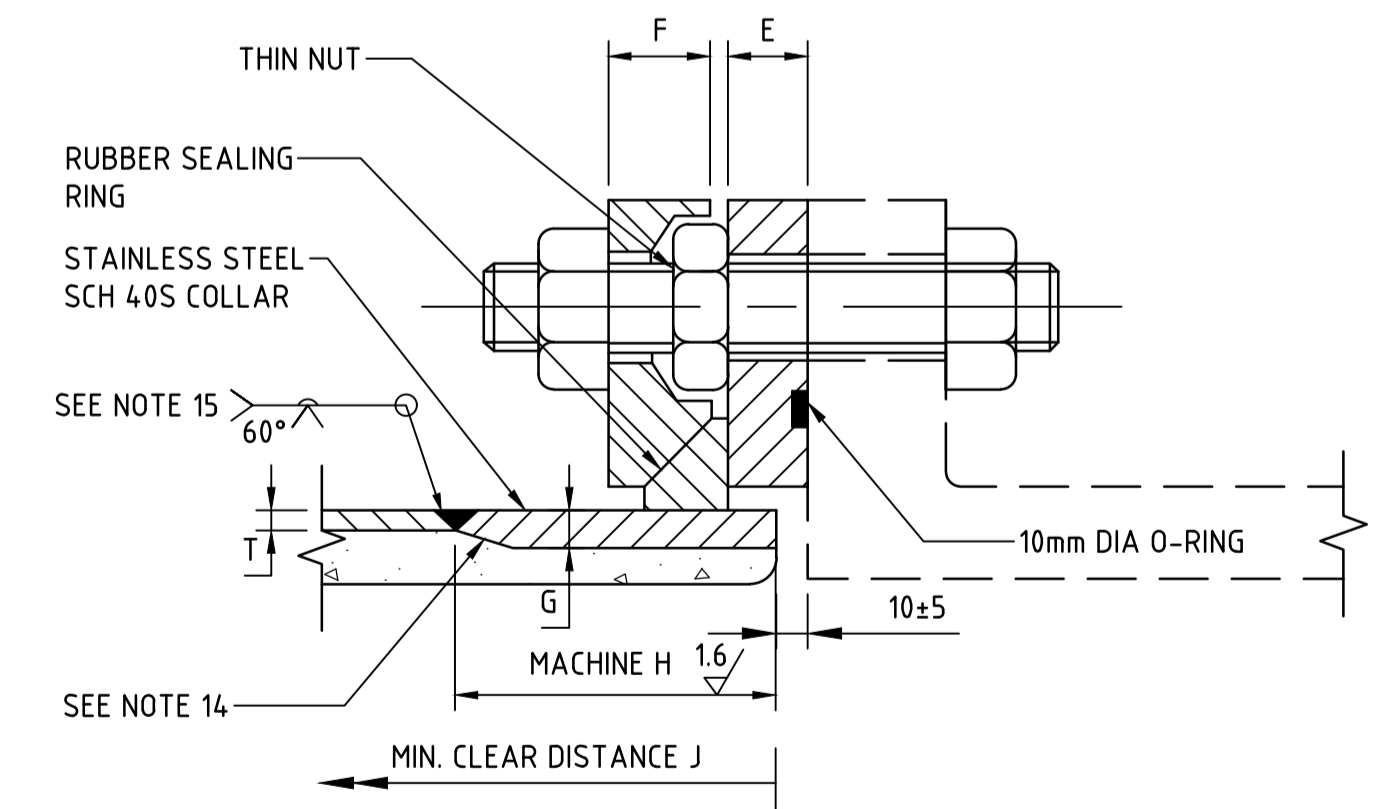
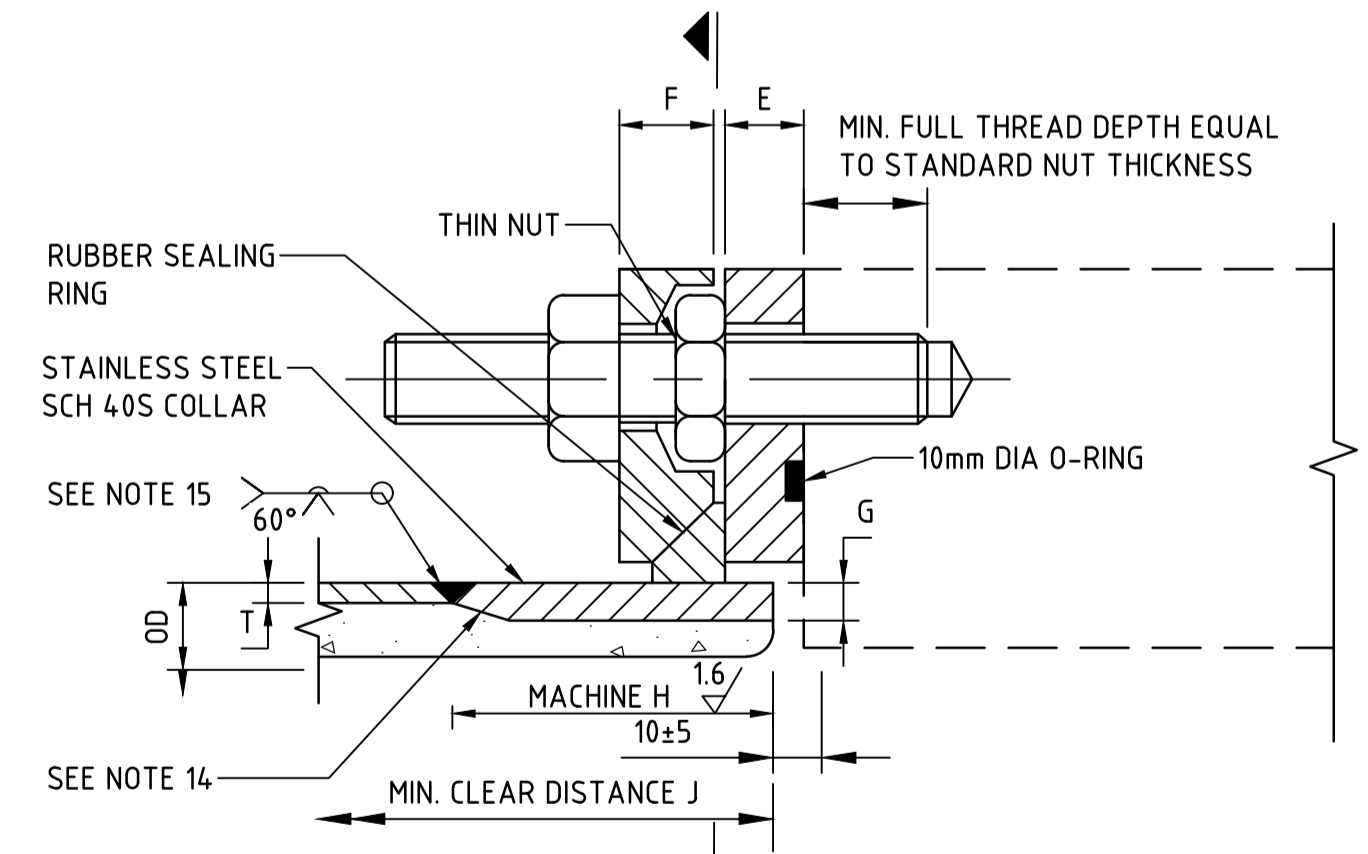
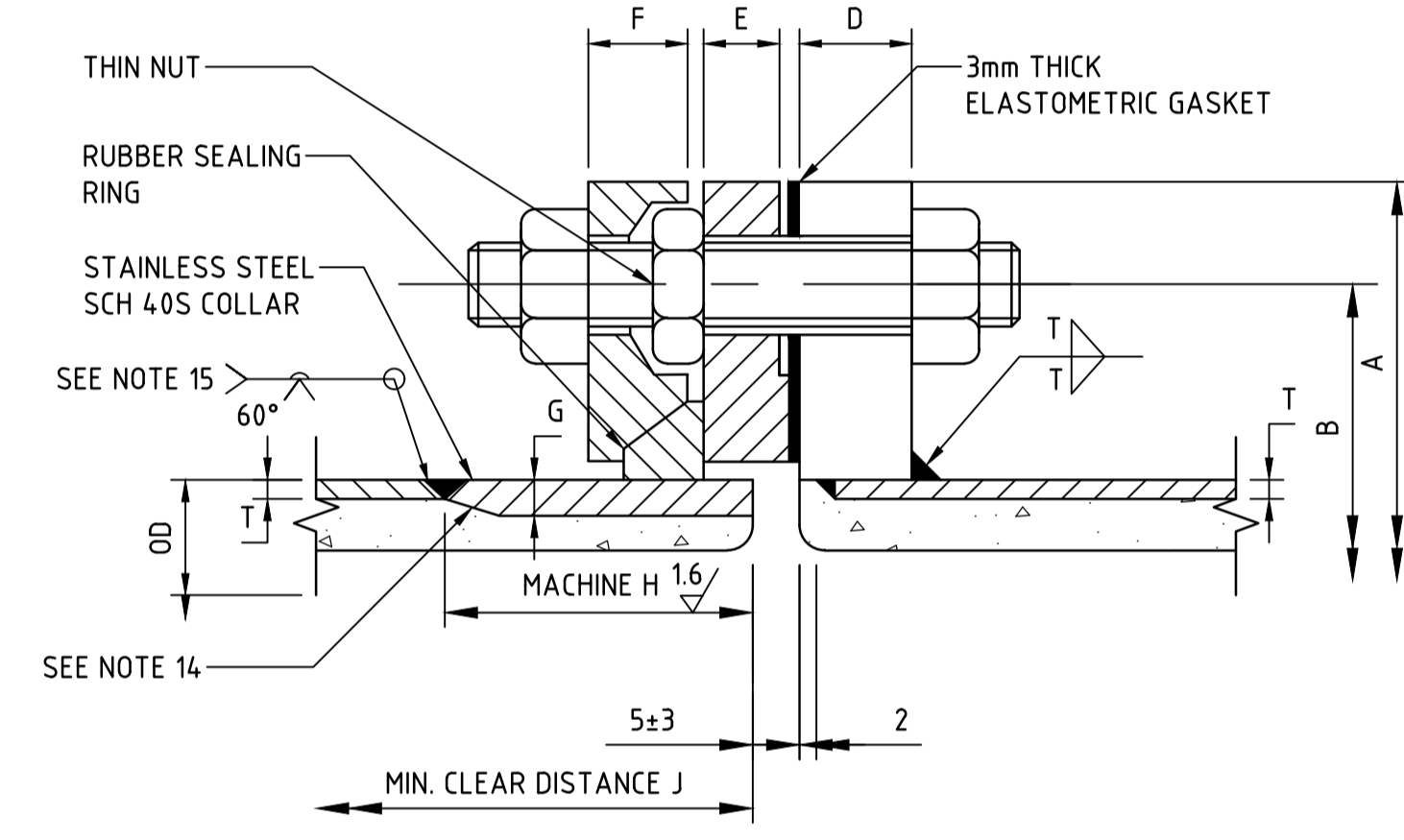
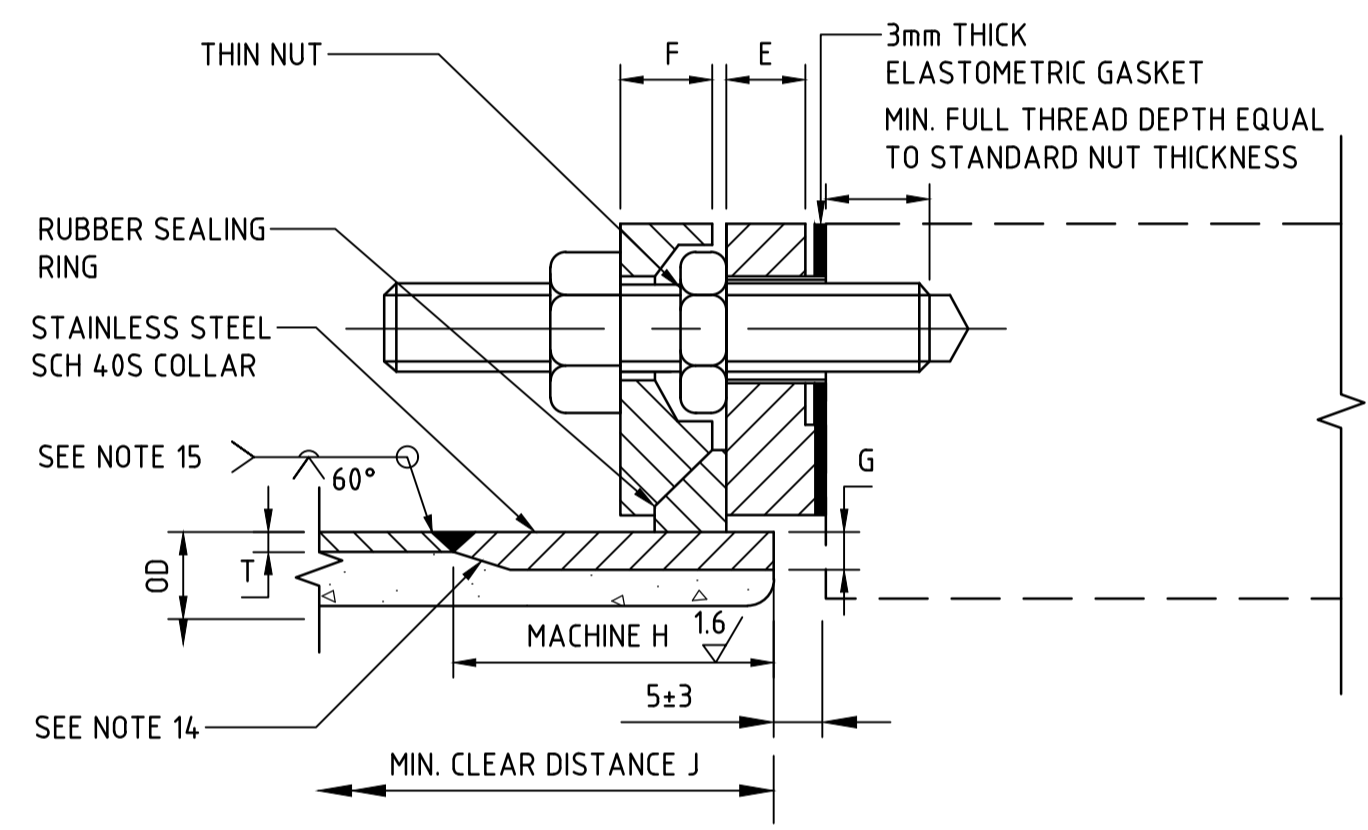
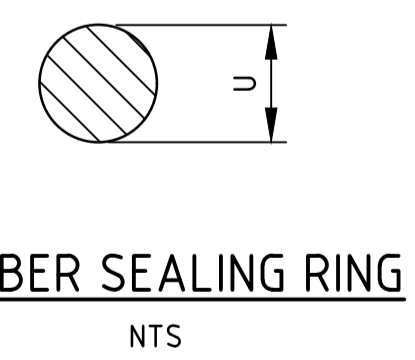
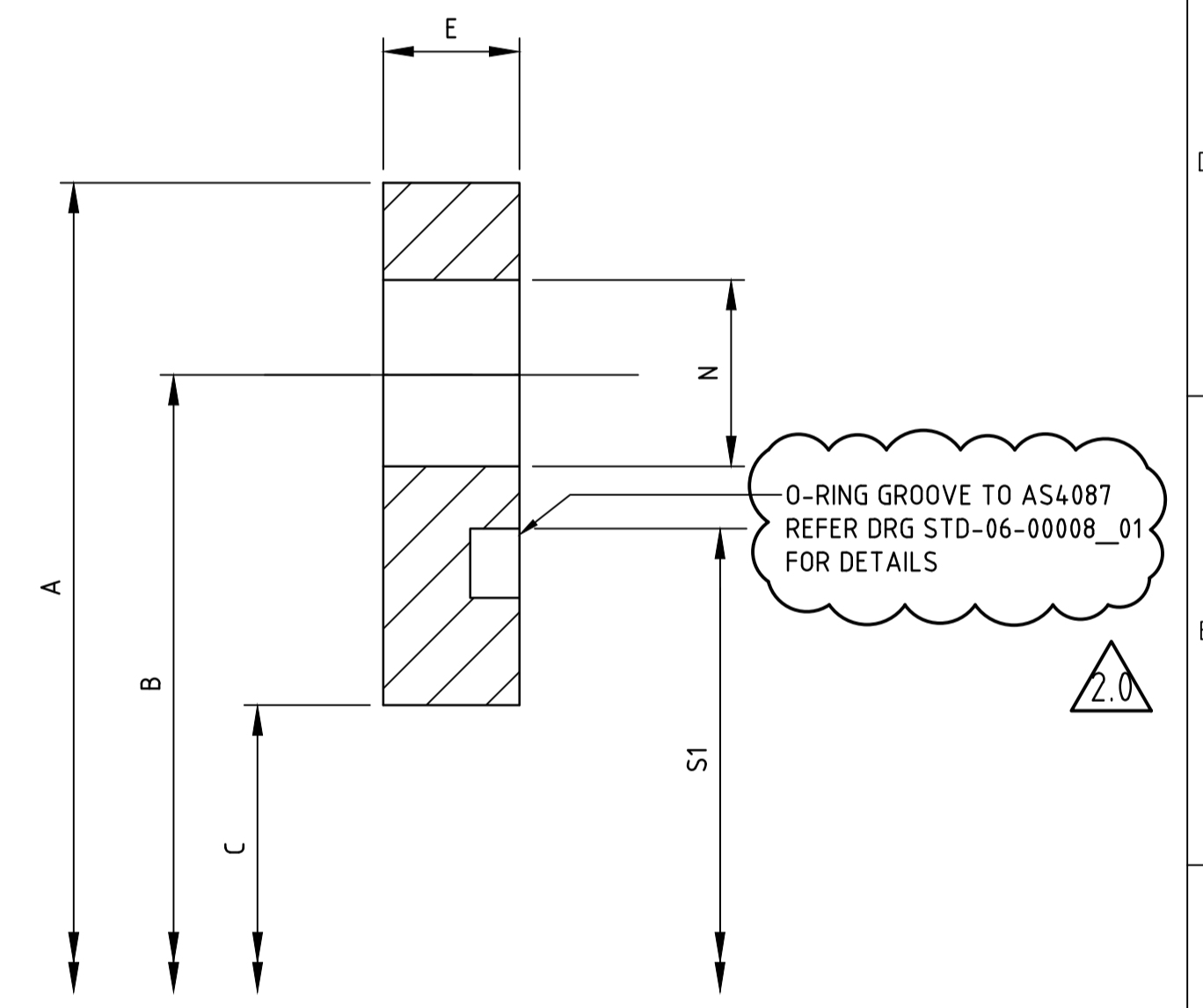
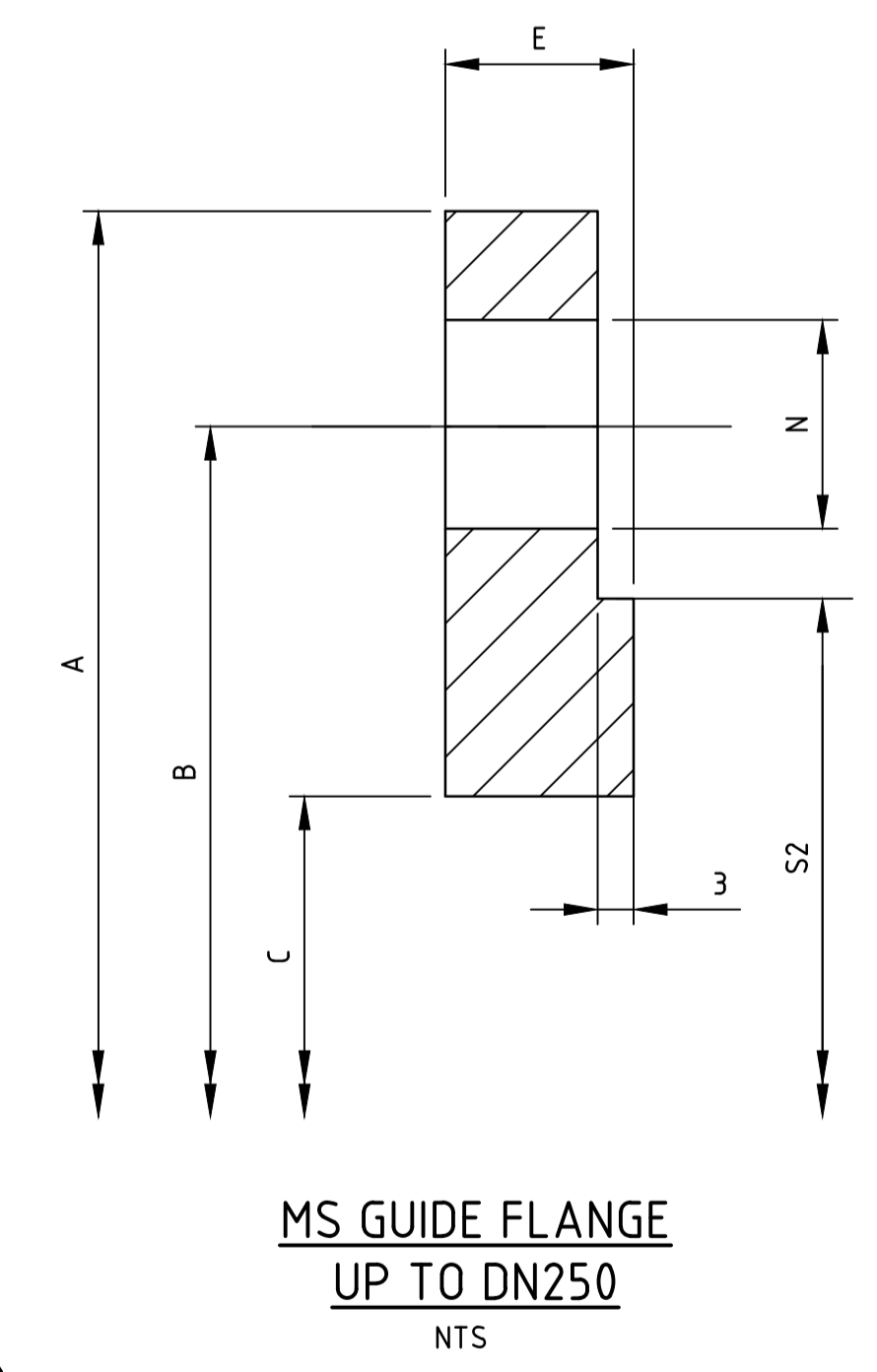
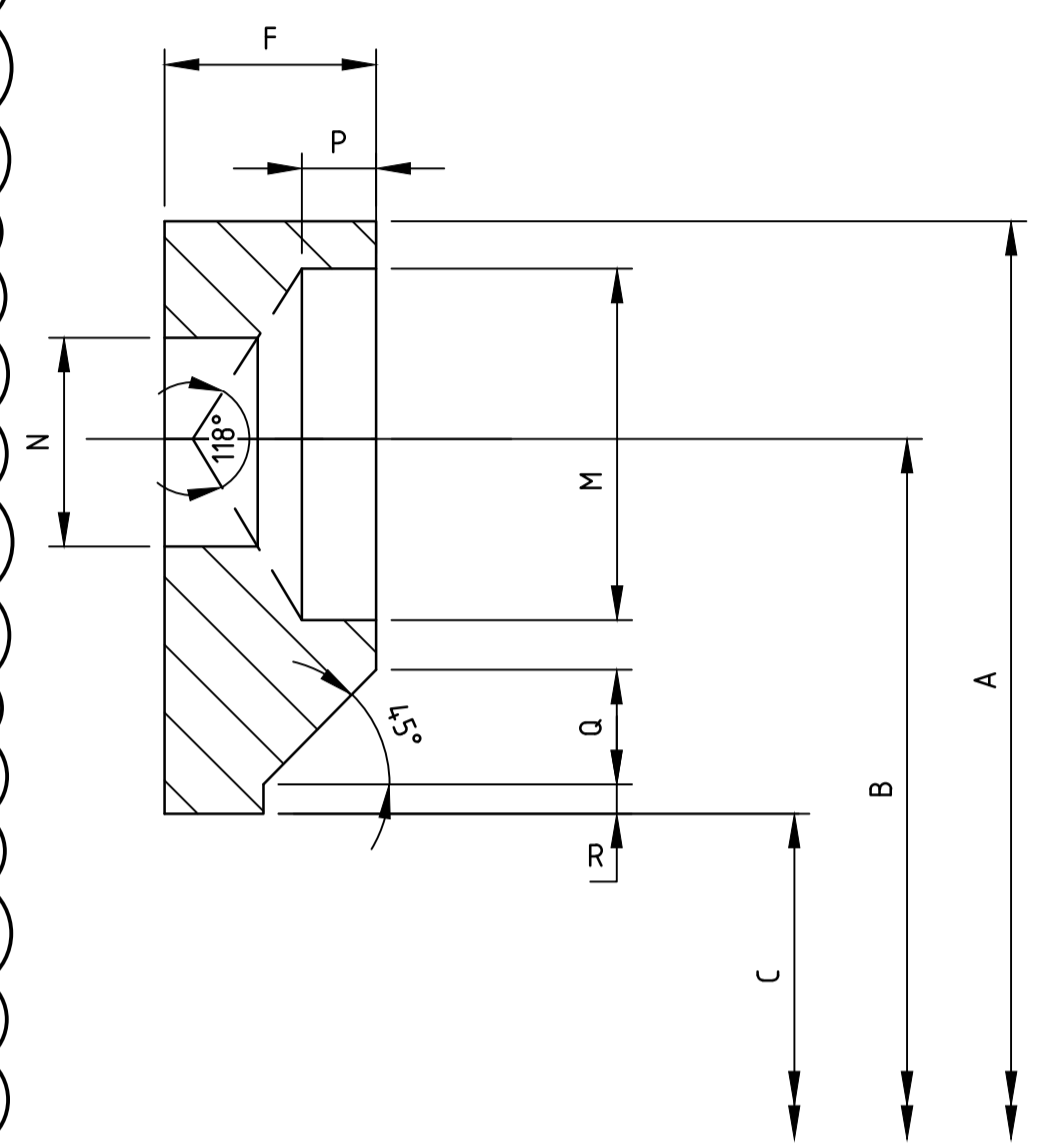
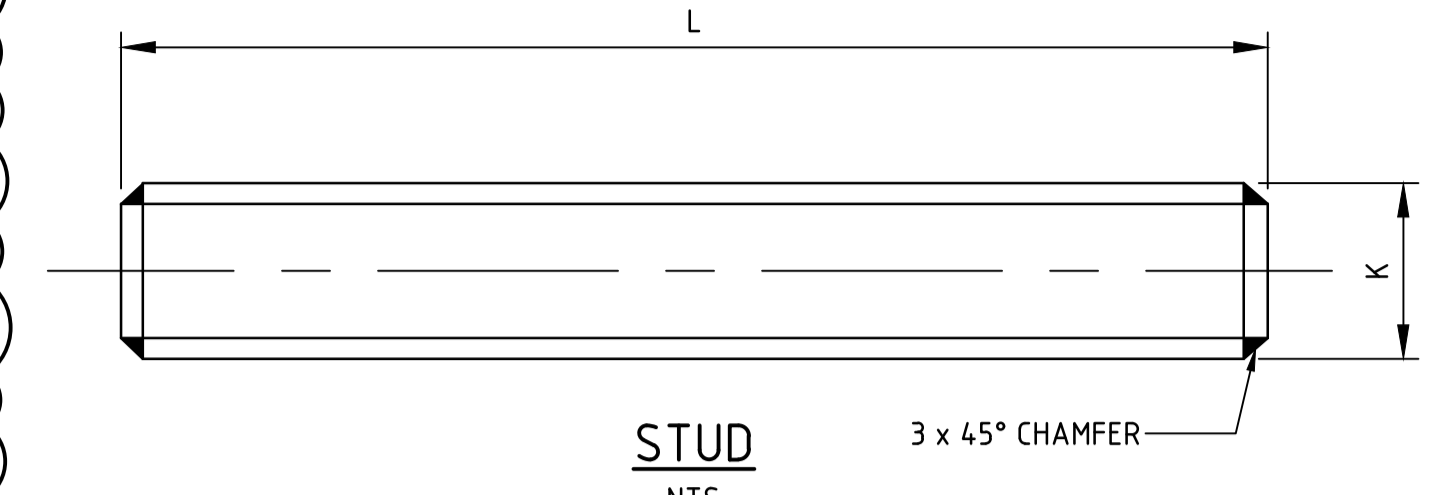


DN	O.D. (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (MIN) (mm)	H (mm)	J (mm)	K	L (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	R (mm)	S1 (mm)	S2 (mm)	T (mm)	U (mm)	NO. BOLTS	DN
80	89	185	146	91	11	11	20	5.49	150	160	M16	100	31	18	10	8	2	-	122	6	10	4	80
100	114	215	178	116	13	13	20	6.02	150	160	M16	100	31	18	10	8	2	-	154	6	10	4	100
150	168	280	235	171	13	13	20	7.11	150	160	M16	100	31	18	10	8	2	-	211	6	10	8	150
200	219	335	292	221	19	19	20	8.18	150	175	M16	110	31	18	10	8	2	-	268	6	10	8	200
250	273	405	356	276	19	19	25	9.27	150	195	M20	125	37	22	12	11	3	-	328	6	13	8	250
300	324	455	406	327	23	23	25	16	150	210	M20	135	37	22	12	11	3	-	370	-	6	13	300
350	356	525	470	359	30	30	28	16	150	255	M24	170	44	26	14	11	3	4.30	-	6	13	12	350
400	406	580	521	409	30	30	28	16	150	255	M24	170	44	26	14	11	3	4.85	-	6	13	12	400
450	457	640	584	460	30	30	28	16	150	255	M24	170	44	26	14	17	3	5.45	-	6	19	12	450
500	508	705	641	511	38	38	28	16	150	275	M24	180	44	26	14	17	3	6.05	-	6	19	16	500
600	610	825	756	613	48	48	32	16	160	320	M27	215	50	30	16	17	3	7.15	-	6	19	16	600
700	711	910	845	715	56	56	32	16	180	350	M27	235	50	30	16	17	3	8.00	-	6	19	20	700
750	762	995	927	765	56	56	36	16	190	360	M30	240	55	33	18	20	3	8.80	-	6	22	20	750
800	813	1060	984	816	56	56	40	16	200	400	M33	275	60	36	20	20	3	9.35	-	6	22	20	800
900	914	1175	1092	918	66	66	40	16	220	430	M33	295	60	36	20	20	3	10.45	-	6	22	24	900
1000	1016	1255	1175	1020	66	66	40	16	220	430	M33	295	60	36	20	20	3	11.25	-	6	22	24	1000
1200	1219	1490	1410	1224	76	76	40	16	240	460	M33	315	60	36	20	20	3	13.60	-	6	22	32	1200

- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
 - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
 - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm
 - GRADE 250 - THICKNESSES GREATER THAN 8mm
 - FLANGES TO BE FABRICATED IN ACCORDANCE WITH AS/NZS 4087.
 - REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
 - EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
 - REFER TO DRG 4004-00001-30 AND 31 FOR FLANGE ISOLATION JOINT DETAILS WHERE DISSIMILAR METALS ARE USED.
 - ALL NUTS & BOLTS TO BE GRADE 8.8 TO AS 4291.1 AND HOT DIP GALVANIZED IN ACCORDANCE WITH AS/NZS 1214.
 - STAINLESS STEEL SPIGOT TO BE FABRICATED FROM GRADE 316 PLATE.
 - ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER INCLUDING COATINGS, GASKETS, O-RING, LUBRICANTS SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800. DISMANTLING JOINTS TO BE SHOP ASSEMBLED AND MATCH MARKED AT TOP CENTRE BEFORE DELIVERY.
 - REFER TO WSA 109 FOR TIGHTENING PROCEDURE AND TORQUE VALUES.
 - O-RINGS AND GASKETS TO COMPLY WITH WSA 109.
 - FOR BUTT WELDS WHERE DIFFERENCE BETWEEN ADJACENT PLATE EXISTS REFER TO APPENDIX N OF AS 4041 FOR WELDING DETAILS.
 - WELDS BETWEEN STAINLESS STEEL AND CARBON STEEL REQUIRE E309MOL ELECTRODES OR SIMILAR.



06-00005_01

REVISION PANEL				DESIGN PANEL			
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	AUTHORISED
2.0	17/09/24	SS	DETAILS UPDATED. RE-ISSUED FOR USE	MW	M.WHITE	T.MZUNGU	H.HABIB
1.0	15/12/22	GB	ISSUED FOR USE	MW		G.BALDONADO	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 2.0			

SA Water
South Australian Water Corporation

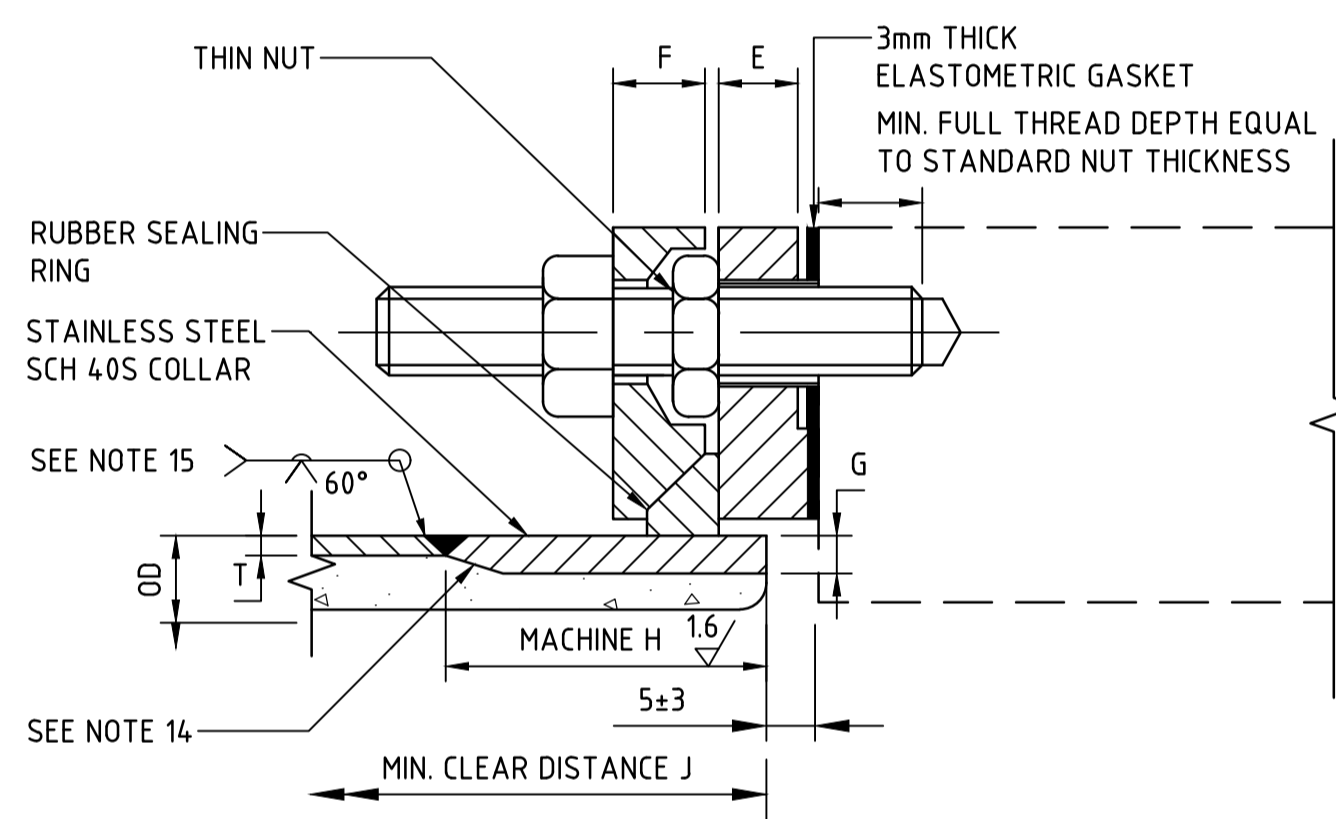
This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.

SA WATER STANDARD DRAWING
STANDARD PN16 UNRESTRAINED
DISMANTLING JOINT
CIVIL

A1	TOTAL SHEETS:	2.0
SHT SIZE	PROJECT No:	
MAXIMO ID:	SUPERSEDES: 75 15C	
DRAWING NUMBER	STD-06-00002_01	

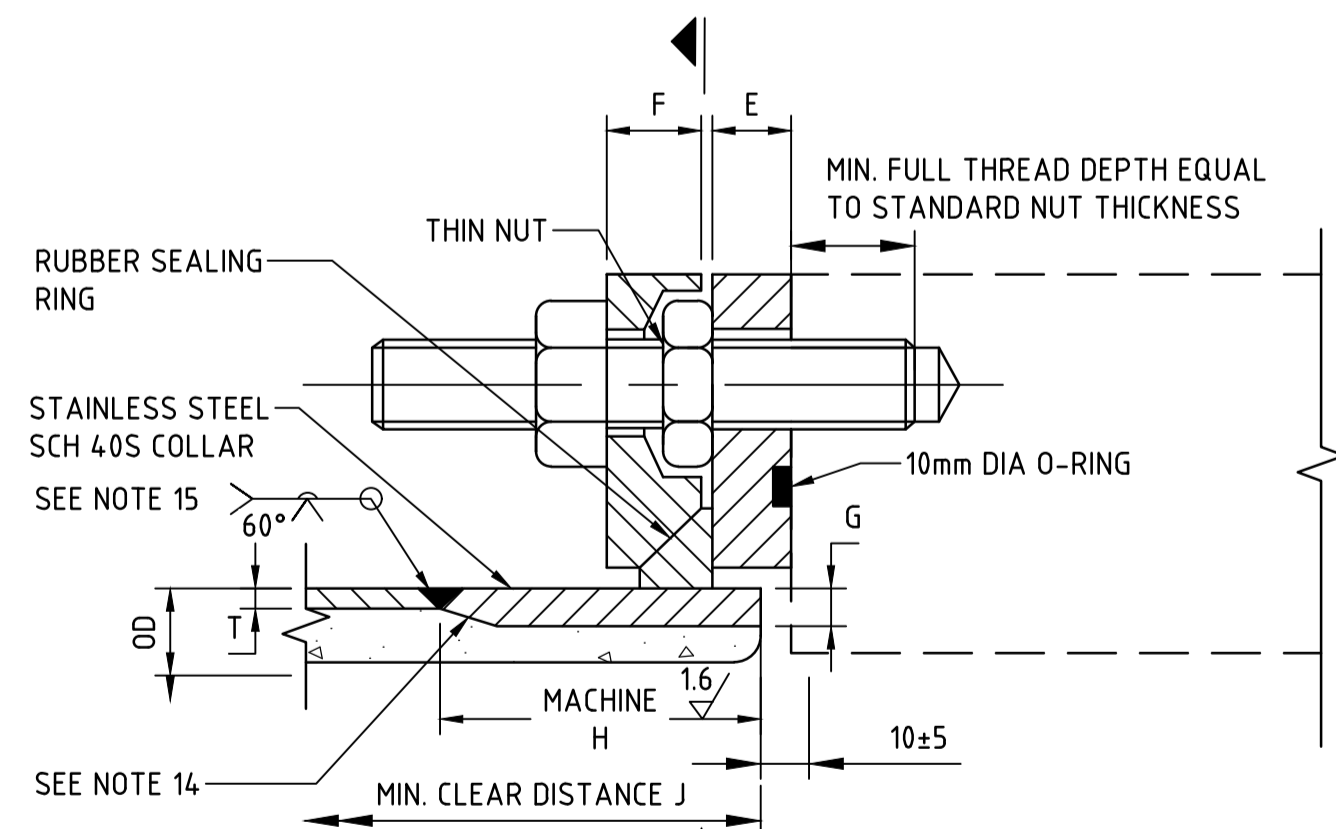
DN	O.D. (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (MIN) (mm)	H (mm)	J (mm)	K	L (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	R (mm)	S1 (mm)	S2 (mm)	T (mm)	U (mm)	NO. BOLTS	DN
80	89	205	165	91	15	15	20	5.49	150	160	M16	100	31	18	10	8	2	-	141	6	10	8	80
100	114	230	191	116	19	19	20	6.02	150	175	M16	110	31	18	10	8	2	-	167	6	10	8	100
150	168	305	260	171	24	24	25	7.11	150	210	M20	135	37	22	12	8	2	-	232	6	10	12	150
200	219	370	324	221	24	24	25	8.18	150	210	M20	135	37	22	12	8	2	-	296	6	10	12	200
250	273	430	381	276	30	30	28	9.27	150	255	M24	170	44	26	14	11	3	-	349	6	13	12	250
300	324	490	438	327	30	30	28	16	150	255	M24	170	44	26	14	11	3	400	-	6	13	16	300
350	356	550	495	359	30	30	32	16	150	265	M27	175	50	30	16	11	3	455	-	6	13	16	350
400	406	610	552	409	38	38	32	16	150	290	M27	195	50	30	16	11	3	510	-	6	13	20	400
450	457	675	610	460	38	38	36	16	150	310	M30	210	55	33	18	17	3	565	-	6	19	20	450
500	508	735	673	511	48	48	36	16	170	340	M30	230	55	33	18	17	3	630	-	6	19	24	500
(550)	559	785	724	562	-	54	36	16	180	345	M30	230	55	33	18	17	3	680	-	6	19	24	(550)
600	610	850	781	613	58	58	40	16	200	410	M33	285	60	36	20	17	3	735	-	6	19	24	600
700	711	935	857	715	58	58	40	16	200	410	M33	285	60	36	20	17	3	810	-	6	19	24	700
750	762	1015	940	765	58	58	40	16	200	410	M33	285	60	36	20	20	3	890	-	6	22	28	750
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900	914	1185	1105	918	68	68	45	16	230	440	M36	300	65	39	22	20	3	1055	-	6	22	32	900
1000	1016	1275	1194	1020	78	78	45	16	250	470	M36	320	65	39	22	20	3	1145	-	6	22	36	1000
1200	1219	1530	1441	1224	88	88	50	16	280	515	M39	350	71	42	24	20	3	1385	-	7	22	40	1200

(I) INDICATES NON-STANDARD FLANGES - FOR USE WITH EXISTING EWS FLANGES ONLY.



