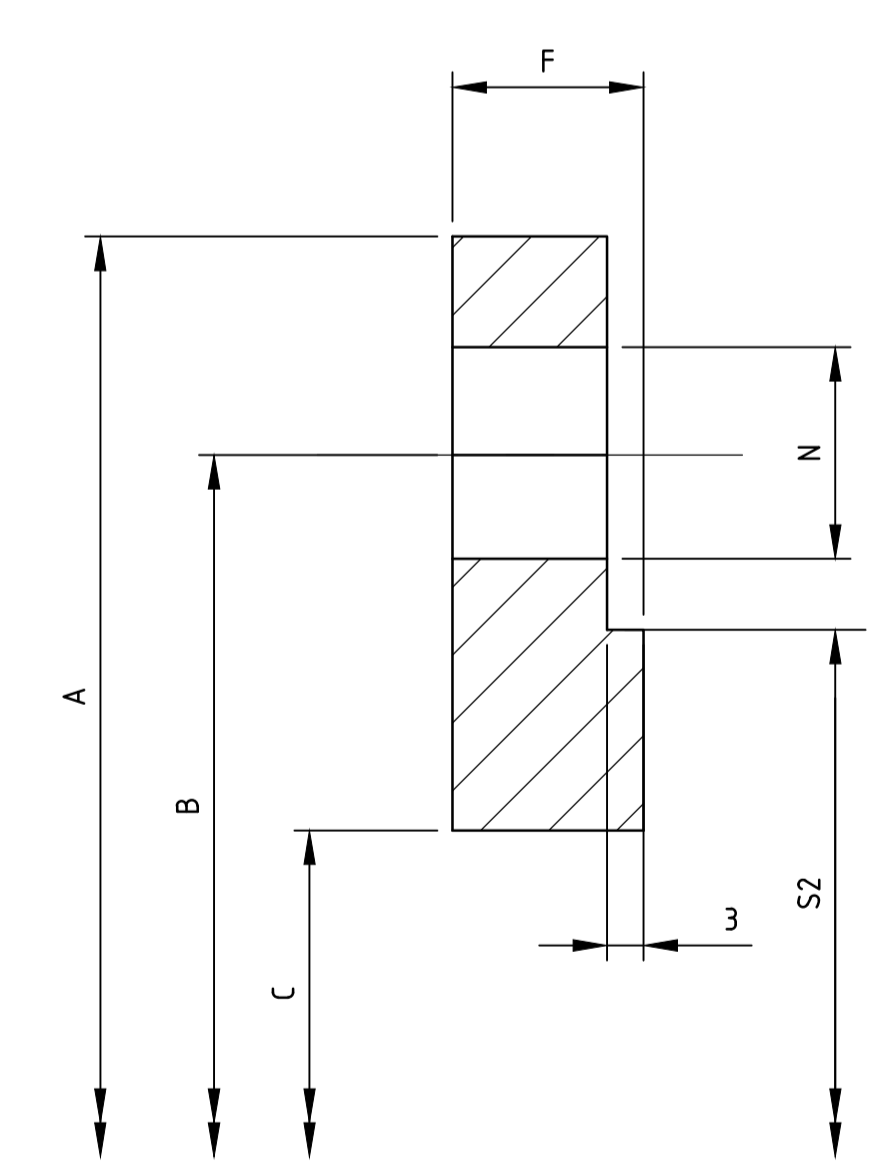
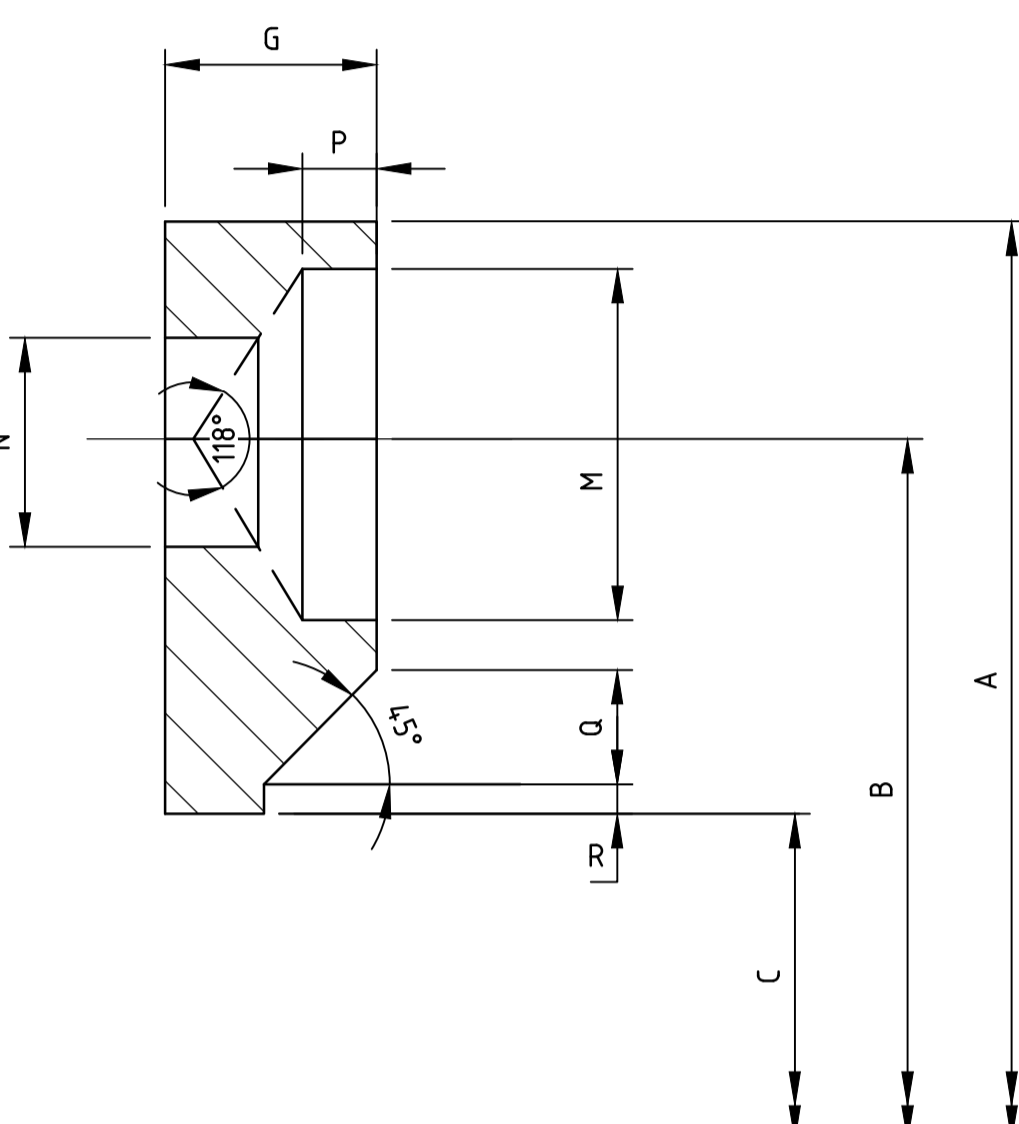
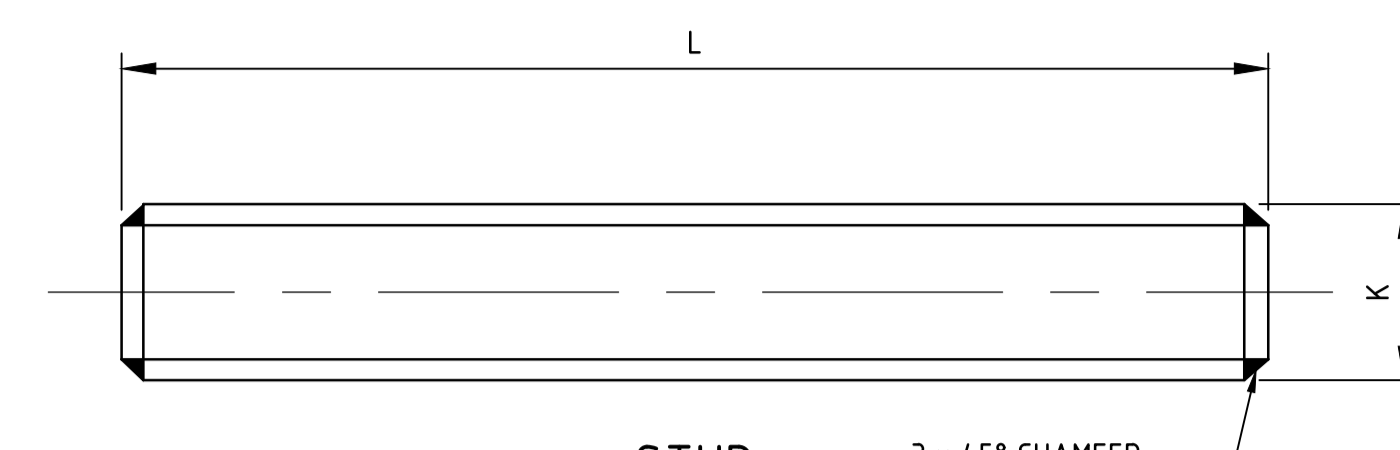
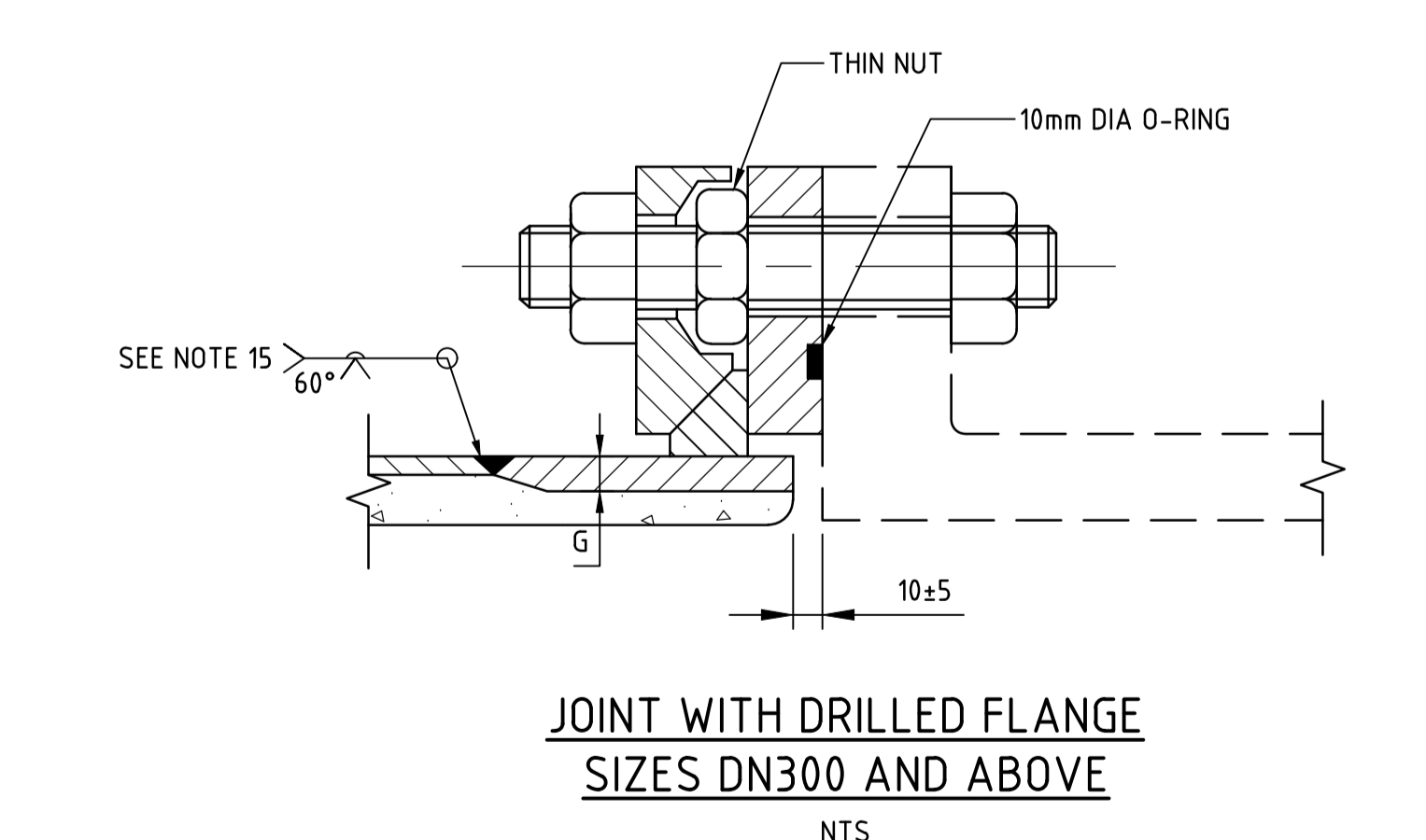
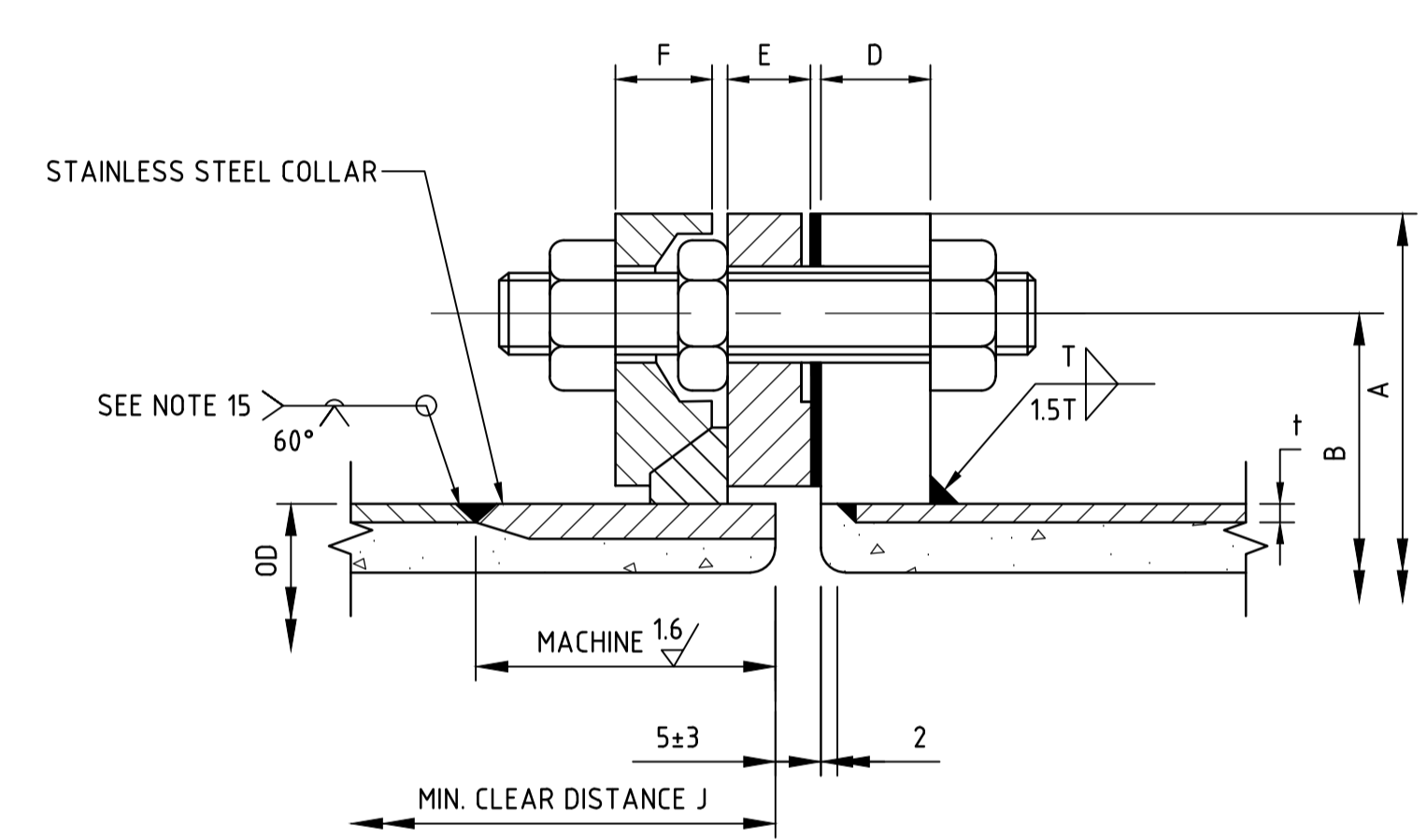
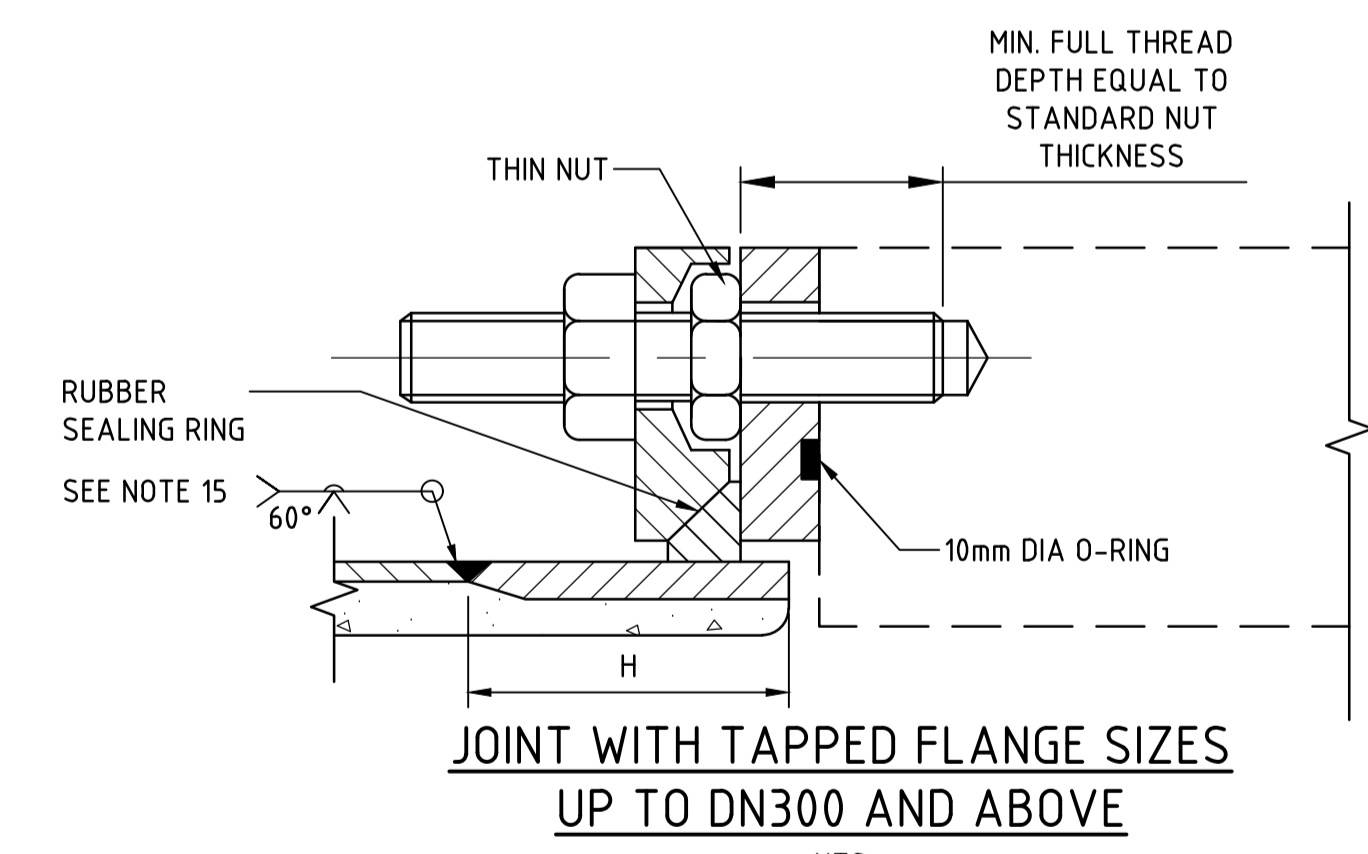
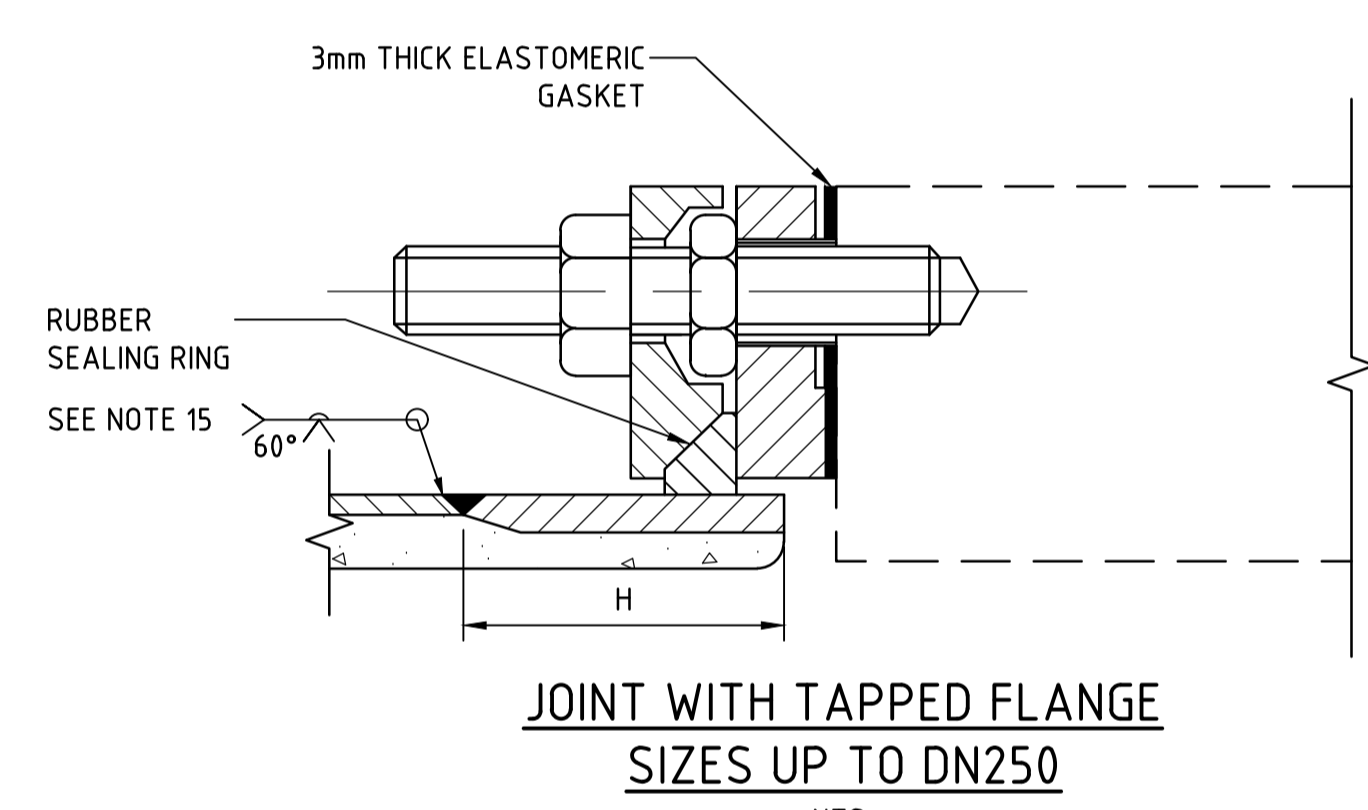
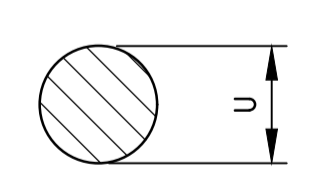
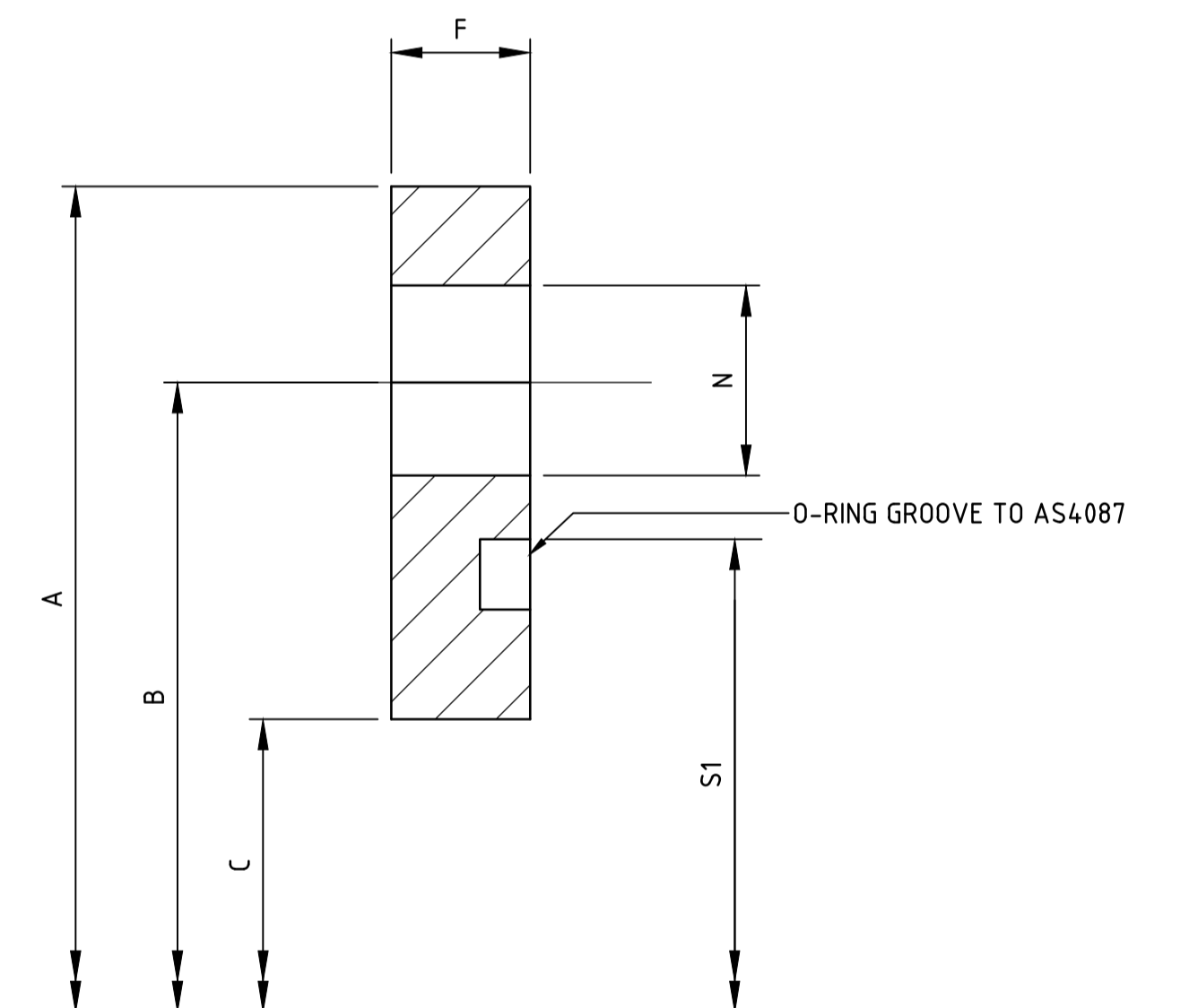


DN	O.D. (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (MIN) (mm)	H (mm)	J (mm)	K	L (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	R (mm)	S1 (mm)	S2 (mm)	T (mm)	U (mm)	NO. BOLTS	DN
80	89	185	146	91	11	11	20	4.5	100	130	M16	80	31	18	10	4	2	-	122	6	10	4	80
100	114	215	178	116	13	13	20	4.5	100	130	M16	80	31	18	10	4	2	-	154	6	10	4	100
150	168	280	235	171	13	13	20	4.5	100	130	M16	80	31	18	10	4	2	-	211	6	10	8	150
200	219	335	292	221	19	19	20	4.5	100	140	M16	90	31	18	10	4	2	-	268	6	10	8	200
250	273	405	356	276	19	19	25	4.5	100	160	M20	105	37	22	12	4	3	-	328	6	13	8	250
300	324	455	406	327	23	23	25	4.5	100	160	M20	105	37	22	12	4	3	-	370	-	6	13	300
350	356	525	470	359	30	30	28	4.5	100	185	M24	125	44	26	14	4	3	430	-	6	13	12	350
400	406	580	521	409	30	30	28	4.5	100	185	M24	125	44	26	14	4	3	485	-	6	13	12	400
450	457	640	584	460	30	30	28	4.5	100	185	M24	125	44	26	14	4	3	545	-	6	19	12	450
500	508	705	641	511	38	38	28	4.5	100	195	M24	135	44	26	14	4	3	605	-	6	19	16	500
600	610	825	756	613	48	48	32	5	100	225	M27	160	50	30	16	4	3	715	-	6	19	16	600
700	711	910	845	715	56	56	32	5.5	100	235	M27	170	50	30	16	4	3	800	-	6	19	20	700
750	762	995	927	765	56	56	36	6	100	240	M30	170	55	33	18	4	3	880	-	6	22	20	750
800	813	1060	984	816	56	56	40	6.5	100	280	M33	205	60	36	20	4	3	935	-	6	22	20	800
900	914	1175	1092	918	66	66	40	7	100	300	M33	225	60	36	20	4	3	1045	-	6	22	24	900
1000	1016	1255	1175	1020	66	66	40	8	100	300	M33	225	60	36	20	4	3	1125	-	6	22	24	1000
1200	1219	1490	1410	1224	76	76	40	9.5	100	310	M33	235	60	36	20	4	3	1360	-	6	22	32	1200



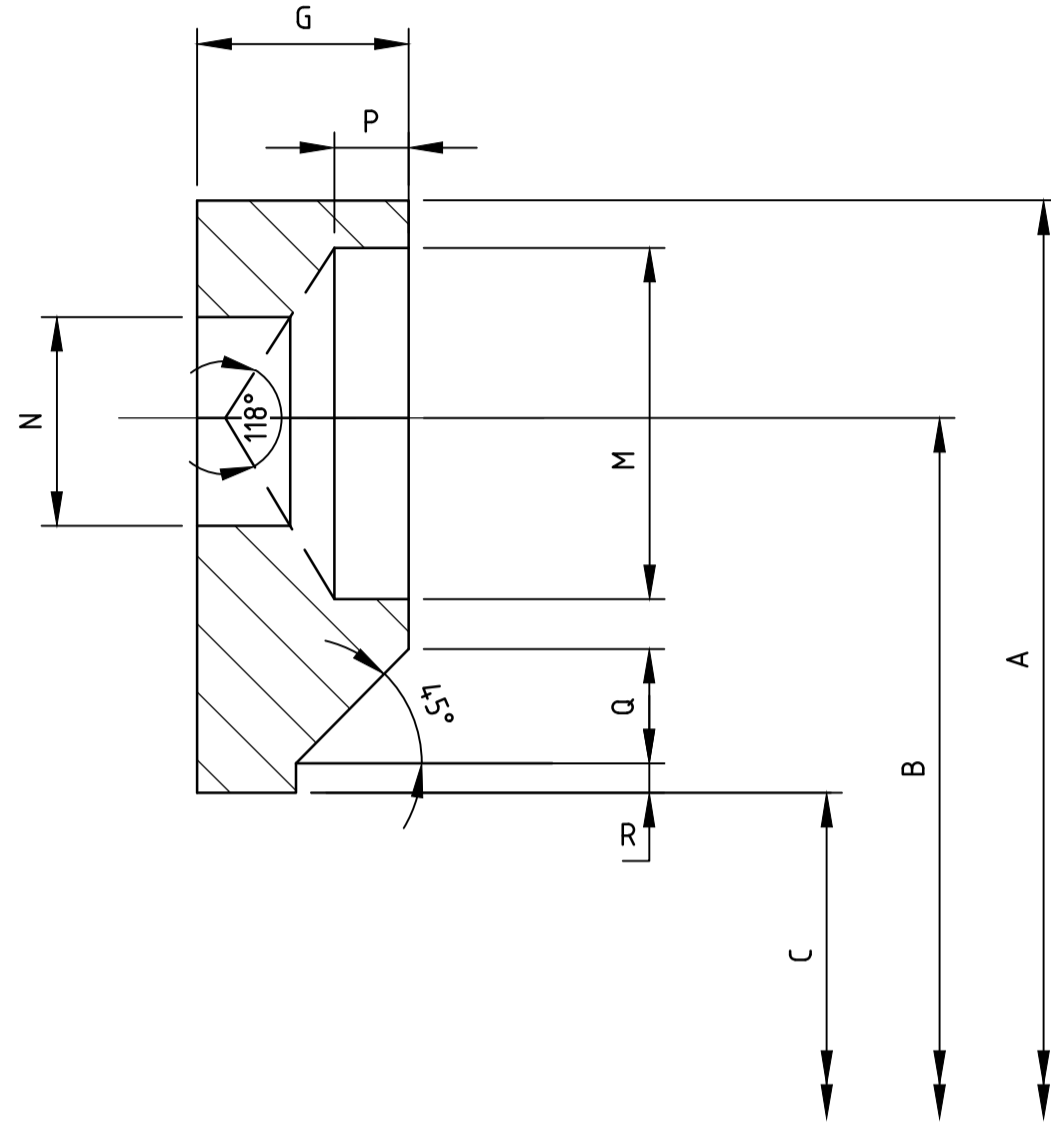
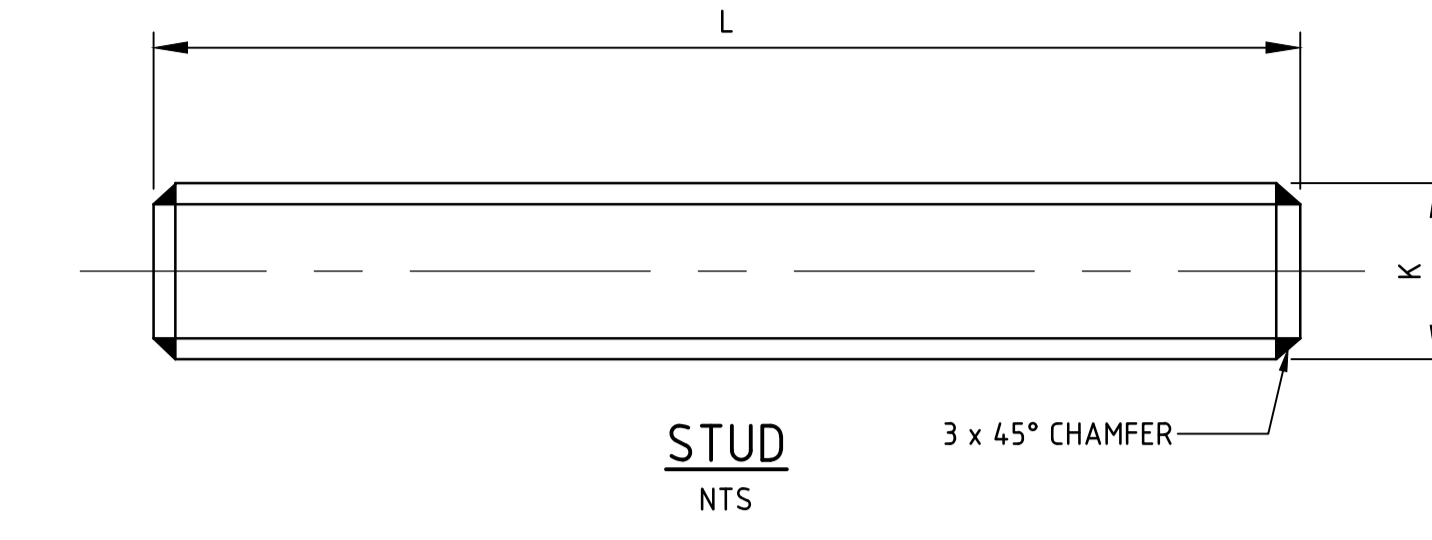
- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
  - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
  - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
    - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm
    - GRADE 250 - THICKNESSES GREATER THAN 8mm
  - FLANGES 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.



