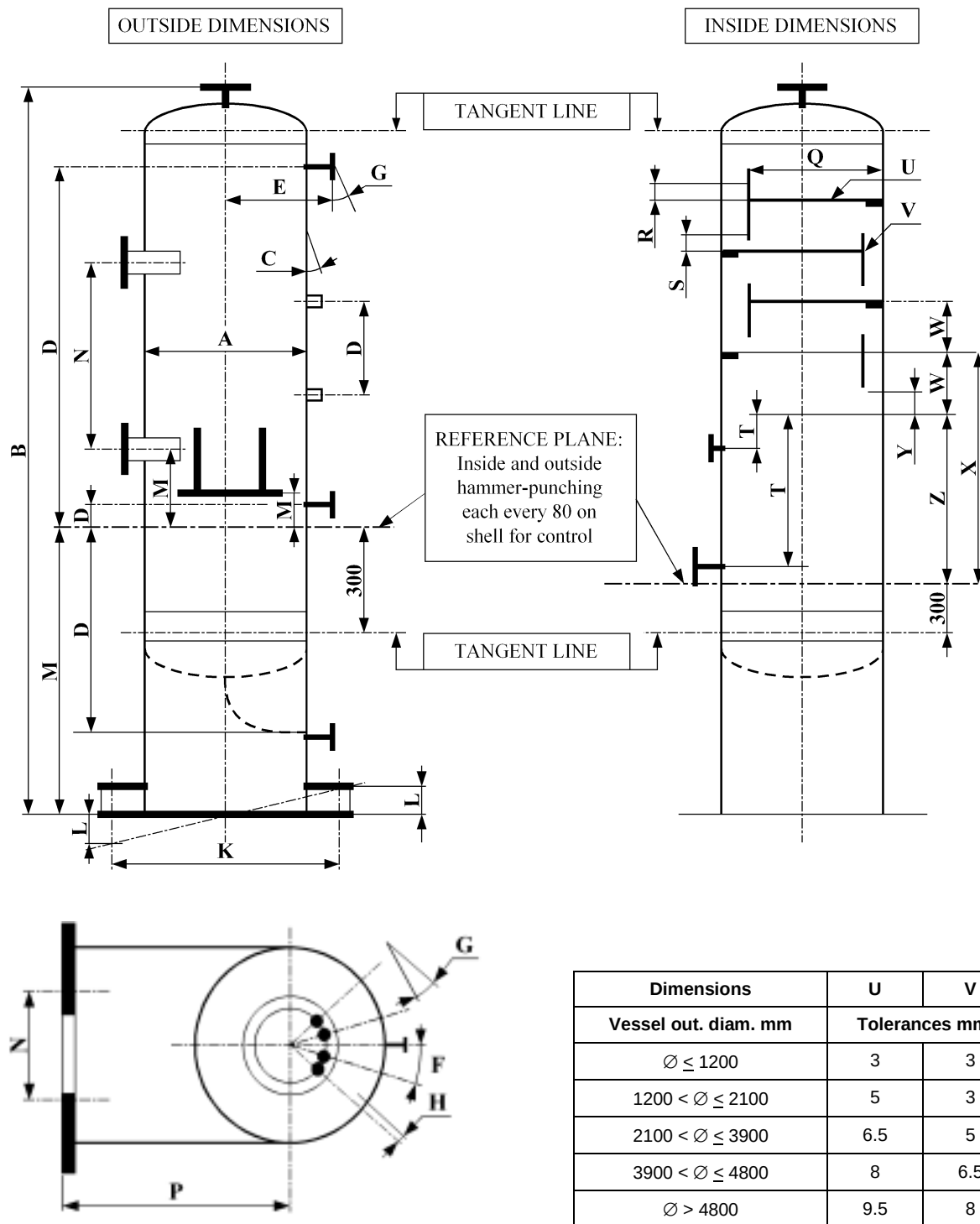
List of Standards Drawings (SD)

Reference	Title
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Reference	Title
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SD PVV 304	Monorail davit and slide
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Standard Drawings	SD PVV 201
Pressure vessel tolerances	Rev.: 01
	Date: 10/03





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Standard Drawings	SD PVV 201
Pressure vessel tolerances	Rev.: 01
	Date: 10/03

Tolerances on outside dimensions

- A - Out of roundness as permitted by code
- B - Tolerance on length: ± 1.3 mm/m (max: 13 mm)
- C - Rectitude of the generatrix: whatever part of a cylinder generatrix with 6.5 mm in length shall range within 2 x 6.5 mm spaced lines both parallel to the centreline
- D - Tolerance on elevations:
For manholes: ± 13 mm for nozzles: ± 6.5 mm clearance between instrument branch connections: ± 3 mm
- E - Flange faces projecting from shell:
For manholes: ± 6.5 mm
For nozzles: ± 5 mm
- F - Circumferential deviation between the theoretical axis and centreline of nozzles, manholes and supports shall not exceed ± 3 mm measured on shell
- G - Angle of flange face in ratio to the theoretical plane: $\pm 1/2^\circ$
- H - Orientation of nozzle bolt holes: ± 1.5 mm measured on drilling circle
- K - Base ring drilling tolerance:
Measured on perpendicular diameters: ± 5 mm
Measured on drilling circle between holes: ± 5 mm
- L - Tolerance on base ring perpendicularity:
 $K \leq 1.2$ mm: ± 3 mm
 1.2 mm $K \leq 1.2$ mm: ± 5 mm
 $K > 1.2$ mm: ± 6.5 mm
- M - Tolerance on reference plane: $^{+6.5}_{-0}$ mm
- N - Clearance between support bolt holes on horizontal vessels: ± 3 mm
- P - Clearance between support setting level and horizontal vessel centreline: ± 6.5 mm



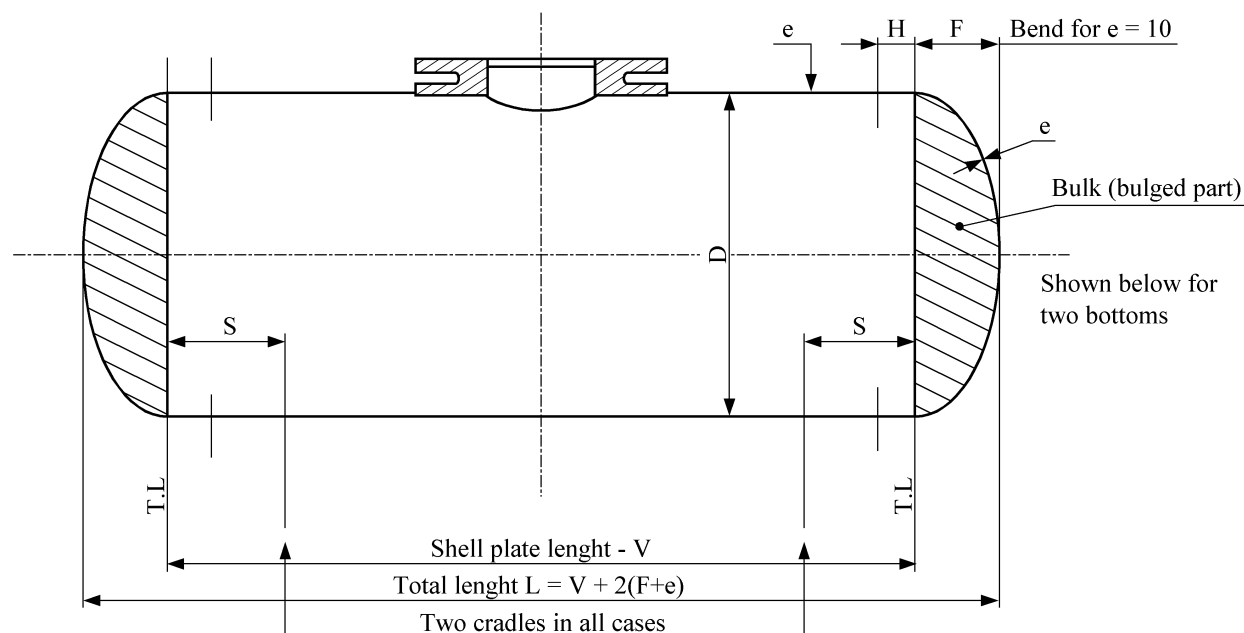
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Standard Drawings	SD PVV 201
Pressure vessel tolerances	Rev.: 01
	Date: 10/03

Tolerances on inside dimensions

- Q - Clearance from vessel inside wall to weir: ± 6.5 mm
- R - Height of fixed weir above tray supporting ring: ± 3 mm
- S - Clearance from bottom of down-flow plate to tray supporting ring: ± 3 mm
- T - Clearance from draw-off pan support to manhole or nozzle centreline when located in ratio to one another: ± 3 mm
- U - Maximum deviation of tray supporting from a plane parallel to reference plane: see table
- V - Maximum deviation of top of weir plate from a plane parallel to reference plane: see table
- W - Clearance between adjoining tray supports: ± 3 mm
- X - Clearance from one tray supporting to the reference plane: ± 6.5 mm
- Y - Clearance from bottom of down-flow plate to lower downcomer support: ± 3 mm
- Z - Clearance from any internal support to reference plane: ± 6.5 mm

Standard Drawings	SD PVV 202
Vessels dished ends with large knuckle radius	Rev.: 01
	Date: 10/03



Nom. Capacity in liters	Ext. dia. D	Shell plate length V	Vol. for bottoms for e=10	Shell plate volume for V=100	S	For e = 10			Nom. Capacity in liters	Ext. dia. D	Shell plate length V	Vol. for bottoms for e=10	Shell plate volume for V=100	S	For e = 10		
						Bend F	Total weight with Hx50	Shell plate weight for V=100							Bend F	Total weight with Hx50	Shell plate weight for V=100
250	500	1200	30.6	18	240	126	198	12	5000	1500	2600	894	170	400	389	1385	37
300	550	1400	41	22	240	140	223	13.5	6000	1600	2800	1088	195	400	416	1502	39
400	600	1600	54	26	280	153	280	14.5	7000	1700	3000	1306	220	400	442	1705	42
500	650	1800	68.8	31	280	166	308	16	8000	1800	3200	1554.4	250	400	468	1835	44
600	700	2000	86.6	36	300	179	354	17	10000	1900	3400	1832	280	400	495	2055	47
700	750	2200	107	42	300	192	382	18	12000	2000	3600	2139	305	400	521	2400	49
800	800	2400	131	48	300	205	418	19.5	15000	2100	3800	2478	340	450	546	2760	52
1000	850	1600	157.4	54	300	219	475	21	2150	3600	2658	355	450	559	2735	53	
	900	1500	187.6	61	300	232	490	22	18000	2200	4200	2854	375	450	572	3140	54
	950	1300	222	70	300	245	483	23	20000	2300	4400	3266	410	450	599	3330	56
1500	1000	1800	252	75	300	258	632	24.5	25000	2400	5000	3716	445	500	625	3990	59
2000	1100	1900	347	92	350	284	745	27	30000	2500	5400	4202	485	500	652	4450	61
2500	1150	2100	397	100	350	297	848	28	40000	2600	6800	4726	520	500	677	5550	64
3000	1200	2400	453	110	350	310	988	29	50000	2700	8000	5300	560	500	703	6600	66
3500	1250	2600	512	120	350	324	1095	30.5	60000	2800	9000	5918	605	600	730	7570	69
4000	1300	2800	578	130	400	337	1215	32	70000	2900	9600	6576	650	600	756	8350	71
4500	1400	2600	724	150	400	363	1265	34	80000	3000	10400	7332	695	600	782	9230	74

Standard thicknesses and heights of corresponding edges

Thickness e	8	9	10	11	12	14	16	18	20	22	25	28	32	35	40
Height H	50			55		60	65	70		75	80	90	100	110	120

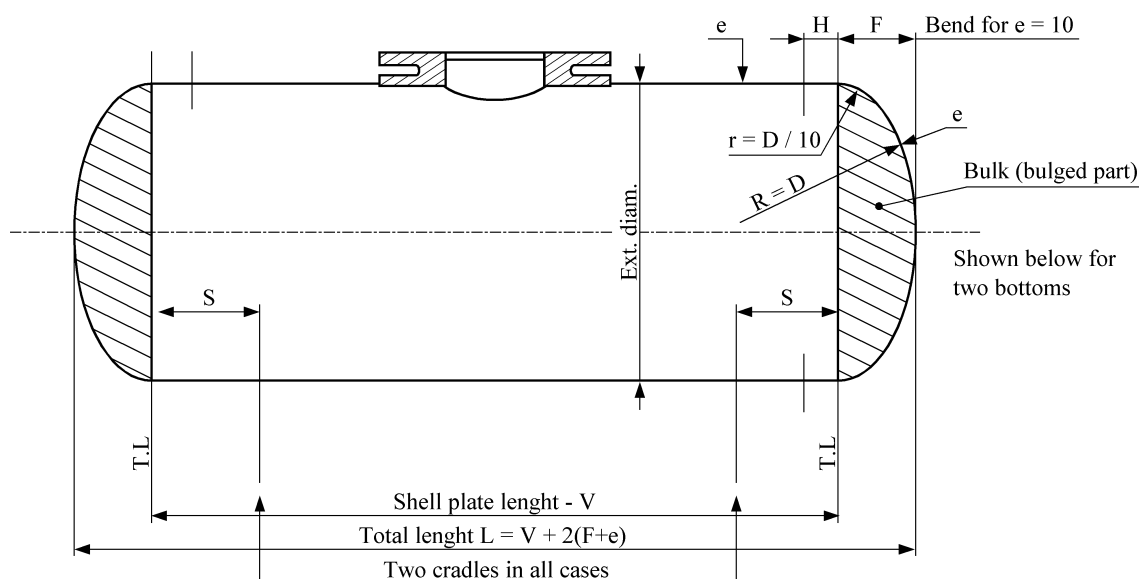
The bend are settled with formula: $F = \frac{D - 2e}{3.8}$

For higher capacities make use of: $S = 0.2 D$ nearly



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Standard Drawings	SD PVV 203
Vessels elliptical dished ends	Rev.: 01
	Date: 10/03



Nom. Capacity in liters	Ext. dia. D	Shell plate length V	Vol. for bottoms for e=10	Shell plate volume for V=100	S	For e = 10		
						Bend F	Total weight with Hx50	Shell plate weight for V=100
250	500	1200	22	18	240	92	198	12
300	550		30	22	240	102	223	13.5
400	600	1400	39	26	280	111	280	14.5
500	650		50	31	280	121	308	16
600	700	1500	63	36	300	131	352	17
700	750		78	42	300	140	382	18.3
800	800		95	48	300	150	415	19.5
1000	850	1600	114	54	300	160	470	21
	900	1500	136	61	300	169	480	22
	950	1300	165	70	300	179	470	23
1200	1000	1400	187	75	300	189	530	24.5
1500	1050	1600	217	83	300	199	620	25.5
2000	1100	1900	250	92	350	208	740	27
2300	1150	2100	287	100	350	218	840	28
2500	1200		326	110	350	228	880	29.3
2800	1250		369	120	350	237	930	30.5
3000					350		975	
3500	1300	2400	418	130	350	247	1070	32
4000		2800			400		1200	
4500	1400	2800	521	150	400	266	1315	34
5000	1500	2600			400		1340	
5500		2800	643	170	400	286	1415	37
6000		3200			400		1560	
	1600	2800	782	195	400	305	1550	39
6500	1700	2600	940	220	400	324	1595	42
7000	1800		1120	250	400	344	1720	44
	1900	2200			400		1655	47
7500		2400	1320	280	400	363	1745	

Nom. Capacity in liters	Ext. dia. D	Shell plate length V	Vol. for bottoms for e=10	Shell plate volume for V=100	S	For e = 10		
						Bend F	Total weight with Hx50	Shell plate weight for V=100
8000	1900	2600			400		1835	
10000		3200			400		2120	
12000		4000	1320	280	400	363	2500	
		5000			400		2960	
15000	2000	4600	1542	305	400	383	2950	49
	2100	4000	1785	340	450	402	2820	52
		17000	2150	4400	1916	355	450	412
18000	2200	4200	2060	375	450	421	3100	54
	2300	4000	2350	410	450	441	3200	56
	2400	3800	2670	445	500	460	3270	59
		20000		3600		500		3320
25000	2500	4600	3030	485	500		3940	61
30000		5600		500		4550		
40000				7600		500		
	2600	7200	3355	520	600	499	5780	64
	2700	6600	3815	560	600	518	5700	66
	45000	2800	6800	4270	605	600	538	6080
50000	2900	6400	4735	650	600	557	6070	71
	2500	9800			600		7090	
	2700	8200			600		6740	
	3000	6400	5240	695	600	576	6340	74
55000	3100	6800	5760	745	700	596	6900	76
60000	3200	7000	6320	795	700	615	7370	78
	3000	8000			700		7500	
		70000	7600	6940	845	700	634	8150
80000	8800	700	9100					
90000	3400	9400	7580	900	700	654	9900	83
100000		10400		700	10800			

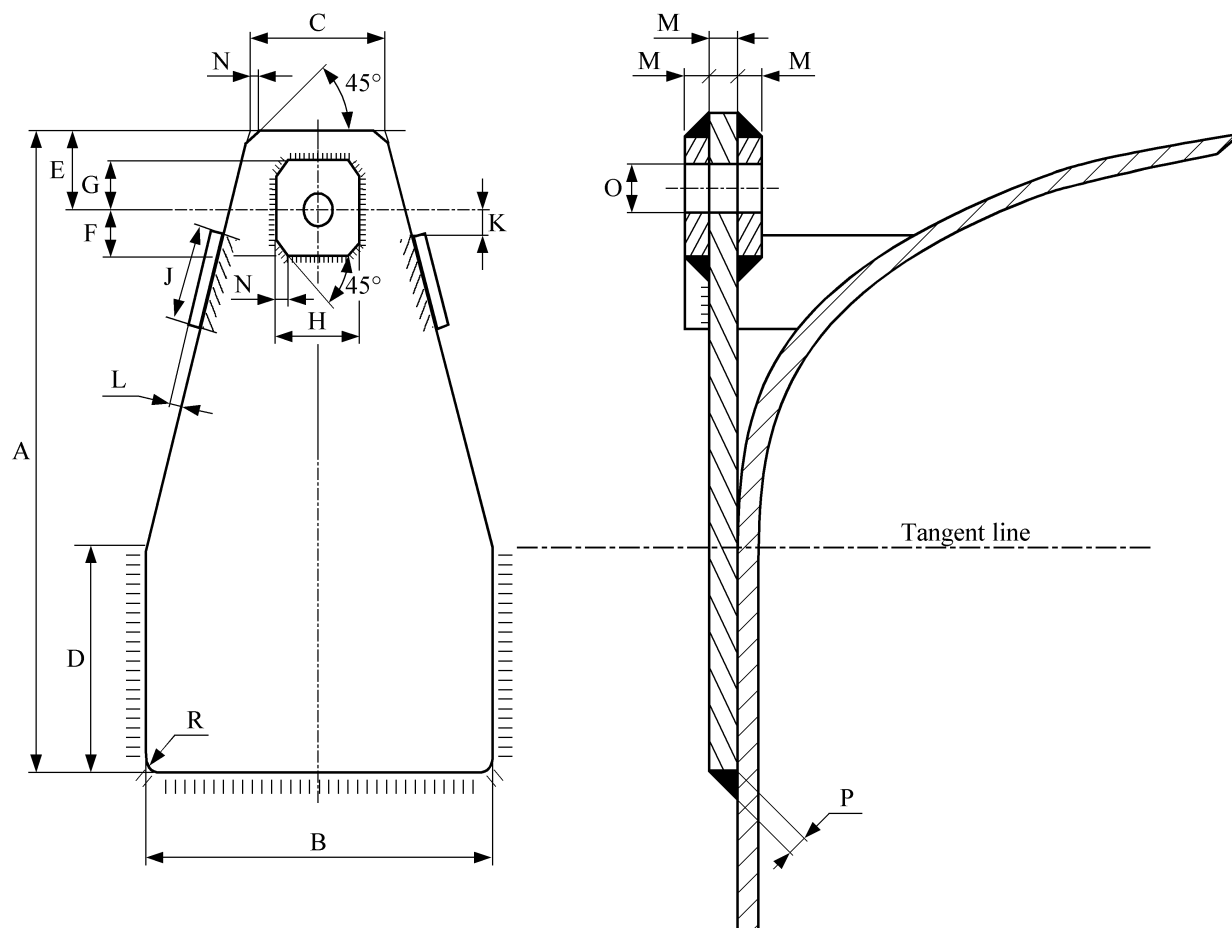
Standard thicknesses and heights of corresponding edges

Thickness e	6	7	8	9	10	11	12	14	16	18	20	22	25	28	32	35	40
Height H	40			50		55		60	65	70		75	80	90	100	110	120

The bend are settled with formula: $F = R - \sqrt{(R-r)^2 - (a-r)^2}$ or $a = \frac{D-2e}{2}$

For higher capacities make use of: $S = 0.2 D$ nearly

Standard Drawings	SD PVV 204
Standard lifting lug for apparatus	Rev.: 01
	Date: 10/03



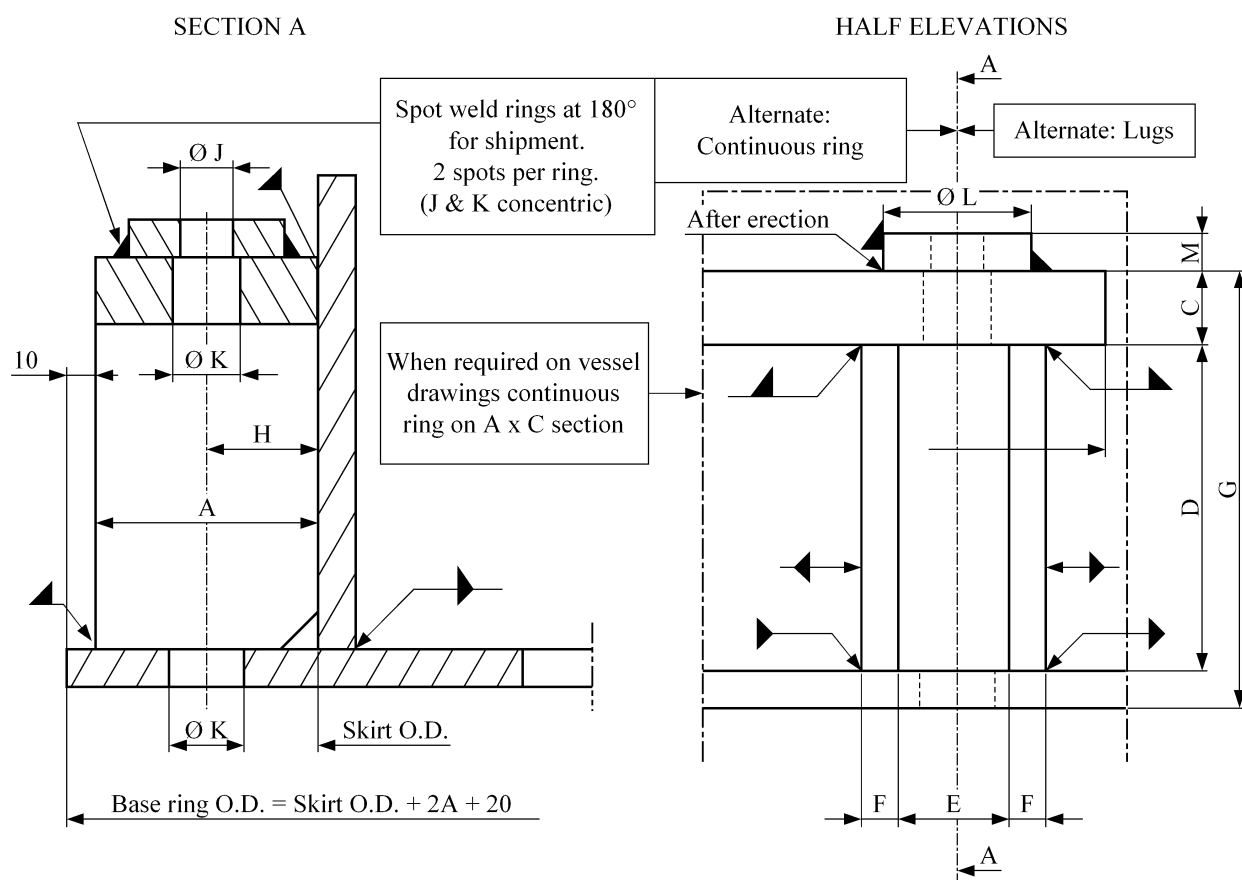
Max. weight of vessel in tons (for two lugs)	Dimensions in millimeters															
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R
20 ≤ 50	910	450	175	260	120	85	105	150	250	60	10	20	20	75	12	35
> 50 ≤ 100	1210	600	240	350	160	130	145	210	350	105	10	25	25	100	15	40
> 100 ≤ 150	1425	750	300	430	200	160	185	270	450	135	12	30	25	130	15	45

Note: Material equivalent to vessel wall.



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Standard Drawings	SD PVV 205
Lugs and base ring for vertical apparatus	Rev.: 01
	Date: 10/03

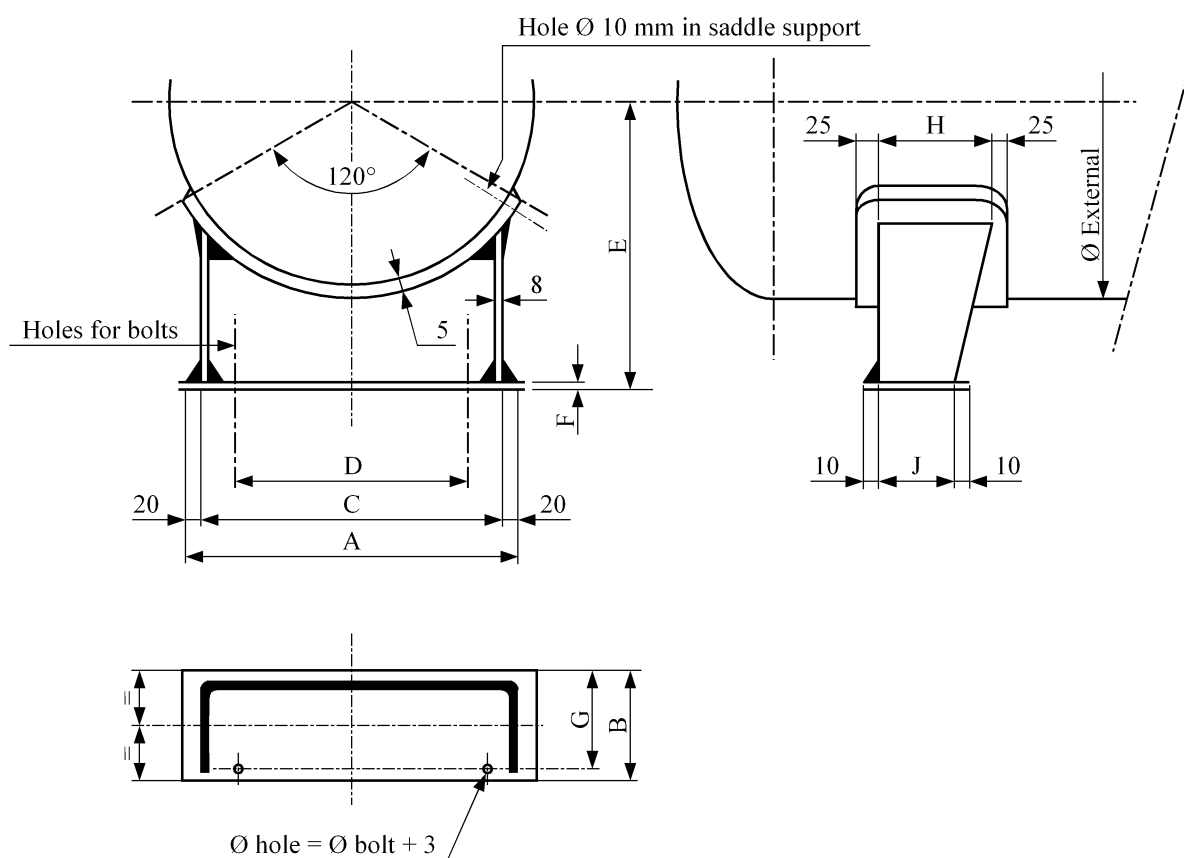


Note: Material: E.24.1 or E.26.1

In case of flat bottom vessel, the base ring is replaced by the vessel bottom plate.