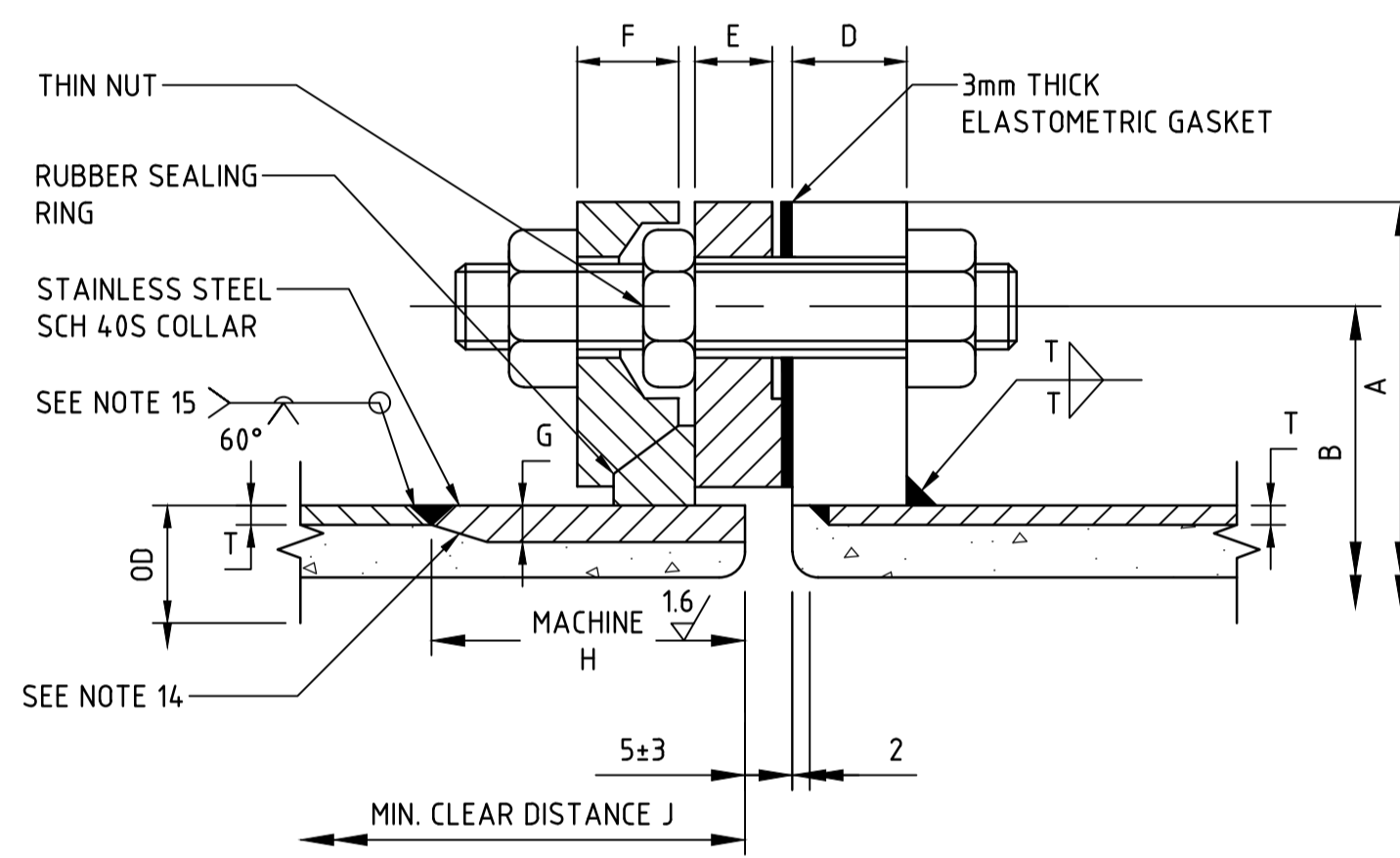
**JOINT WITH TAPPED FLANGE
SIZES UP TO DN250**

NTS



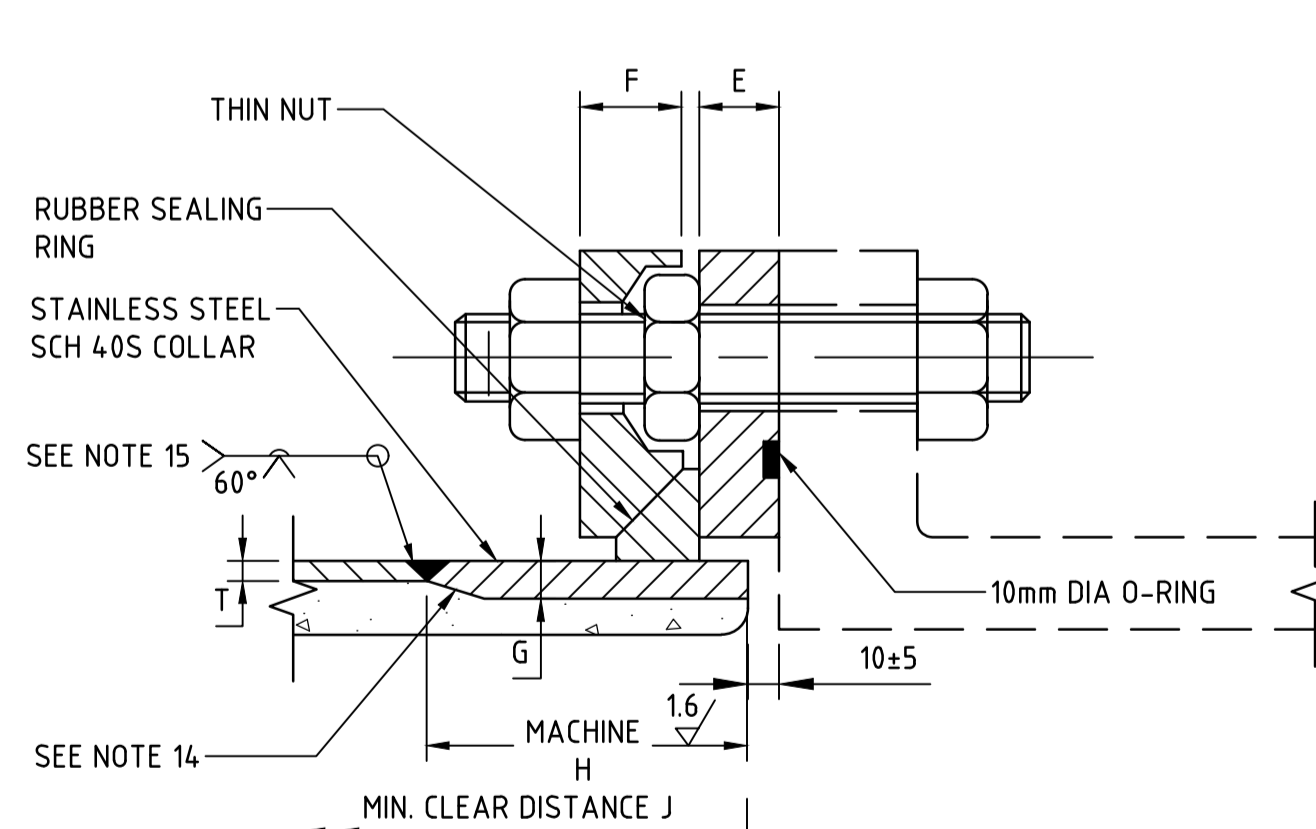
**JOINT WITH TAPPED FLANGE SIZES
UP TO DN300 AND ABOVE**

NTS



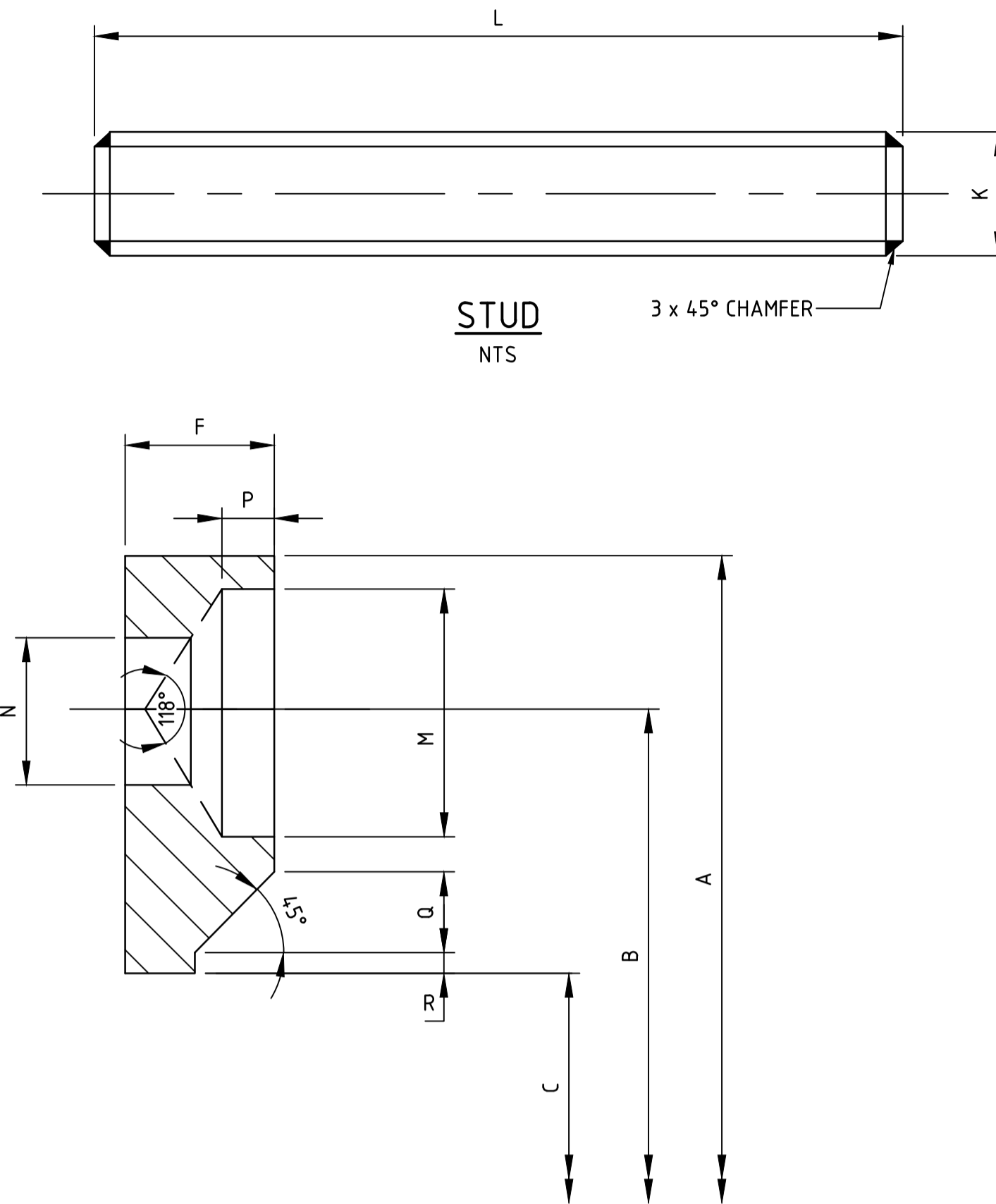
**JOINT WITH DRILLED FLANGE
SIZES UP TO DN250**

NTS



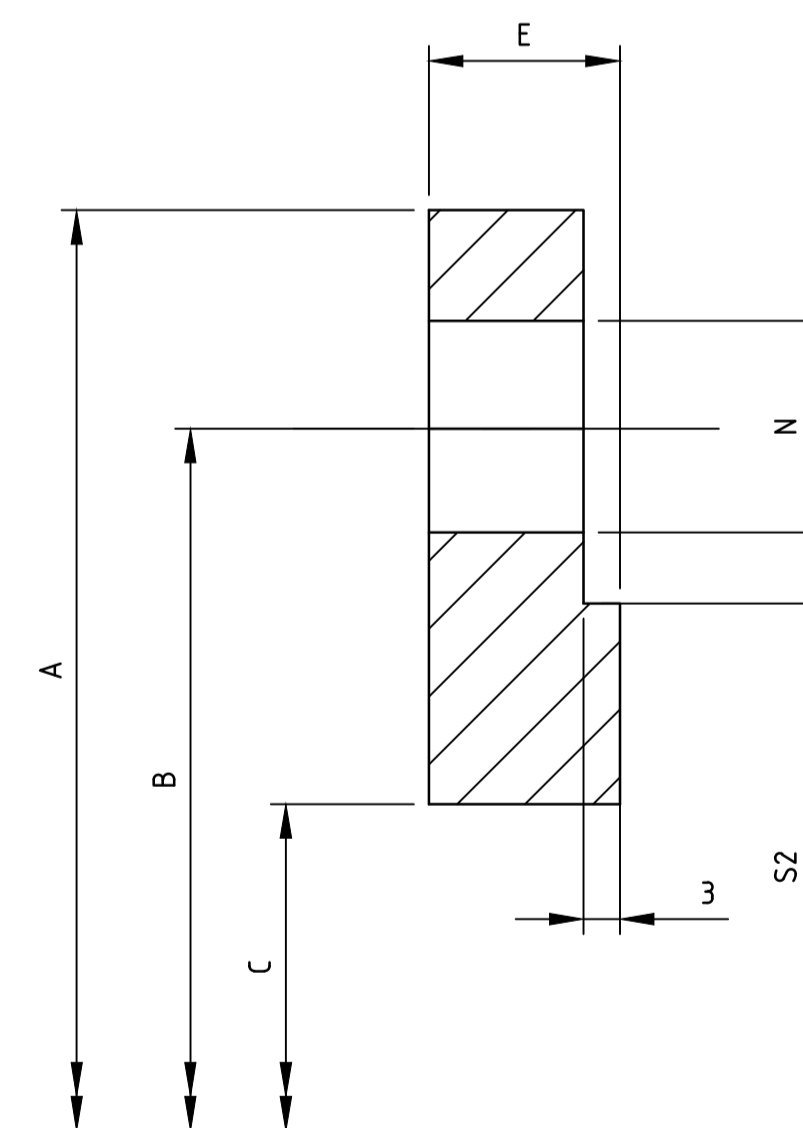
**JOINT WITH DRILLED FLANGE
SIZES DN300 AND ABOVE**

NTS



MS CLAMP FLANGE DETAIL

NTS

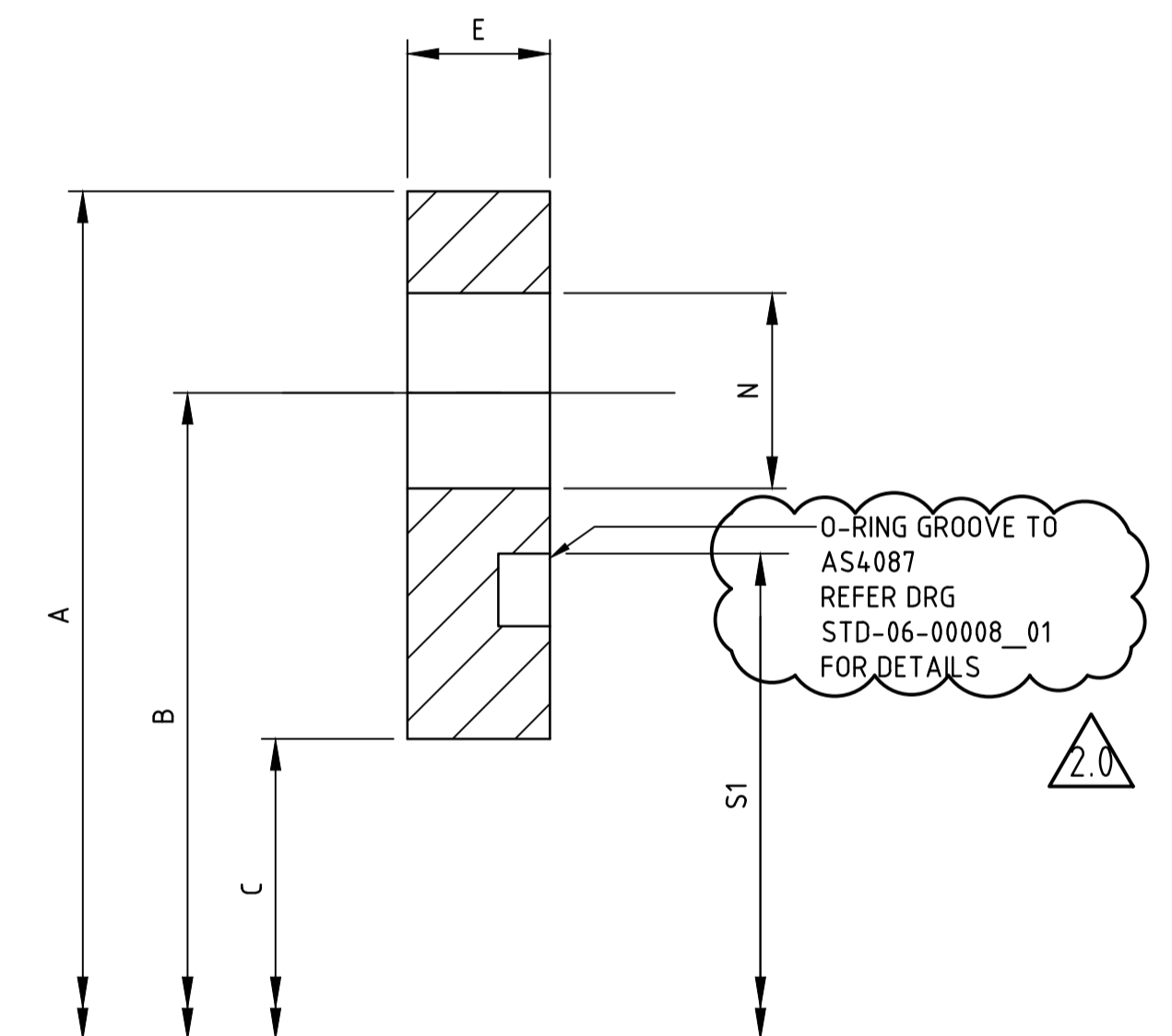


**MS GUIDE FLANGE
UP TO DN250**

NTS

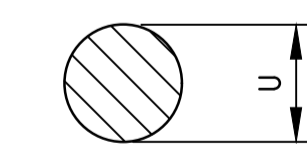
NOTES:

- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
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- ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
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- EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
- REFER TO DRG 4004-00001-30 AND 31 FOR FLANGE ISOLATION JOINT DETAILS WHERE DISSIMILAR METALS ARE USED.
- ALL NUTS & BOLTS TO BE GRADE 8.8 TO AS 4291.1 AND HOT DIP GALVANIZED IN ACCORDANCE WITH AS/NZS 1214.
- STAINLESS STEEL SPIGOT TO BE FABRICATED FROM GRADE 316 PLATE.
- ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER INCLUDING COATINGS, GASKETS, O-RING, LUBRICANTS SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800. DISMANTLING JOINTS TO BE SHOP ASSEMBLED AND MATCH MARKED AT TOP CENTRE BEFORE DELIVERY.
- REFER TO WSA 109 FOR TIGHTENING PROCEDURE AND TORQUE VALUES.
- O-RINGS AND GASKETS TO COMPLY WITH WSA 109.
- FOR BUTT WELDS WHERE DIFFERENCE BETWEEN ADJACENT PLATE EXISTS REFER TO APPENDIX N OF AS 4041 FOR WELDING DETAILS.
- WELDS BETWEEN STAINLESS STEEL AND CARBON STEEL REQUIRE E309MOL ELECTRODES OR SIMILAR.



**MS GUIDE FLANGE DN300
AND ABOVE**

NTS



RUBBER SEALING RING

NTS

REV	DATE	DRN	DETAILS	APR'D
2.0	17/09/24	SS	DETAILS UPDATED. RE-ISSUED FOR USE	MW
1.0	15/12/22	GB	ISSUED FOR USE	MW

REVISION PANEL	DESIGN PANEL
CURRENT REV AUTHORIZED M.WHITE SIGNATURE	AUTHORIZED H.HABIB SIGNATURE
CURRENT REV PROJECT: 2.0 CONTRACTOR: GHD	DESIGNED T.MZUNGU DRAWN G.BALDONADO REVIEWED M.WHITE CONTRACTOR:

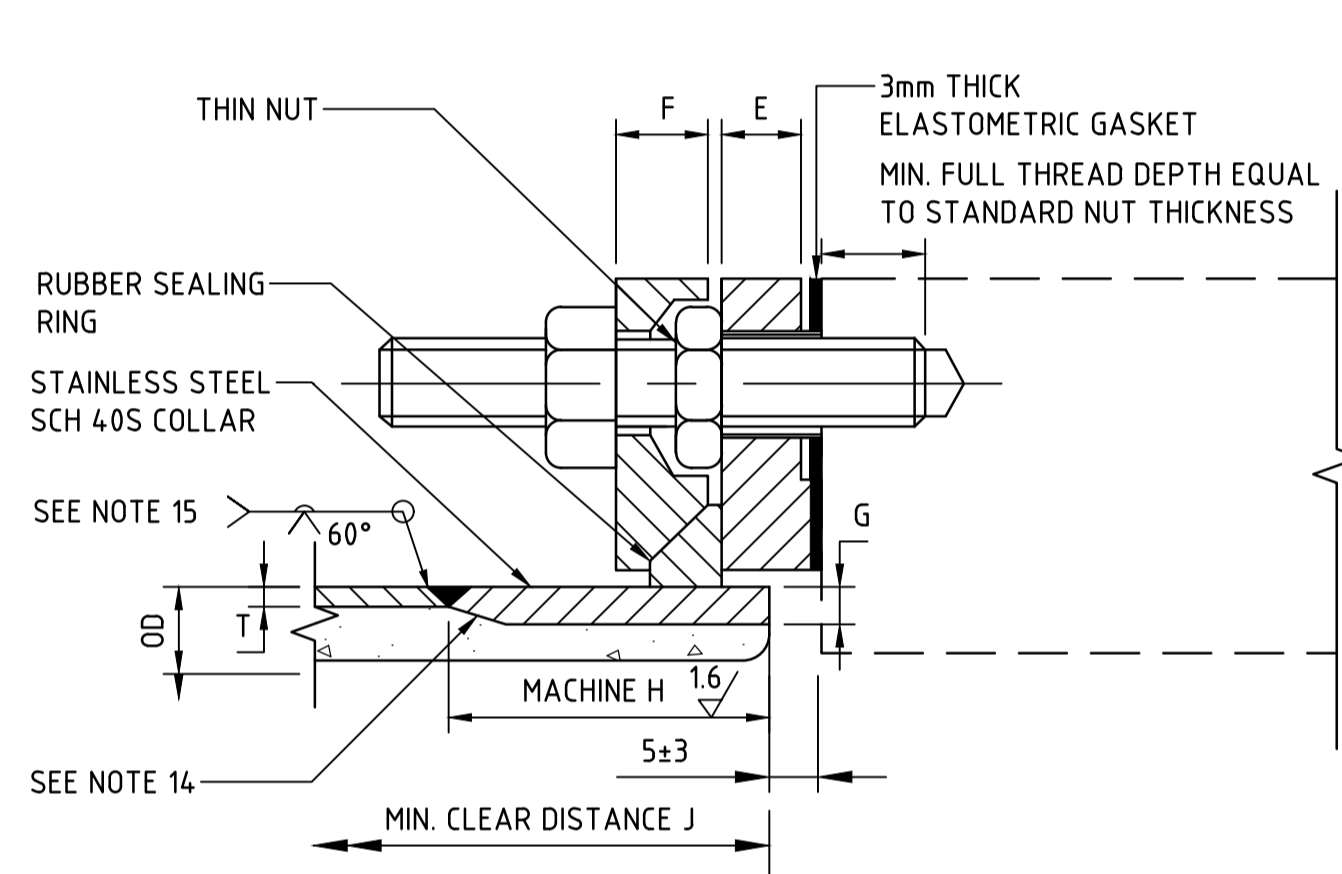
SA Water
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SA WATER STANDARD DRAWING
 STANDARD PN21 UNRESTRAINED
 DISMANTLING JOINT
 CIVIL

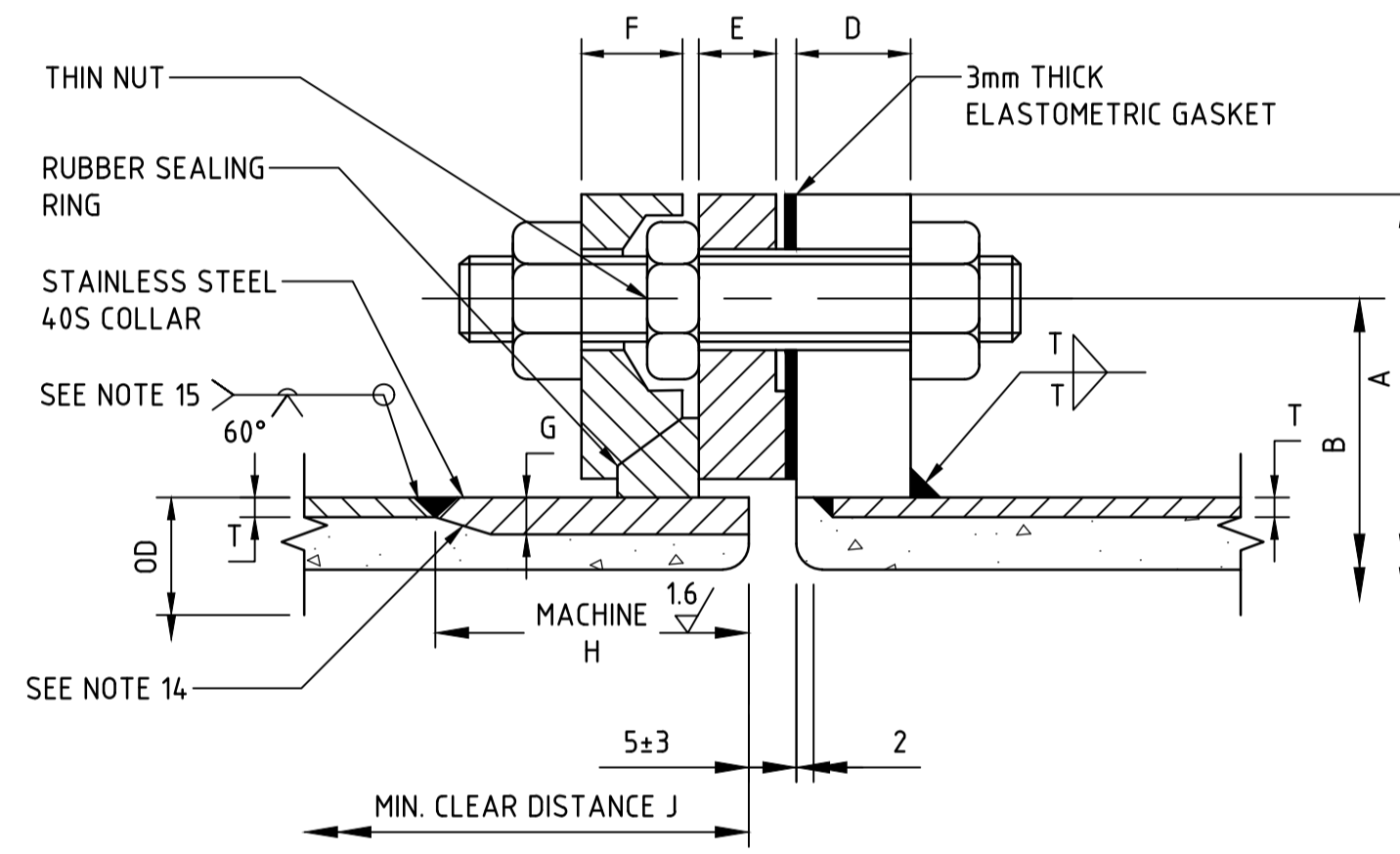
A1	TOTAL SHEETS:	2.0
SHT SIZE	PROJECT No:	
MAXIMO ID:	SUPERSEDES: 75 17C	
DRAWING NUMBER	STD-06-00003_01	

DN	O.D. (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	J (mm)	K	L (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	R (mm)	S1 (mm)	S2 (mm)	T (mm)	U (mm)	NO. BOLTS	DN
80	89	205	165	91	24	15	20	5.49	150	170	M16	110	31	18	10	8	2	-	141	6	10	8	80
100	114	230	191	116	24	19	20	6.02	150	185	M16	120	31	18	10	8	2	-	167	6	10	8	100
150	168	305	260	171	31	24	25	7.11	150	220	M20	145	37	22	12	8	2	-	232	6	10	12	150
200	219	370	324	221	31	24	25	8.18	150	220	M20	145	37	22	12	8	2	-	260	6	10	12	200
250	273	430	381	276	38	30	28	9.27	150	255	M24	170	44	26	14	11	3	-	311	6	13	12	250
300	324	490	438	327	38	30	28	16	150	255	M24	170	44	26	14	11	3	400	-	6	13	16	300
350	356	550	495	359	48	30	32	16	150	285	M27	195	50	30	16	11	3	455	-	6	13	16	350
400	406	610	552	409	48	38	32	16	150	300	M27	205	50	30	16	11	3	510	-	6	13	20	400
450	457	675	610	460	58	38	36	16	150	330	M30	230	55	33	18	17	3	565	-	6	19	20	450
500	508	735	673	511	58	48	36	16	170	350	M30	240	55	33	18	17	3	630	-	6	19	24	500
(550)	559	785	724	562	-	54	36	16	180	355	M30	240	55	33	18	17	3	680	-	6	19	24	(550)
600	610	850	781	613	68	58	40	16	200	420	M33	295	60	36	20	17	3	735	-	6	19	24	600
700	711	935	857	715	78	58	40	16	200	430	M33	305	60	36	20	17	3	810	-	7	19	24	700
750	762	1015	940	765	78	58	40	16	200	430	M33	305	60	36	20	20	3	890	-	8	22	28	750
800	813	1060	984	816	84	68	40	16	220	450	M33	315	60	36	20	20	3	935	-	8	22	28	800
900	914	1185	1105	918	94	68	45	16	230	460	M36	320	65	39	22	20	3	1055	-	9	22	32	900
1000	1016	1275	1194	1020	98	78	45	20	250	490	M36	340	65	39	22	20	3	1145	-	10	22	36	1000
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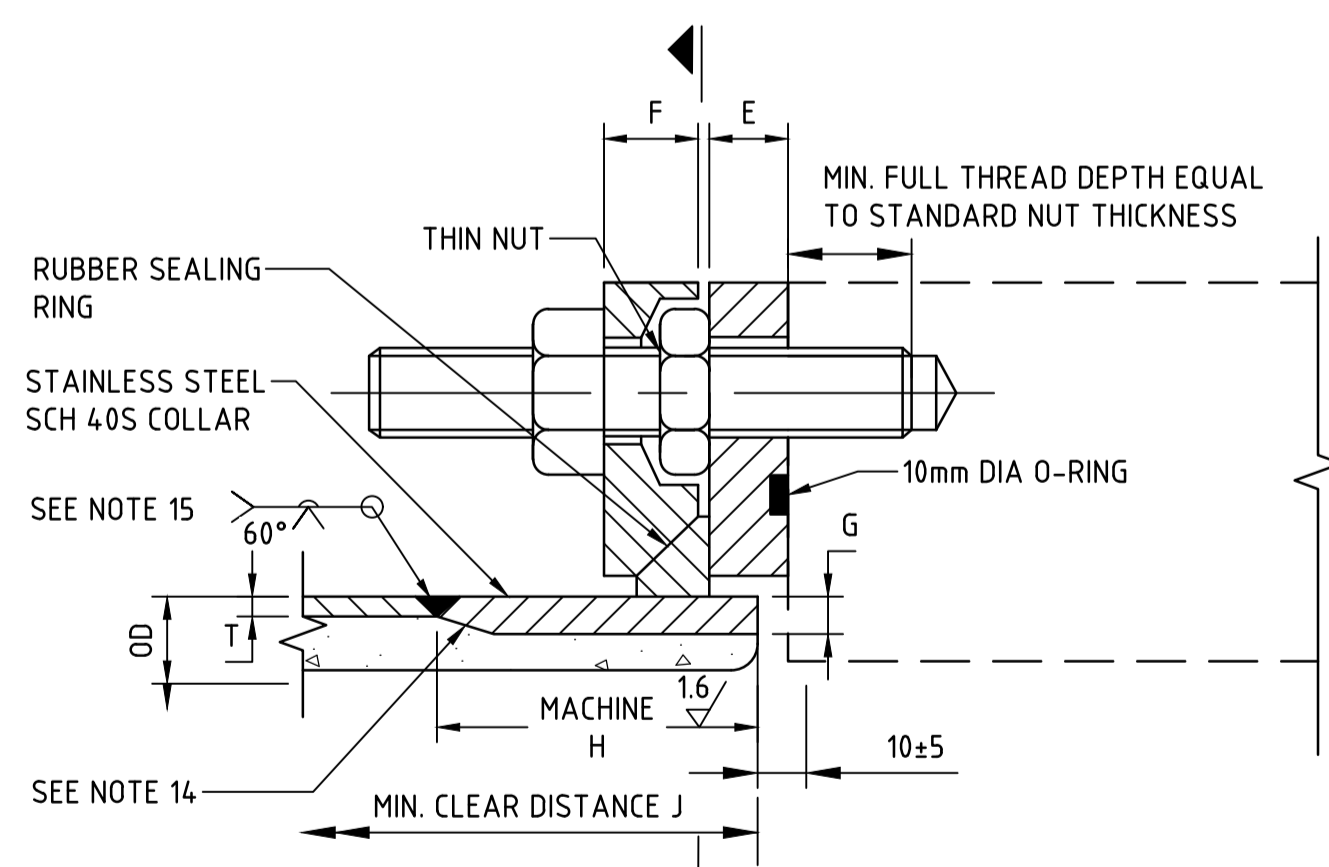
(I) INDICATES NON-STANDARD FLANGES - FOR USE WITH EXISTING EWS FLANGES ONLY.



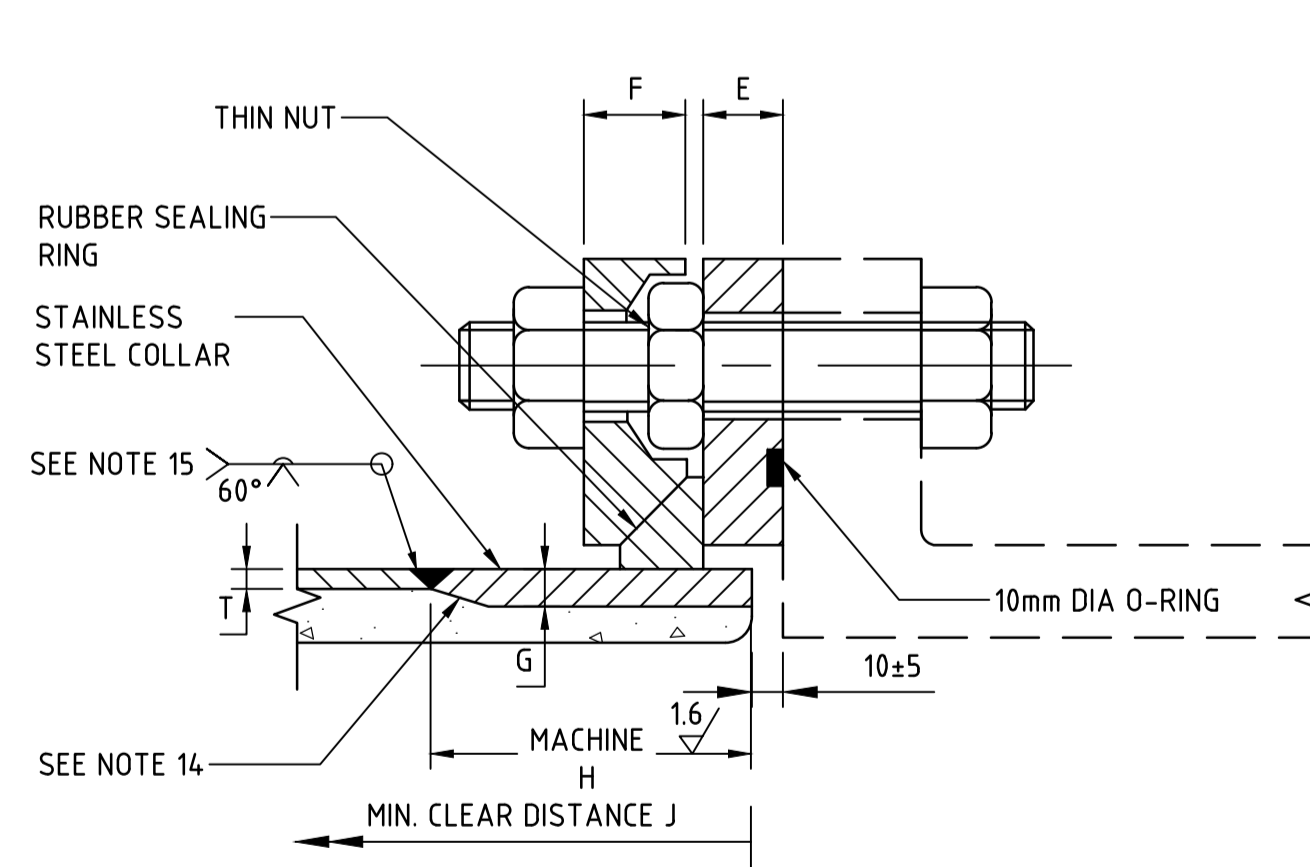
**JOINT WITH TAPPED FLANGE
SIZES UP TO DN250**
NTS



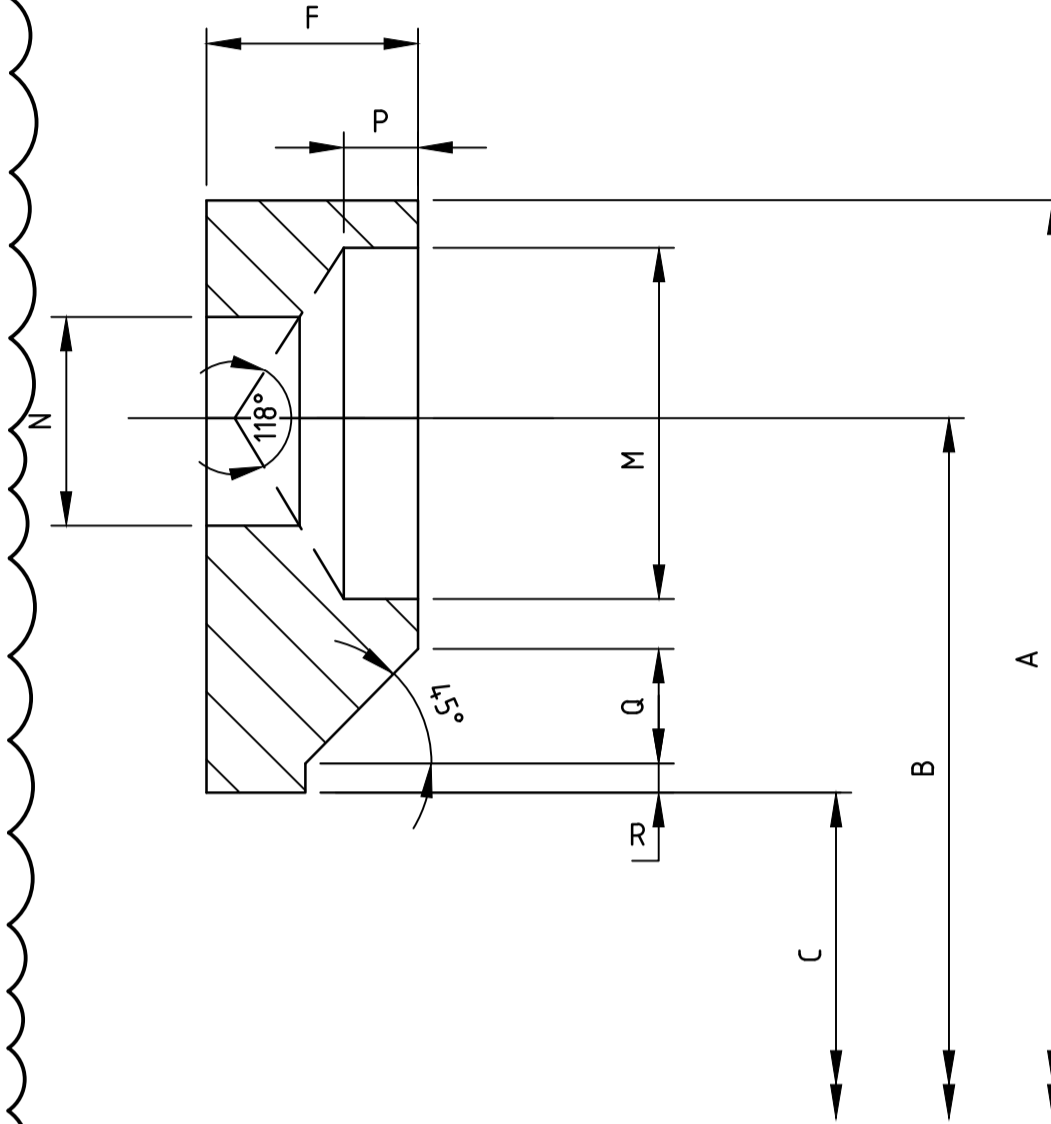
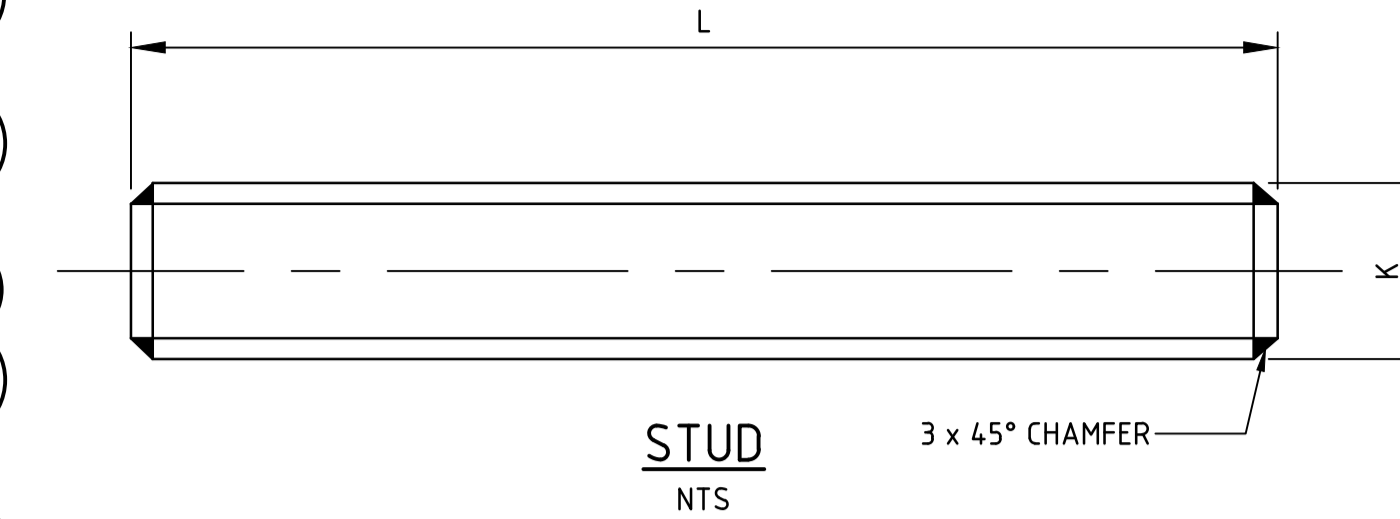
**JOINT WITH DRILLED FLANGE
SIZES UP TO DN250**
NTS



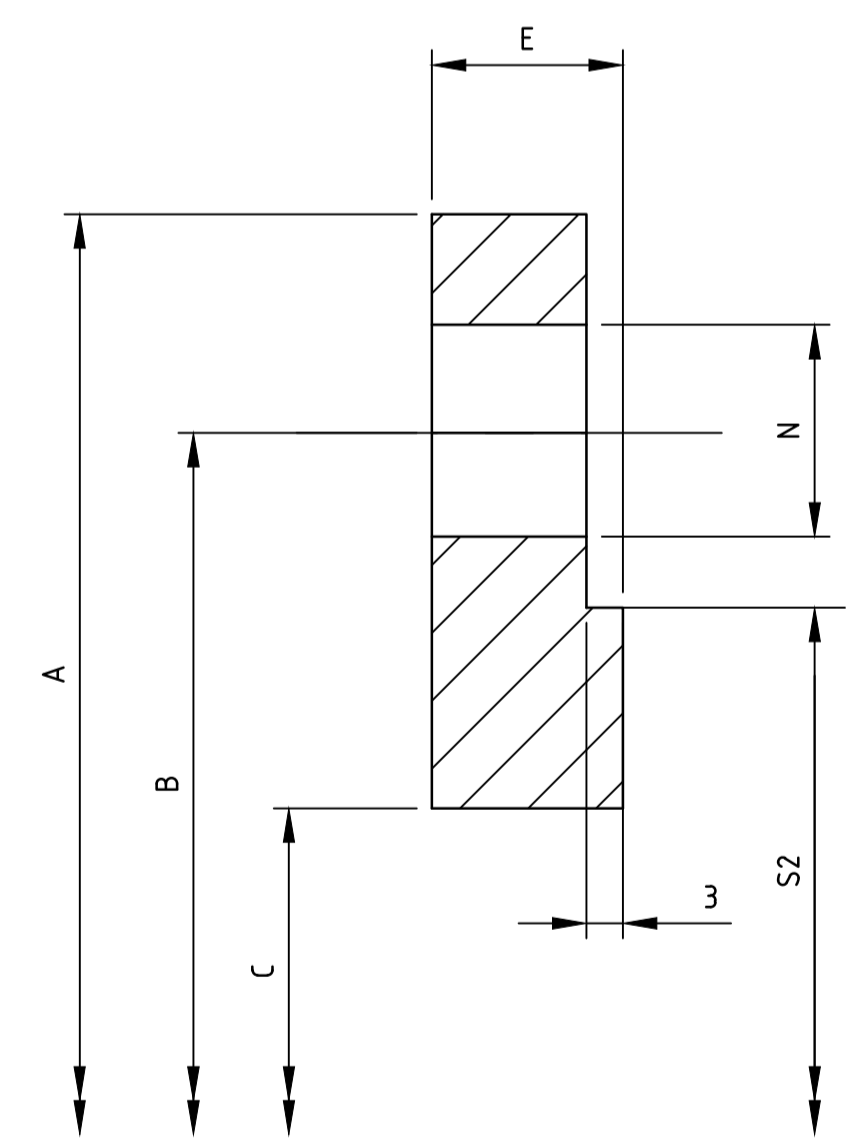
**JOINT WITH TAPPED FLANGE SIZES
UP TO DN300 AND ABOVE**
NTS



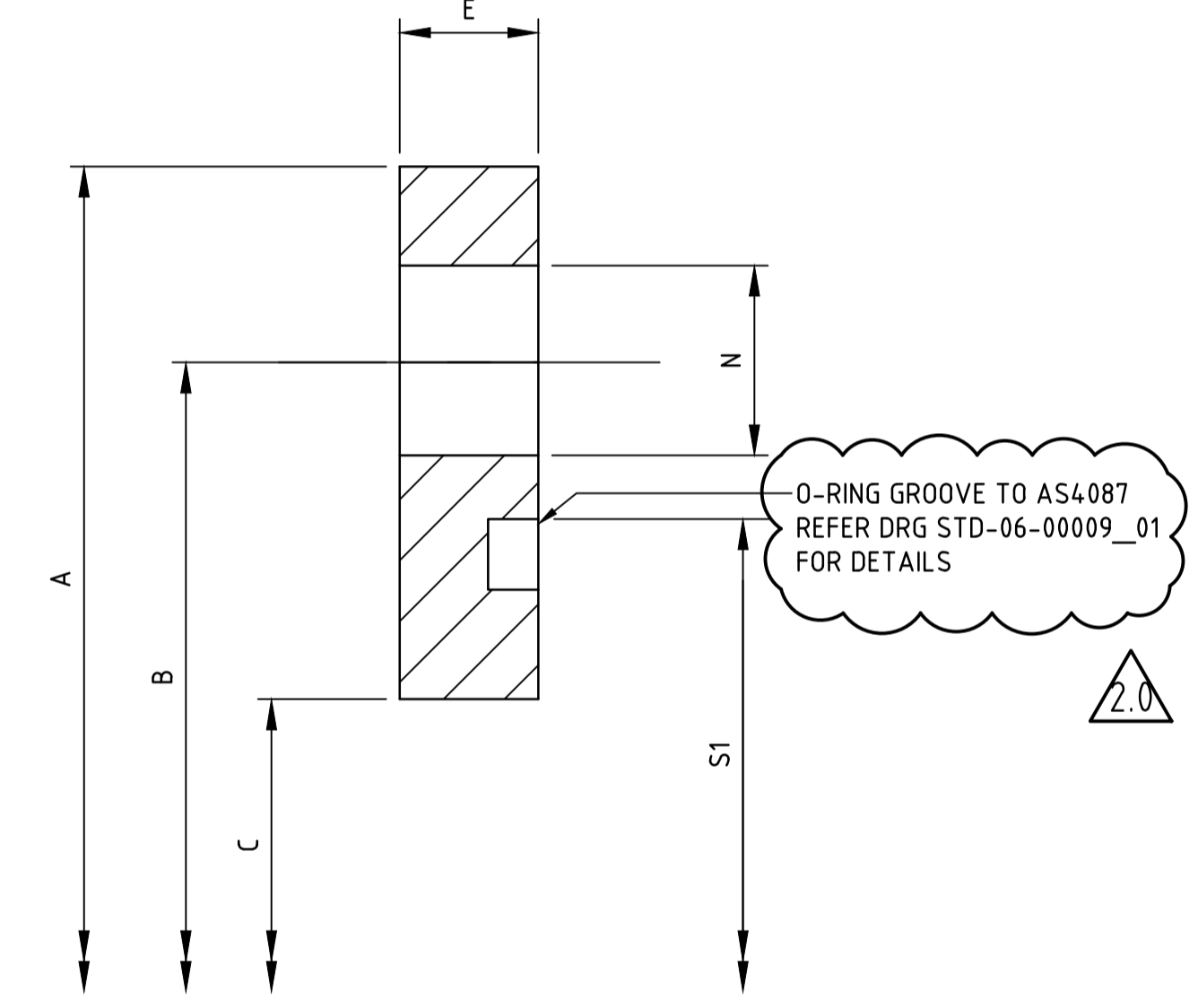
**JOINT WITH DRILLED FLANGE
SIZES DN300 AND ABOVE**
NTS



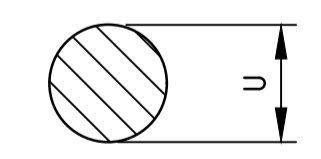
MS CLAMP FLANGE DETAIL
NTS



**MS GUIDE FLANGE
UP TO DN250**
NTS



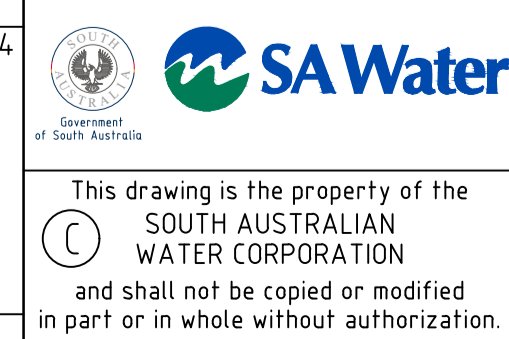
**MS GUIDE FLANGE DN300
AND ABOVE**
NTS



RUBBER SEALING RING
NTS

- NOTES:**
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 - STAINLESS STEEL SPIGOT TO BE FABRICATED FROM GRADE 316 PLATE.
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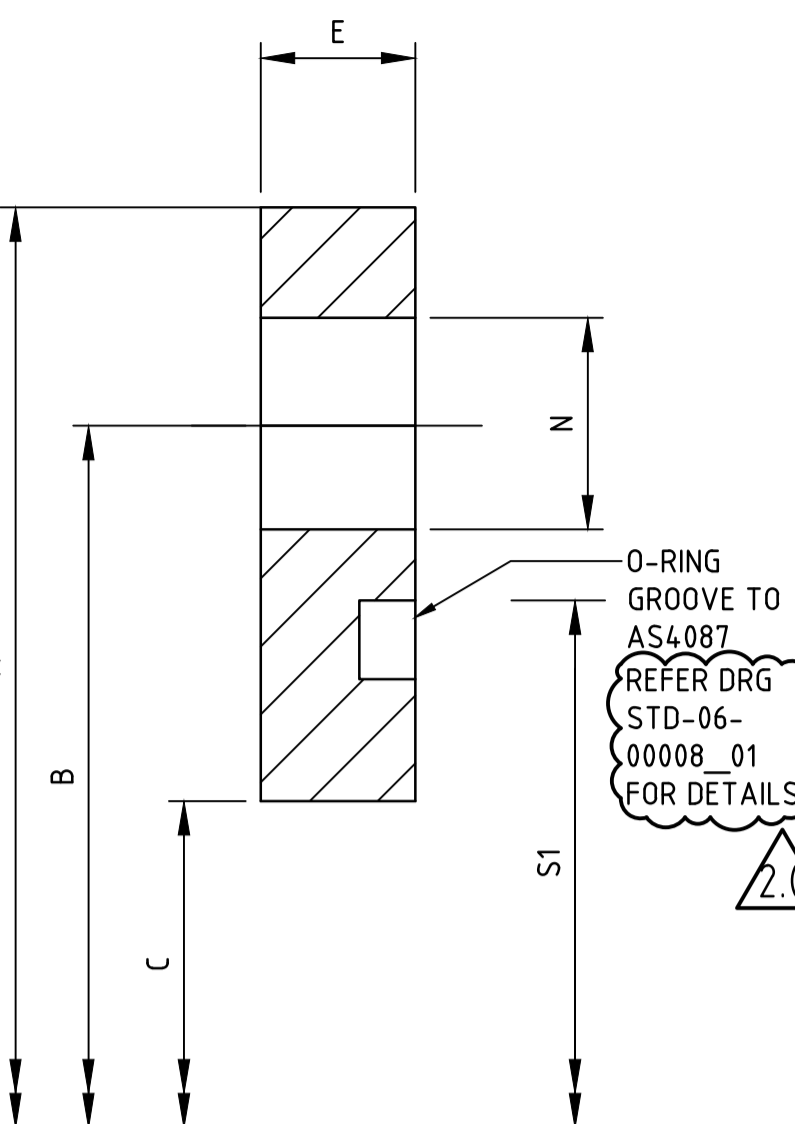
REVISION PANEL				DESIGN PANEL			
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	AUTHORIZED
2.0	17/09/24	SS	DETAILS UPDATED. RE-ISSUED FOR USE	MW	M.WHITE	T.MZUNGU	H.HABIB
1.0	15/12/22	GB	ISSUED FOR USE	MW		G.BALDONADO	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 2.0			