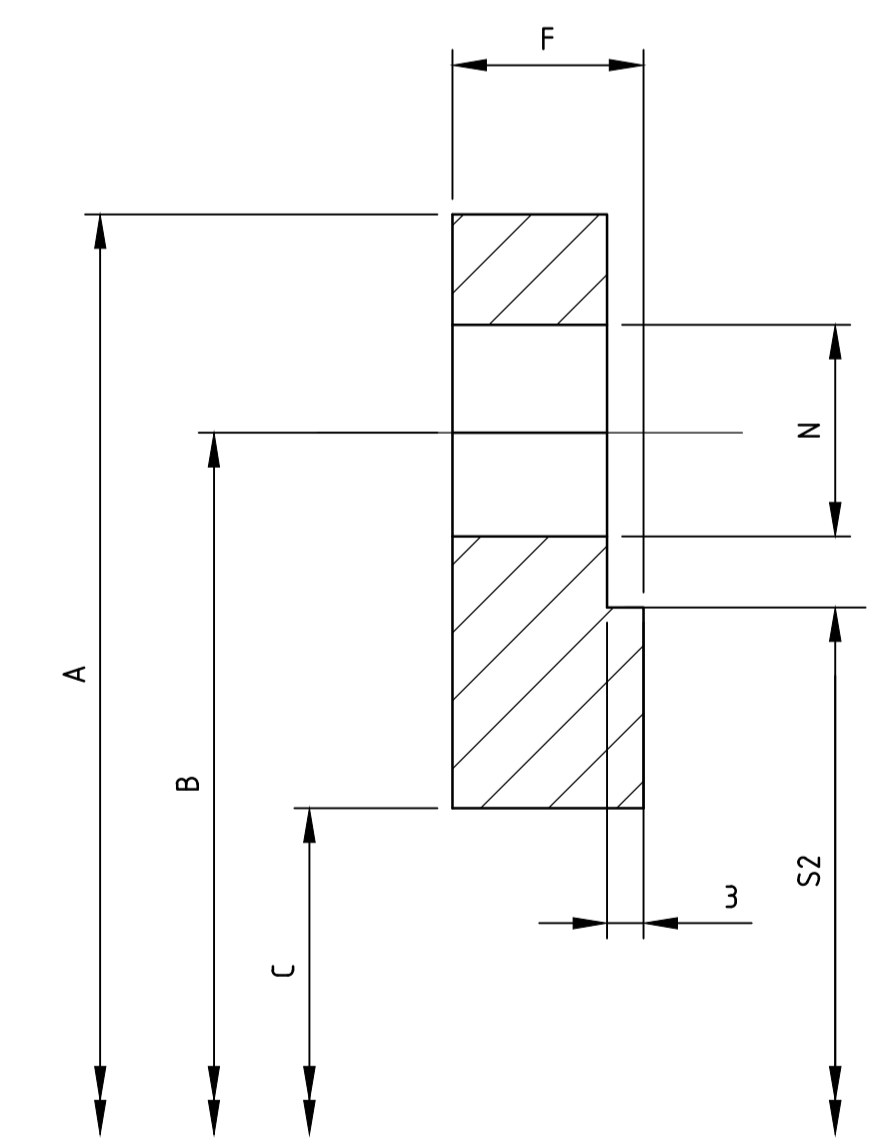
REVISION PANEL				DESIGN PANEL				SA WATER		SA WATER STANDARD DRAWING		TOTAL SHEETS: 1.0	
REV	DATE	DRN	APR'D	DESIGNED	AUTHORISED	SA Water		STANDARD PN16 UNRESTRAINED		PROJECT No:		REVISION	
1.0	15/12/22	GB	MW	T.MZUNGU	H.HABIB	Government of South Australia		DISMANTLING JOINT		MAXIMO ID:		1.0	
CURRENT REV AUTHORIZED M.WHITE				DRAWN G. BALDONADO				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.		SUPERSEDES:		DRAWING NUMBER	
CURRENT REV PROJECT: 1.0				REVIEWED M.WHITE				CIVIL		DRAWING NUMBER		STD-06-00002_01	
CURRENT REV CONTRACTOR: GHD				CONTRACTOR:									

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	4.5	100	150	M16	90	31	18	10	4	2	-	141	6	10	8	80
100	114	230	191	116	19	19	20	4.5	100	165	M16	100	31	18	10	4	2	-	167	6	10	8	100
150	168	305	260	171	24	24	25	4.5	100	200	M20	125	37	22	12	4	2	-	232	6	10	12	150
200	219	370	324	221	24	24	25	4.5	100	200	M20	125	37	22	12	4	2	-	296	6	10	12	200
250	273	430	381	276	30	30	28	4.5	120	240	M24	155	44	26	14	4	3	-	349	6	13	12	250
300	324	490	438	327	30	30	28	4.5	120	240	M24	155	44	26	14	4	3	-	400	-	6	13	300
350	356	550	495	359	30	30	32	4.5	130	250	M27	160	50	30	16	4	3	455	-	6	13	16	350
400	406	610	552	409	38	38	32	4.5	140	275	M27	180	50	30	16	4	3	510	-	6	13	20	400
450	457	675	610	460	38	38	36	5	150	290	M30	190	55	33	18	4	3	565	-	6	19	20	450
500	508	735	673	511	48	48	36	5.5	170	320	M30	210	55	33	18	4	3	630	-	6	19	24	500
600	610	850	781	613	58	58	40	6.5	200	390	M33	265	60	36	20	4	3	735	-	6	19	24	600
700	711	935	857	715	58	58	40	7.5	200	390	M33	265	60	36	20	4	3	810	-	6	19	24	700
750	762	1015	940	765	58	58	40	8	200	390	M33	265	60	36	20	4	3	890	-	6	22	28	750
800	813	1060	984	816	68	68	40	8.5	220	420	M33	285	60	36	20	4	3	935	-	6	22	28	800
900	914	1185	1105	918	68	68	45	9.5	230	415	M36	275	65	39	22	4	3	1055	-	6	22	32	900
1000	1016	1275	1194	1020	78	78	45	10.5	250	445	M36	295	65	39	22	4	3	1145	-	6	22	36	1000
1200	1219	1530	1441	1224	88	88	50	12.5	280	490	M39	325	71	42	24	5	3	1385	-	7	22	40	1200

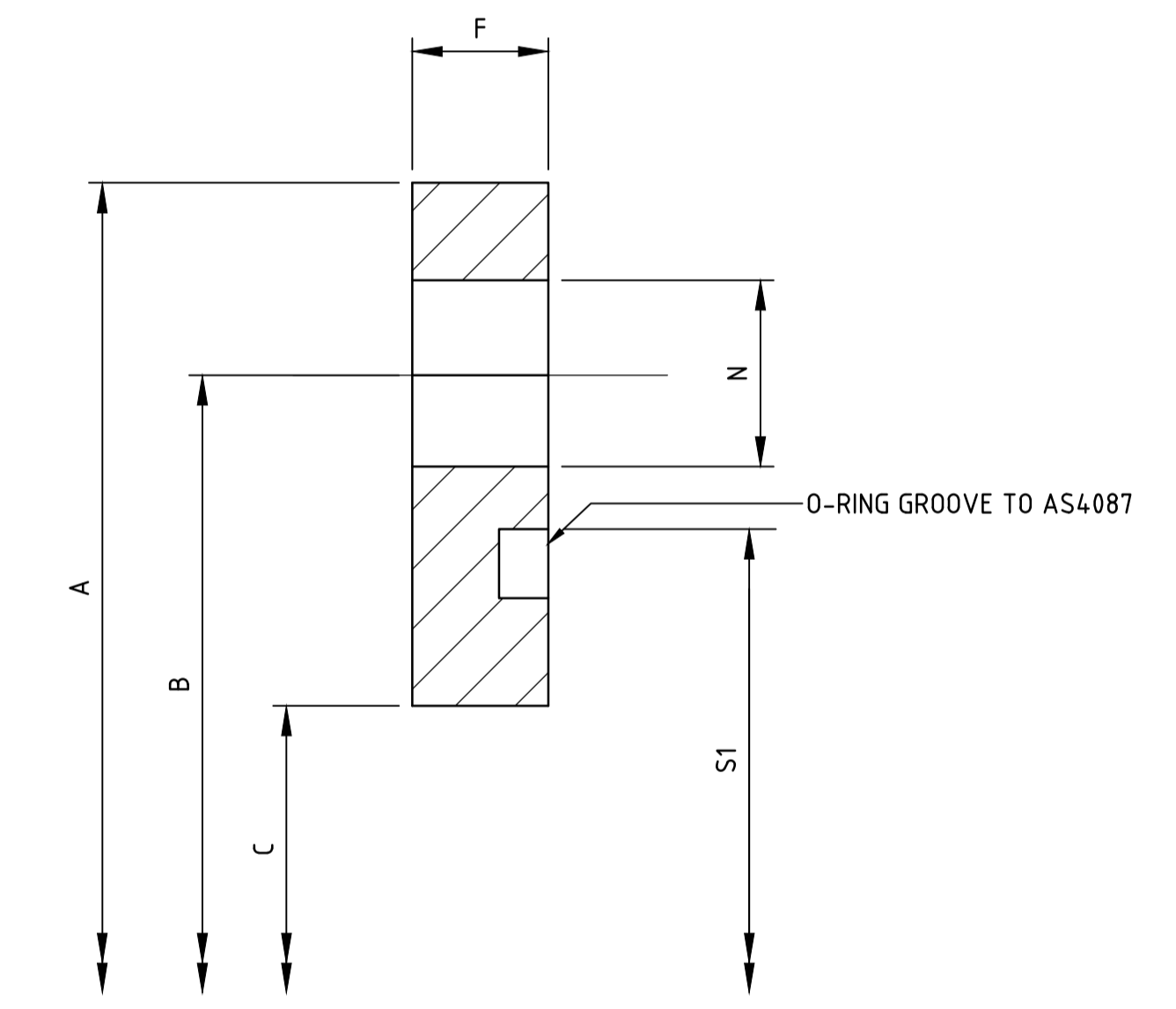
- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
  - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
  - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
    - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm
    - GRADE 250 - THICKNESSES GREATER THAN 8mm
  - FLANGES 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.



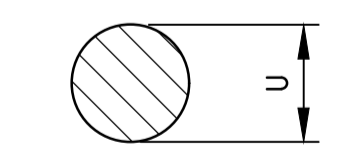
**MS CLAMP FLANGE DETAIL**  
NTS



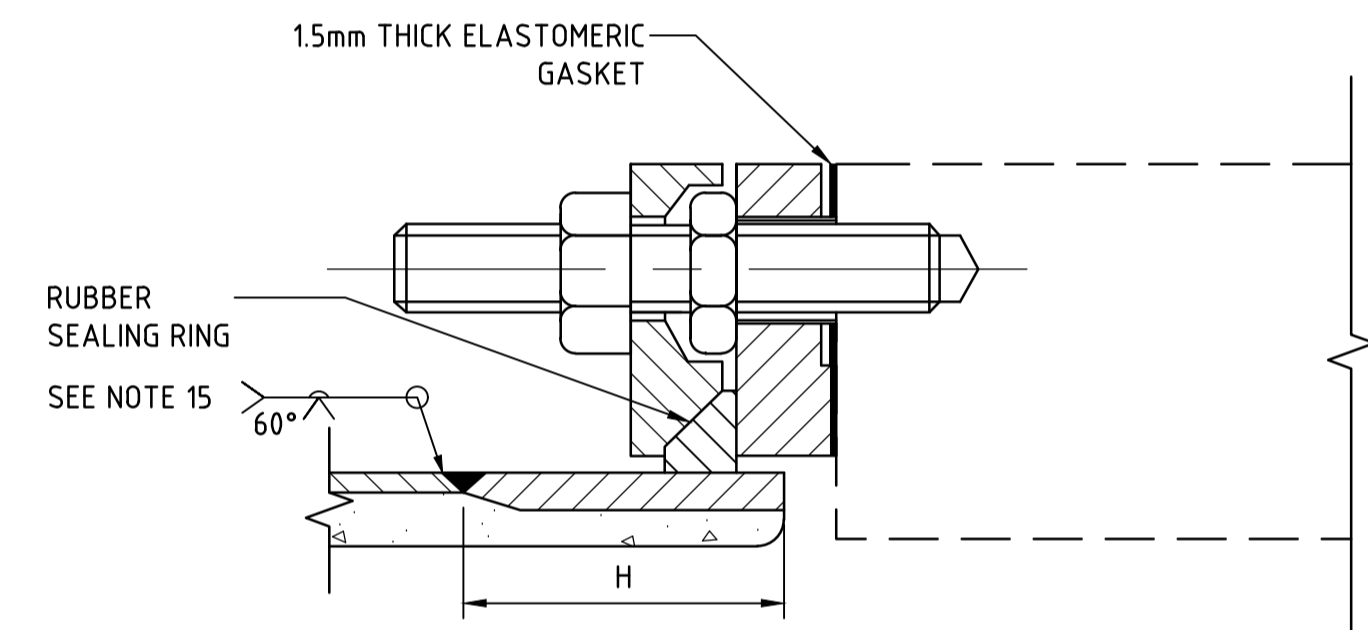
**MS GUIDE FLANGE**  
**UP TO DN250**  
NTS



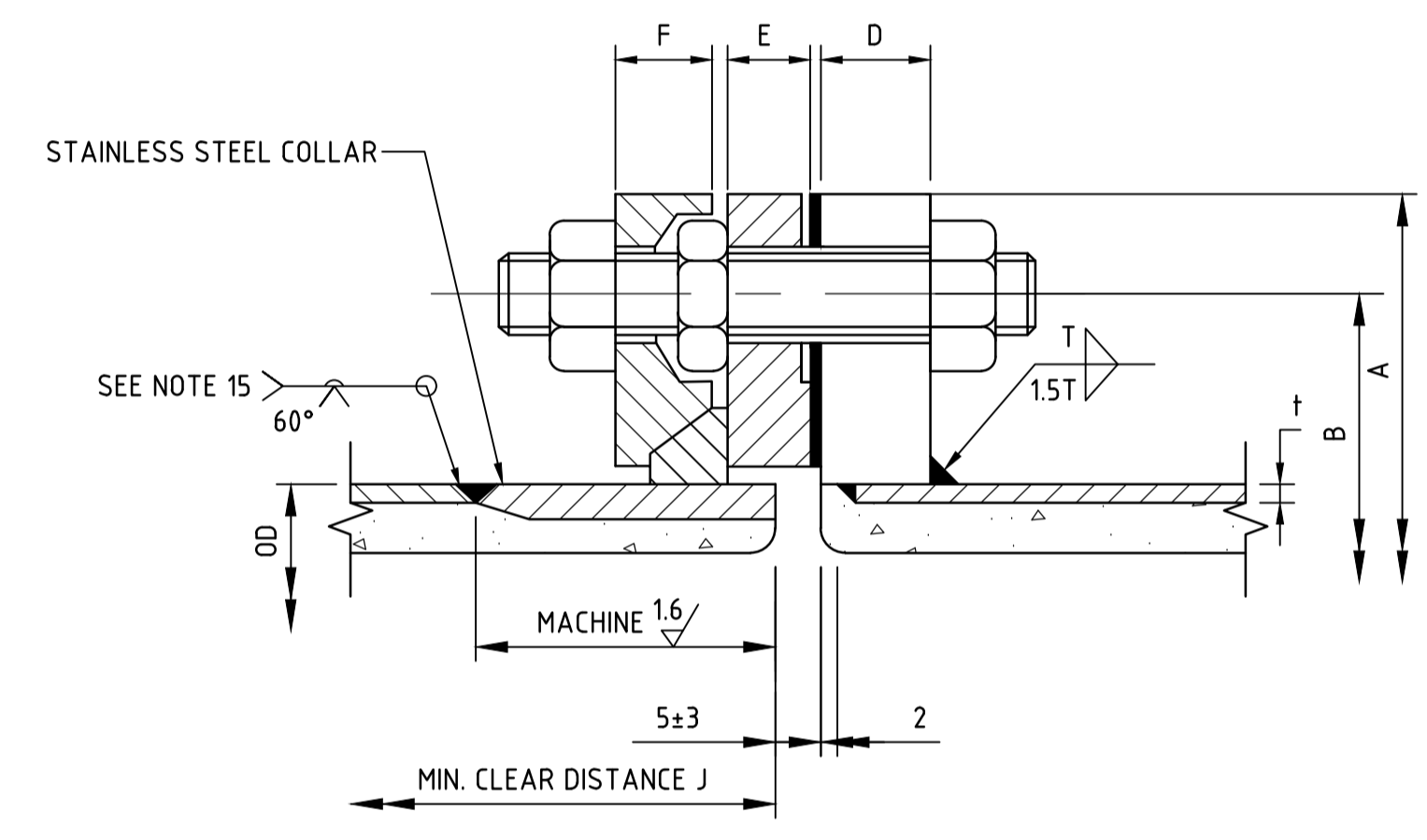
**MS GUIDE FLANGE DN300**  
**AND ABOVE**  
NTS



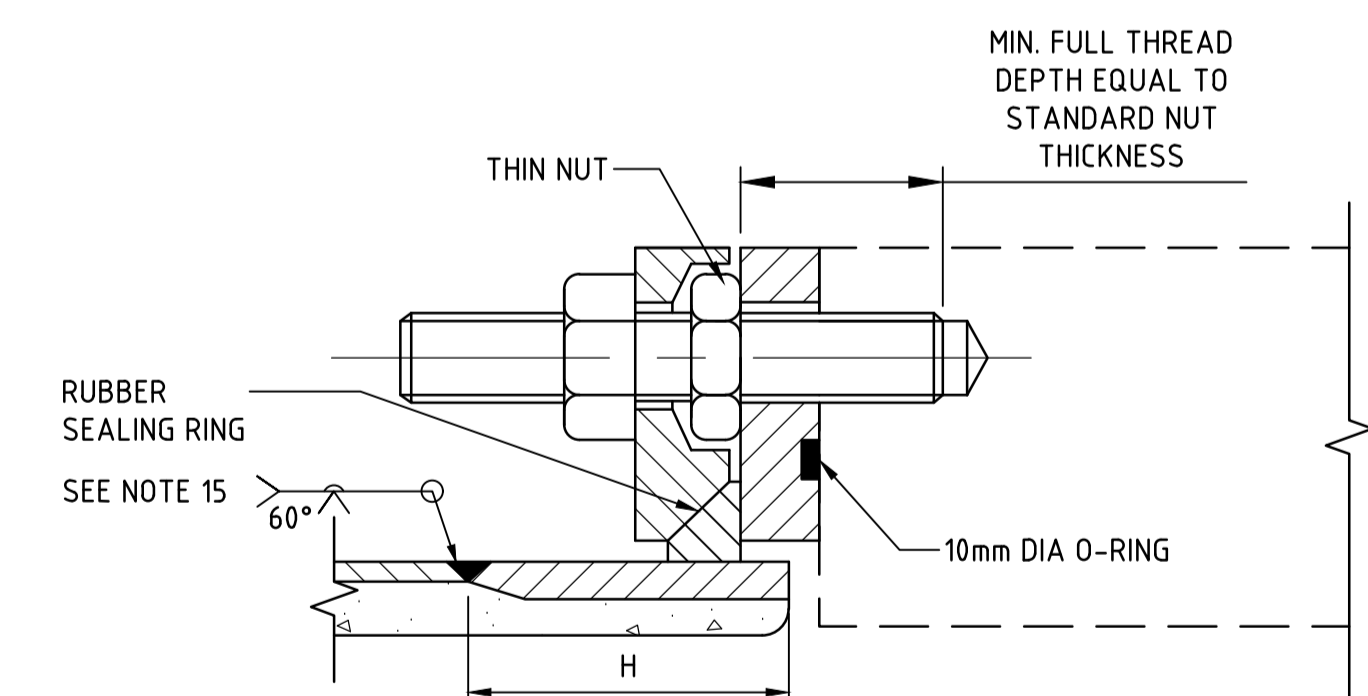
**RUBBER SEALING RING**  
NTS



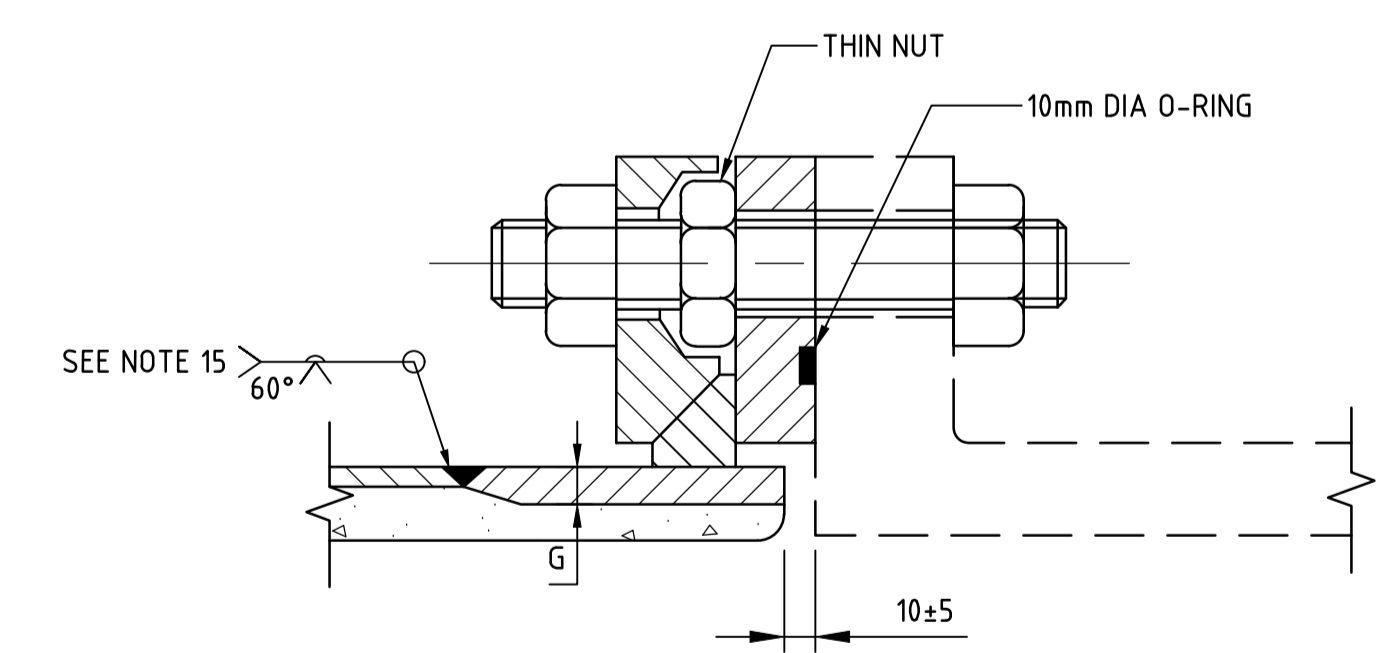
**JOINT WITH TAPPED FLANGE**  
**SIZES UP TO DN250**  
NTS