Bolt Ø	A	B	C	D	E	F	G	H	J	K	L	M	Base ring dimen's	Weld seam thickness.	Weight per lug kg	Weight 2 flats AxFxD kg
27	100	120	20	148	70	10	180	55	30	41	55	12	12 x 200	10	4.1	2.3
30	100	120	20	148	70	10	180	55	33	44	60	12	12 x 200	10	4.1	2.3
33	100	120	25	155	70	10	200	55	36	47	65	20	20 x 200	10	4.5	2.4
36	100	120	25	155	70	10	200	55	39	50	65	20	20 x 200	10	4.5	2.4
39	120	140	40	185	80	16	250	65	42	53	75	25	25 x 250	10	12	5.6
42	120	140	40	185	80	16	250	65	45	56	80	25	25 x 250	10	12	5.6
45	120	140	40	185	80	16	250	65	48	59	85	25	25 x 250	12	12	5.6
48	120	140	40	185	80	16	250	65	51	62	85	25	25 x 250	12	12	5.6
52	140	170	40	285	100	20	350	75	55	66	100	25	25 x 300	12	21.8	12.6
56	140	170	50	318	100	20	400	75	59	70	105	32	32 x 300	12	22.6	14
64	140	170	50	318	100	20	400	75	67	78	105	32	32 x 300	12	22.6	14
72	150	200	50	418	120	25	500	80	75	86	113	32	32 x 300	12	35.5	24.6

Standard Drawings	SD PVV 206
Saddles for horizontal drums and tanks	Rev.: 01
	Date: 10/03



Size in millimeter											Support weight in kg	
Ø Ext	A	B	C	D	E	F	G	H	J	Ø Bolt		
350	290	130	250	150	380	13	95	160	110	22	23	
400	330		290	190	405						25	
450	370		330	230	430						27	
500	390	170	350	250	455		125	200	150		30	
550	420		380	280	485						32	

Note:

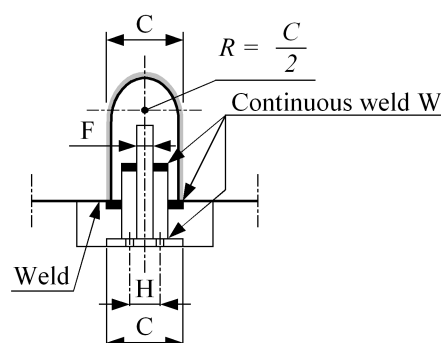
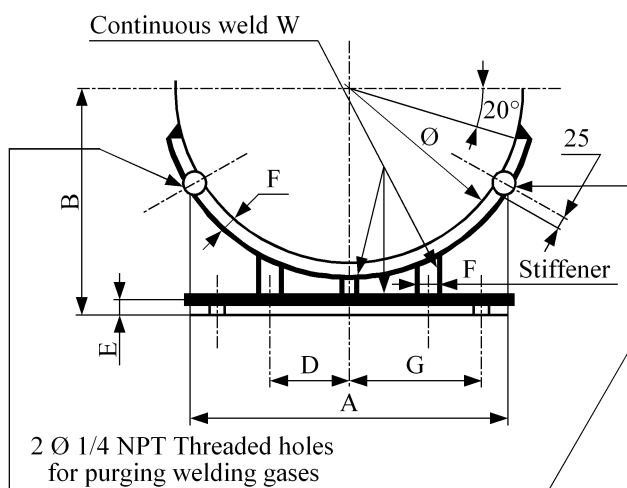
- For drums and tanks of an intermediate diameter take saddle size of immediate upper diameter.
- These saddles are to weld on vessel (unceasing welding).

Standard Drawings	SD PVV 207
Saddles welded on vessels	Rev.: 01
	Date: 10/03

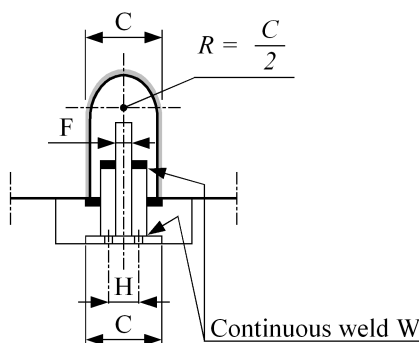
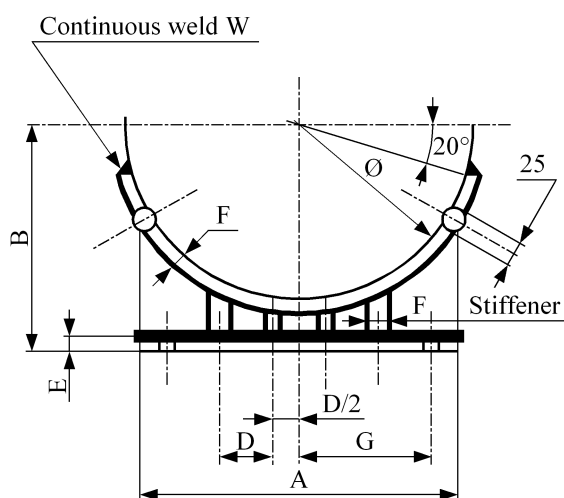
Horizontal vessels

Weld on saddles

Type: 1 $\varnothing \leq 1200$

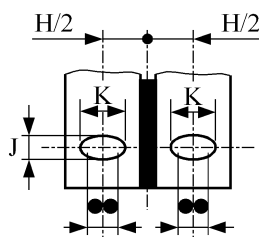


Type: 2 $\varnothing > 1200$



FOR WELDING SPECIFICATION
SEE TYPE 1

Ovalized holes detail





Standard Drawings	SD PVV 207
Saddles welded on vessels	Rev.: 01
	Date: 10/03

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Weld sizes: $W = 6$ for $\varnothing \leq 1700$

$W = 10$ for $\varnothing \geq 1800$

$\varnothing$	A	B	C	D	E	F	G	H	Slotted Holes sizes		$\varnothing$ Bolts	Stiffeners sizes	Masse kg
									J	K			
600	540	650	180	180	12	10	230	95	26	40	20	80 x 10	43
750	670	725		205			270						52
900	800	800		280			340						62
1000	890	850		295			370						74
1200	1080	950	220	350	16	12	440	140	28	45	22	100 x 12	117
1400	1240	1050		305			540						136
1500	1320	1100		325			575						144
1700	1500	1200		365			650						165
1800	1580	1250		390			690						174
2000	1760	1350		440			770						194
2100	1850	1400	250	475	20	16	820	150				110 x 16	289
2300	2020	1500		525			900						316
2400	2110	1550		550			940		33	50	27		332
2600	2280	1650		600			1020						360
2700	2370	1700	300	620			1060	180				130 x 16	420
2900	2540	1800		670			1140						452
3000	2630	1850		680			1170						474
3200	2800	1950	350	720			1240	210				150 x 16	559
3400	2980	2050		780			1330						604
3500	3080	2100		795			1360						617
3700	3230	2200		840			1440						658
3900	3420	2300	400	860		20	1500	230				170 x 20	897
4000	3500	2400		875	25		1530		36	55	30		1004
4200	3680	2500		900			1600						1060
4400	3850	2600	440	945			1670	250				190 x 20	1190
4500	3940	2650		960			1710						1222
4700	4100	2750		980			1750						1271
4900	4280	2850		990			1800						1336
5000	4380	2900		1000			1840						1344

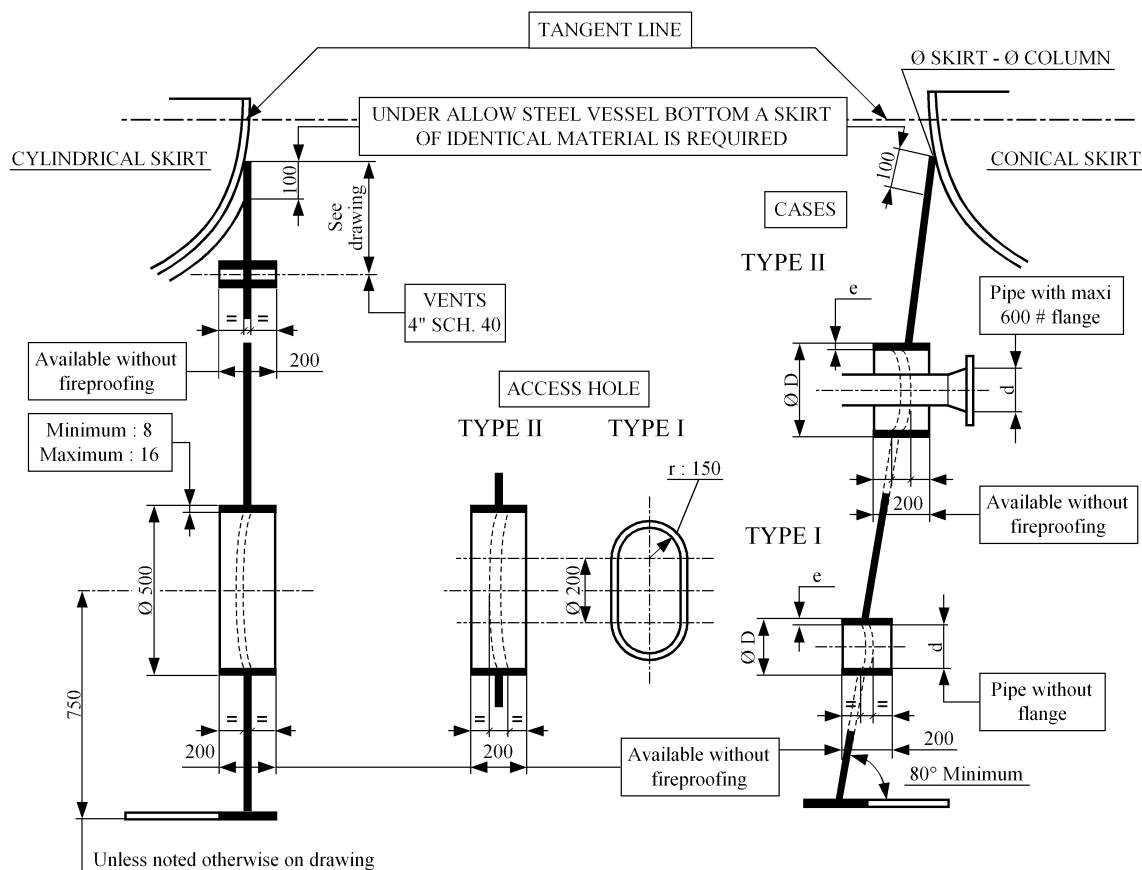
For each vessel

- 1 fixed saddle with 4 holes of diameter equal to bolts diameter + 6 mm
- 1 free saddle with 4 slotted holes (folio I)

All saddles are to be welded on vessel.

For vessels of an intermediate $\varnothing$ select saddle dimensions of the next higher diameter.

Standard Drawings	SD PVV 208
Column skirt standard equipment	Rev.: 01
	Date: 10/03



Note: Details: vents, access hole, and cases are available for both skirt type.

Vents	
Skirt outside diameter	Quantity
$500 \leq \varnothing \leq 950$	2
$1000 \leq \varnothing \leq 3000$	3
$3100 \leq \varnothing \leq 4000$	4
$4200 \leq \varnothing \leq 5800$	6
$6100 \leq \varnothing$	8
Equally Spacer	

Access hole		
Skirt outside diameter	Type	Quantity
$500 \leq \varnothing \leq 950$	I	1
$1000 \leq \varnothing$	II	2 Equi.

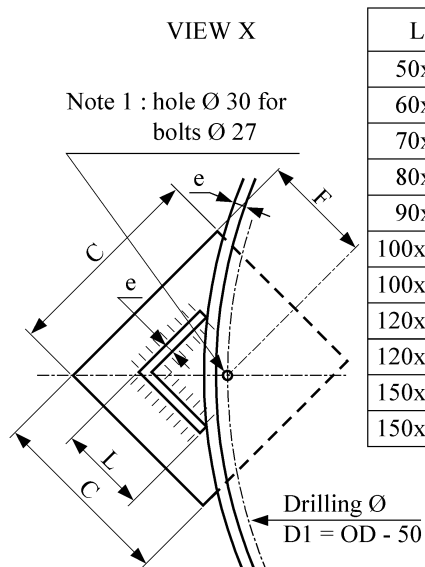
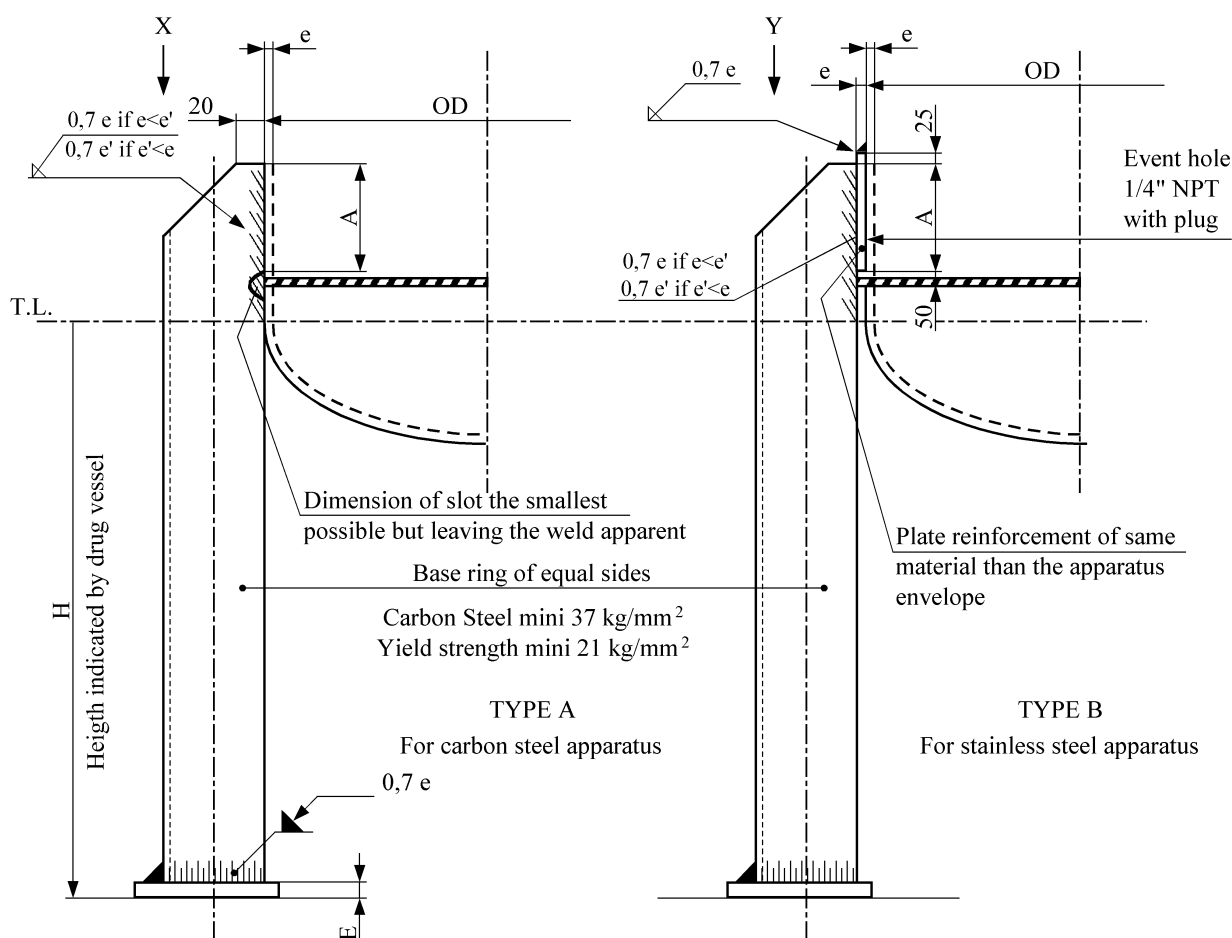
Cases Type: I		
d	D	e
¾"	Tube 1 ½"	SCH 40
1"	Tube 1 ½"	SCH 40
1 ½"	Tube 2 ½"	SCH 40
2"	Tube 3"	SCH 40
3"	Tube 4"	SCH 40
4"	Tube 6"	SCH 40
6"	Tube 8"	SCH 40
8"	Tube 10"	SCH 40
10"	Tube 12"	SCH 40
12"	425 mm	13 mm
14"	460 mm	13 mm
16"	500 mm	13 mm
18"	560 mm	13 mm

Cases Type: II		
d	D	e
¾"	Tube 6"	SCH 40
1"	Tube 6"	SCH 40
1 ½"	Tube 8"	SCH 40
2"	Tube 8"	SCH 40
3"	Tube 10"	SCH 40
4"	Tube 12"	SCH 40
6"	400 mm	Mini 8 mm
8"	460 mm	
10"	550 mm	Maxi 16 mm
12"	610 mm	
14"	650 mm	
16"	750 mm	
18"	800 mm	

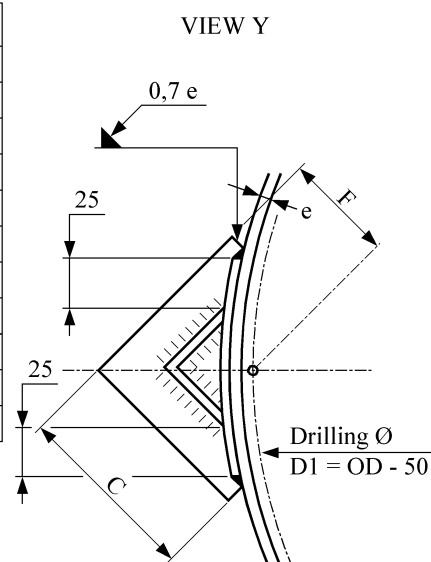
Material:

- Skirt: ASTM A 283 grade C → unless noted otherwise
- Vents and cases: ASTM A 106 or A 53 → unless noted otherwise

Standard Drawings	SD PVV 209
Legs for small apparatus	Rev.: 01
	Date: 10/03



Leg L	A	C ⁽¹⁾	e ⁽¹⁾	F
50x50x5	100	100	10	68
60x60x6	150	110	12	73
70x70x7	150	130	14	83
80x80x8	200	150	16	93
90x90x9	200	170	18	103
100x100x10	250	200	20	118
100x100x14	250	200	22	118
120x120x12	250	230	24	133
120x120x14	300	250	26	143
150x150x15	300	300	28	168
150x150x18	350	300	30	168



Note 1: When the torque reaction under the effect of the wind (empty apparatus) or under seismic load (full apparatus) needs a more important anchoring, anchoring defined by this standard must be studied consequently.



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Standard Drawings	SD PVV 209
Legs for small apparatus	Rev.: 01
	Date: 10/03

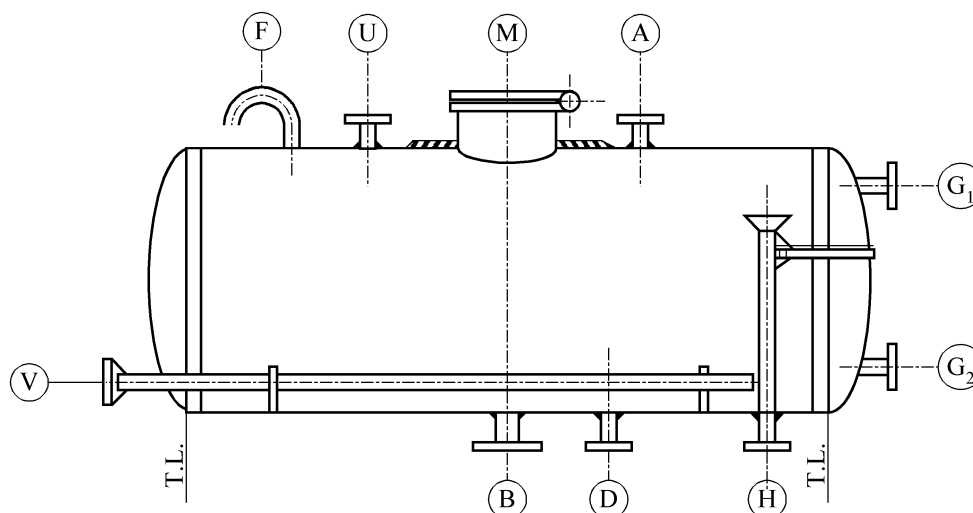
Loading per foot (kg) (see notes)

Height (mm)	1000	1500	2000	2400	2500	2800	3000	3100	3500	4000	4500	4700	5000	5500	6000
50 x 50 x 5	3800	1650	950	(3)											
60 x 60 x 6	6000	4500	2000	1350	(3)										
70 x 70 x 7	8900	7100	3600	2500	2300	1850	(3)								
80 x 80 x 8	12200	10000	8000	4200	3900	3100	2700	2500	(3)						
90 x 90 x 9	16000	13500	11300	6800	6400	5100	4400	4100	3800	(3)					
100 x 100 x 10	20000	17500	15000	13100	12500	7900	6700	6400	4100	3800	(3)				
100 x 100 x 14	27000	24000	20500	17900	17000	10800	9100	8700	6700	5400	(3)				
120 x 120 x 12	30000	27000	24000	21500	21000	19200	18000	12300	10300	7900	6100	5500			
120 x 120 x 14	34500	31000	27500	24800	24000	22000	20500	14200	11900	9100	7000	6300			
150 x 150 x 15	48000	45000	42000	38400	38000	35200	34000	33000	30000	20000	15000	13700	12300	10200	8500
150 x 150 x 18	57000	53400	49700	45500	45000	41600	40300	39000	35600	23600	17800	16200	14500	12000	10000

Notes:

- The table indicates the loading per foot according to the profiles and heights per loading, it is heard the sum of the following loads:
 - Actual weight of the apparatus
 - Weight of the fluid (with density > 1)
 - Forces and moments induced by piping
 - Compression due to the wind or seismic loads on the foot more solicits.
- The apparatuses will rest on 3 legs as a minimum, however a higher number could be adopted if necessary.
- In the table, loads not mentioned correspond to heights prohibited with the profile considered.
- The Manufacturer is entitled has to select higher profiles, if it considers it necessary to assume his responsibility.

Standard Drawings	SD PVV 210
Nozzles designation	Rev.: 01
	Date: 10/03



A	Main product inlet
B	Main product outlet
C	Condensate outlet
D	Drain
E	Water inlet, outlet
F	Vent
G	Level gage
H	Overflow
J	Auxiliary product inlet
K	Auxiliary product outlet
L	Level LI-LAH-LRC...
M	Manhole
N	Handhole-Nozzle support
P	Pressure connection
R	To or from of exchanger
S	Escape or safety valve
T	Temperature connection
U	Utility connection - Sample
V	Steam inlet
W	Spare connection

Note: When in the presence of several connections of same mark, indicate them as follows: A1, A2, ... An.



Exploration & Production

Standard Drawings	SD PVV 211
Minimum thickness of wall nozzles welded on vessels	Rev.: 01
	Date: 10/03

**Minimum wall thickness of tubes for nozzles welded on vessels
According to ASME section VIII & UG 45**

Seamless tube nozzles

N.D. (inches)	Thickness STD as per B 36-10M		Corrosion allowance and corresponding schedules							
	mm SCH	-12.5% mm	1 mm	1/16" 1.6 mm	2 mm	1/8" 3.2 mm	4 mm	3/16" 4.8 mm	6 mm	1/4" 6.4 mm
3/4	2.87 40	2.51	3.51 160	4.1 160	4.51 160	5.71 XXS	6.51 XXS	7.31 XXS**	8.51	8.91
1	3.38 40	2.96	3.96 80	4.56 160	4.96 160	6.16 XXS	6.96 XXS	7.76 XXS	8.96 XXS**	9.36
1 1/2	3.68 40	3.22	4.22 80	4.82 160	5.22 160	6.42 XXS	7.22 XXS	8.02 XXS	9.22 XXS**	9.62 XXS**
2	3.91 40	3.42	4.42 80	5.02 160	5.42 160	6.62 160	7.42 160	8.22 XXS	9.42 XXS	9.82 XXS**
3	5.49 40	4.81	5.81 80	6.41 80	6.81 160	8.01 160	8.81 160	9.61 160	10.81 XXS	11.22 XXS
4	6.02 40	5.27	6.27 80	6.87 80	7.27 80	8.47 120	9.27 120	10.07 160	11.27 160	11.67 160
6	7.11 40	6.22	7.22 80	7.82 80	8.22 80	9.42 80	10.22 120	11.02 120	12.22 120	12.62 160
8	8.18 40	7.17	8.17 60	8.77 60	9.17 80	10.37 80	11.17 100	11.97 100	13.17 100	13.57 120
10	9.27 40	8.10	9.10 60	9.70 60	10.10 60	11.30 80	12.10 80	12.90 80	14.10 100	14.50 100
12	9.53 STD	8.34	9.32 XS	9.92 XS	10.32 XS	11.52 60	12.32 60	13.12 80	14.32 80	14.72 80
14	9.53 30	8.34	9.32 40	9.92 XS	10.32 60	11.52 60	12.32 60	13.12 60	14.32 80	14.72 80
16	9.53 30	8.34	9.32 40	9.92 40	10.32 40	11.52 60	12.32 60	13.12 60	14.32 60	14.72 80
18	9.53 STD	8.34	9.32 30	9.92 XS	10.32 XS	11.52 40	12.32 40	13.12 60	14.32 60	14.72 60
20	9.53 STD	8.34	9.32 30	9.92 30	10.32 30	11.52 40	12.32 40	13.12 40	14.32 60	14.72 60
24	9.53 STD	8.34	9.32 XS	9.92 XS	10.32 XS	11.52 30	12.32 30	13.12 40	14.32 40	14.72 40
30	9.53 STD	8.34	9.32 20	9.92 20	10.32 20	11.52 30	12.32 30	13.12 30	14.32 **30	14.72 **30

* Maximum standard nominal thickness lower than ASME minimum thickness

** Maximum standard nominal thickness lower than ASME minimum thickness for walls of which thickness is equal to nominal size reduced of 12.5% allowance.