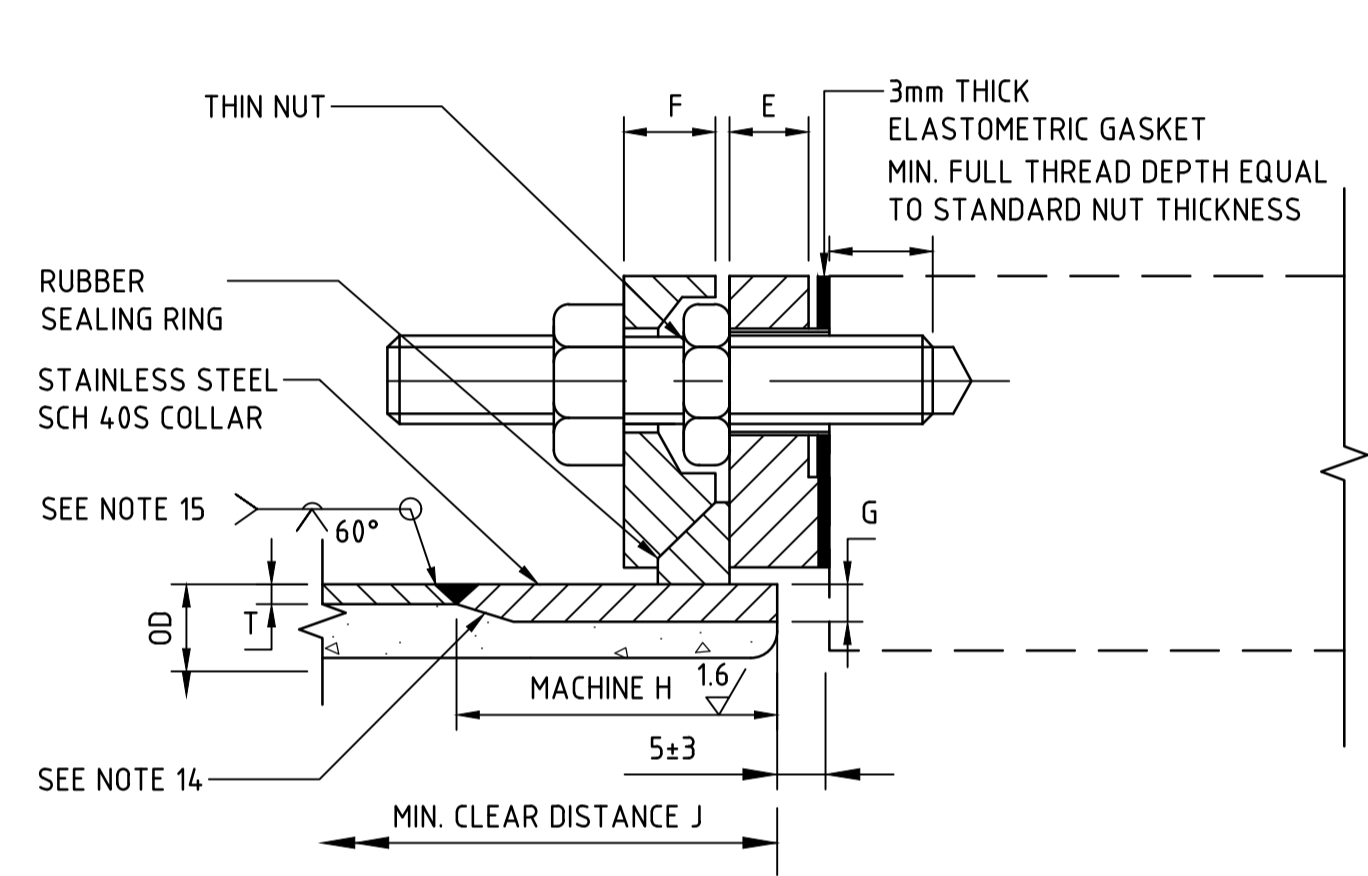
SA WATER STANDARD DRAWING
STANDARD PN35 UNRESTRAINED
DISMANTLING JOINT
CIVIL

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SHT SIZE	PROJECT No:	
SUPERSEDES: 75 18C		
DRAWING NUMBER		
STD-06-00004_01		

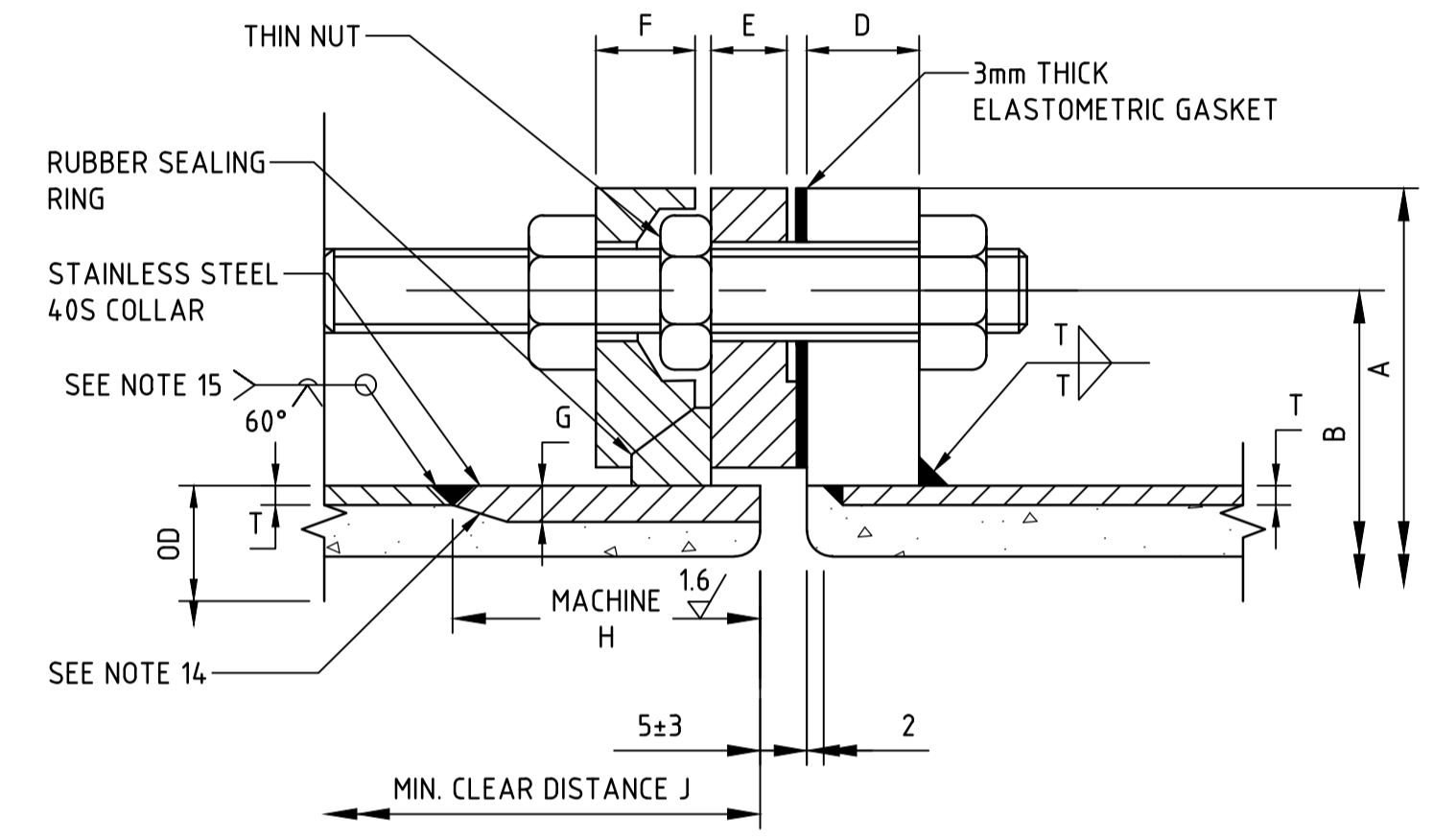
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80	89	185	146	91	11	11	20	5.49	150	400	290	M16	230	31	18	10	8	2	-	122	6	10	130	6	-	4	80
100	114	215	178	116	13	13	20	6.02	150	400	290	M16	230	31	18	10	8	2	-	154	6	10	130	6	-	4	100
150	168	280	235	171	13	13	20	7.11	150	400	290	M16	230	31	18	10	8	2	-	211	6	10	130	6	-	8	150
200	219	335	292	221	19	19	20	8.18	150	450	325	M16	260	31	18	10	8	2	-	268	6	10	145	6	-	8	200
250	273	405	356	276	19	19	25	9.27	150	505	365	M20	295	37	22	12	11	3	-	328	6	13	165	6	-	8	250
300	324	455	406	327	23	23	25	16	150	545	390	M20	315	37	22	12	11	3	370	-	6	13	180	6	-	12	300
350	356	525	470	359	30	30	28	16	150	725	505	M24	420	44	26	14	11	3	430	-	6	13	250	6	-	12	350
400	406	580	521	409	30	30	28	16	150	725	505	M24	420	44	26	14	11	3	485	-	6	13	250	6	-	12	400
450	457	640	584	460	30	30	28	16	150	725	505	M24	420	44	26	14	17	3	545	-	6	19	250	6	-	12	450
500	508	705	641	511	38	38	28	16	150	785	545	M24	450	44	26	14	17	3	605	-	6	19	270	6	-	16	500
600	610	825	756	613	48	48	32	16	160	865	610	M27	505	50	30	16	17	3	715	-	6	19	285	6	-	16	600
700	711	910	845	715	56	56	32	16	180	945	660	M27	545	50	30	16	17	3	800	-	6	19	315	6	-	20	700
750	762	995	927	765	56	56	36	16	190	965	680	M30	560	55	33	18	20	3	880	-	6	22	320	6	20	20	750
800	813	1060	984	816	56	56	40	16	200	1080	760	M33	635	60	36	20	20	3	935	-	6	22	360	7	20	20	800
900	914	1175	1092	918	66	66	40	16	220	1170	820	M33	685	60	36	20	20	3	1045	-	6	22	390	7	24	24	900
1000	1016	1255	1175	1020	66	66	40	16	220	1170	820	M33	685	60	36	20	20	3	1125	-	6	22	390	8	24	24	1000
1200	1219	1490	1410	1224	76	76	40	16	240	1260	880	M33	735	60	36	20	20	3	1360	-	6	22	420	9	32	32	1200



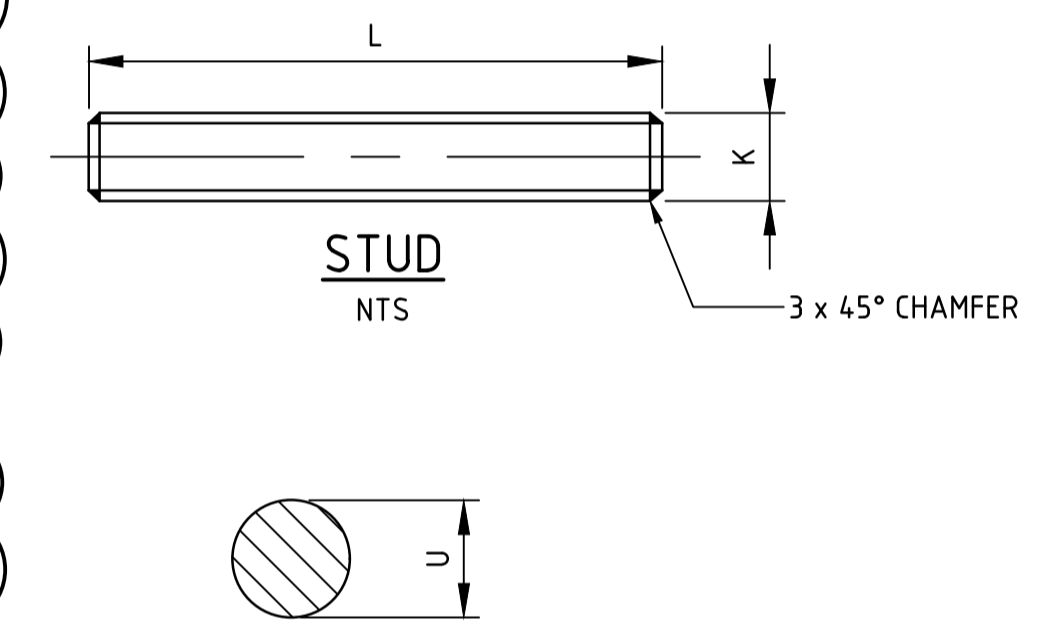
- NOTES:**
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 - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
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 - GRADE 250 - THICKNESSES GREATER THAN 8mm
 - FLANGES TO BE FABRICATED IN ACCORDANCE WITH AS/NZS 4087.
 - REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
 - EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
 - REFER TO DRG 4004-00001-30 AND 31 FOR FLANGE ISOLATION JOINT DETAILS WHERE DISSIMILAR METALS ARE USED.
 - ALL NUTS & BOLTS TO BE GRADE 8.8 TO AS 4291.1 AND HOT DIP GALVANIZED IN ACCORDANCE WITH AS/NZS 1214.
 - STAINLESS STEEL SPIGOT TO BE FABRICATED FROM GRADE 316 PLATE.
 - ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER INCLUDING COATINGS, GASKETS, O-RING, LUBRICANTS SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.
 - DISMANTLING JOINTS TO BE SHOP ASSEMBLED AND MATCH MARKED AT TOP CENTRE BEFORE DELIVERY.
 - REFER TO WSA 109 FOR TIGHTENING PROCEDURE AND TORQUE VALUES.
 - O-RINGS AND GASKETS TO COMPLY WITH WSA 109.
 - FOR BUTT WELDS WHERE DIFFERENCE BETWEEN ADJACENT PLATE EXISTS REFER TO APPENDIX N OF AS 4041 FOR WELDING DETAILS.
 - WELDS BETWEEN STAINLESS STEEL AND CARBON STEEL REQUIRE E309MOL ELECTRODES OR SIMILAR.



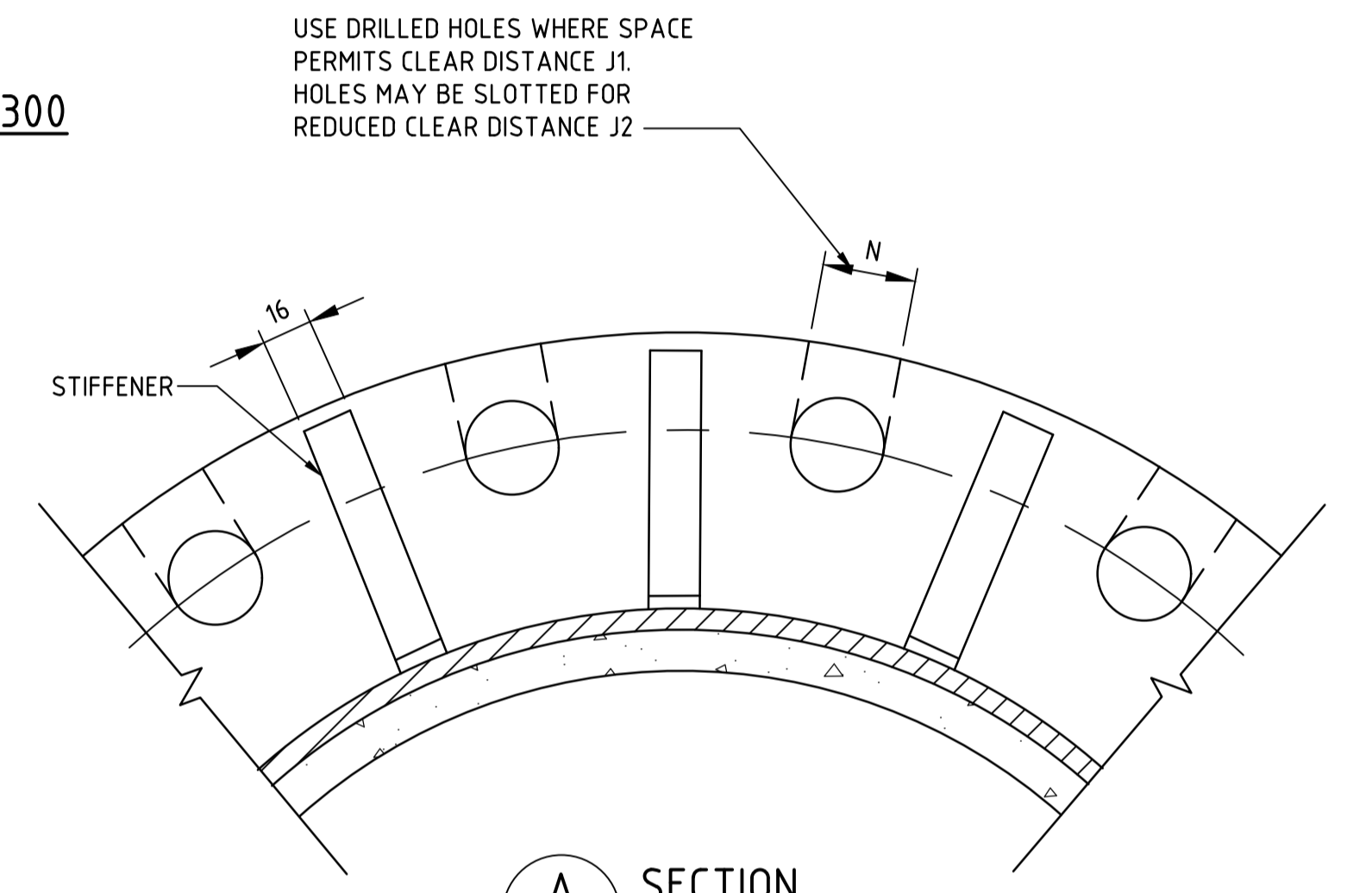
**JOINT WITH TAPPED FLANGE
SIZES UP TO DN250**
NTS



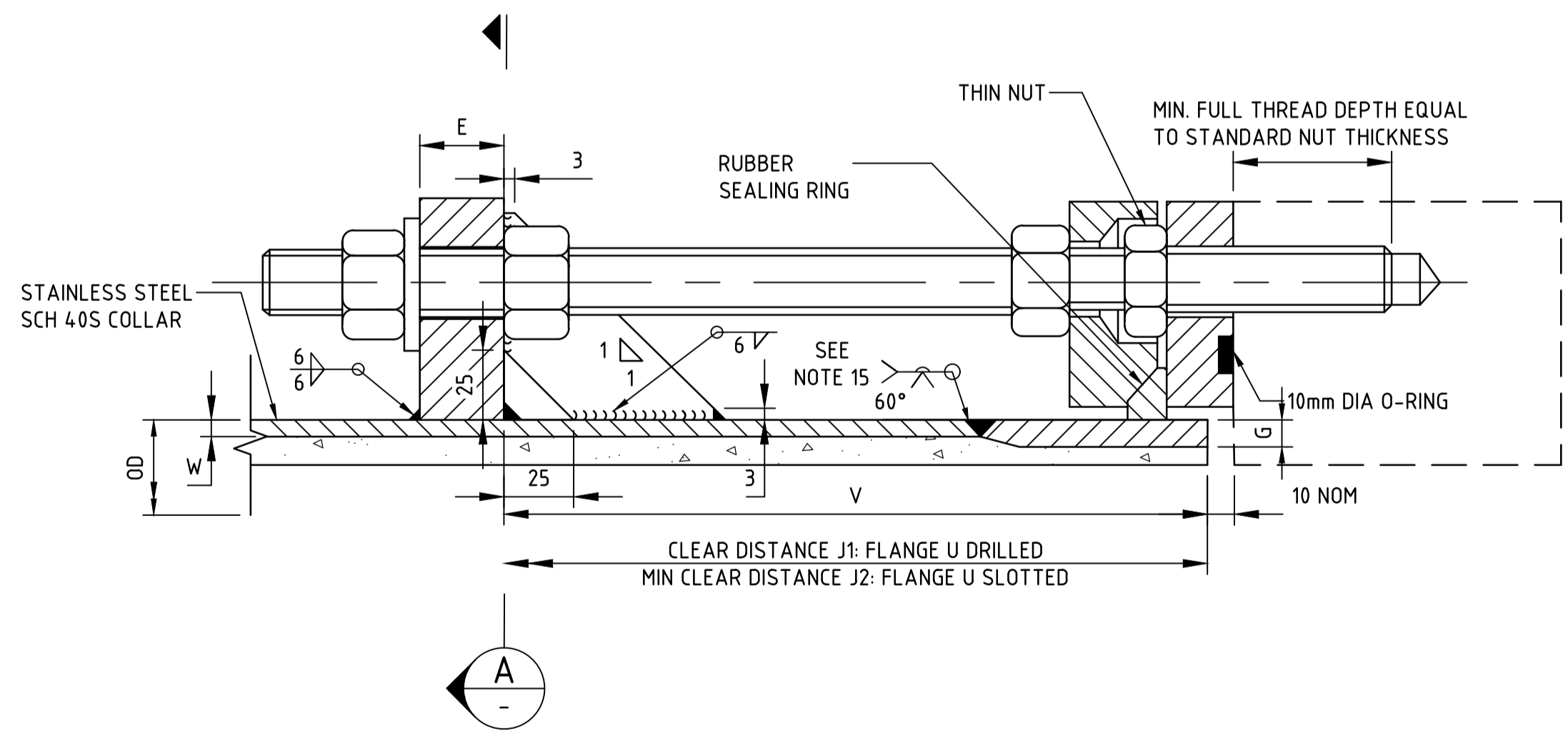
**JOINT WITH DRILLED FLANGE
SIZES UP TO DN250**
NTS



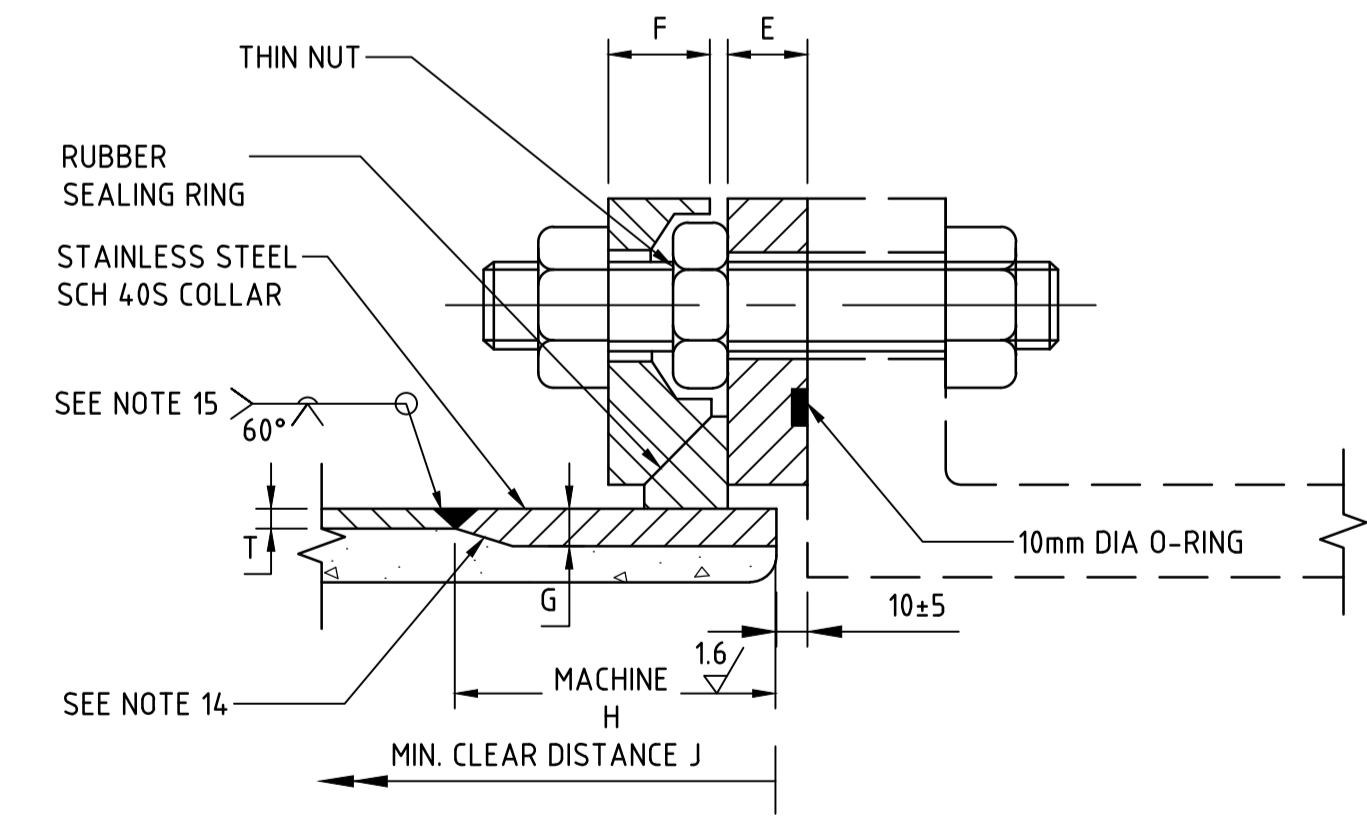
RUBBER SEALING RING
NTS



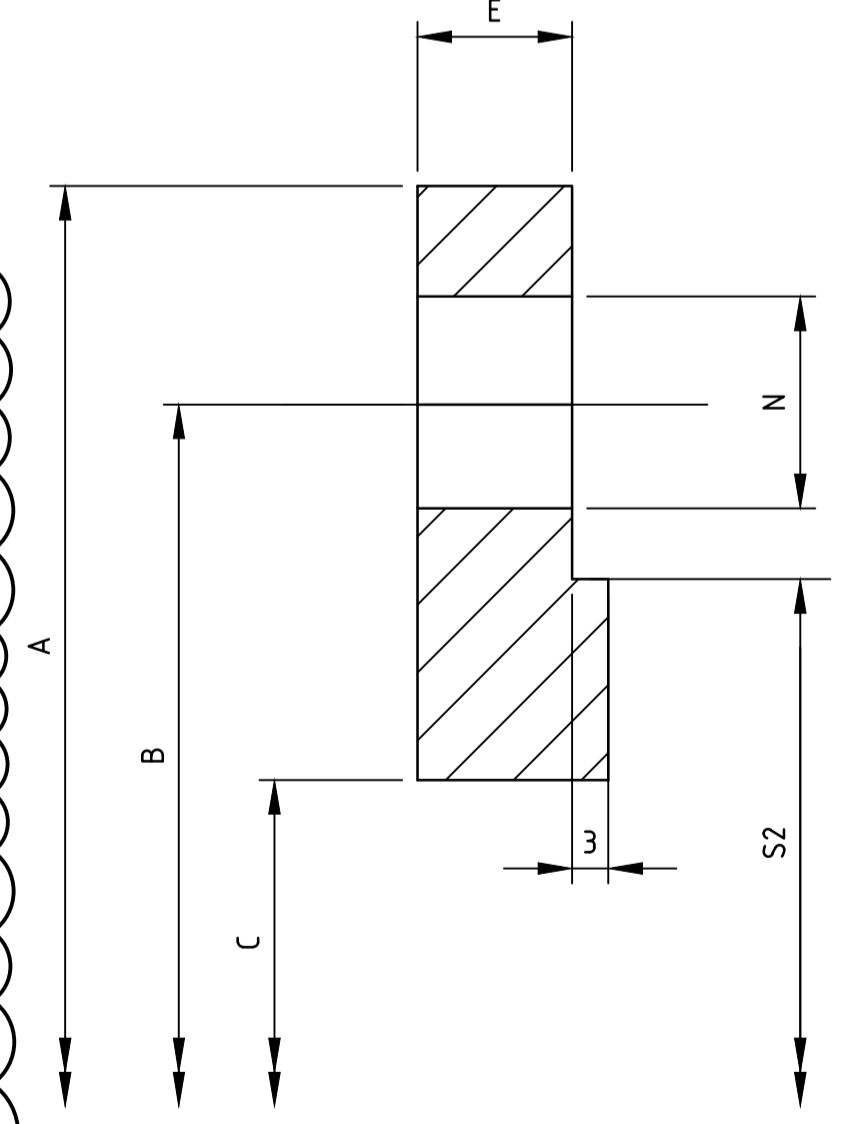
MS CLAMP FLANGE DETAIL
NTS



**JOINT WITH TAPPED FLANGE
UP TO DN300 AND ABOVE**
NTS



**JOINT WITH DRILLED FLANGE
SIZES DN300 AND ABOVE**
NTS

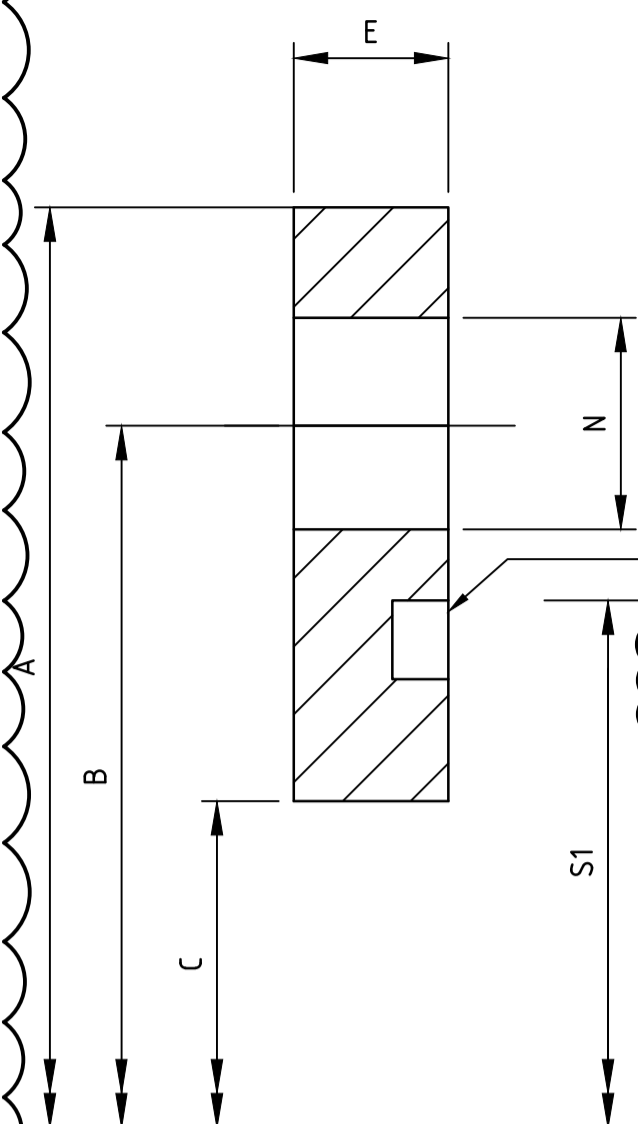


**MS GUIDE FLANGE
UP TO DN250**
NTS

<table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DRN</th> <th>DETAILS</th> <th>APR'D</th> </tr> </thead> <tbody> <tr> <td>2.0</td> <td>17/09/24</td> <td>SS</td> <td>DETAILS UPDATED. RE-ISSUED FOR USE</td> <td>MW</td> </tr> <tr> <td>1.0</td> <td>15/12/22</td> <td>GB</td> <td>ISSUED FOR USE</td> <td>MW</td> </tr> </tbody> </table>				REV	DATE	DRN	DETAILS	APR'D	2.0	17/09/24	SS	DETAILS UPDATED. RE-ISSUED FOR USE	MW	1.0	15/12/22	GB	ISSUED FOR USE	MW	<table border="1"> <thead> <tr> <th>REVISION PANEL</th> <th>DETAILS</th> <th>APR'D</th> </tr> </thead> <tbody> <tr> <td>17/09/24</td> <td>M.WHITE</td> <td>MW</td> </tr> </tbody> </table>		REVISION PANEL	DETAILS	APR'D	17/09/24	M.WHITE	MW	<table border="1"> <thead> <tr> <th>DESIGN PANEL</th> <th>AUTHORISED</th> <th>17/09/24</th> </tr> </thead> <tbody> <tr> <td>DESIGNED T.MZUNGU</td> <td>H.HABIB</td> <td></td> </tr> <tr> <td>DRAWN G.BALDONADO</td> <td></td> <td></td> </tr> <tr> <td>REVIEWED M.WHITE</td> <td></td> <td></td> </tr> </tbody> </table>		DESIGN PANEL	AUTHORISED	17/09/24	DESIGNED T.MZUNGU	H.HABIB		DRAWN G.BALDONADO			REVIEWED M.WHITE					<p>SA WATER STANDARD DRAWING STANDARD PN16 RESTRAINED DISMANTLING JOINT CIVIL</p>		<table border="1"> <tr> <td>A1</td> <td>TOTAL SHEETS:</td> <td>2.0</td> </tr> <tr> <td></td> <td>PROJECT No:</td> <td></td> </tr> <tr> <td></td> <td>SUPERSEDES:</td> <td>79 117B</td> </tr> <tr> <td></td> <td>DRAWING NUMBER</td> <td>STD-06-00005_01</td> </tr> </table>		A1	TOTAL SHEETS:	2.0		PROJECT No:			SUPERSEDES:	79 117B		DRAWING NUMBER	STD-06-00005_01
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DN	O.D. (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	J1 (mm)	J2 (mm)	K	L (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	R (mm)	S1 (mm)	S2 (mm)	T (mm)	U (mm)	V	W	NO. STIFFENER	NO. BOLTS	DN
80	89	205	165	91	15	15	20	5.4.9	100	400	290	M16	230	31	18	10	8	2	-	141	6	10	130	6	-	8	80
100	114	230	191	116	19	19	20	6.02	100	435	315	M16	250	31	18	10	8	2	-	167	6	10	140	6	-	8	100
150	168	305	260	171	24	24	25	7.11	100	505	370	M20	295	37	22	12	8	2	-	232	6	10	160	6	-	12	150
200	219	370	324	221	24	24	25	8.18	100	540	390	M20	315	37	22	12	8	2	-	296	6	10	175	6	-	12	200
250	273	430	381	276	30	30	28	9.27	120	685	485	M24	400	44	26	14	11	3	-	349	6	13	230	6	-	12	250
300	324	490	438	327	30	30	28	16	120	690	485	M24	400	44	26	14	11	3	400	-	6	13	235	6	-	16	300
350	356	550	495	359	30	30	32	16	130	690	495	M27	405	50	30	16	11	3	455	-	6	13	230	6	-	16	350
400	406	610	552	409	38	38	32	16	140	740	530	M27	435	50	30	16	11	3	510	-	6	13	240	6	-	20	400
450	457	675	610	460	38	38	36	16	150	780	560	M30	460	55	33	18	17	3	565	-	6	19	255	6	-	20	450
500	508	735	673	511	48	48	36	16	170	865	620	M30	510	55	33	18	17	3	630	-	6	19	280	6	-	24	500
550	559	785	724	562	-	54	36	16	180	930	655	M30	540	55	33	18	17	3	680	-	6	19	310	6	-	24	550
600	610	850	781	613	58	58	40	16	200	1070	760	M33	635	60	36	20	17	3	735	-	6	19	350	6	-	24	600
700	711	935	857	715	58	58	40	16	200	1110	780	M33	655	60	36	20	17	3	810	-	6	19	370	8	24	24	700
750	762	1015	940	765	58	58	40	16	200	1110	780	M33	655	60	36	20	20	3	890	-	6	22	370	8	28	28	750
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900	914	1185	1105	918	68	68	45	16	230	1180	830	M36	690	65	39	22	20	3	1055	-	6	22	395	10	32	32	900
1000	1016	1275	1194	1020	78	78	45	16	250	1230	870	M36	720	65	39	22	20	3	1145	-	6	22	405	10	36	36	1000
1200	1219	1530	1441	1224	88	88	50	16	280	1365	965	M39	800	71	42	24	20	3	1385	-	7	22	450	12	40	40	1200

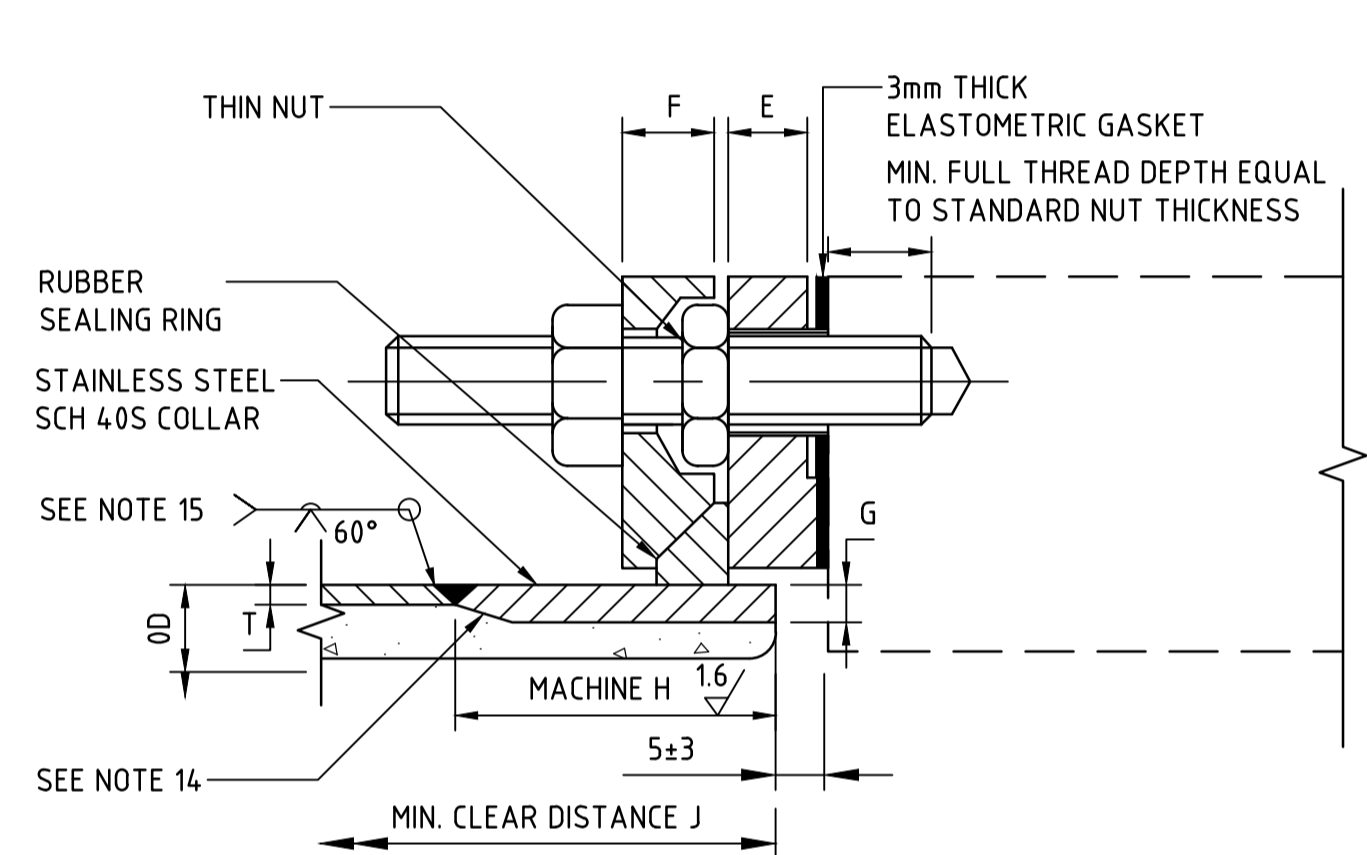
(I) INDICATES NON-STANDARD FLANGES - FOR USE WITH EXISTING EWS FLANGES ONLY.



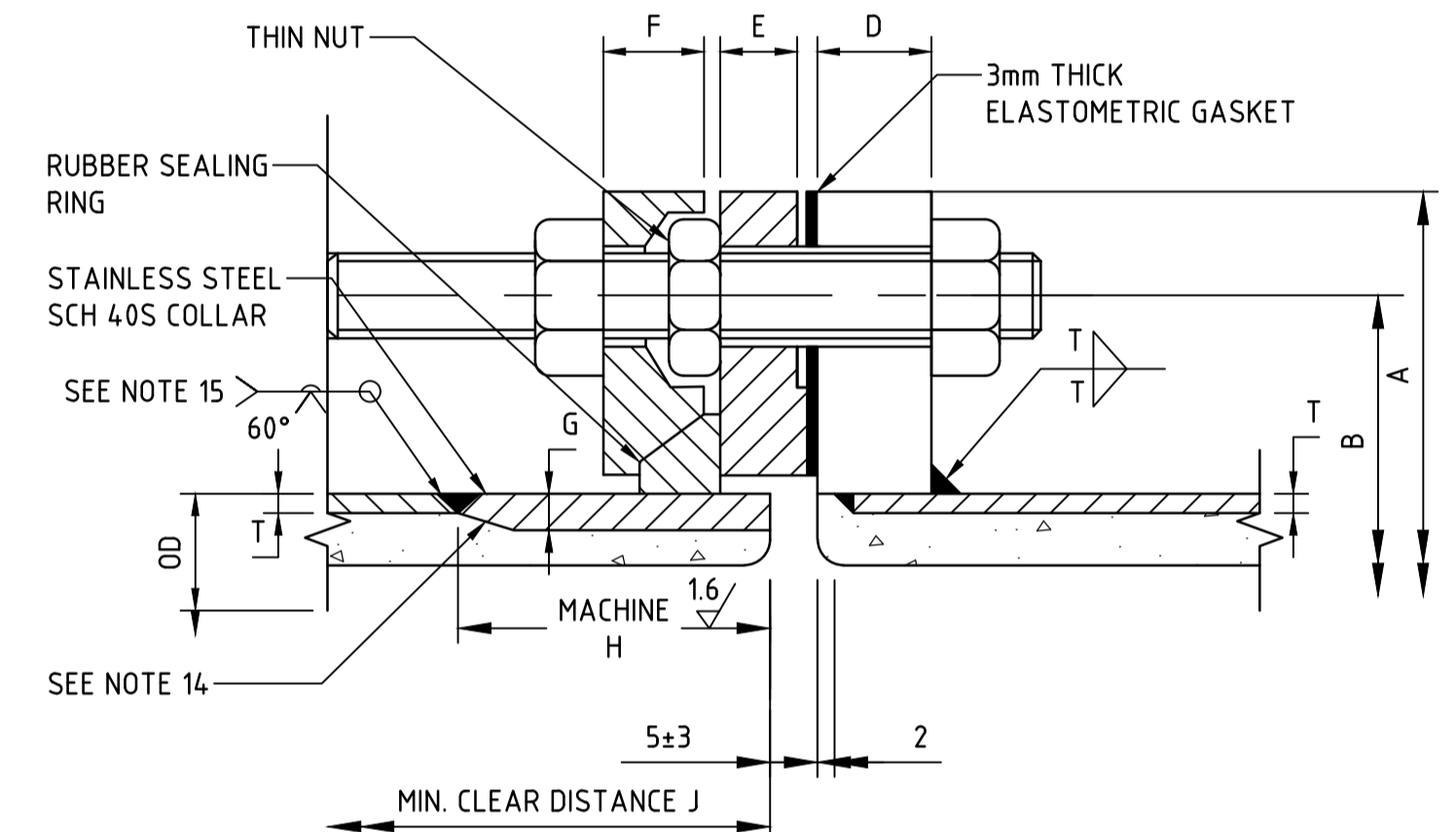
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MS GUIDE FLANGE DN300 AND ABOVE
NTS

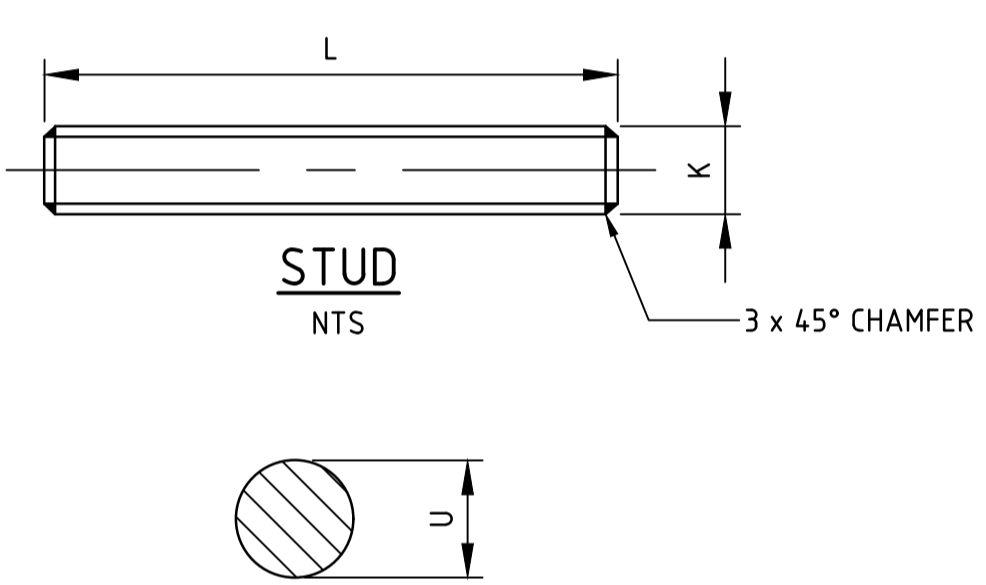
USE DRILLED HOLES WHERE SPACE PERMITS CLEAR DISTANCE J1. HOLES MAY BE SLOTTED FOR REDUCED CLEAR DISTANCE J2



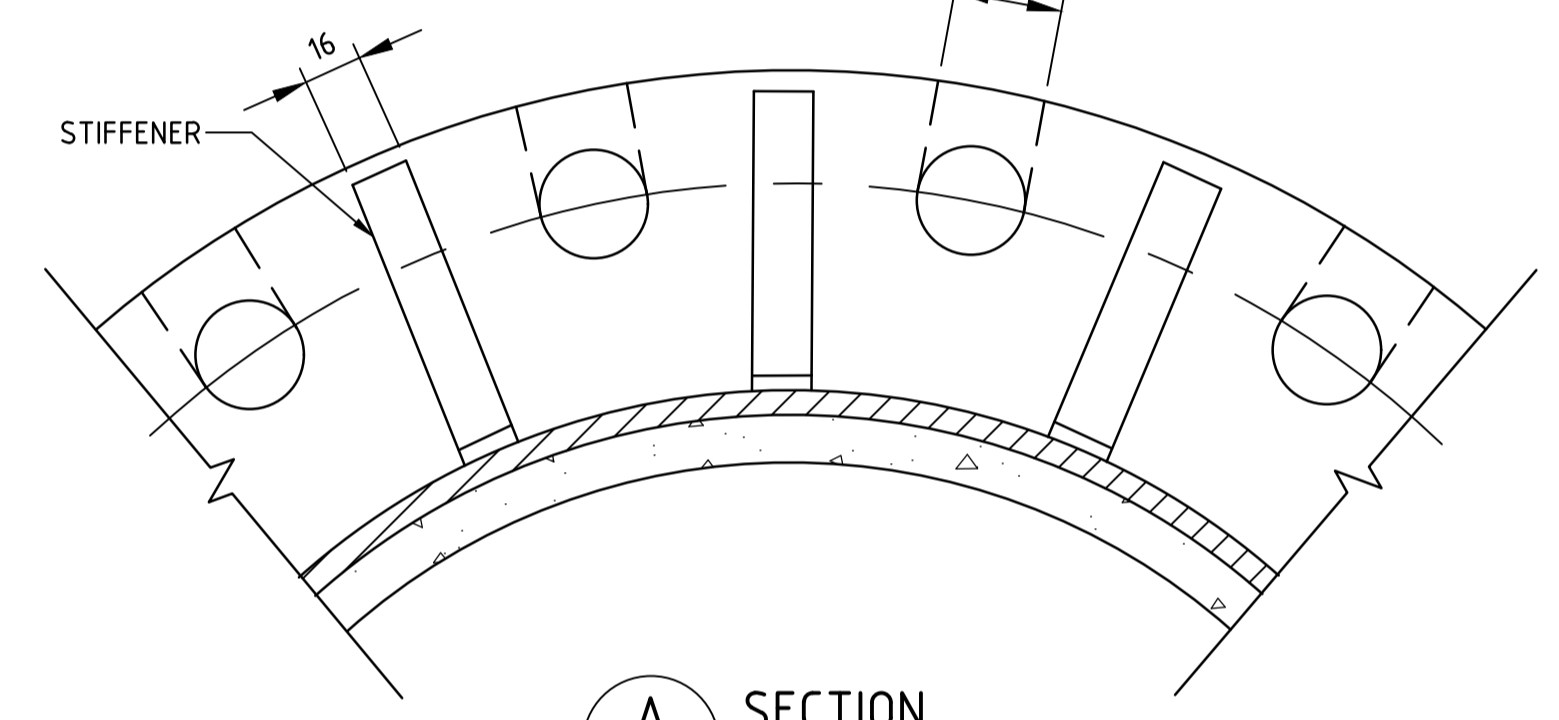
JOINT WITH TAPPED FLANGE SIZES UP TO DN250
NTS