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



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

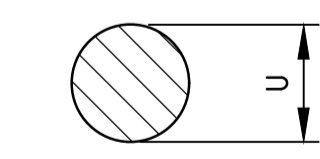
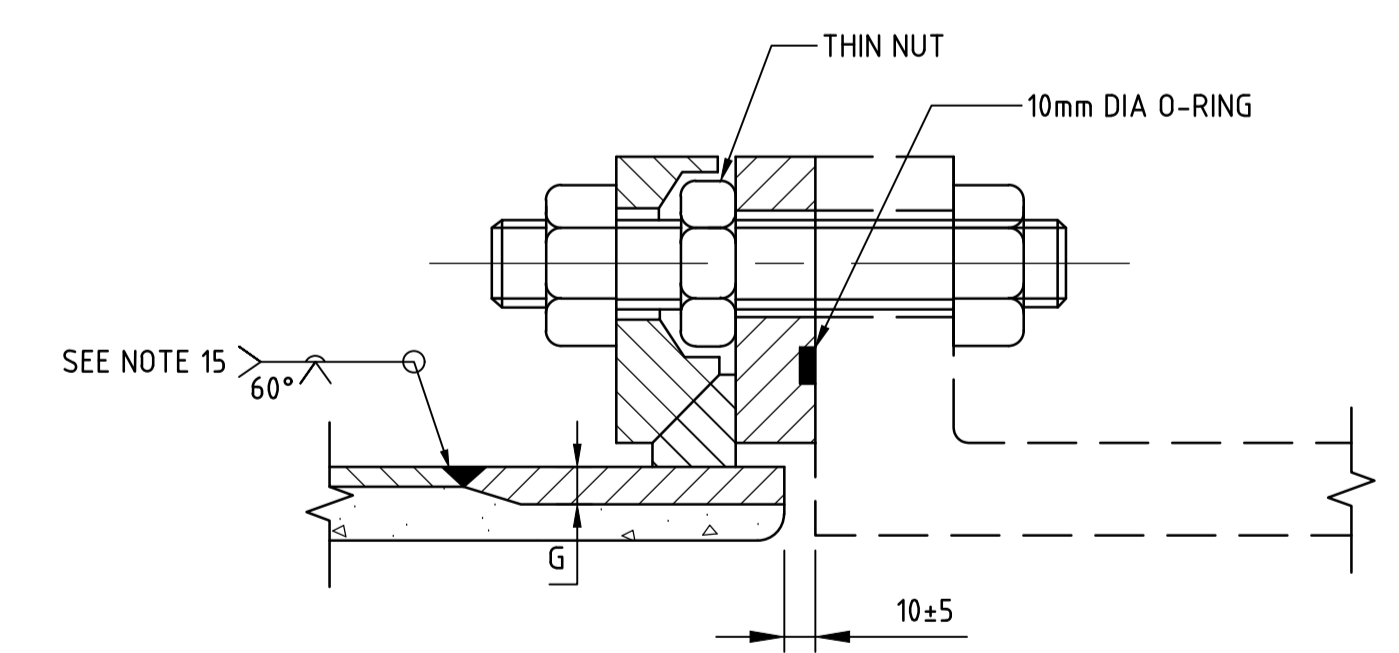
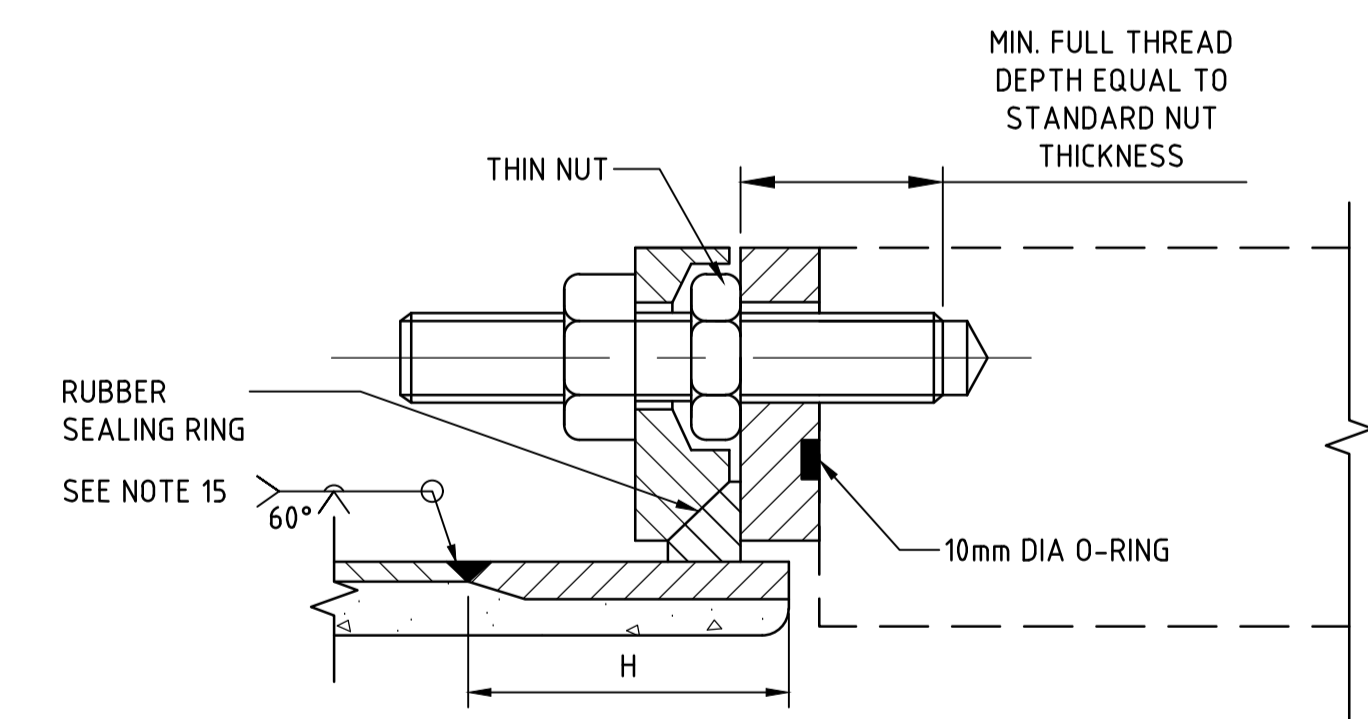
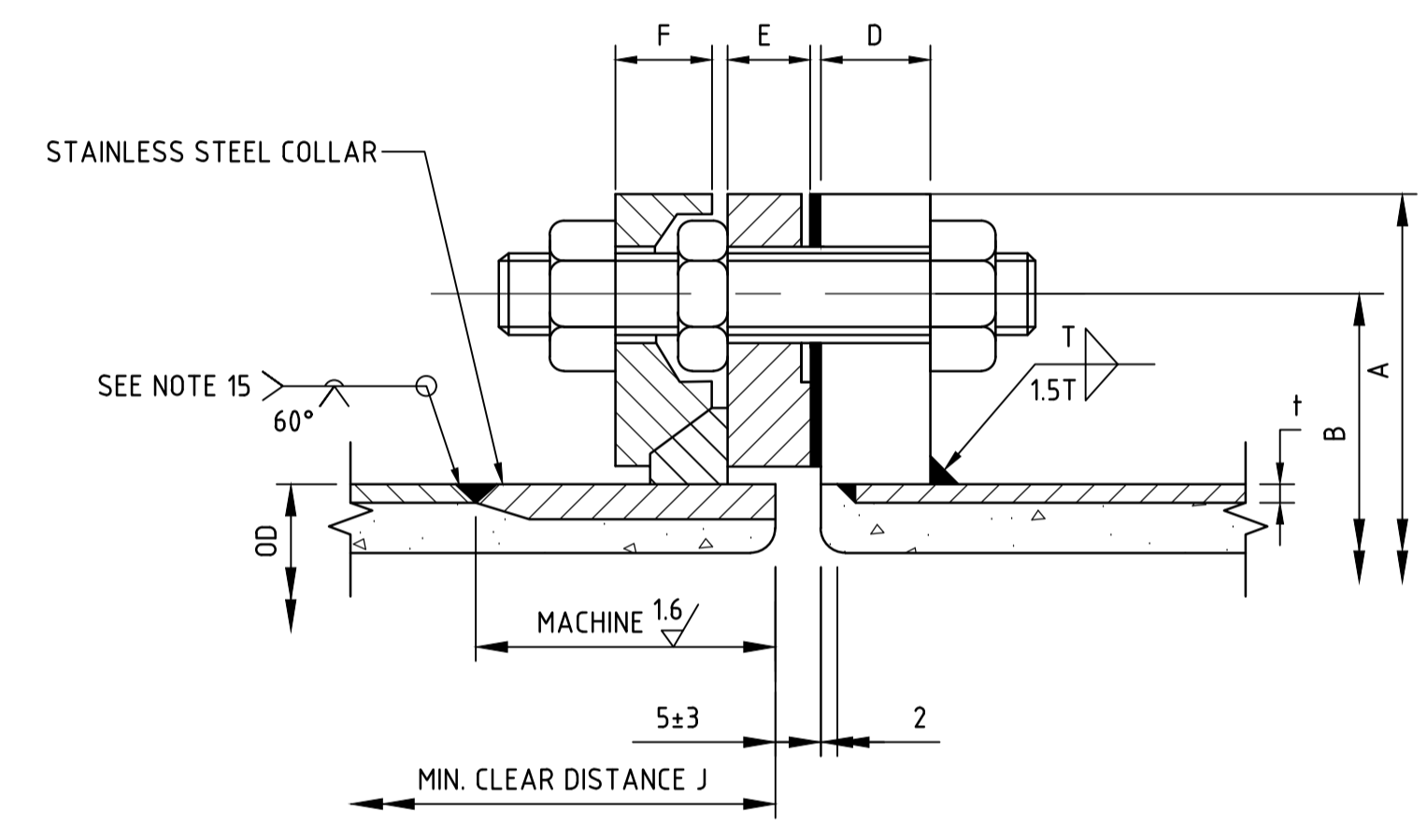
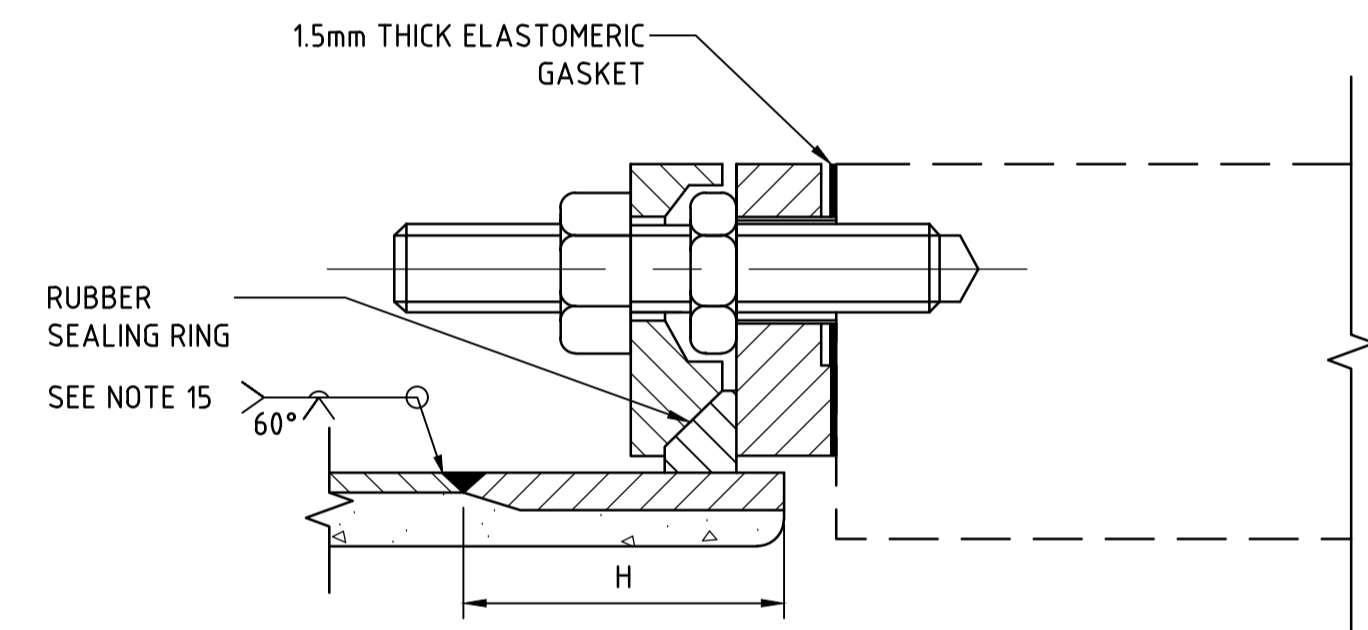
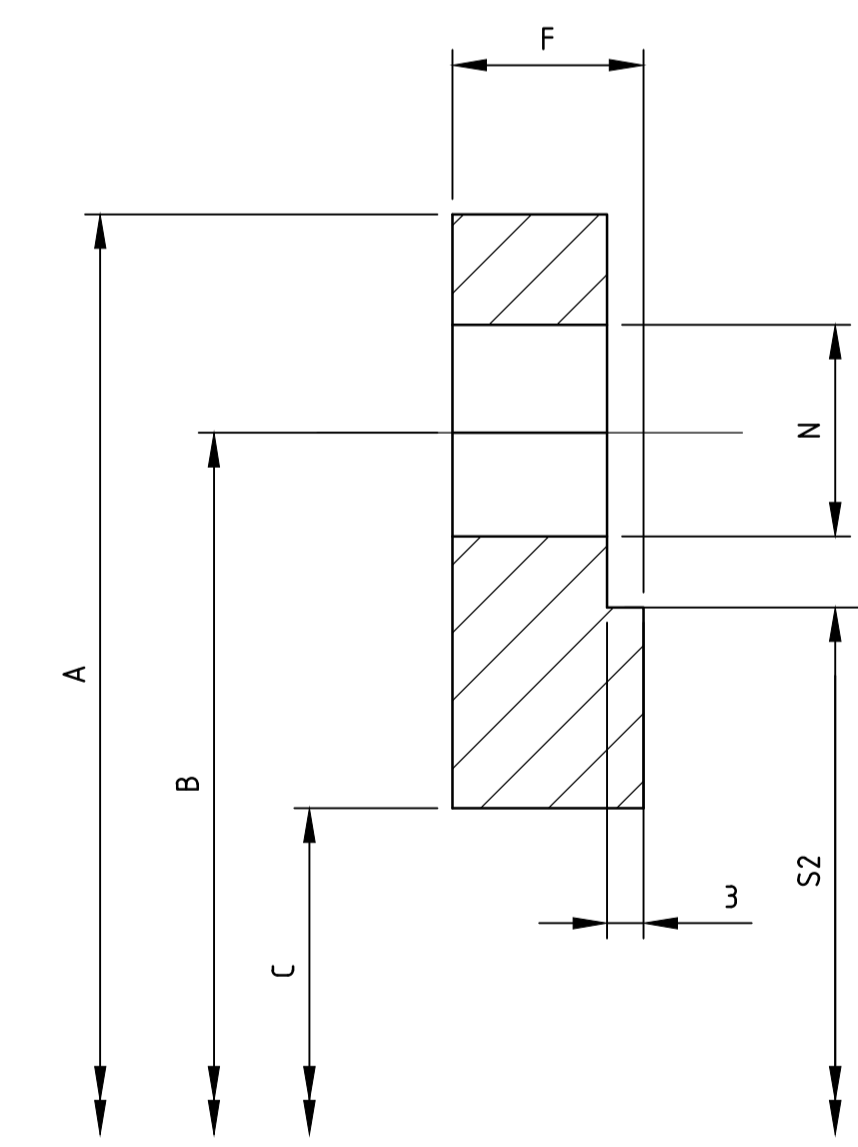
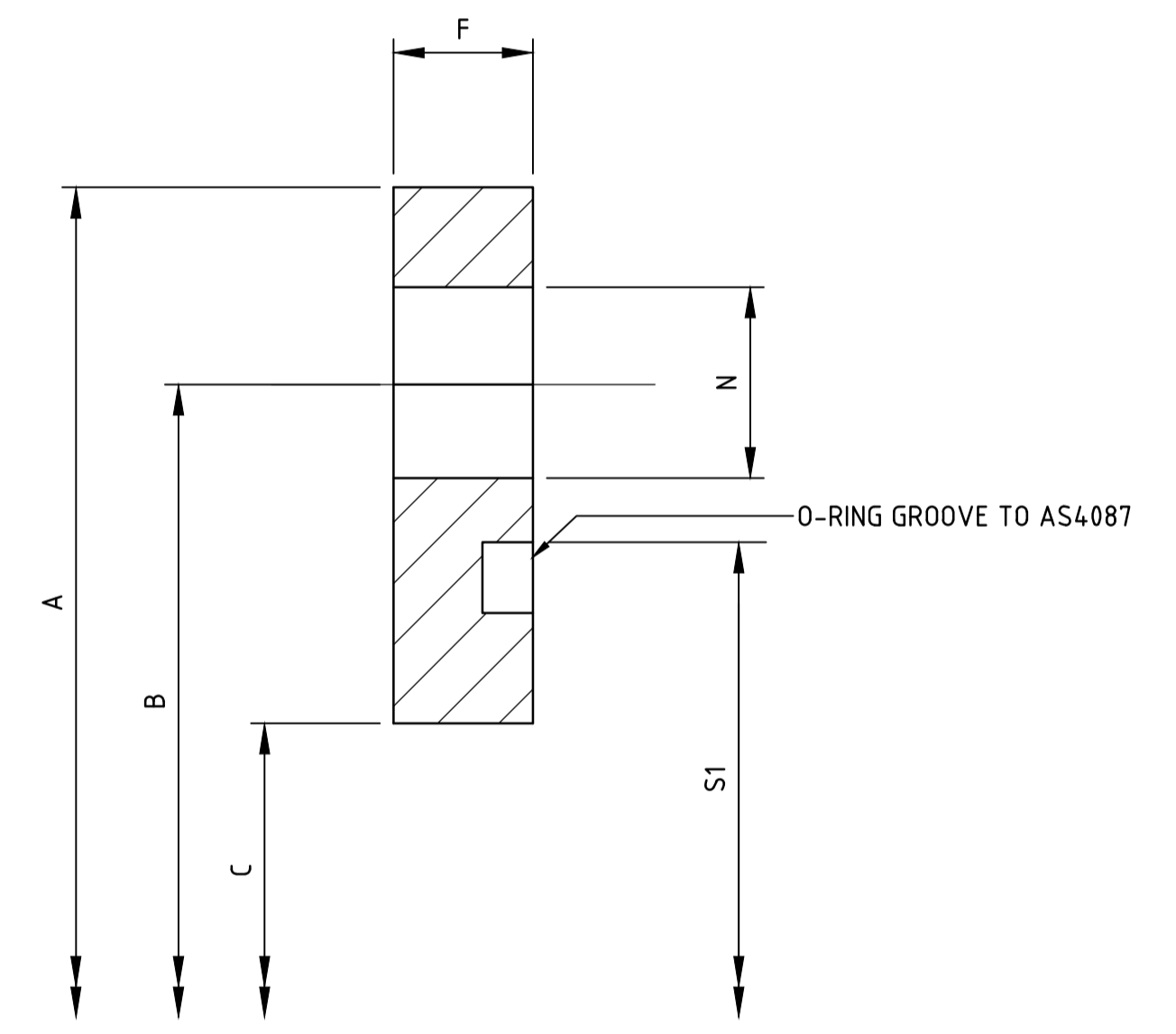
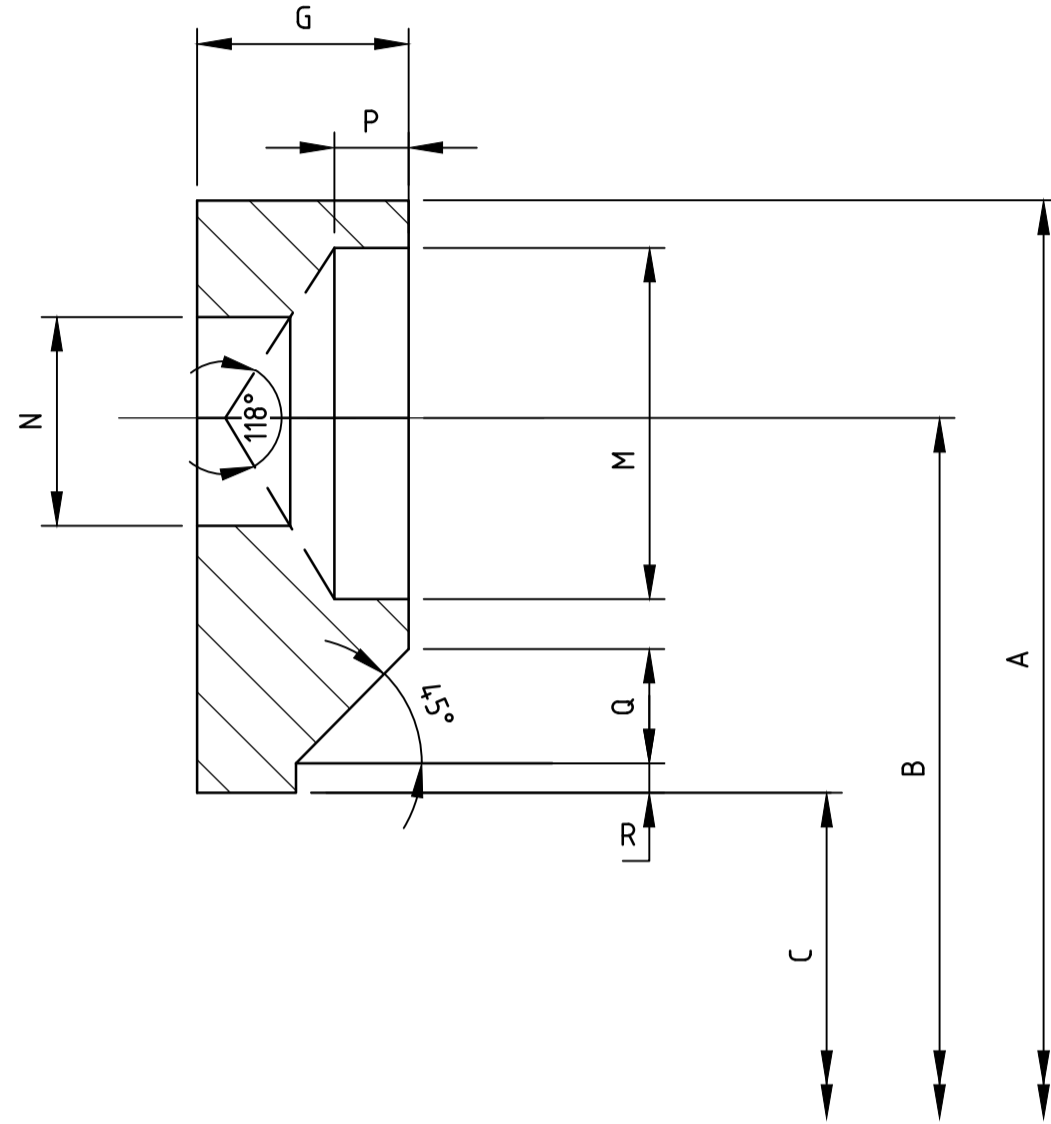
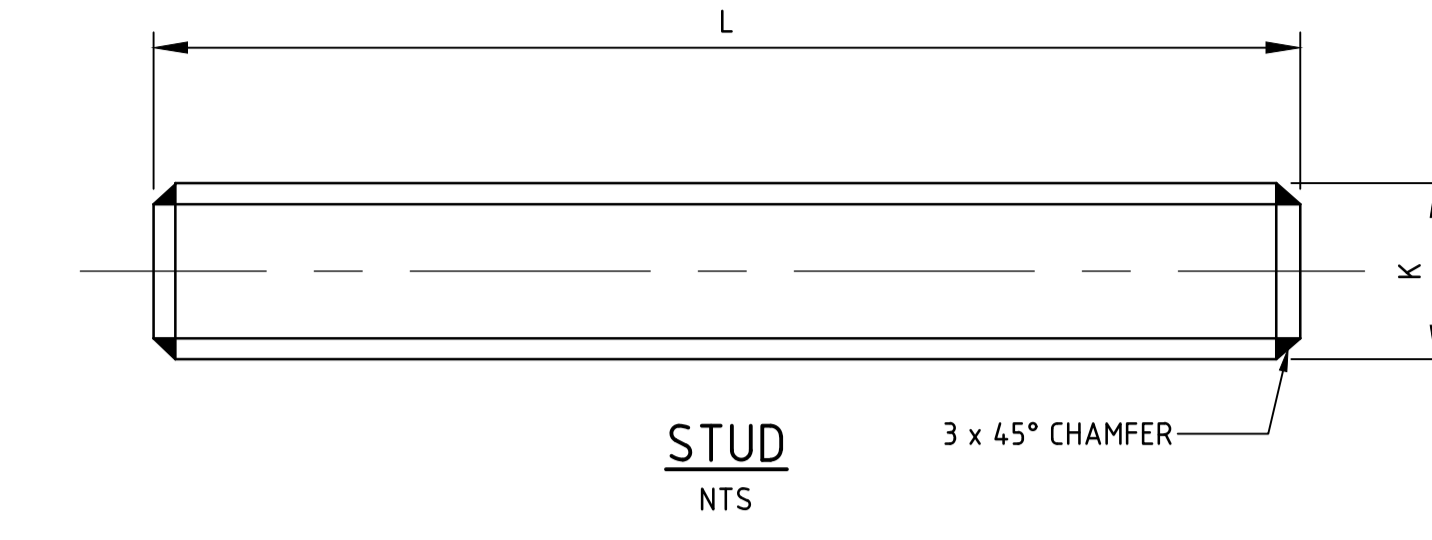


**JOINT WITH DRILLED FLANGE**  
**SIZES DN300 AND ABOVE**  
NTS

REVISION PANEL				DESIGN PANEL				SA WATER		SA WATER STANDARD DRAWING		TOTAL SHEETS: 1.0	
REV	DATE	DRN	APR'D	DESIGNED	AUTHORISED	SA Water		STANDARD PN21 UNRESTRAINED		PROJECT No:		REVISION	
1.0	15/12/22	GB	MW	T.MZUNGU	H.HABIB	Government of South Australia		DISMANTLING JOINT		MAXIMO ID:		1.0	
CURRENT REV AUTHORIZED				DRAWN				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.		SUPERSEDES:		DRAWING NUMBER STD-06-00003_01	
CURRENT REV PROJECT: 1.0				REVIEWED				CIVIL		DRAWING NUMBER			
CURRENT REV CONTRACTOR: GHD				CONTRACTOR:									

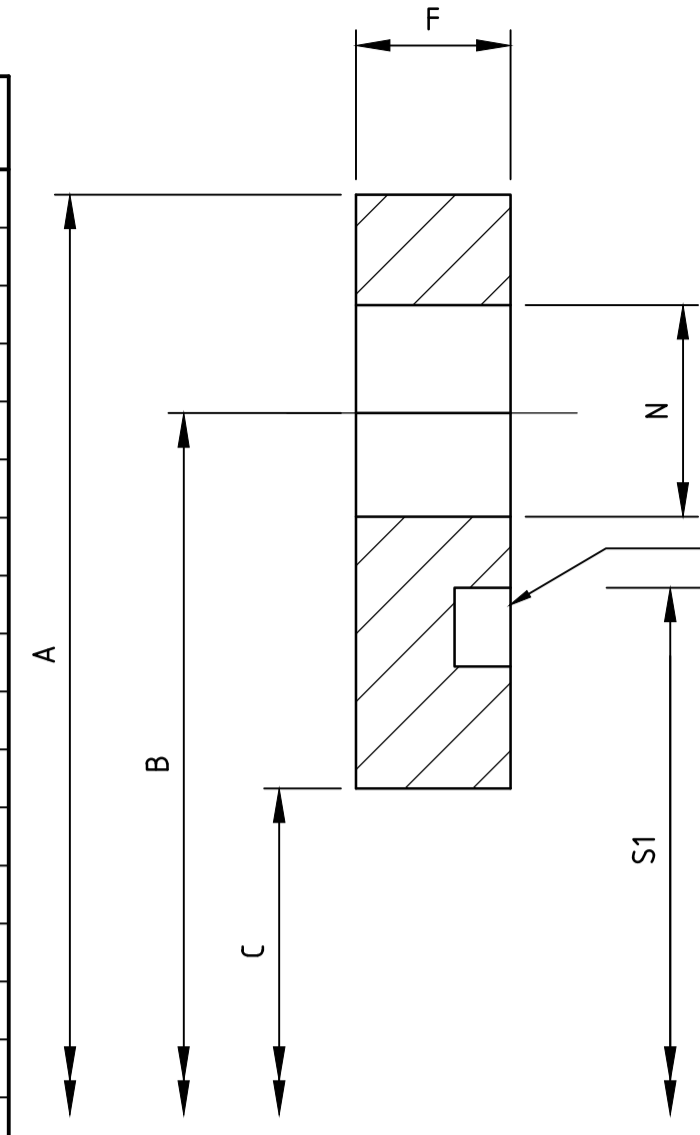
DN	O.D. (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (MIN) (mm)	H (mm)	J (mm)	K	L (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	R (mm)	S1 (mm)	S2 (mm)	T (mm)	U (mm)	NO. BOLTS	DN
80	89	205	165	91	24	15	20	4.5	100	160	M16	100	31	18	10	4	2	-	141	6	10	8	80
100	114	230	191	116	24	19	20	4.5	100	175	M16	110	31	18	10	4	2	-	167	6	10	8	100
150	168	305	260	171	31	24	25	4.5	100	210	M20	135	37	22	12	4	2	-	232	6	10	12	150
200	219	370	324	221	31	24	25	4.5	100	210	M20	135	37	22	12	4	2	-	260	6	10	12	200
250	273	430	381	276	38	30	28	4.5	120	240	M24	155	44	26	14	4	3	-	311	6	13	12	250
300	324	490	438	327	38	30	28	5.5	120	240	M24	155	44	26	14	4	3	400	-	6	13	16	300
350	356	550	495	359	48	30	32	6	130	270	M27	180	50	30	16	4	3	455	-	6	13	16	350
400	406	610	552	409	48	38	32	7	140	285	M27	190	50	30	16	4	3	510	-	6	13	20	400
450	457	675	610	460	58	38	36	7.5	150	310	M30	210	55	33	18	4	3	565	-	6	19	20	450
500	508	735	673	511	58	48	36	8.5	170	330	M30	220	55	33	18	4	3	630	-	6	19	24	500
600	610	850	781	613	68	58	40	10	200	400	M33	275	60	36	20	4	3	735	-	6	19	24	600
700	711	935	857	715	78	58	40	12	200	410	M33	285	60	36	20	5	3	810	-	7	19	24	700
750	762	1015	940	765	78	58	40	12.5	200	410	M33	285	60	36	20	6	3	890	-	8	22	28	750
800	813	1060	984	816	84	68	40	13.5	220	430	M33	295	60	36	20	6	3	935	-	8	22	28	800
900	914	1185	1105	918	94	68	45	15	230	435	M36	295	65	39	22	7	3	1055	-	9	22	32	900
1000	1016	1275	1194	1020	98	78	45	17	250	465	M36	315	65	39	22	8	3	1145	-	10	22	36	1000
1200	1219	1530	1441	1224	108	88	50	20	280	510	M39	345	71	42	24	10	3	1385	-	12	22	40	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.



REVISION PANEL				DESIGN PANEL				SA WATER		SA WATER STANDARD DRAWING		TOTAL SHEETS: 1.0	
REV	DATE	DRN	DETAILS	DESIGNED	AUTHORISED	PROJECT No:		STANDARD PN35 UNRESTRAINED		MAXIMO ID:		REVISION	
1.0	15/12/22	GB	ISSUED FOR USE	T.MZUNGU	H.HABIB	PROJECT No:		STANDARD PN35 UNRESTRAINED		MAXIMO ID:		1.0	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0				SA WATER		STANDARD PN35 UNRESTRAINED		SUPERSEDES:	
				DRAWN: G. BALDONADO				SA WATER		STANDARD PN35 UNRESTRAINED		DRAWING NUMBER	
				REVIEWED: M. WHITE				SA WATER		STANDARD PN35 UNRESTRAINED		STD-06-00004_01	
				CONTRACTOR:				SA WATER		STANDARD PN35 UNRESTRAINED		CIVIL	

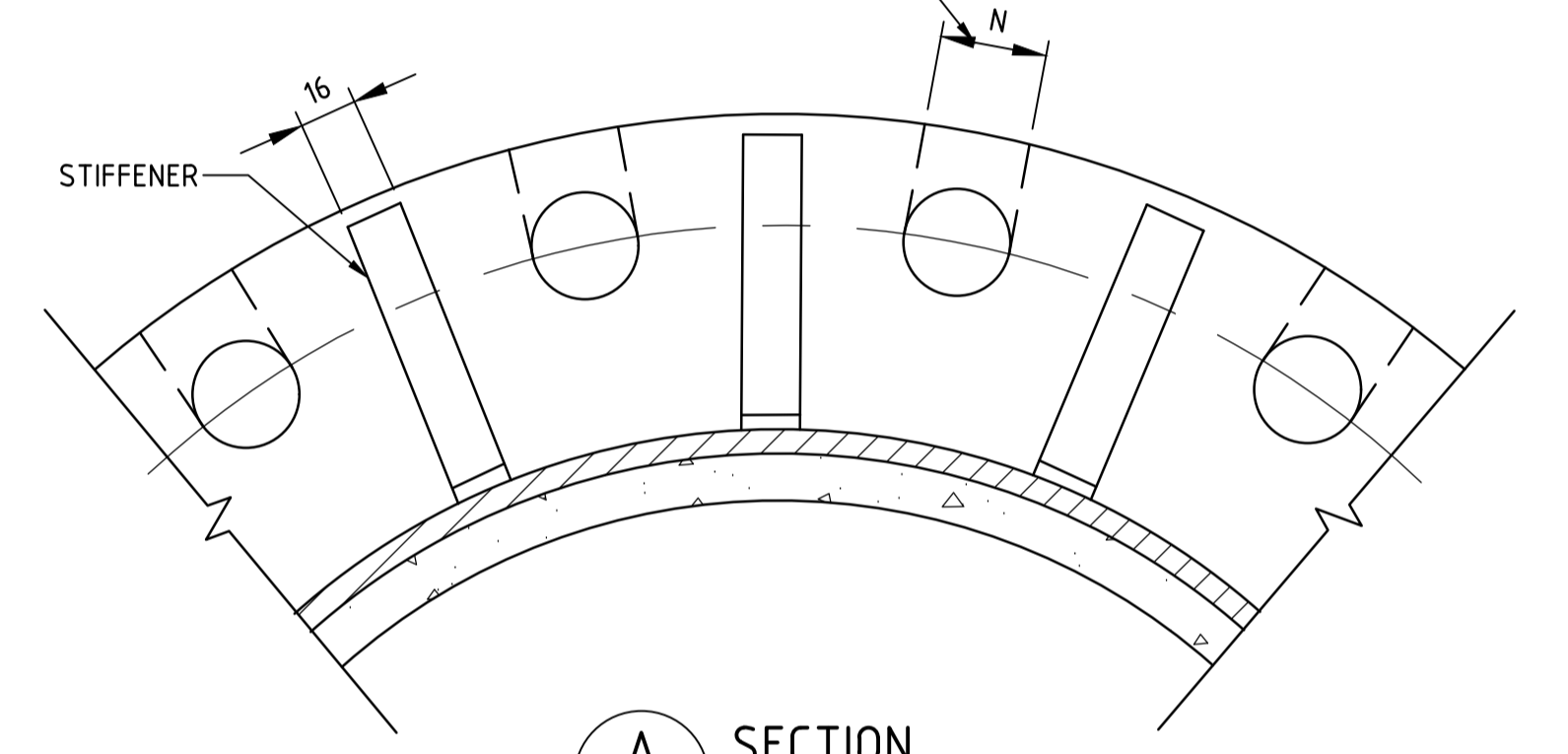
DN	O.D. (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (MIN) (mm)	H (mm)	J1 (mm)	J2 (mm)	K	L (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	R (mm)	S1 (mm)	S2 (mm)	T (mm)	U (mm)	V (mm)	W (mm)	NO. STIFFENERS	NO. BOLTS	DN
80	89	185	146	91	11	11	20	4.5	100	340	255	M16	190	31	18	10	4	2	-	122	6	10	130	5	-	4	80
100	114	215	178	116	13	13	20	4.5	100	350	260	M16	190	31	18	10	4	2	-	154	6	10	130	4.8	-	4	100
150	168	280	235	171	13	13	20	4.5	100	350	260	M16	190	31	18	10	4	2	-	211	6	10	130	5	-	8	150
200	219	335	292	221	19	19	20	4.5	100	395	290	M16	210	31	18	10	4	2	-	268	6	10	145	5	-	8	200
250	273	405	356	276	19	19	25	4.5	100	450	325	M20	235	37	22	12	4	3	-	328	6	13	165	5	-	8	250
300	324	455	406	327	23	23	25	4.5	100	485	355	M20	255	37	22	12	4	3	370	-	6	13	180	4.5	-	12	300
350	356	525	470	359	30	30	28	4.5	120	595	465	M24	345	44	26	14	4	3	430	-	6	13	250	4.5	-	12	350
400	406	580	521	409	30	30	28	4.5	120	595	465	M24	345	44	26	14	4	3	485	-	6	13	250	4.5	-	12	400
450	457	640	584	460	30	30	28	4.5	120	595	465	M24	345	44	26	14	4	3	545	-	6	19	250	4.5	-	12	450
500	508	705	641	511	38	38	28	4.5	140	645	510	M24	375	44	26	14	4	3	605	-	6	19	270	5	-	16	500
600	610	825	756	613	48	48	32	5	160	695	570	M27	410	50	30	16	4	3	715	-	6	19	285	5	-	16	600
700	711	910	845	715	56	56	32	5.5	180	755	620	M27	440	50	30	16	4	3	800	-	6	19	315	6	-	20	700
750	762	995	927	765	56	56	36	6	190	770	635	M30	450	55	33	18	4	3	880	-	6	22	320	6	20	20	750
800	813	1060	984	816	56	56	40	6.5	200	885	720	M33	525	60	36	20	4	3	935	-	6	22	360	7	20	20	800
900	914	1175	1092	918	66	66	40	7	220	955	780	M33	565	60	36	20	4	3	1045	-	6	22	390	7	24	24	900
1000	1016	1255	1175	1020	66	66	40	8	220	955	780	M33	565	60	36	20	4	3	1125	-	6	22	390	8	24	24	1000
1200	1219	1490	1410	1224	76	76	40	9.5	240	1025	840	M33	605	60	36	20	4	3	1360	-	6	22	420	9	32	32	1200



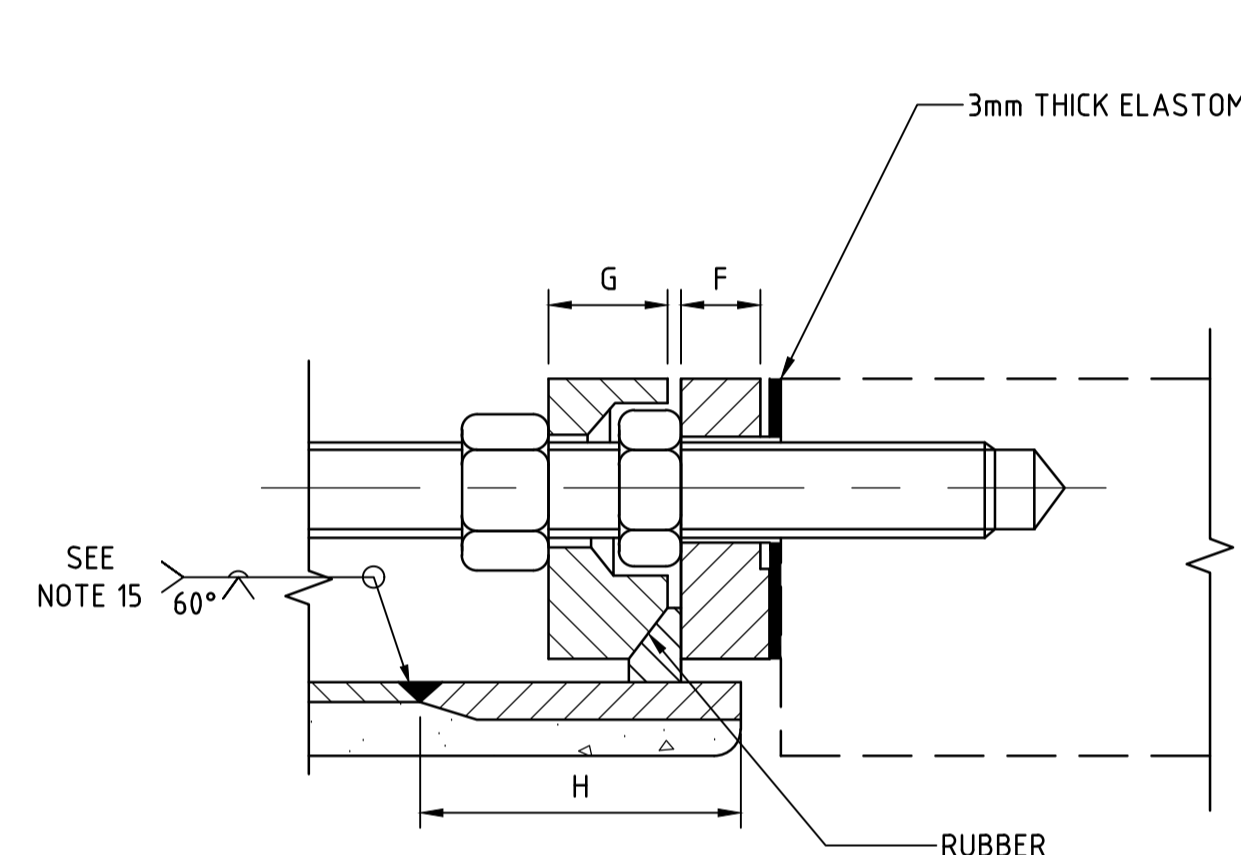
- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
  - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
  - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
    - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm
    - GRADE 250 - THICKNESSES GREATER THAN 8mm
  - FLANGES 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.