Exploration & Production

Standard Drawings	SD PVV 211
Minimum thickness of wall nozzles welded on vessels	Rev.: 01
	Date: 10/03

Welded steel pipe nozzles $18" \leq ND \leq 42"$

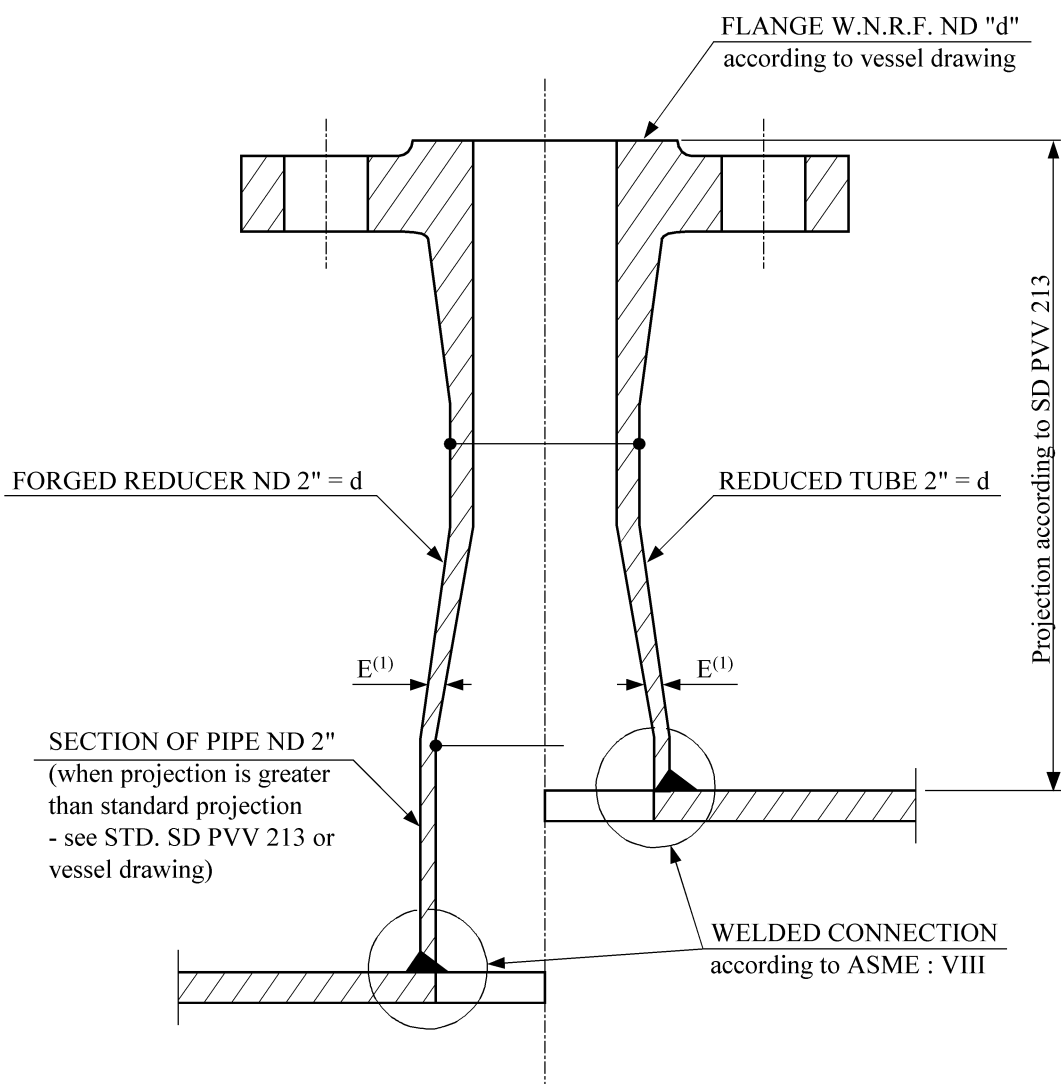
Corrosion allowance	inches			1/16"		1/8"		3/16"		1/4"
	mm	0	1	1.5	2	3.2	4	4.8	6	6.4
Minimum thickness	mm	9	10	10.6	11	12.2	13	13.8	15	15.4
Minimum nominal thickness of steel plates to be used	mm	9.5	10.5	11.5	11.5	13	13.5	14.5	15.5	16

Note: The thickness value measured on pipe wall during the acceptance of the vessel shall be the greatest of the following values:

- Minimum thickness given by this standard
- Thickness calculated under pressure effect taking into account both joint efficiency and corrosion allowance.

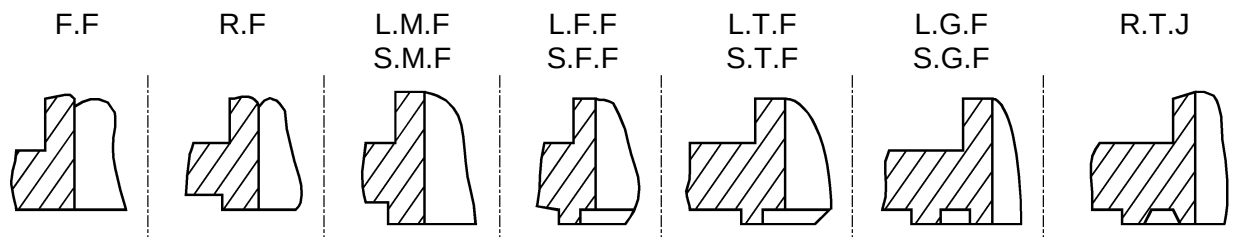
However, the thickness shall be limited to that of the vessel wall on which the nozzle is welded, corrosion allowance inclusive.

Standard Drawings	SD PVV 212
Nozzle DN < 2" on vessels	Rev.: 01
	Date: 10/03



Note (1): E according to STD SD PVV 211

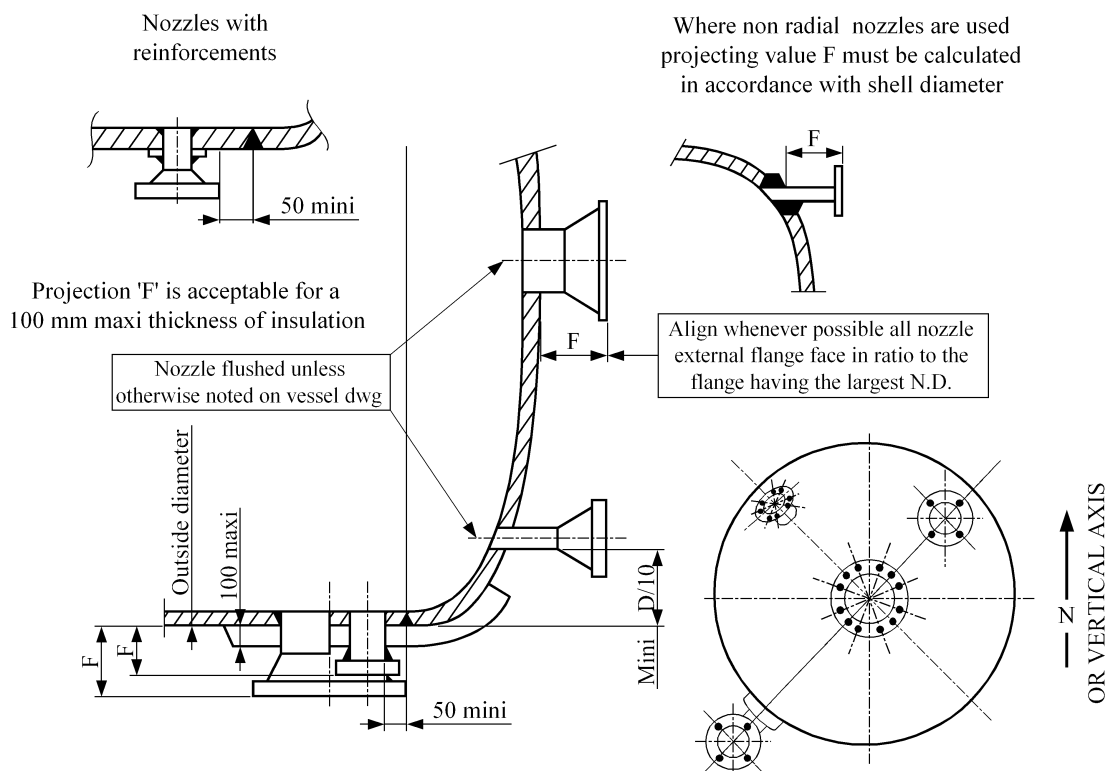
Standard Drawings		SD PVV 213
Projection and drilling of nozzles		Rev.: 01
		Date: 10/03



F.F : Flat Face
 R.F : Raised Face
 L.M.F : Large Male Face
 S.M.F : Small Male Face
 L.F.F : Large Female Face
 S.F.F : Small Female Face

L.T.F : Large Tongue Face
 S.T.F : Small Tongue Face
 L.G.F : Large Groove Face
 S.G.F : Small Groove Face
 R.T.J : Ring Type Joint

Where large male or tongued flanges are used, install flange male part on vessel preferentially

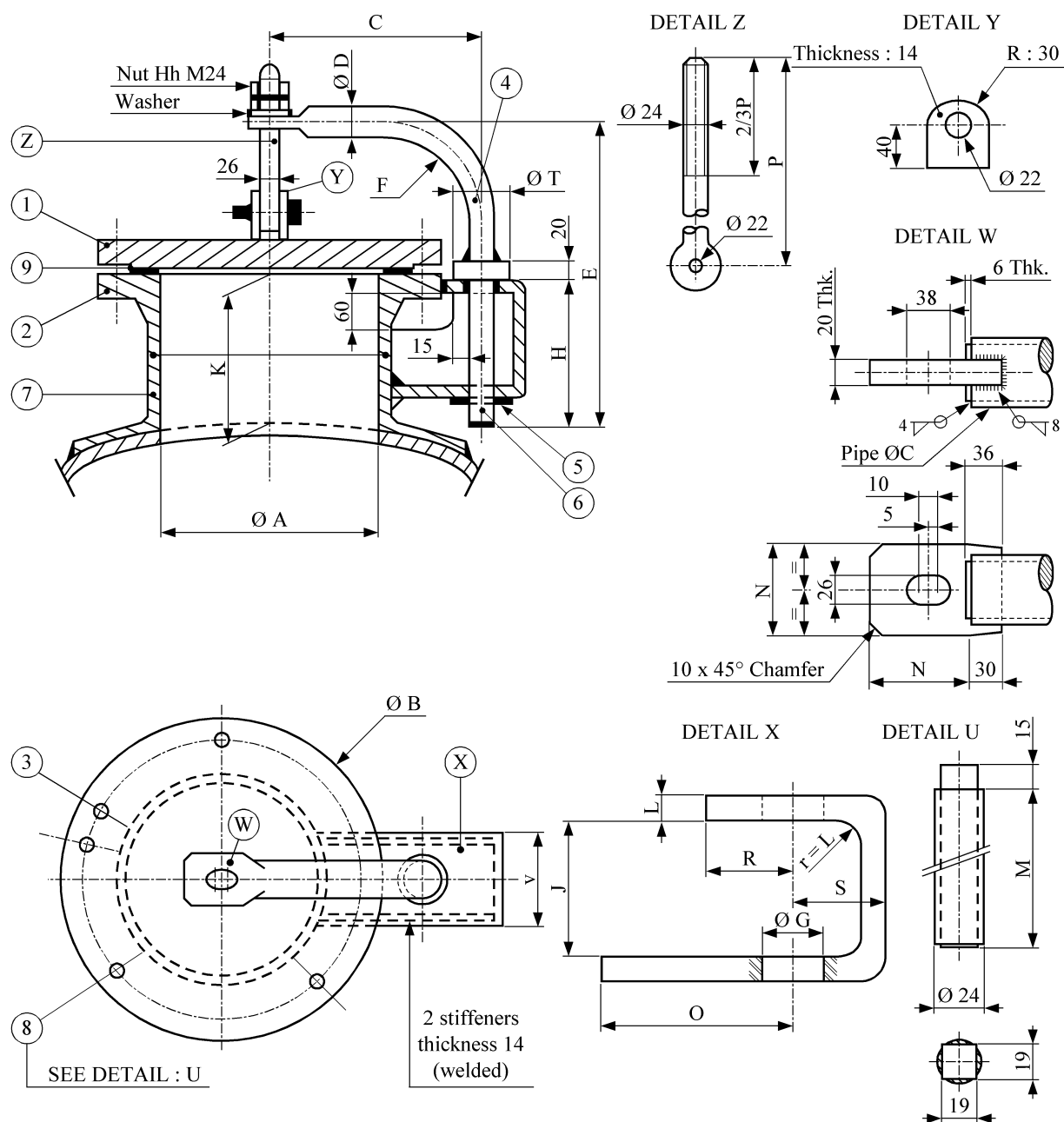


Rating #		150/300	600	900	1500	2500
P.N. bar eff.		10 to 40	64			
D.N. mm		10 to 40	64 to 160	250		
Nozzles nominal size		F: Value projecting from vessel O.D.				
inches	mm					
from 0 to 4	from 0 to 100	200	200	200	200	300
from 5 to 10	from 125 to 250	200	250	300	350	550
from 12 to 20	from 300 to 500	250	300	350	450	600 for 12"
> 20	> 500	300	350	450	550	300 mm
Drains on vertical vessels		250 For every size and rating				

Nozzles drilling to be:

- straddling the north south axis for vertical centerline nozzles.
- straddling the vertical axis for horizontal centerline nozzles.
- straddling the radiant and vertical axis for inclined nozzles

Standard Drawings	SD PVV 214
Vertical manhole with Davit (welding neck flange)	Rev.: 01
	Date: 10/03



Note: Where large male or tongued flanges are used "K" to be measured from gasket seat. The indicated weight is that of material listed below (incl. nozzle sch. 20).

Item	Description	Material	Quantity	Observations
9	Gasket	See vessel material	1	
8	Release threaded screw		3	
7	Spool piece		1	
6	Cotter pin		1	
5	Washer		1	
4	Davit		1	
3	Bolt		According to pressure	
2	Flange and support - Detail: X		1	
1	Blind flange and relevant hanging axis complete		1	

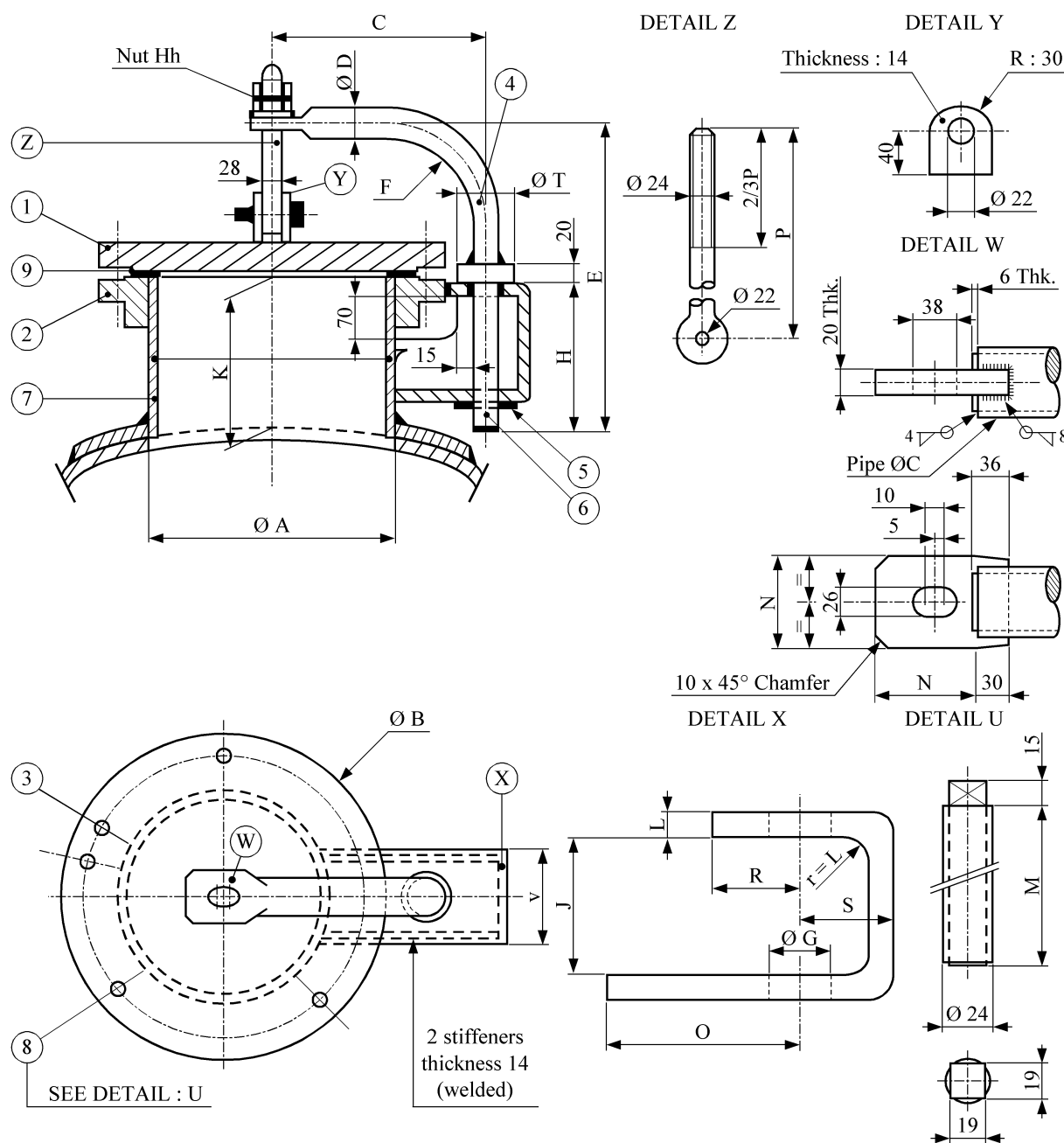


Standard Drawings	SD PVV 214
Vertical manhole with Davit (welding neck flange)	Rev.: 01
	Date: 10/03

Exploration & Production

N.D.	Rating	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S	T	V	Weight
18"	150#	457	635	390	2" SCH 80	540	300	62	220	150	300	20	80	80	159	300	70	100	100	140	225 kg
	300#	457	711	430	2" SCH 80	580	340	62	220	150	350	20	100	80	197	300	70	100	100	140	395 kg
	600#	457	743	460	3" SCH 160	740	340	92	280	200	450	20	130	100	228	350	85	120	130	180	670 kg
	900#	457	787	480	3" SCH 160	770	360	92	280	200	450	25	150	100	250	350	85	130	130	180	880 kg
20"	150#	508	698	420	2" SCH 80	550	300	62	220	150	300	20	85	80	166	300	70	100	100	140	275 kg
	300#	508	775	460	3" SCH 160	590	340	92	220	150	300	20	105	100	206	300	70	100	100	140	500 kg
	600#	508	813	495	3" SCH 160	800	400	92	280	200	450	25	130	100	241	450	85	130	130	180	835 kg
	900#	508	857	520	3" SCH 160	850	440	92	280	200	450	25	170	100	266	450	90	140	140	180	1090 kg
24"	150#	610	813	480	2" SCH 80	570	300	62	220	150	350	20	90	80	172	350	70	100	100	140	390 kg
	300#	610	914	545	3" SCH 160	650	410	92	220	150	350	20	110	100	237	350	85	120	130	180	730 kg
	600#	610	940	560	3" SCH 160	850	440	92	280	200	450	25	150	100	250	450	85	130	130	180	1135 kg
	900#	610	1041	620	ROD Ø 95	940	500	98	280	200	500	25	190	130	310	450	95	140	140	180	1880 kg

Standard Drawings	SD PVV 215
Vertical manhole with Davit (slip-on flange)	Rev.: 01
	Date: 10/03



Note: Where large male or tongued flanges are used "K" to be measured from gasket seat. The indicated weight is that of material listed below (incl. nozzle sch. 20).

Item	Description	Material	Quantity	Observations
9	Gasket	See vessel material	1	
8	Release threaded screw		3	
7	Spool piece		1	
6	Cotter pin		1	
5	Washer		1	
4	Davit		1	
3	Bolt		According to pressure	
2	Flange and support - Detail: X		1	
1	Blind flange and relevant hanging axis complete		1	

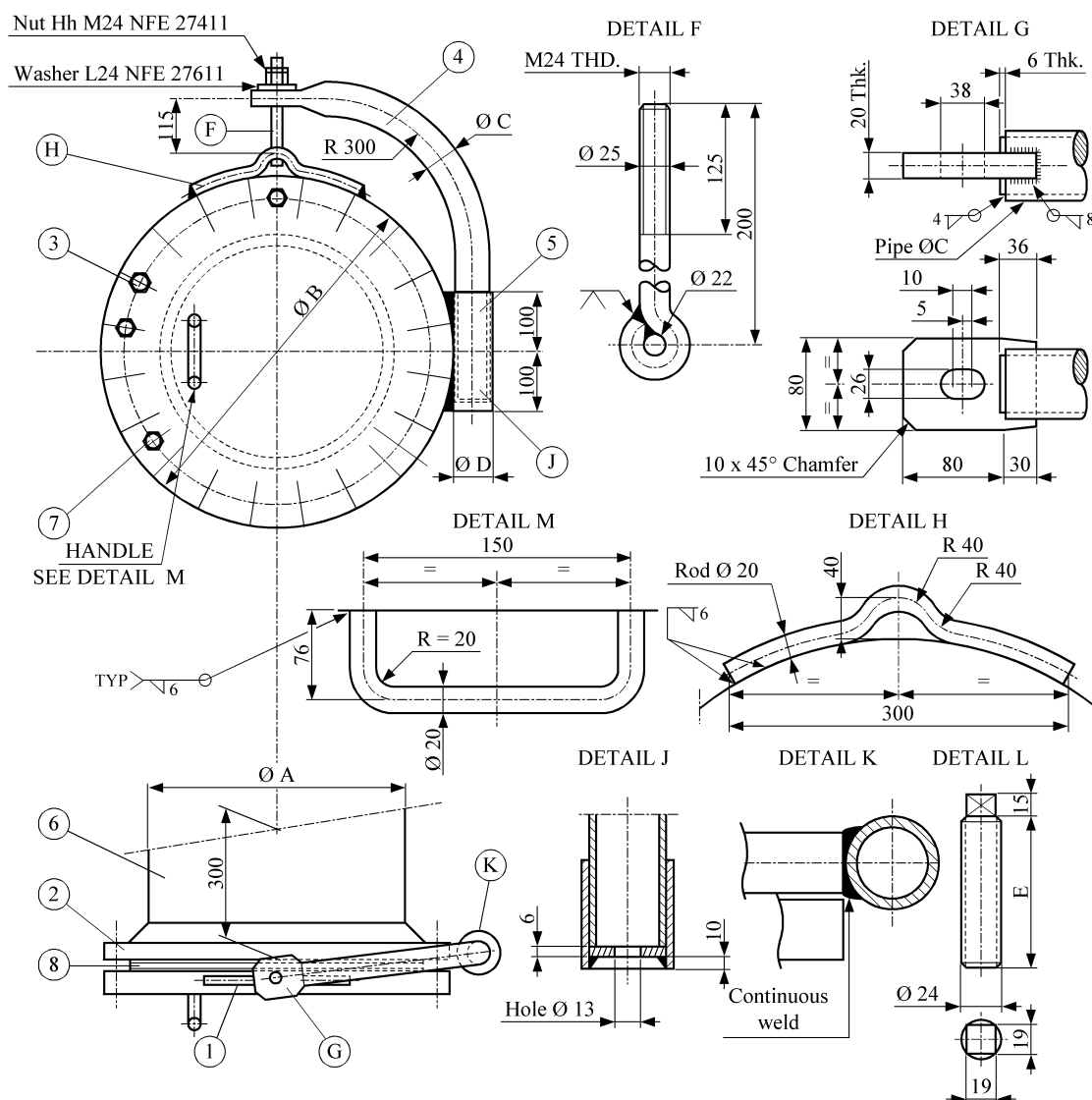


Exploration & Production

Standard Drawings	SD PVV 215
Vertical manhole with Davit (slip-on flange)	Rev.: 01
	Date: 10/03

N.D.	Rating	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S	T	V	Weight
18"	150#	457	635	390	2" SCH 80	540	300	62	220	150	300	20	80	80	159	300	70	100	100	140	200 kg
	300#	457	711	430	2" SCH 80	580	340	62	220	150	350	20	100	80	197	300	70	100	100	140	380 kg
	600#	457	743	460	3" SCH 160	740	340	92	280	200	450	20	130	100	228	350	85	120	130	180	630 kg
	900#	457	787	480	3" SCH 160	770	360	92	280	200	450	25	150	100	250	350	85	130	130	180	840 kg
20"	150#	508	698	420	2" SCH 80	550	300	62	220	150	300	20	85	80	166	300	70	100	100	140	250 kg
	300#	508	775	460	3" SCH 160	590	340	92	220	150	300	20	105	100	206	300	70	100	100	140	465 kg
	600#	508	813	495	3" SCH 160	800	400	92	280	200	450	25	130	100	241	450	85	130	130	180	760 kg
	900#	508	857	520	3" SCH 160	850	440	92	280	200	450	25	170	100	266	450	90	140	140	180	1030 kg
24"	150#	610	813	480	2" SCH 80	570	300	62	220	150	350	20	90	80	172	350	70	100	100	140	360 kg
	300#	610	914	545	3" SCH 160	650	410	92	220	150	350	20	110	100	237	350	85	120	130	180	700 kg
	600#	610	940	560	3" SCH 160	850	440	92	280	200	450	25	150	100	250	450	85	130	130	180	1125 kg
	900#	610	1041	620	ROD Ø 95	940	500	98	280	200	500	25	190	130	310	450	95	140	140	180	1850 kg

Standard Drawings	SD PVV 216
Horizontal manhole with Davit (welding neck flange)	Rev.: 01
	Date: 10/03

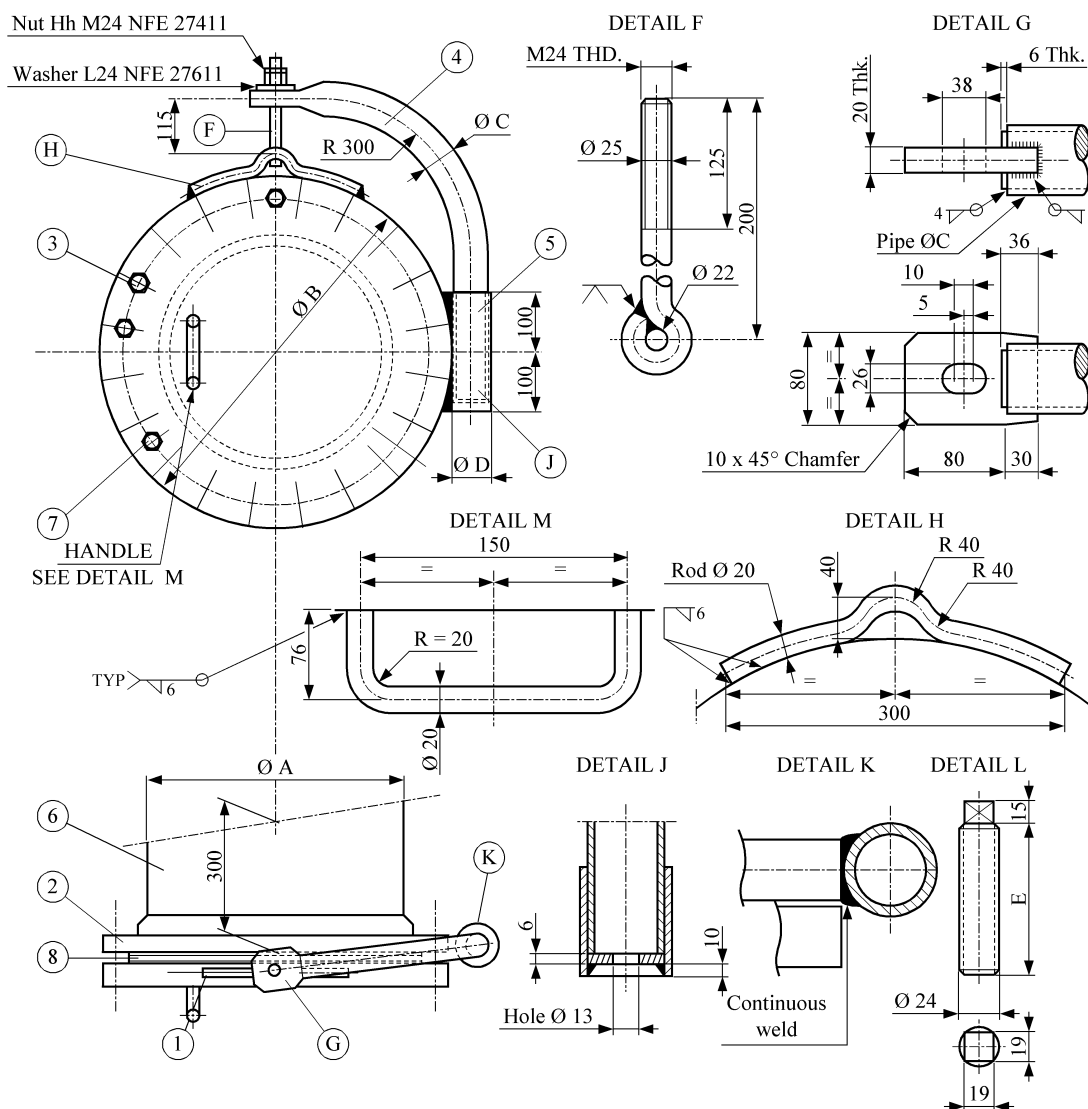


Note: Where large male or tongued flanges are used 300 to be measured from gasket seat. The indicated weight is that of material listed below (incl. nozzle sch. 20).