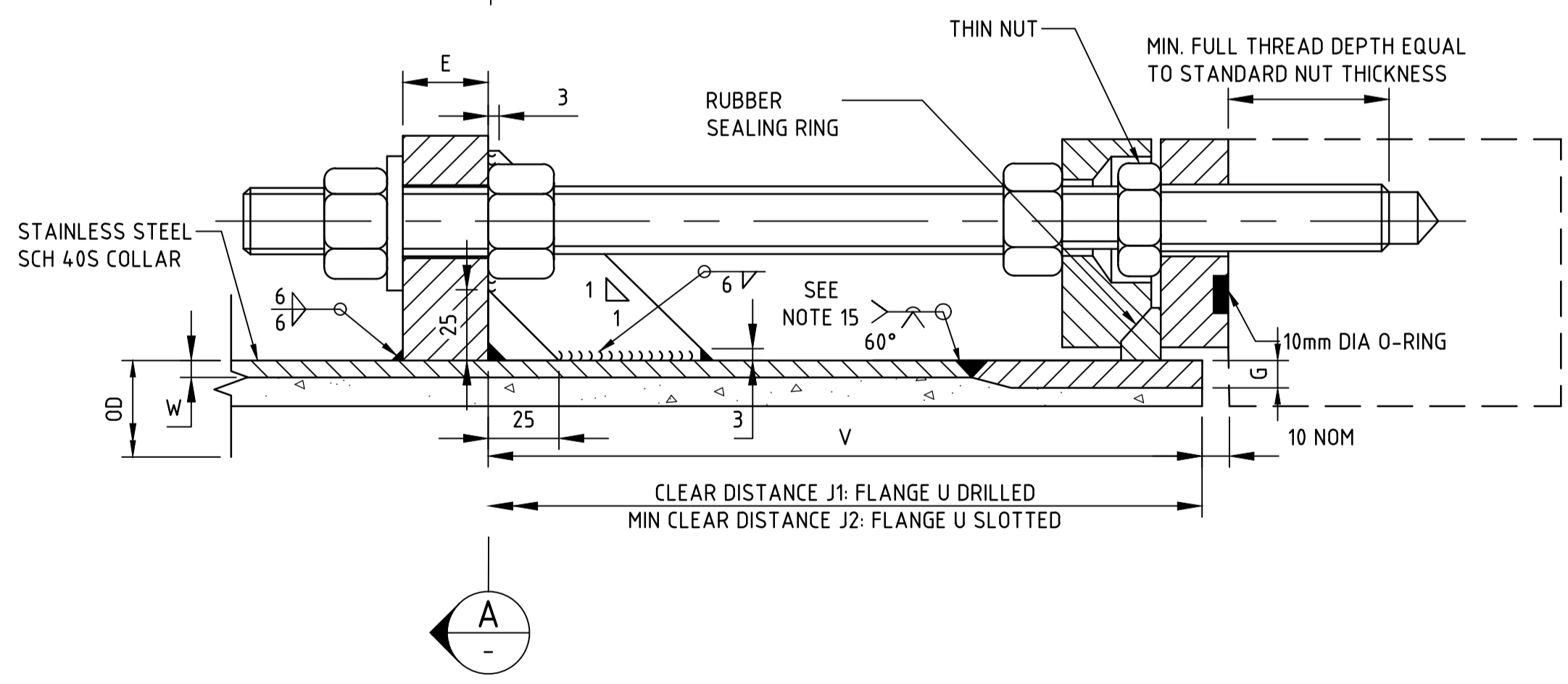
JOINT WITH DRILLED FLANGE SIZES UP TO DN250
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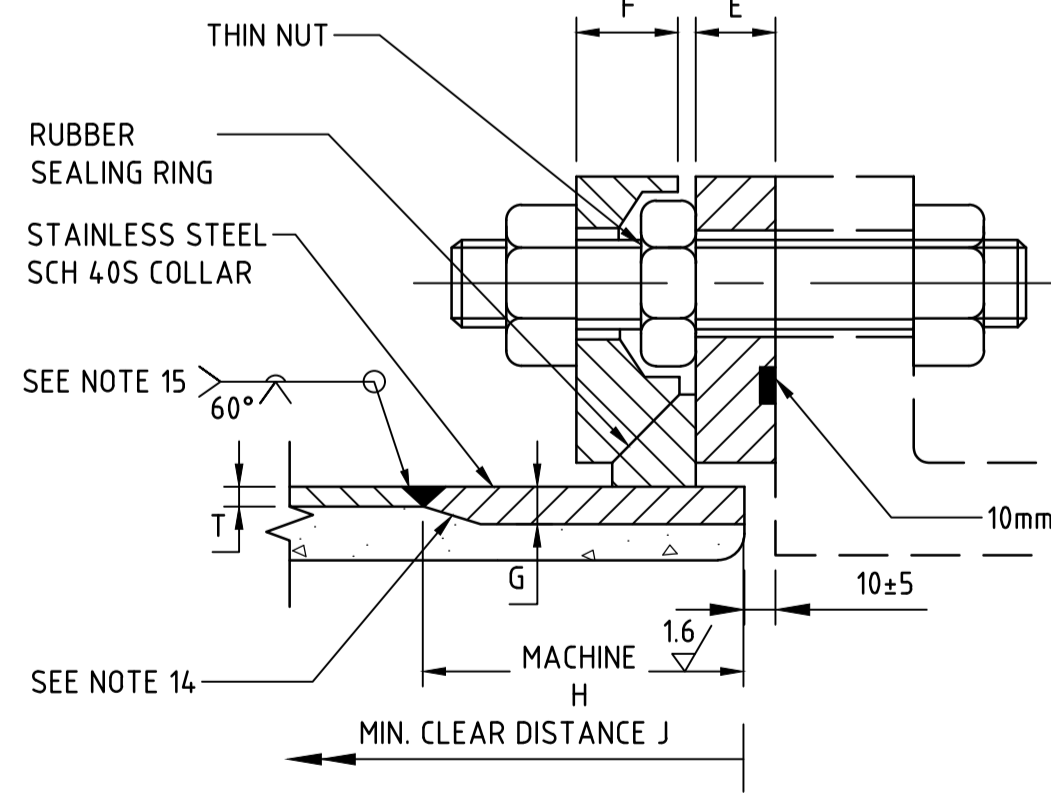
RUBBER SEALING RING
NTS



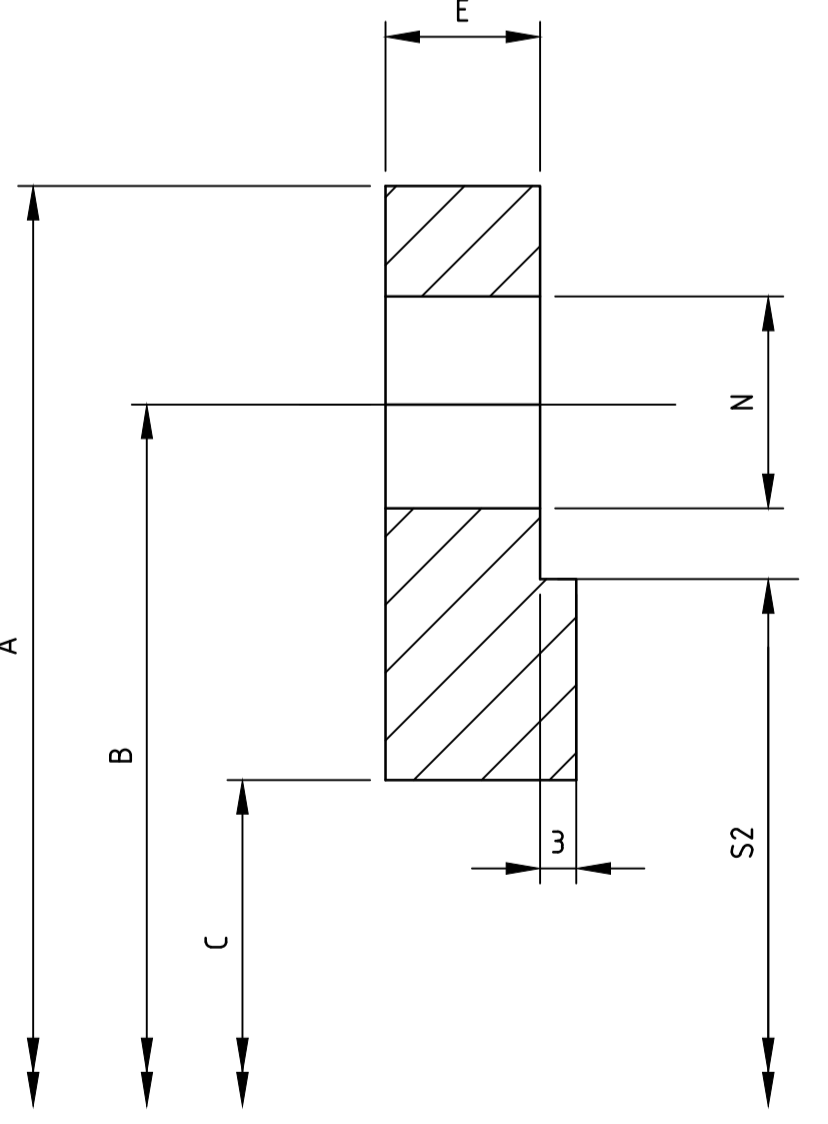
SECTION A
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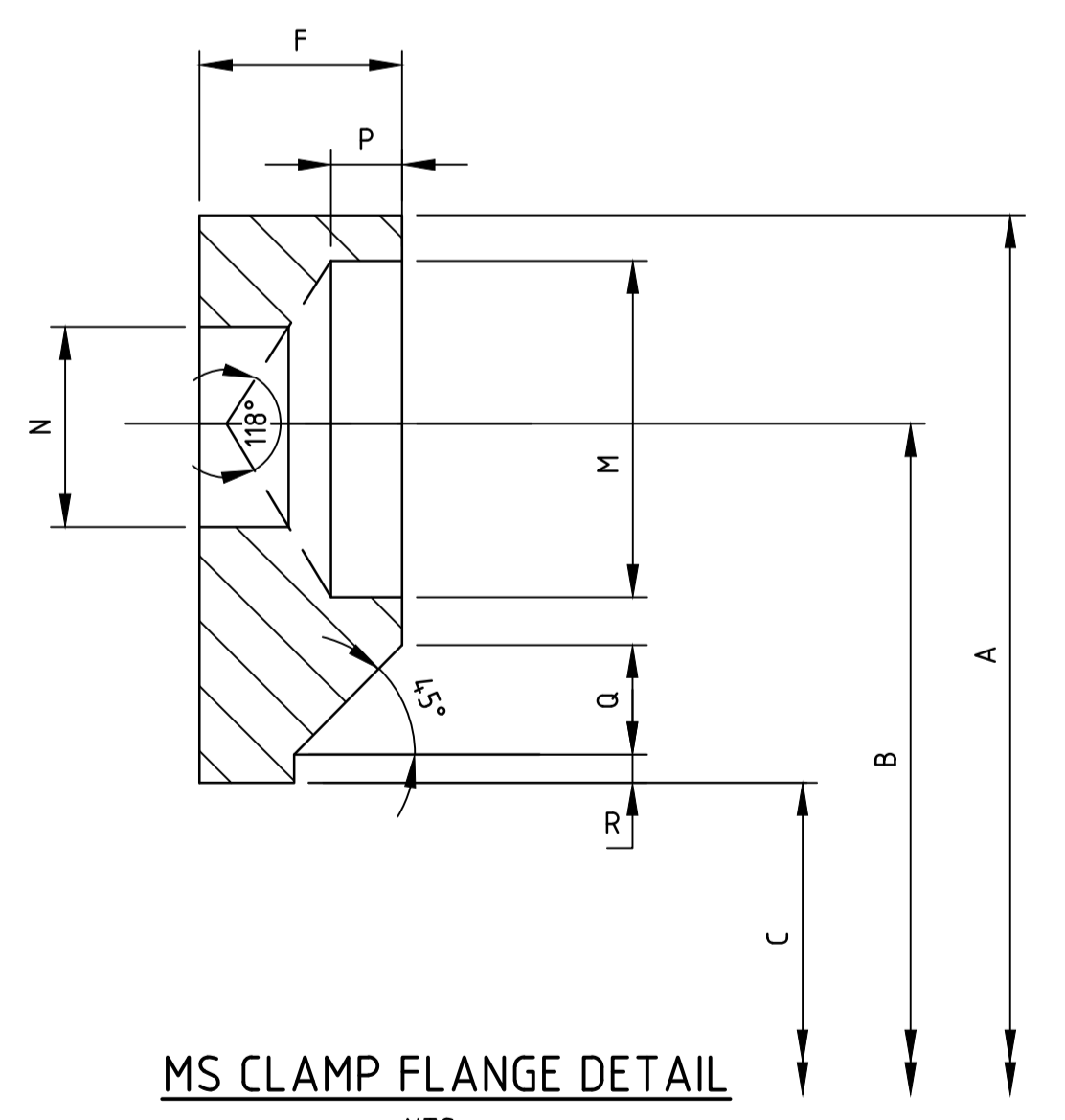
JOINT WITH TAPPED FLANGE SIZES UP TO DN300 AND ABOVE
NTS



JOINT WITH DRILLED FLANGE SIZES DN300 AND ABOVE
NTS



MS CLAMP FLANGE UP TO DN250
NTS

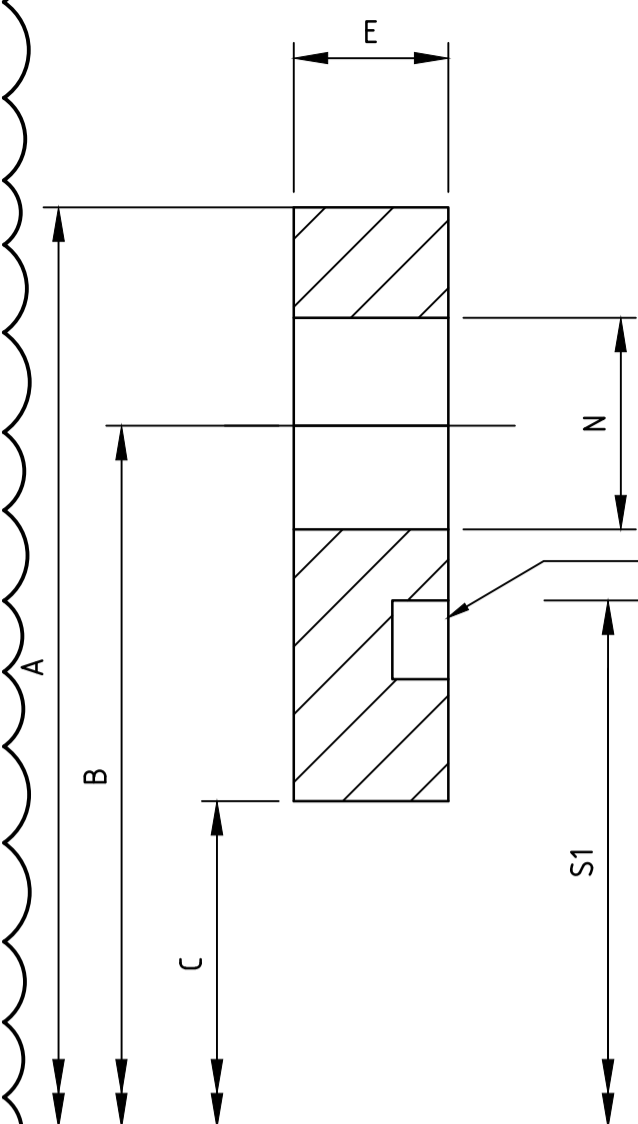


MS CLAMP FLANGE DETAIL
NTS

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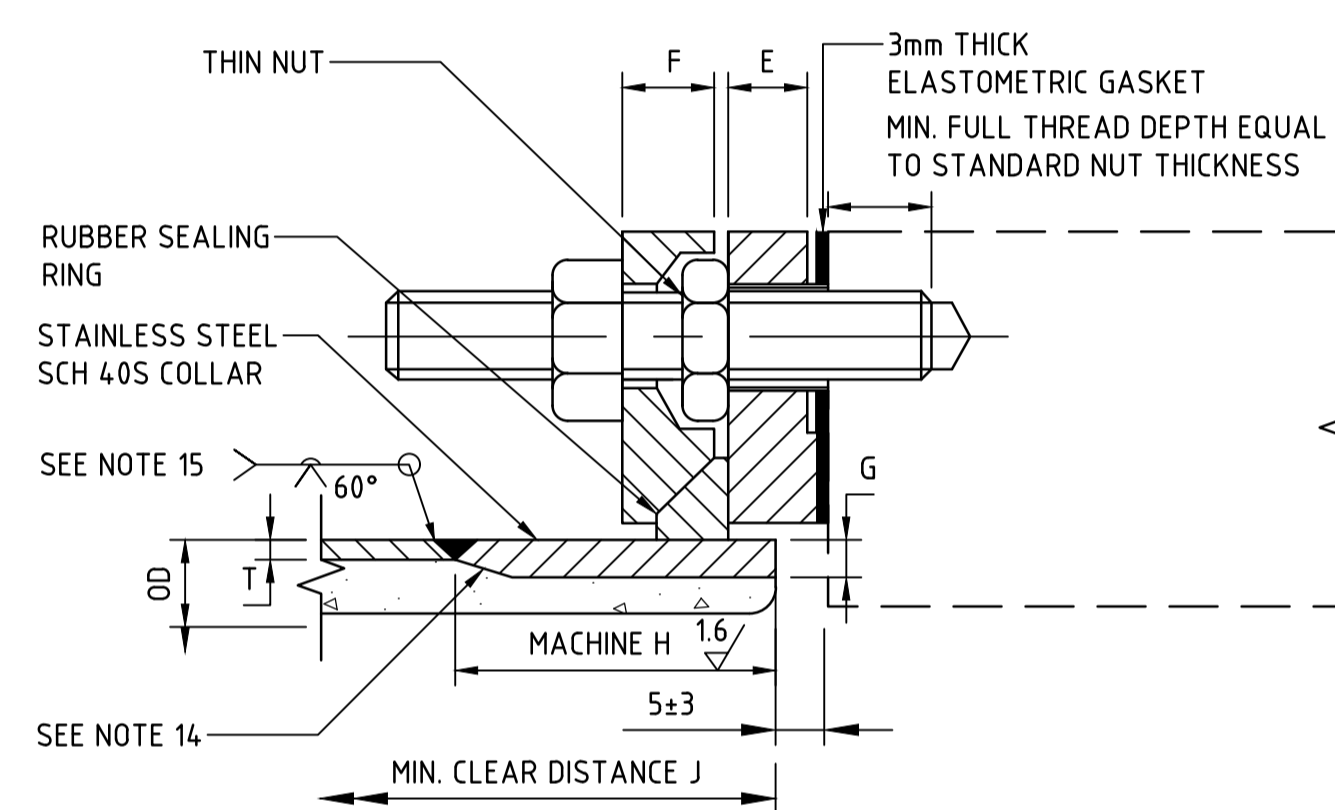
DN	O.D. (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	J1 (mm)	J2 (mm)	K	L (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	R (mm)	S1 (mm)	S2 (mm)	T (mm)	U (mm)	V (mm)	W (mm)	NO. STIFFENER	NO. BOLTS	DN
80	89	205	165	91	24	15	20	5.49	100	430	310	M16	250	31	18	10	8	2	-	141	6	10	140	6	-	8	80
100	114	230	191	116	24	19	20	6.02	100	445	325	M16	260	31	18	10	8	2	-	167	6	10	140	6	-	8	100
150	168	305	260	171	31	24	25	7.11	100	535	390	M20	315	37	22	12	8	2	-	232	6	10	170	6	-	12	150
200	219	370	324	221	31	24	25	8.18	100	570	410	M20	335	37	22	12	8	2	-	260	6	10	185	6	-	12	200
250	273	430	381	276	38	30	28	9.27	120	685	485	M24	400	44	26	14	11	3	-	311	6	13	230	6	-	12	250
300	324	490	438	327	38	30	28	16	120	720	505	M24	420	44	26	14	11	3	400	-	6	13	245	6	-	16	300
350	356	550	495	359	48	30	32	16	130	750	535	M27	445	50	30	16	11	3	455	-	6	13	250	6	-	16	350
400	406	610	552	409	48	38	32	16	140	770	550	M27	455	50	30	16	11	3	510	-	6	13	250	8	-	20	400
450	457	675	610	460	58	38	36	16	150	840	600	M30	500	55	33	18	17	3	565	-	6	19	275	8	-	20	450
500	508	735	673	511	58	48	36	16	170	895	640	M30	530	55	33	18	17	3	630	-	6	19	290	8	-	24	500
(550)	559	785	724	562	-	54	36	16	180	640	355	M30	240	55	33	18	17	3	680	-	6	19	320	10	24	24	(550)
600	610	850	781	613	68	58	40	16	200	1100	780	M33	655	60	36	20	17	3	735	-	6	19	360	10	24	24	600
700	711	935	857	715	78	58	40	16	200	1170	820	M33	695	60	36	20	17	3	810	-	7	19	390	12	24	24	700
750	762	1015	940	765	78	58	40	16	200	1170	820	M33	695	60	36	20	20	3	890	-	8	22	390	12	28	28	750
800	813	1060	984	816	84	68	40	16	220	1190	840	M33	705	60	36	20	20	3	935	-	8	22	390	16	28	28	800
900	914	1185	1105	918	94	68	45	16	230	1250	880	M36	740	65	39	22	20	3	1055	-	9	22	415	16	32	32	900
1000	1016	1275	1194	1020	98	78	45	20	250	1290	910	M36	760	65	39	22	20	3	1145	-	10	22	425	16	36	36	1000
1200	1219	1530	1441	1224	108	88	50	20	280	1425	1005	M39	840	71	42	24	20	3	1385	-	12	22	470	20	40	40	1200

(I) INDICATES NON-STANDARD FLANGES - FOR USE WITH EXISTING EWS FLANGES ONLY.

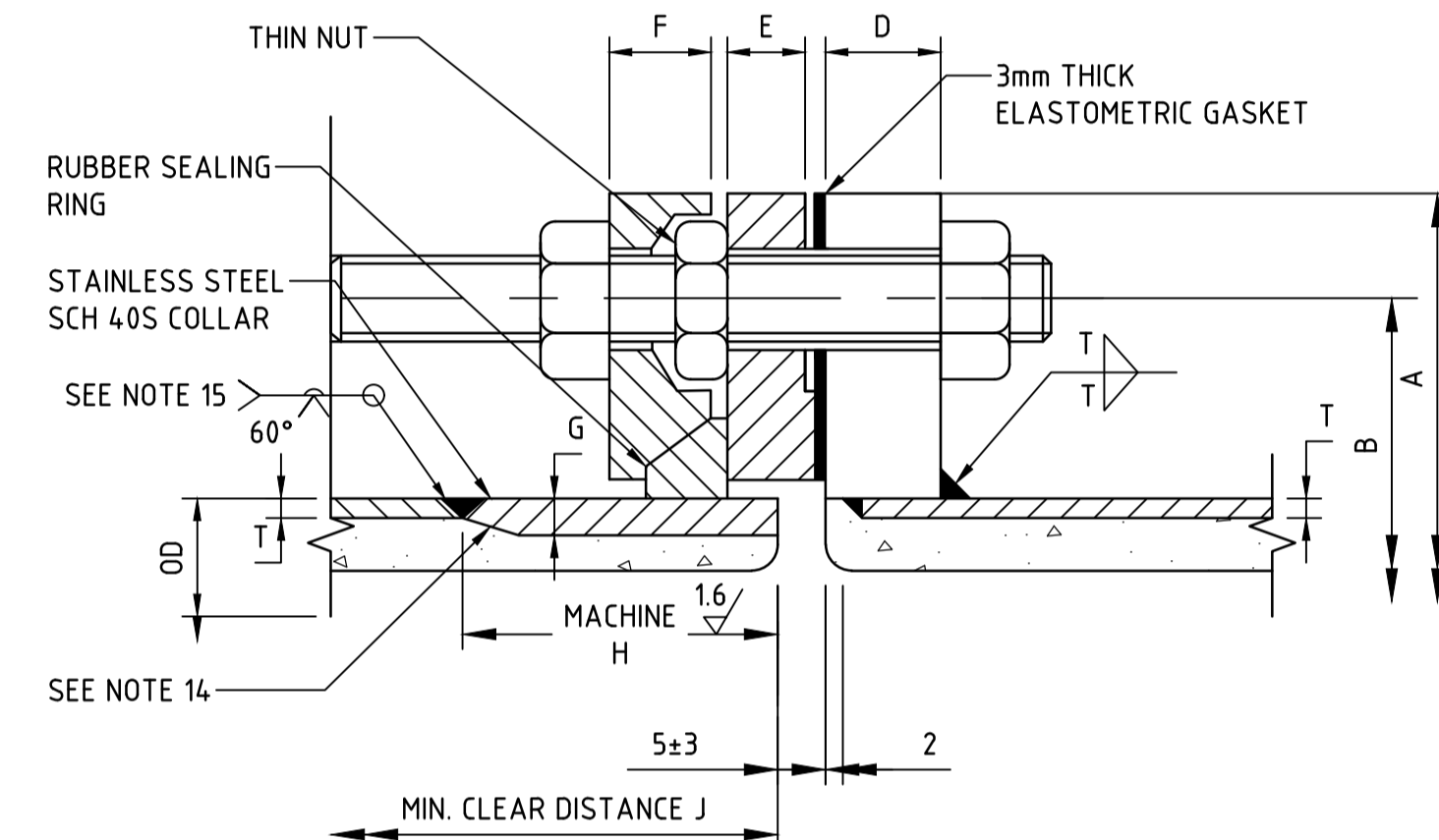


MS GUIDE FLANGE DN300 AND ABOVE
NTS

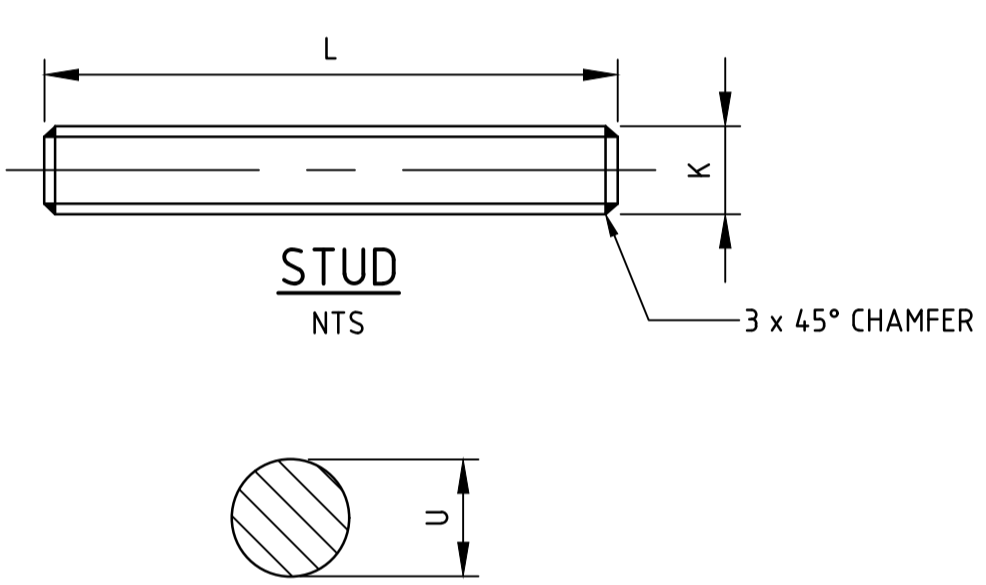
- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
 - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
 - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm
 - GRADE 250 - THICKNESSES GREATER THAN 8mm
 - FLANGES TO BE FABRICATED IN ACCORDANCE WITH AS/NZS 4087.
 - REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
 - EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
 - REFER TO DRG 4004-00001-30 AND 31 FOR FLANGE ISOLATION JOINT DETAILS WHERE DISSIMILAR METALS ARE USED.
 - ALL NUTS & BOLTS TO BE GRADE 8.8 TO AS 4291.1 AND HOT DIP GALVANIZED IN ACCORDANCE WITH AS/NZS 1214.
 - STAINLESS STEEL SPIGOT TO BE FABRICATED FROM GRADE 316 PLATE.
 - ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER INCLUDING COATINGS, GASKETS, O-RING, LUBRICANTS SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.
 - DISMANTLING JOINTS TO BE SHOP ASSEMBLED AND MATCH MARKED AT TOP CENTRE BEFORE DELIVERY.
 - REFER TO WSA 109 FOR TIGHTENING PROCEDURE AND TORQUE VALUES.
 - O-RINGS AND GASKETS TO COMPLY WITH WSA 109.
 - FOR BUTT WELDS WHERE DIFFERENCE BETWEEN ADJACENT PLATE EXISTS REFER TO APPENDIX N OF AS 4041 FOR WELDING DETAILS.
 - WELDS BETWEEN STAINLESS STEEL AND CARBON STEEL REQUIRE E309MOL ELECTRODES OR SIMILAR.



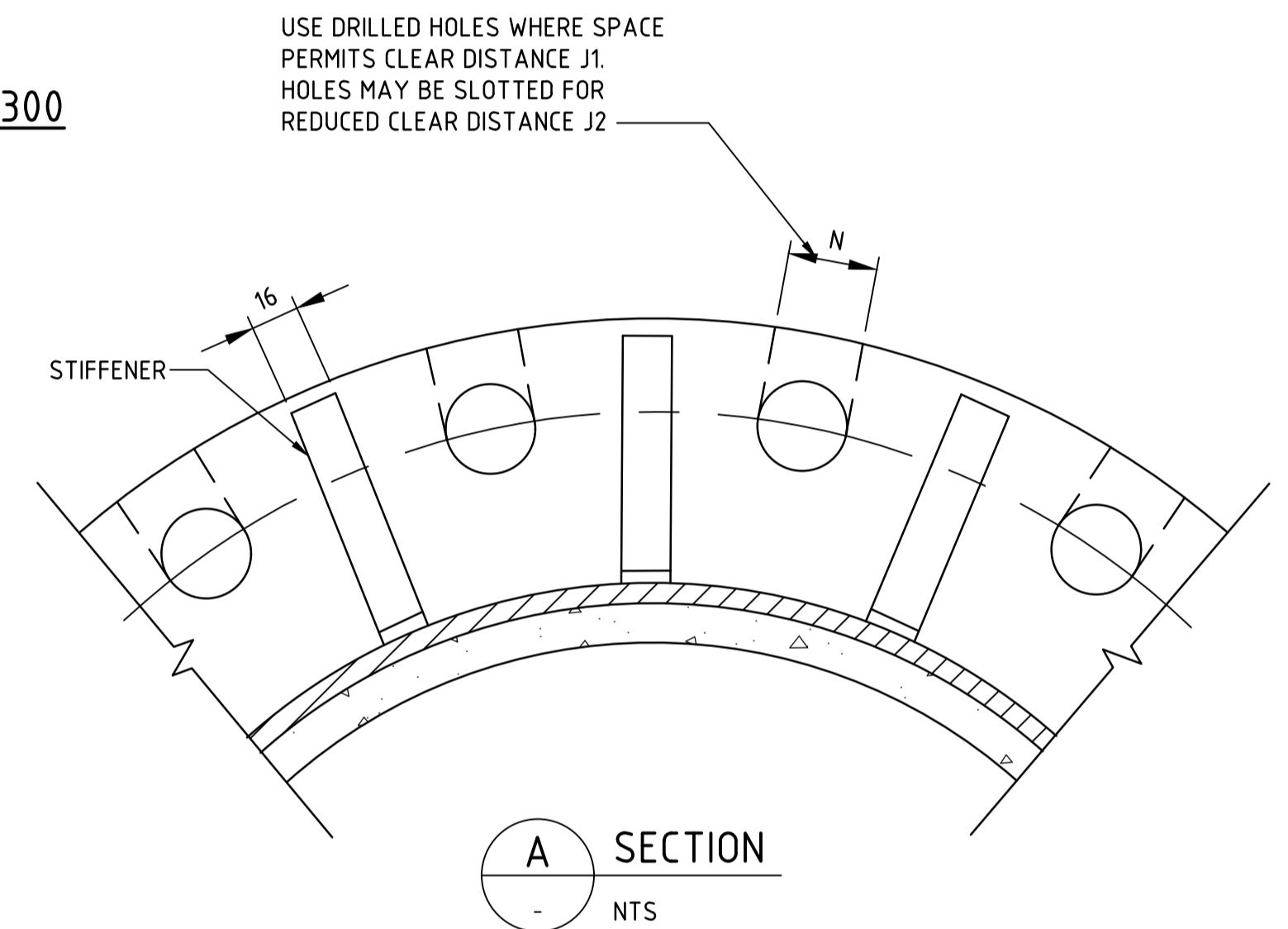
JOINT WITH TAPPED FLANGE
SIZES UP TO DN250
NTS



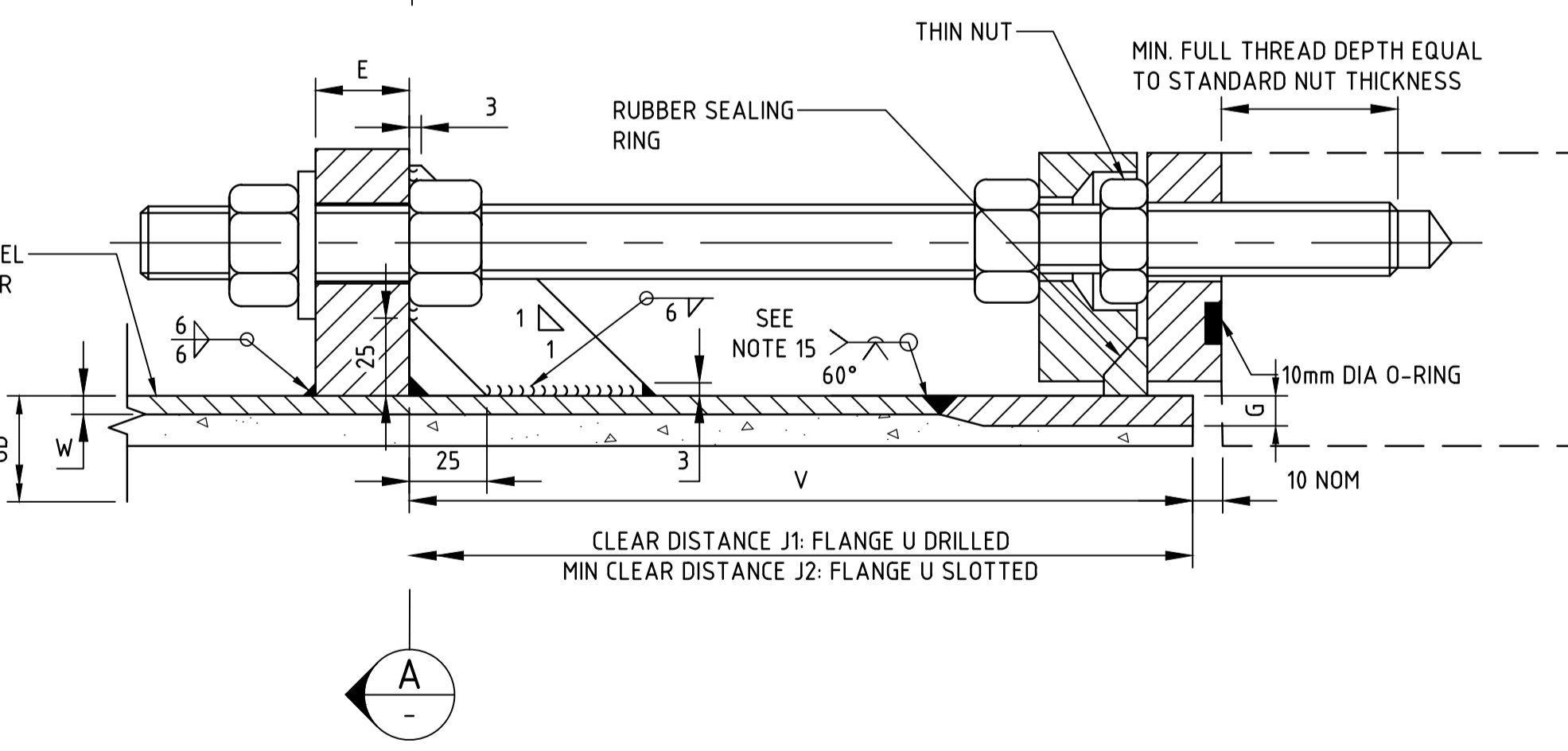
JOINT WITH DRILLED FLANGE
SIZES UP TO DN250
NTS



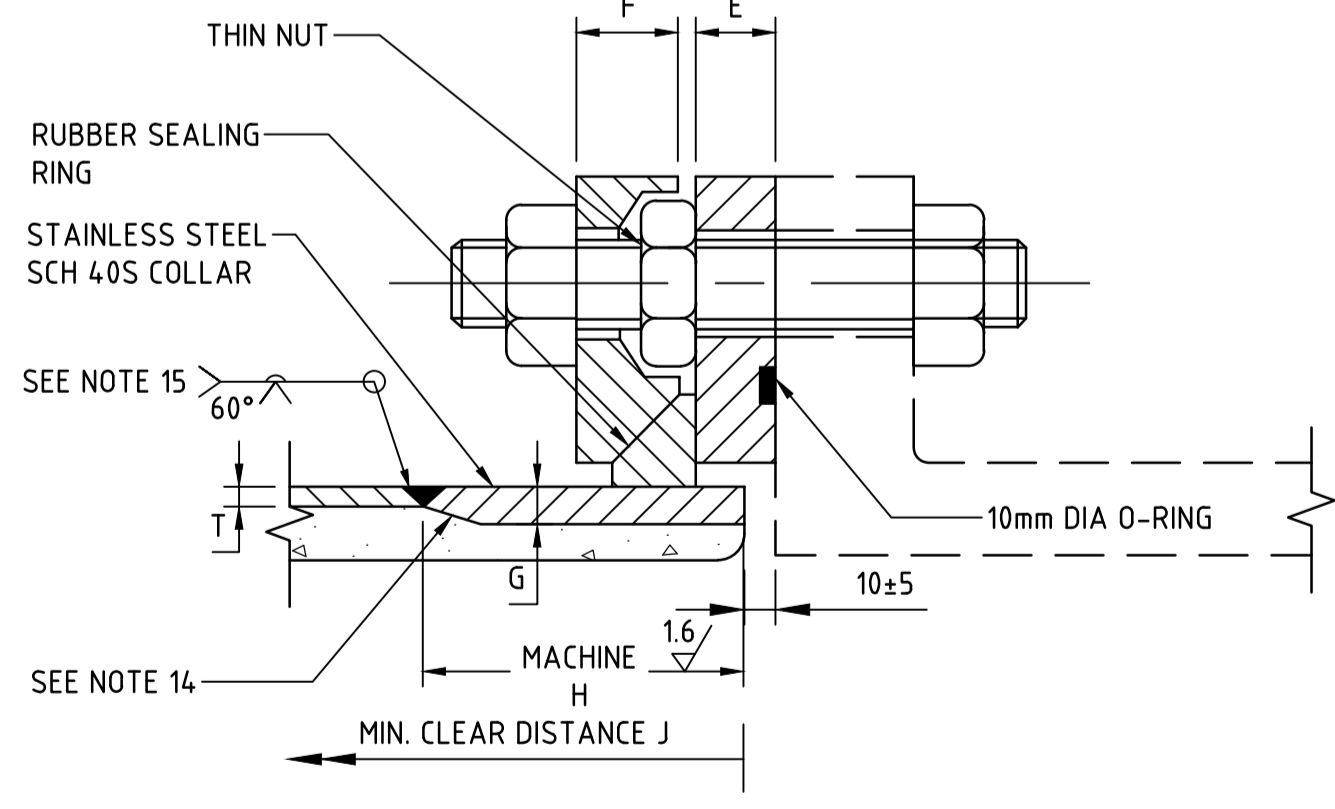
RUBBER SEALING RING
NTS



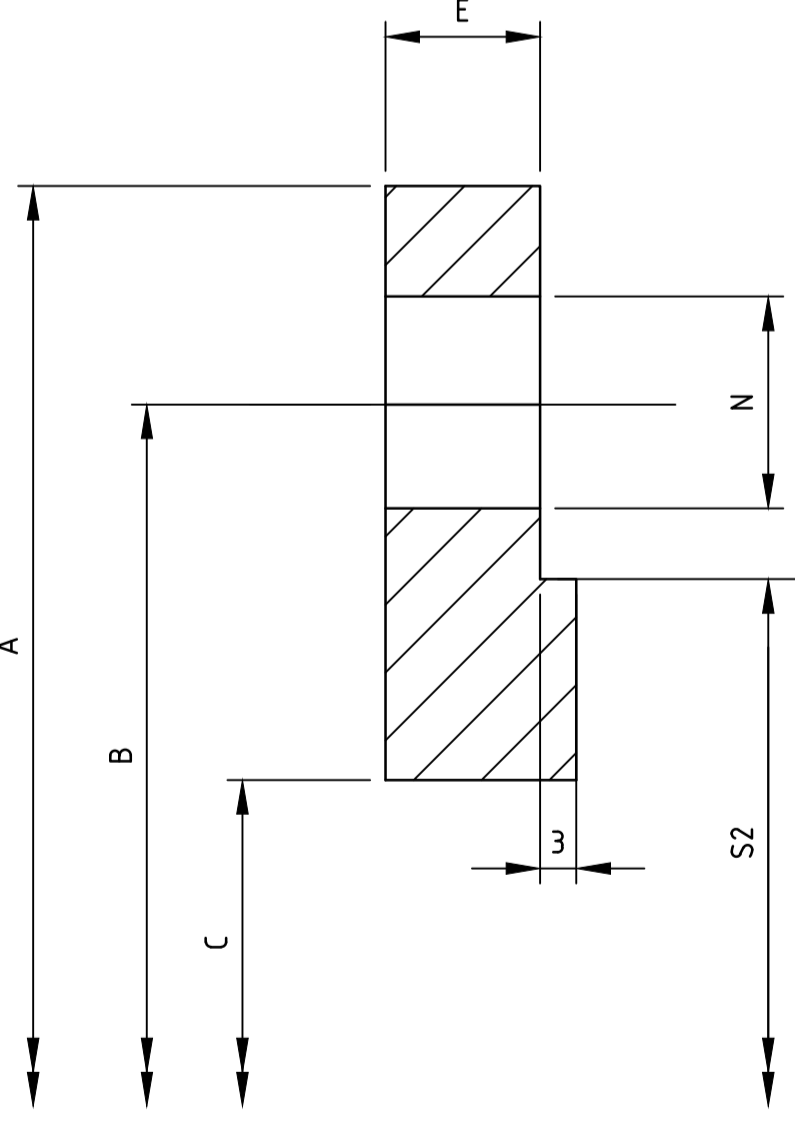
SECTION A
NTS



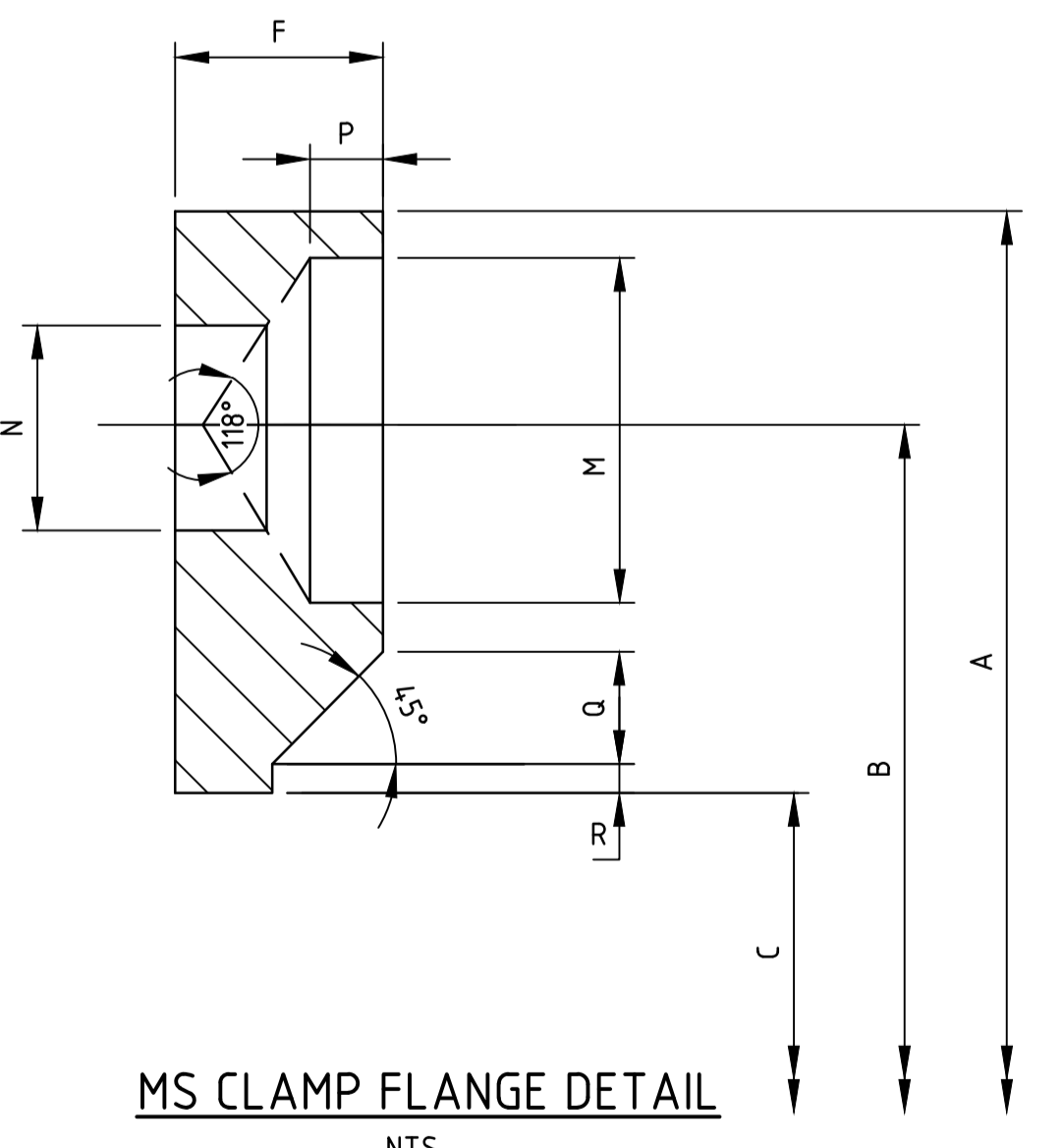
JOINT WITH TAPPED FLANGE
UP TO DN300 AND ABOVE
NTS



JOINT WITH DRILLED FLANGE
SIZES DN300 AND ABOVE
NTS



MS GUIDE FLANGE
UP TO DN250
NTS



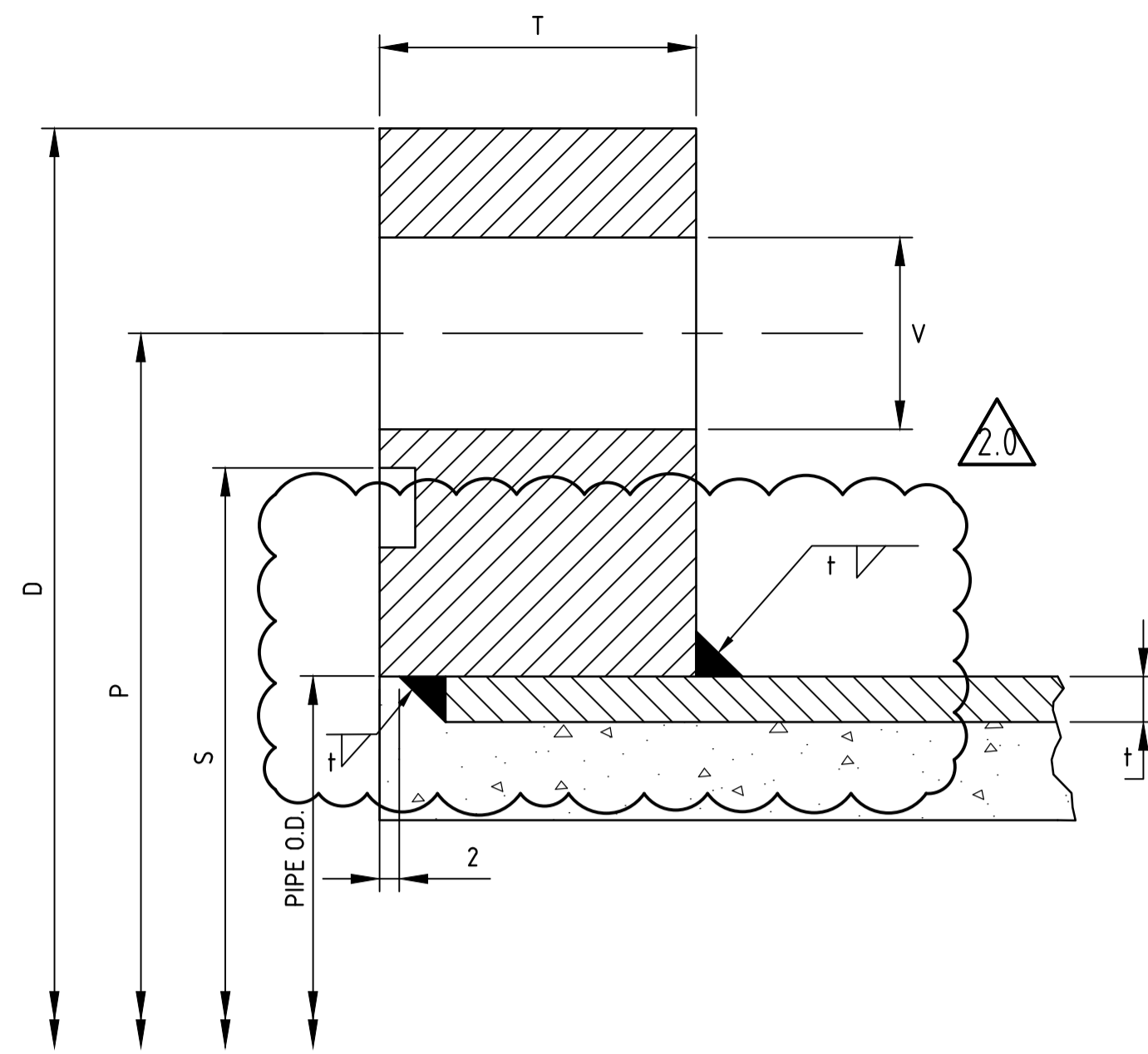
MS CLAMP FLANGE DETAIL
NTS

REVISION PANEL				DESIGN PANEL			
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	AUTHORISED
2.0	17/09/24	SS	DETAILS UPDATED. RE-ISSUED FOR USE	MW	M.WHITE	T.MZUNGU	H.HABIB
1.0	15/12/22	GB	ISSUED FOR USE	MW		G.BALDONADO	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 2.0			

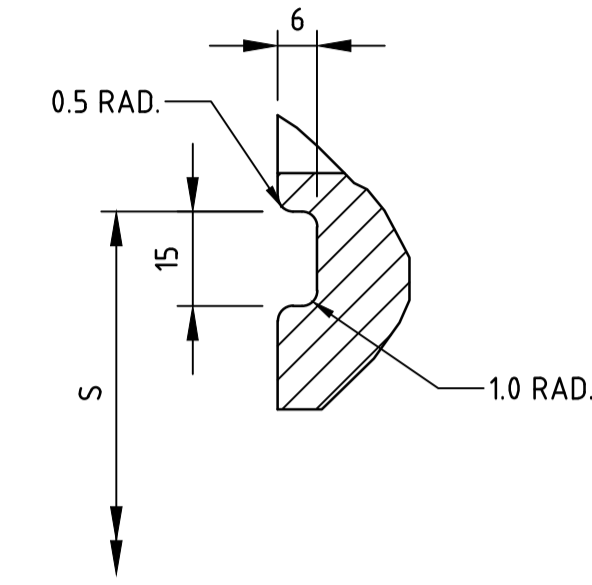
SA Water
This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.