**MS GUIDE FLANGE DN300 AND ABOVE**  
NTS

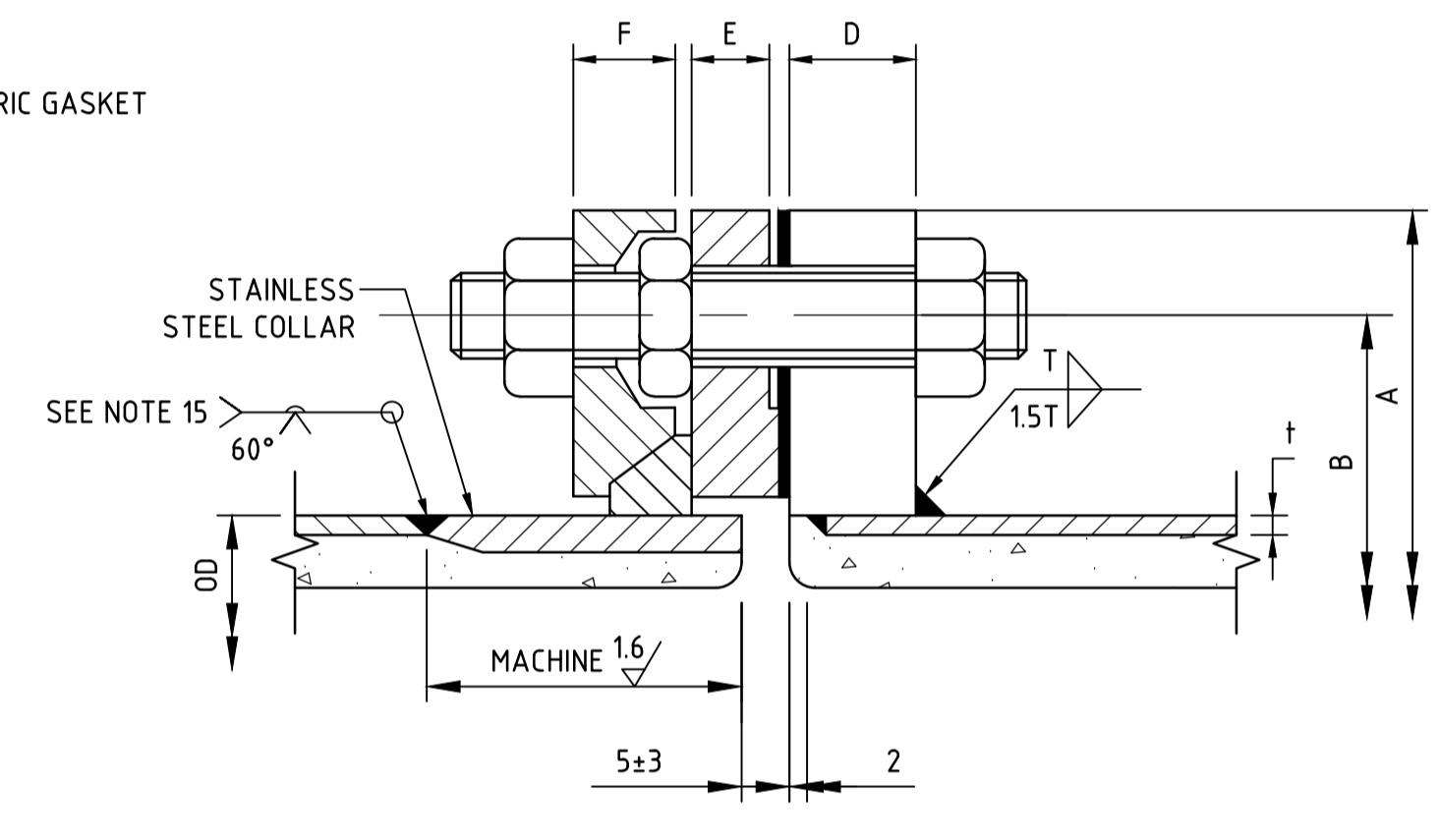
USE DRILLED HOLES WHERE SPACE PERMITS CLEAR DISTANCE J1. HOLES MAY BE SLOTTED FOR REDUCED CLEAR DISTANCE J2



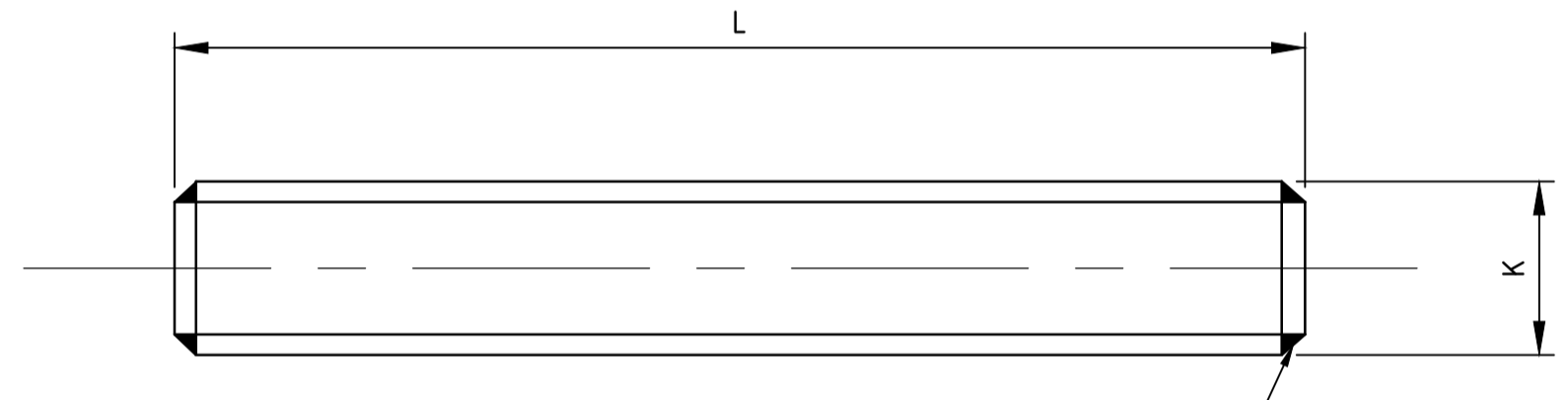
**SECTION A**  
NTS



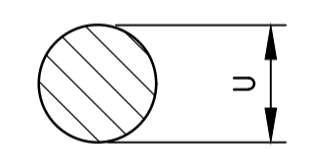
**JOINT WITH TAPPED FLANGE SIZES UP TO 250mm**  
NTS



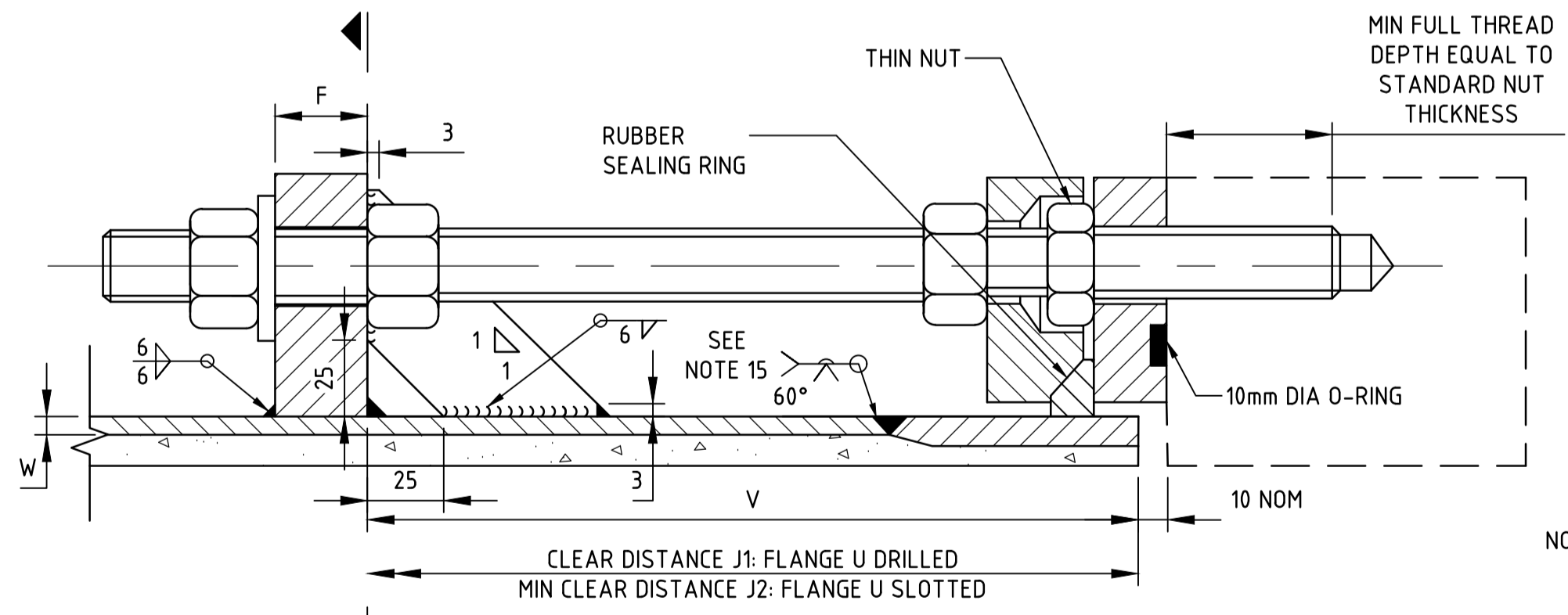
**JOINT WITH DRILLED FLANGE SIZES UP TO DN250mm**  
NTS



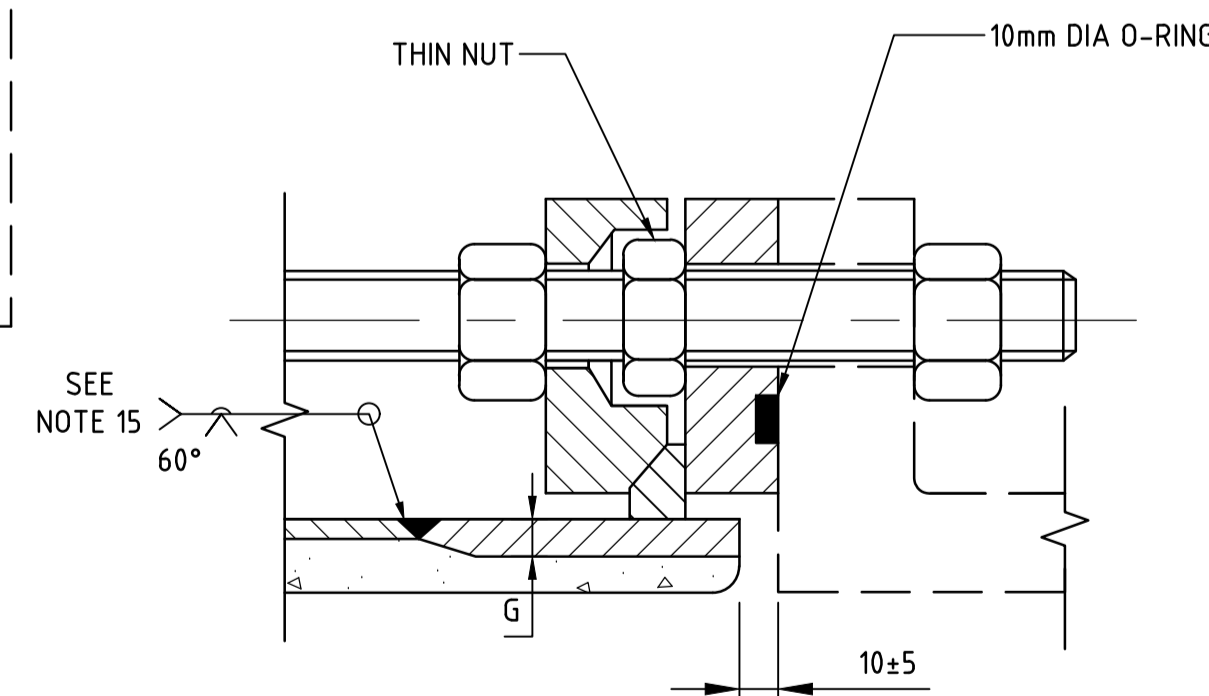
**STUD**  
NTS



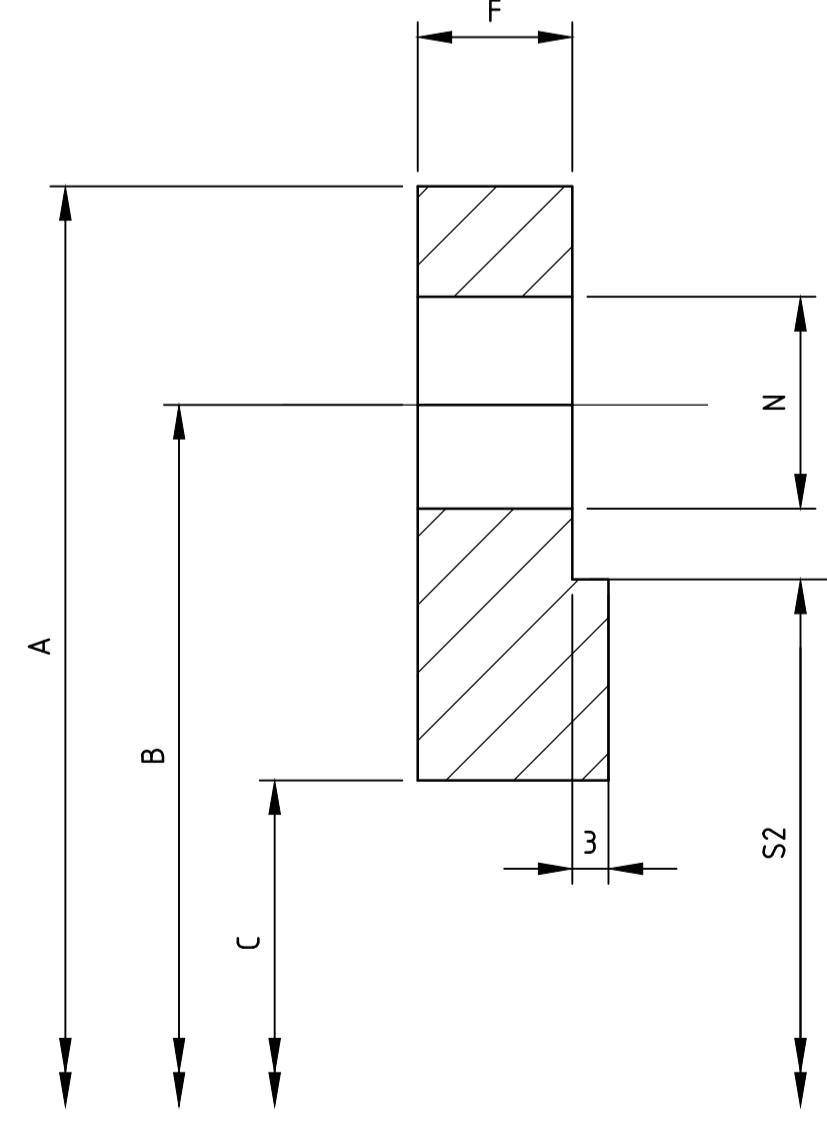
**RUBBER SEALING RING**  
NTS



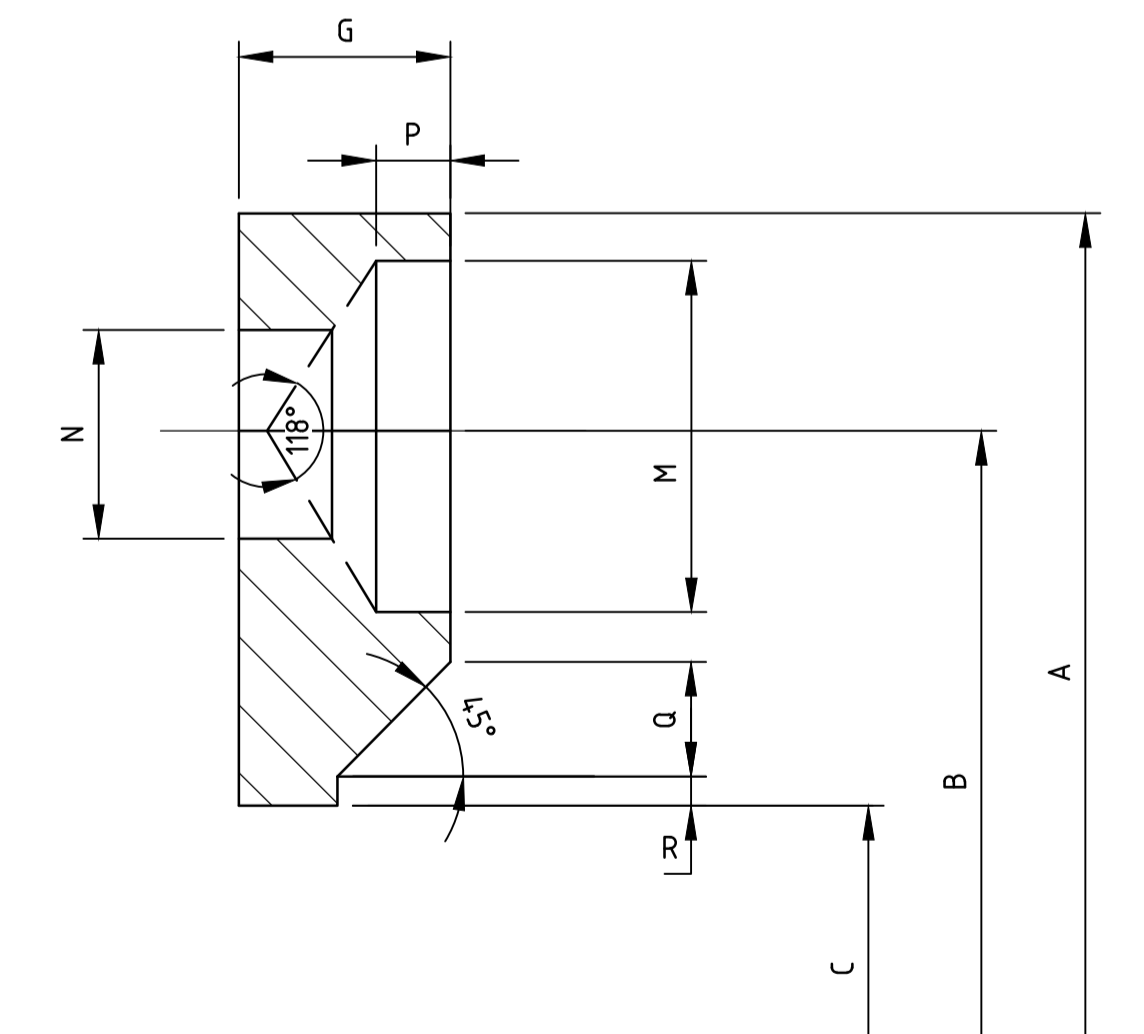
**JOINT WITH TAPPED FLANGE SIZES DN300mm AND ABOVE**  
NTS



**JOINT WITH DRILLED FLANGE SIZES DN300mm AND ABOVE**  
NTS



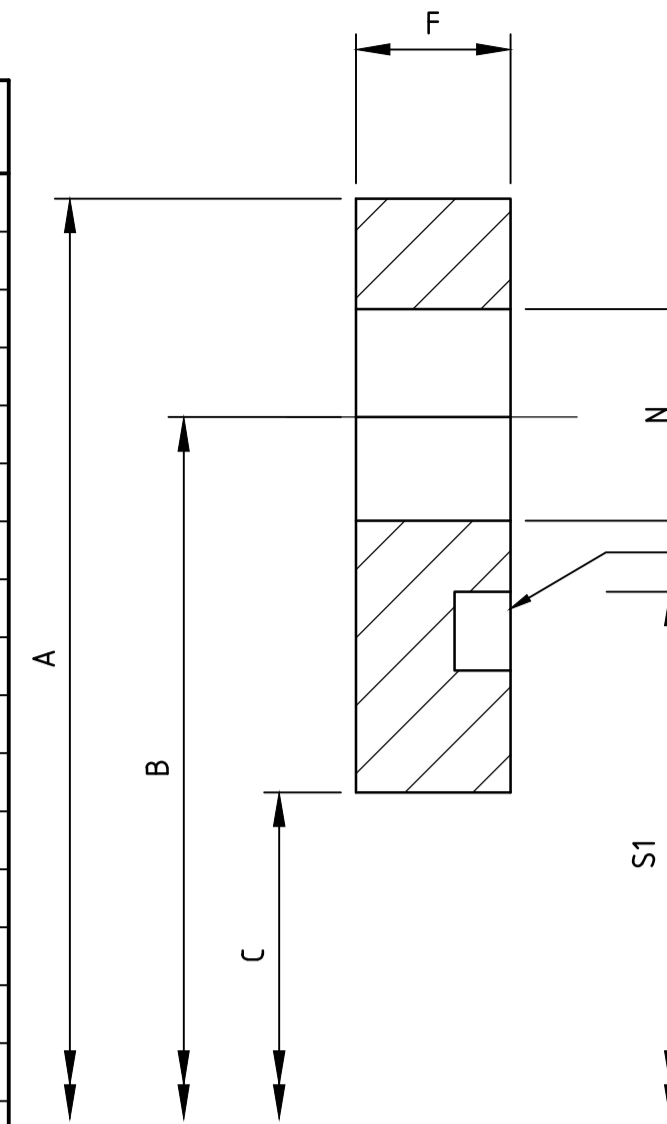
**MS GUIDE FLANGE UP TO DN250**  
NTS



**MS CLAMP FLANGE DETAIL**  
NTS

REV	DATE	DRN	REVISION PANEL	DETAILS	APR'D	CURRENT REV AUTHORIZED	15/12/22	DESIGNED	14/02/22	AUTHORISED	DESIGN PANEL	SA WATER STANDARD DRAWING		TOTAL SHEETS: 1.0	
1.0	15/12/22	GB	ISSUED FOR USE		MW	M.WHITE		T.MZUNGU	14/02/22	H.HABIB		STANDARD PN16 RESTRAINED DISMANTLING JOINT		PROJECT No: _____	
											CIVIL		MAXIMO ID: _____		
											SA Water		SUPERSEDES: _____		
											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.		DRAWING NUMBER		
													STD-06-00005_01		
													REVISION		

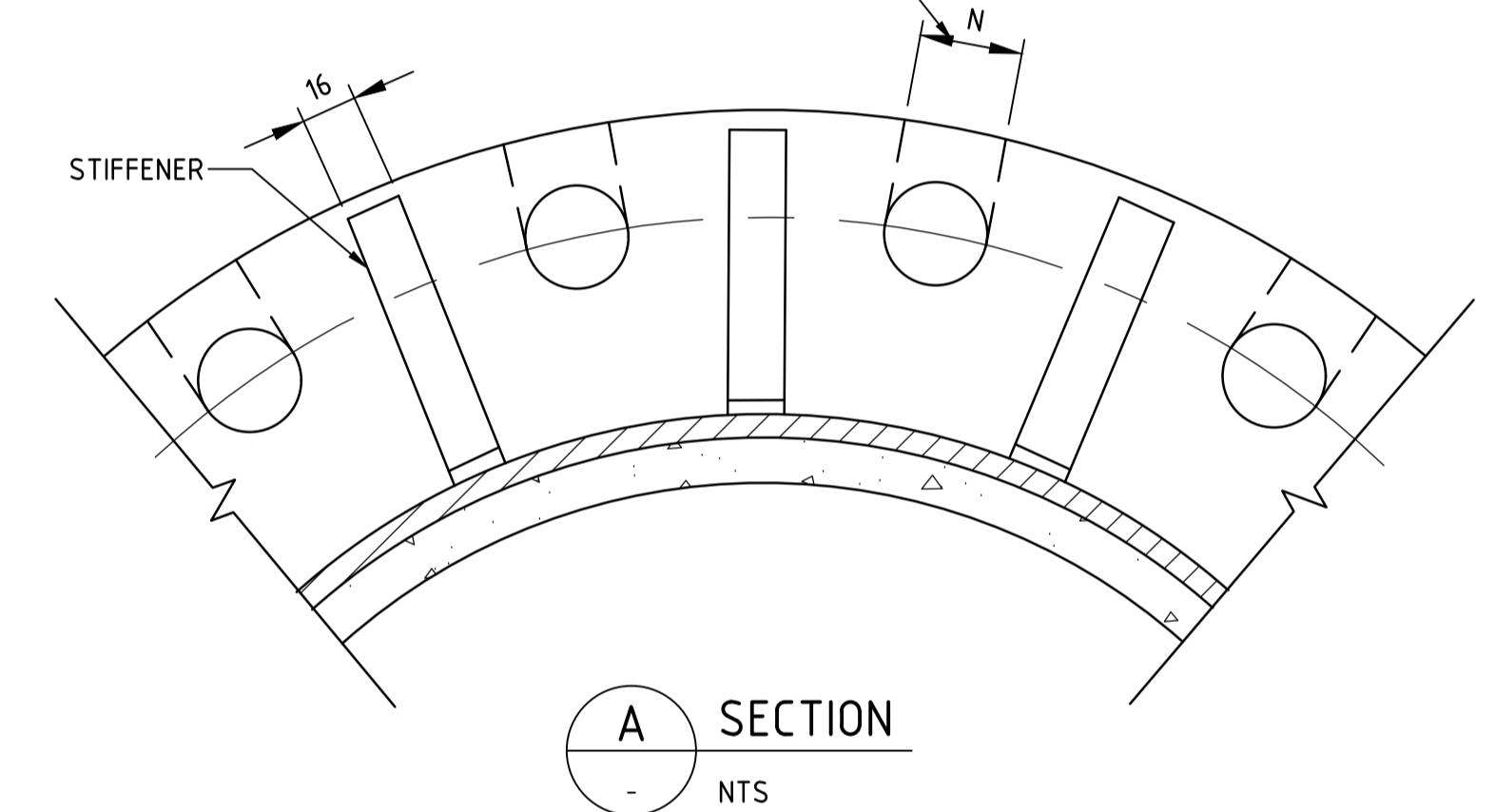
DN	O.D. (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (MIN) (mm)	H (mm)	J1 (mm)	J2 (mm)	K	L (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	R (mm)	S1 (mm)	S2 (mm)	T (mm)	U (mm)	V (mm)	W (mm)	NO. STIFFENERS	NO. BOLTS	DN
80	89	205	165	91	15	15	20	4.5	100	340	260	M16	190	31	18	10	4	2	-	141	6	10	130	5	-	8	80
100	114	230	191	116	19	19	20	4.5	100	370	280	M16	200	31	18	10	4	2	-	167	6	10	140	4.8	-	8	100
150	168	305	260	171	24	24	25	4.5	100	435	335	M20	235	37	22	12	4	2	-	232	6	10	160	5	-	12	150
200	219	370	324	221	24	24	25	4.5	100	470	355	M20	255	37	22	12	4	2	-	296	6	10	175	5	-	12	200
250	273	430	381	276	30	30	28	4.5	120	605	445	M24	325	44	26	14	4	3	-	349	6	13	230	5	-	12	250
300	324	490	438	327	30	30	28	4.5	120	610	445	M24	325	44	26	14	4	3	400	-	6	13	235	4.5	-	16	300
350	356	550	495	359	30	30	32	4.5	130	560	455	M27	330	50	30	16	4	3	455	-	6	13	230	4.5	-	16	350
400	406	610	552	409	38	38	32	4.5	140	590	490	M27	350	50	30	16	4	3	510	-	6	13	240	5	-	20	400
450	457	675	610	460	38	38	36	5	150	625	520	M30	370	55	33	18	4	3	565	-	6	19	255	5	-	20	450
500	508	735	673	511	48	48	36	5.5	170	680	570	M30	400	55	33	18	4	3	630	-	6	19	280	6	-	24	500
600	610	850	781	613	58	58	40	6.5	200	865	715	M33	515	60	36	20	4	3	735	-	6	19	350	6	-	24	600
700	711	935	857	715	58	58	40	7.5	200	905	735	M33	535	60	36	20	4	3	810	-	6	19	370	8	24	24	700
750	762	1015	940	765	58	58	40	8	200	905	735	M33	535	60	36	20	4	3	890	-	6	22	370	8	28	28	750
800	813	1060	984	816	68	68	40	8.5	220	935	775	M33	555	60	36	20	4	3	935	-	6	22	380	8	28	28	800
900	914	1185	1105	918	68	68	45	9.5	230	950	785	M36	555	65	39	22	4	3	1055	-	6	22	395	10	32	32	900
1000	1016	1275	1194	1020	78	78	45	10.5	250	980	825	M36	575	65	39	22	4	3	1145	-	6	22	405	10	36	36	1000
1200	1219	1530	1441	1224	88	88	50	12.5	280	1085	915	M39	635	71	42	24	5	3	1385	-	7	22	450	12	40	40	1200



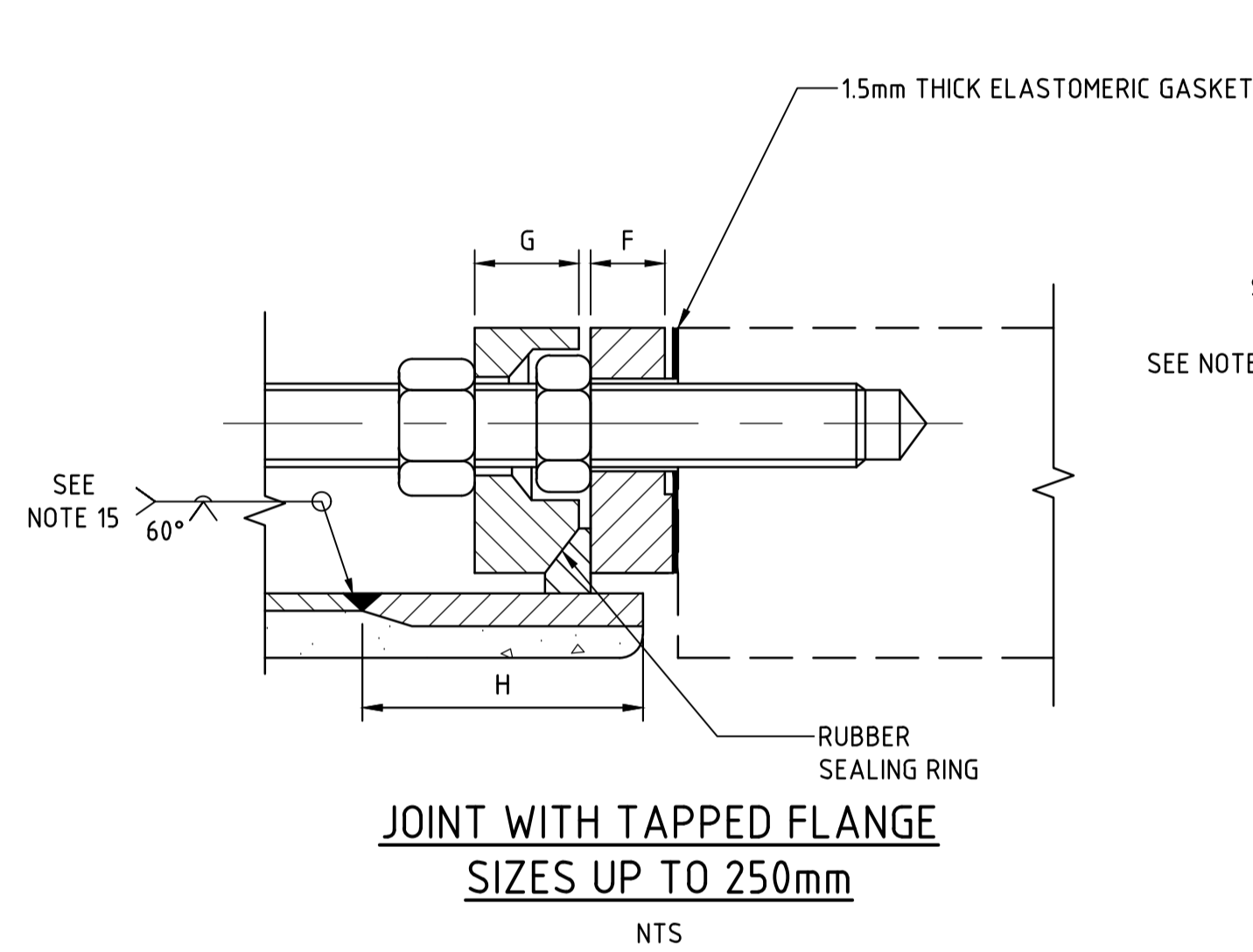
- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
  - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
  - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
    - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm
    - GRADE 250 - THICKNESSES GREATER THAN 8mm
  - FLANGES 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.