N°	Description	Nbr	Dia.	Press	A	B	Ø C SCH 80	Ø D	E	Weight
8	Gasket	1	18"	150#	457	635	2"	2 1/2" SCH 40	80	215 kg
7	Release threaded screw (detail L)	3	20"		508	698	2"	2 1/2" SCH 40	85	270 kg
6	Spool piece	1	24"		610	813	2"	2 1/2" SCH 40	90	375 kg
5	Sheath	1	18"	300#	457	711	2"	2 1/2" SCH 40	100	385 kg
4	Davit	1	20"		508	775	2 1/2"	3" SCH 80	105	480 kg
3	Bolting	•	24"		610	915	3"	3 1/2" SCH 40	110	700 kg
2	Flange	1	18"	400#	457	711	2 1/2"	3" SCH 80	105	460 kg
1	Blind flange and complete relevant hanging axis	1	20"		508	775	2 1/2"	3" SCH 80	110	575 kg
			24"		610	915	3"	3 1/2" SCH 40	115	840 kg
			18"	600#	457	743	3"	3 1/2" SCH 40	130	645 kg
			20"		508	813	3"	3 1/2" SCH 40	130	800 kg
			24"		610	940	3"	3 1/2" SCH 40	150	1110 kg

• According to pressure

Standard Drawings	SD PVV 217
Horizontal manhole with Davit (slip-on flange)	Rev.: 01
	Date: 10/03

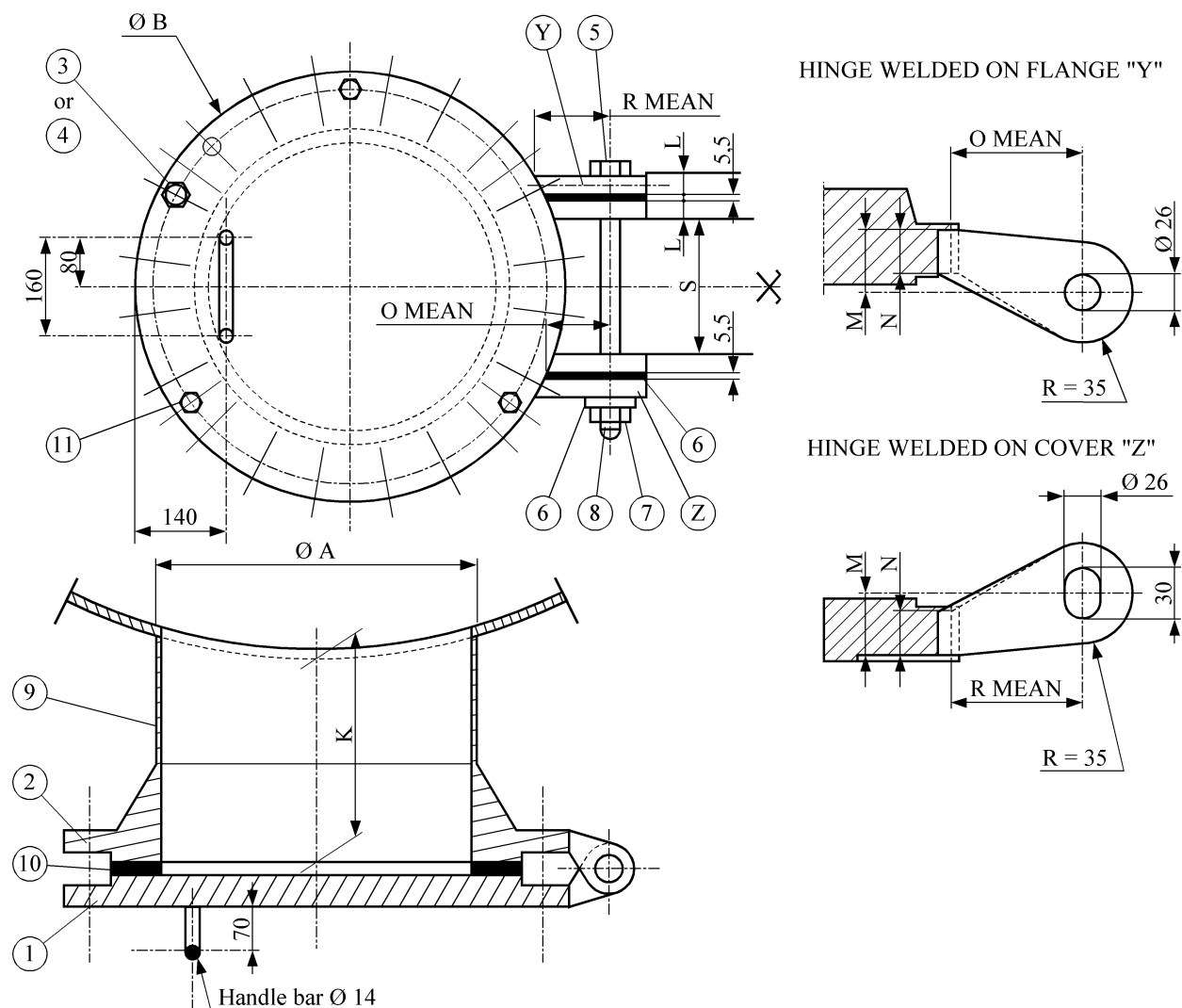


Note: Where large male or tongued flanges are used 300 to be measured from gasket seat. The indicated weight is that of material listed below (incl. nozzle sch. 20).

N°	Description	Nbr	Dia.	Press	A	B	Ø C SCH 80	Ø D	E	Weight
8	Gasket	1	18"	150#	457	635	2"	2 1/2" SCH 40	80	205 kg
7	Release threaded screw (detail L)	3	20"		508	698	2"	2 1/2" SCH 40	85	260 kg
6	Spool piece	1	24"		610	813	2"	2 1/2" SCH 40	90	365 kg
5	Sheath	1	18"	300#	457	711	2"	2 1/2" SCH 40	100	390 kg
4	Davit	1	20"		508	775	2 1/2"	3" SCH 80	105	460 kg
3	Bolting	•	24"		610	915	3"	3 1/2" SCH 40	110	695 kg
2	Flange	1	18"	400#	457	711	2 1/2"	3" SCH 80	105	440 kg
1	Blind flange and complete relevant hanging axis	1	20"		508	775	2 1/2"	3" SCH 80	110	555 kg
			24"		610	915	3"	3 1/2" SCH 40	115	810 kg
			18"	600#	457	743	3"	3 1/2" SCH 40	130	595 kg
			20"		508	813	3"	3 1/2" SCH 40	130	750 kg
			24"		610	940	3"	3 1/2" SCH 40	150	1090 kg

• According to pressure

Standard Drawings	SD PVV 218
Hinged manhole (welding neck flange)	Rev.: 01
	Date: 10/03



Note: Tighten the manhole cover bolts before welding hinges the cover to permit compression of the gasket. Where large male or tongued flanges are used, "K" to be measured from gasket seat.

The weights indicated are those listed in the bill of materials, including a SCH 20 tube coupling.

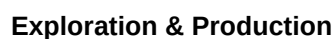
Item	Description	Material	Quantity	Remarks
11	Loosening screws Ø d length l.	See vessel material	3	Totally threaded
10	Gasket		1	See Spec
9	Spool piece Ø A		1	TH. or SCH. see drawing
8	Split pin Ø 5		1	See drawing or Spec
7	Nut Ø 24		1	
6	Washers		3	
5	Hinge bolt: screw Ø 24 length H		1	
4	Threaded stud, nuts		See ND and rating	3 tapped holes φ d
3	Bolt		1	
2	W.N. Flange with hinge "Y"		1	
1	Cover, blind flange, handle, hinge "Z"		1	



Standard Drawings	SD PVV 218
Hinged manhole (welding neck flange)	Rev.: 01
	Date: 10/03

Exploration & Production

N.D. rating		A	B	H	K	L	M	N	O	R	S	d	I	Weight
18"	150 #	457	635	220	300	20	80	80	159	70	100	27	130	210 kg
	300 #	457	711	220	350	20	100	80	197	70	100	27	170	395 kg
	600 #													
	900 #													
20"	150 #	508	698	220	300	20	85	80	166	70	100	27	130	270 kg
	300 #	508	775	220	300	20	105	100	206	70	100	27	170	470 kg
	600 #													
	900 #													
24"	150 #	610	813	220	350	20	90	80	172	70	100	27	130	375 kg
	300 #	610	914	220	350	20	110	100	237	85	120	27	170	700 kg
	600 #													
	900 #													



Hinged manhole (slip-on flange)



HINGE WELDED ON COVER "Z"

Note: Tighten the manhole cover bolts before welding hinges the cover to permit compression of the gasket. Where large male or tongued flanges are used, “K” to be measured from gasket seat.

The weights indicated are those listed in the bill of materials, including a SCH 20 tube coupling.

Item	Description	Material	Quantity	Remarks
11	Loosening screws Ø d length l.	See vessel material	3	Totally threaded
10	Gasket		1	See Spec
9	Spool piece Ø A		1	TH or SCH see drawing
8	Split pin Ø 5		1	See drawing or Spec
7	Nut Ø 24		1	
6	Washers		3	
5	Hinge bolt: screw Ø 24 length H		1	
4	Threaded stud, nuts		See ND and rating	
3	Bolt		1	
2	S.O. Flange with hinge "Y"		1	
1	Cover, blind flange, handle, hinge "Z"		1	3 tapped holes ø d



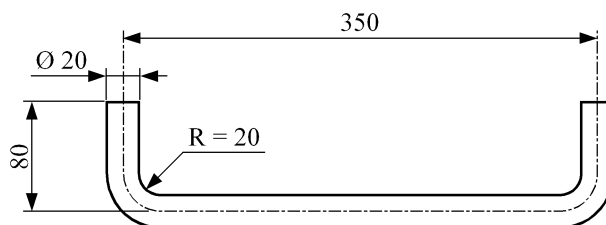
Standard Drawings	SD PVV 219
Hinged manhole (slip-on flange)	Rev.: 01
	Date: 10/03

Exploration & Production

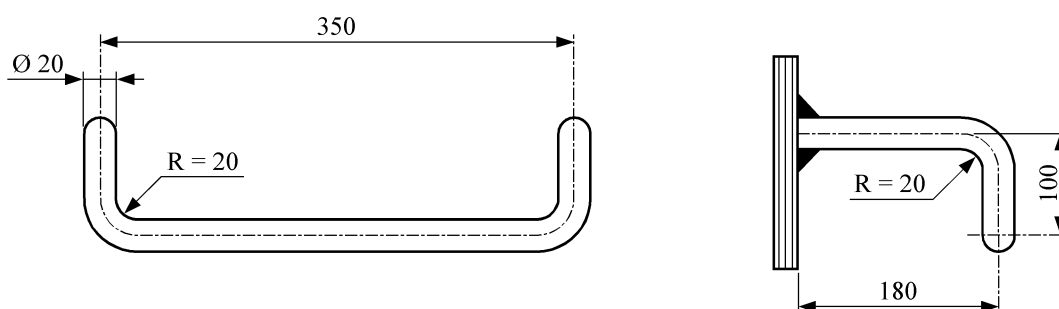
N.D. rating		A	B	H	K	L	M	N	O	R	S	d	I	Weight
18"	150 #	457	635	220	300	20	80	80	159	70	100	27	150	210 kg
	300 #	457	711	220	350	20	100	80	197	70	100	27	170	395 kg
	600 #													
	900 #													
20"	150 #	508	698	220	300	20	85	80	166	70	100	27	130	270 kg
	300 #	508	775	220	300	20	105	100	206	70	100	27	170	470 kg
	600 #													
	900 #													
24"	150 #	610	813	220	350	20	90	80	172	70	100	27	130	375 kg
	300 #	610	914	220	350	20	110	100	237	85	120	27	170	700 kg
	600 #													
	900 #													

Standard Drawings	SD PVV 220
Hand grip and ladder rung for manhole	Rev.: 01
	Date: 10/03

Hand grip

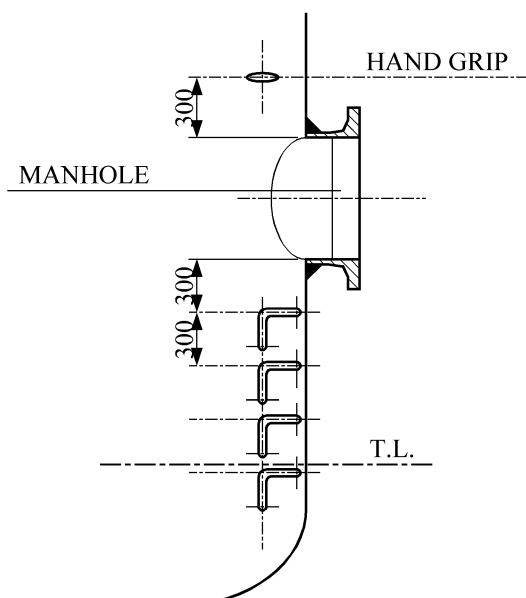


Ladder rung

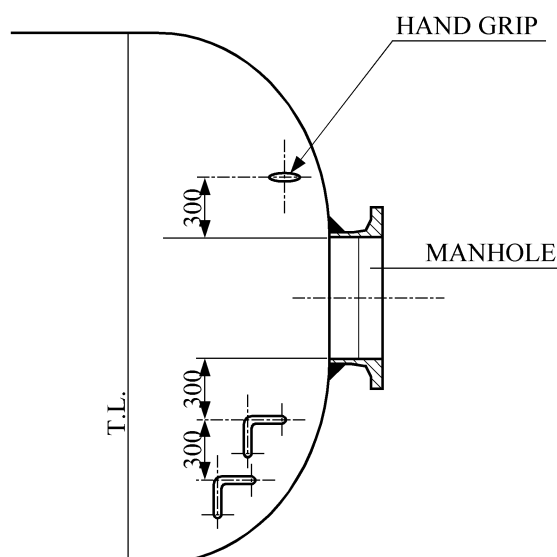


Installation example

VERTICAL

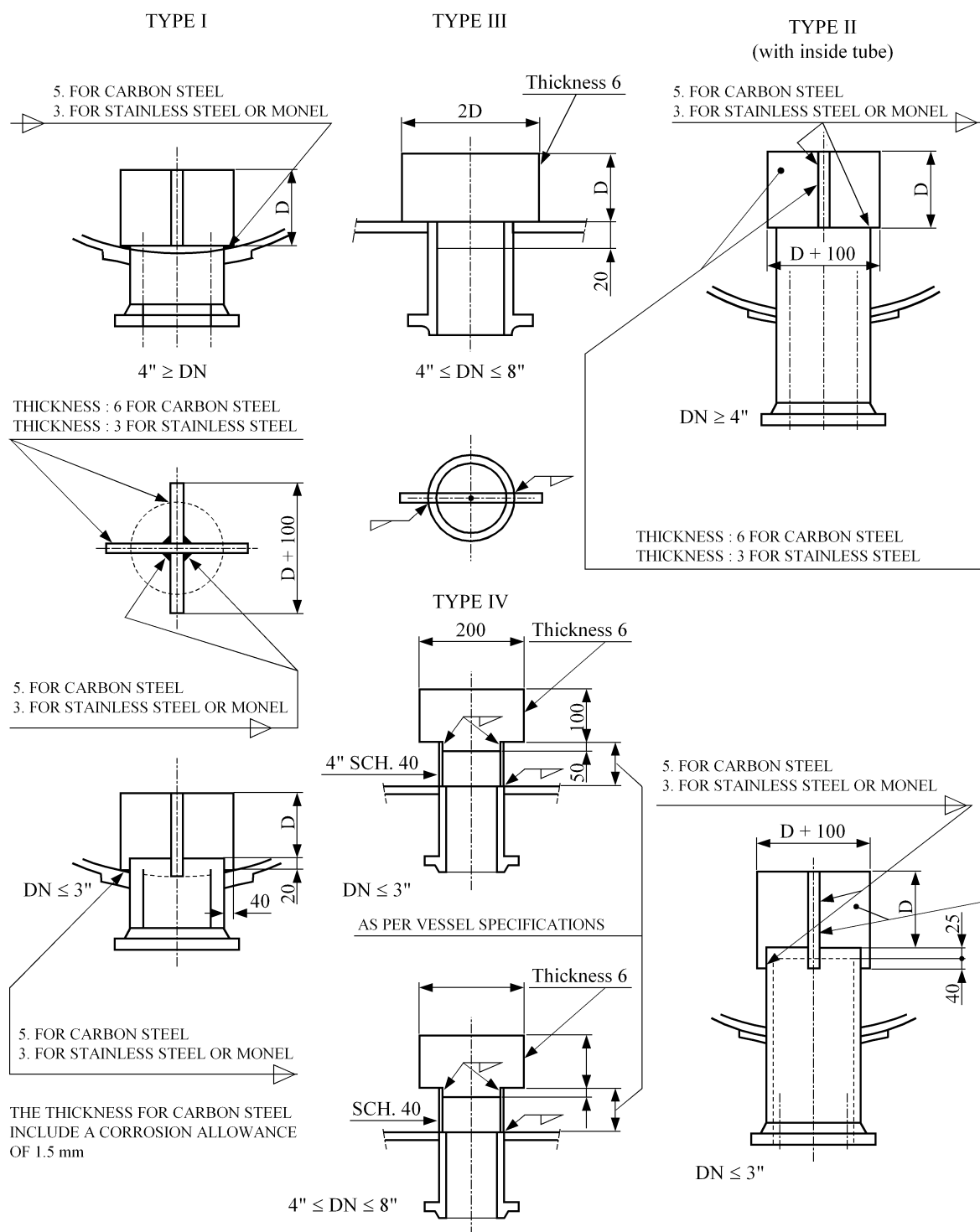


HORIZONTAL



Note 1: Material is the same than vessel one.

Standard Drawings	SD PVV 221
Vortex breakers on fluid outlet	Rev.: 01
	Date: 10/03

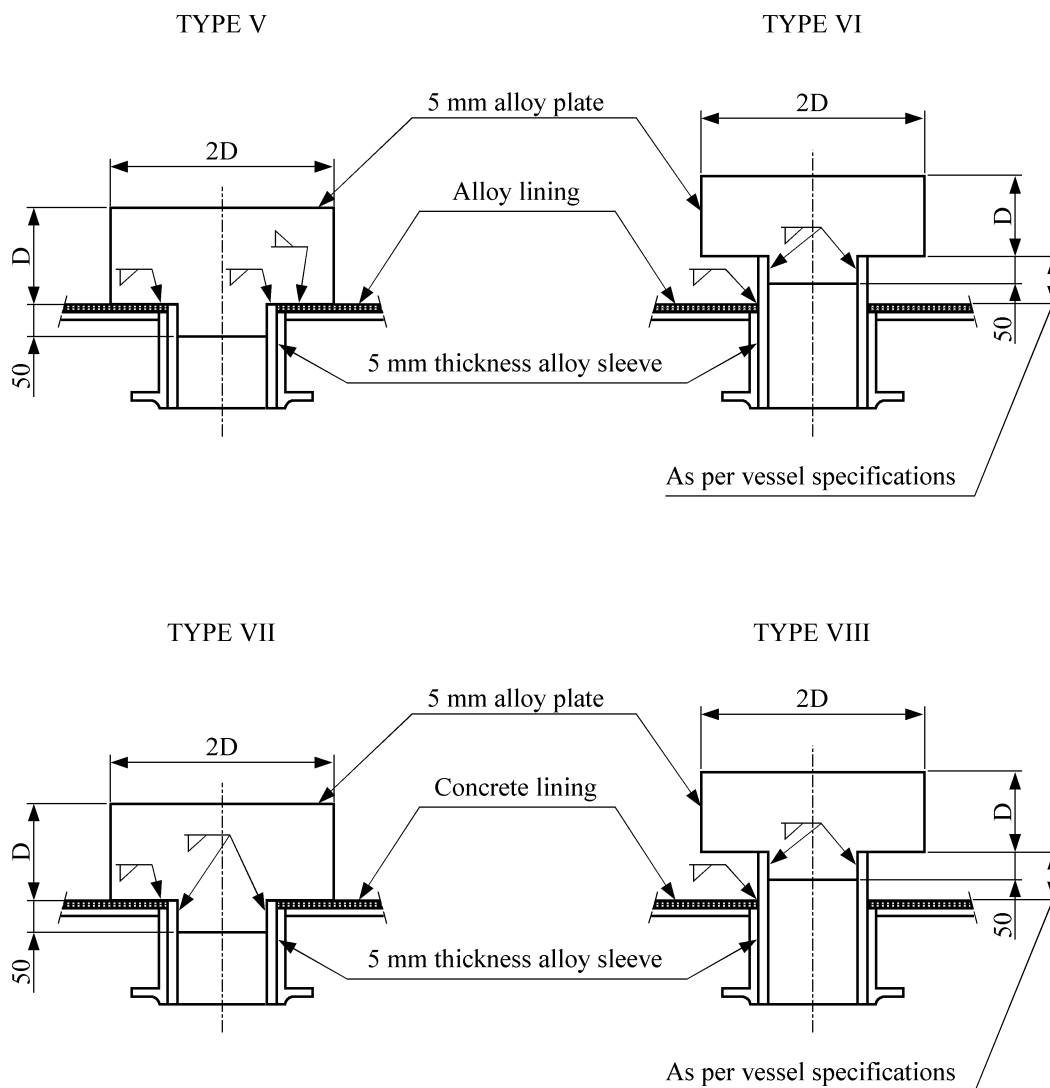


The thicknesses for carbon steel include a corrosion allowance of 1.5 mm.

Note:

1. Type and material according to vessel drawing.
2. Where size is indicated "D" = nozzle nominal diameter.
3. Details and dimensions shown in vessel drawing take precedent over those shown hereon.

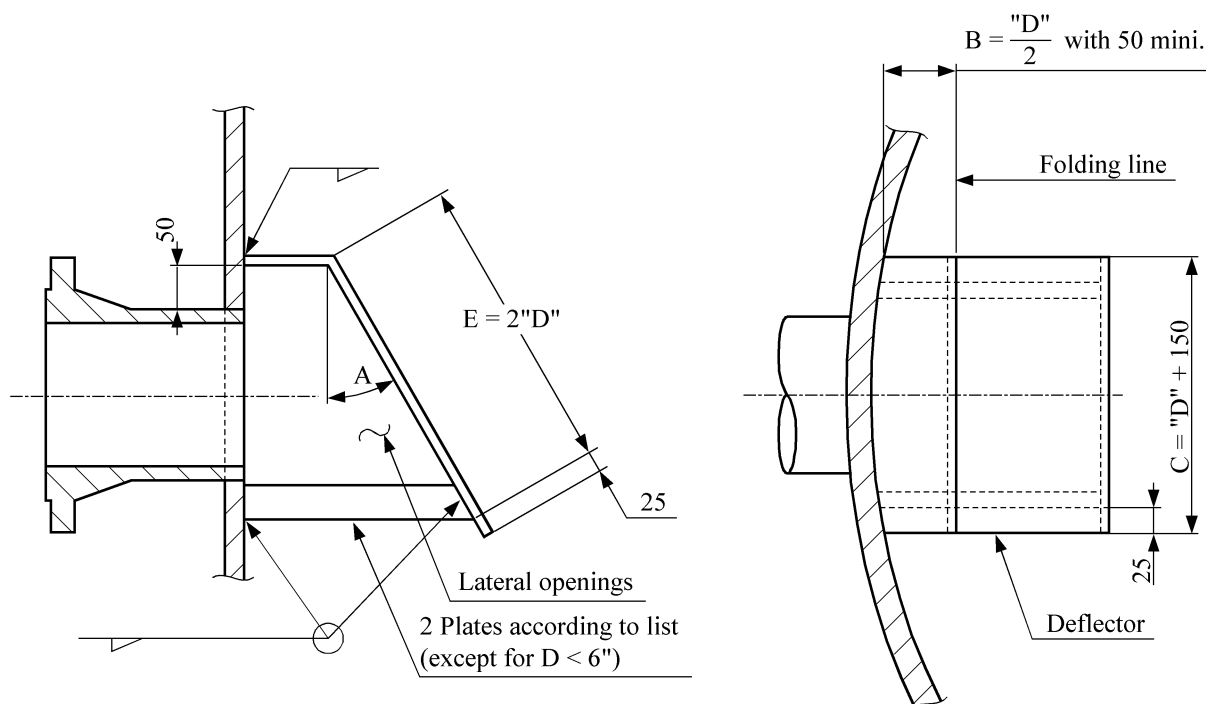
Standard Drawings	SD PVV 221
Vortex breakers on fluid outlet	Rev.: 01
	Date: 10/03



Note:

1. Type and material according to vessel drawing.
2. Where size is indicated "D" = nozzle nominal diameter.
3. Details and dimensions shown in vessel drawing take precedent over those shown hereon.

Standard Drawings	SD PVV 222
Deflector on steam inlet	Rev.: 01
	Date: 10/03



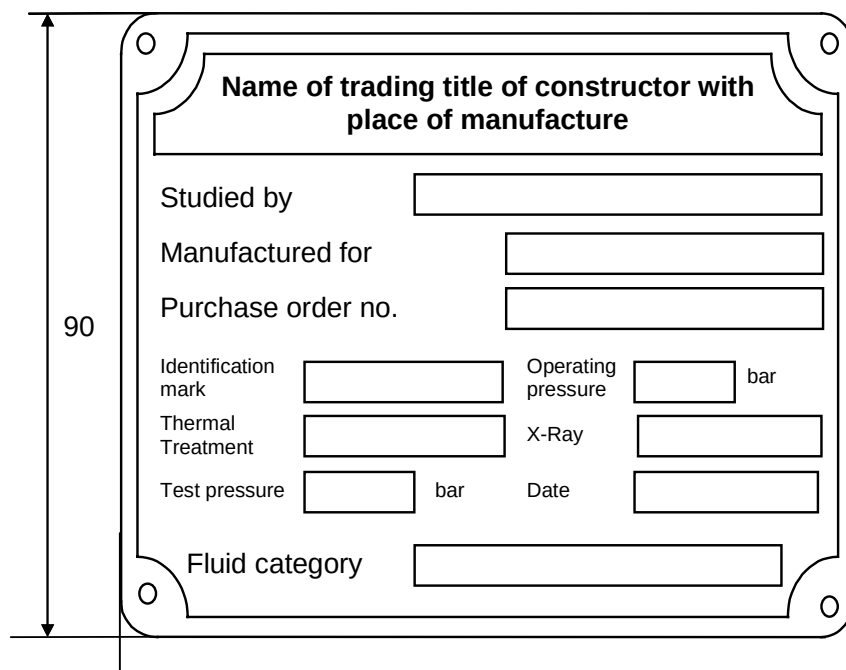
	Carbon steel	Stainless steel or monel
Plate	40 x 10	40 x 3
Welding	Thickness. 5	Thickness. 3
Deflector	Thickness. 10	Thickness. 5

Note:

1. The material will be defined on vessel drawing.
2. The steam jet do not ought to be towards on the tightness basin of the trays
 "A" = 30° except contrary indication.
 This angle may be adjusted to avoid eddies in the tightness basin.
3. D = nominal diameter of the nozzle.

Standard Drawings	SD PVV 223
Names plates for vessels	Rev.: 01
	Date: 10/03

1 - Identification plate



90

Name of trading title of constructor with place of manufacture

Studied by

Manufactured for

Purchase order no.