SA WATER STANDARD DRAWING
STANDARD PN35 RESTRAINED
DISMANTLING JOINT
CIVIL

A1	TOTAL SHEETS:	2.0
SHT SIZE	PROJECT No:	
MAXIMO ID:	SUPERSEDES: 79 117C	
DRAWING NUMBER	STD-06-00007_01	



SLIP-ON O-RING FLANGE
NTS



O-RING GROOVE
DETAILS
NTS

NOTES:

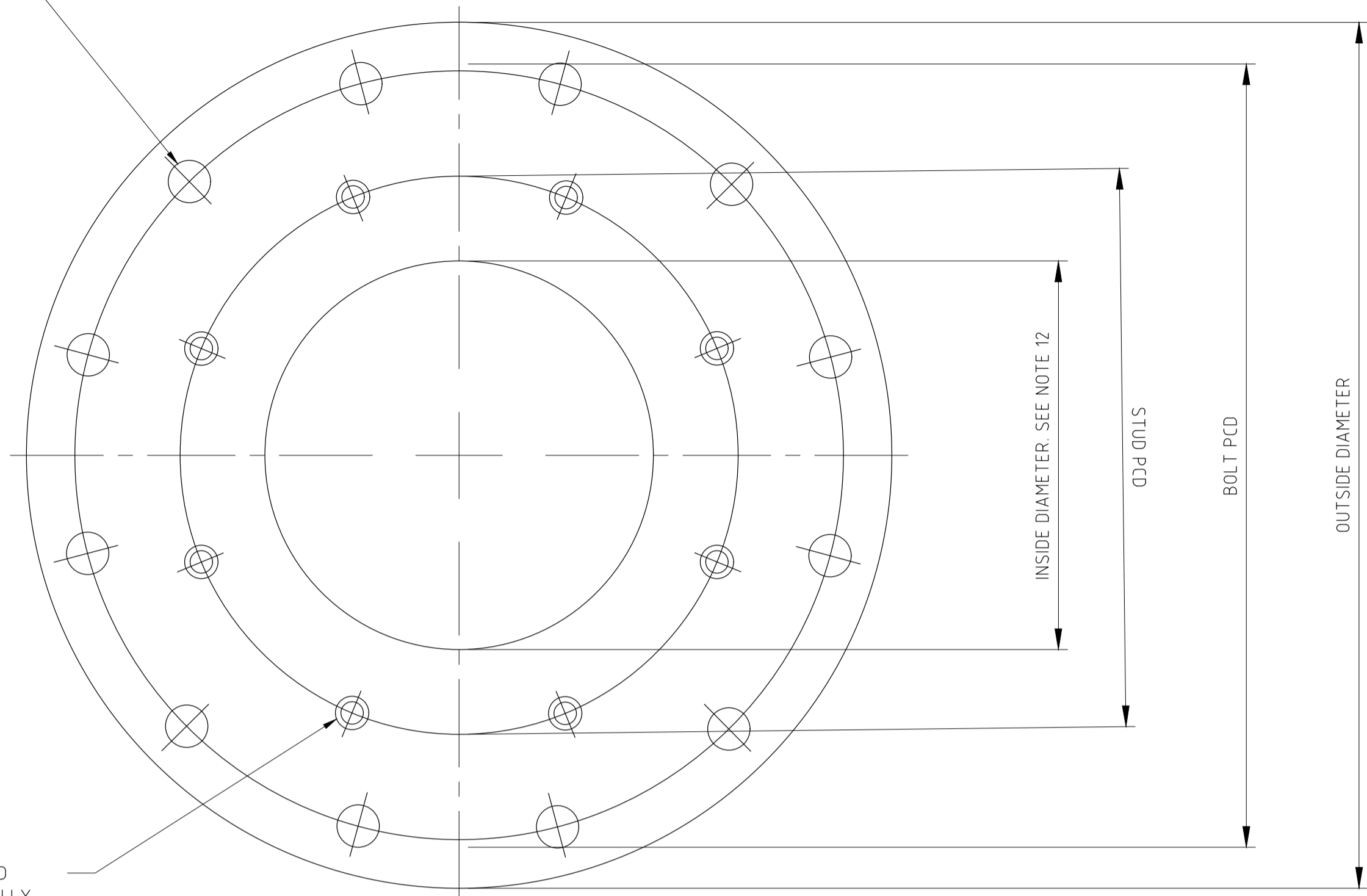
1. ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
2. ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
3. ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - a. GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - b. GRADE 250 - THICKNESSES GREATER THAN 8mm.
4. FLANGES TO BE FABRICATED IN ACCORDANCE WITH AS/NZS 4087.
5. REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
6. EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, AND TS 18 AS APPROPRIATE.
7. REFER TO DRG 4004-00001-30 AND 31 FOR FLANGE ISOLATION JOINT DETAILS WHERE DISSIMILAR METALS ARE USED.
8. ALL NUTS & BOLTS TO BE GRADE 8.8 TO AS 4291.1 AND HOT DIP GALVANIZED IN ACCORDANCE WITH AS/NZS 1214.
9. GASKETS TO COMPLY WITH WSA 109.
10. REFER TO WSA 109 FOR TIGHTENING PROCEDURE AND TORQUE VALUES.
11. ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER INCLUDING COATINGS, GASKETS, O-RING, LUBRICANTS SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.
12. WHERE FLANGE IS TO BE SITE INSTALLED ALLOW 300mm OF UNOBSTRUCTED ACCESS TO BOTH SIDES OF THE FLANGE FOR WELDING ACCESS.
13. FLANGE TO PIPE CONNECTIONS IN ACCORDANCE WITH AS 1210 FIGURE 3.21.3 (a to j) ARE ACCEPTABLE ALTERNATIVE CONNECTION DETAILS.

DN	PIPE O.D. (mm)	PRESSURE RATING (PN)	FLANGE O.D. D (mm)	O-RING GROOVE O.D. S (mm)	P.C.D. P (mm)	NUMBER OF HOLES N	DIAMETER OF HOLES V (mm)	FASTENER SIZE AND THREAD	FLANGE THICKNESS
									T (mm)
300	324	16	455	370	406	12	22	M20	23
		21	490	400	438	16	26	M24	30
		35	490	400	438	16	26	M24	38
350	356	16	525	430	470	12	26	M24	30
		21	550	455	495	16	30	M27	30
		35	550	455	495	16	30	M27	48
400	406	16	580	485	521	12	26	M24	30
		21	610	510	552	20	30	M27	38
		35	610	510	552	20	30	M27	48
450	457	16	640	545	584	12	26	M24	30
		21	675	565	610	20	33	M30	38
		35	675	565	610	20	33	M30	58
500	508	16	705	605	641	16	26	M24	38
		21	735	630	673	24	33	M30	48
		35	735	630	673	24	33	M30	58
600	610	16	825	715	756	16	30	M27	48
		21	850	735	781	24	36	M33	58
		35	850	735	850	24	36	M33	68
700	711	16	910	800	845	20	30	M27	56
		21	935	810	857	24	36	M33	58
		35	935	810	935	24	36	M33	78
750	762	16	995	880	927	20	33	M30	56
		21	1015	890	940	28	36	M33	58
		35	1015	890	1015	28	36	M33	78
800	813	16	1060	935	984	20	36	M33	56
		21	1060	935	984	28	36	M33	68
		35	1060	935	1060	28	36	M33	84
900	914	16	1175	1045	1092	24	36	M33	66
		21	1185	1055	1105	32	39	M36	68
		35	1185	1055	1185	32	39	M36	94
1000	1016	16	1255	1125	1175	24	36	M33	66
		21	1275	1145	1194	36	39	M36	78
		35	1275	1145	1275	36	39	M36	98
1200	1219	16	1490	1360	1410	32	36	M33	76
		21	1530	1385	1441	40	42	M39	88
		35	1530	1385	1530	40	42	M39	108

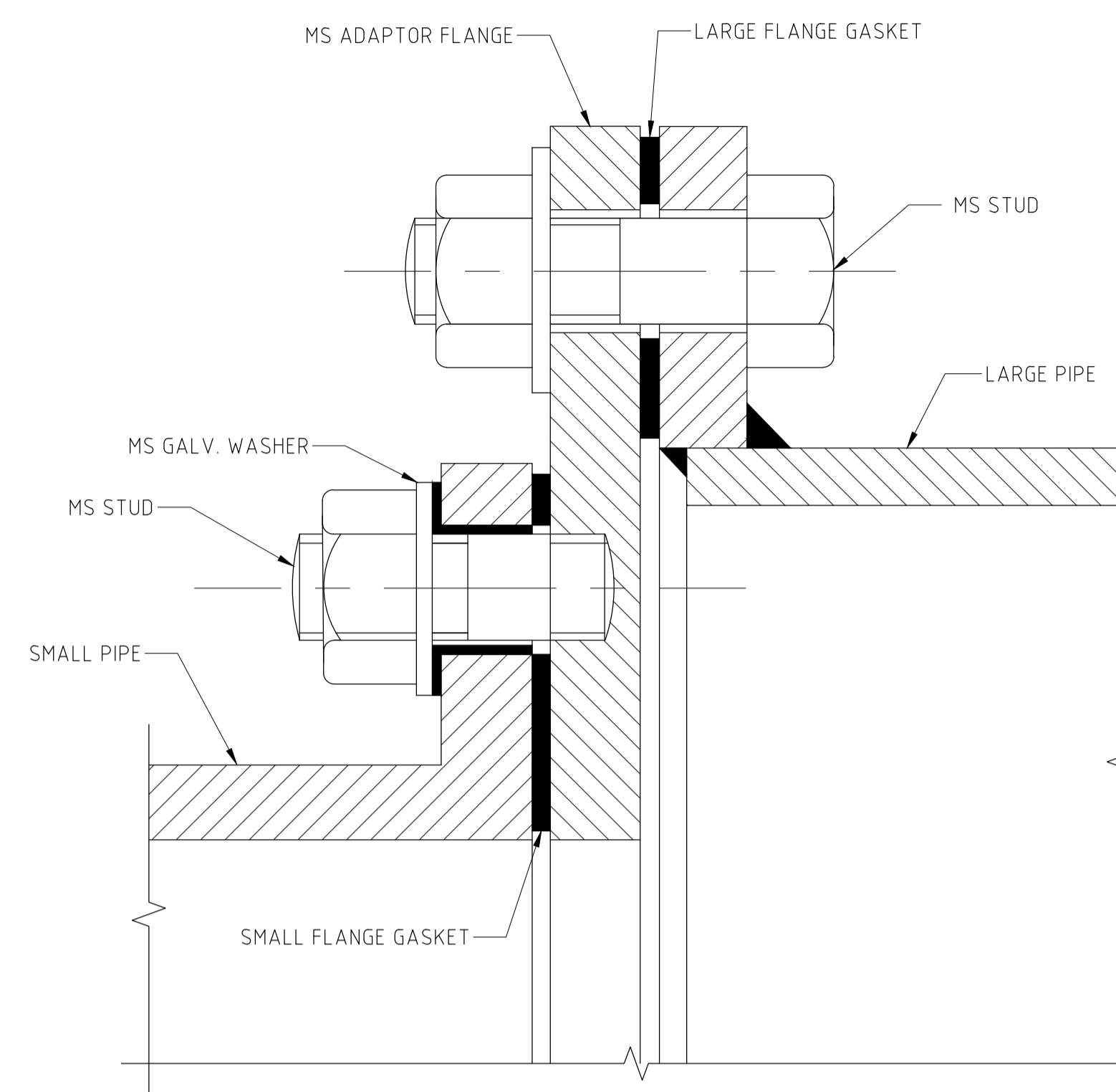
REVISION PANEL DETAILS				DESIGN PANEL AUTHORIZED						SA WATER STANDARD DRAWING STANDARD O-RING FLANGE DETAILS PN16, PN21, & PN35 CIVIL		TOTAL SHEETS: 2.0 PROJECT No: SUPERSEDES: DRAWING NUMBER STD-06-00008_01	
REV	DATE	DRN	APR'D	CURRENT REV AUTHORIZED	DESIGNED	AUTHORIZED	This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.						
				M.WHITE	T.MZUNGU	H.HABIB							
				SIGNATURE	G. BALDONADO	SIGNATURE							
2.0	17/09/24	SS			17/09/24	17/09/24							
1.0	15/12/22	GB			17/09/24								
CURRENT REV CONTRACTOR: GHD			CURRENT REV PROJECT: 2.0			CONTRACTOR:							

BOLT HOLES TO BE DRILLED OFF CENTER. HOLE SIZE EQUALS BOLT SIZE PLUS 2mm. SEE FLANGE TABLE FOR BOLT SIZE AND NUMBER REQUIRED.

STUD HOLES TO BE DRILLED AND TAPPED OFF CENTER AND EQUALLY SPACED. SEE FLANGE TABLE FOR SIZES AND NUMBER REQUIRED.



MS ADAPTER FLANGE
NTS



ADAPTER FLANGE ASSEMBLY
NTS

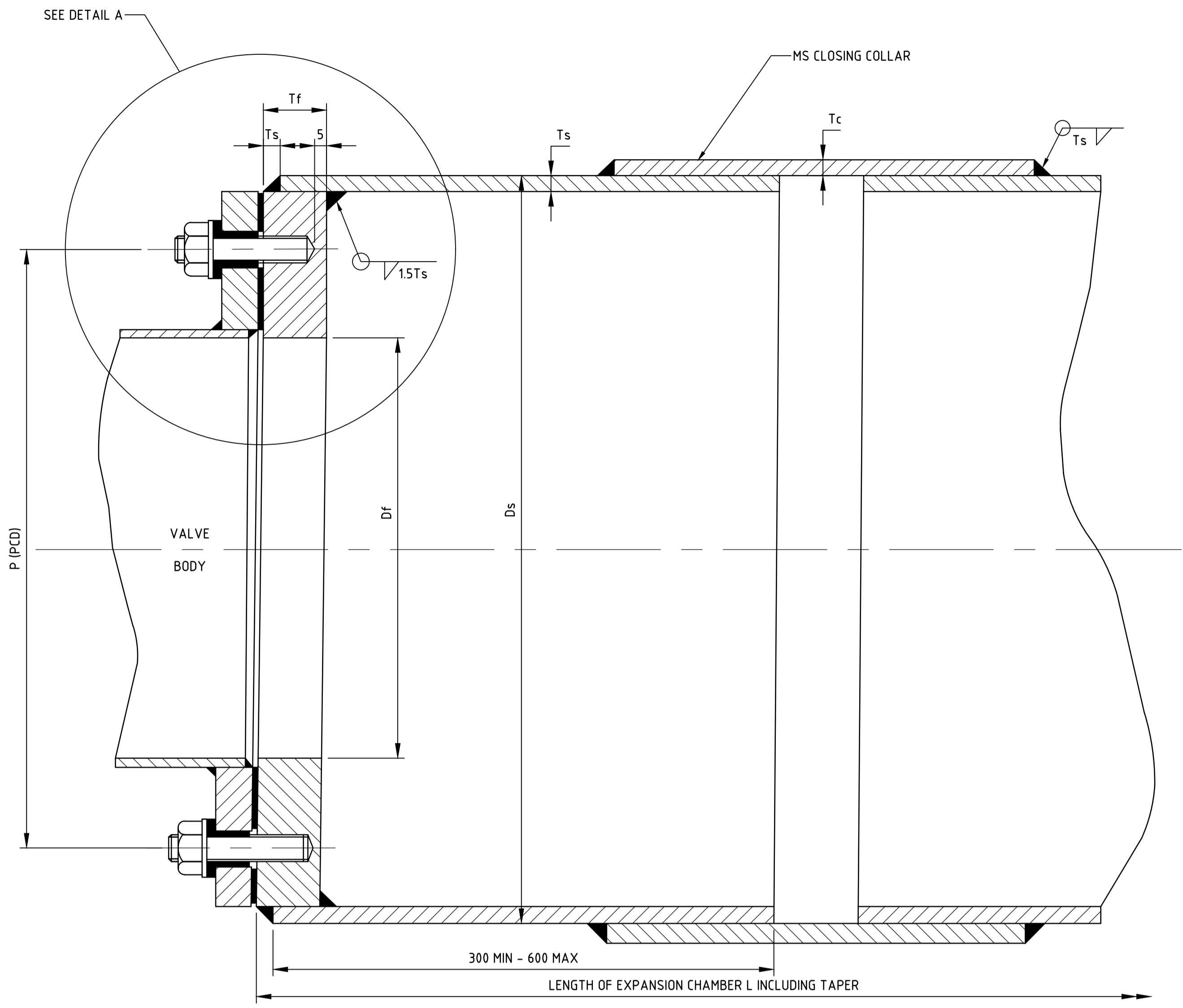
NOTES:

- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
- ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
- ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - GRADE 250 - THICKNESSES GREATER THAN 8mm.
- FLANGE FABRICATION TOLERANCES TO BE TO THE REQUIREMENTS OF AS/NZS 4087.
- REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
- EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, AND TS 18 AS APPROPRIATE.
- REFER TO DRG 4004-00001-30 AND 31 FOR FLANGE ISOLATION JOINT DETAILS WHERE DISSIMILAR METALS ARE USED.
- ALL NUTS & BOLTS TO BE GRADE 8.8 TO AS 4291.1 AND HOT DIP GALVANIZED IN ACCORDANCE WITH AS/NZS 1214.
- GASKETS TO COMPLY WITH WSA 109.
- REFER TO WSA 109 FOR TIGHTENING PROCEDURE AND TORQUE VALUES.
- FLANGE INSIDE DIAMETER TO MATCH ID OF SMALL PIPE.
- ALL MATERIALS THAT MAY BE IN CONTACT WITH WATER INCLUDING COATINGS, GASKETS, LUBRICANTS SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.

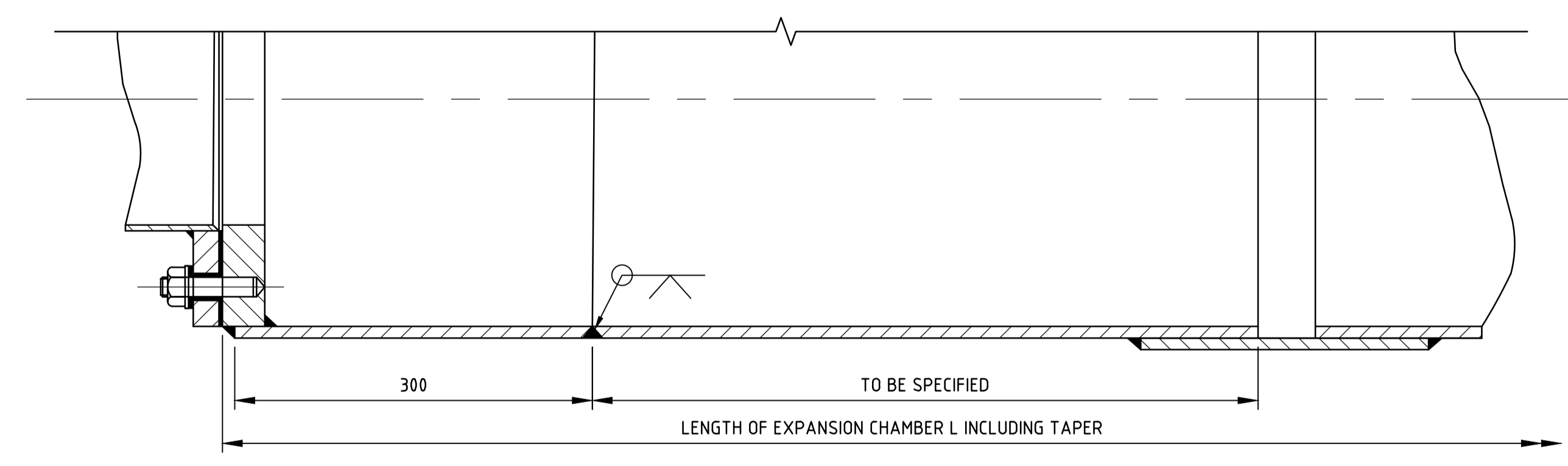
PN16													
FLANGE SIZE		FLANGE OD	BOLT PCD	STUD PCD	FLANGE THICKNESS	BOLT SIZE	NO BOLTS	STUD SIZE	NO OF STUDS	STUD LENGTH	THREADED DEPTH	SMALL FLANGE GASKET	LARGE FLANGE GASKET
SMALL	LARGE	(mm)	(mm)	(mm)	(mm)					(mm)	(mm)		
DN80	DN150	280	235	146	28	M16	8	M16	4	70	24	3mm ELASTOMERIC	
DN100	DN200	335	292	178	28	M16	8	M16	4	70	24		
DN200	DN300	455	406	292	28	M20	12	M16	8	75	24		
DN200	DN400	580	521	292	28	M24	12	M16	8	75	24	3mm ELAS.	3mm ELAS. NARROW FACE

PN21													
FLANGE SIZE		FLANGE OD	BOLT PCD	STUD PCD	FLANGE THICKNESS	BOLT SIZE	NO BOLTS	STUD SIZE	NO OF STUDS	STUD LENGTH	THREADED DEPTH	SMALL FLANGE GASKET	LARGE FLANGE GASKET
SMALL	LARGE	(mm)	(mm)	(mm)	(mm)					(mm)	(mm)		
DN80	DN150	305	260	165	28	M20	12	M16	8	75	24	15 mm COMPRESSED FIBRE NARROW FACE	
DN100	DN200	370	324	191	28	M20	12	M16	8	75	24		
DN200	DN300	490	438	324	36	M24	16	M20	12	90	30		
DN200	DN400	610	552	324	36	M27	20	M20	12	90	30		

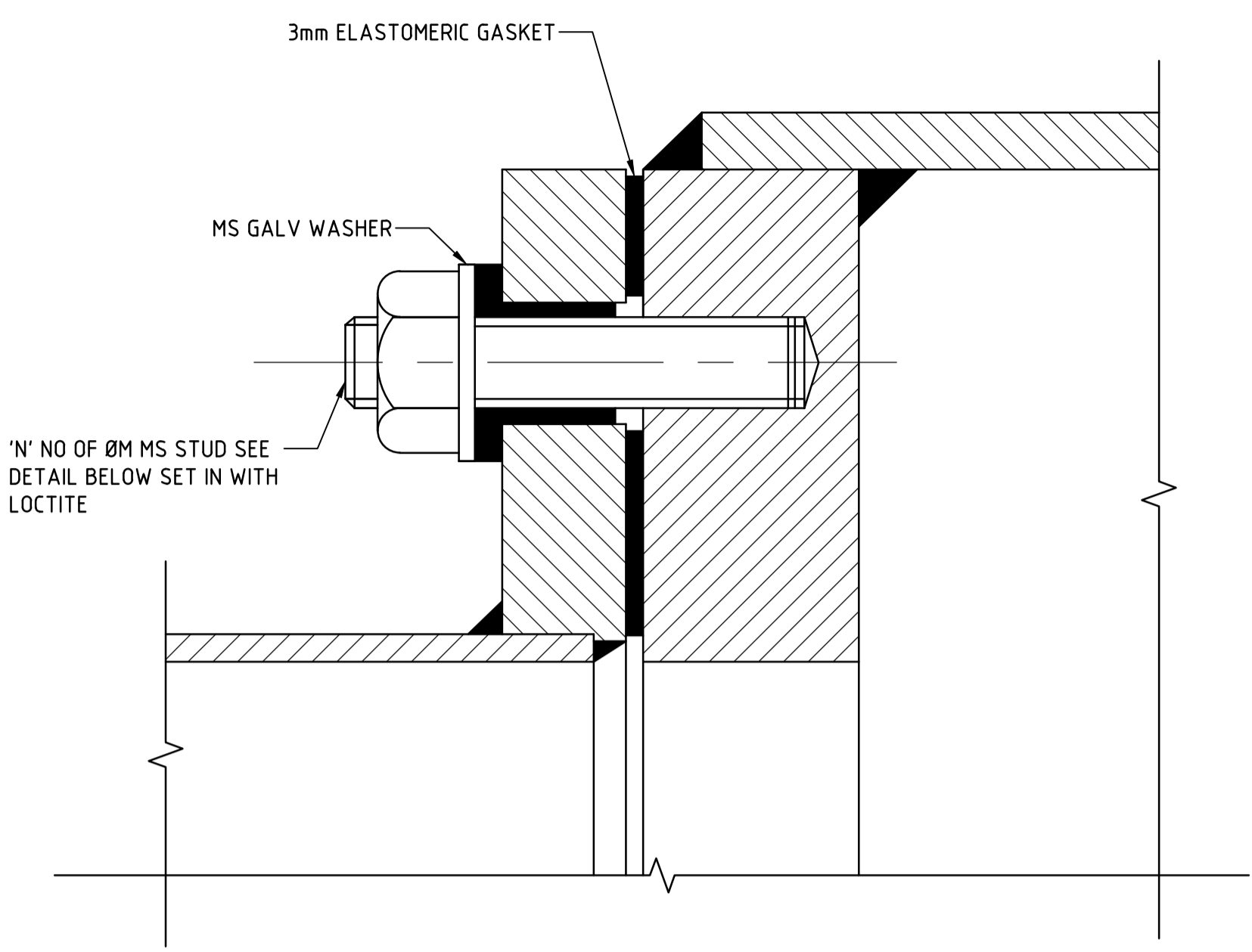
REVISION PANEL				DESIGN PANEL				 SA WATER STANDARD DRAWING STANDARD MS ADAPTOR FLANGES PN16 AND PN21 CIVIL		A1 TOTAL SHEETS: 1.0 PROJECT No: _____ MAXIMO ID: _____ SUPERSEDES: _____ DRAWING NUMBER: STD-06-00009_01	
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	AUTHORIZED			 This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.	
1.0	15/12/22	GB	ISSUED FOR USE	MW	M.WHITE	T.MZUNGU	H.HABIB				
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0							



EXPANSION CHAMBER ASSEMBLY DETAILS
NTS
(FOR USE WHERE CLOSING COLLAR CAN BE FITTED WITHIN 600mm OF THE VALVE)



ALTERNATIVE EXPANSION CHAMBER ASSEMBLY DETAILS
NTS
(FOR USE WHERE CLOSING COLLAR CAN BE FITTED WITHIN 600mm OF THE VALVE)

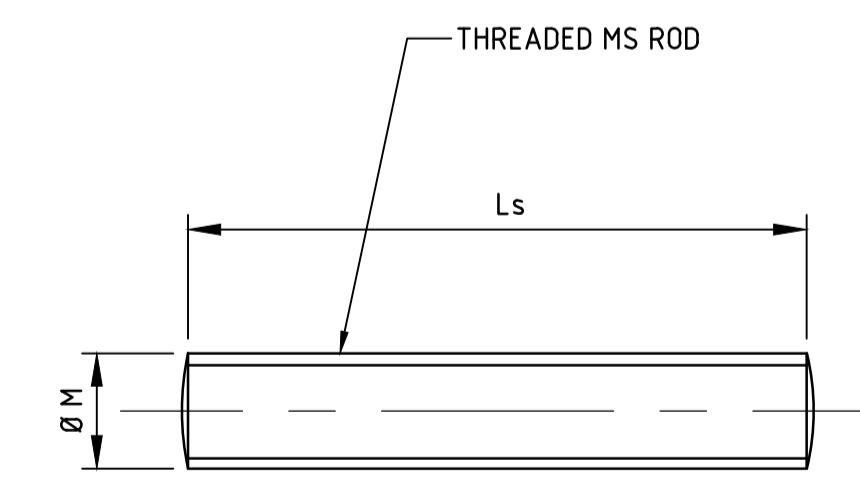


DETAIL A
NTS

- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
 - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
 - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - GRADE 250 - THICKNESSES GREATER THAN 8mm.
 - FLANGE FABRICATION TOLERANCES TO BE TO THE REQUIREMENTS OF AS/NZS 4087.
 - REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
 - EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
 - REFER TO DRG 4004-00001-30 AND 31 FOR FLANGE ISOLATION JOINT DETAILS WHERE DISSIMILAR METALS ARE USED.
 - ALL NUTS & BOLTS TO BE GRADE 8.8 TO AS 4291.1 AND HOT DIP GALVANIZED IN ACCORDANCE WITH AS/NZS 1214.
 - REFER TO DRG STD-06-00012_01 FOR DETAILS OF CLOSING COLLAR.
 - FLANGE GASKETS LARGER THAN DN300 TO BE NARROW FACE GASKETS.
 - GASKETS TO COMPLY WITH WSA 109.
 - REFER TO WSA 109 FOR TIGHTENING PROCEDURE AND TORQUE VALUES.
 - ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER INCLUDING COATINGS, GASKETS, LUBRICANTS SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.
 - THIS DRAWING TO BE USED FOR INSTALLATIONS INCORPORATING HYDRAULICALLY OPERATED SLEEVE VALVES (HOSV) AND HYDRAULICALLY OPERATED CONTROL VALVES (HOCV).
 - EXPANSION CHAMBER CAN BE MANUFACTURED FROM SEAMLESS LINE PIPE IN WHICH CASE T_s MAY BE REDUCED TO T_p .

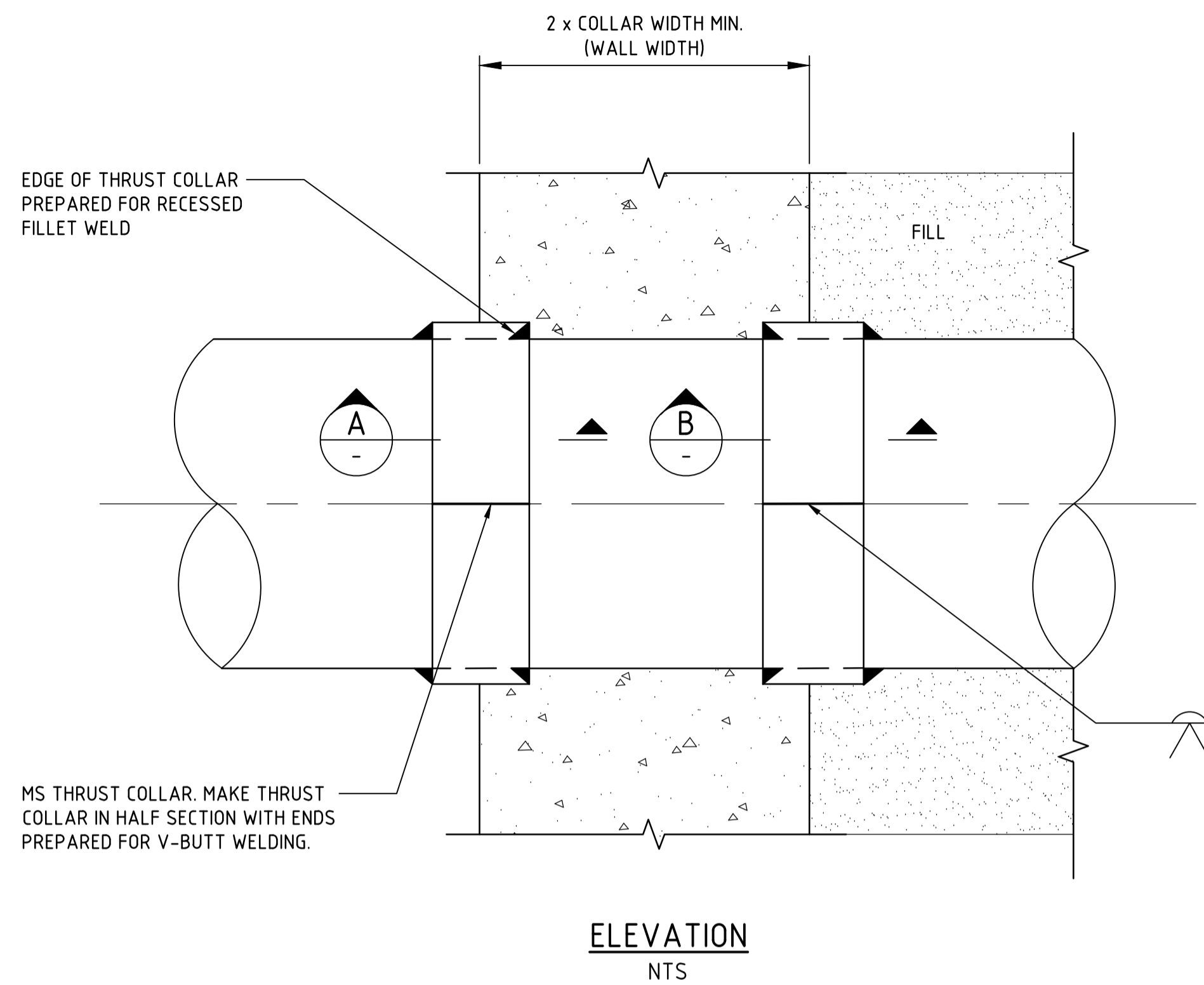
HOSV	Df (mm)	Tf (mm)	Ds (mm)	Ts (SEE NOTE 15) (mm)	Tc (mm)	N	M	P (mm)	Ls (mm)	L (mm)	Tp (mm)
200	200	30	324	10	12	8	M16	292	80	1500	9.5
250	250	38	457	10	12	8	M20	356	80	2000	9.5
300	300	38	508	12	16	12	M20	406	100	2500	12.7
400	400	56	711	12	16	12	M24	521	120	3500	12.7

HOCV	Df (mm)	Tf (mm)	Ds (mm)	Ts (SEE NOTE 15) (mm)	Tc (mm)	N	M	P (mm)	Ls (mm)	L (mm)	Tp (mm)
100	100	30	219	8	10	4	M16	178	70	1000	8.2
200	200	30	406	10	12	8	M16	292	70	2000	9.5



MS STUD DETAIL
NTS

REVISION PANEL DETAILS REV DATE DRN APR'D 1.0 18/11/22 GB ISSUED FOR USE MW CURRENT REV CONTRACTOR: GHD CURRENT REV PROJECT: 10				DESIGN PANEL AUTHORIZED DESIGNED: T.MZUNGU 14/02/22 AUTHORIZED: H.HABIB DRAWN: G. BALDONADO 14/02/22 SIGNATURE REVIEWED: M.WHITE 14/02/22 CONTRACTOR:		<p>SA WATER STANDARD DRAWING STANDARD EXPANSION CHAMBER DETAILS MSCL PIPELINES CIVIL</p>		A1 TOTAL SHEETS: 1.0 SH1 SIZE PROJECT No: MAXIMO ID: SUPERSEDES: DRAWING NUMBER STD-06-00010_01	
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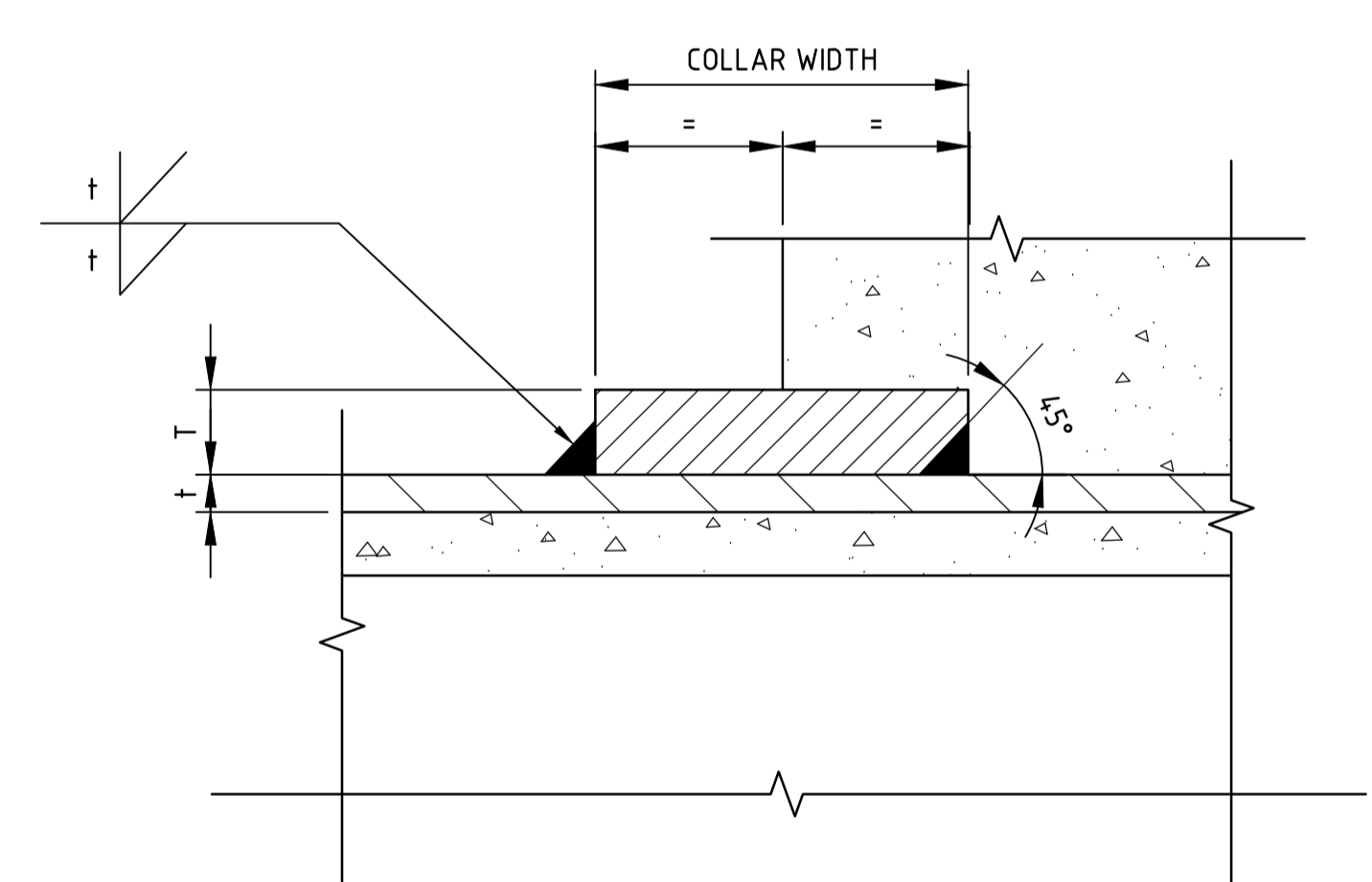
DN	O.D. (mm)	COLLAR WIDTH (mm)	COLLAR THICKNESS T (mm)		
			PN16	PN21	PN35
100	114	100	12	16	20
150	168	100			
200	219	100			
250	273	100			
300	324	100			
350	356	150	12	16	25
400	406	150			
450	457	150			
500	508	150	12	16	25
550	559	150			
600	610	200	12	16	25
700	711	200	12	16	25
750	762	200	16	20	25
800	813	200	16	20	25
900	914	250	16	20	25
1000	1016	250	20	25	
1200	1219	250	20		
1400	1422	250	25		

- MINIMUM WALL THICKNESS TO BE 2.5 x WALL THICKNESS

- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
 - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
 - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - GRADE 250 - THICKNESSES GREATER THAN 8mm.
 - EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
 - PLATE USED FOR THRUST COLLAR TO BE MINIMUM GRADE 250.
 - PRIOR TO WELDING EXTERNAL COATING SHALL BE SET BACK 100 mm FROM WELDS.
 - WHERE THE PIPELINE DIAMETER CHANGES BETWEEN THE THRUST COLLAR AND THE NEXT POINT OF RESTRAINT THE LARGEST DIAMETER OF PIPE SHALL BE ASSUMED FOR THE SIZING OF THE COLLAR.
 - TO PREVENT LOCAL CONCRETE FAILURE, ENCASING CONCRETE TO HAVE A MINIMUM $f_c = 32 \text{ MPa}$ IN ACCORDANCE WITH AS 3600 AND TS 0710.

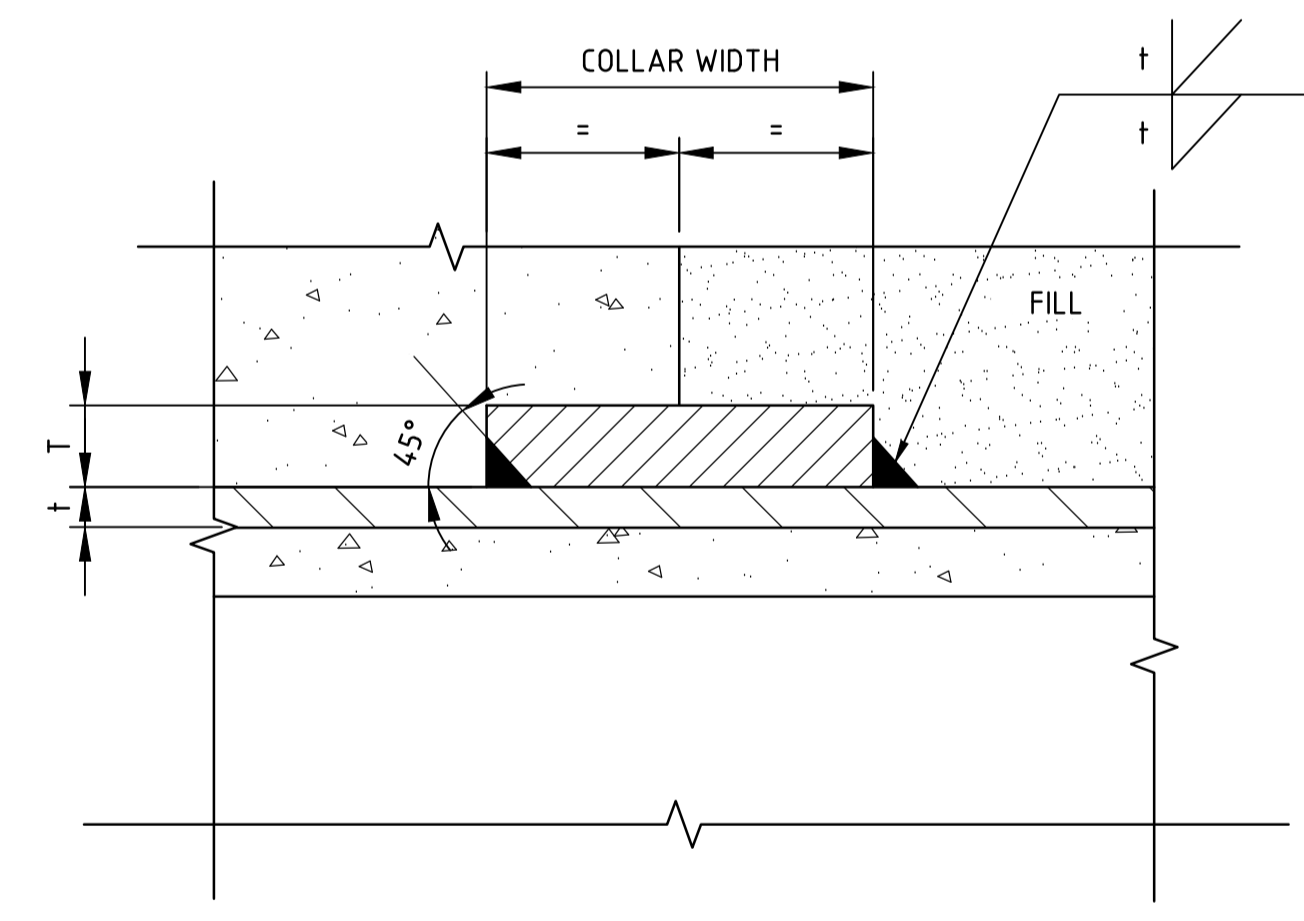
DETAILS ARE FOR USE ON NEW
CONCRETE WALLS AND THRUST BLOCKS
WHERE AXIAL THRUST RESTRAINT IS
REQUIRED.

WALL/BLOCK DESIGNER SHALL ENSURE
THE CONCRETE HAS SUFFICIENT
STRENGTH AND STABILITY TO RESIST
THE IMPOSED THRUST FORCES.



ABOVE GROUND INSTALLATION

A SECTION
NTS



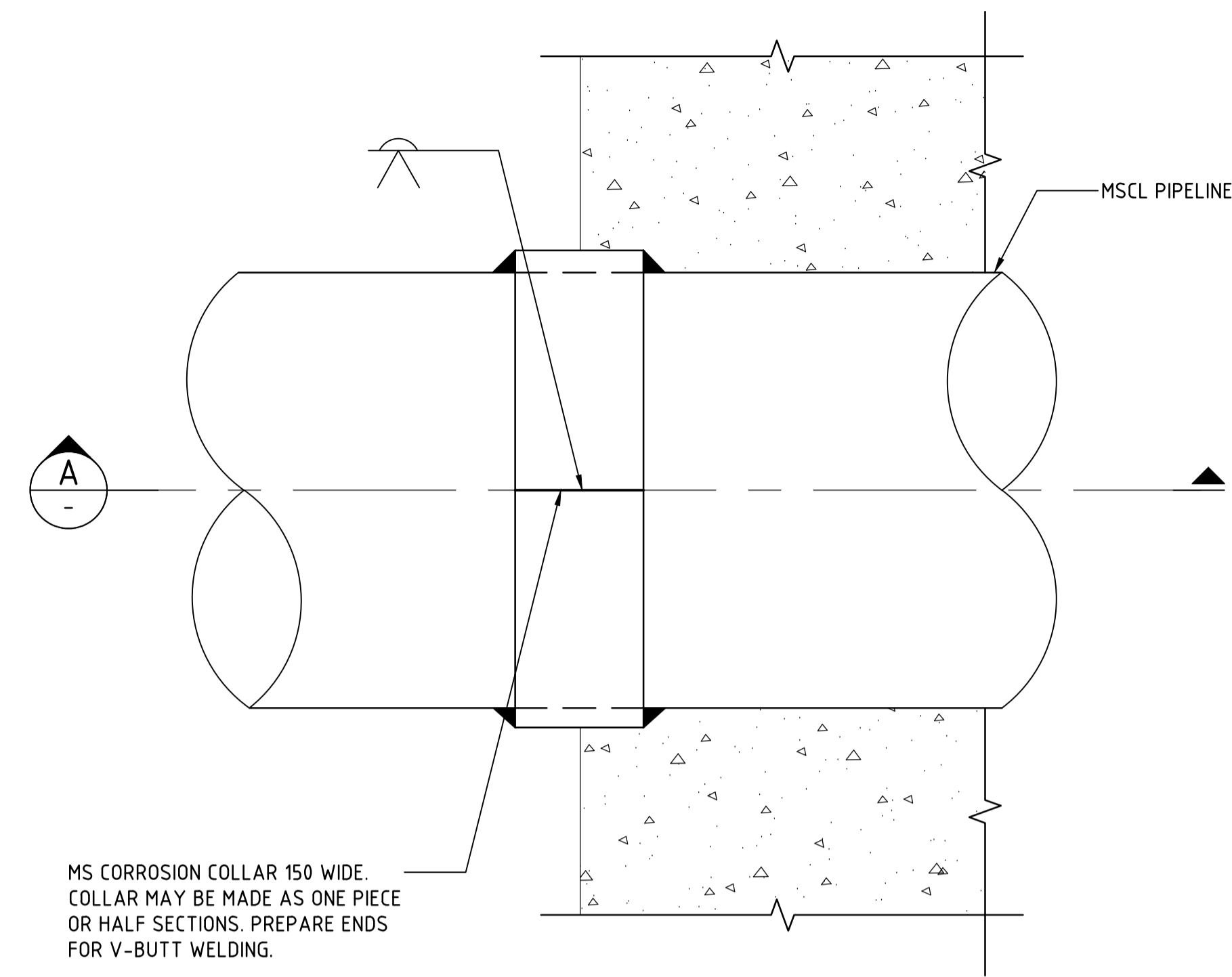
BELOW GROUND INSTALLATION

B SECTION
NTS

REVISION PANEL				DESIGN PANEL				SA Water		SA WATER STANDARD DRAWING STANDARD THRUST COLLARS FOR MSCL PIPELINES CIVIL		A1 TOTAL SHEETS: 1.0	
REV	DATE	DRN	APR'D	DESIGNED	AUTHORISED	SHT SIZE	PROJECT No:					REVISION	
1.0	15/12/22	GB	ISSUED FOR USE	T.MZUNGU	H.HABIB					MAXIMO ID:		1.0	
				G. BALDONADO						SUPERSEDES:			
CURRENT REV CONTRACTOR: GHD				CONTRACTOR:				<p>This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.</p>		DRAWING NUMBER		STD-06-00011_01	
CURRENT REV PROJECT: 1.0													

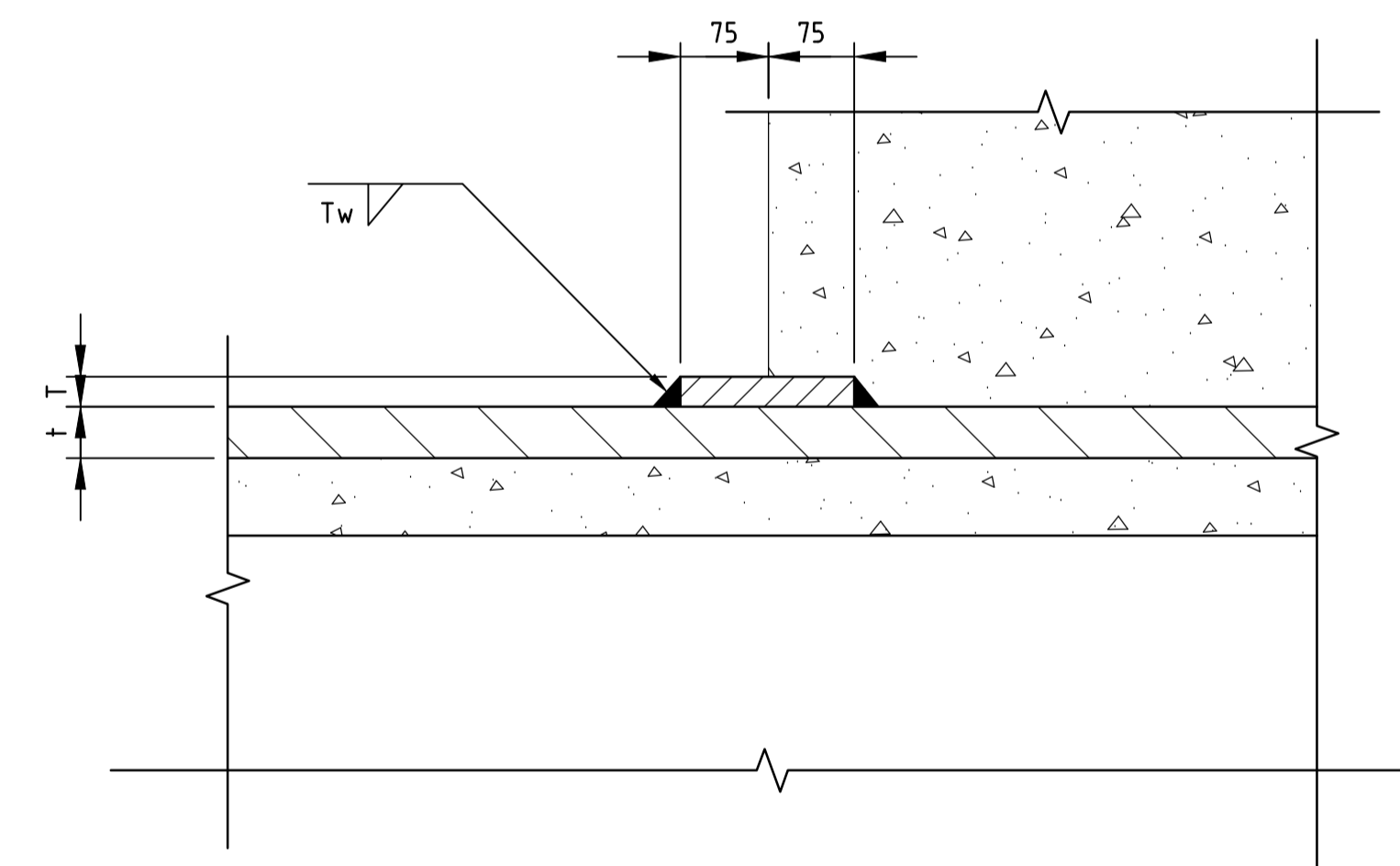
NOTES:

1. ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
2. ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
3. ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - a. GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - b. GRADE 250 - THICKNESSES GREATER THAN 8mm.
4. EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
5. PLATE USED FOR CORROSION COLLAR TO BE MINIMUM GRADE 250.
6. PRIOR TO WELDING EXTERNAL COATING SHALL BE SET BACK 100 mm FROM WELDS.