**MS GUIDE FLANGE DN300 AND ABOVE**  
NTS

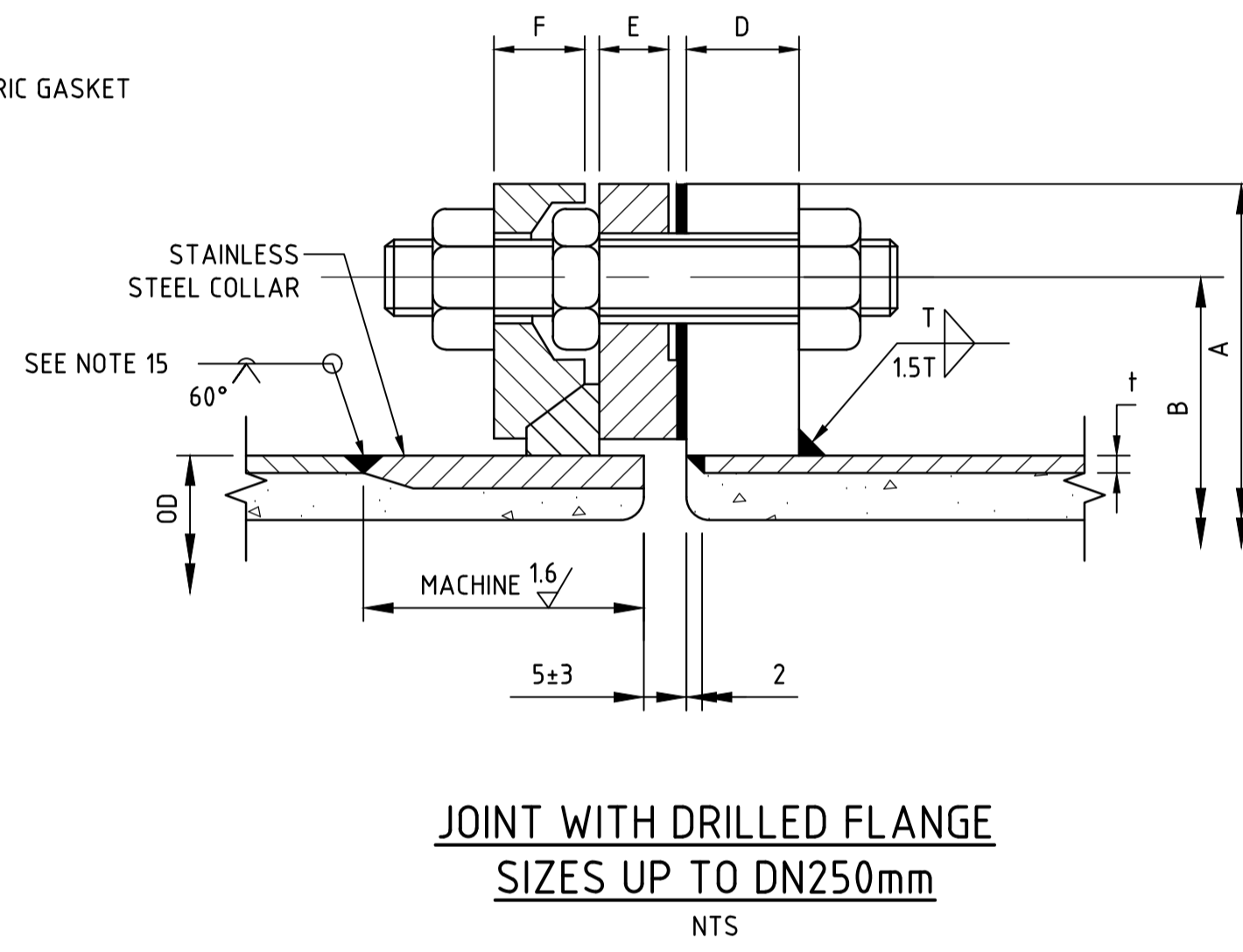
USE DRILLED HOLES WHERE SPACE PERMITS CLEAR DISTANCE J1. HOLES MAY BE SLOTTED FOR REDUCED CLEAR DISTANCE J2



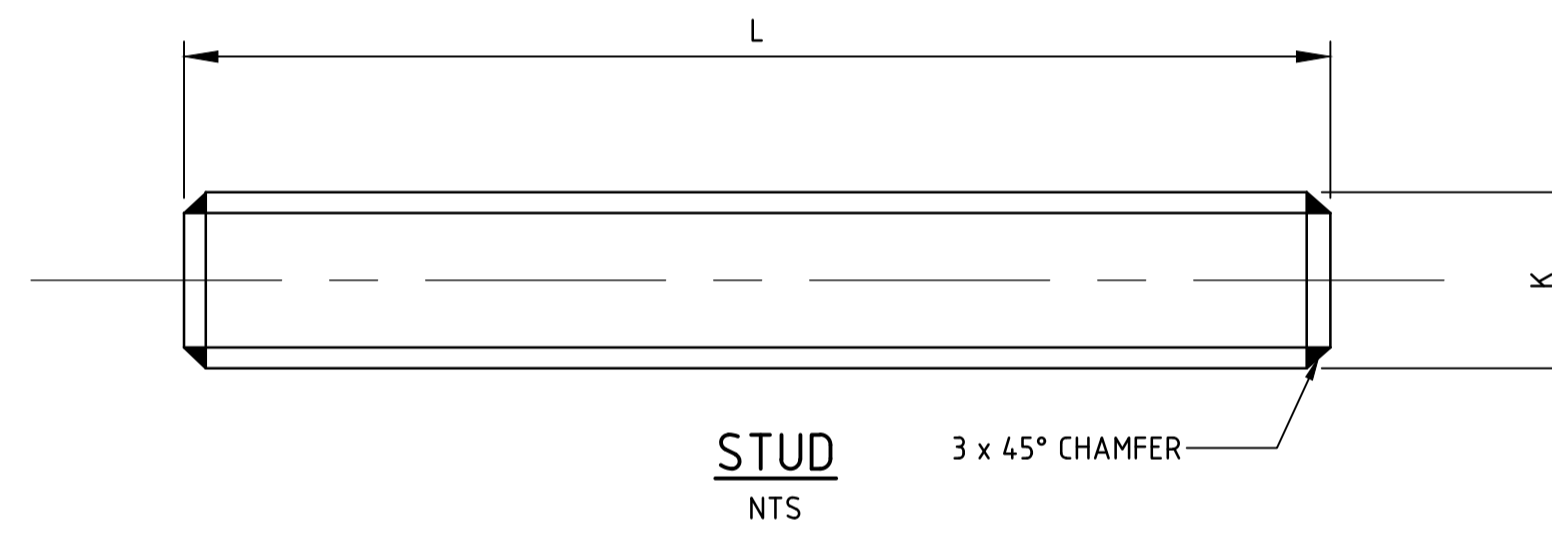
**SECTION A**  
NTS



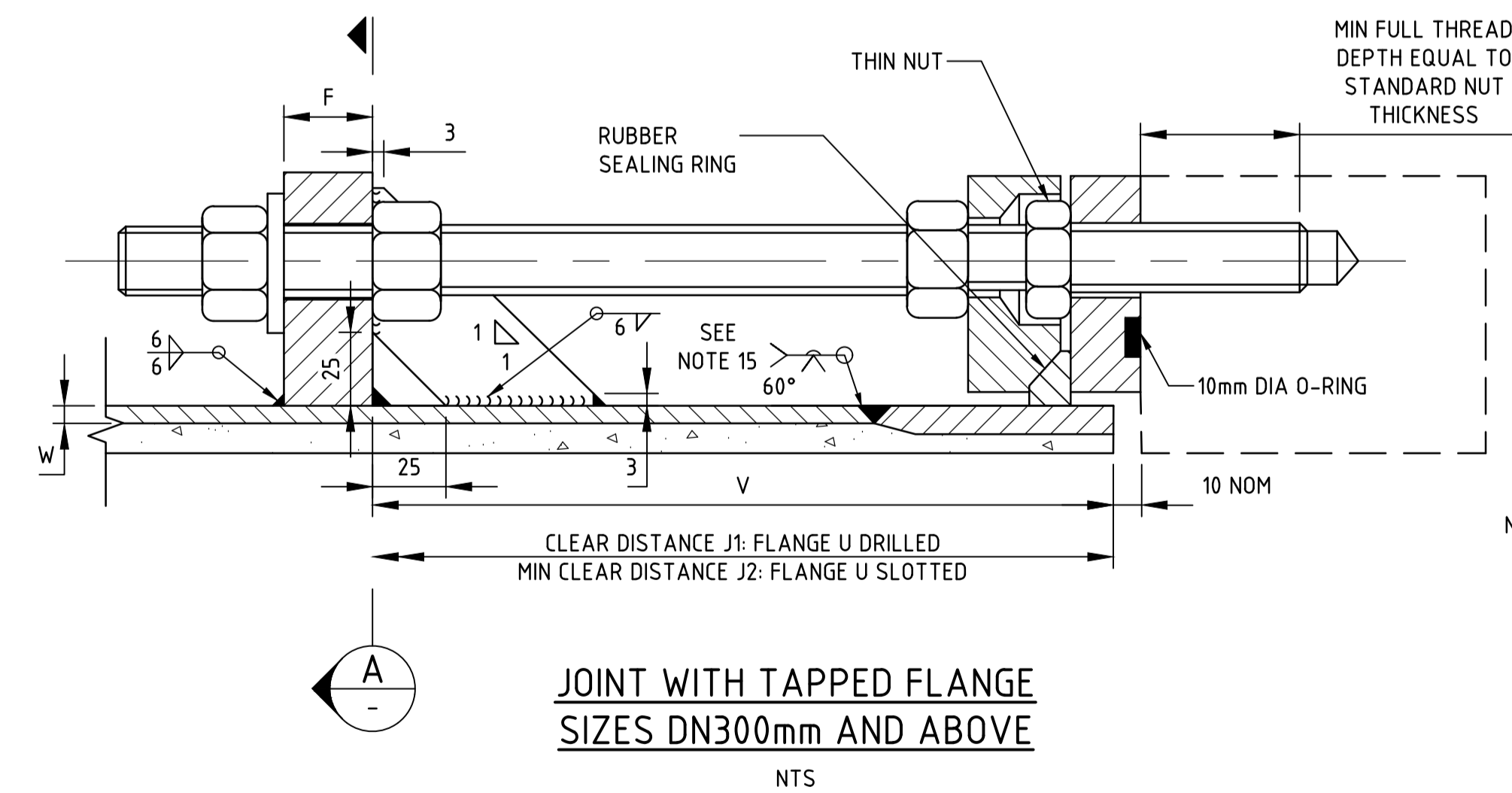
**JOINT WITH TAPPED FLANGE SIZES UP TO 250mm**  
NTS



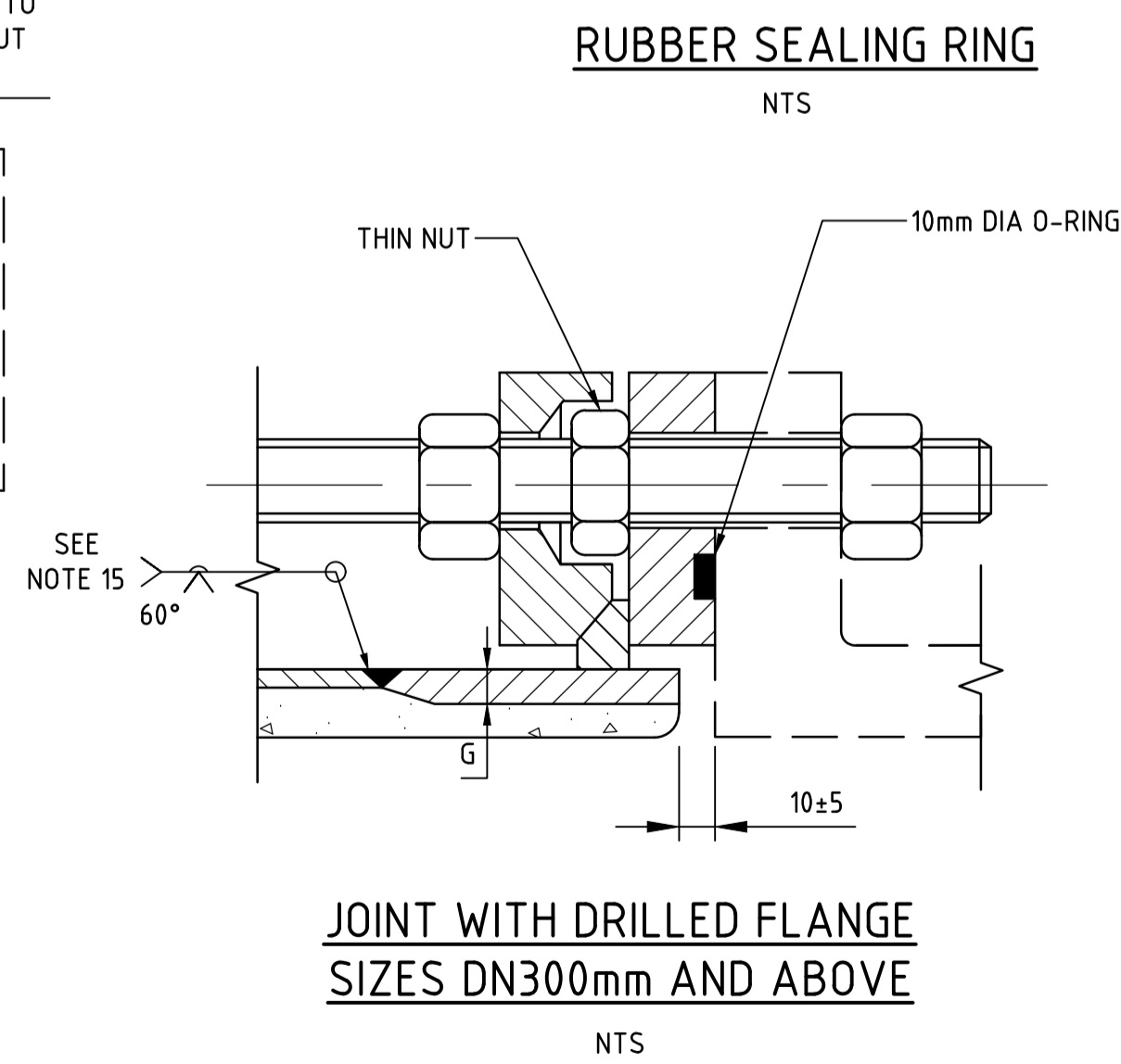
**JOINT WITH DRILLED FLANGE SIZES UP TO DN250mm**  
NTS



**STUD**  
NTS

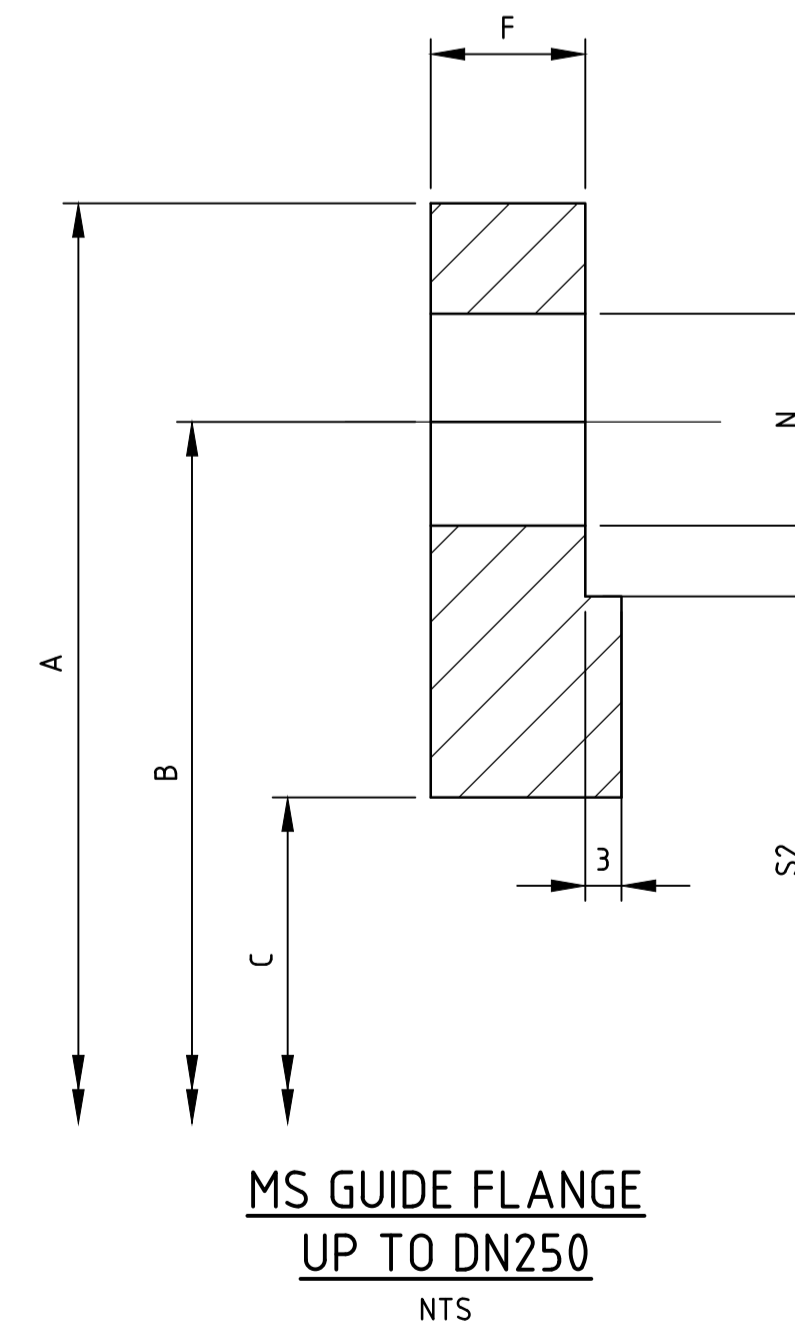


**JOINT WITH TAPPED FLANGE SIZES DN300mm AND ABOVE**  
NTS

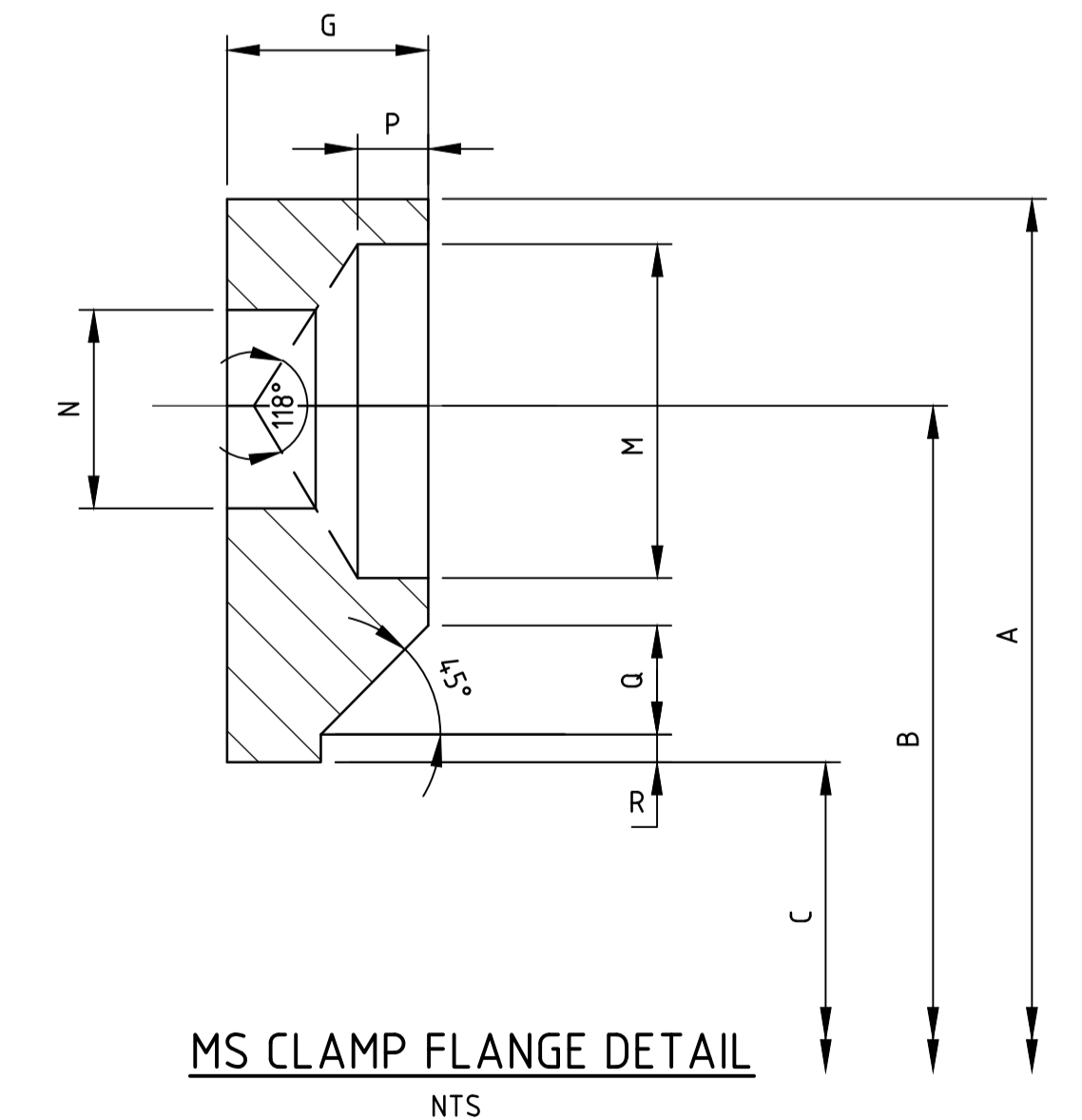


**JOINT WITH DRILLED FLANGE SIZES DN300mm AND ABOVE**  
NTS

**RUBBER SEALING RING**  
NTS



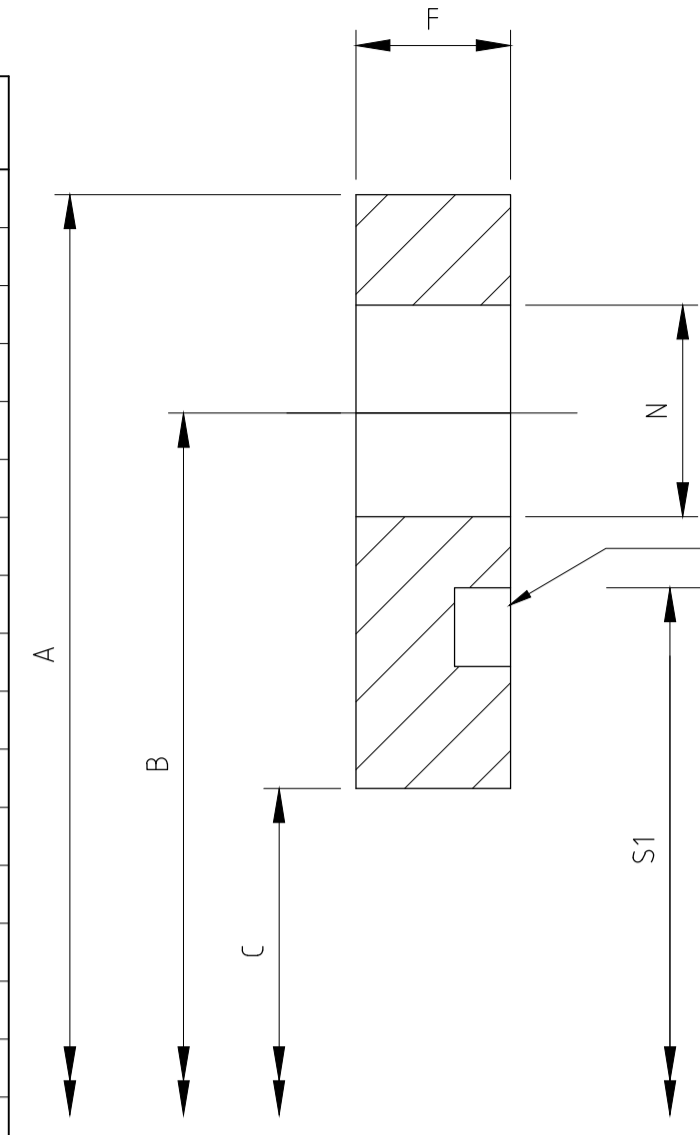
**MS CLAMP FLANGE UP TO DN250**  
NTS



**MS CLAMP FLANGE DETAIL**  
NTS

REV	DATE	DRN	REVISION PANEL	DETAILS	APR'D	CURRENT REV AUTHORIZED	15/12/22	DESIGNED	14/02/22	DESIGN PANEL	AUTHORISED	SA Water		SA WATER STANDARD DRAWING	STANDARD PN21 RESTRAINED		DISMANTLING JOINT		CIVIL		A1 TOTAL SHEETS: 1.0	
1.0	15/12/22	GB	ISSUED FOR USE		MW	M.WHITE		T.MZUNGU	14/02/22		H.HABIB	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.		PROJECT No:		DRAWING NUMBER				STU-06-00006_01		
			CURRENT REV CONTRACTOR: GHD			CURRENT REV PROJECT: 1.0																

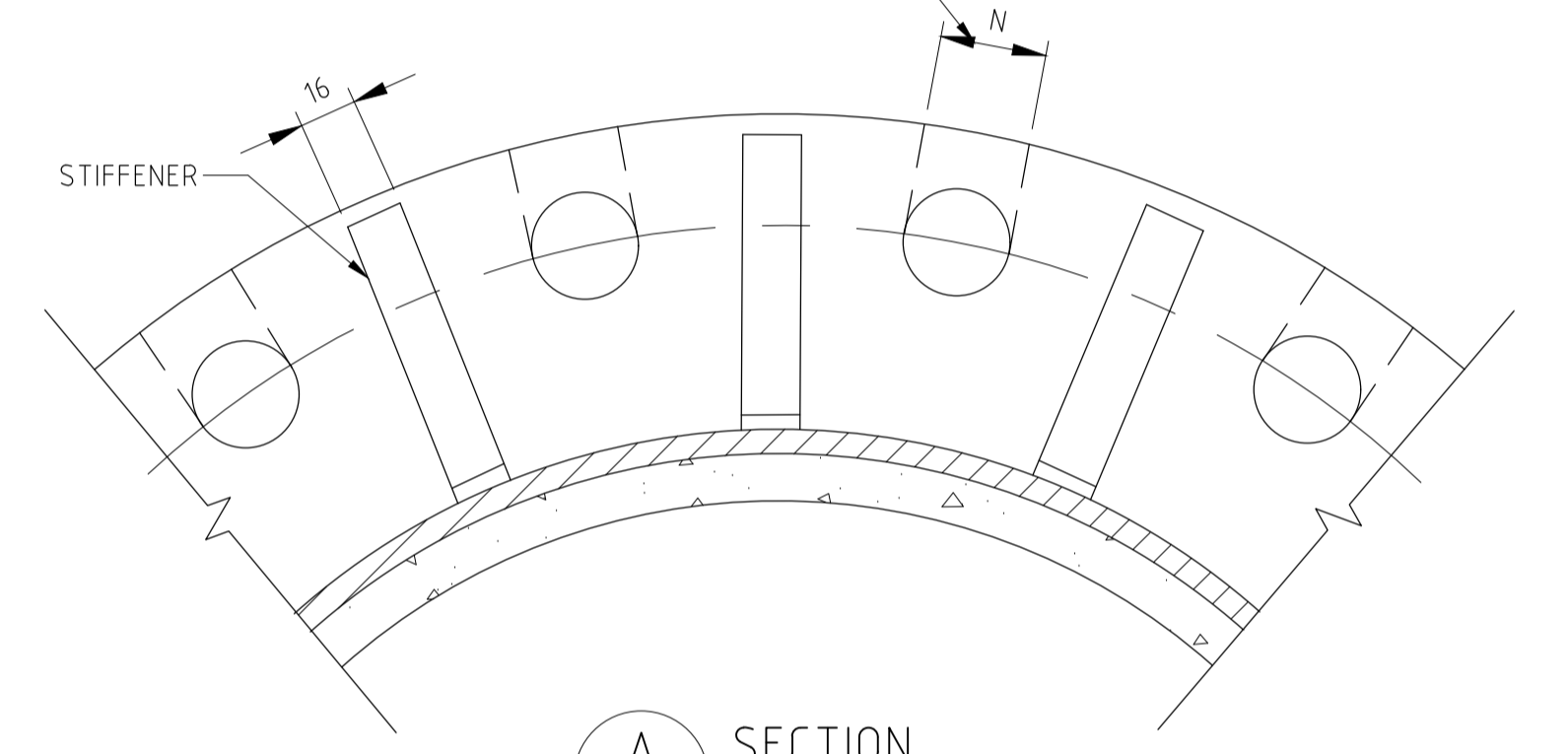
DN	O.D. (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (MIN) (mm)	H (mm)	J1 (mm)	J2 (mm)	K	L (mm)	M (mm)	N (mm)	P (mm)	Q (mm)	R (mm)	S1 (mm)	S2 (mm)	T (mm)	U (mm)	V (mm)	W (mm)	NO. STIFFENERS	NO. BOLTS	DN
80	89	205	165	91	24	15	20	4.5	100	370	280	M16	210	31	18	10	4	2	-	141	6	10	140	5	-	8	80
100	114	230	191	116	24	19	20	4.5	100	380	290	M16	210	31	18	10	4	2	-	167	6	10	140	4.8	-	8	100
150	168	305	260	171	31	24	25	4.5	100	465	355	M20	255	37	22	12	4	2	-	232	6	10	170	5	-	12	150
200	219	370	324	221	31	24	25	4.5	100	500	375	M20	275	37	22	12	4	2	-	260	6	10	185	5	-	12	200
250	273	430	381	276	38	30	28	4.5	120	615	455	M24	335	44	26	14	4	3	-	311	6	13	230	5	-	12	250
300	324	490	438	327	38	30	28	5.5	120	640	465	M24	345	44	26	14	4	3	400	-	6	13	245	6	-	16	300
350	356	550	495	359	48	30	32	6	130	620	495	M27	370	50	30	16	4	3	455	-	6	13	250	6	-	16	350
400	406	610	552	409	48	38	32	7	140	620	510	M27	370	50	30	16	4	3	510	-	6	13	250	8	-	20	400
450	457	675	610	460	58	38	36	7.5	150	685	560	M30	410	55	33	18	4	3	565	-	6	19	275	8	-	20	450
500	508	735	673	511	58	48	36	8.5	170	710	590	M30	420	55	33	18	4	3	630	-	6	19	290	8	-	24	500
600	610	850	781	613	68	58	40	10	200	895	735	M33	535	60	36	20	4	3	735	-	6	19	360	10	24	24	600
700	711	935	857	715	78	58	40	12	200	965	775	M33	575	60	36	20	5	3	810	-	7	19	390	12	24	24	700
750	762	1015	940	765	78	58	40	12.5	200	965	775	M33	575	60	36	20	6	3	890	-	8	22	390	12	28	28	750
800	813	1060	984	816	84	68	40	13.5	220	975	805	M33	585	60	36	20	6	3	935	-	8	22	390	16	28	28	800
900	914	1185	1105	918	94	68	45	15	230	1020	835	M36	605	65	39	22	7	3	1055	-	9	22	415	16	32	32	900
1000	1016	1275	1194	1020	98	78	45	17	250	1040	865	M36	615	65	39	22	8	3	1145	-	10	22	425	16	36	36	1000
1200	1219	1530	1441	1224	108	88	50	20	280	1145	955	M39	675	71	42	24	10	3	1385	-	12	22	470	20	40	40	1200



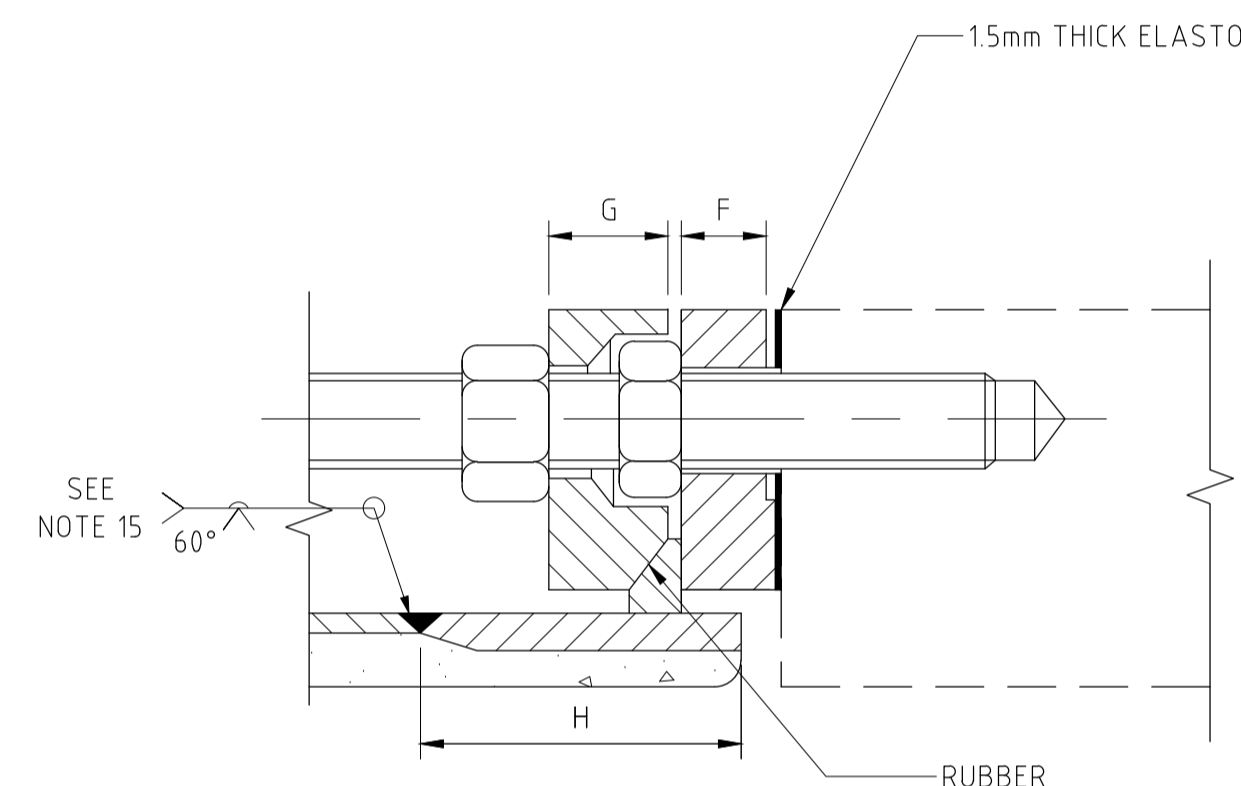
- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
  - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
  - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
    - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm
    - GRADE 250 - THICKNESSES GREATER THAN 8mm
  - FLANGES 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.