Identification mark Operating pressure bar

Thermal Treatment X-Ray

Test pressure bar Date

Fluid category

Material:

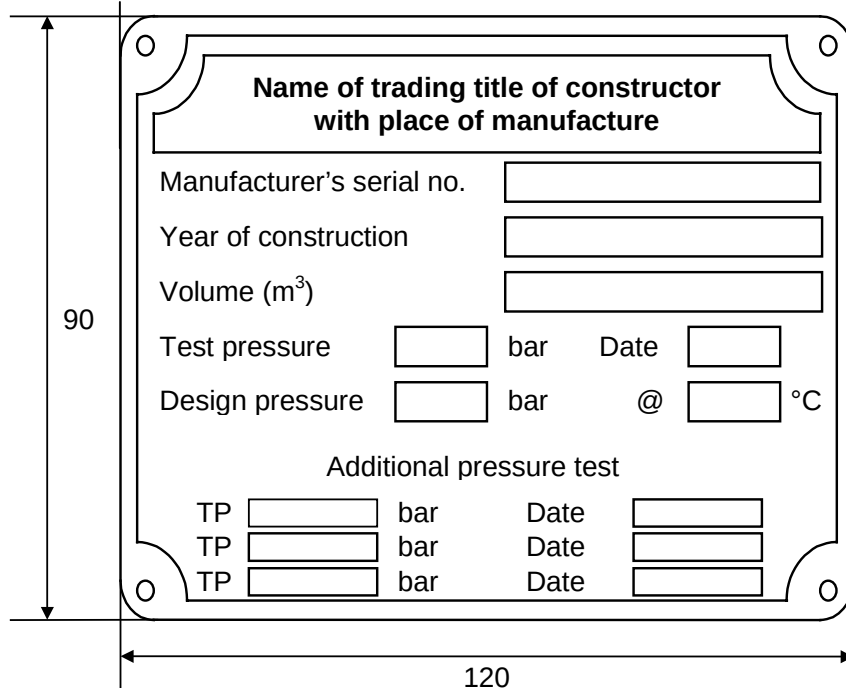
Stainless steel 316
Thickness 2 mm

Composition

All letters as well as the edges will be polished and raised to relief of 0.2 mm approx. on black background

1. Identification plate will be affixed on all the vessels what ever their pressure
2. Number plate will be affixed on all the vessels which are subject to regulations in addition to the identification plate
3. An optional firm plate could be proposed by the Manufacturer according to his model standard

2 – Number plate



90

Name of trading title of constructor with place of manufacture

Manufacturer's serial no.

Year of construction

Volume (m³)

Test pressure bar Date

Design pressure bar @ °C

Additional pressure test

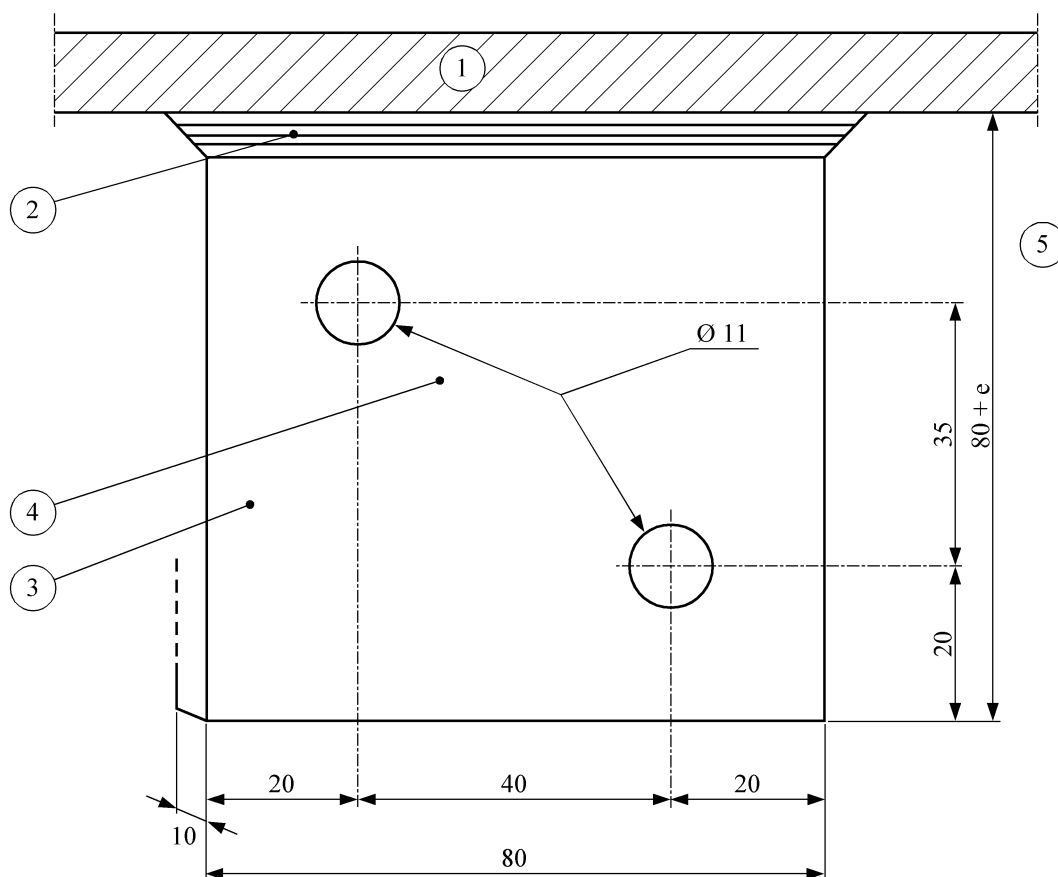
TP bar Date

TP bar Date

TP bar Date

120

Standard Drawings	SD PVV 224
Earthing plate	Rev.: 01
	Date: 10/03

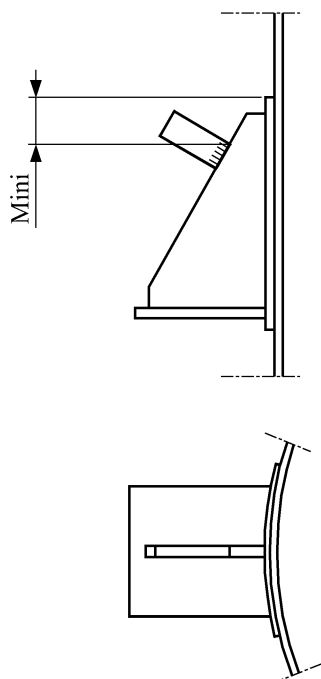


Legend

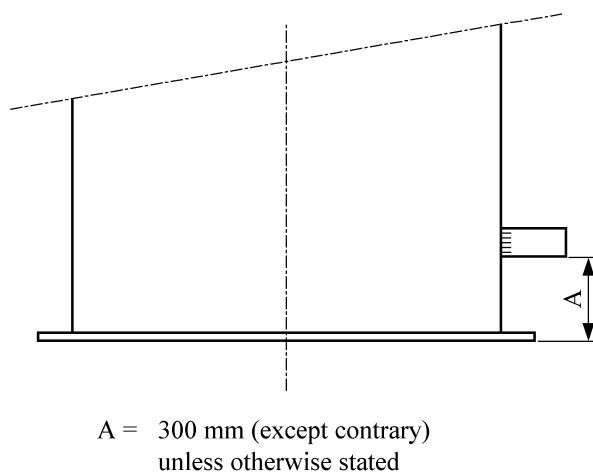
1. Vessel
2. Welding
3. Material = such as vessel material
4. Tinned contact surfaces
5. e = Fire proof material thickness

Standard Drawings	SD PVV 224
Earthing plate	Rev.: 01
	Date: 10/03

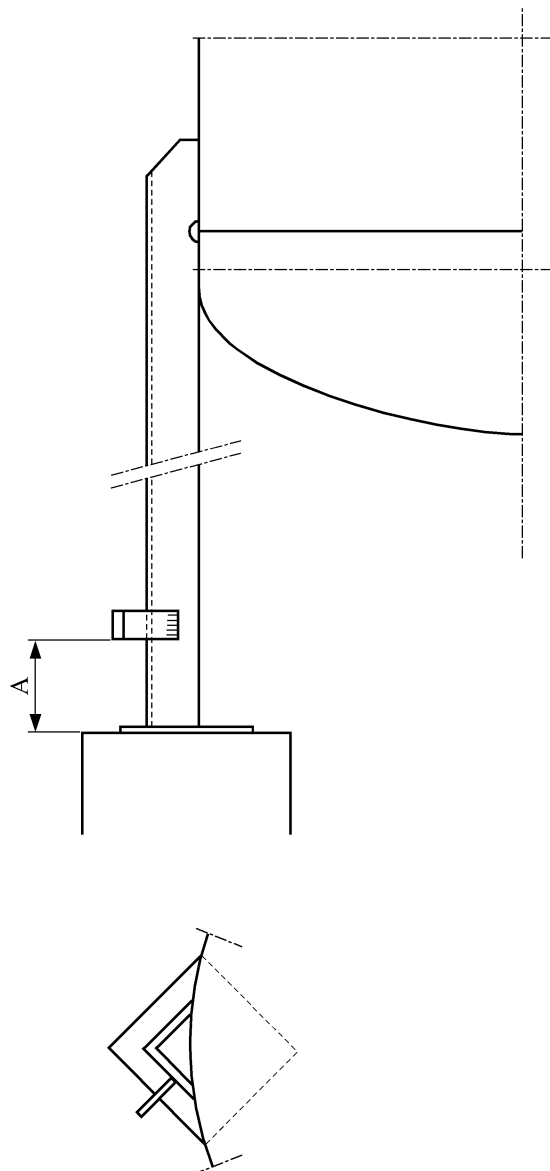
VESSEL ON CHAIRS



VESSEL ON SKIRT

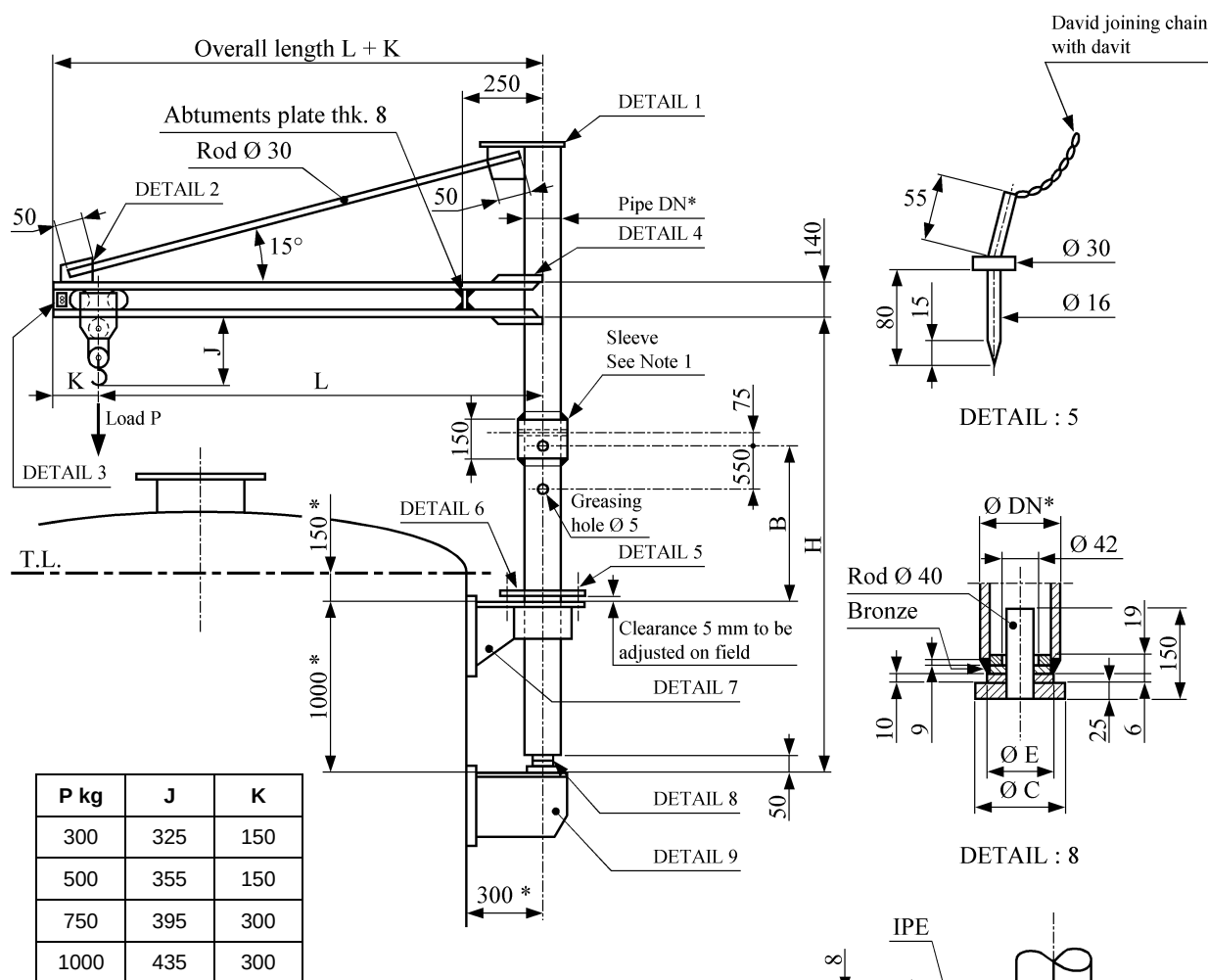


VESSEL ON LEGS



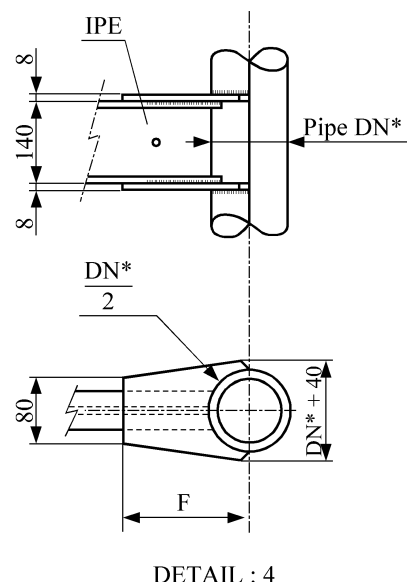
A = 300 mm (except contrary)
unless otherwise stated

Standard Drawings	SD PVV 225
Monorail Davit	Rev.: 01
	Date: 10/03



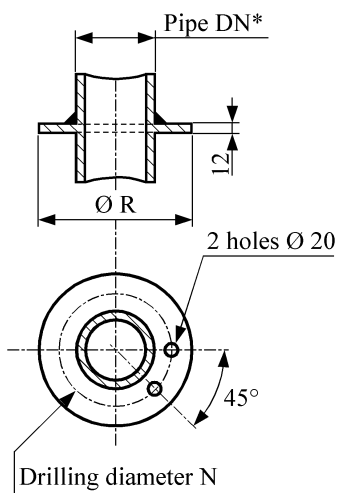
Notes:

1. Sleeve thk.: 10 welded with 2 holes Ø 24 at 90° for hinge pin
2. Dimension J and K are for a normal hand operated hoist
3. Dimension B will be indicated on drawing of apparatus
4. * Dimension being able to be modified on drawing of apparatus
5. The supports will be welded onto the apparatus before possible annealing
6. Material see sheet N° 2
7. On the davit the value of the load that can be lifted will be visibly indicated by the Constructor
8. The supply neither includes the travelling block nor the hoist

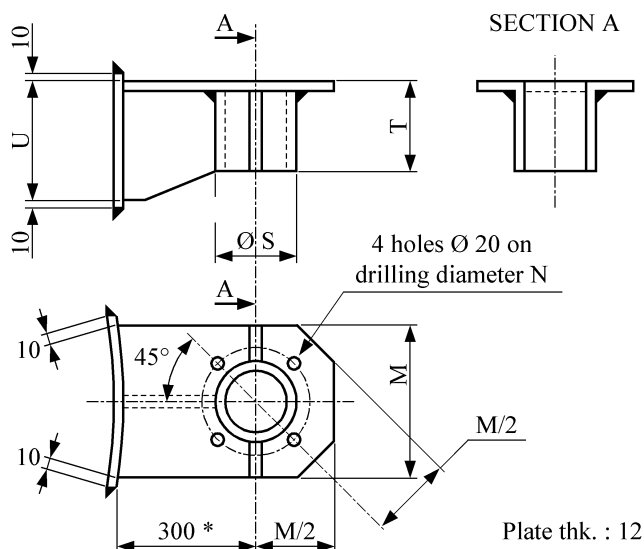


Standard Drawings	SD PVV 225
Monorail Davit	Rev.: 01
	Date: 10/03

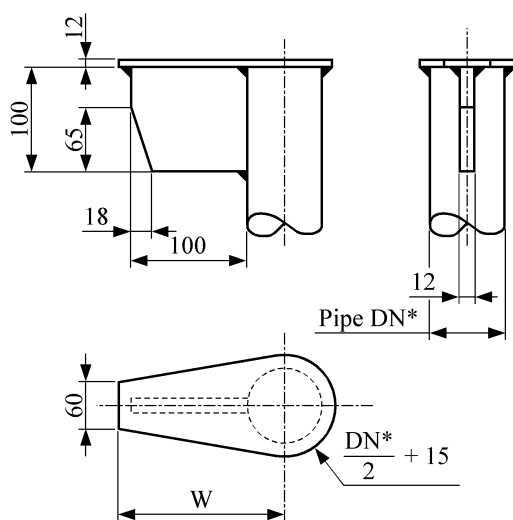
DETAIL 6



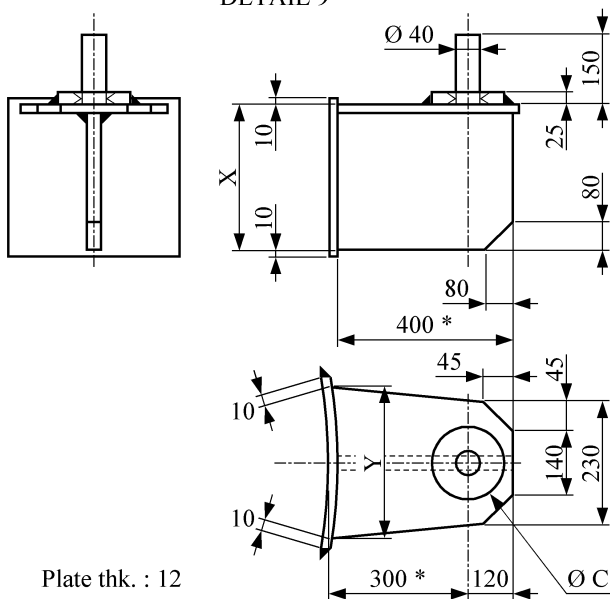
DETAIL 7



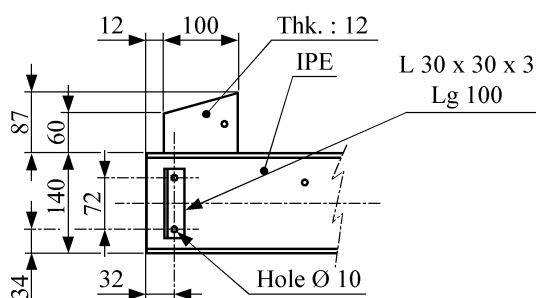
DETAIL 1



DETAIL 9



DETAILS 2, 3



Notes:

1. Material - Pipe A53 grade A or B or equal plate according to vessel drawing back-up plate - Use grade of vessel.
2. For dimensions see sheet 3
3. * Dimension being able to be modified on drawing of apparatus

Standard Drawings	SD PVV 225
Monorail Davit	Rev.: 01
	Date: 10/03

DN" \ SCH	6 \ 40	6 \ 80	8 \ 40	8 \ 80
C	175	175	220	220
E	154	146	202	193
F	200	200	230	230
M	300	300	400	400
N	260	260	350	350
R	300	300	400	400
S	194x10	194x10	245x10	245x10
T	200	200	250	250
U	300	300	350	350
W	200	200	225	225
X	300	300	350	350
Y	300	300	400	400

Load 300 kg

H \ L	1000		1500		2000		2500		3000		3500		4000		4500	
	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH
2000	6	40	6	40	6	40	6	80	8	40	8	40	8	40	8	40
2500	6	40	6	40	6	80	8	40	8	40	8	40	8	40	8	80
3000	6	40	6	80	8	40	8	40	8	40	8	40	8	80	8	80
3500	6	40	6	80	8	40	8	40	8	40	8	80	8	80		
4000	6	40	8	40	8	40	8	40	8	80	8	80				
4500	6	80	8	40	8	40	8	80	8	80						
5000	6	80	8	40	8	40	8	80								
IPE	140		140		140		140		140		140		140		140	

Load 500 kg

H \ L	1000		1500		2000		2500		3000		3500		4000		4500	
	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH
2000	6	40	6	80	8	40	8	40	8	40	8	80				
2500	6	40	8	40	8	40	8	40	8	80	8	80				
3000	6	80	8	40	8	40	8	80	8	80						
3500	6	80	8	40	8	80	8	80								
4000	8	40	8	40	8	80										
4500	8	40	8	80	8	80										
5000	8	40	8	80												
IPE	140		140		140		140		140		140					



Exploration & Production

Standard Drawings	SD PVV 225
Monorail Davit	Rev.: 01
	Date: 10/03

Load 750 kg

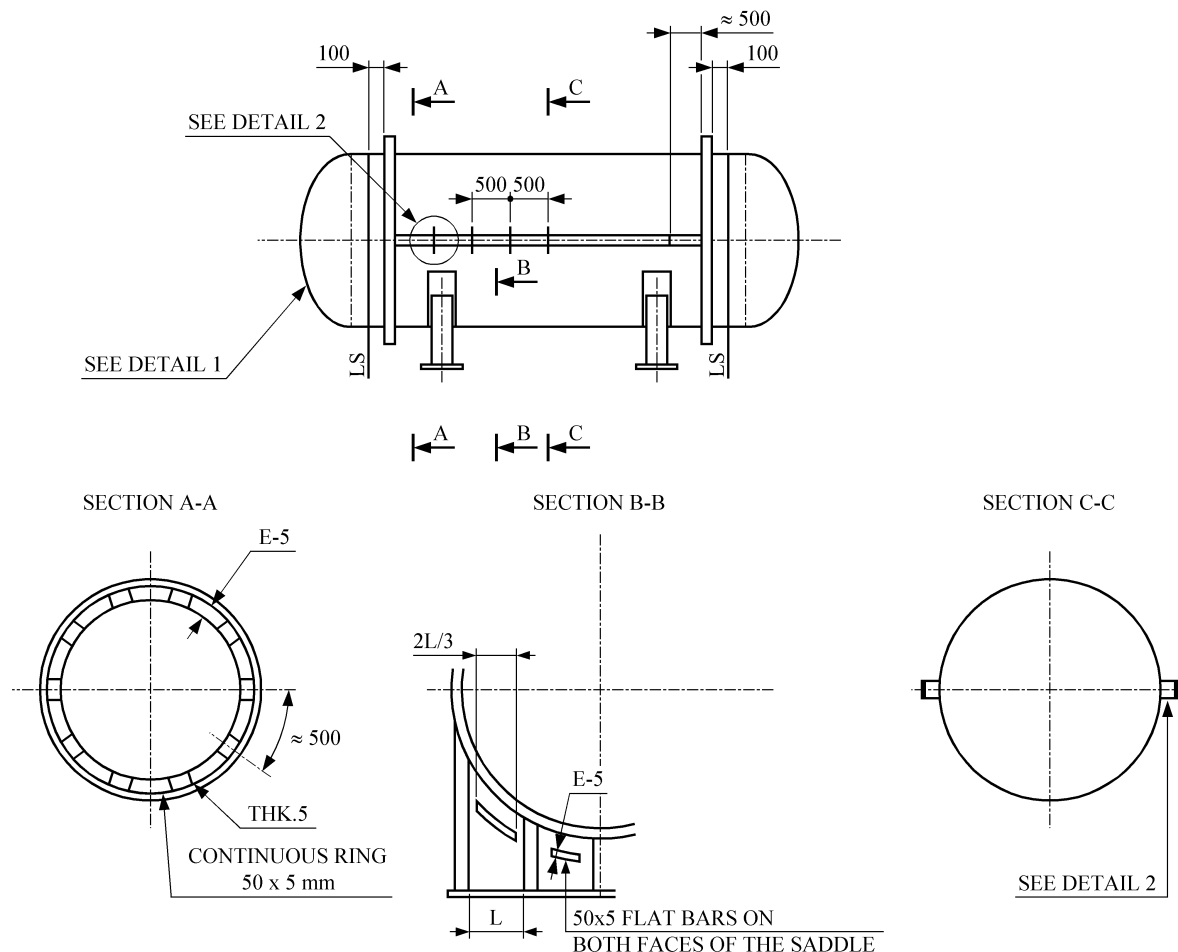
H \ L	1000		1500		2000		2500		3000	
	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH
2000	6	80	8	40	8	40	8	80	8	80
2500	8	40	8	40	8	80	8	80		
3000	8	40	8	80	8	80				
3500	8	40	8	80						
4000	8	40	8	80						
4500	8	80								
5000	8	80								
IPE	140		140		140		140		140	

Load 1000 kg

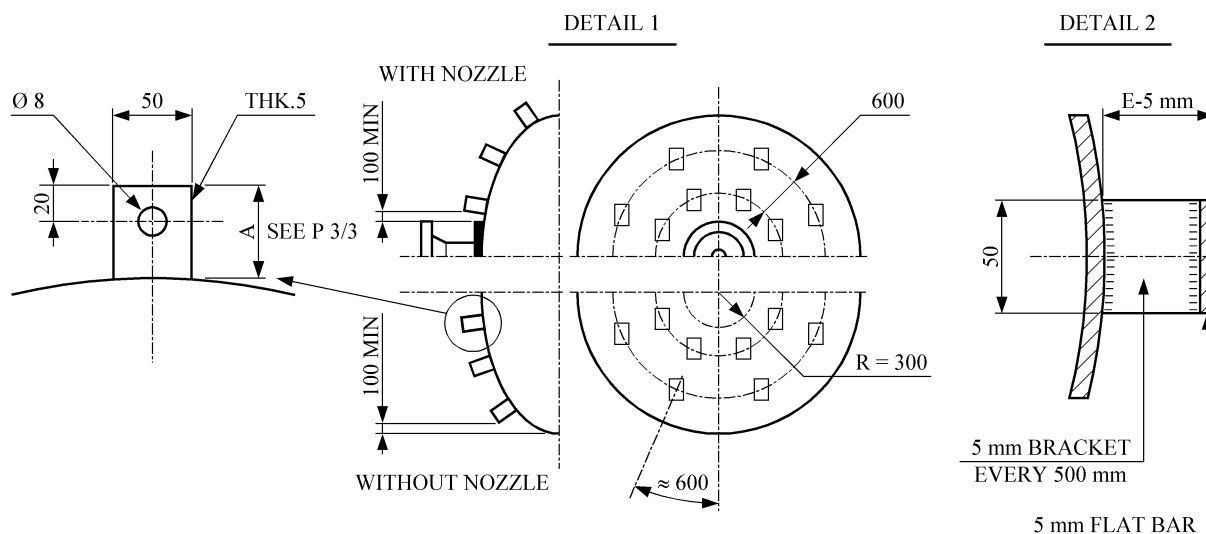
H \ L	1000		1500		2000		2500		3000	
	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH	DN"	SCH
2000	8	40	8	40	8	80				
2500	8	40	8	80						
3000	8	40	8	80						
3500	8	80								
4000	8	80								
4500	8	80								
5000										
IPE	140		140		140					

Standard Drawings	SD PVV 230
Support for heat insulation hot service	Rev.: 01
	Date: 10/03