ELEVATION
NTS

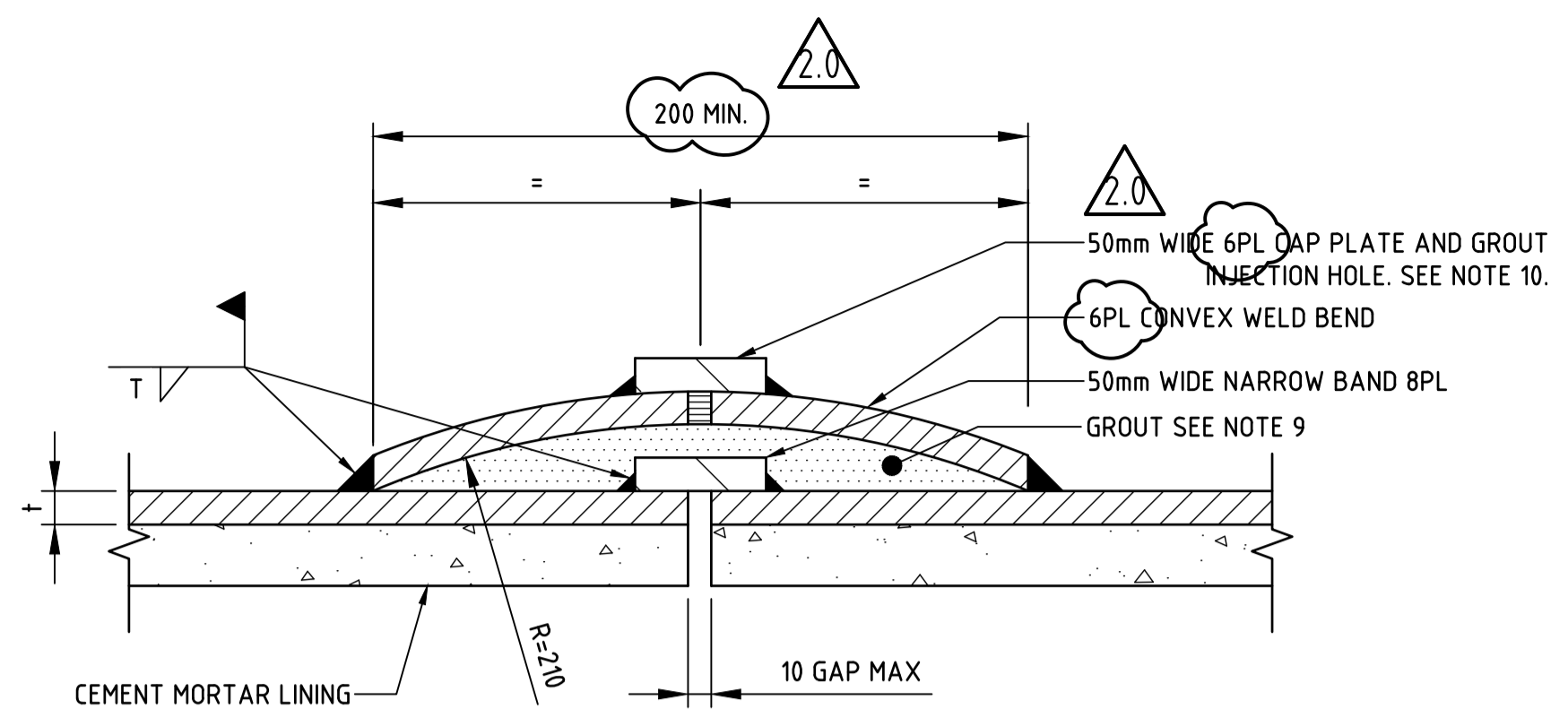
PIPE PLATE THICKNESS UP TO AND INCLUDING: t (mm)	COLLAR THICKNESS T (mm)	WELD SIZE A (mm)
6	5	5
9	6	5
12	8	5
18	10	6
25	12	6



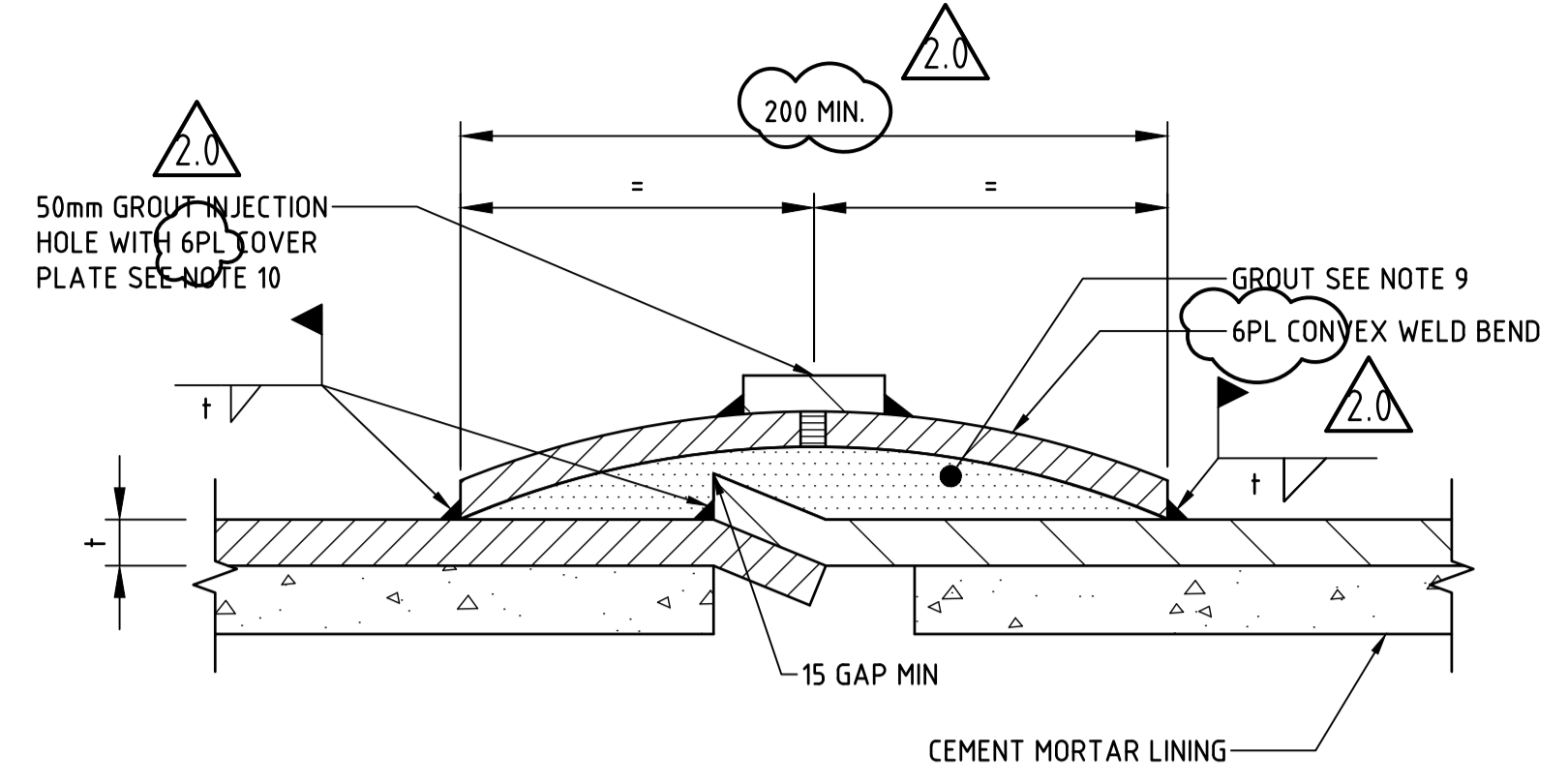
A SECTION
NTS

REVISION PANEL				DESIGN PANEL				SA Water	SA WATER STANDARD DRAWING STANDARD CORROSION COLLARS FOR MSCL PIPELINES CIVIL	A1 TOTAL SHEETS: 1.0	
REV	DATE	DRN	APR'D	DESIGNED	10/03/22	AUTHORISED	H.HABIB			SHT SIZE	PROJECT No:
				DESIGNED	T.MZUNGU	10/03/22	SIGNATURE	<p>This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.</p>			
				DRAWN	G. BALDONADO	10/03/22					
				REVIEWED	M.WHITE	10/03/22					
1.0	15/12/22	GB	ISSUED FOR USE	CURRENT REV AUTHORIZED	M.WHITE	15/12/22					
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0							

MAXIMO ID:	
SUPERSEDES:	
DRAWING NUMBER	STD-06-00012_01

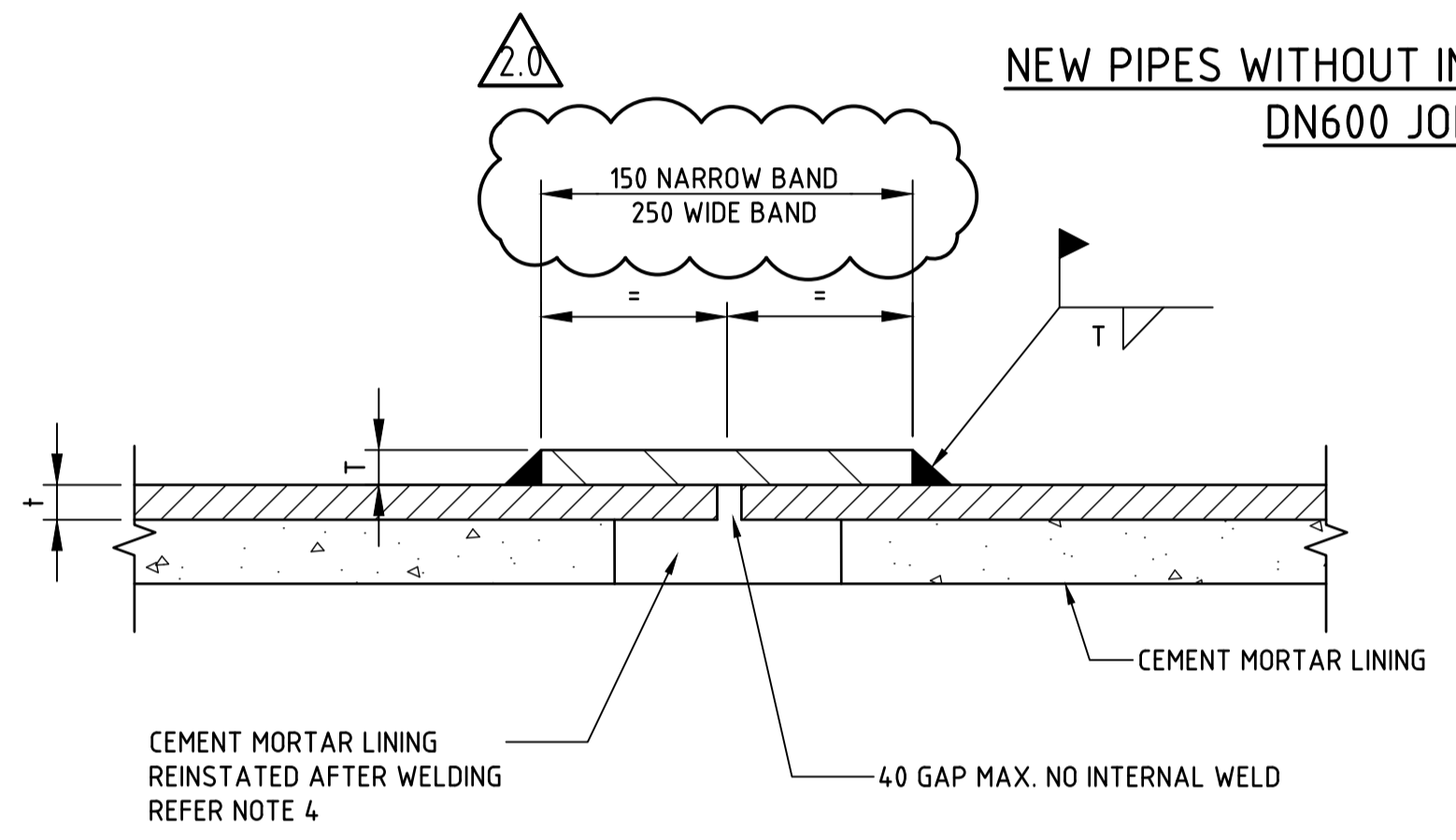


MSCL WELD BAND
NTS

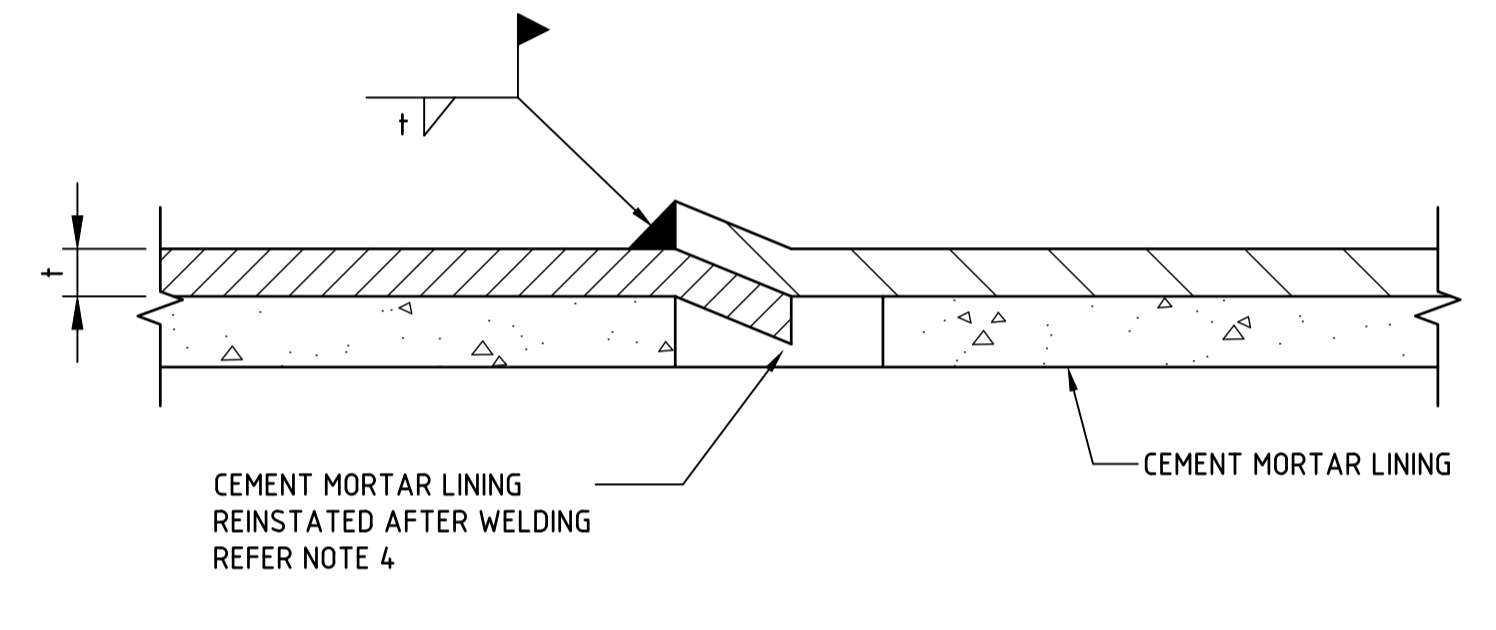


MSCL WELDED SPHERICAL SLIP IN JOINT
NTS

NEW PIPES WITHOUT INTERNAL ACCESS AND PIPES SMALLER THAN DN600 JOINT WELDED EXTERNALLY ONLY

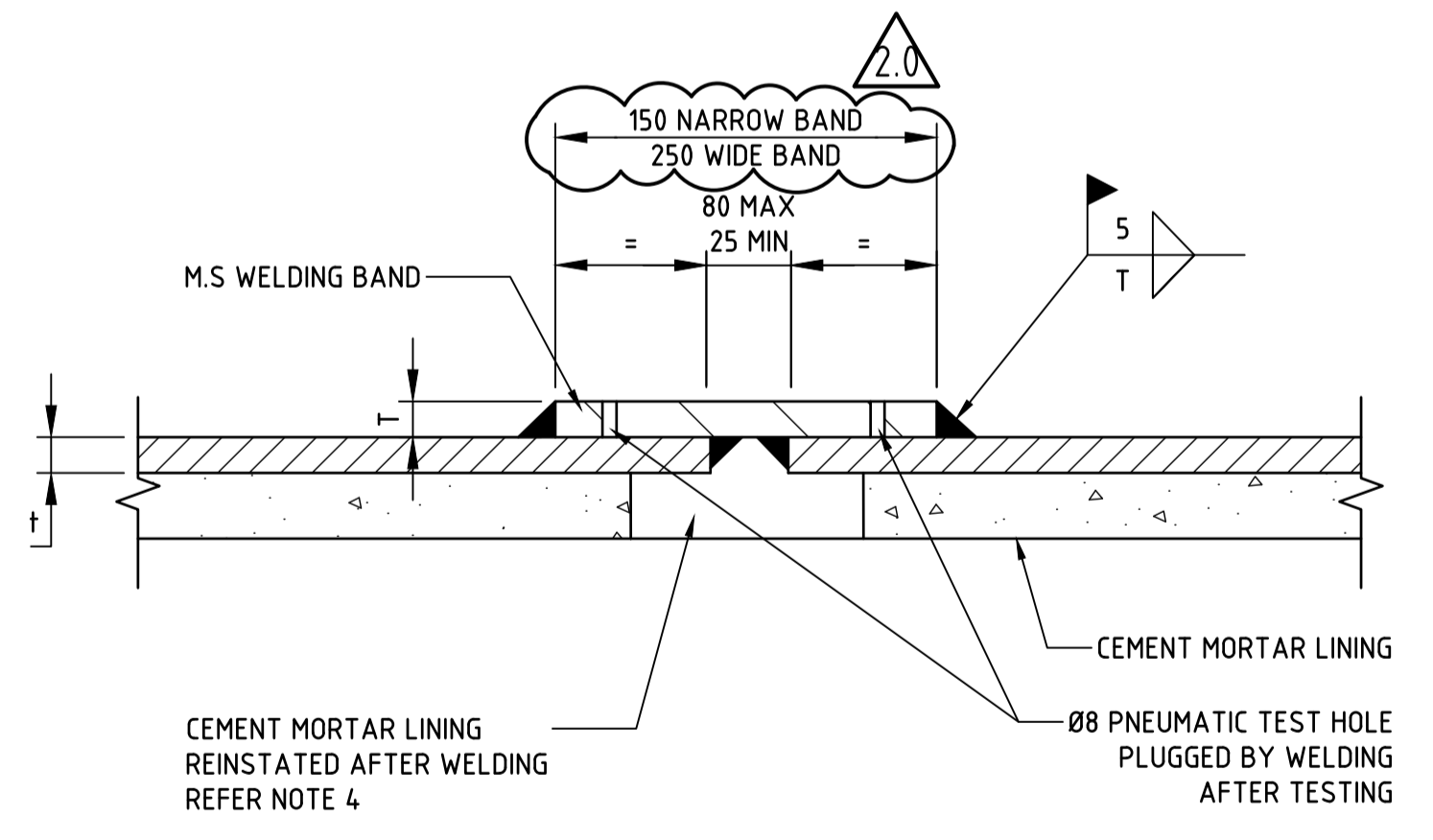


MSCL WELD BAND
NTS

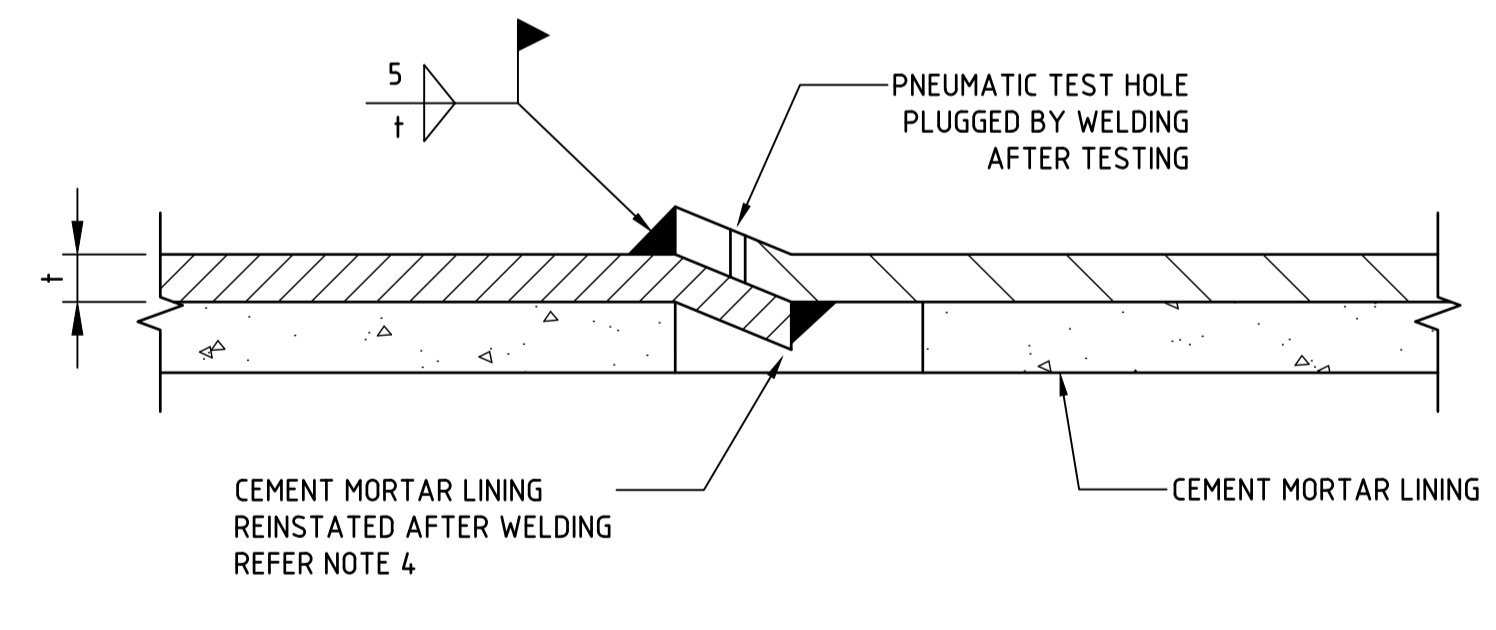


MSCL WELDED SPHERICAL SLIP IN JOINT
NTS

PIPES WITH INTERNAL ACCESS (DN600 TO DN900) JOINT WELDED EXTERNALLY ONLY



MSCL WELD BAND
NTS



MSCL WELDED SPHERICAL SLIP IN JOINT
NTS

DN900 AND LARGER PIPES JOINT WELDED EXTERNALLY AND INTERNALLY

NOTES:

- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
- ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
- ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - GRADE 250 - THICKNESSES GREATER THAN 8mm.
- REPAIR CEMENTS MORTAR LINING IN ACCORDANCE WITH TS 0465.
- EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
- THE GRADE OF PLATE USED FOR THE WELD BAND SHALL BE NO LESS THAN THE MAIN PIPE. WHERE PIPE GRADE IS UNKNOWN BAND SHALL BE MINIMUM 300 GRADE.
- PRIOR TO WELDING EXTERNAL COATING SHALL BE SET BACK FROM BOTH SIDES OF THE JOINT 100 mm FROM WELDS.
- ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.
- AFTER BAND HAS BEEN INSTALLED, WELDED AND COOLED, BAND TO BE INJECTED WITH TS 0800 APPROVED SHRINKING COMPENSATING CEMENT GROUT (EG.FOSROC CONBEXTRA GP) THROUGH HOLE ON TOP OF IT, ENSURING ALL AIR IS DISPLACED.
- ONCE GROUT HAS HARDENED, WELD CAP PLATE OVER INJECTION POINT.

THICKNESS OF MAIN PIPE	CLOSING COLLAR THICKNESS
t < 9.9mm	T
10mm < t < 11.9mm	10mm
12mm < t < 15.9mm	12mm
16mm < t < 19.9mm	16mm
	20mm

REV	DATE	DRN	DETAILS	APRD	CURRENT REV AUTHORISED
2.0	17/09/24	SS	DETAILS UPDATED. RE-ISSUED FOR USE	MW	M.WHITE
1.0	15/12/22	GB	ISSUED FOR USE	MW	

DESIGNED	17/09/24	AUTHORISED	17/09/24
T.MZUNGU		H.HABIB	
DRAWN	17/09/24	SIGNATURE	
G. BALDONADO			
REVIEWED	17/09/24		
M.WHITE			

SA WATER STANDARD DRAWING
WELDED PIPE JOINTS
CIVIL

A1	TOTAL SHEETS: 2.0
SHT SIZE	PROJECT No:
MAXIMO ID:	
SUPERSEDES:	
DRAWING NUMBER	STD-06-00013_01

DN	O.D.	THICKNESS A (mm)	MAX SPAN (m)
100	114	4.8	11.8
150	168	5	13.5
200	219	5	14.5
250	273	5	15.2
300	324	4.5	15.0
		5	15.6
		6	16.5
350	356	4.5	15.2
		5	15.8
400	406	6	16.9
		4.5	15.6
450	457	5	16.2
		6	17.4
		8	19.1
500	508	4.5	15.9
		5	16.6
		6	17.7
550	559	8	19.6
		4.5	16.2
		5	16.9
		6	18.1
600	610	8	20.0
		4.5	16.4
		5	17.1
		6	18.4
700	711	8	20.4
		9.5	22.9
		12	24.9
		4.5	15.9
800	813	5	16.6
		6	17.7
		8	19.6
		9.5	22.9

DN	O.D.	THICKNESS A (mm)	MAX SPAN (m)
600	610	4.5	16.6
		5	17.3
		6	18.6
		8	20.7
		9.5	22.0
700	711	5	17.6
		6	19.0
		8	21.3
		9.5	22.6
750	762	12	24.5
		5	17.8
		6	19.2
		8	21.5
		9.5	22.9
800	813	12	24.9
		5	17.7
		6	19.1
		7	20.4
		8	21.5

DN	O.D.	THICKNESS A (mm)	MAX SPAN (m)
900*	914	6	19.4
		7	20.7
		8	21.8
		10	23.8
		12	25.5
1000*	1016	8	22.1
		10	24.2
		12	25.9
1200*	1219	8	22.6
		9	23.8
		10	24.8
1400*	1422	12	26.6
		10	25.1
		11	26.1
1600*	1626	12	27.1
		10	25.5
		12	27.5
1800*	1829	16	30.9
		12	27.9
		16	31.3

NOTES:

- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
- ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
- ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - GRADE 250 - THICKNESSES GREATER THAN 8mm.
- REFER TO DRAWING STD-06-00005_01 FOR JOINT DETAILS.
- 't' = THICKNESS OF MAIN PIPE
- FULL PENETRATION BUTT WELDS MAY BE USED AS AN ALTERNATIVE AND BE TREATED AS EQUIVALENT TO INTERNAL AND EXTERNALLY WELDED JOINTS FOR THE PURPOSE OF SPAN CAPACITY.
- ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.
- NOT ALL PIPE THICKNESSES ARE COMMONLY STOCKED. CONFIRM AVAILABILITY OF PIPE PARTICULARLY IF HEAVY WALLED PIPE IS REQUIRED.
- SPAN LENGTHS ASSUME SELF-WEIGHT AND WATER ONLY. SPANS SHOULD BE RECHECKED IF ADDITIONAL EQUIPMENT IS TO BE SUPPORTED BY THE PIPE OR IF FLUIDS OTHER THAN WATER ARE TO BE CARRIED.
- THE TABLES SHOULD NOT BE USED FOR PIPES JOINED BY FLANGES OR RUBBER RING JOINTS.
- PIPELINE DESIGNER SHALL CONSIDER EFFECTS OF EXTERNAL LOADS INCLUDING EARTHQUAKE, WIND, AND THERMAL LOADS ON THE PIPE SPAN.

* PREFERRED INTERNAL AND EXTERNAL WELDS WHERE ACCESS IS AVAILABLE

MAXIMUM ALLOWABLE SPAN BETWEEN SUPPORTS FOR JOINTS WITH EXTERNAL WELD ONLY

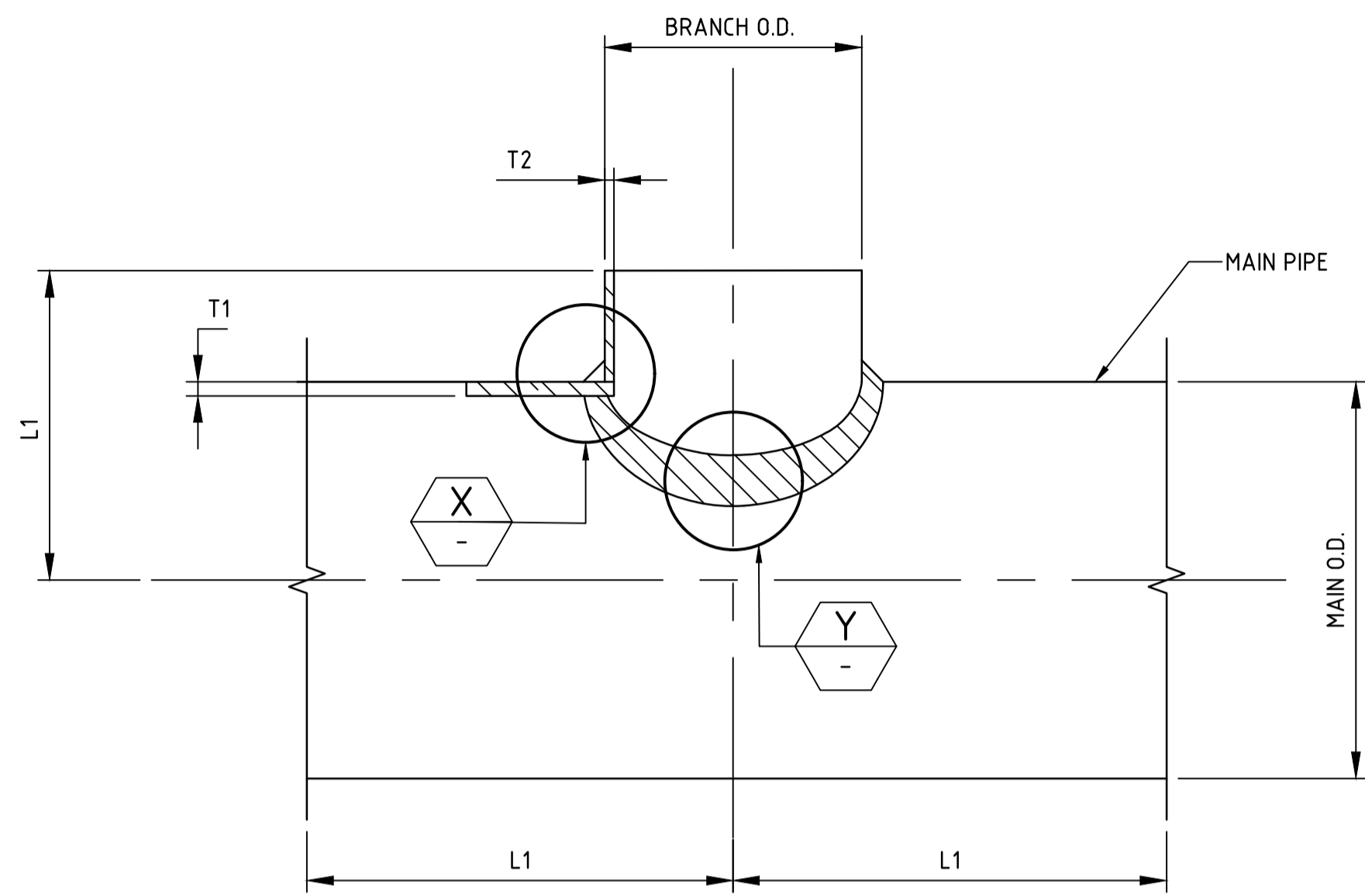
DN	O.D.	THICKNESS A (mm)	MAX SPAN (m)
600*	610	4.5	18.2
		5	19.0
		6	20.4
		8	22.7
		9.5	24.1
700*	711	5	19.3
		6	20.8
		8	23.3
		9.5	24.8
750*	762	12	26.9
		5	19.5
		6	21.0
800*	813	8	23.5
		9.5	25.1
		12	27.2

DN	O.D.	THICKNESS A (mm)	MAX SPAN (m)
900	914	6	21.3
		7	22.7
		8	23.9
		10	26.1
		12	27.9
1000	1016	8	24.3
		10	26.5
		12	28.4
1200	1219	8	24.8
		9	26.0
		10	27.2
1400	1422	12	29.2
		10	27.5
		11	28.6
1600	1626	12	29.7
		10	27.9
		16	33.8
1800	1829	12	30.1
		16	34.3

NON STANDARD FOR INTERNAL WELDING

MAXIMUM ALLOWABLE SPAN BETWEEN SUPPORTS FOR JOINTS WITH EXTERNAL AND INTERNAL WELDS

REVISION PANEL				DESIGN PANEL				SA WATER		SA WATER STANDARD DRAWING		A1	
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	10/03/22	AUTHORISED	H.HABIB	STANDARD ABOVE GROUND RIGID MSCL PIPELINES 100mm TO 1800mm		TOTAL SHEETS: 1.0	
					M.WHITE	T.MZUNGU	10/03/22	SIGNATURE		DIA-BALL & SOCKET & COLLAR JOINTED PIPES MAXIMUM SPAN FOR ALLOWABLE WELD SIZE		PROJECT No: _____	
					SIGNATURE	G.BALDONADO	10/03/22			CIVIL		MAXIMO ID: _____	
1.0	15/12/22	GB	ISSUED FOR USE	MW		REVIEWED	10/03/22			DRAWING NUMBER		1.0	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0				CONTRACTOR:				STD-06-00014_01	

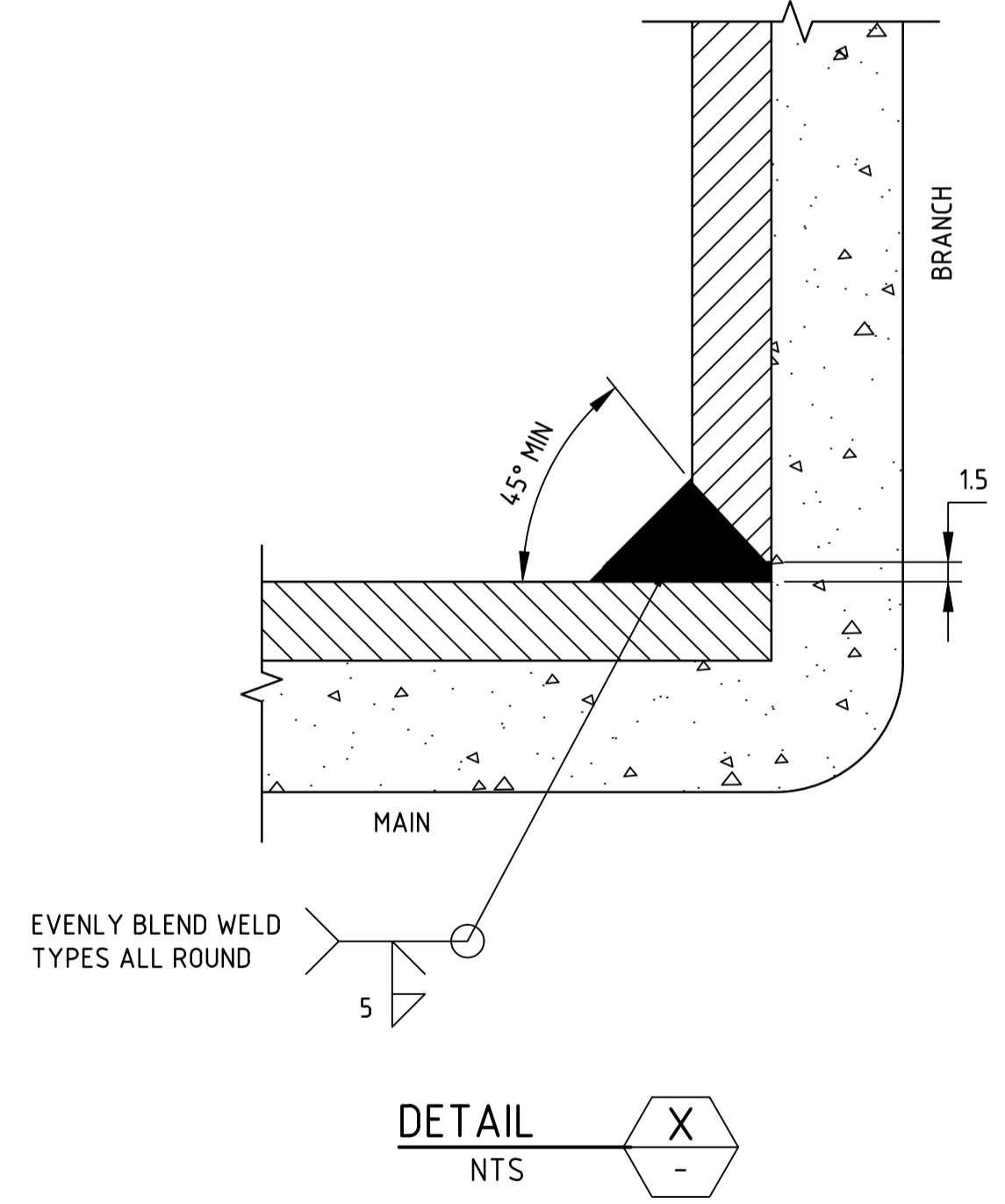


UNEQUAL BRANCH WITHOUT REINFORCEMENT
NTS

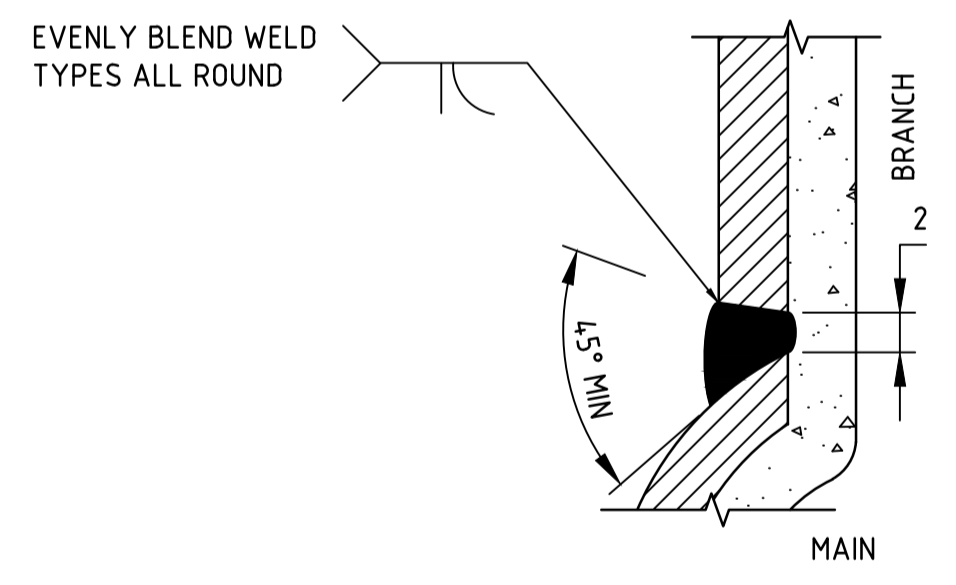
BRANCH OFFTAKE						
MAIN PIPE				BRANCH PIPE		
DN	OD (mm)	T1 (MIN) (mm)	L1 (MIN) (mm)	DN	OD (mm)	T2 (MIN) (mm)
100	114	4.8	100	100	114	4.8
150	168	5	150	150	168	5
200	219	5	200	200	219	5
250	273	5	250	250	273	5
300	324	5	300	300	324	5

BOSS DIMENSIONS					
DN	NPS	THREADED		SOCKETED	
		D (mm)	L2 (mm)	D (mm)	L2 (mm)
8	1/4	19	18	18	26
15	1/2	28	24	27	32
20	3/4	35	26	39	37
25	1	44	30	40	41
40	1.5	64	40	61	45
50	2	76	43	74	57

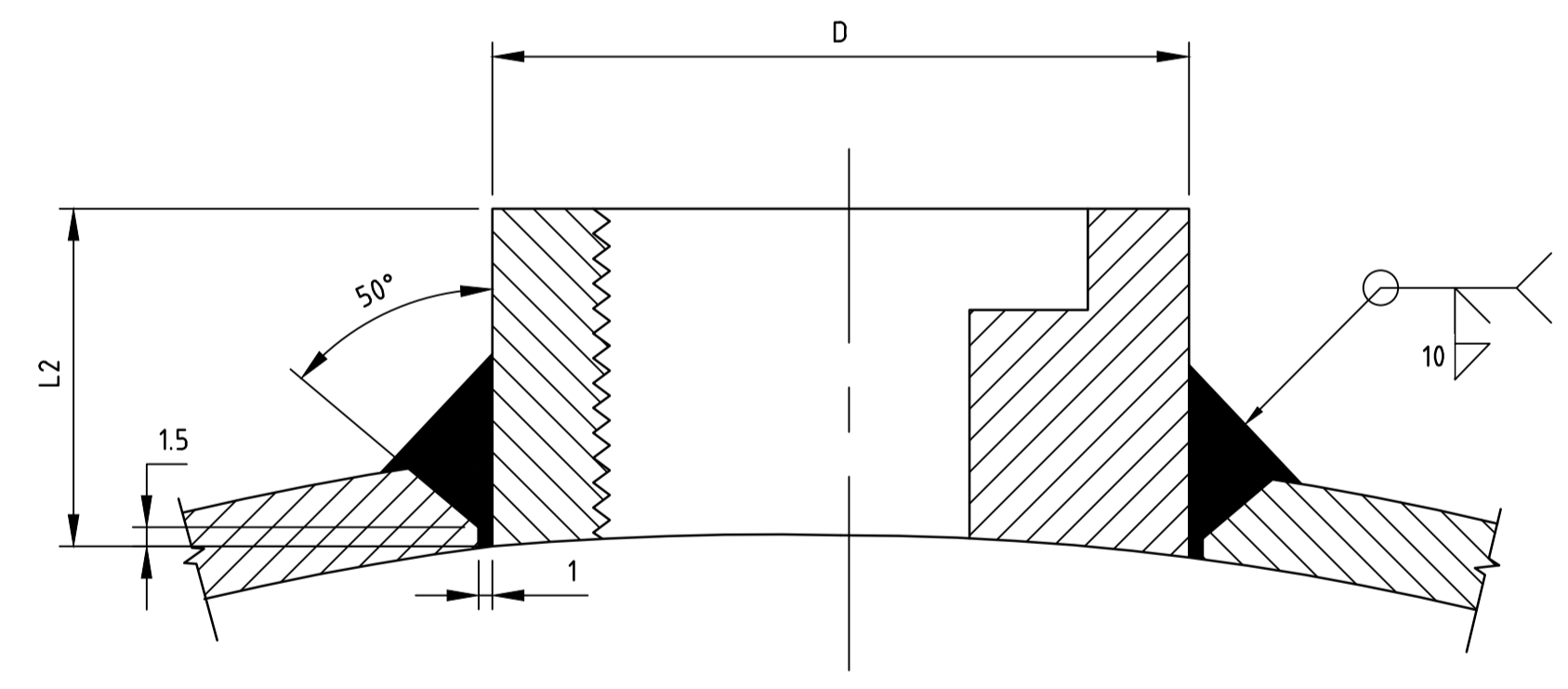
- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
 - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
 - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - GRADE 250 - THICKNESSES GREATER THAN 8mm.
 - REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
 - EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
 - BOSSSES SHALL BE TO ASME B16.11.
 - BOSS THREADING SHALL BE BSP.
 - 't' = THE SMALLER OF T1 AND T2.
 - THE MAIN AND/OR BRANCH PIPES MAY BE SUBSTITUTED FOR PIPE FABRICATED TO ASME 36.10 SCH 40.
 - FOR STAINLESS STEEL BRANCHES BOTH PIPES SHALL BE FABRICATED TO ASME 36.19 SCH 40S. ALL WELDS TO BE PASSIVATED INTERNALLY AND EXTERNALLY TO ASTM A380 AND TS 420.
 - ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.
 - REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
 - FOR FURTHER DETAILS ON WELDING REFER TO AS 4041 APPENDIX M.
 - WELDS BETWEEN STAINLESS STEEL AND CARBON STEEL REQUIRE E309MOL ELECTRODES OR SIMILAR.