**MS GUIDE FLANGE DN300 AND ABOVE**  
NTS

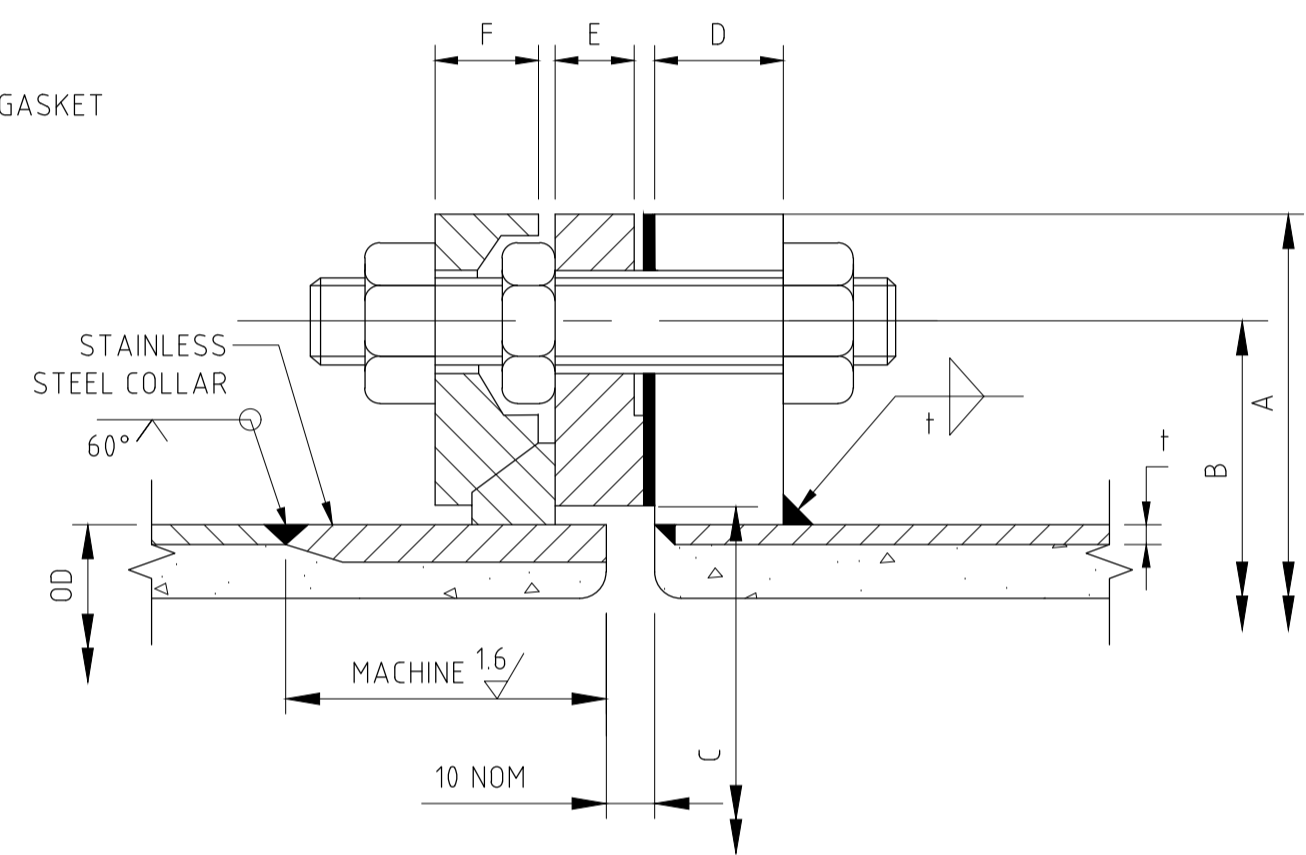
USE DRILLED HOLES WHERE SPACE PERMITS CLEAR DISTANCE J1. HOLES MAY BE SLOTTED FOR REDUCED CLEAR DISTANCE J2



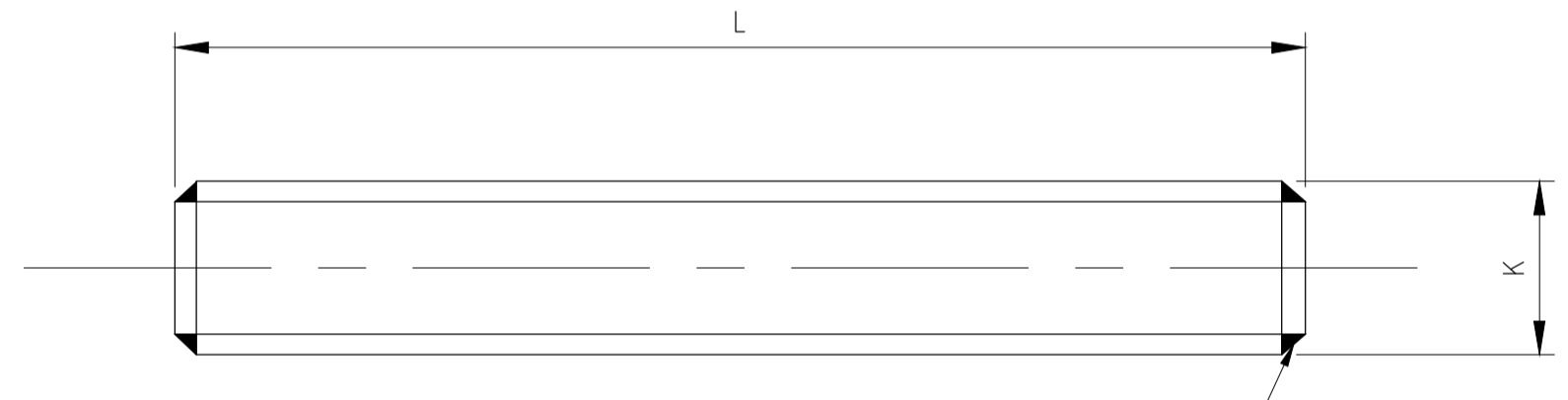
**SECTION A**  
NTS



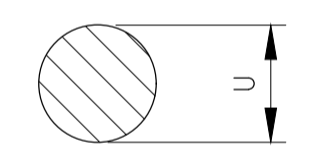
**JOINT WITH TAPPED FLANGE**  
SIZES UP TO 250mm  
NTS



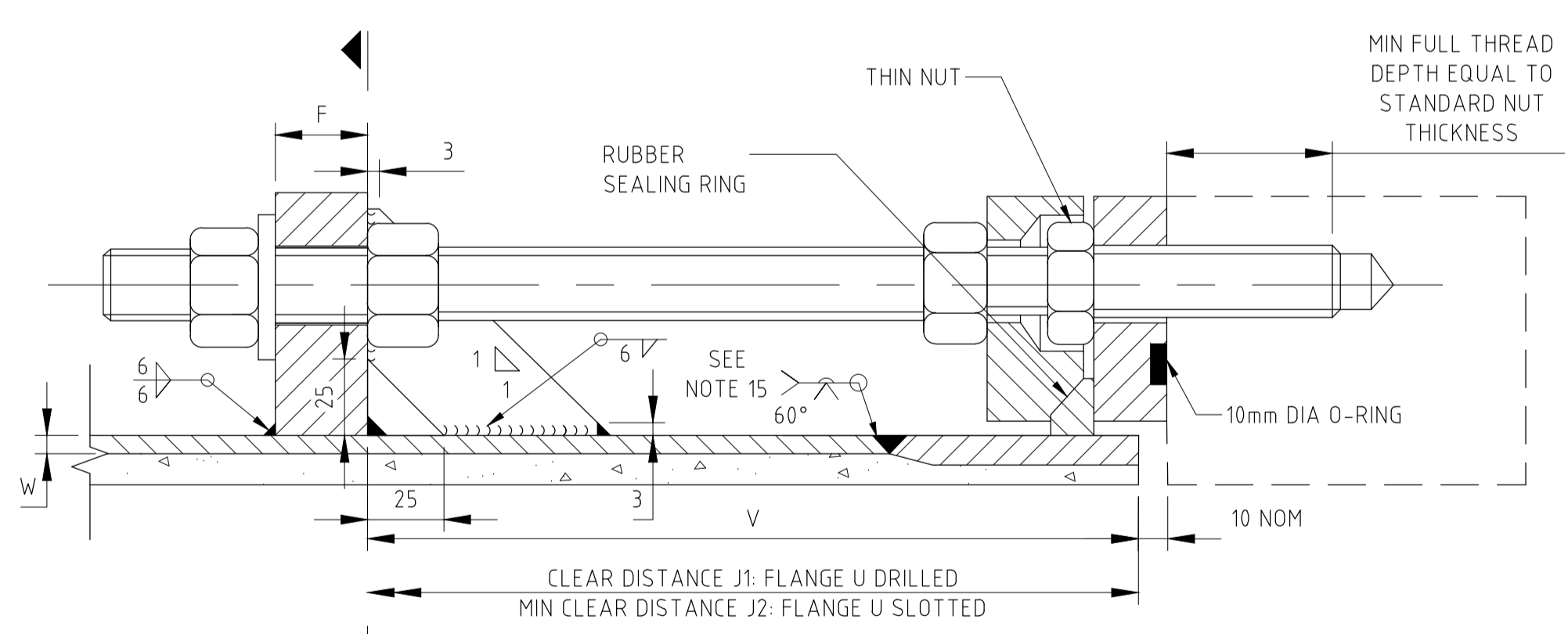
**JOINT WITH DRILLED FLANGE**  
SIZES UP TO DN250mm  
NTS



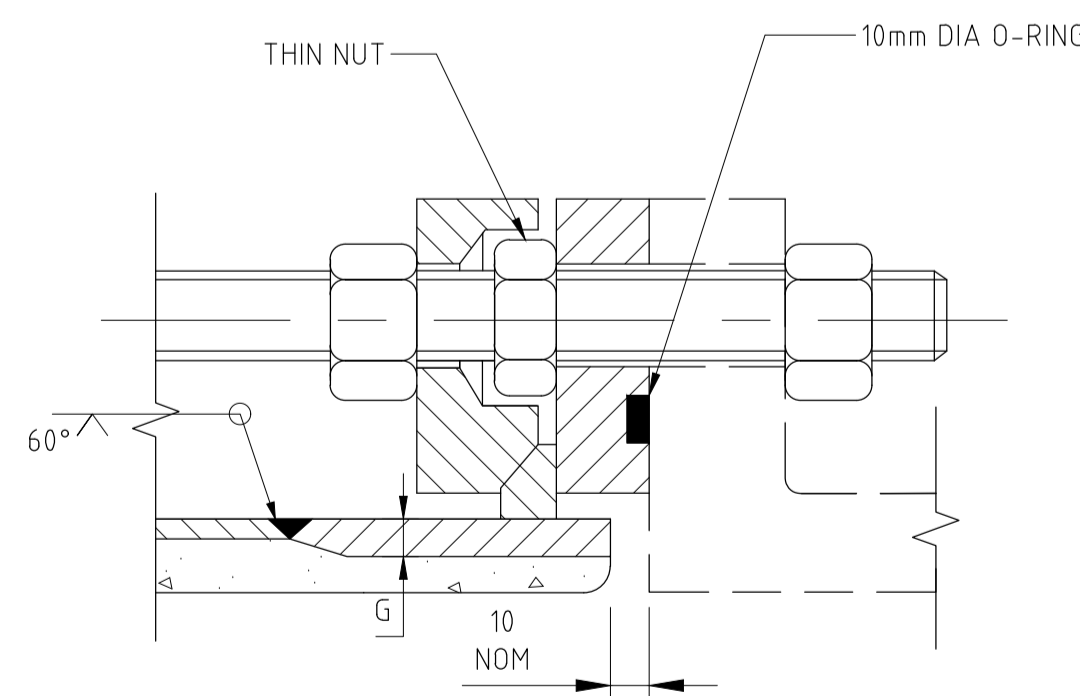
**STUD**  
NTS  
3 x 45° CHAMFER



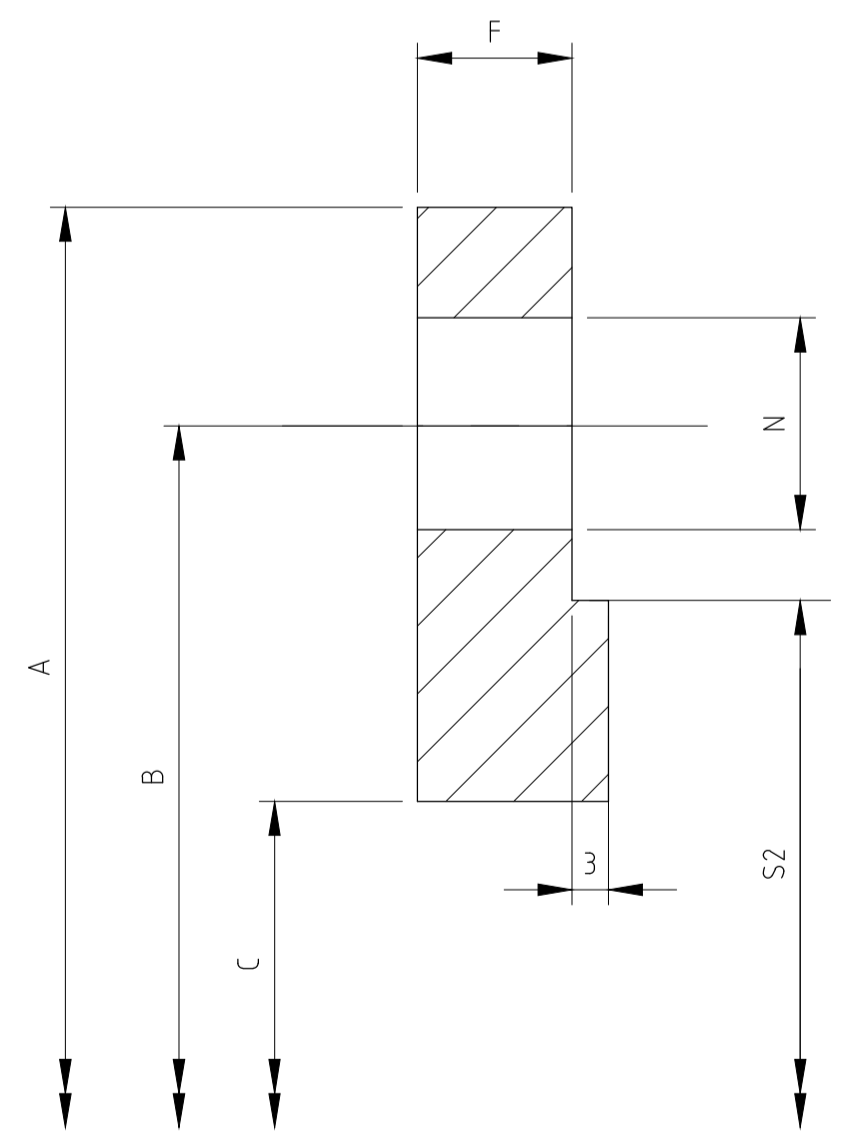
**RUBBER SEALING RING**  
NTS



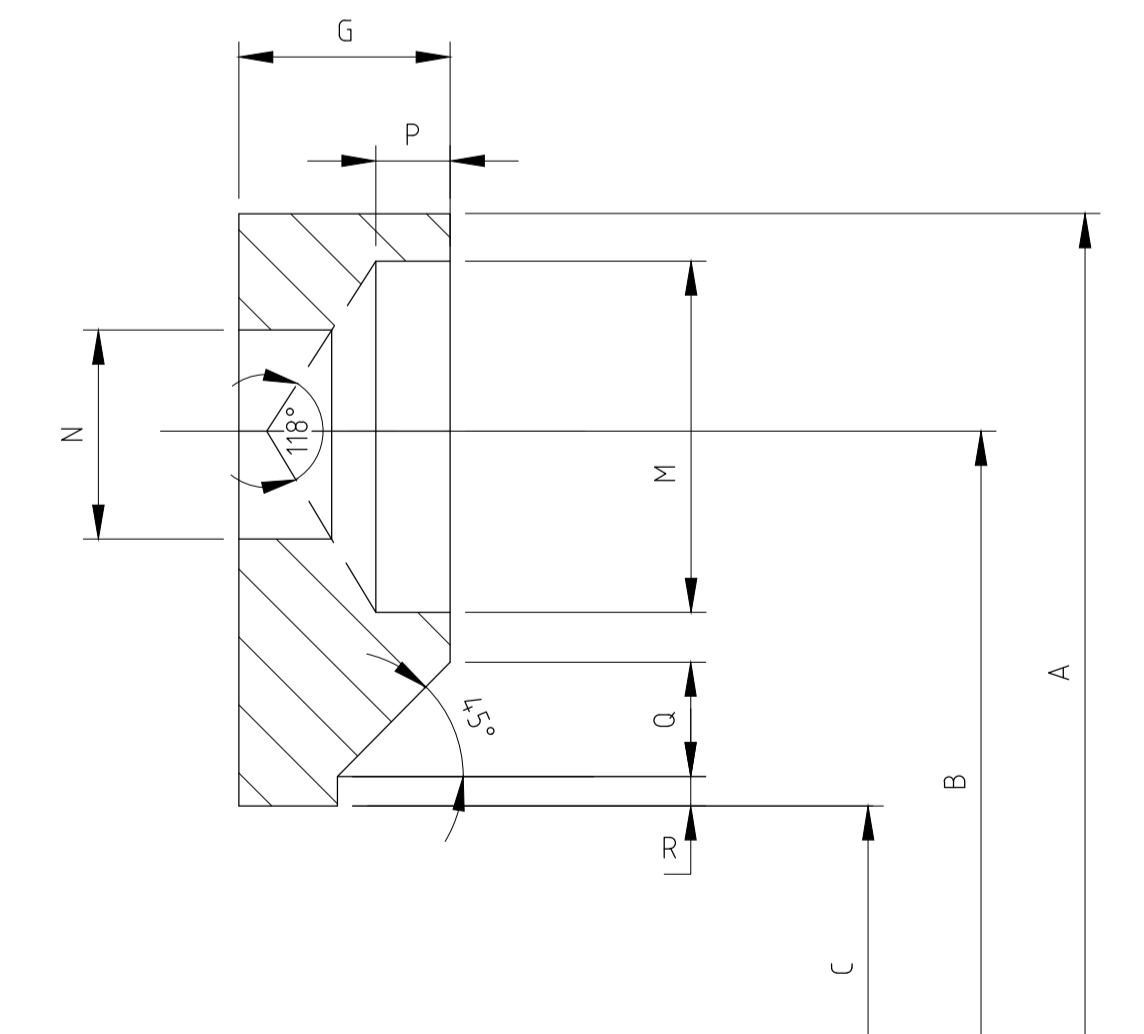
**JOINT WITH TAPPED FLANGE**  
SIZES DN300mm AND ABOVE  
NTS



**JOINT WITH DRILLED FLANGE**  
SIZES DN300mm AND ABOVE  
NTS

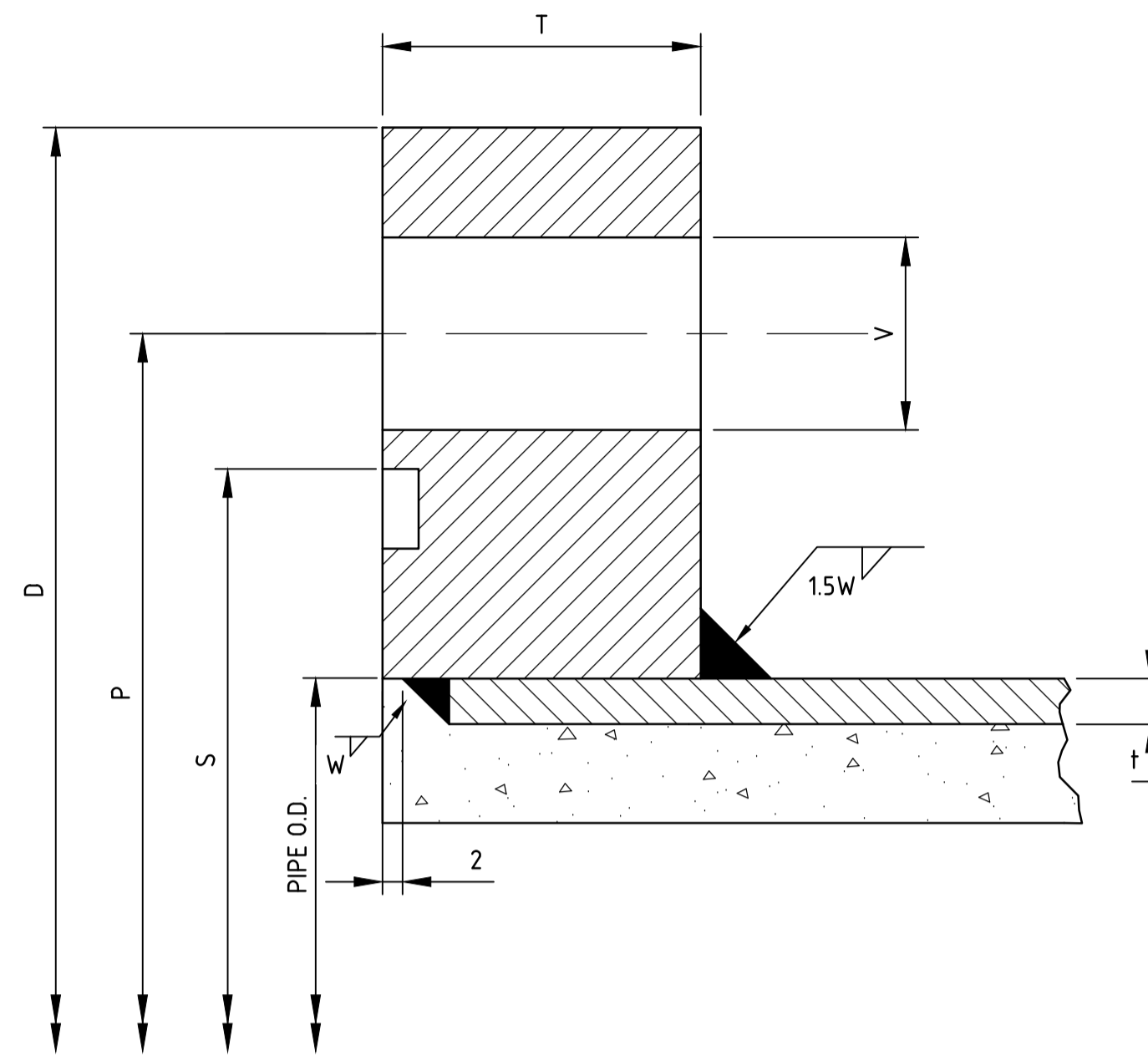


**MS GUIDE FLANGE**  
UP TO DN250  
NTS

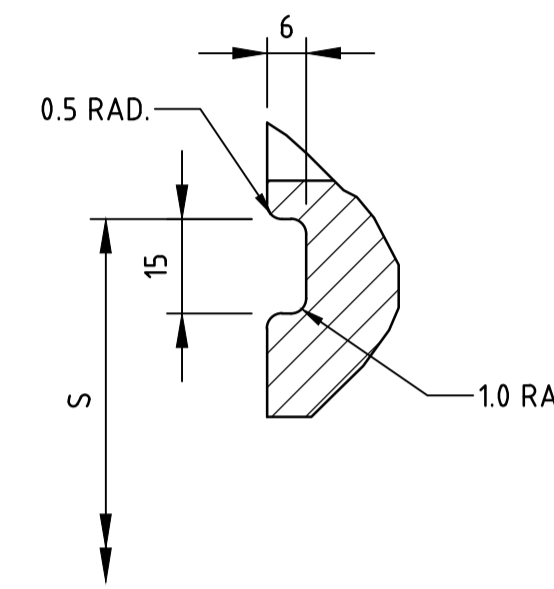


**MS CLAMP FLANGE DETAIL**  
NTS

REVISION PANEL				DESIGN PANEL				SA WATER		TOTAL SHEETS: 1.0	
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	AUTHORIZED	SA WATER		PROJECT No:	
1.0	15/12/22	GB	ISSUED FOR USE	MW	M.WHITE	T.MZUNGU	H.HABIB	SA WATER STANDARD DRAWING		MAXIMO ID:	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0				STANDARD PN35 RESTRAINED		SUPERSEDES:	
								CIVIL		DRAWING NUMBER	
										STD-06-00007_01	



**SLIP-ON O-RING FLANGE**  
NTS



**O-RING GROOVE DETAILS**  
NTS

**NOTES:**

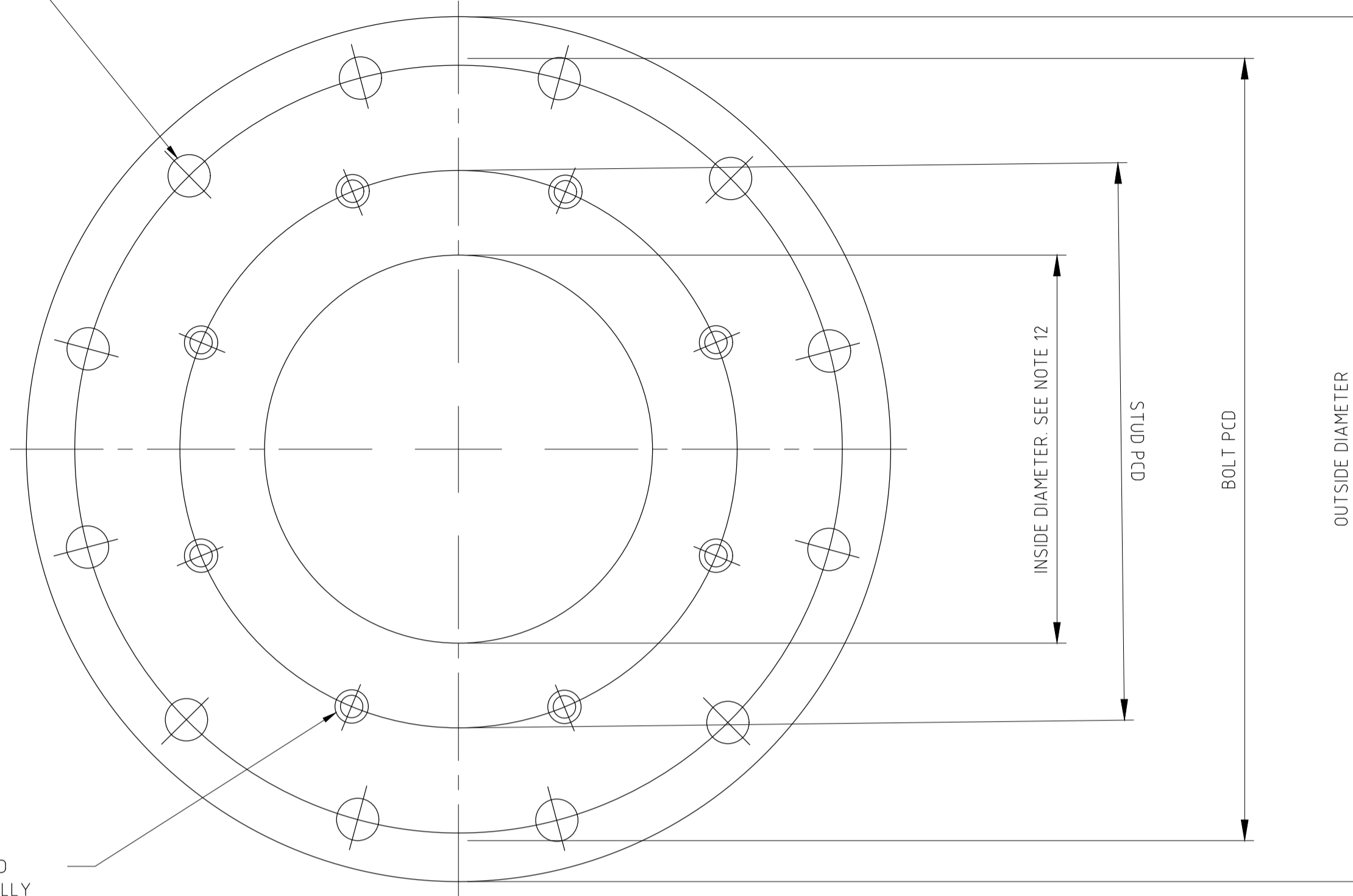
1. ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
2. ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
3. ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
  - a. GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
  - b. GRADE 250 - THICKNESSES GREATER THAN 8mm.
4. FLANGES TO BE FABRICATED 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.

DN	PIPE O.D.	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)	WELD SIZE W (mm)	FASTENER SIZE AND THREAD	FLANGE THICKNESS T (mm)
600	610	16	825	715	756	16	30	6	M27	48
		21	850	735	781	24	36	6	M33	58
		35	850	735	850	24	36	6	M33	68
700	711	16	910	800	845	20	30	6	M27	56
		21	935	810	857	24	36	6	M33	58
		35	935	810	935	24	36	7	M33	78
750	762	16	995	880	927	20	33	6	M30	56
		21	1015	890	940	28	36	6	M33	58
		35	1015	890	1015	28	36	8	M33	78
800	813	16	1060	935	984	20	36	6	M33	56
		21	1060	935	984	28	36	6	M33	68
		35	1060	935	1060	28	36	8	M33	84
900	914	16	1175	1045	1092	24	36	6	M33	66
		21	1185	1055	1105	32	39	6	M36	68
		35	1185	1055	1185	32	39	9	M36	94
1000	1016	16	1255	1125	1175	24	36	6	M33	66
		21	1275	1145	1194	36	39	6	M36	78
		35	1275	1145	1275	36	39	10	M36	98
1200	1219	16	1490	1360	1410	32	36	6	M33	76
		21	1530	1385	1441	40	42	7	M39	88
		35	1530	1385	1530	40	42	12	M39	108

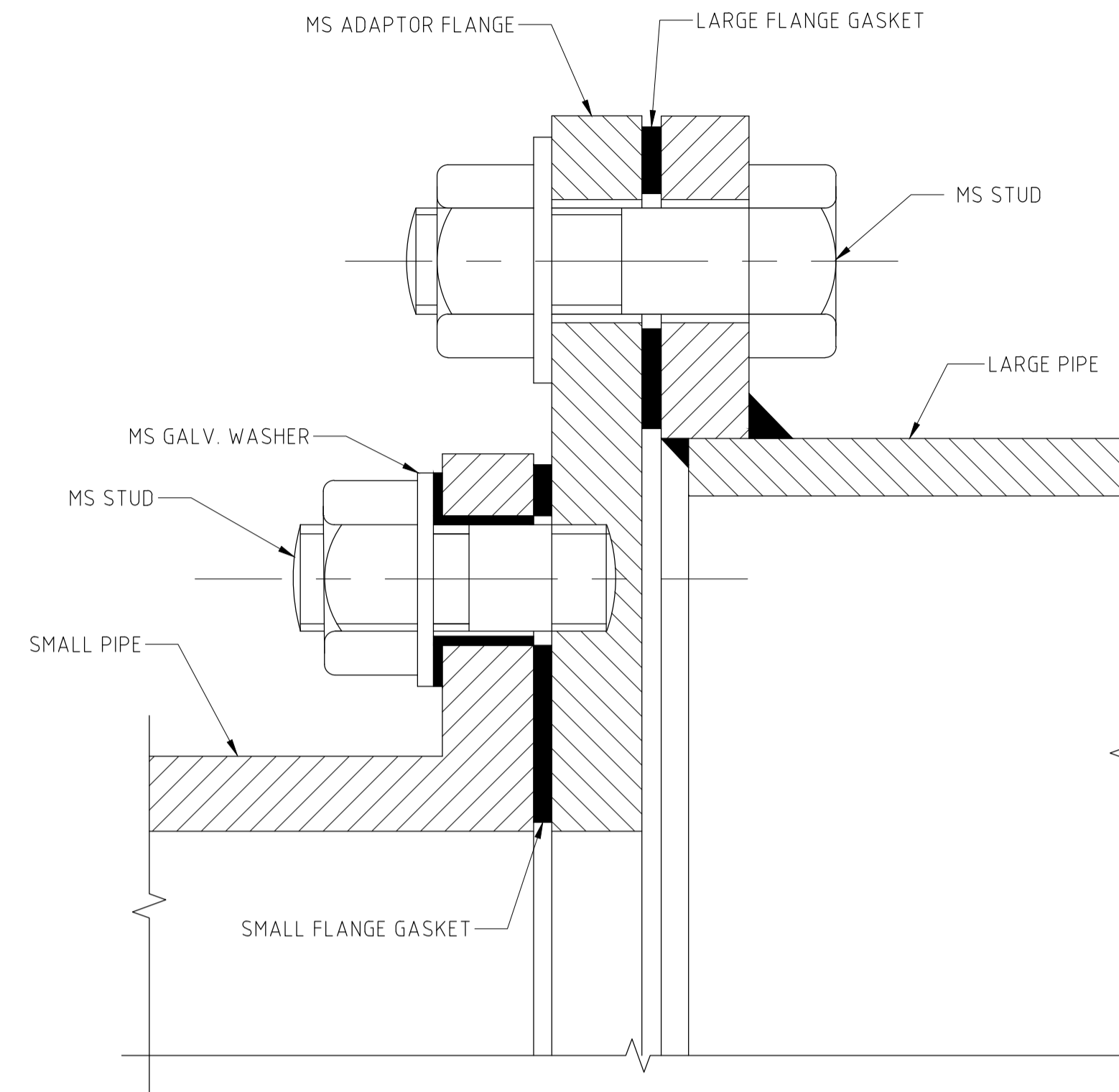
REVISION PANEL				DESIGN PANEL				 SA WATER STANDARD DRAWING STANDARD O-RING FLANGE DETAILS PN16, PN21, & PN35 CIVIL		A1 TOTAL SHEETS: 1.0 PROJECT No: _____ MAXIMO ID: _____ SUPERSEDES: _____ DRAWING NUMBER STD-06-00008_01	
REV	DATE	DRN	APR'D	DESIGNED	AUTHORISED	This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.				1.0 REVISION	
				T.MZUNGU	H.HABIB						
				G. BALDONADO	SIGNATURE						
				M.WHITE							
				SIGNATURE							
1.0	15/12/22	GB	ISSUED FOR USE	M.WHITE							
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0							