**Supports on shells, horizontal vessels $\varnothing > 1200$
(no support for $\varnothing < 1200$)**



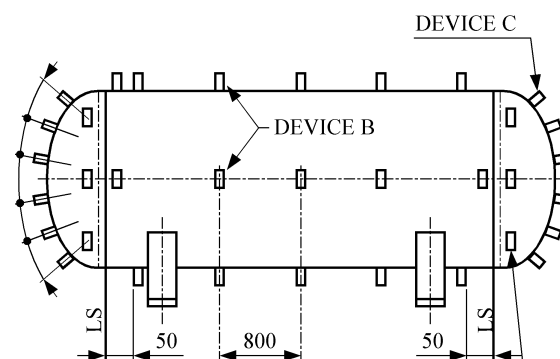
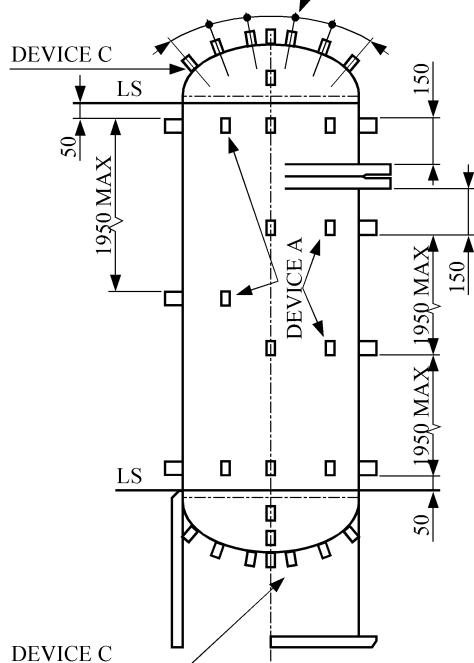
**Supports on ends/bottoms $\varnothing > 1200$
(no support for $\varnothing \leq 1200$)**



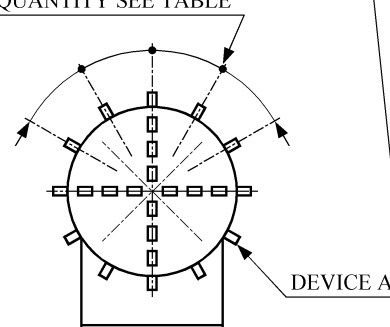
Standard Drawings	SD PVV 230
Support for heat insulation hot service	Rev.: 01
	Date: 10/03

Brackets for bolted supports

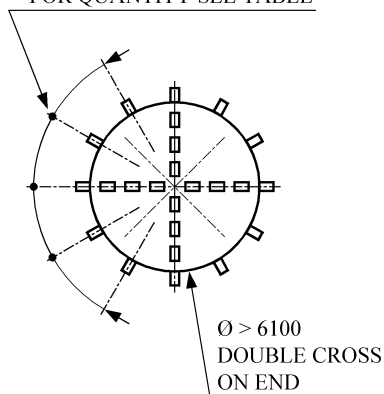
FOR QUANTITY SEE TABLE



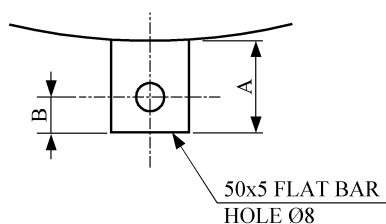
FOR QUANTITY SEE TABLE



FOR QUANTITY SEE TABLE



DETAIL OF INSULATION SUPPORT BRACKETS

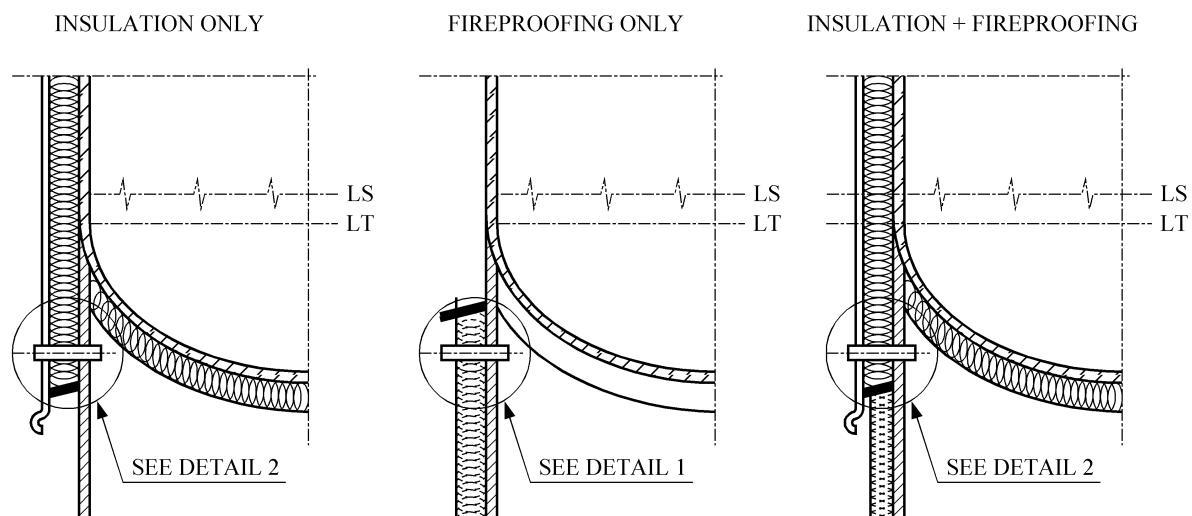


INSULATION THICKNESS	A	B
30 mm	25	10
40 TO 70 mm	30	15
80 TO 110 mm	40	20
120 AND + mm	60	30

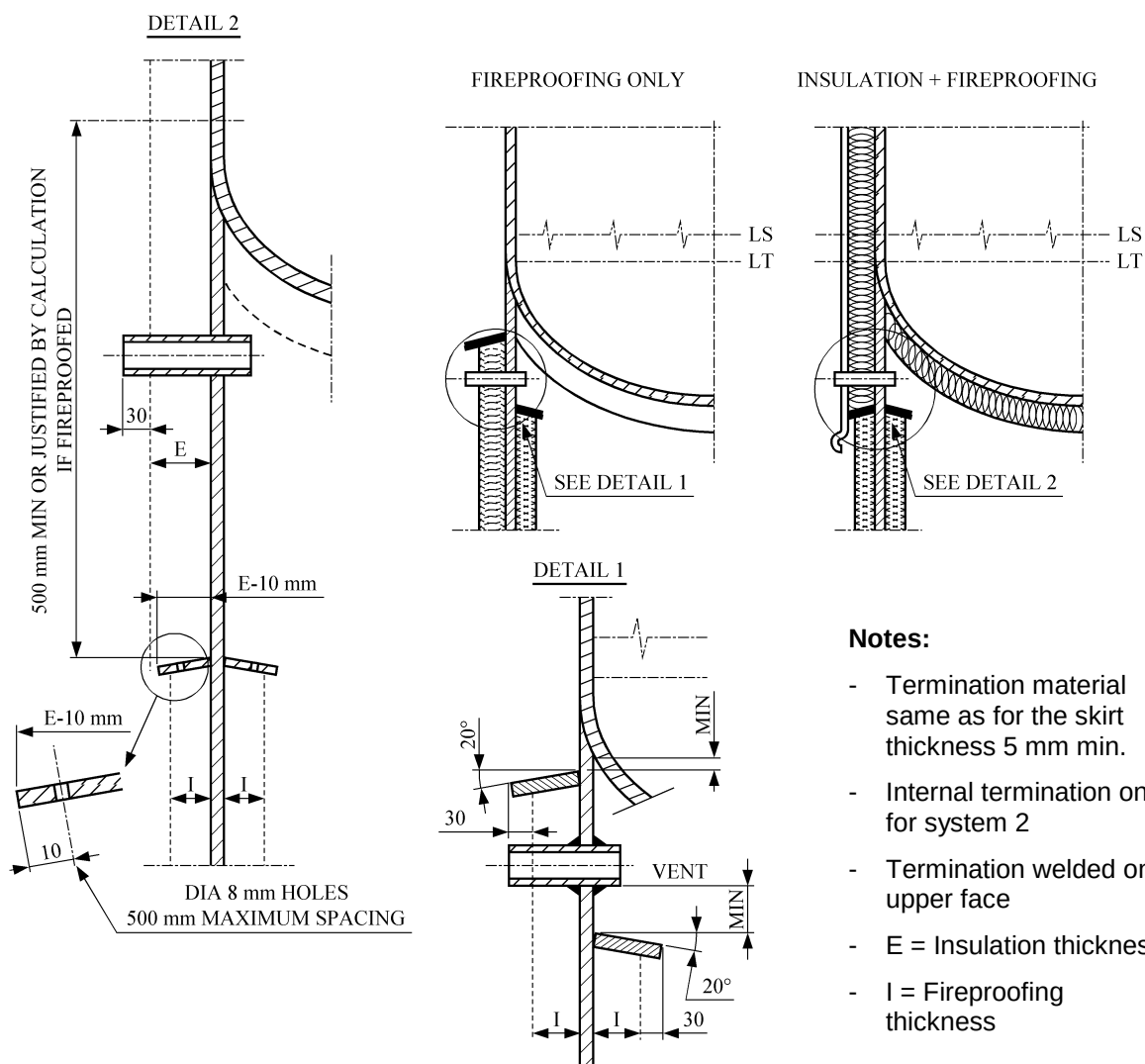
Vessel diameter	Horizontal vessels				Vertical vessels	
	Device A	Device B	Device C		Device A	Device C
Ø < 1200	none	none	none		none	none
1200 ≤ Ø < 2400	8	on lateral generating line	horizontal axis	4	8	90° to 270° axis
2400 ≤ Ø < 3700	10	on lateral generating line		6	10	4
3700 ≤ Ø < 4900	12	on all 4 generating lines	cross arrangement	12	12	cross arrangement
4900 ≤ Ø < 6100	16	on all 4 generating lines		16	16	16
Ø ≥ 6100					1 anchor every meter	double cross 32 anchors

Standard Drawings	SD PVV 231
Insulation or fire-proofing termination for vessel skirts	Rev.: 01
	Date: 10/03

System 1 (external fireproofing)



System 2 (external and internal fireproofing)



Notes:

- Termination material same as for the skirt thickness 5 mm min.
- Internal termination only for system 2
- Termination welded on upper face
- E = Insulation thickness
- I = Fireproofing thickness

Standard Drawings	SD PVV 232
Clad alloy vessel welding procedure	Rev.: 01
	Date: 10/03

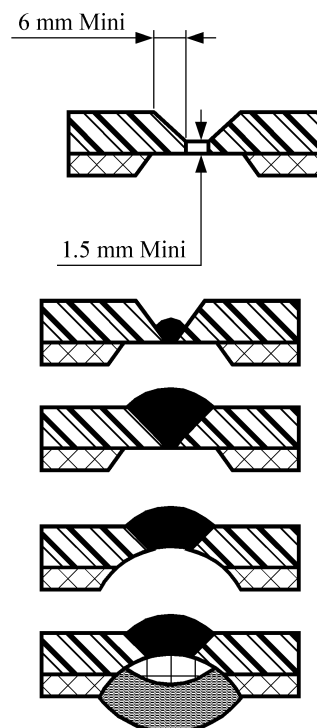
Welding details

Preparation of joint welded assembly and welding operations

1. Bevel base plate leaving a minimum root face of 1.6 mm wide.

Proceed to same on clad leaving parent metal clear over 6.5 mm in width.

2. Proceed to spot welding of base plates using electrodes ① Note 2A.
3. Proceed to welding completion of base plates using electrodes ① avoiding weld penetrations into the clad alloy.
4. Chip out or grind clad side in order to improve weld.
5. Weld clad using alloy ② and ③ electrodes.



Notes

1. Above details are not intended to provide a complete welding procedure. Additional informations to be given by the vessel Manufacturer covering the preparation and the qualification of his procedure in accordance with A.S.M.E. section IX and pressure vessel code.

Base plate parent metal	Electrodes
Carbon steel	ASTM SFA 51
Low alloy steel	ASTM SFA 55

2. Electrodes to be selected as follows:

A. For base plates:

Where ASTM SFA 55 are used their composition is to be that of the base plate metal. A special specification is to be developed for materials not covered by ASTM SFA 55.

Standard Drawings	SD PVV 232
Clad alloy vessel welding procedure	Rev.: 01
	Date: 10/03

B. For clad:

Cladding alloy	Intermediate alloy ¶	Alloy @
AISI TYPE 405	* ASTM SFA 54 E 310	ASTM SFA 54 E 310*
304 L		
AISI TYPE 321	ASTM SFA 54 E 309 CB	ASTM SFA 54 E 347
347		
AISI TYPE 316 L	ASTM SFA 54 E 309 MO	ASTM SFA 54 E 316
MONEL	ASTM SFA 511 E NI CU 1	ASTM SFA 511 E NI CU 1

- * Although it is general practice to weld type 405 and other straight chromium clad steels with austenitic electrodes to avoid post heat brittleness (specific for each case but generally at $T \geq 444^{\circ}\text{C}$) austenitic weld deposits can't tolerated because of differential thermal expansion. in this case 430 should be used with appropriate pre and post heat treatment however E 310 is preferred for $T < 444^{\circ}\text{C}$. Unless extreme thermal cycling condition exists.

- For flange facings the deposit shall be made in a machined groove for welding. Finished flange thickness shall be ASME standard.
- Dilution of the final alloy weld pass should be avoided. Generally 2 passes are required to avoid dilution of the surface exposed to corrosion. This is particularly important when thin cladding is used. The vessel Manufacturer shall ensure by suitable examination that the final weld pass meets the requirement.

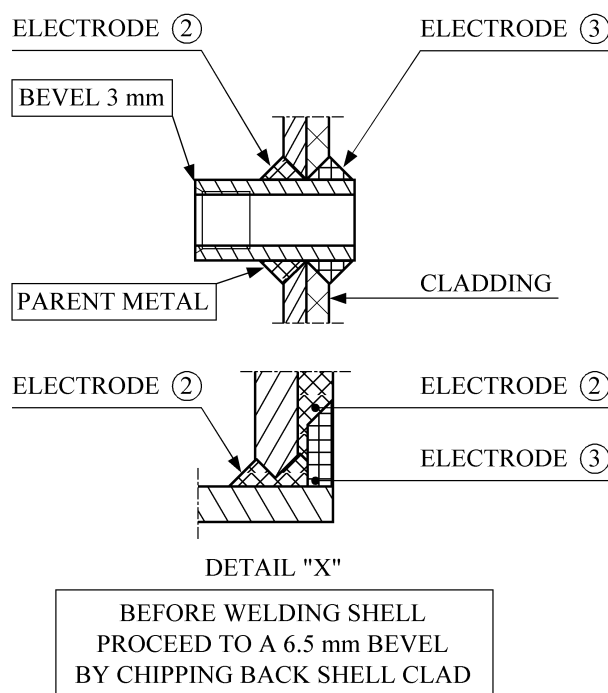
Miscellaneous details

Welding of threaded couplings

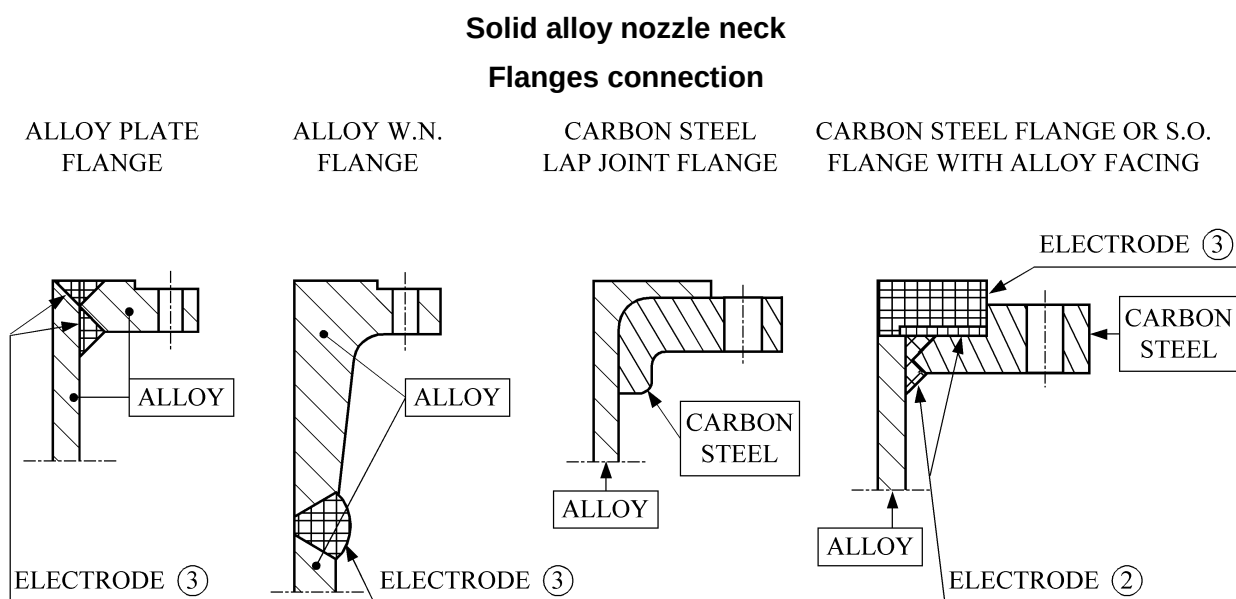
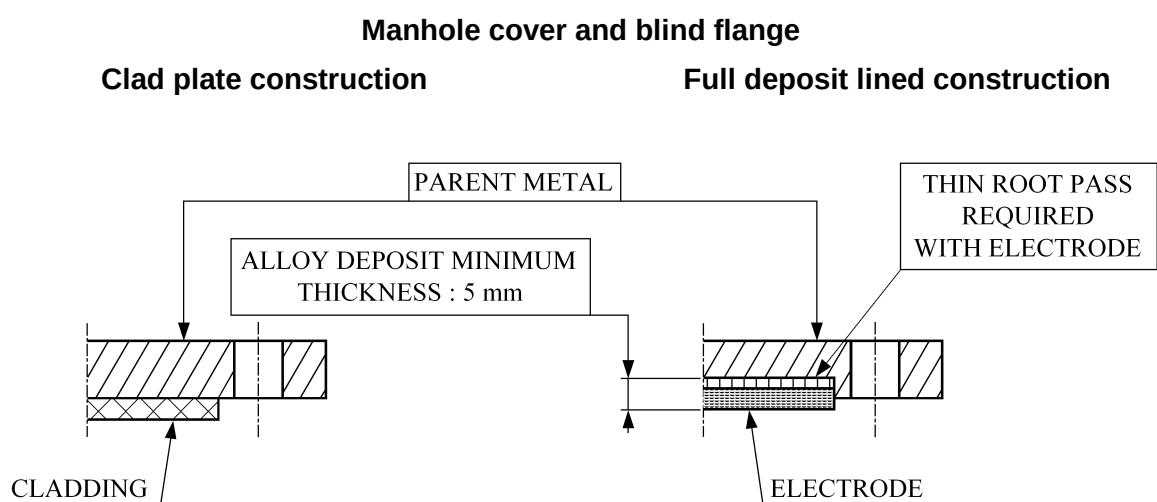
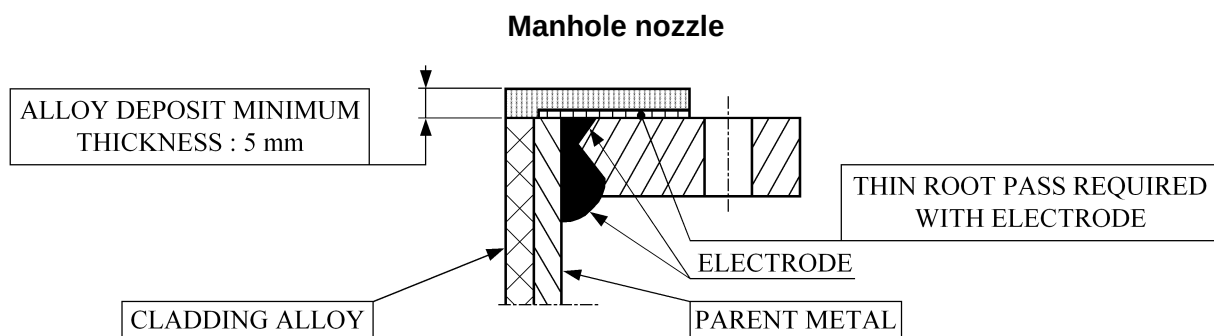
Couplings shall be made of the same alloy as the vessel cladding sampled from alloy steel bars. Threads as per ASME. B 21.

This construction mode is not to be used for vessels operating beyond 250°C .

Where levelling of inside face is required for internal motion purposes, use detail "X".



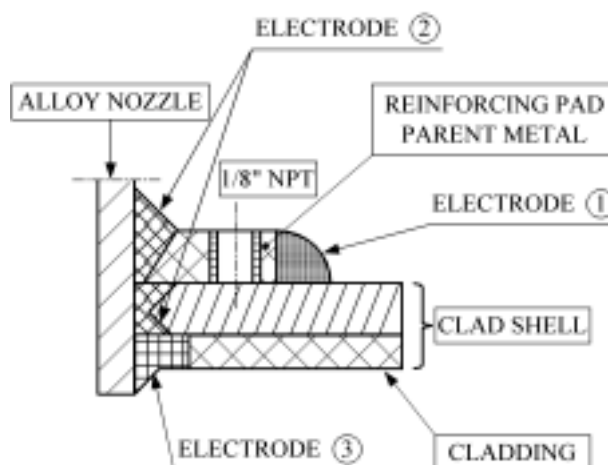
Standard Drawings	SD PVV 232
Clad alloy vessel welding procedure	Rev.: 01
	Date: 10/03



Standard Drawings	SD PVV 232
Clad alloy vessel welding procedure	Rev.: 01
	Date: 10/03

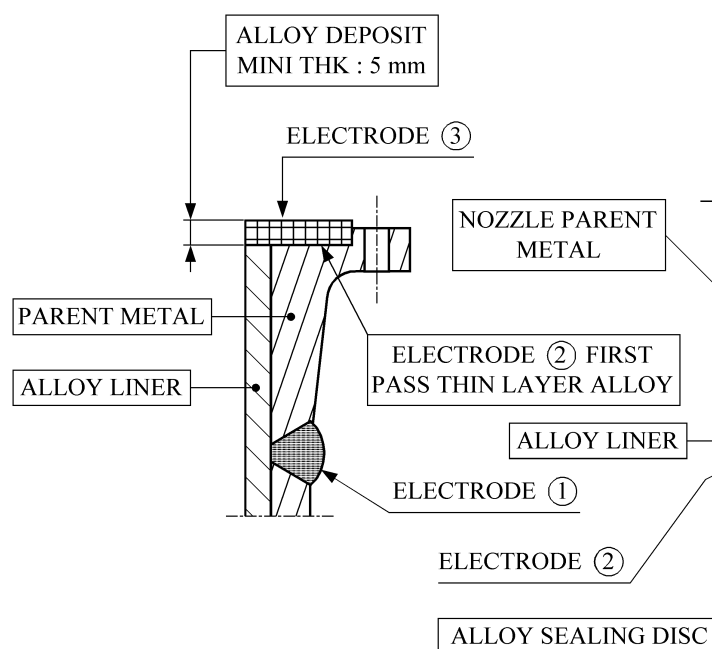
Shell connection

1. Where the temperature exceeds 250°C, solid austenitic stainless nozzles for ferritic steel shells shall not be used.
2. Where carbon steel is subject to hydrogen attack carbon steel plate flanges with alloy facing shall be used under conditions.

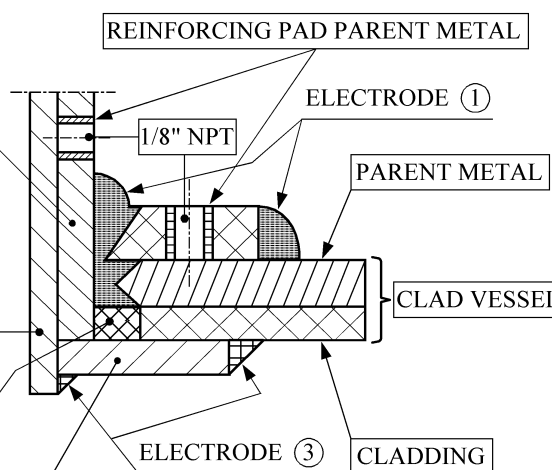


Alloy lined nozzle neck

Flanges connection



Shell connection

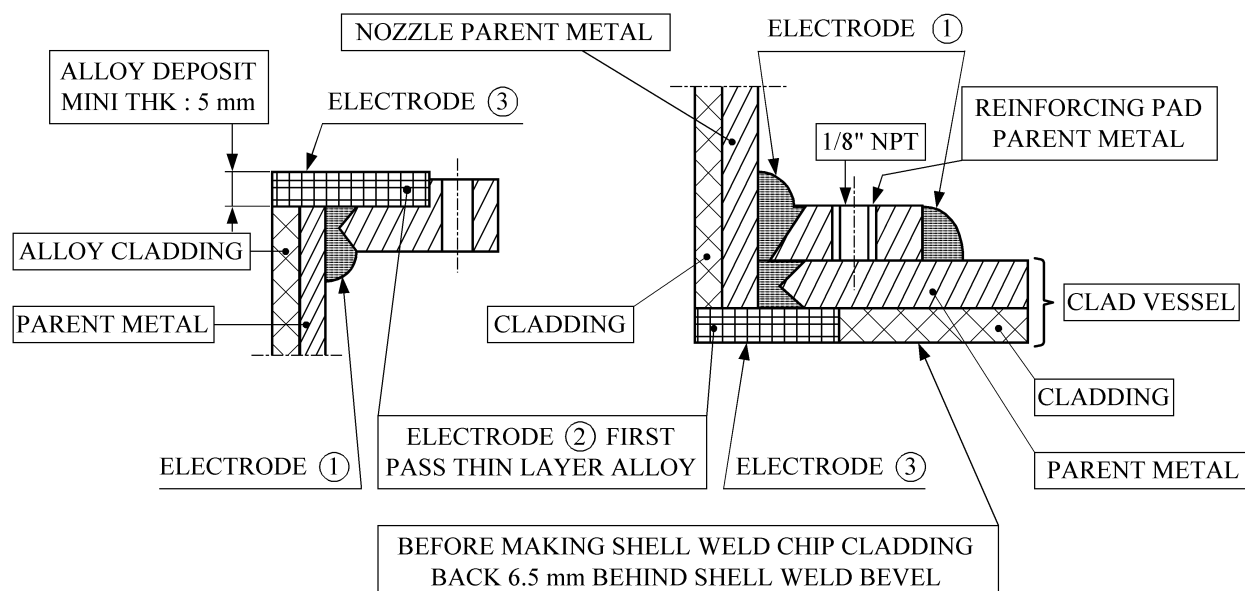


Standard Drawings	SD PVV 232
Clad alloy vessel welding procedure	Rev.: 01
	Date: 10/03

Alloy clad nozzle neck

Flanges connection

Shell connection



LEGEND

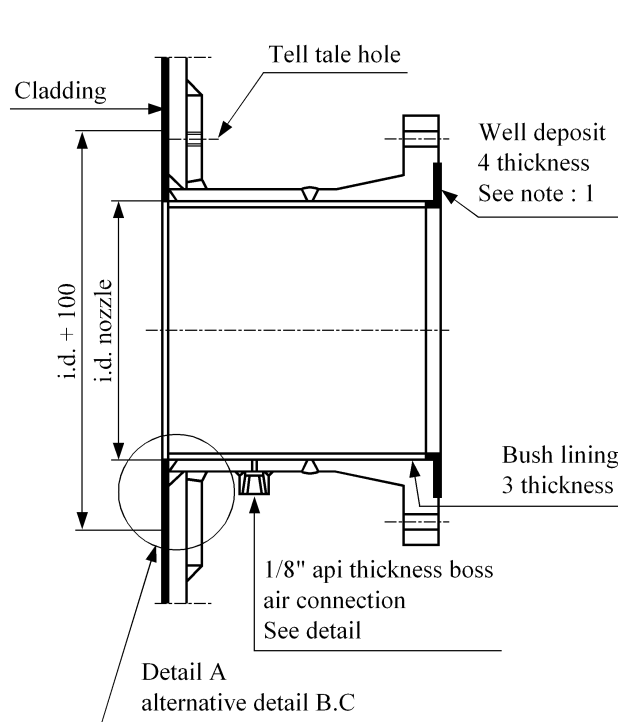
	PARENT METAL
	SOLID ALLOY OR ALLOY LINER
	ALLOY CLADDING
	PARENT METAL WELDING ELECTRODE ①
	INTERMEDIATE ALLOY WELDING ELECTRODE ②
	ALLOY WELDING ELECTRODE ③

Design notes

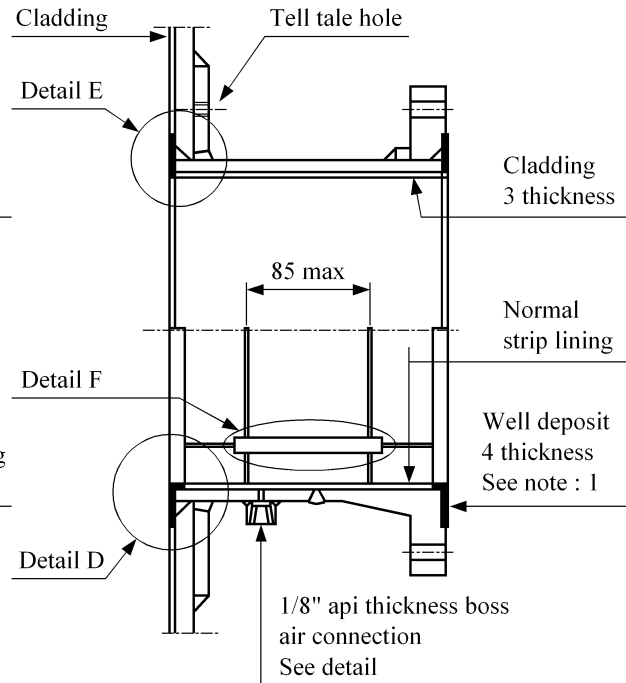
1. Flange facings shown are 1.6 mm raised face where other flange facings are specified at least 3.5 mm thickness of alloy deposit shall be provided beneath the gasket face.
2. Test holes in nozzles shall be tapped 1/8" national pipe thread greased and left unplugged.
3. Reinforcing pads and nozzles liners shall be tested tight with 2 bar air.