DETAIL X
NTS



DETAIL Y
NTS



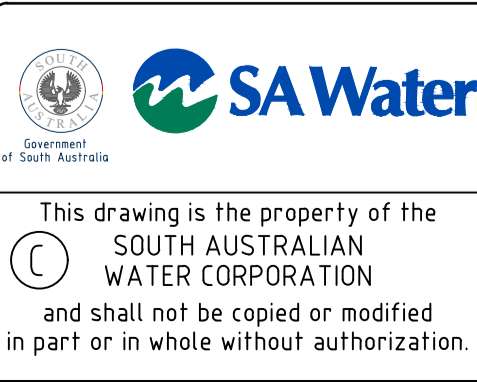
ATTACHMENT DETAILS FOR THREADED/SOCKETED BOSSES
NTS

REVISION PANEL				
REV	DATE	DRN	DETAILS	APR'D
2.0	17/09/24	SS	DETAILS UPDATED. RE-ISSUED FOR USE	MW
1.0	15/12/22	GB	ISSUED FOR USE	MW

CURRENT REV CONTRACTOR: GHD CURRENT REV PROJECT: 2.0

DESIGN PANEL			
CURRENT REV AUTHORIZED	DESIGNED	AUTHORIZED	DATE
M.WHITE	T.MZUNGU	H.HABIB	17/09/24
SIGNATURE	G. BALDONADO	SIGNATURE	17/09/24
	M.WHITE		

CONTRACTOR:

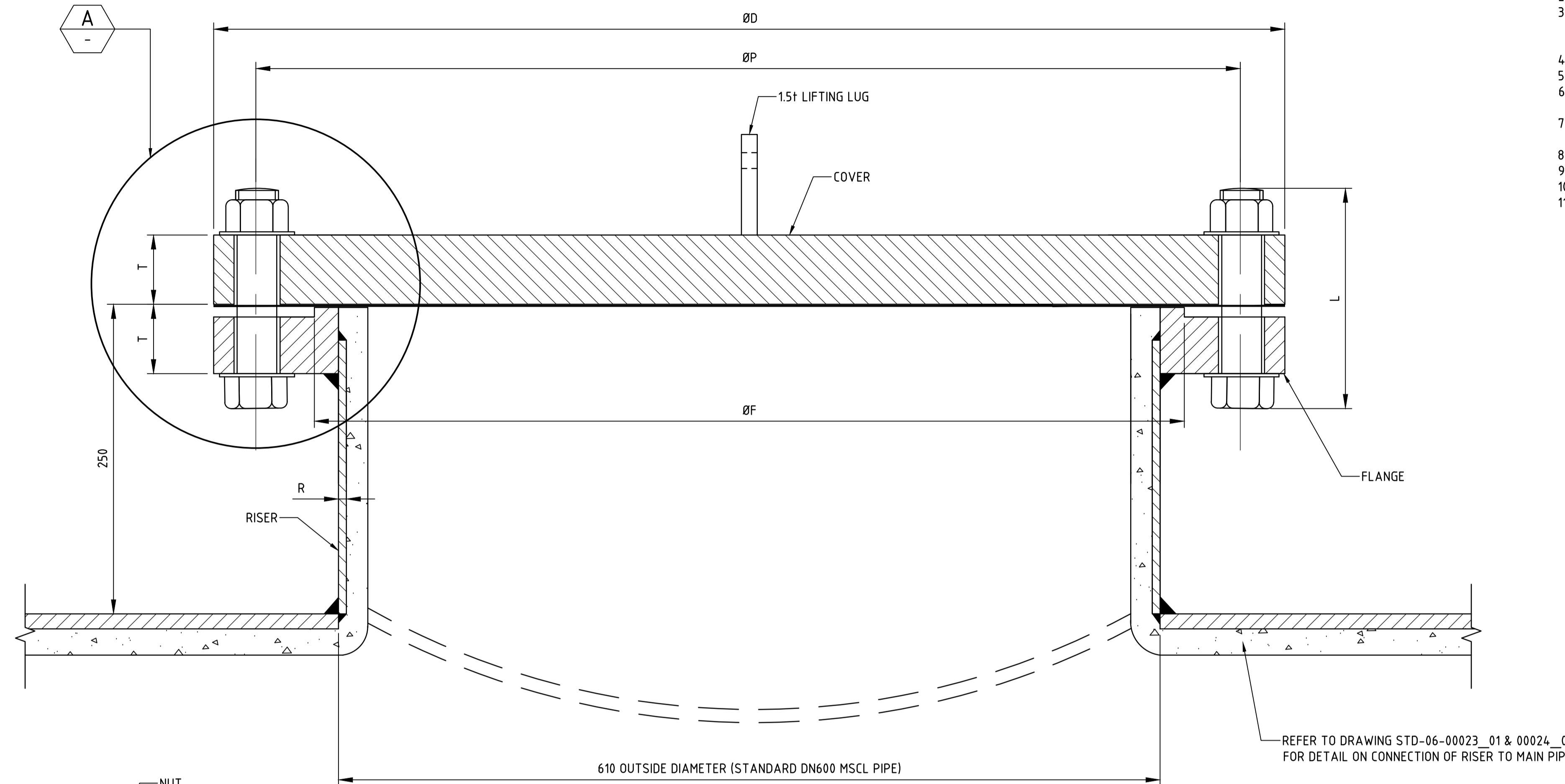


SA WATER STANDARD DRAWING
STANDARD PIPE DETAILS 90° BRANCHES IN STEEL PIPES
FOR PRESSURES UP TO PN21
CIVIL

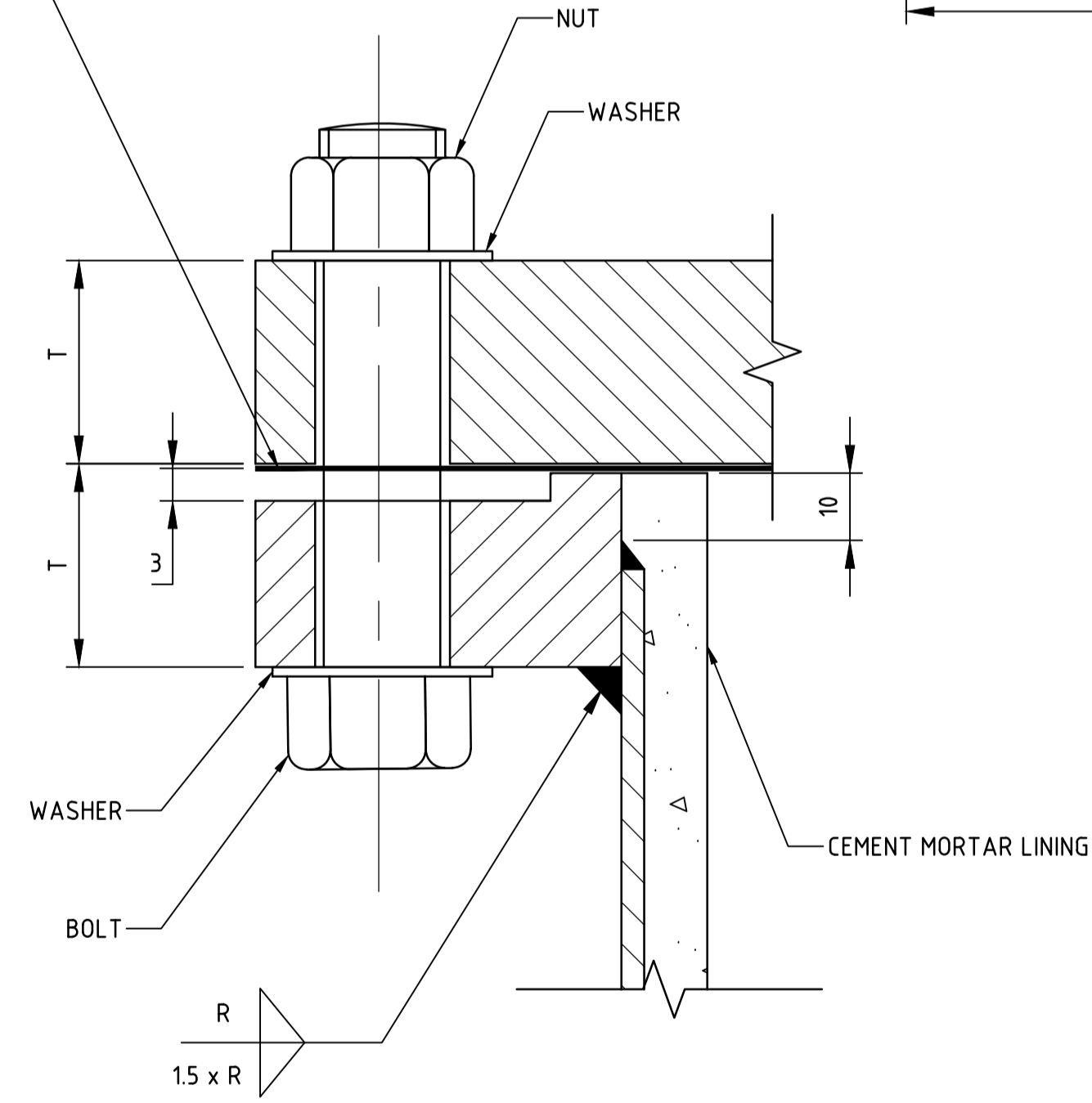
A1	TOTAL SHEETS:	2.0
	PROJECT No:	
	SUPERSEDES:	
	DRAWING NUMBER	STD-06-00015_01

NOTES:

1. ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
2. ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
3. ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - a. GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - b. GRADE 250 - THICKNESSES GREATER THAN 8mm.
4. FLANGES TO BE FABRICATED IN ACCORDANCE WITH AS/NZS 4087.
5. REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
6. EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16 & TS 18 AS APPROPRIATE.
7. ALL NUTS & BOLTS TO BE GRADE 8.8 TO AS 4291.1 AND HOT DIP GALVANIZED IN ACCORDANCE WITH AS/NZS 1214.
8. BOLTS SHALL BE INSTALLED NUT SIDE UP.
9. GASKETS TO COMPLY WITH WSA 109.
10. REFER TO WSA 109 FOR TIGHTENING PROCEDURE AND TORQUE VALUES.
11. ALL MATERIALS THAT MAY BE IN CONTACT WITH WATER SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.



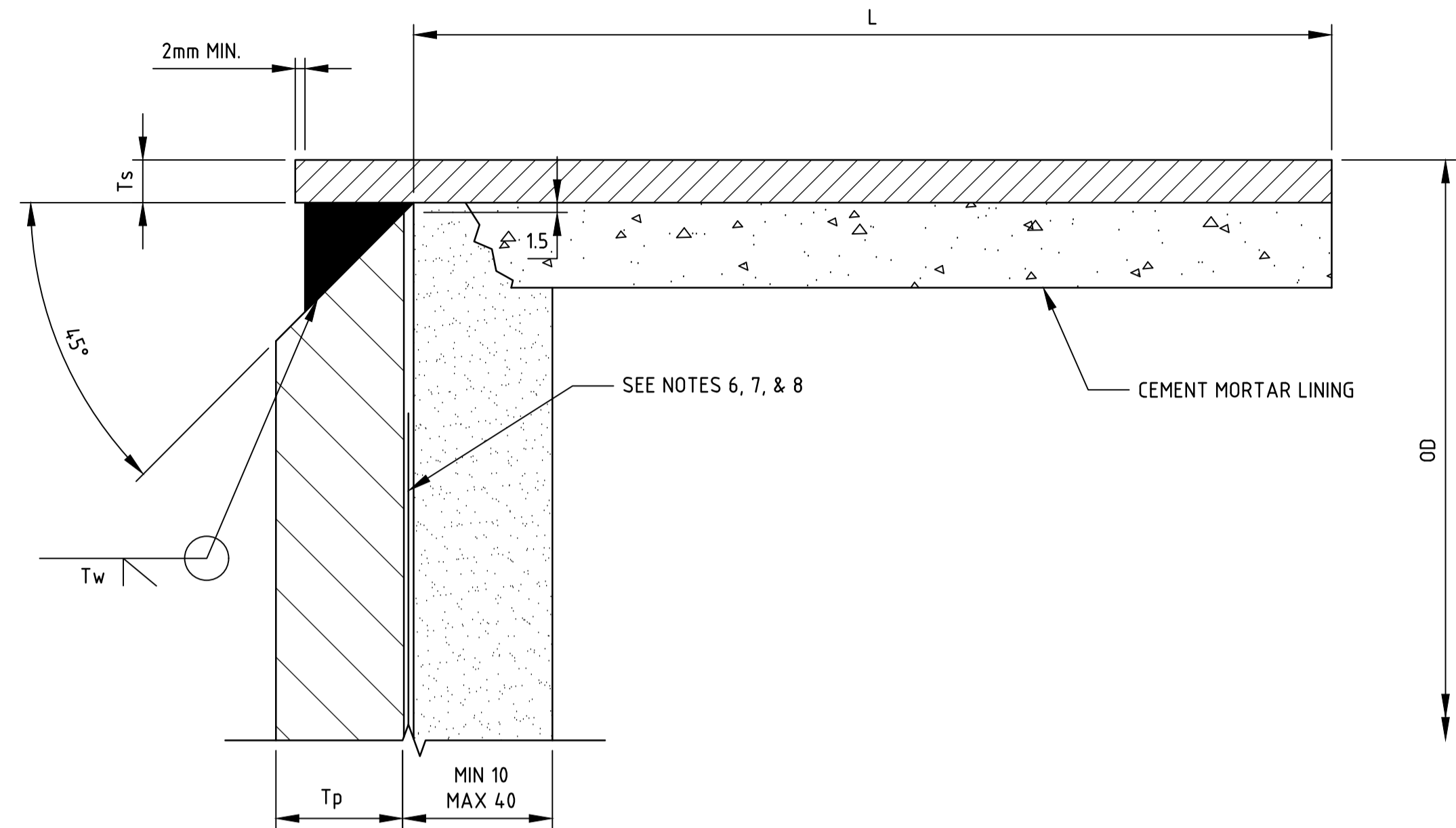
FULL FACE GASKET GLUED TO COVER FLANGE WITH TS 0800 COMPLIANT CONTACT ADHESIVE



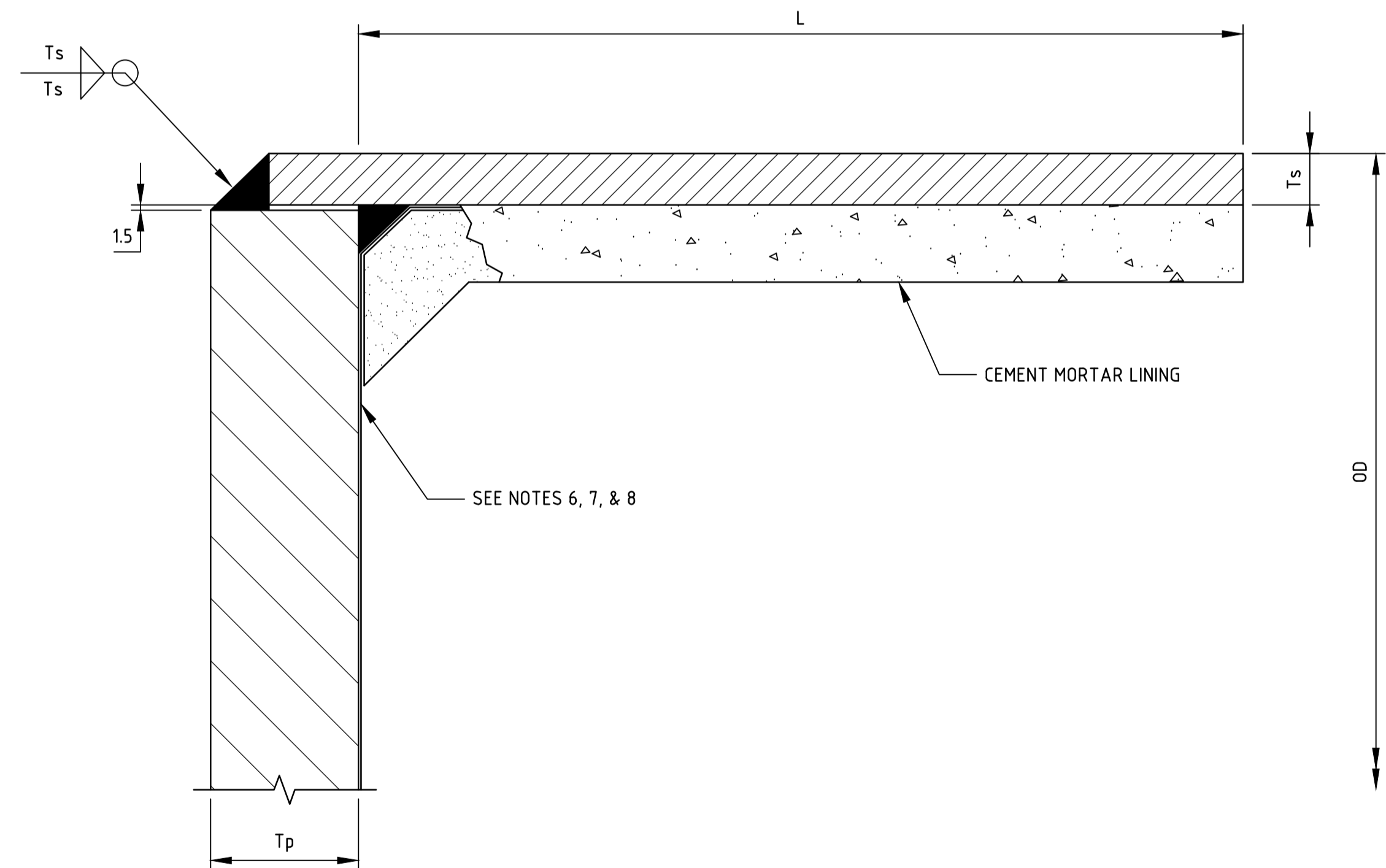
DETAIL NTS A

PRESSURE RATING	OUTSIDE DIAMETER OF FLANGE D (mm)	DIAMETER OF RAISED FACE F (mm)	PITCH CIRCLE DIAMETER P (mm)	NUMBER OF BOLTS N	BOLT SIZE AND THREAD O	BOLT HOLE DIAMETER V (mm)	BOLT LENGTH L (mm)	BOLT/NUT STRENGTH GRADE	COVER/FLANGE THICKNESS T (mm)	RISER THICKNESS R (mm)	GASKET TYPE	APPROX. COVER WEIGHT (kg)
PN16	825	720	756	16	M27	30	135	4.6	48	5	3mm ELASTOMERIC	200
PN21	850	739	781	24	M33	36	165	8.8	58	5	1.5mm COMPRESSED FIBRE	260
PN35		699					185		68	8		300

REVISION PANEL				DESIGN PANEL				SA Water		SA WATER STANDARD DRAWING STANDARD MANHOLE BRANCH & COVER FOR MSCL PIPES CIVIL		A1 TOTAL SHEETS: 1.0 PROJECT No: _____ MAXIMO ID: _____ SUPERSEDES: _____ DRAWING NUMBER STD-06-00016_01	
REV	DATE	DRN	APR'D	CURRENT REV AUTHORIZED	DESIGNED	AUTHORIZED	 This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.		1.0 15/12/22 GB ISSUED FOR USE MW CURRENT REV CONTRACTOR: GHD CURRENT REV PROJECT: 1.0				
				M.WHITE	T.MZUNGU	H.HABIB							
				SIGNATURE	G. BALDONADO	SIGNATURE							
					REVIEWED								
					M.WHITE								
				CONTRACTOR:									



TYPE 1 END PLATE
NTS



TYPE 2 END PLATE
NTS

TYPE 1 END PLATE											
DN	OD (mm)	L (mm)	PN16			PN21			PN35		
			Ts (mm)	Tp (mm)	Tw (mm)	Ts (mm)	Tp (mm)	Tw (mm)	Ts (mm)	Tp (mm)	Tw (mm)
100	114	350	4.8	8	6	4.8	10	6	4.8	12	6
150	168	350	5	12	7	5	12	7	5	16	7
200	219	350	5	16	7	5	16	7	5	20	7
250	273	350	5	20	7	5	20	7	5	25	7
300	324	350	4.5	20	6	4.5	25	6	5	32	8
350	356	400	4.5	25	6	4.5	25	6	5	32	8
400	406	450	4.5	25	6	4.5	32	6	6	40	10
450	457	500	4.5	32	6	4.5	32	7	8	40	11
500	508	550	4.5	32	6	4.5	40	7	8	50	12
550	559	600	4.5	40	6	5	40	8	8	50	13
600	610	650	4.5	40	7	6	50	9	8	60	14
650	660	700	4.5	40	7	6	50	9	9.5	60	15
700	711	750	5	50	8	6	50	10	9.5	70	16
750	762	800	5	50	8	8	60	11	9.5	70	17
800	813	900	6	50	9	7	60	11	12	70	19
900	914	1000	6	60	10	8	70	13	12*	80	21
1000	1016	1100	8	60	11	8	70	14	16*	90	23
1050	1067	1100	8	70	11	10	80	15	16*	100	24
1200	1219	1200	8	80	13	10	90	17	-	-	-
1400	1422	1400	10	90	17	12	100	22	-	-	-
1600	1626	1600	12	100	20	-	-	-	-	-	-

* ROLLED PLATE

TYPE 2 END PLATE								
DN	OD (mm)	L (mm)	PN16		PN21		PN35	
			Ts (mm)	Tp (mm)	Ts (mm)	Tp (mm)	Ts (mm)	Tp (mm)
600	610	650	4.5	40	6	40	8	60
650	660	700	4.5	40	6	50	9.5	60
700	711	750	5	50	6	50	9.5	60
750	762	800	5	50	8	50	9.5	70
800	813	900	6	50	7	60	12	70
900	914	1000	6	60	8	60	12*	80
1000	1016	1100	8	60	8	70	16*	80
1050	1067	1100	8	60	10	70	16*	90
1200	1219	1200	8	70	10	80	16*	100
1400	1422	1400	10	90	12	100	-	-
1600	1626	1600	12	90	16	100	-	-

* ROLLED PLATE

NOTES:

- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
- ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
- ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - GRADE 250 - THICKNESSES GREATER THAN 8mm.
- REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
- EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16 & TS 18 AS APPROPRIATE.
- PLATE USED FOR ROLLED PIPE AND END PLATE TO BE MINIMUM GRADE 300.
- LONGITUDINAL BUTT WELDS IN ROLLED PIPE SHALL BE FULL PENETRATION. PRIOR TO WELDING, COAT THE INSIDE FACE OF END PLATE TO A DISTANCE TO $2 \times T_s$ FROM THE PERIMETER IN ACCORDANCE WITH TS 15.
- FOR PIPE DIAMETERS DN600 OR LESS, FOLLOWING WELDING APPLY CEMENT MORTAR TO THE FACE ENSURING FULL COVERAGE IN ACCORDANCE WITH TS 0465. FOR PIPES GREATER THAN DN600 TREAT THE PERIMETER OF THE END PLATE AND THE EXPOSED INTERNAL PIPE STEEL IN ACCORDANCE WITH TS 15 THEN APPLY CEMENT MORTAR TO THE END OF THE PIPE AS SHOWN AND IN ACCORDANCE WITH TS 0465.
- ALL MATERIALS THAT MAY BE IN CONTACT WITH WATER SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.

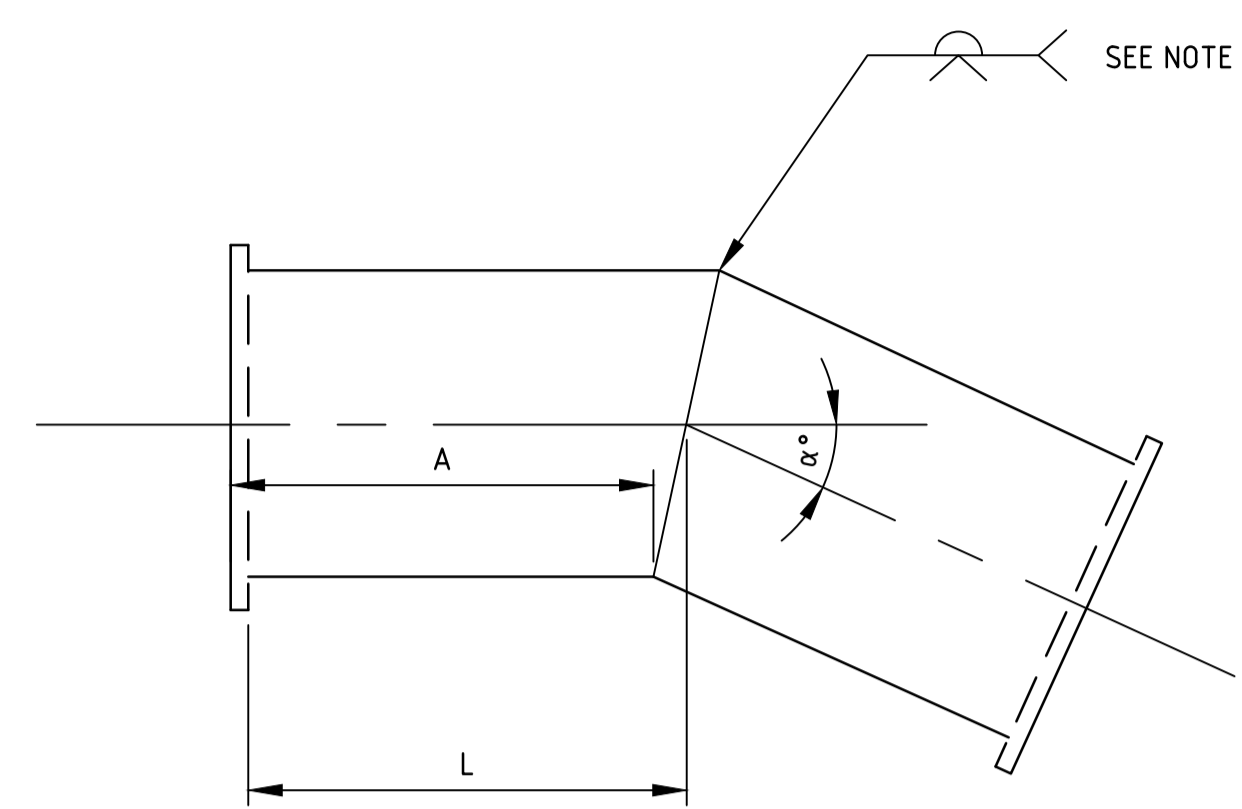
REVISION PANEL				DESIGN PANEL	
REV	DATE	DRN	DETAILS	DESIGNED	AUTHORISED
1.0	15/12/22	GB	ISSUED FOR USE	T.MZUNGU	H.HABIB
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0	

DESIGN PANEL	
DESIGNED	AUTHORISED
T.MZUNGU	H.HABIB
DRAWN	SIGNATURE
G. BALDONADO	
REVIEWED	
M.WHITE	
CONTRACTOR:	

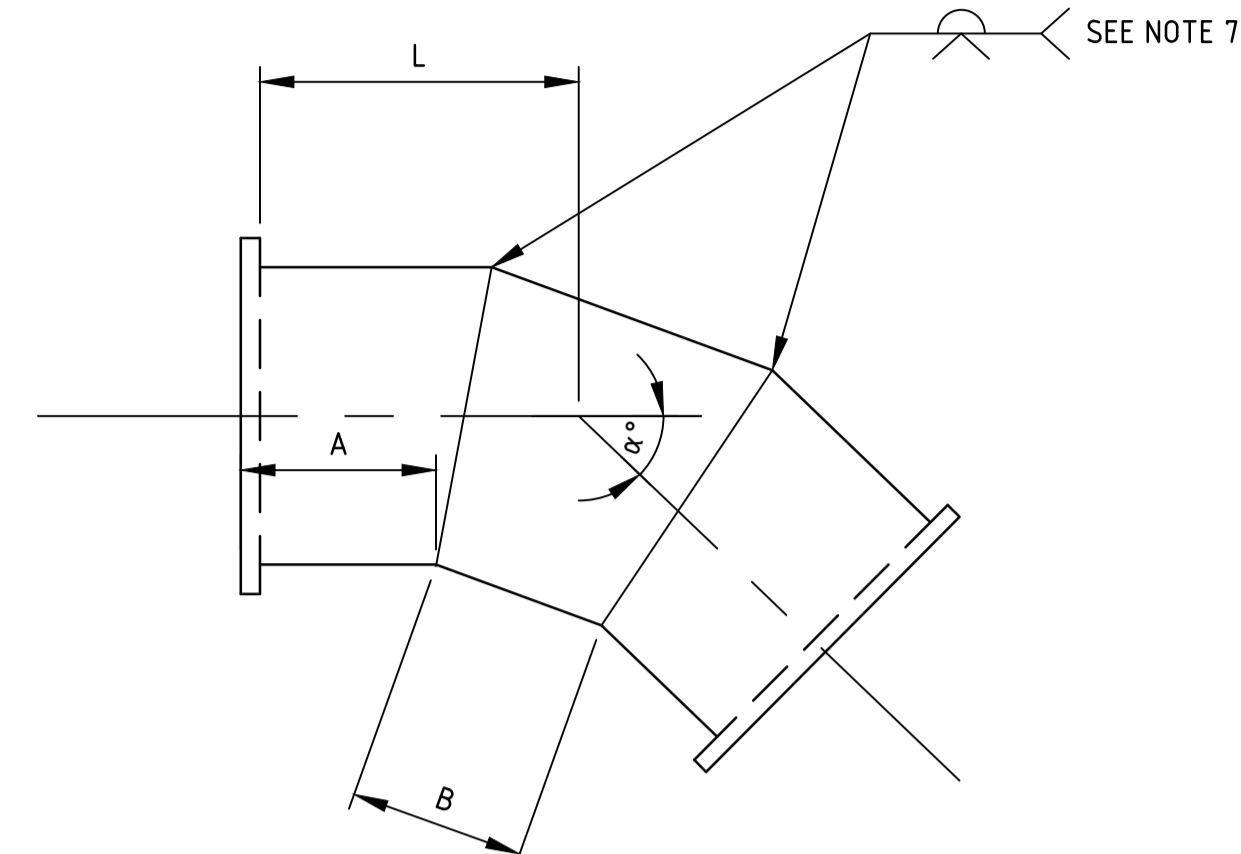


SA WATER STANDARD DRAWING
STANDARD PIPE DETAILS WELDED END PLATES
FOR MILD STEEL PIPES PN16, PN21, & PN35
CIVIL

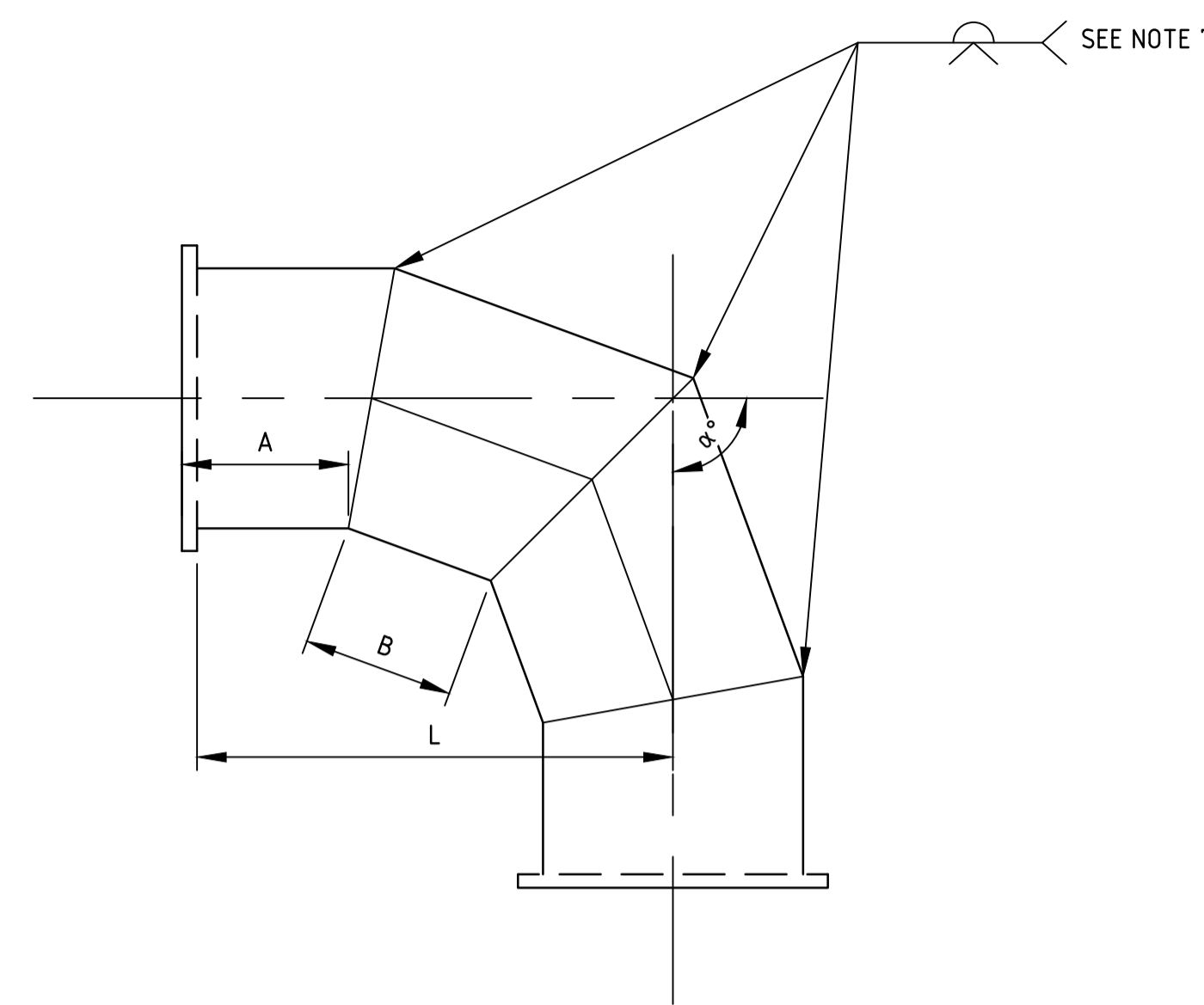
A1	TOTAL SHEETS:	1.0
	PROJECT No:	
	MAXIMO ID:	
	SUPERSEDES:	
	DRAWING NUMBER	STD-06-00017_01



1 CUT BEND ($\alpha \leq 22.5$)
NTS



2 CUT BEND ($22.5 < \alpha \leq 45$)
NTS



3 CUT BEND ($45 < \alpha \leq 90$)
NTS

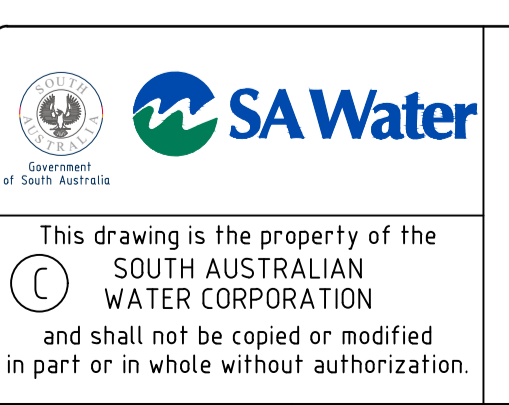
NOTES:

1. ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
2. ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
3. ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - a. GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - b. GRADE 250 - THICKNESSES GREATER THAN 8mm.
4. REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
5. EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16 & TS 18 AS APPROPRIATE.
6. LONGITUDINAL BUTT WELDS IN ROLLED PIPE SHALL BE FULL STRENGTH.
7. INTERNAL BACKING WELD FOR PIPES DN600 OR GREATER.
8. ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.

NOMINAL SIZE	OUTSIDE DIAMETER	DIM 'A'		DIM 'B'	1 & 2 CUT									3 CUT									NOMINAL SIZE							
		PLAIN	FLANGED		MIN THK STD PIPE (mm)			MINIMUM THICKNESS OF ROLLED PLATE (mm)						MIN THK STD PIPE (mm)			MINIMUM THICKNESS OF ROLLED PLATE (mm)													
					PN16	PN21	PN35	PN16		PN21		PN35		PN16	PN21	PN35	PN16		PN21		PN35									
DN	(mm)	(mm)	(mm)	(mm)	PN16	PN21	PN35	G250	G300	G350	G250	G300	G350	G250	G300	G350	PN16	PN21	PN35	G250	G300	G350	G250	G300	G350	G250	G300	G350	DN	
100	114	200	100	100																									100	
150	168	200	100	100																										150
200	219	200	100	100																										200
250	273	200	100	100																										250
300	324	200	100	100																										300
350	356	200	100	100																										350
400	406	300	200	200																										400
450	457	300	200	200																										450
500	508	300	200	200																										500
550	559	300	200	200																										550
600	610	300	200	200																										600
650	660	300	200	200																										650
700	711	300	200	200																										700
750	762	300	200	200																										750
800	813	300	200	200																										800
900	914	300	200	200																										900
1000	1016	300	200	200																										1000
1200	1219	300	200	200																										1200
1400	1422	400	300	300																										1400
1600	1626	400	300	300																										1600
1800	1829	400	300	300																										1800
2000	2032	400	300	300																										2000
2200	2235	400	300	300																										2200
2400	2438	400	300	300																										2400

REVISION PANEL				DETAILS		APR'D	CURRENT REV	17/09/24
REV	DATE	DRN						
2.0	17/09/24	SS	DETAILS UPDATED. RE-ISSUED FOR USE			MW		
1.0	15/12/22	GB	ISSUED FOR USE			MW		
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 2.0				

DESIGN PANEL		AUTHORISED		17/09/24	
DESIGNED	T.MZUNGU	SIGNATURE	H.HABIB		
DRAWN	G. BALDONADO	SIGNATURE			
REVIEWED	M.WHITE	SIGNATURE			
CONTRACTOR:					



SA WATER STANDARD DRAWING
STANDARD BENDS FOR MSCL PIPES
CIVIL

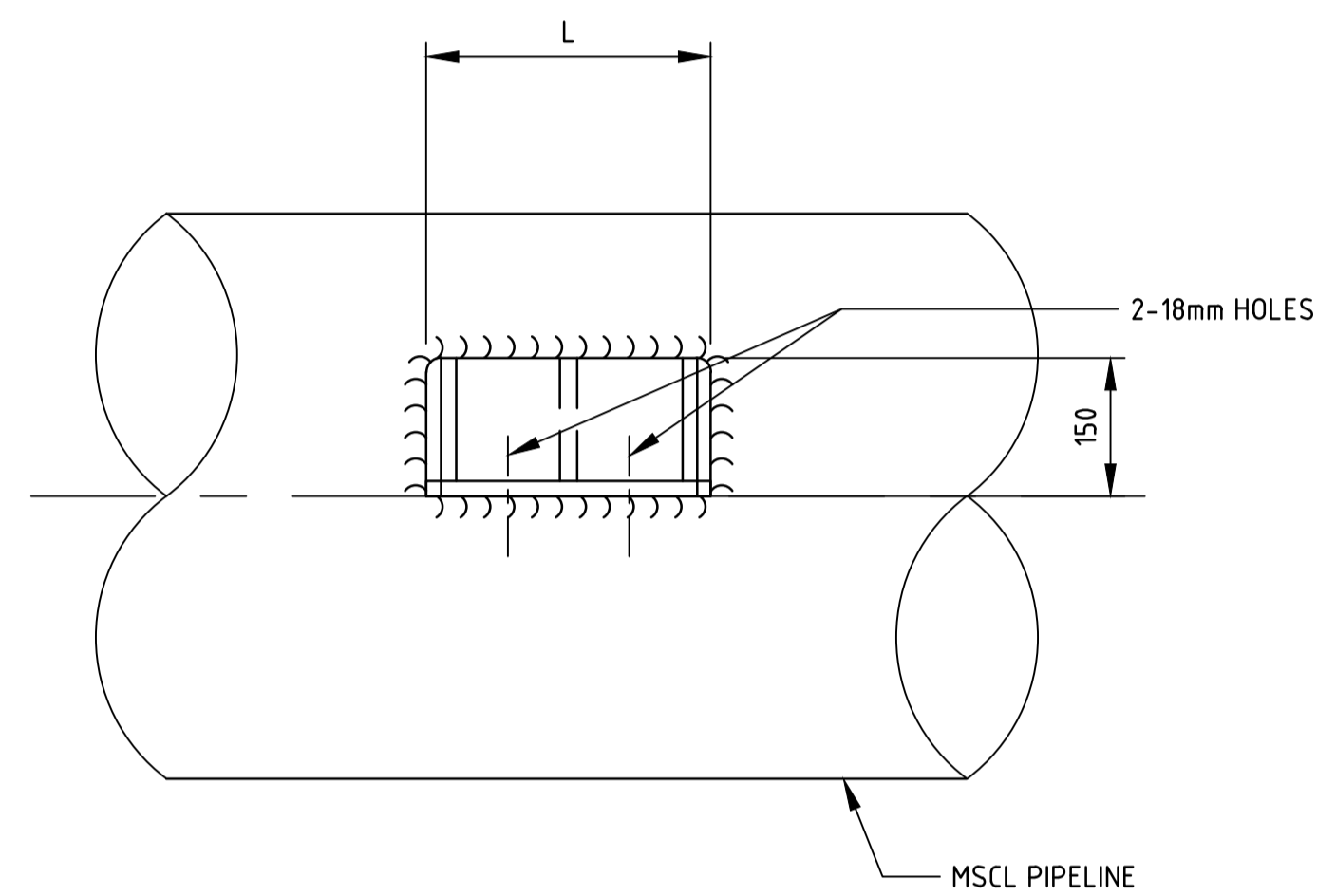
A1	TOTAL SHEETS:	2.0
	PROJECT No:	
	MAXIMO ID:	
	SUPERSEDES:	
	DRAWING NUMBER	STD-06-00018_01

NOTES:

1. ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
2. EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
3. ALL NUTS & BOLTS TO BE GRADE 8.8 TO AS 4291.1 AND HOT DIP GALVANIZED IN ACCORDANCE WITH AS/NZS 1214.
4. ALL PLATE TO BE MINIMUM GRADE 300.
5. BREAK ALL EXPOSED EDGES AND ROUND ALL EXPOSED CORNERS.

CLEATS TO BE USED TO ATTACH PIPES TO ABOVE GROUND SUPPORTS.

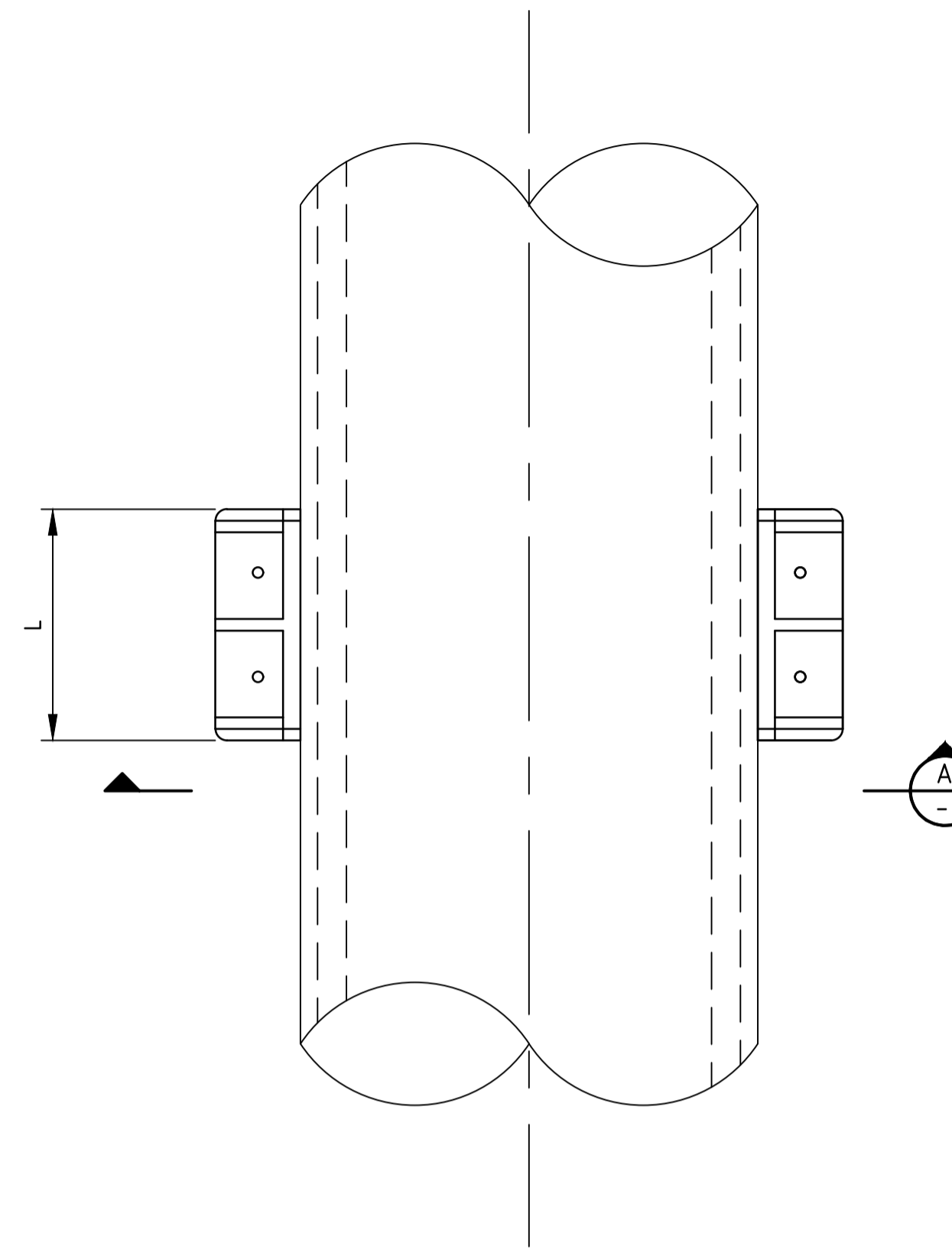
CLEATS SHALL NOT BE USED TO TRANSFER LOADS TO THRUST RESTRAINTS.