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:

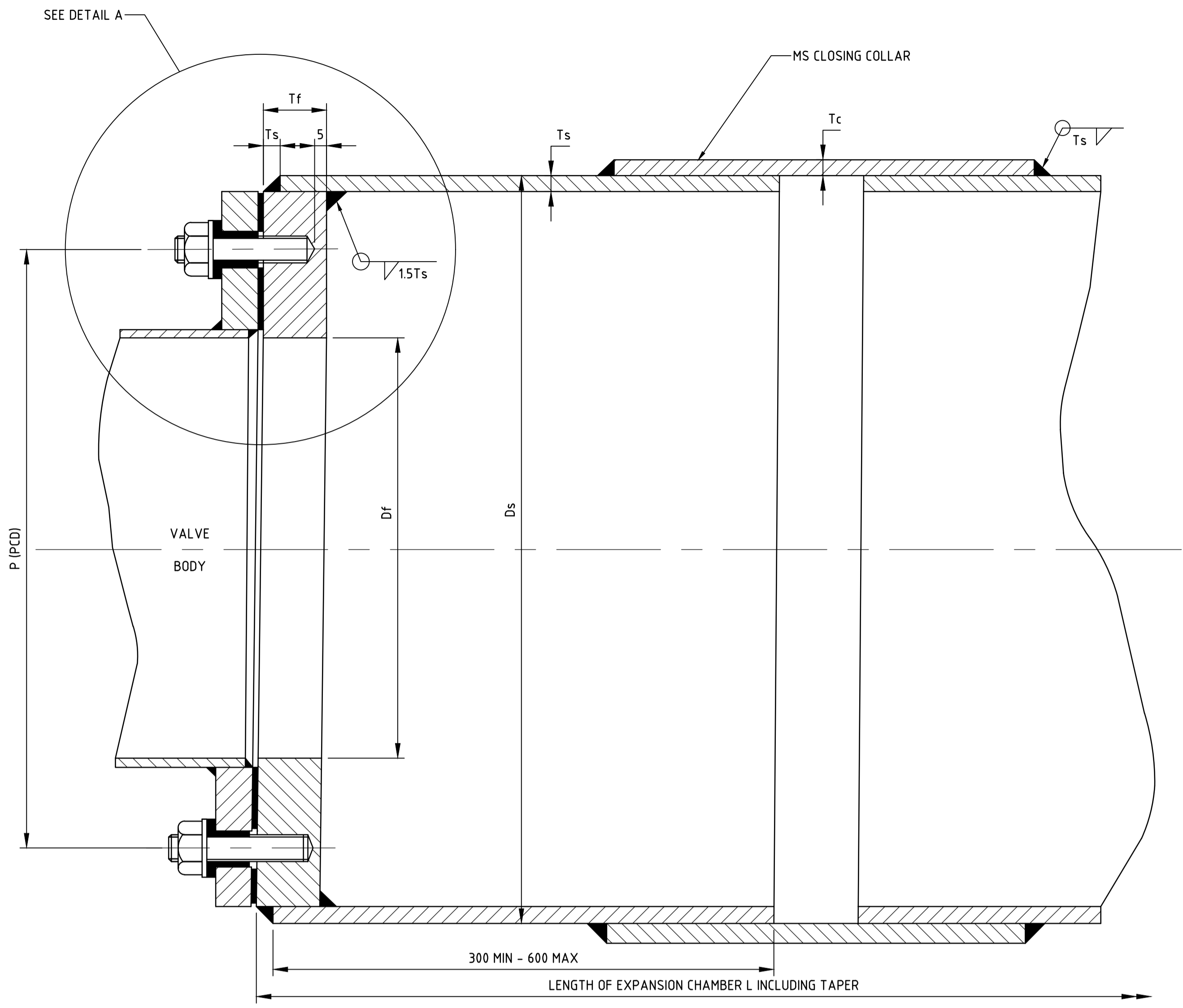
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
- ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
- ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
  - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
  - GRADE 250 - THICKNESSES GREATER THAN 8mm.
- FLANGE FABRICATION TOLERANCES 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

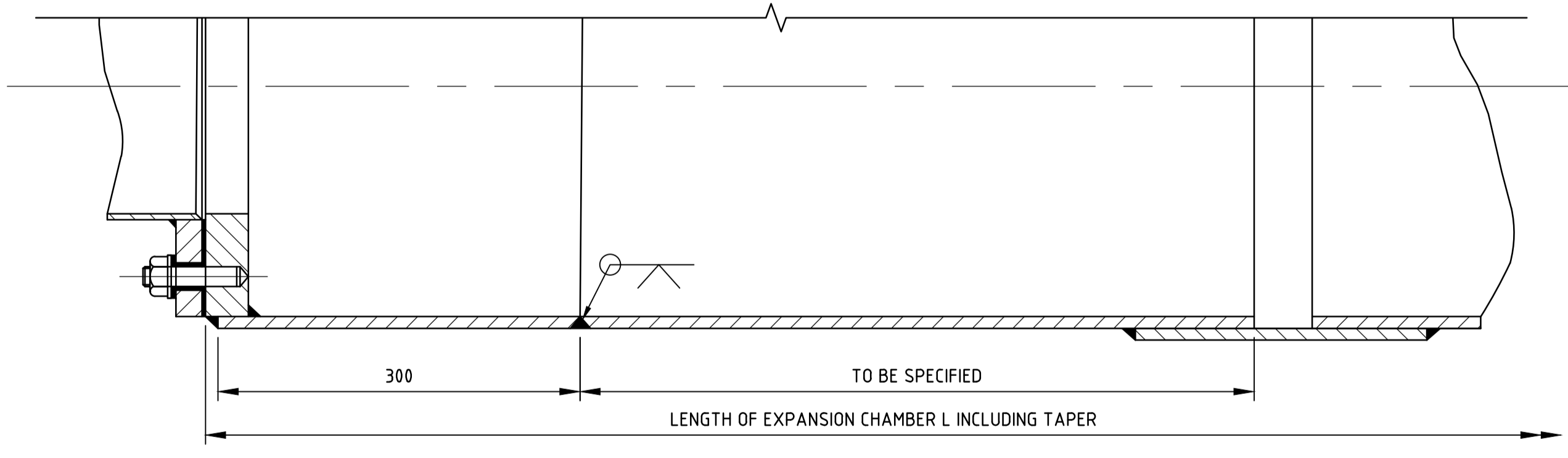
PN21													
FLANGE SIZE		FLANGE OD	BOLT PCD	STUD PCD	FLANGE THICKNESS	BOLT SIZE	NO BOLTS	STUD SIZE	NO OF STUDS	STUD LENGTH	THREADED DEPTH	SMALL FLANGE GASKET	LARGE FLANGE GASKET
SMALL	LARGE	(mm)	(mm)	(mm)	(mm)					(mm)	(mm)		
DN80	DN150	305	260	165	28	M20	12	M16	8	75	24	15 mm COMPRESSED FIBRE NARROW 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		SA WATER STANDARD DRAWING		A1		TOTAL SHEETS: 1.0	
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	14/02/22	AUTHORISED		STANDARD MS ADAPTOR FLANGES		PROJECT No:		REVISION	
					M.WHITE	T.MZUNGU	14/02/22	H.HABIB		PN16 AND PN21		MAXIMO ID:			
					SIGNATURE	G.BALDONADO	14/02/22	SIGNATURE		CIVIL		SUPERSEDES:			
1.0	15/12/22	GB	ISSUED FOR USE	MW		M.WHITE	14/02/22			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.		DRAWING NUMBER		STD-06-00009_01	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0				CONTRACTOR:							

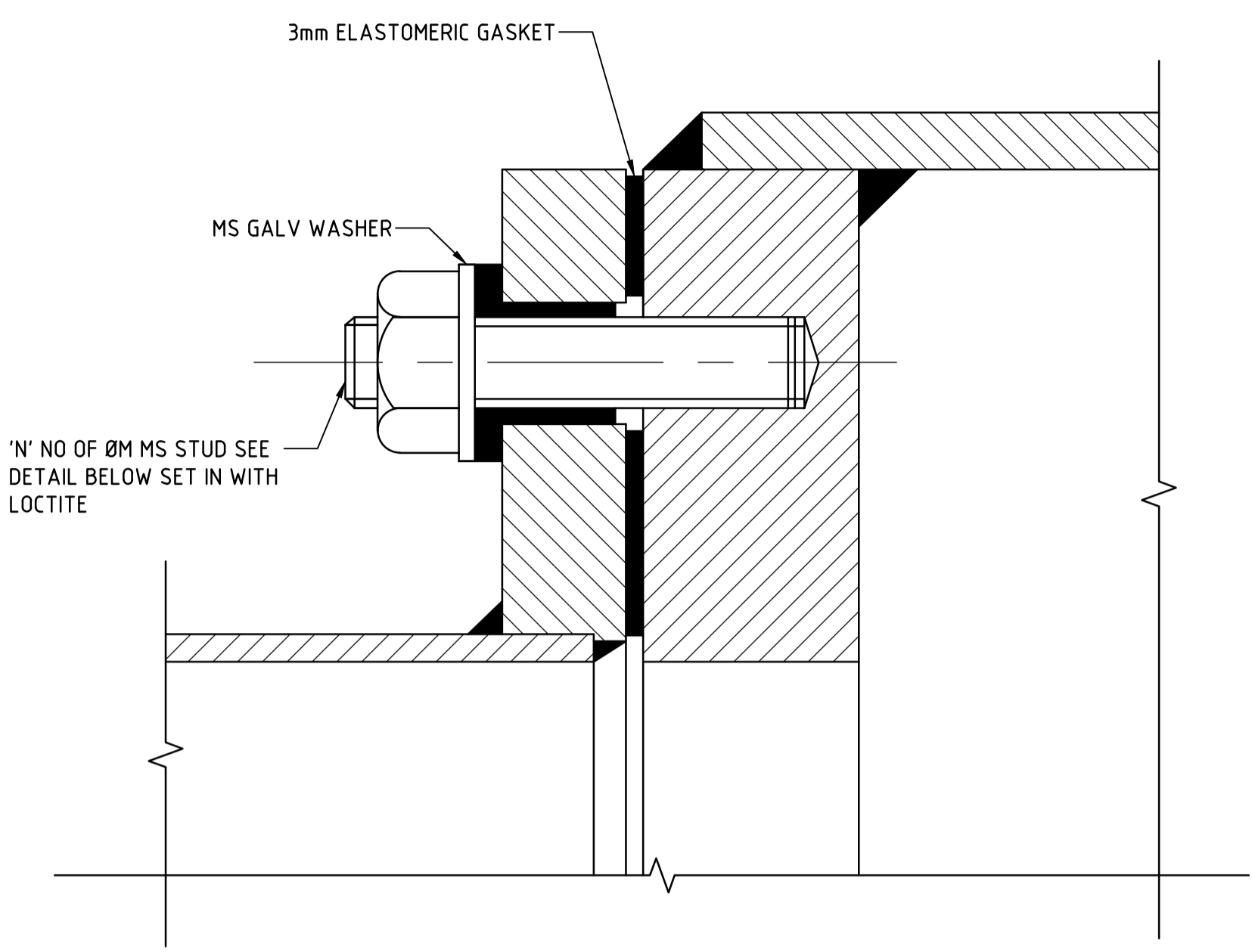




**EXPANSION CHAMBER ASSEMBLY DETAILS**  
 NTS  
 (FOR USE WHERE CLOSING COLLAR CAN BE FITTED WITHIN 600mm OF THE VALVE)



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

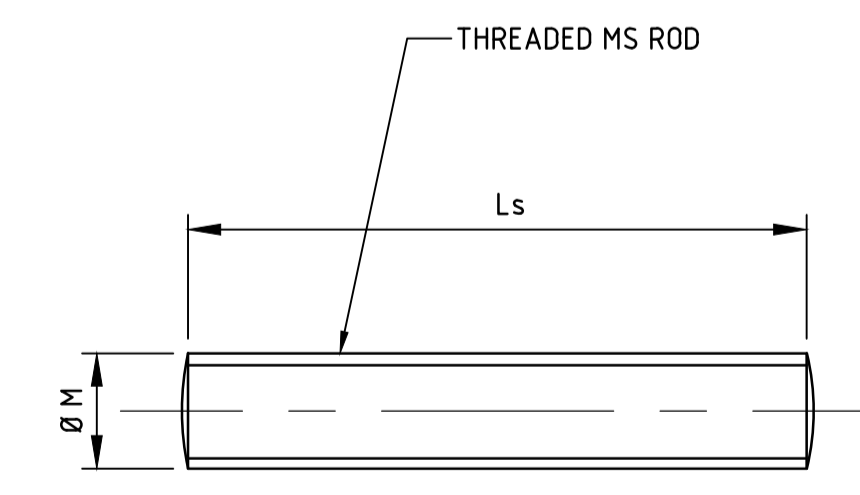


**DETAIL A**  
 NTS

- 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 Ts MAY BE REDUCED TO Tp.

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

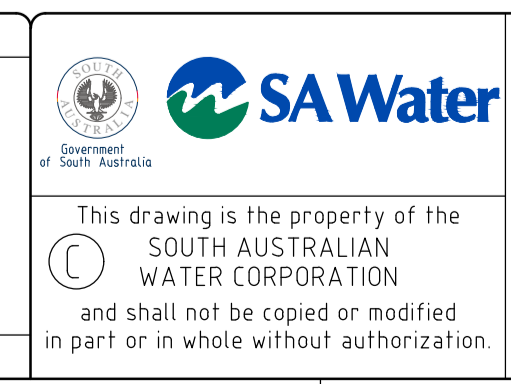
HOCV	Df (mm)	Tf (mm)	Ds (mm)	Ts (SEE NOTE 15) (mm)	Tc (mm)	N	M	P (mm)	Ls (mm)	L (mm)	TP (mm)
100	100	30	219	8	10	4	M16	178	70	1000	8.2
200	200	30	406	10	12	8	M16	292	70	2000	9.5



**MS STUD DETAIL**  
 NTS

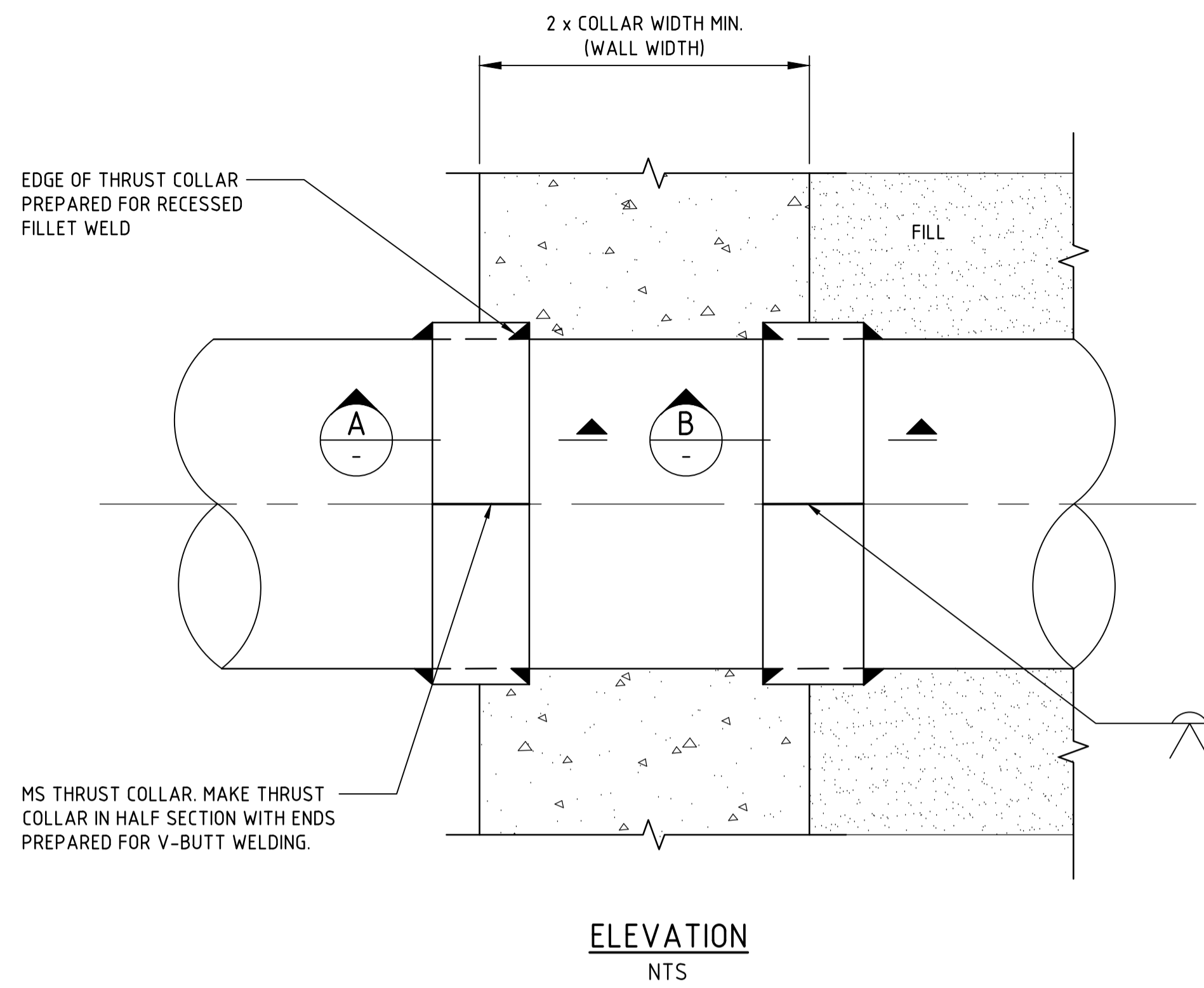
REVISION PANEL				DETAILS		APR'D	CURRENT REV	18/11/22
REV	DATE	DRN						
1.0	18/11/22	GB	ISSUED FOR USE			MW		
CURRENT REV CONTRACTOR:				GHD	CURRENT REV PROJECT: 10			

DESIGN PANEL		AUTHORISED	
DESIGNED	14/02/22	T.MZUNGU	H.HABIB
DRAWN	14/02/22	G. BALDONADO	
REVIEWED	14/02/22	M.WHITE	
CONTRACTOR:			



SA WATER STANDARD DRAWING  
 STANDARD EXPANSION CHAMBER DETAILS  
 MSCL PIPELINES  
 CIVIL

A1	TOTAL SHEETS:	1.0
SHT SIZE	PROJECT No:	
MAXIMO ID:		
SUPERSEDES:		
DRAWING NUMBER		
STD-06-00010_01		



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	20
550	559	150			
600	610	200	12	16	20
700	711	200	12	16	20
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		

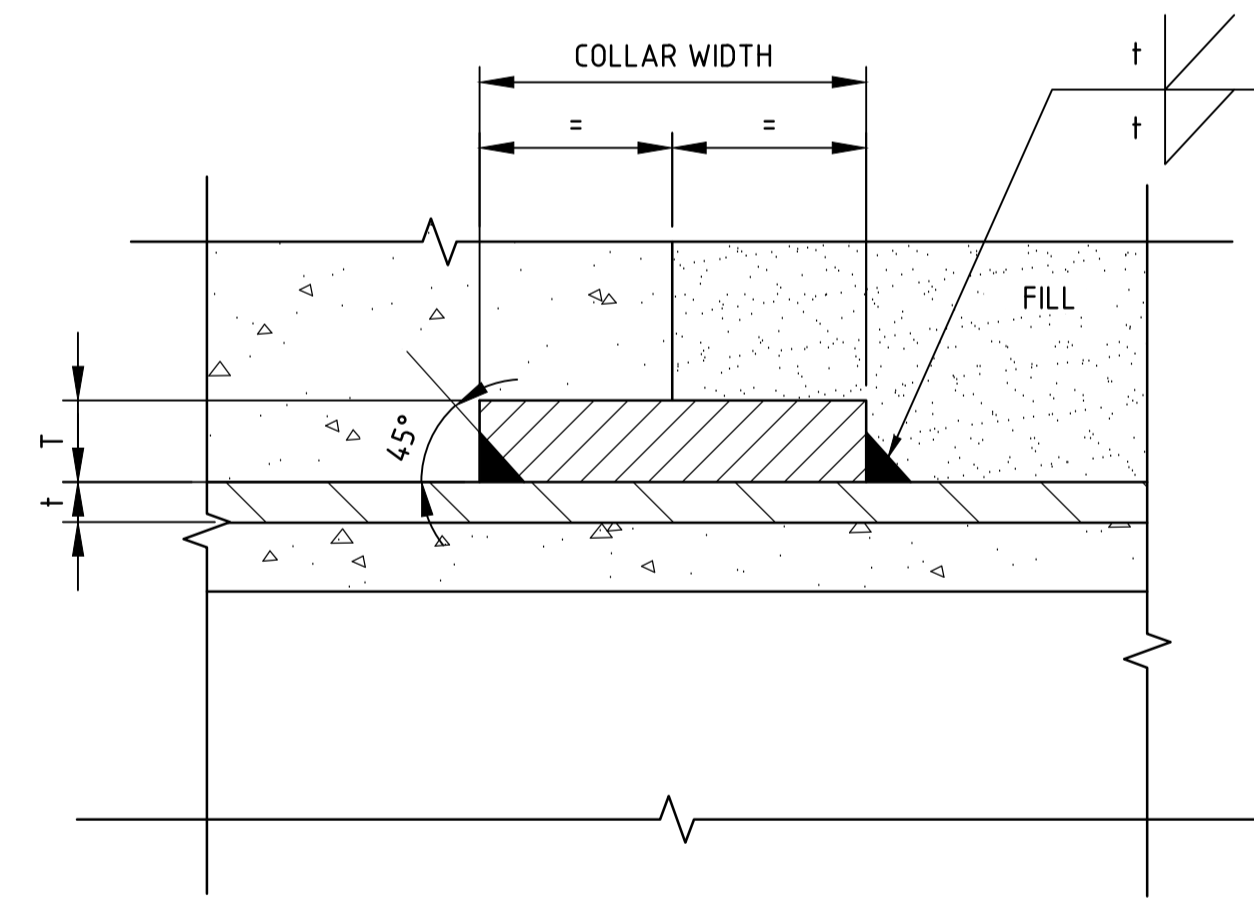
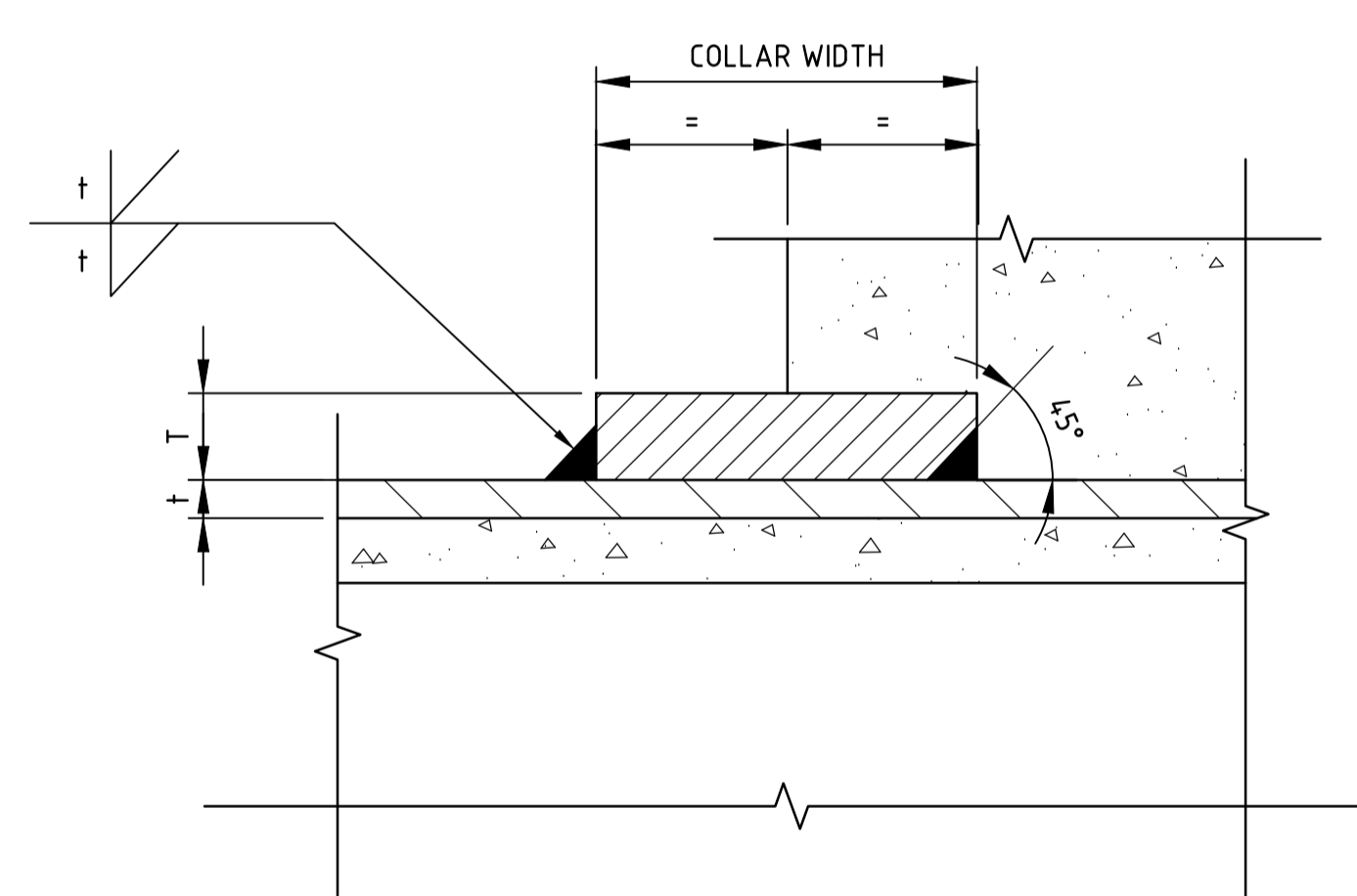
- MINIMUM WALL THICKNESS TO BE 2.5 x WALL THICKNESS

**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.

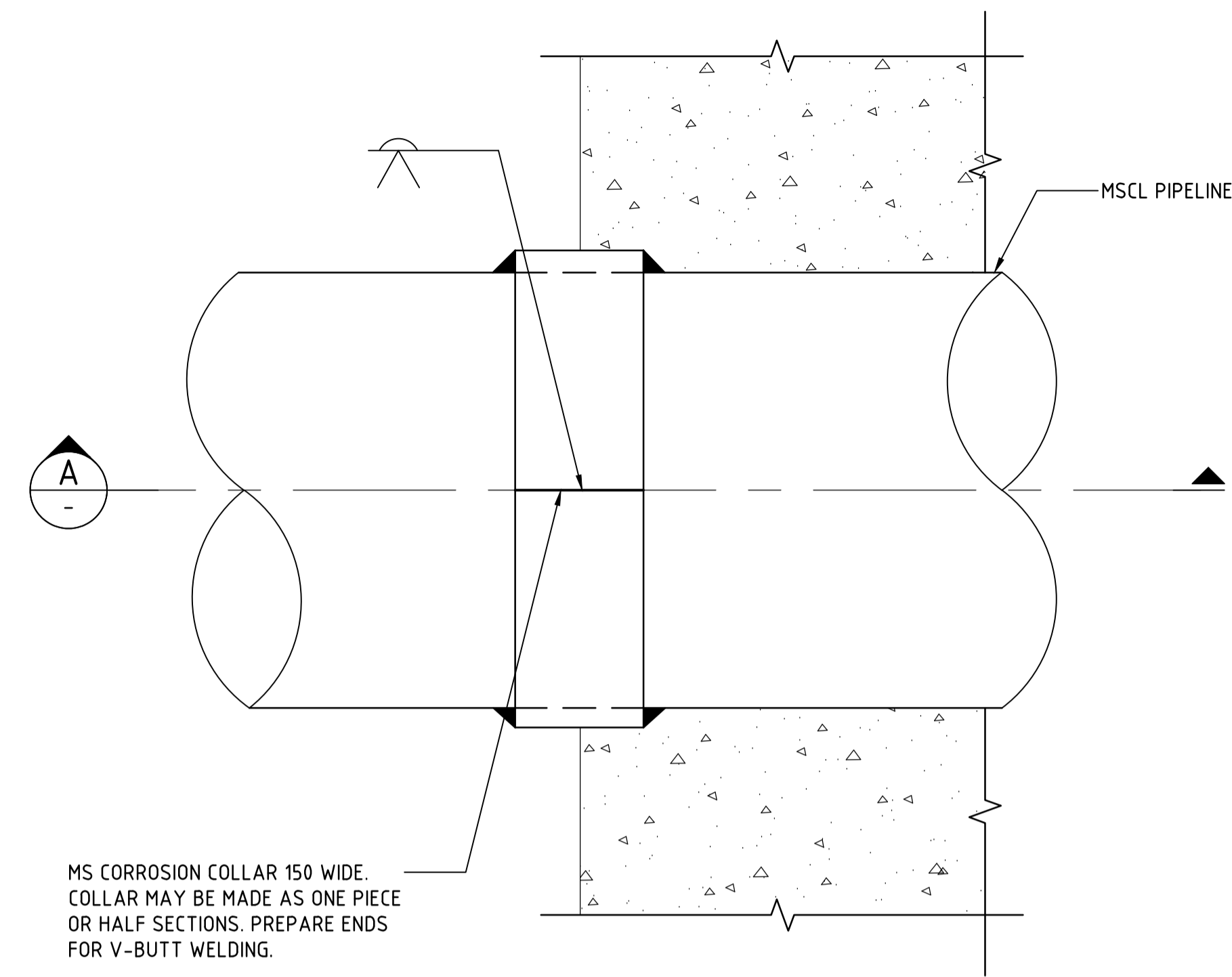
WALL/BLOCK DESIGNER SHALL ENSURE  
THE CONCRETE HAS SUFFICIENT  
STRENGTH AND STABILITY TO RESIST  
THE IMPOSED THRUST FORCES.



REVISION PANEL				DESIGN PANEL				SA Water	SA WATER STANDARD DRAWING STANDARD THRUST COLLARS FOR MSCL PIPELINES CIVIL	A1 TOTAL SHEETS: 1.0 SHT SIZE PROJECT No: REVISION
REV	DATE	DRN	APR'D	DESIGNED	AUTHORISED	DRAWN	SIGNATURE			
1.0	15/12/22	GB	ISSUED FOR USE	T.MZUNGU	H.HABIB	G. BALDONADO	M.WHITE	<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>	MAXIMO ID: SUPERSEDES: DRAWING NUMBER <b>STD-06-00011_01</b>	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0						CONTRACTOR:

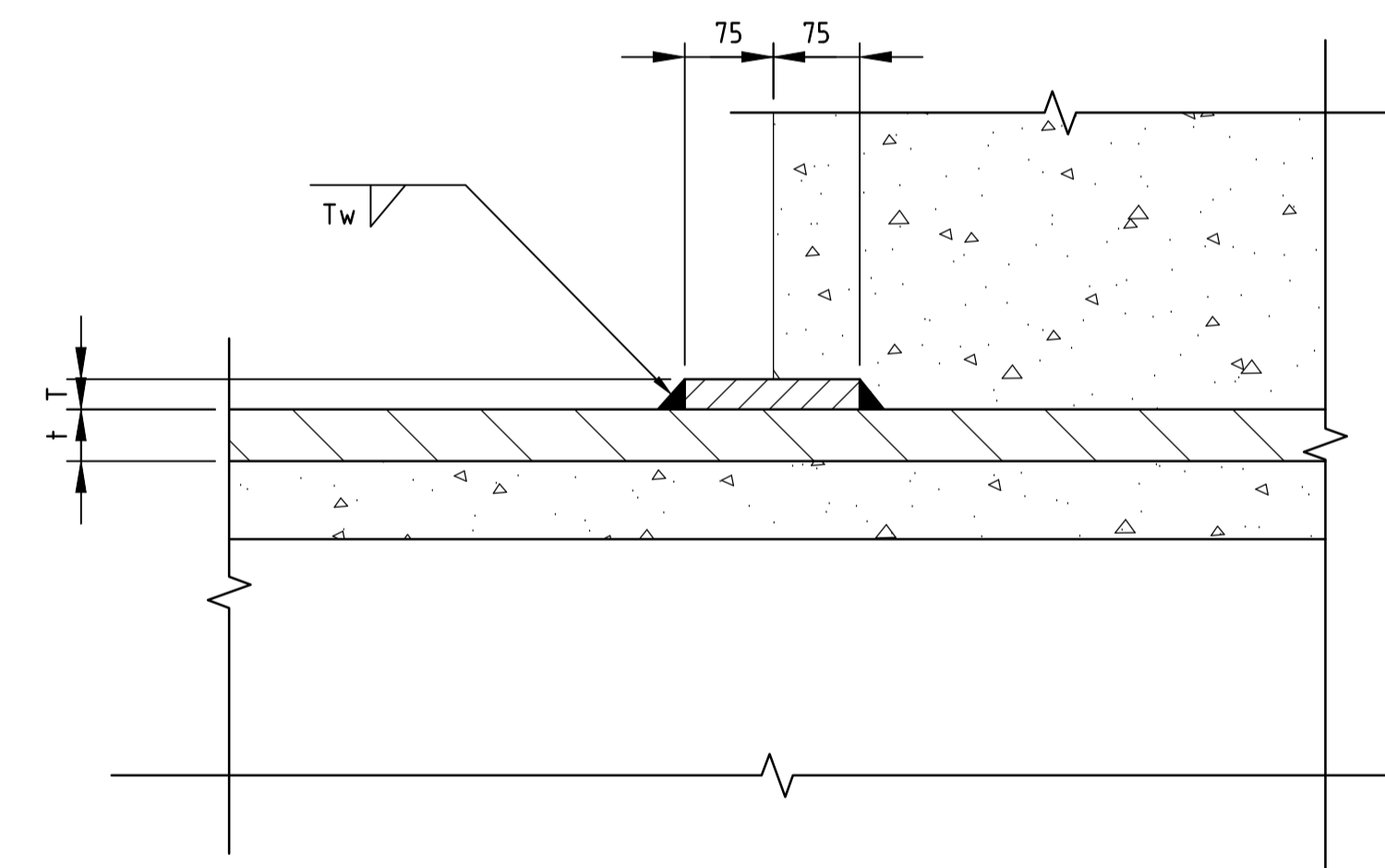
**NOTES:**

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.