Standard Drawings	SD PVV 233
Nozzles lining	Rev.: 01
	Date: 10/03

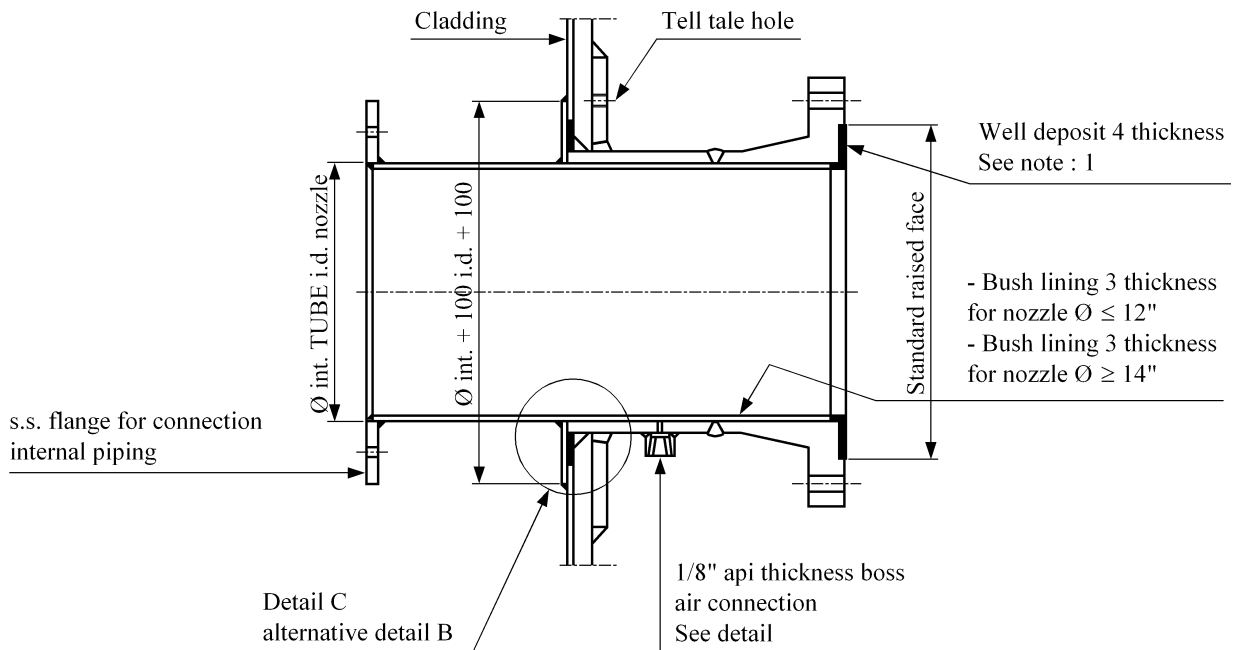
BUSH LINED NOZZLE 12" AND SMALLER



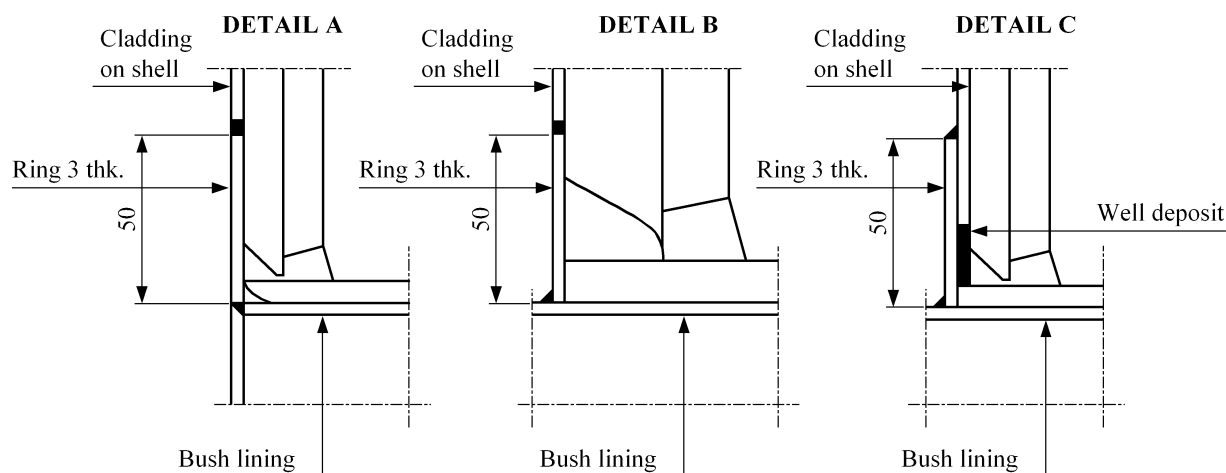
CLAD OR STRIP LINED NOZZLE 14" AND LARGER



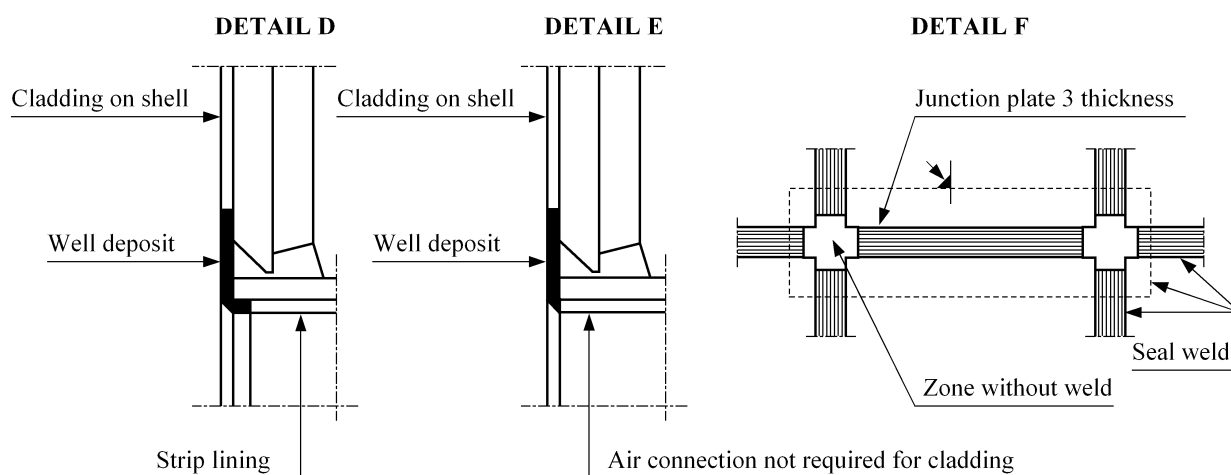
BUSH LINED INTERNAL CONNECTED NOZZLE $\leq 12"$



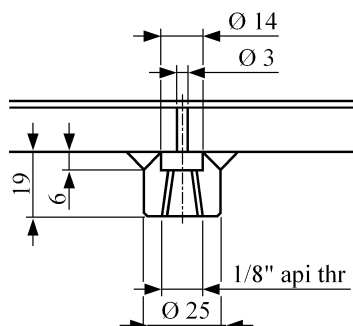
Standard Drawings	SD PVV 233
Nozzles lining	Rev.: 01
	Date: 10/03



TO BE USED FOR HEAT EXCHANGERS ON SHELL SIDE ONLY



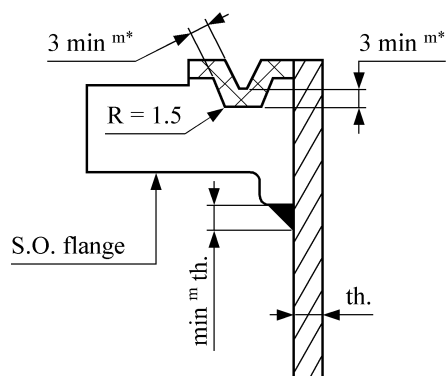
AIR CONNECTION DETAIL



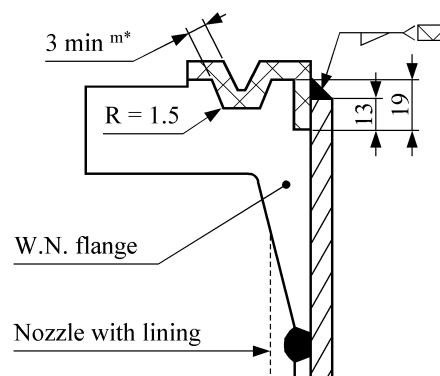
Notes:

- Nozzles lining: same metallurgic shade as shell cladding.
- For ferritic stainless steel lining: 11-13 Cr type, the details D and E may be used for nozzles with bush lining.

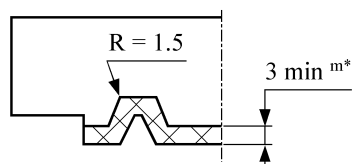
Standard Drawings	SD PVV 234
Lined ring joint face	Rev.: 01
	Date: 10/03



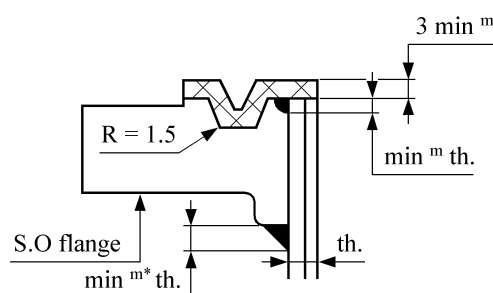
ALLOY STEEL NECKS $1\frac{1}{2}" \leq DN \leq 4"$



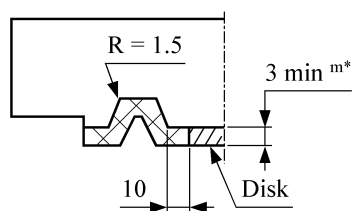
LINED NECKS $DN \geq 6"$



COVERS $1\frac{1}{2}" \leq DN \leq 4"$



CLAD NECKS $DN \geq 6"$



Alloy steel disk

Spot or plug weld at the centre for DN 10", 12" & 14" nozzles, 3 welds equidistant on 150 mm dia. circle for nozzles DN 16" & 18", and on 250 mm circle for nozzles DN 20" et 24".

Cover $DN \geq 6"$

Legend

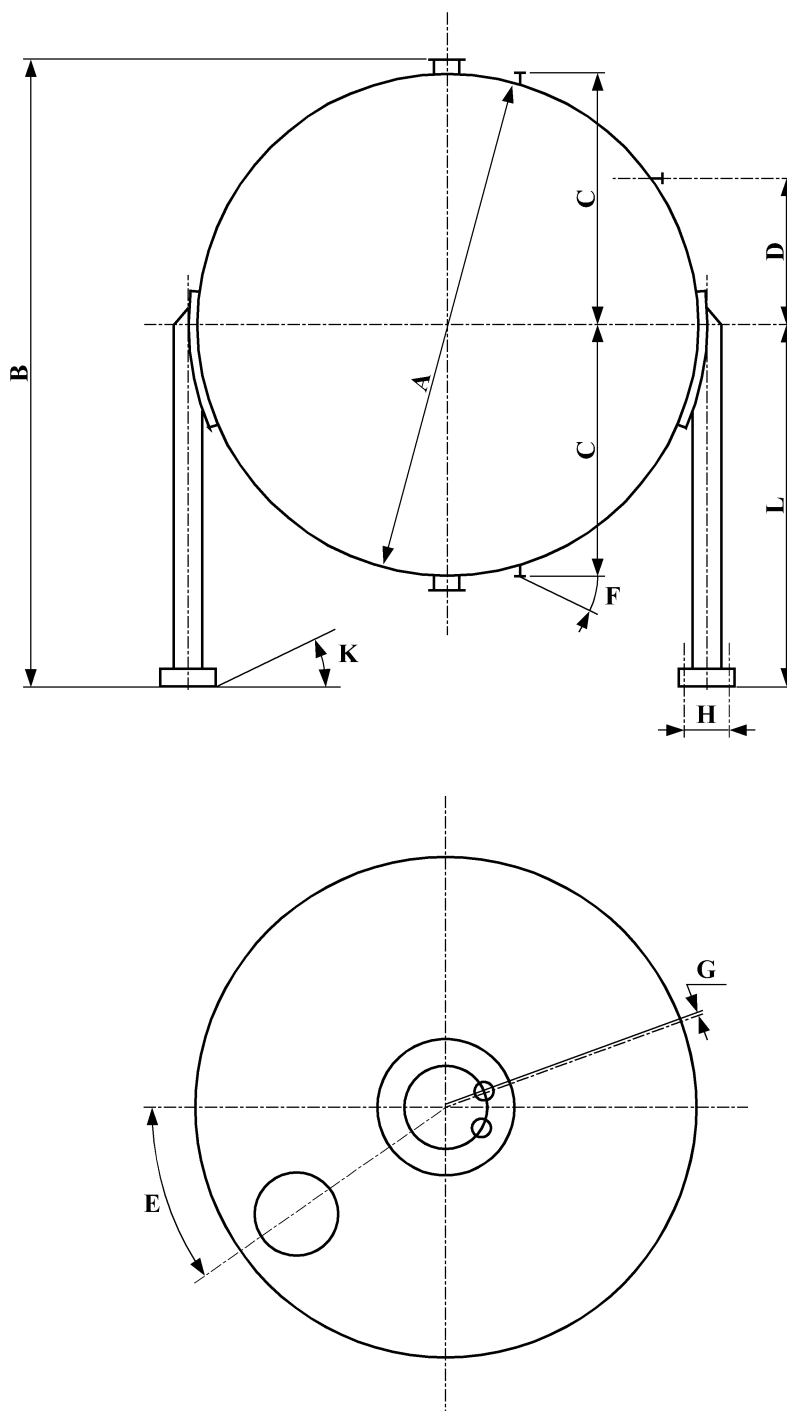
	Carbon steel
	Carbon steel weld
	Alloy steel
	Alloy steel weld

See vessel drawing for grade of alloy steel & type of electrodes.

NOTE : See ANSI B 16.5 for dimensions & tolerances of ring joint faces.

* Uniform thickness of sound metal after machining.

Standard Drawings	SD PVV 301
Spherical vessels tolerances	Rev.: 01
	Date: 10/03



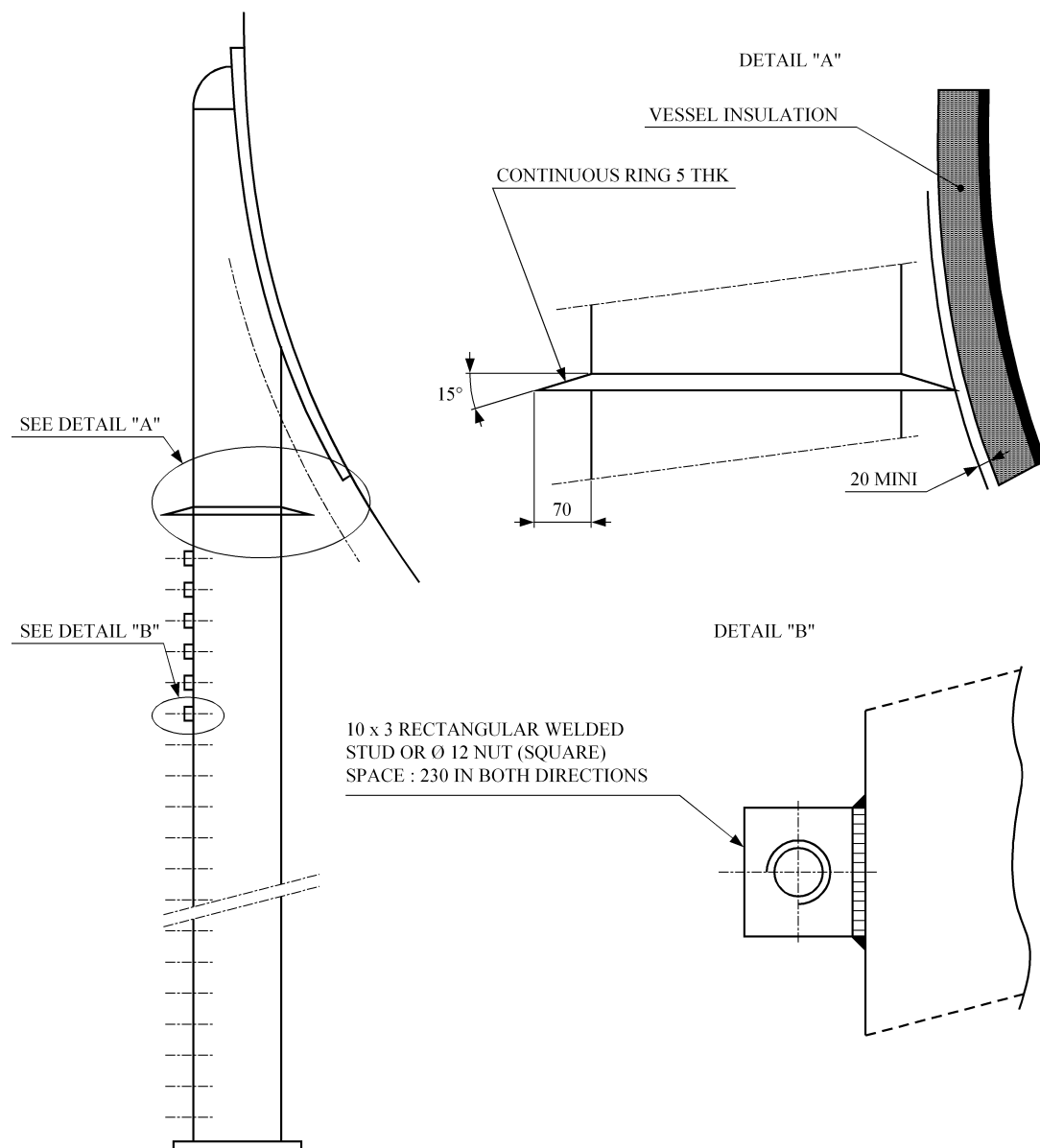


Standard Drawings	SD PVV 301
Spherical vessels tolerances	Rev.: 01
	Date: 10/03

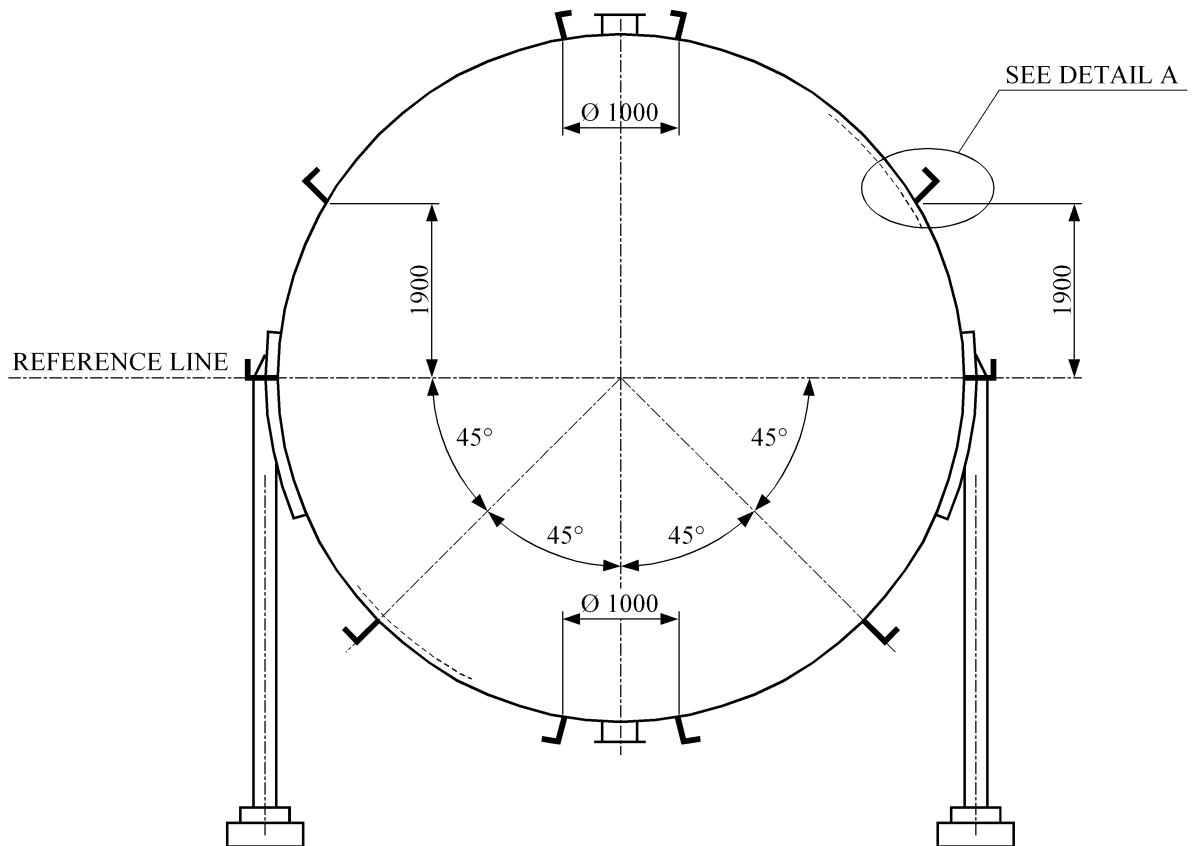
Exploration & Production

- A - Out of roundness as permitted by code
- B - Tolerance on length: $\pm 1.3 \text{ mm/m}$ (max: 13 mm)
- C - Flange faces projecting from shell:
For manholes: $\pm 6.5 \text{ mm}$
For nozzles: $\pm 5 \text{ mm}$
- D - Tolerance on elevations:
For manholes: $\pm 13 \text{ mm}$
For nozzles: $\pm 6.5 \text{ mm}$
Clearance between instrument branch connections: $\pm 3 \text{ mm}$
- E - Circumferential deviation between the theoretical axis and centreline of nozzles, manholes and supports shall not exceed $\pm 3 \text{ mm}$ measured on shell.
- F - Angle of flange face in ratio to the theoretical plane: $\pm 1/2^\circ$.
- G - Orientation of nozzle bolt holes: $\pm 1.5 \text{ mm}$ measured on drilling circle.
- K - Base ring drilling tolerance:
Measured on perpendicular diameters: $\pm 5 \text{ mm}$
Measured on drilling circle between holes: $\pm 5 \text{ mm}$
- L - Tolerance on base ring perpendicularity:
 $K \leq 1.2 \text{ m}$: $\pm 3 \text{ mm}$
 $1.2 \text{ m} < K \leq 2.1 \text{ m}$: $\pm 5 \text{ mm}$
 $K > 2.1 \text{ m}$: $+ 6.5 \text{ mm}$

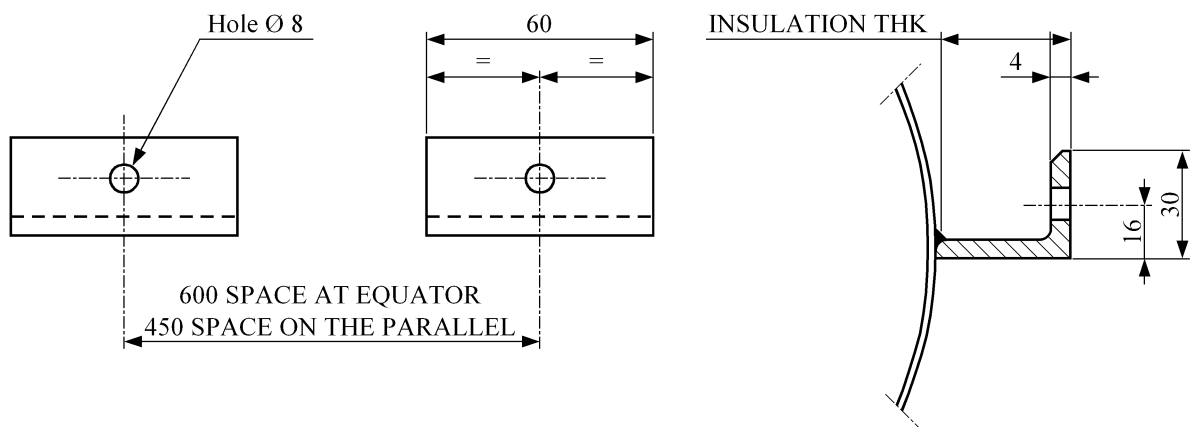
Standard Drawings	SD PVV 302
Fire-proofing supports for spherical vessels	Rev.: 01
	Date: 10/03



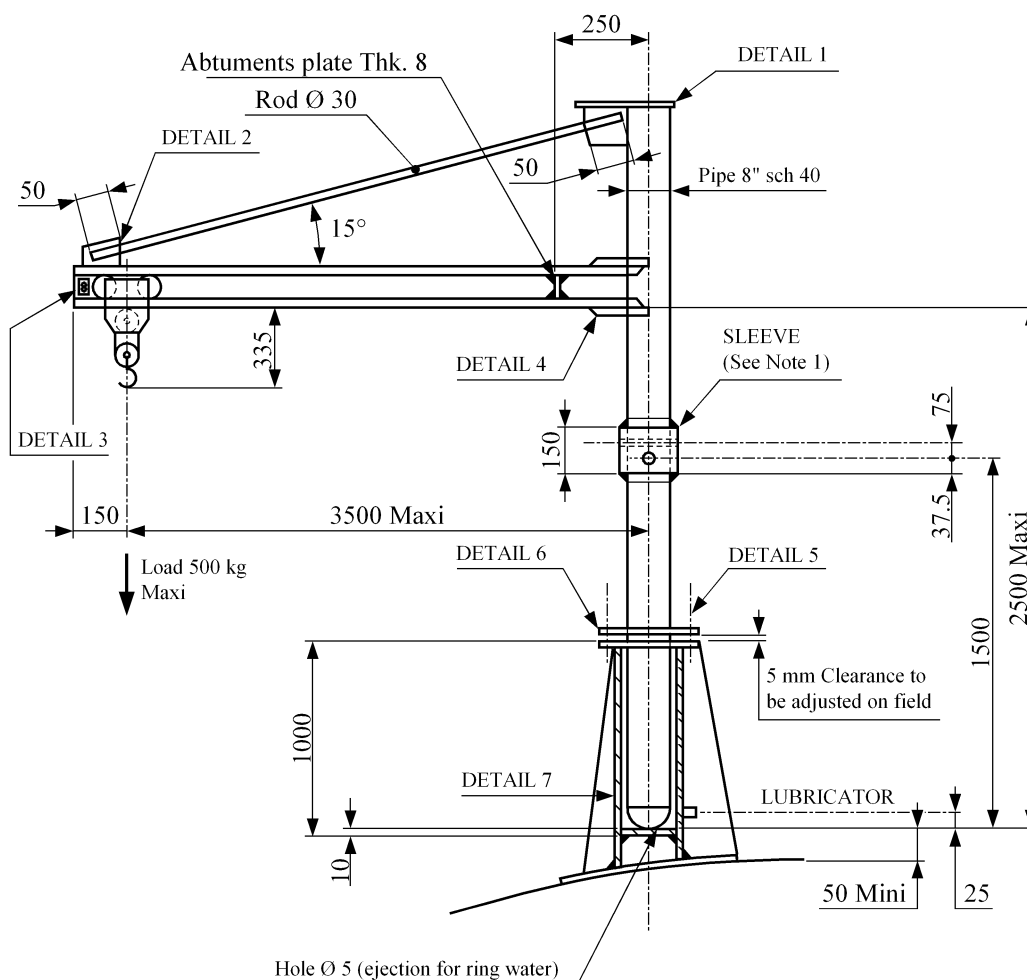
Standard Drawings	SD PVV 303
Insulation supports on spherical vessels	Rev.: 01
	Date: 10/03



DETAIL "A"



Standard Drawings	SD PVV 304
Monorail Davit and slide	Rev.: 01
	Date: 10/03

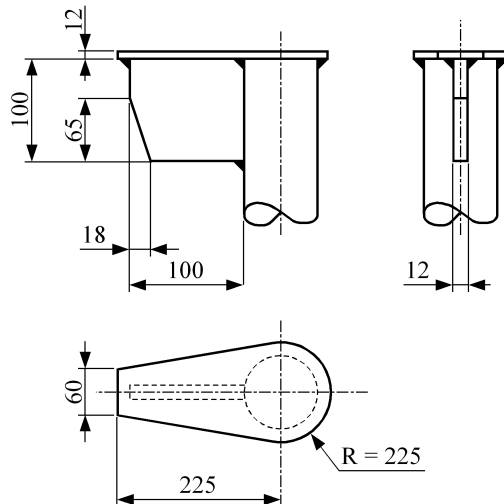


Note:

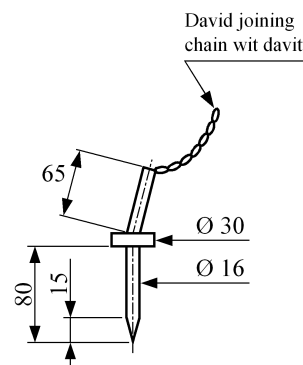
1. Sleeve THK 10 welded with 2 holes 24 Ø at 90° for hinge pin.
2. Material - Pipe A53 grade A or B or equal plate according to vessel drawing back-up plate - Use grade of vessel.
3. On the davit the value of the load that can be lifted will be visibly indicated by Constructor.
4. The supply neither includes the travelling block nor the hoist.