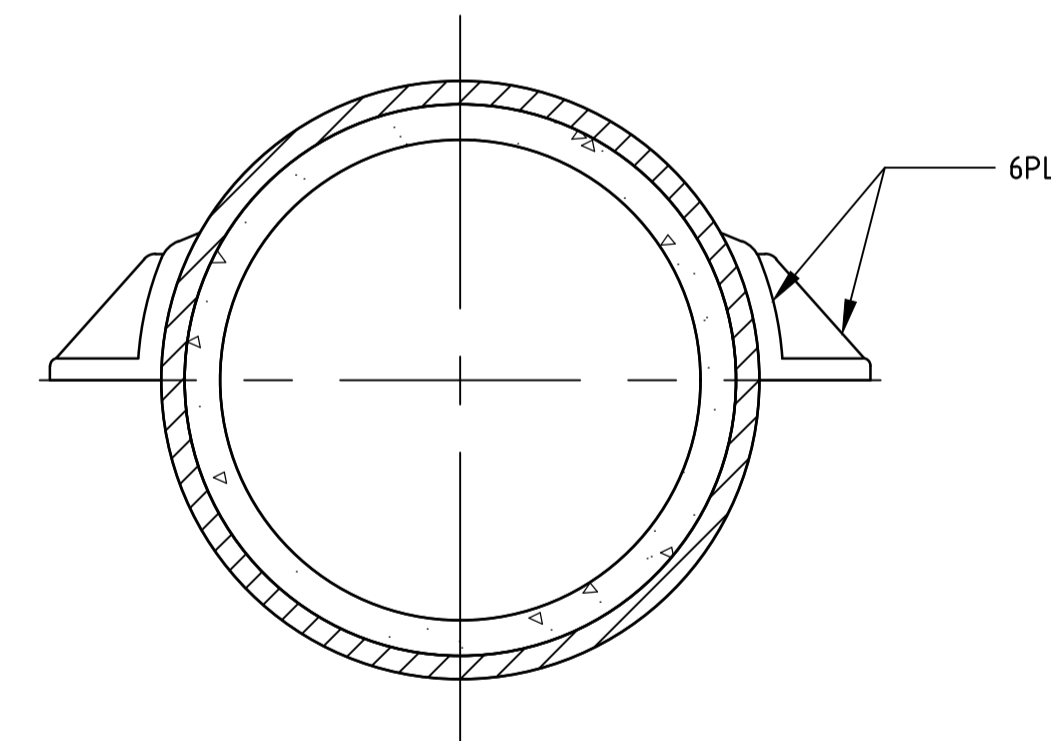
LOCATING / STABILITY CLEAT FOR ABOVE GROUND PIPELINES ELEVATION VIEW

NTS
NOTE: 2 CLEATS PER SET

NOMINAL PIPE DIAMETER	LENGTH OF CLEAT, L mm
≤ 600	150
> 600	270



PLAN VIEW
NTS



A SECTION
SCALE 1:10

REVISION PANEL				DESIGN PANEL				SA WATER STANDARD DRAWING		A1	
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	AUTHORISED	PROJECT No:		TOTAL SHEETS:	
2.0	17/09/24	SS	DETAILS UPDATED. RE-ISSUED FOR USE	MW	M.WHITE	T.MZUNGU	H.HABIB	MAXIMO ID:		2.0	
1.0	15/12/22	GB	ISSUED FOR USE	MW		G. BALDONADO		SUPERSEDES:		REVISION	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 2.0				DRAWING NUMBER		STD-06-00019_01	
CONTRACTOR:								SA Water		CIVIL	



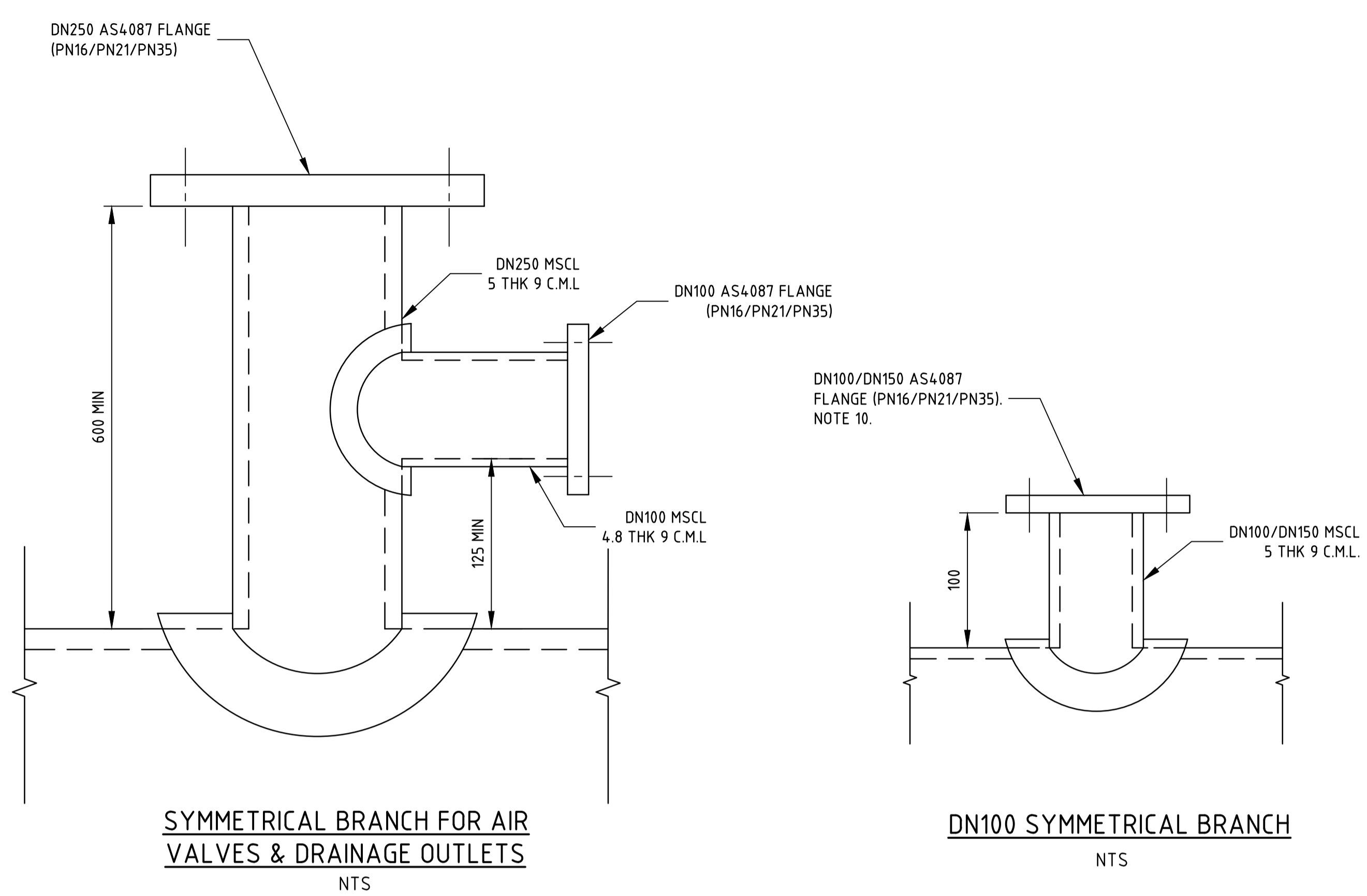
SA WATER STANDARD DRAWING
LOCATING / STABILITY CLEAT

CIVIL

A1 TOTAL SHEETS: 2.0

MAXIMO ID:

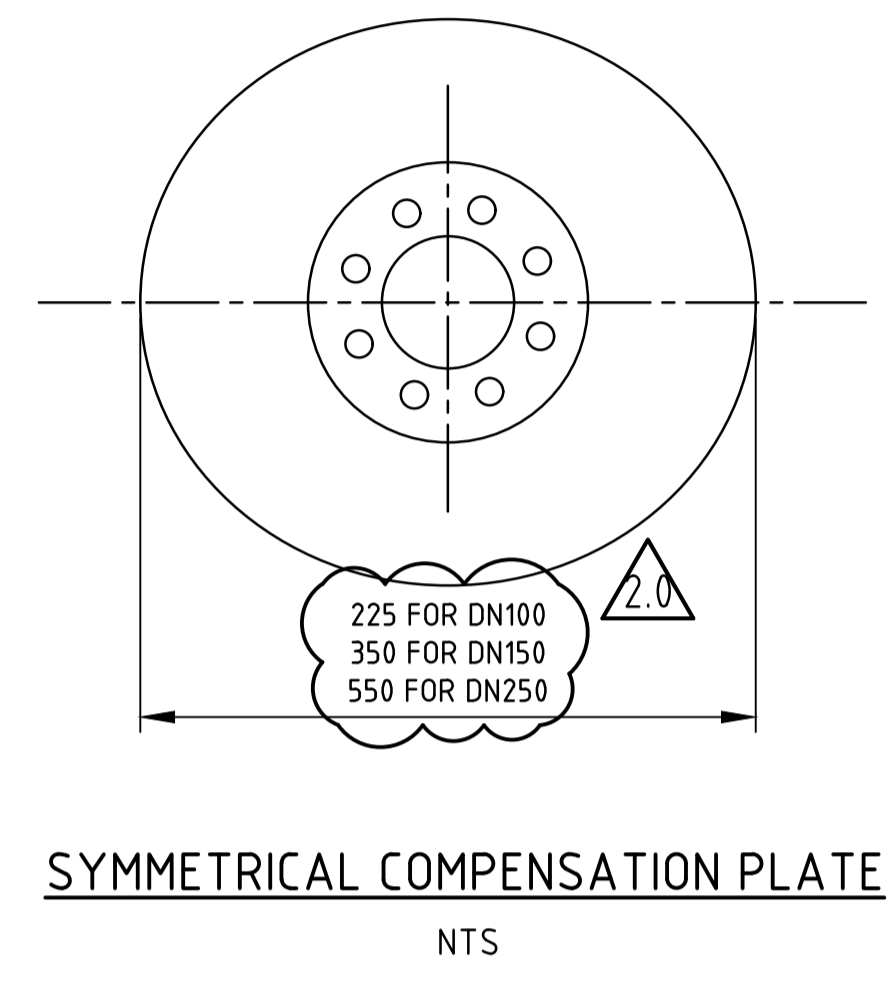
DRAWING NUMBER
STD-06-00019_01



SYMMETRICAL BRANCH FOR AIR VALVES & DRAINAGE OUTLETS
NTS

DN100 SYMMETRICAL BRANCH
NTS

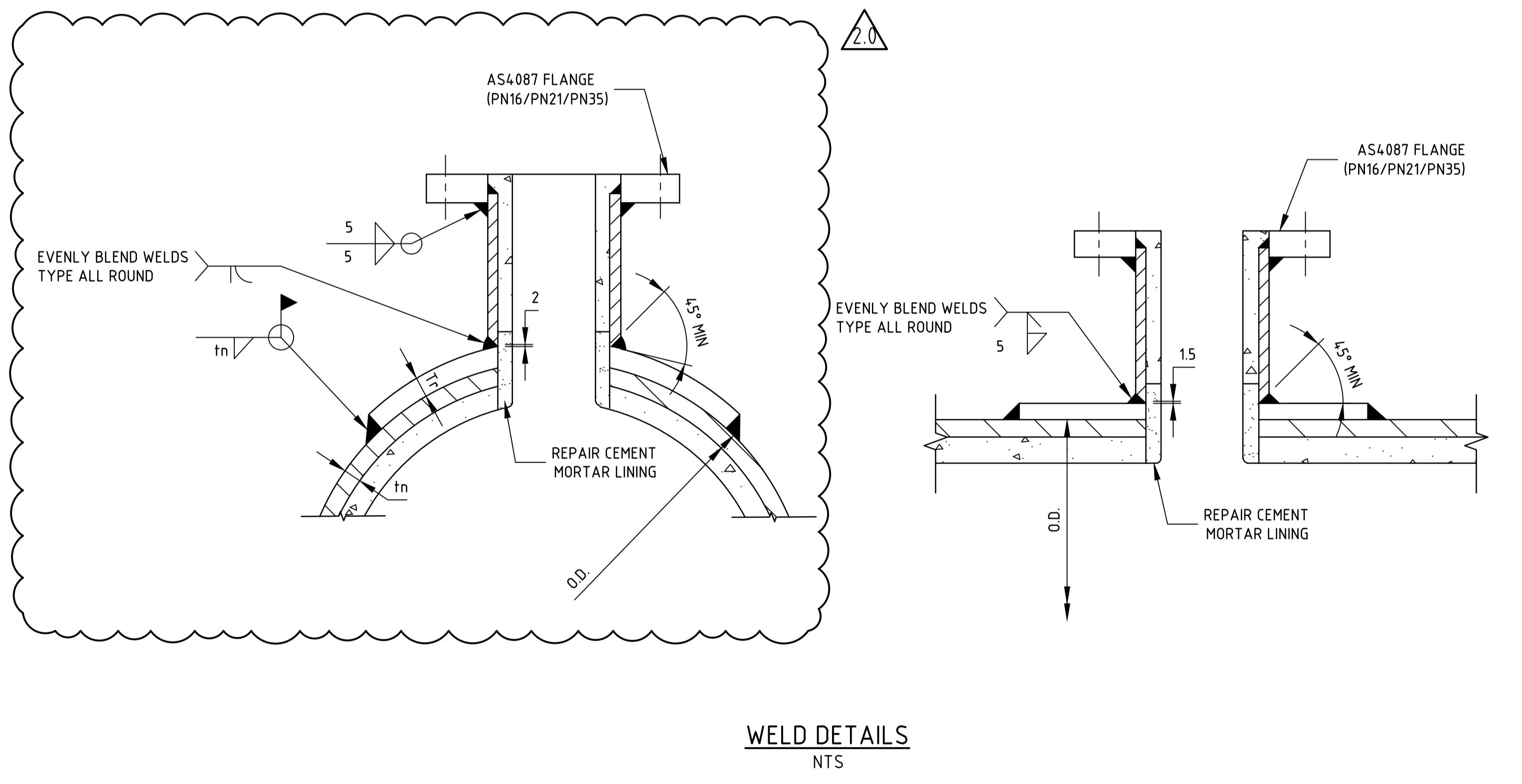
THESE DETAILS SHALL BE USED FOR INSTALLATION ON EXISTING IN-SITU PIPES ONLY. THEY SHALL NOT BE USED FOR NEW INSTALLATIONS.



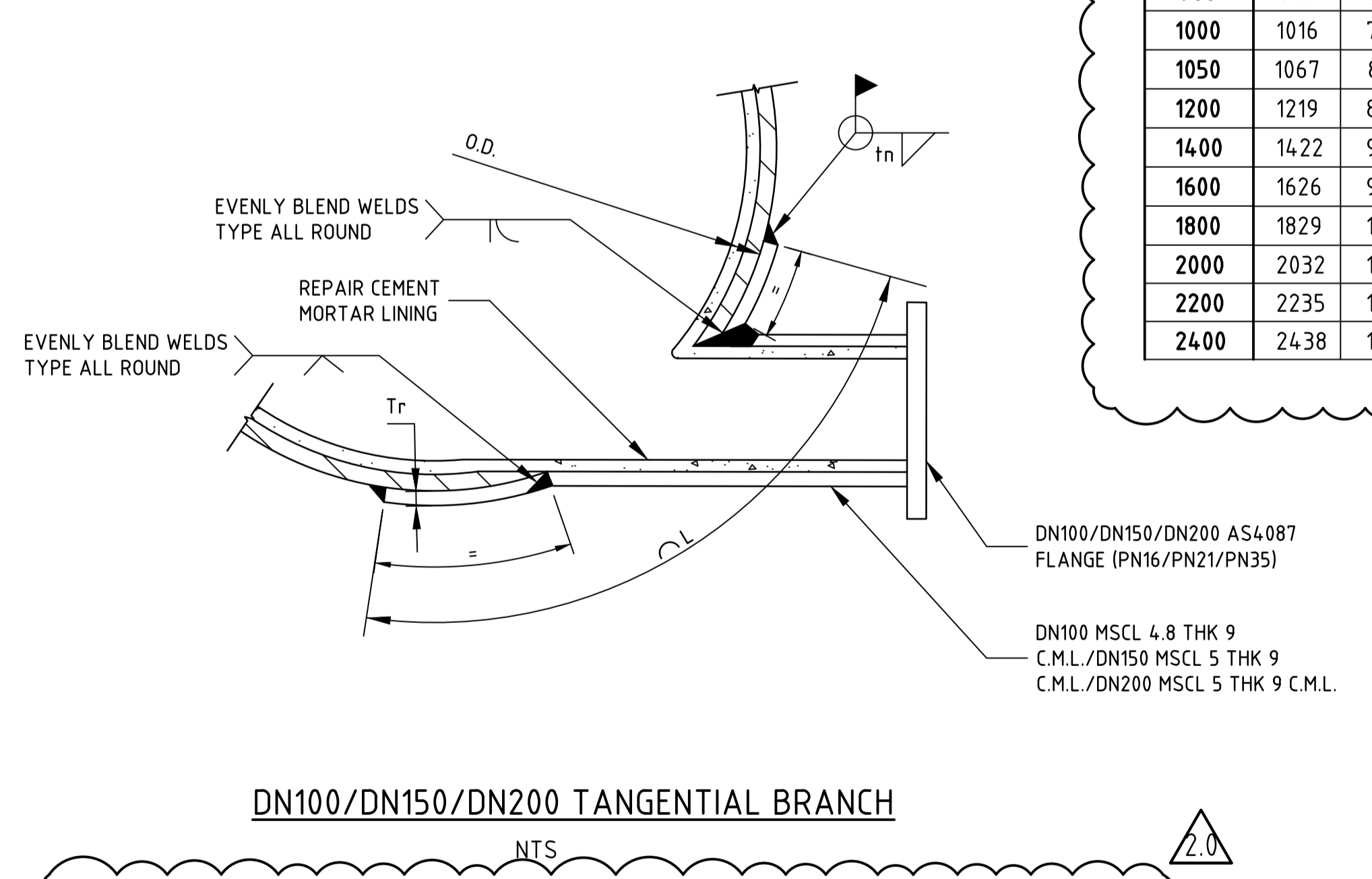
SYMMETRICAL COMPENSATION PLATE
NTS

- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
 - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
 - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
 - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
 - GRADE 250 - THICKNESSES GREATER THAN 8mm.
 - FLANGE TO BE FABRICATED IN ACCORDANCE WITH AS/NZS 4087.
 - REPAIR CEMENT MORTAR LINING IN ACCORDANCE WITH TS 0465.
 - EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
 - REFER TO DRG 4004-00001-30 AND 31 FOR FLANGE ISOLATION JOINT DETAILS WHERE DISSIMILAR METALS ARE USED.
 - ALL NUTS & BOLTS TO BE GRADE 8.8 TO AS 4291.1 AND HOT DIP GALVANIZED IN ACCORDANCE WITH AS/NZS 1214.
 - ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.
 - DN100 TO DN200 TAPER REQUIRED WHERE BRANCH USED AS FIRE PLUG OFF-TAKE.
 - COMPENSATION PLATES TO BE FABRICATED FROM G350 PLATE.

MAIN PIPE DN	O.D. (mm)	SCOUR DIA			THICKNESS OF COMPENSATION PLATE Tr (mm)				
		DN100	DN150	DN200	PN16	PN21	PN35		
250	273	-	-	-	5	5	5		
300	324	-	-	-			6	6	
350	356	530	-	-				8	
400	406	555	-	-		6	10		
450	457	580	-	-			12		
500	508	605	775	-	8	10	16		
550	559	625	800	-			8	20	20
600	610	650	825	-					10
650	660	670	850	1015	12	16	32		
700	711	690	875	1040			16	20	40
750	762	710	895	1065	20	25			
800	813	725	920	1090			20	25	
900	914	760	960	1140					
1000	1016	795	1005	1185					
1050	1067	815	1025	1205					
1200	1219	860	1080	1270					
1400	1422	920	1150	1350					
1600	1626	975	1215	1425					
1800	1829	1025	1280	1495					
2000	2032	1075	1340	1560					
2200	2235	1120	1395	1625					
2400	2438	1165	1450	1685					



WELD DETAILS
NTS



DN100/DN150/DN200 TANGENTIAL BRANCH
NTS

NOTE: COMPENSATION PLATE DIMENSIONS MAY NEED TO BE INCREASED (OR SELECT NEXT LARGER DIAMETER SCOUR PLATE) FOR IN-FIELD REPLACEMENT OF EXISTING SCOURS TO SUIT EXISTING PIPE CUTOFF.

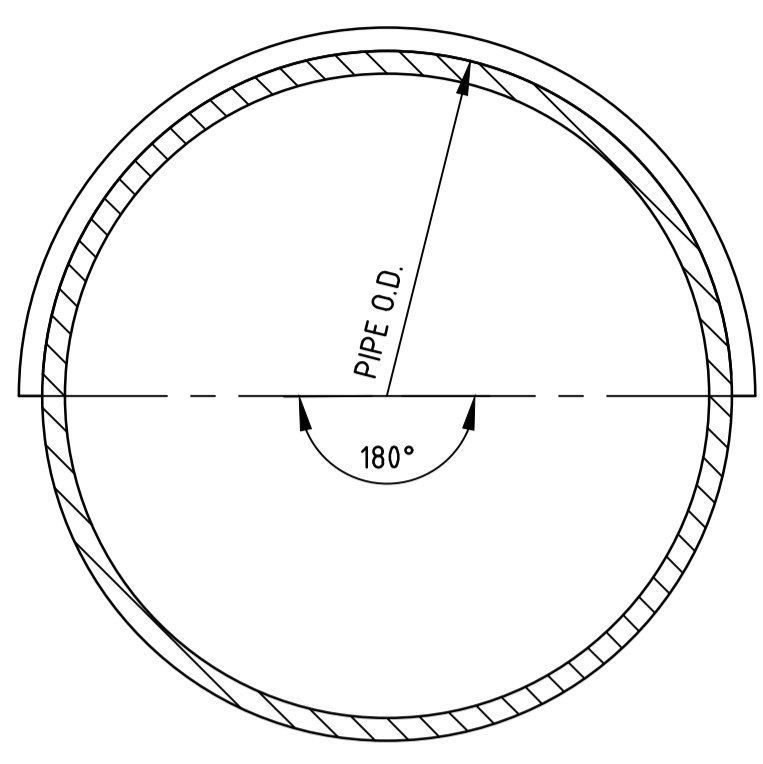
REVISION PANEL				DESIGN PANEL			
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	AUTHORISED
2.0	17/09/24	SS	DETAILS UPDATED. RE-ISSUED FOR USE	MW	M.WHITE	T.MZUNGU	H.HABIB
1.0	15/12/22	GB	ISSUED FOR USE	MW		G. BALDONADO	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 2.0			

SA WATER STANDARD DRAWING
SITE INSTALLED REPAIR FOR BRANCH AND SCOURS

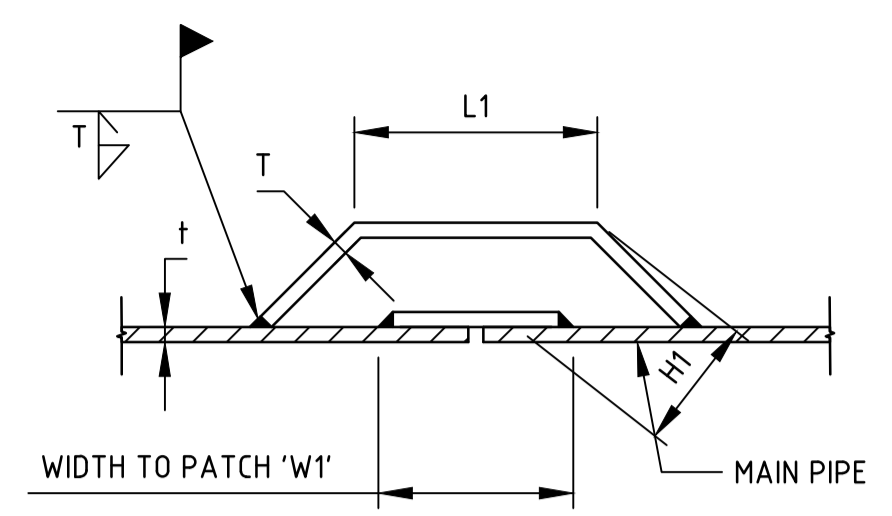
CIVIL

SA Water
This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.

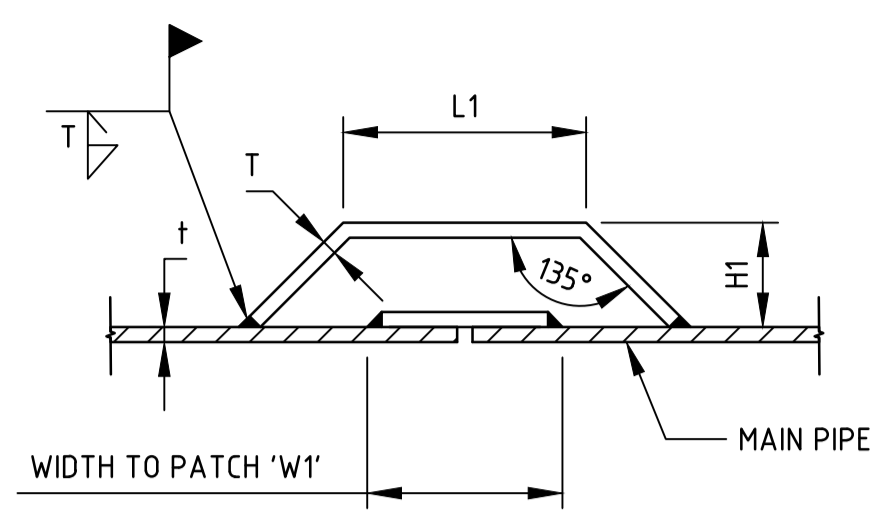
A1 TOTAL SHEETS: 2.0
PROJECT No: MAXIMO ID:
SUPERSEDES:
DRAWING NUMBER
STD-06-00020_01



TOP BAND
NTS



TOP BAND
NTS



BOTTOM BAND
NTS

TYPE 1 PATCH BAND

TYPE 1 PATCH	
THICKNESS OF PATCH BAND T (mm)	HEIGHT OF PATCH BAND H1 (mm)
5	20
6	30

TYPE 1 PATCH	
WIDTH OF BREACH W1 (mm)	WIDTH OF PATCH L1 (mm)
≤ 150	200
150 < W1 ≤ 250	300

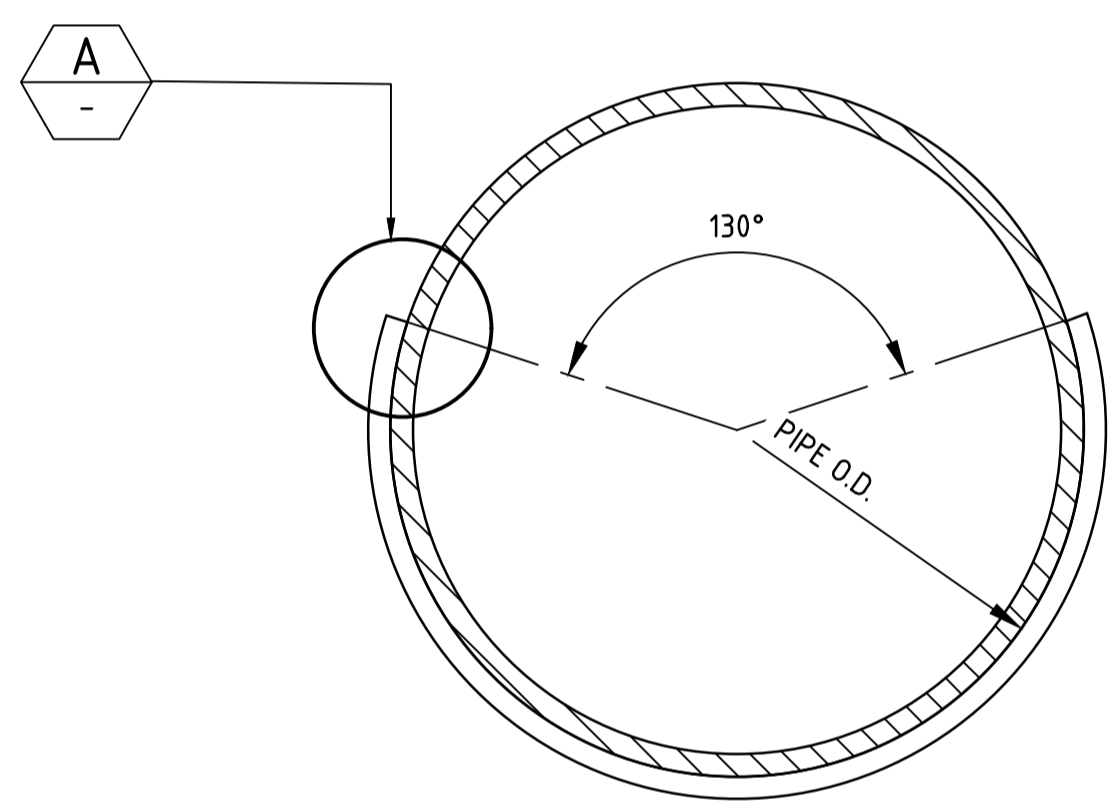
TYPE 2 PATCH	
DEPTH OF EXISTING BAND D2 (mm)	HEIGHT OF PATCH BAND H2 (mm)
≤ 10	20
10 < D2 ≤ 25	40
25 < D2 ≤ 35	50
35 < D2 ≤ 45	60

MAIN PIPE		MINIMUM BAND THICKNESS T		
DN	OD (mm)	PN16 (mm)	PN21 (mm)	PN35 (mm)
DN100	114	5	5	5
DN150	168	5	5	5
DN200	219	5	5	5
DN250	273	5	5	5
DN300	324	5	5	5
DN350	356	5	5	5
DN400	406	5	5	5
DN450	457	5	5	6
DN500	508	5	5	6
DN550	559	5	5	N/A
DN600	610	5	5	
DN650	660	5	5	
DN700	711	5	6	
DN750	762	5	6	
DN800	813	5	6	
DN900	914	5	N/A	
DN1000	1016	6		
DN1050	1067	6		

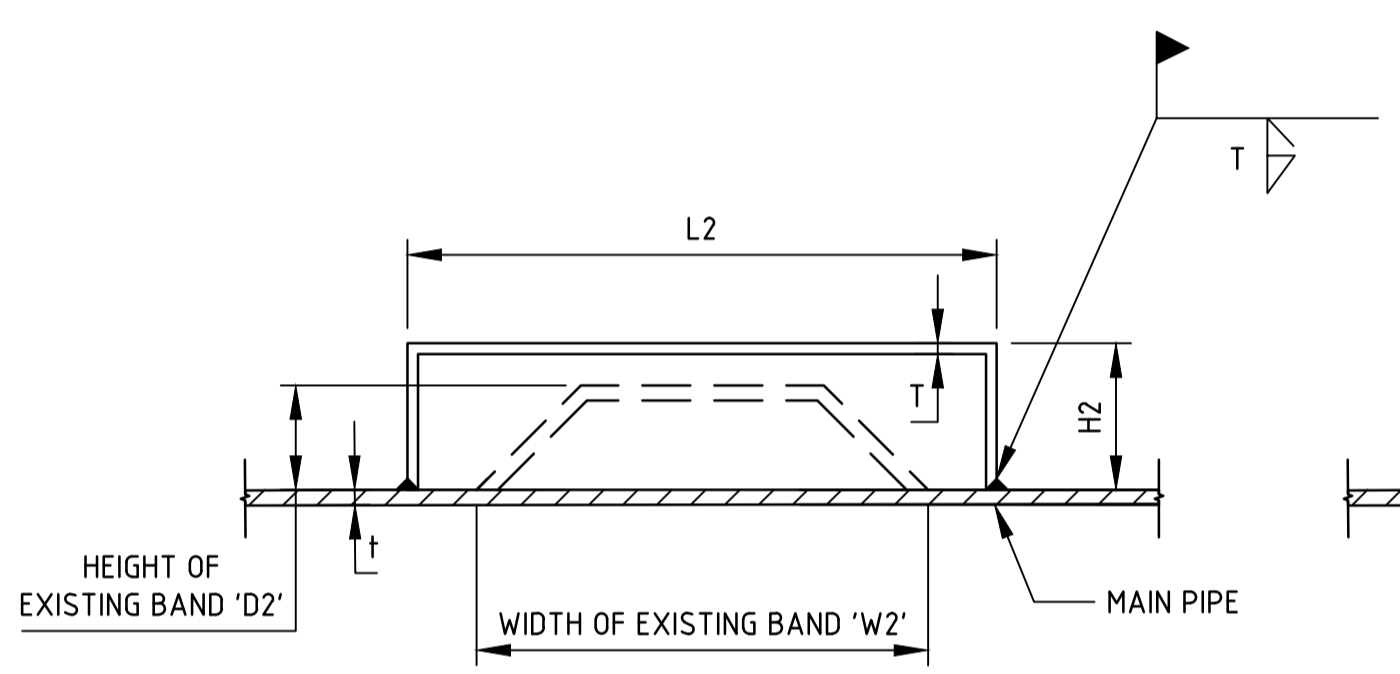
TYPE 2 PATCH	
WIDTH OF EXISTING BAND W2 (mm)	WIDTH OF PATCH BAND L2 (mm)
≤ 100	150
100 < W2 ≤ 200	300
200 < W2 ≤ 300	400

TYPE 3 PATCH	
THICKNESS OF PATCH BAND T (mm)	HEIGHT OF PATCH BAND H3 (mm)
5	50
6	55

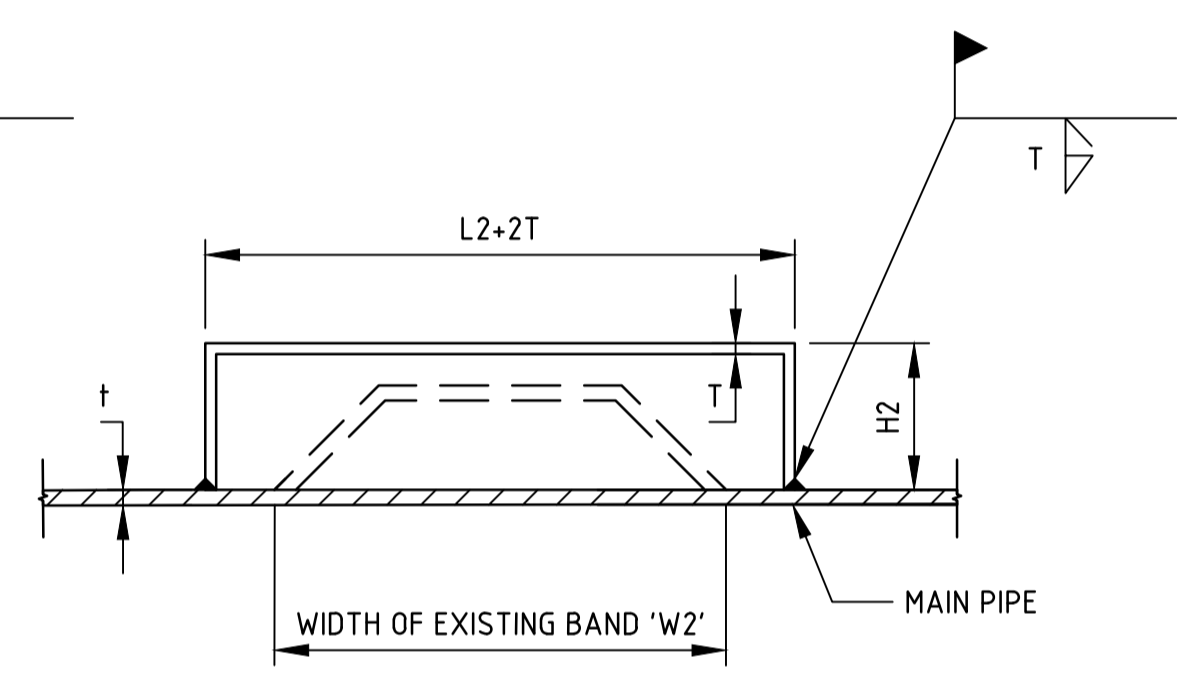
TYPE 3 PATCH	
WIDTH OF EXISTING BAND W3 (mm)	PATCH BAND LEG LENGTH L3 (mm)
≤ 150	150
150 < W2 ≤ 200	200
200 < W2 ≤ 300	250



BOTTOM BAND
NTS

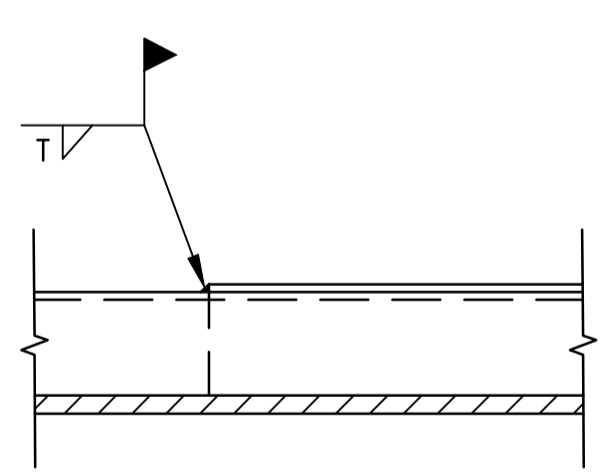


TOP BAND
NTS

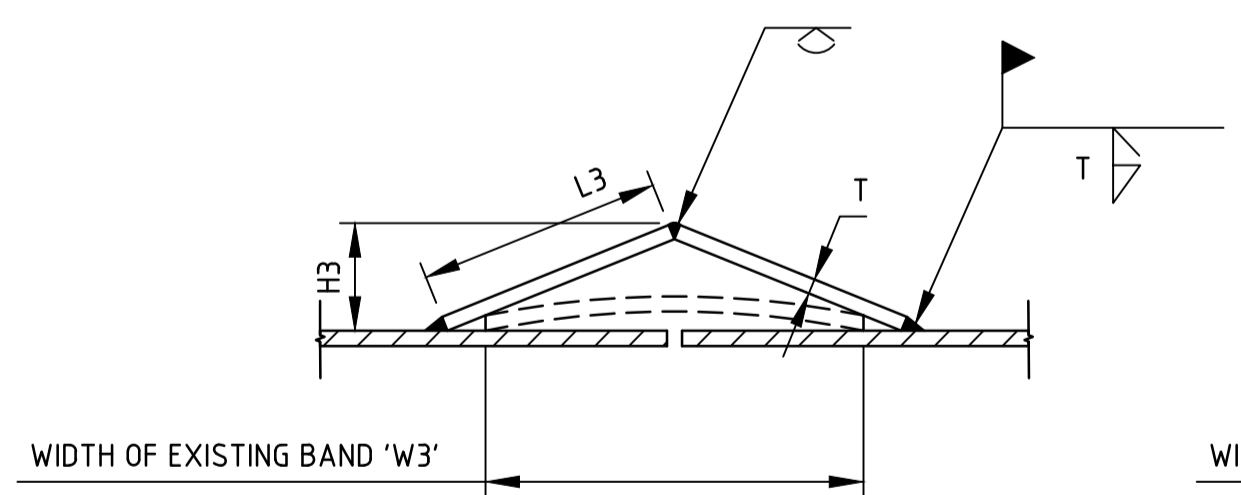


BOTTOM BAND
NTS

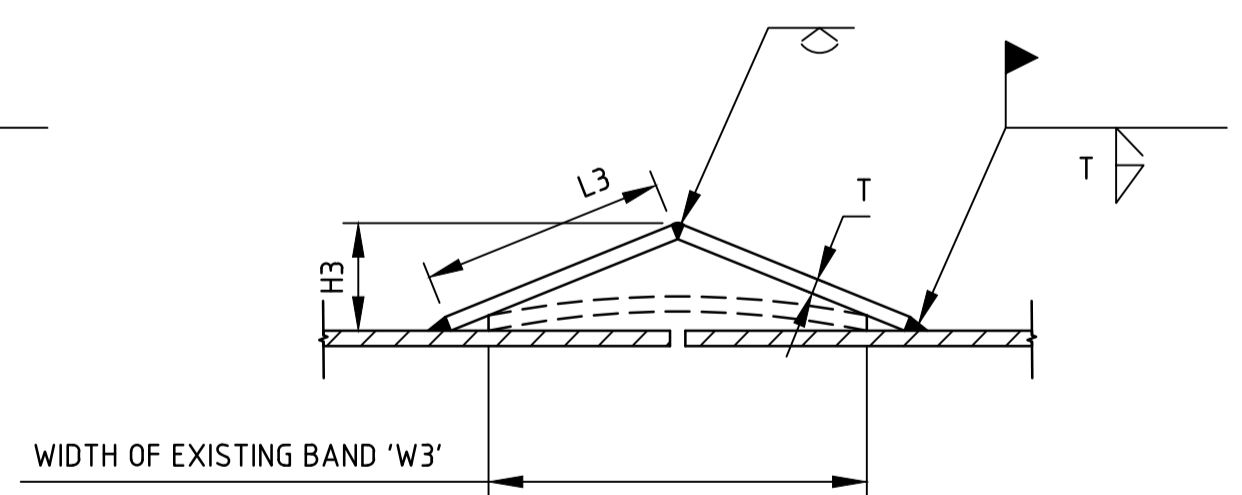
TYPE 2 PATCH BAND



**PATCH BAND LAP
DETAIL**
NTS



TOP BAND
NTS



BOTTOM BAND
NTS

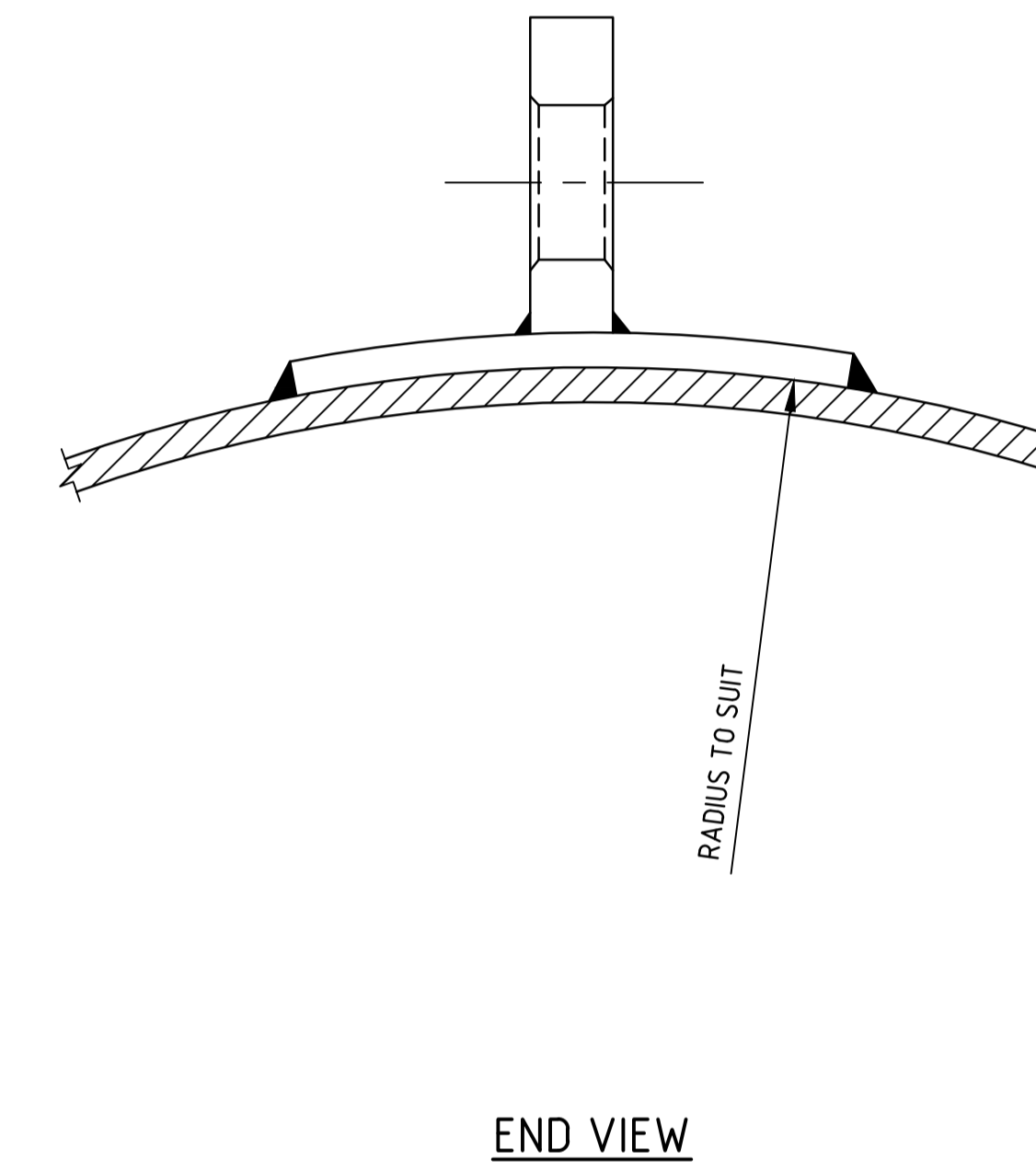
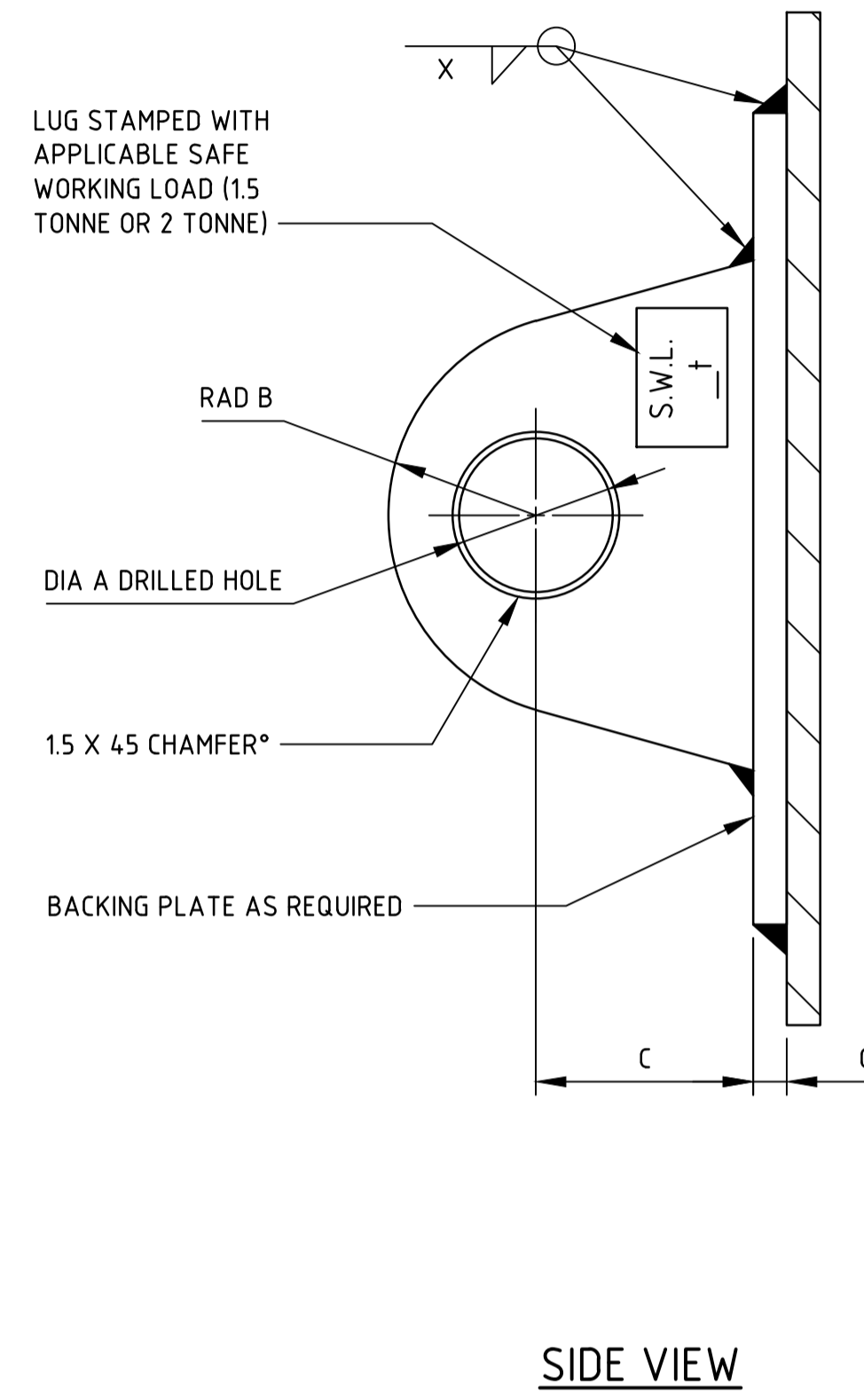
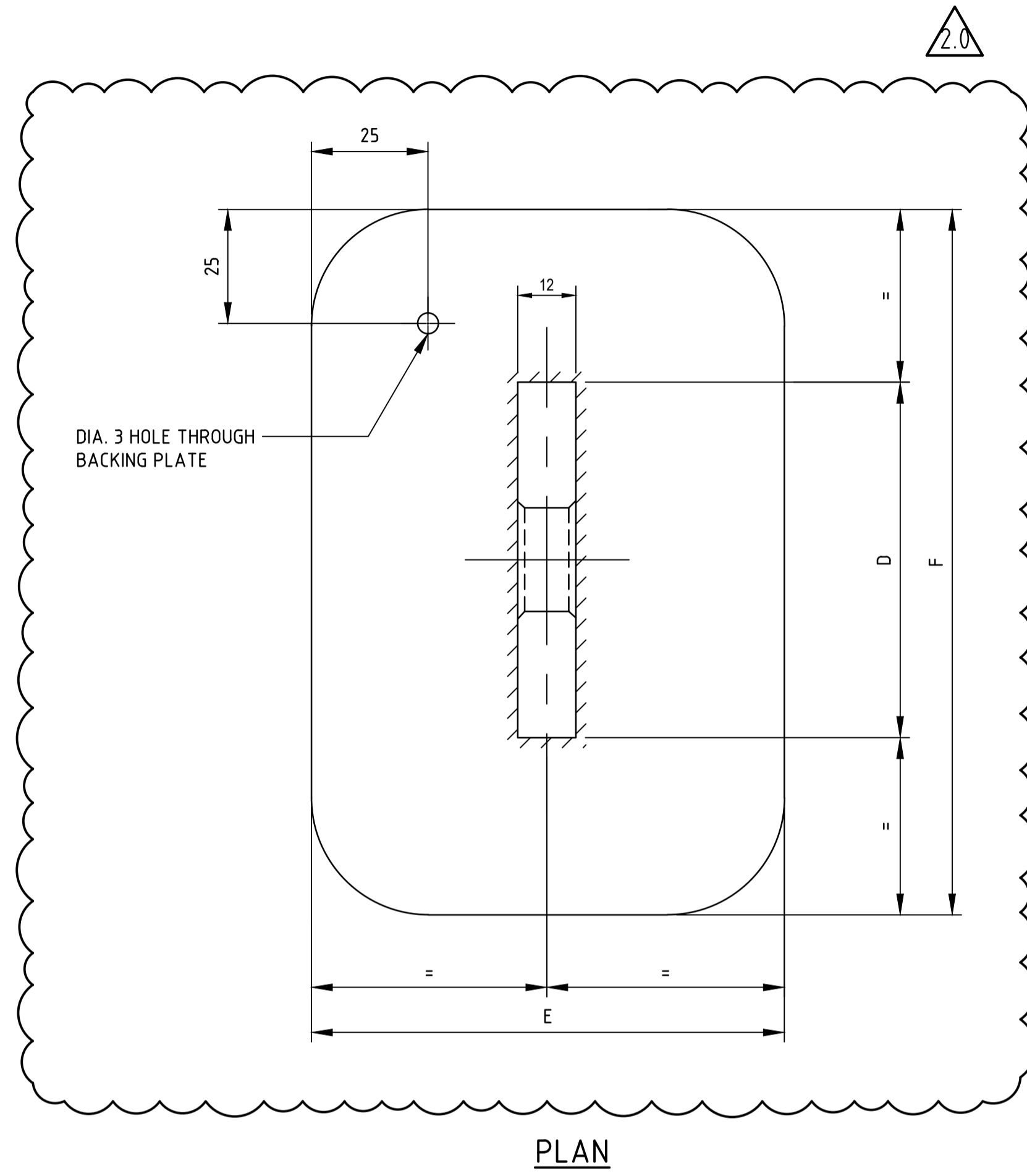
TYPE 3 PATCH BAND

THESE DETAILS SHALL BE USED FOR INSTALLATION ON EXISTING IN-SITU PIPES ONLY. THEY SHALL NOT BE USED FOR NEW INSTALLATIONS.

REVISION PANEL				DESIGN PANEL				SA WATER STANDARD DRAWING		A1 TOTAL SHEETS: 2.0	
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	17/09/24	AUTHORISED	17/09/24	SHT SIZE	PROJECT No:
2.0	17/09/24	SS	DETAILS UPDATED. RE-ISSUED FOR USE	MW	M.WHITE	T.MZUNGU	17/09/24	H.HABIB	17/09/24	MAXIMO ID:	
1.0	15/12/22	GB	ISSUED FOR USE	MW		G. BALDONADO	17/09/24			SUPERSEDES:	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 2.0				CONTRACTOR:		DRAWING NUMBER	
								SA Water		STD-06-00021_01	

NOTES:

1. ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
2. EXPOSED STEEL TO BE TREATED IN ACCORDANCE WITH TS 15, TS 16, & TS 18 AS APPROPRIATE.
3. ALL PLATE TO BE MINIMUM GRADE 300.
4. SAFE WORKING LOAD TO BE STAMPED ON LIFTING POINT.



S.W.L. (TONNES)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	T (mm)	X (mm)
1.50	22	30	35	75	100	150	6	12	6
2	24	35	40	100	140	200	8	16	6

REVISION PANEL				DESIGN PANEL				SA WATER STANDARD DRAWING LIFTING LUG		SA Water This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.		A1 TOTAL SHEETS: 2.0	
REV	DATE	DRN	APR'D	CURRENT REV AUTHORIZED	DESIGNED	AUTHORISED	SHT SIZE					PROJECT No:	REVISION
2.0	17/09/24	SS		M.WHITE	T.MZUNGU	H.HABIB							
1.0	15/12/22	GB			G.BALDONADO								
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 2.0				CIVIL		DRAWING NUMBER		STD-06-00023_01	