Standard Drawings	SD PVV 304
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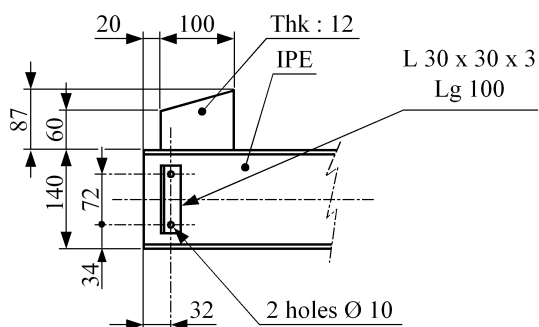
DETAIL 1



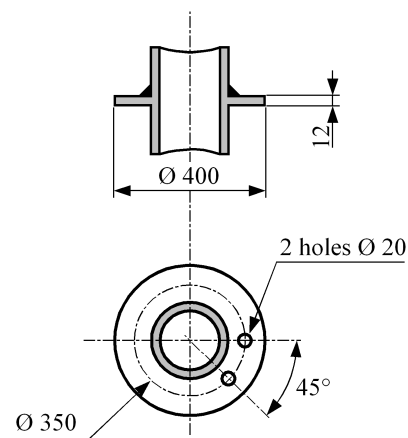
DETAIL 5



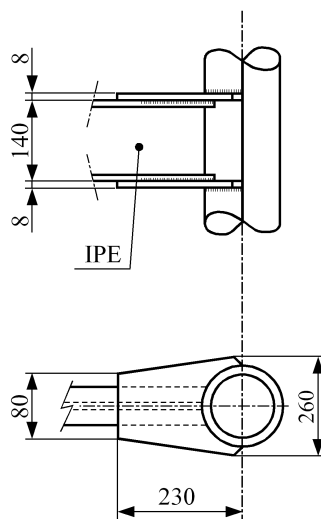
DETAIL 2 & 3



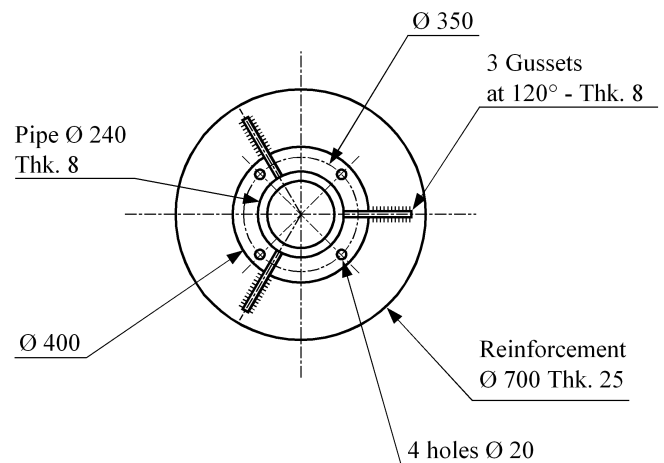
DETAIL 6



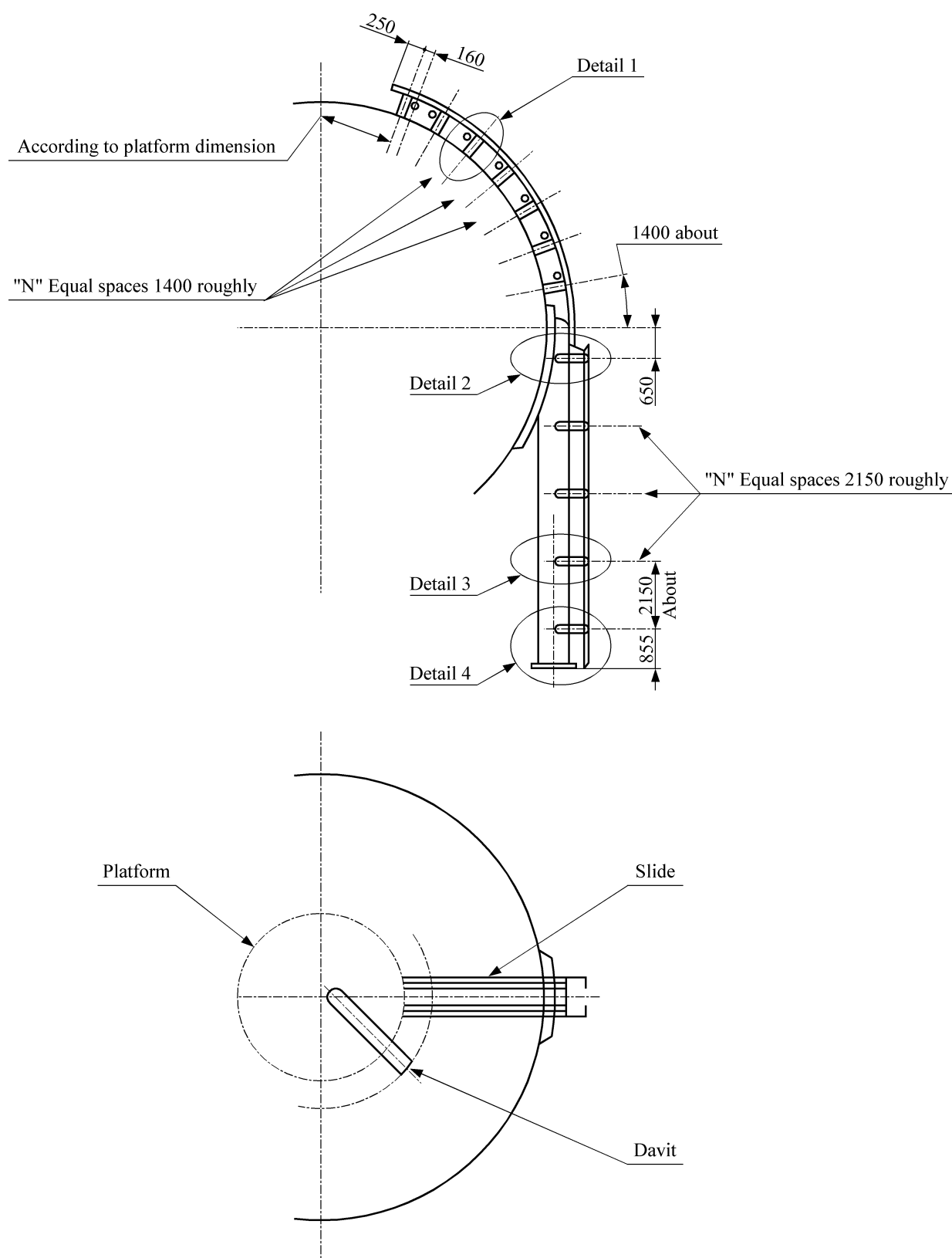
DETAIL 4



DETAIL 7

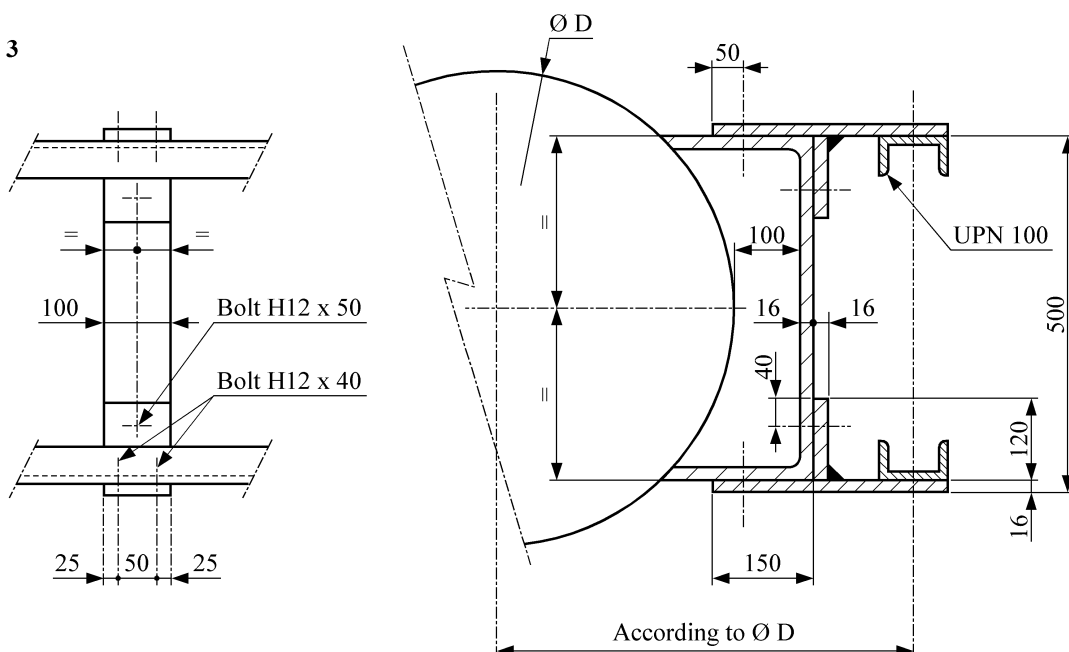


Standard Drawings	SD PVV 304
Monorail Davit and slide	Rev.: 01
	Date: 10/03

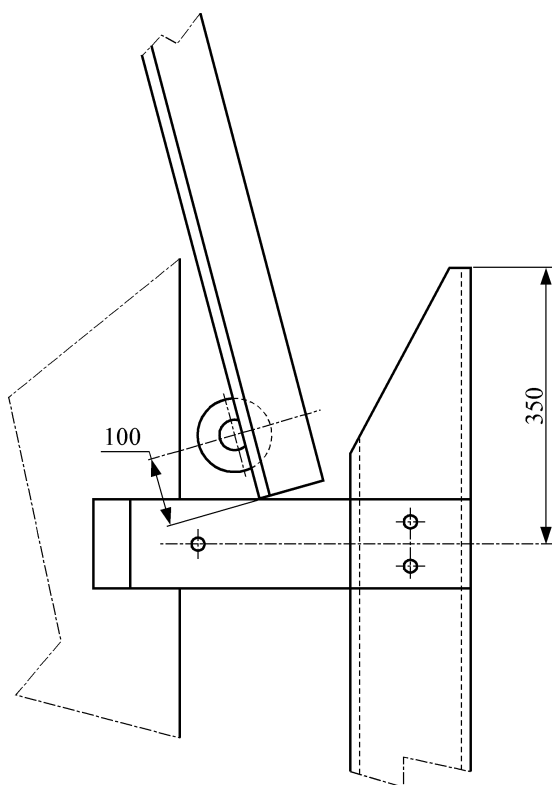


Standard Drawings	SD PVV 304
Monorail Davit and slide	Rev.: 01
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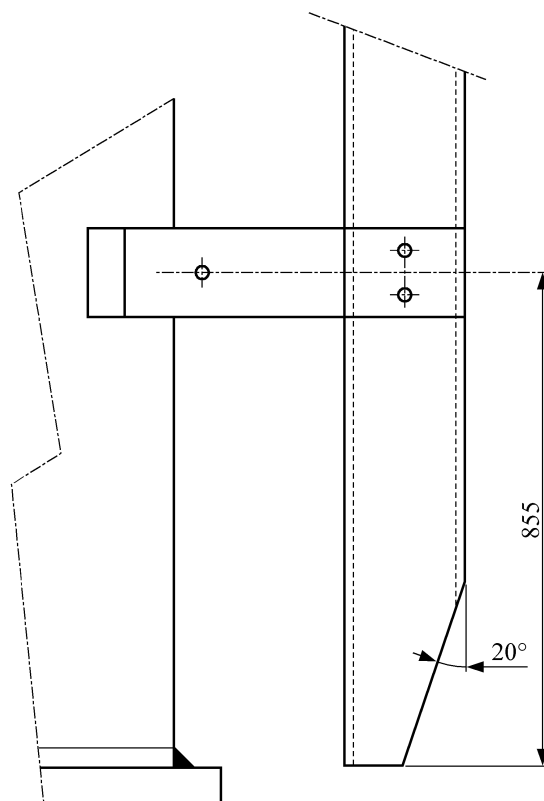
DETAIL 3



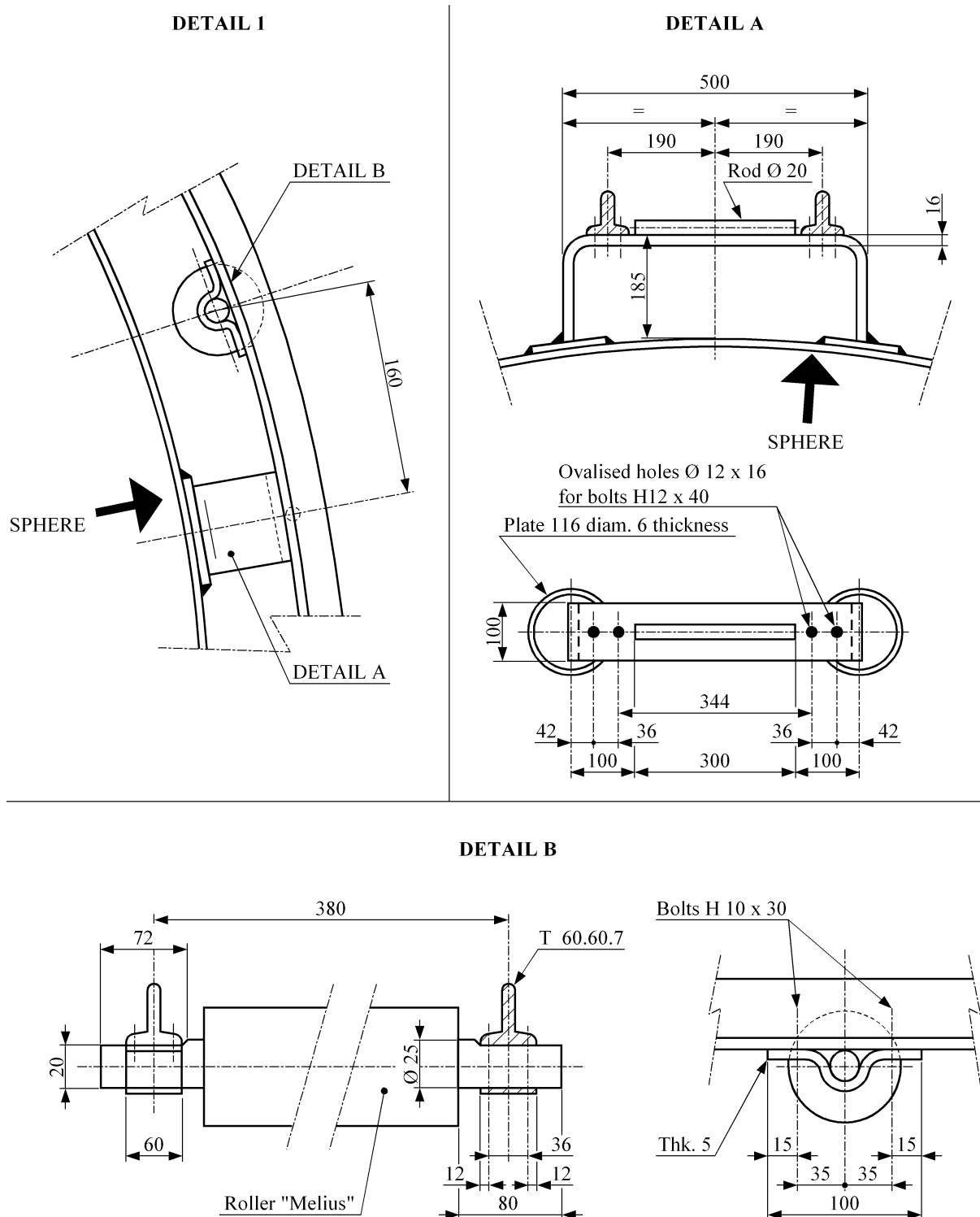
DETAIL 2



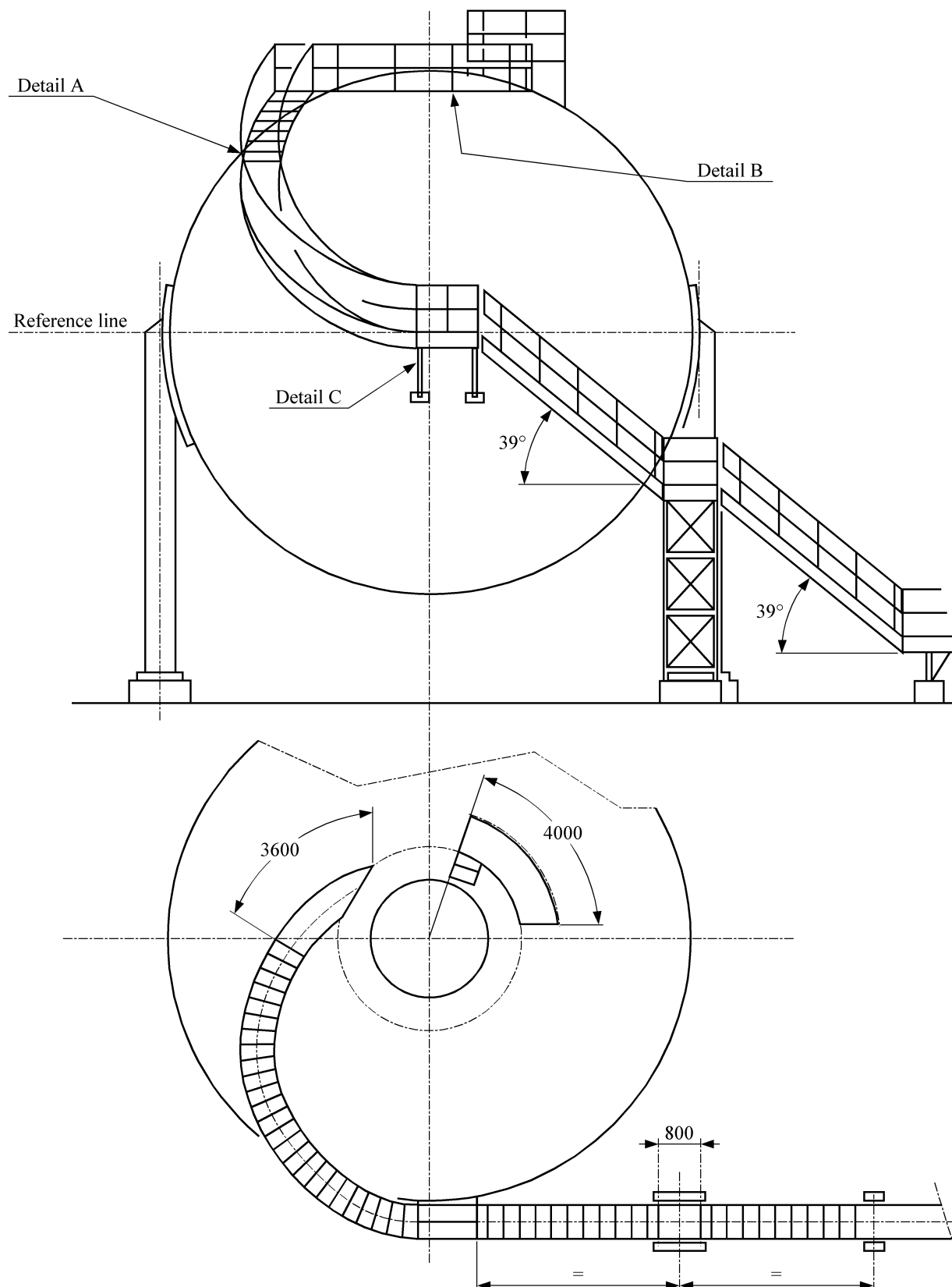
DETAIL 4



Standard Drawings	SD PVV 304
Monorail Davit and slide	Rev.: 01
	Date: 10/03

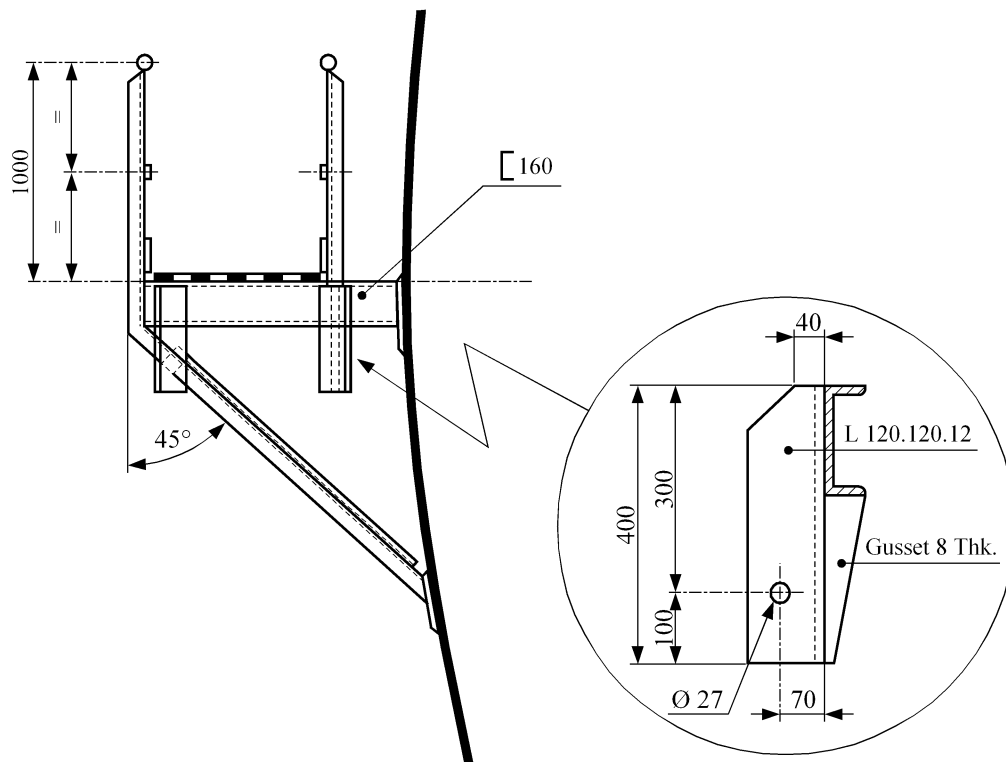


Standard Drawings	SD PVV 305
Platform and stairway	Rev.: 01
	Date: 10/03

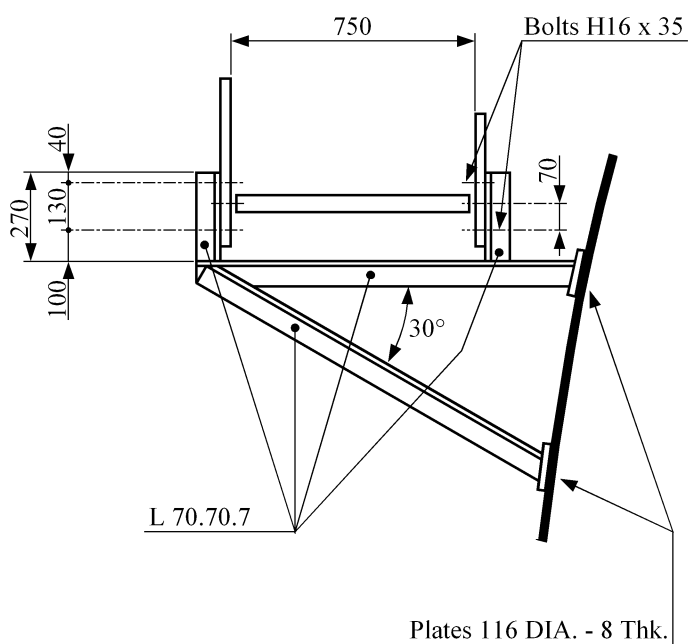


Standard Drawings	SD PVV 305
Platform and stairway	Rev.: 01
	Date: 10/03

DETAIL C



DETAIL A



DETAIL B