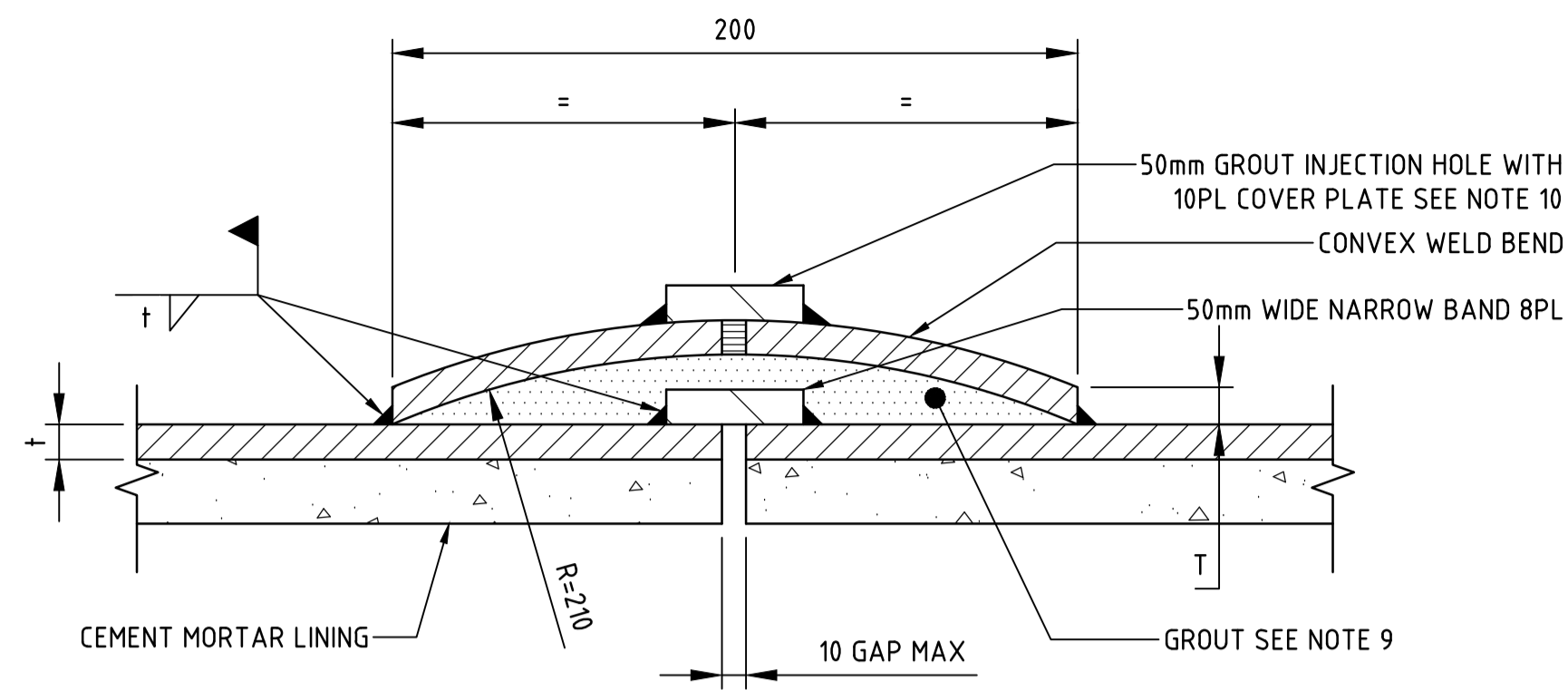
**ELEVATION**  
NTS

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

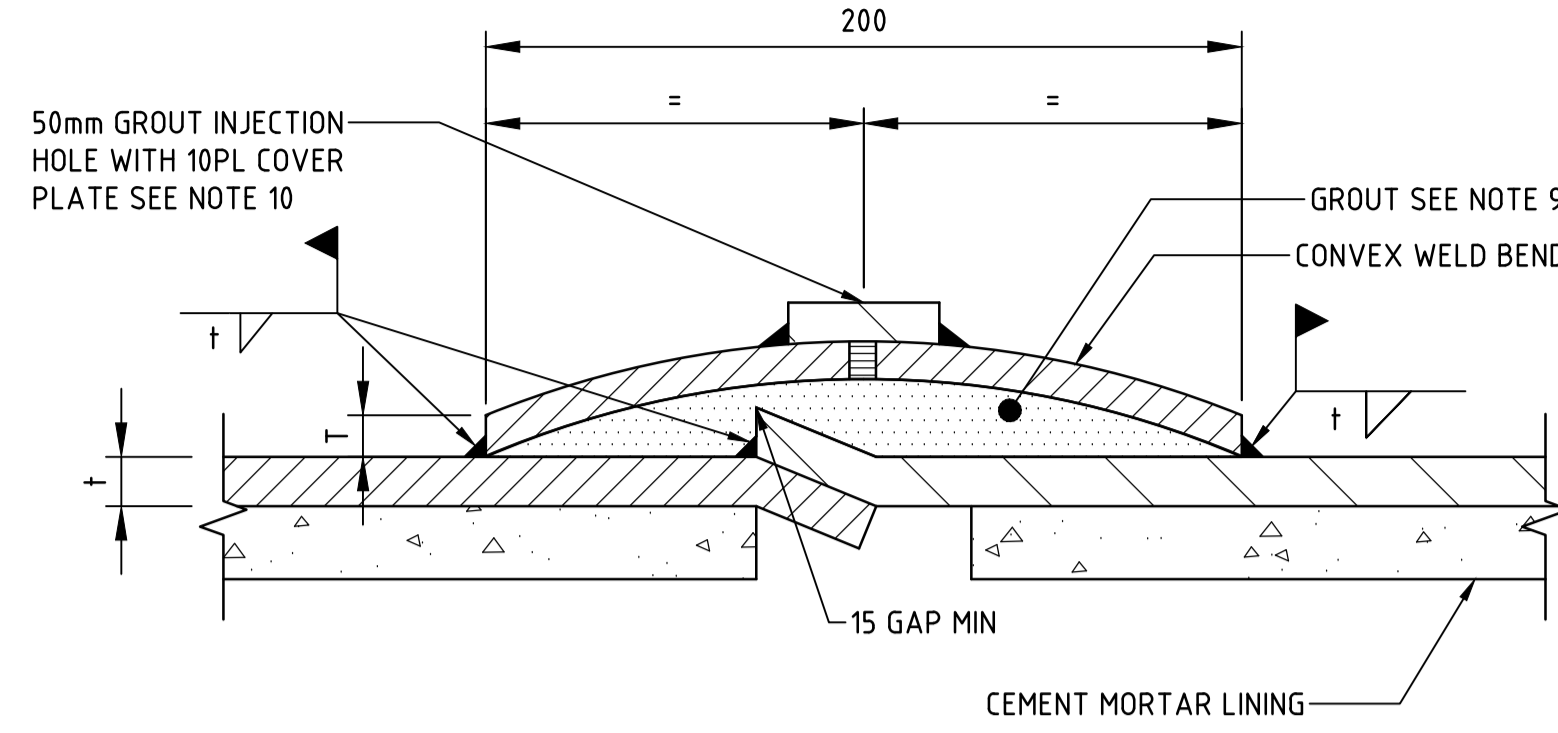


**A SECTION**  
NTS

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	AUTHORISED	DRAWN	SIGNATURE			SHT SIZE	PROJECT No:
1.0	15/12/22	GB	ISSUED FOR USE	M.WHITE	T.MZUNGU	G.BALDONADO	M.WHITE	<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>	MAXIMO ID: SUPERSEDES: DRAWING NUMBER STD-06-00012_01	1.0	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0							

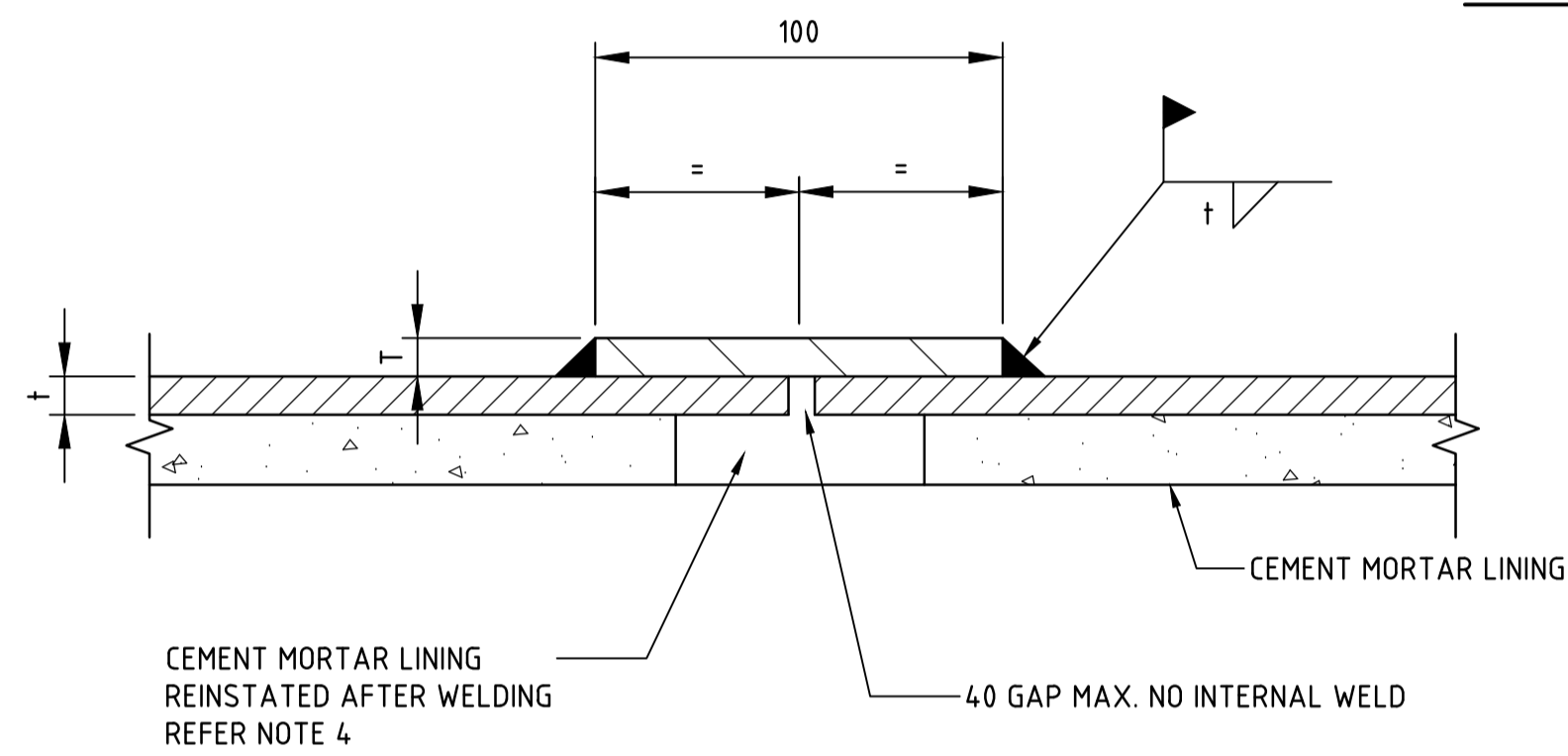


**MSCL WELD BAND**  
NTS

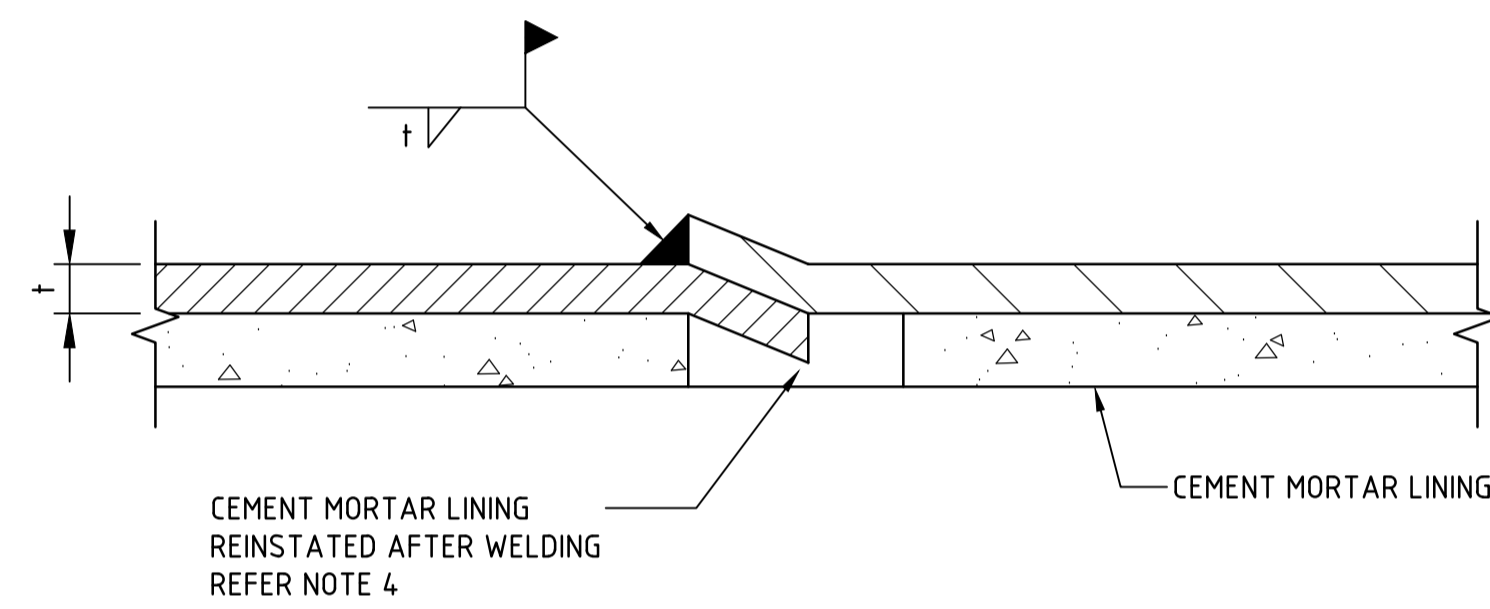


**MSCL WELDED SPHERICAL SLIP IN JOINT**  
NTS

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

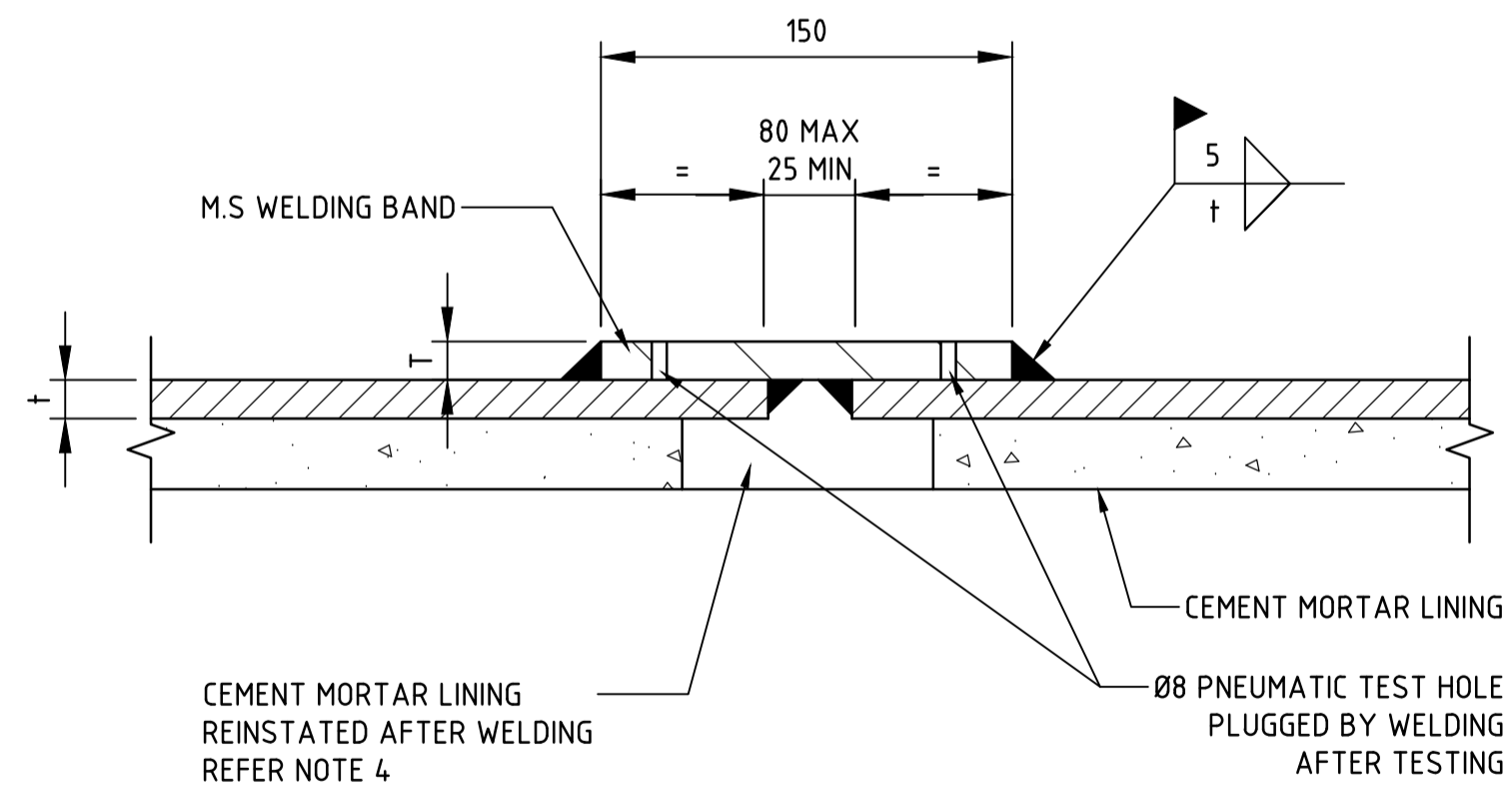


**MSCL WELD BAND**  
NTS

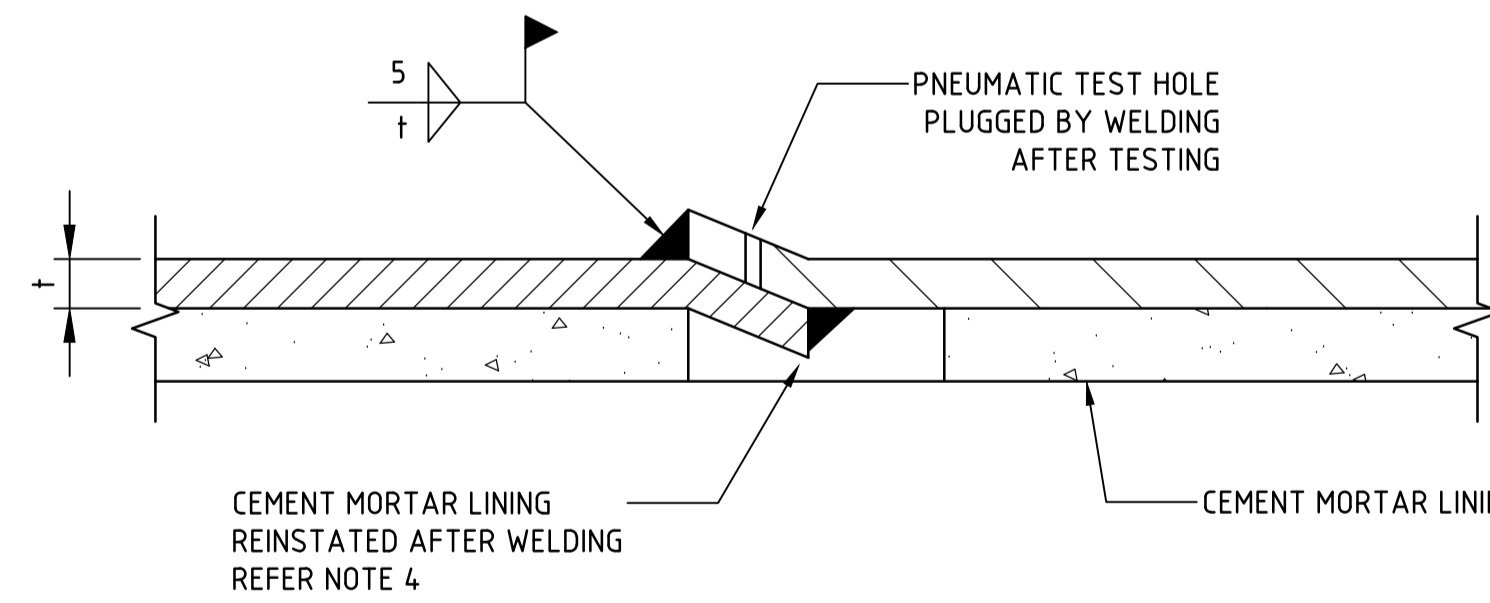


**MSCL WELDED SPHERICAL SLIP IN JOINT**  
NTS

**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:**

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'S 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. 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.
7. PRIOR TO WELDING EXTERNAL COATING SHALL BE SET BACK FROM BOTH SIDES OF THE JOINT 100 mm FROM WELDS.
8. ALL MATERIALS THAT MAY COME INTO CONTACT WITH WATER SHALL COMPLY WITH THE REQUIREMENTS OF TS 0800.
9. 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.
10. ONCE GROUT HAS HARDENED, WELD CAP PLATE OVER INJECTION POINT.

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

REVISION PANEL				DESIGN PANEL				SA WATER STANDARD DRAWING		A1 TOTAL SHEETS: 1.0	
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	10/03/22	AUTHORISED	PROJECT No:	REVISION	
1.0	15/12/22	GB	ISSUED FOR USE	MW	M.WHITE	T.MZUNGU	10/03/22	H.HABIB			
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0				SA Water		CIVIL	
								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.		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
		5	16.2
450	457	6	17.4
		8	19.1
		4.5	15.9
		5	16.6
500	508	6	17.7
		8	19.6
		4.5	16.2
550	559	5	16.9
		6	18.1
		8	20.0
		4.5	16.4
550	559	5	17.1
		6	18.4
		8	20.4

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
800	813	9.5	22.9
		12	25.0
		12	25.0

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**

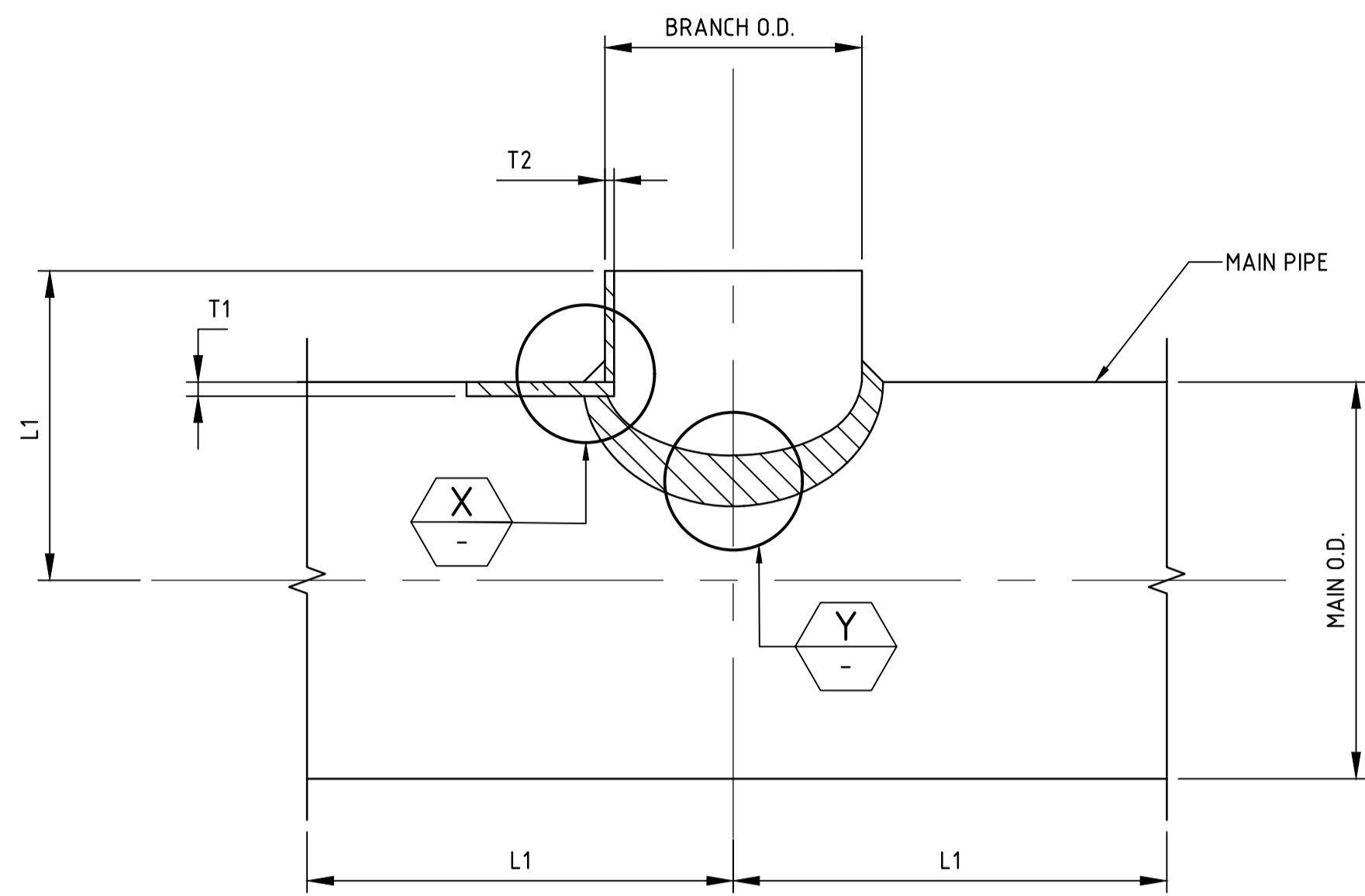
DN	O.D.	THICKNESS A (mm)	MAX SPAN (m)
600*	610	4.5	18.2
		5	19.0
		6	20.4
		8	22.7
		9.5	24.1
700*	711	5	19.3
		6	20.8
		8	23.3
		9.5	24.8
750*	762	12	26.9
		5	19.5
		6	21.0
800*	813	8	23.5
		9.5	25.1
		12	27.2

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	30.5
		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 STANDARD DRAWING		A1	
REV	DATE	DRN	DETAILS	APR'D	CURRENT REV AUTHORIZED	DESIGNED	AUTHORISED	STANDARD ABOVE GROUND RIGID MSCL PIPELINES 100mm TO 1800mm		SHT SIZE	TOTAL SHEETS:
1.0	15/12/22	GB	ISSUED FOR USE	MW	M.WHITE	T.MZUNGU	H.HABIB	DIA-BALL & SOCKET & COLLAR JOINTED PIPES MAXIMUM SPAN FOR ALLOWABLE WELD SIZE		PROJECT No:	1.0
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0				CIVIL		REVISION	
								SA Water		DRAWING NUMBER	
								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.		STD-06-00014_01	



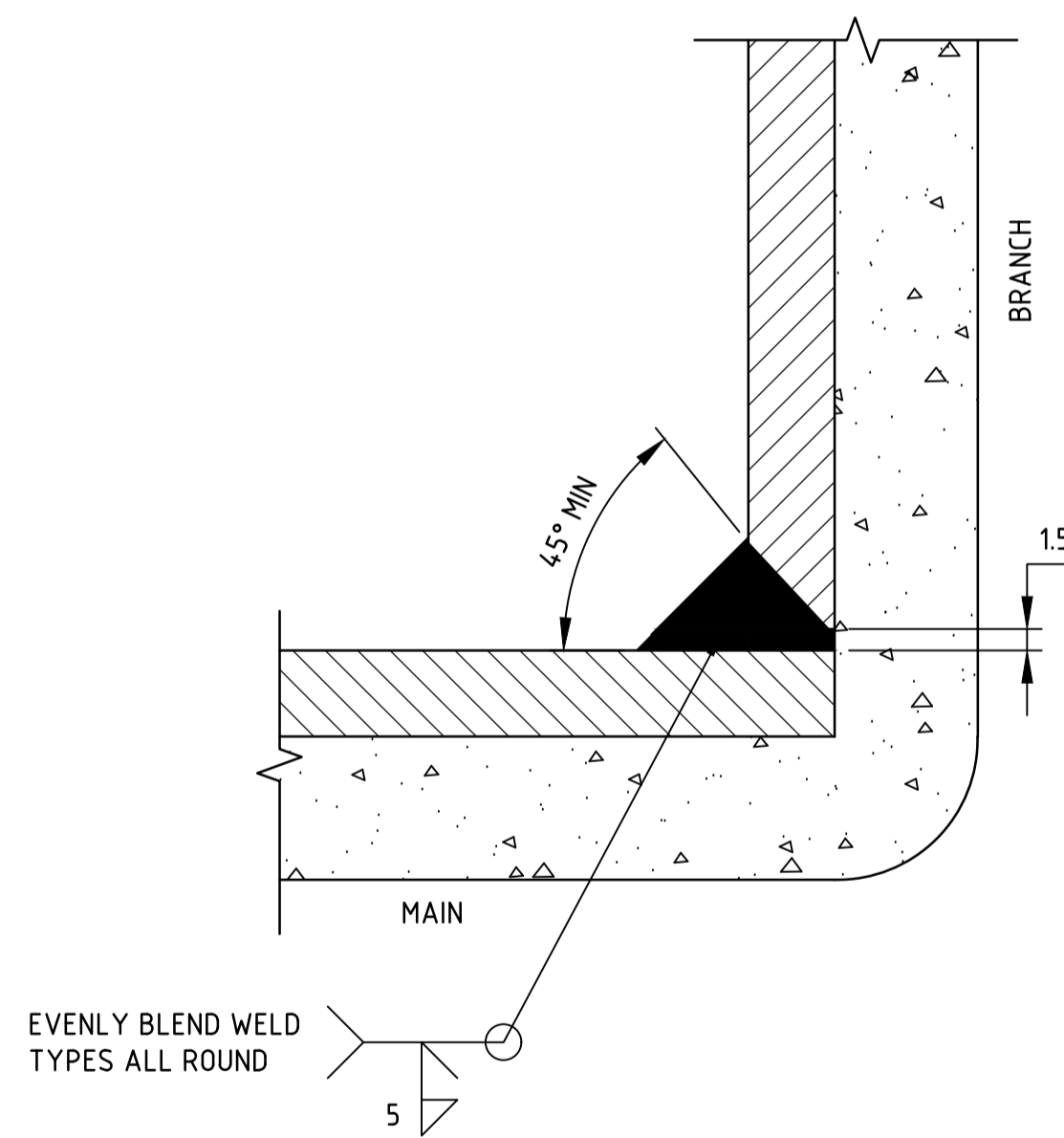
**UNEQUAL BRANCH WITHOUT REINFORCEMENT**  
NTS

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

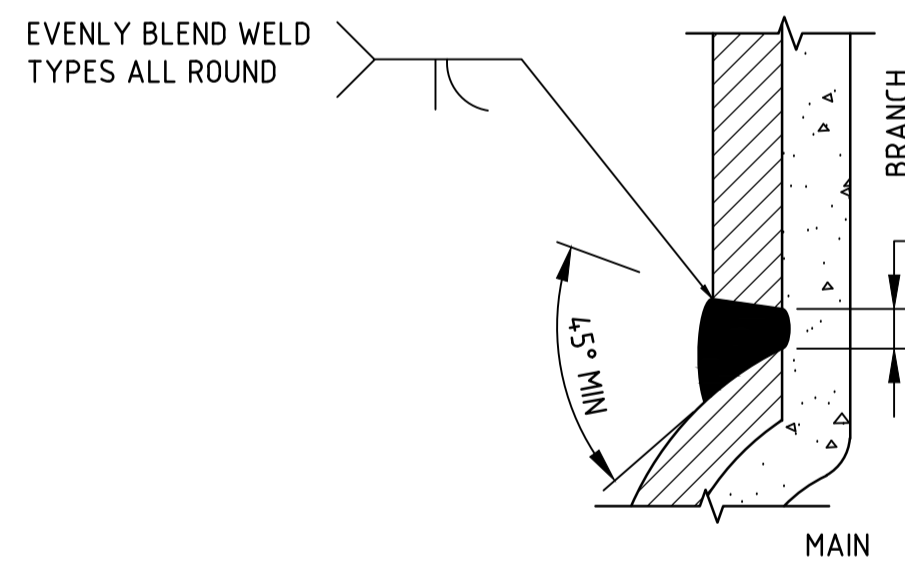
BOSS DIMENSIONS					
DN	NPS	THREADED		SOCKETED	
		D (mm)	L2 (mm)	D (mm)	L2 (mm)
8	1/4	19	18	18	26
15	1/2	28	24	27	32
20	3/4	35	26	39	37
25	1	44	30	40	41

**NOTES:**

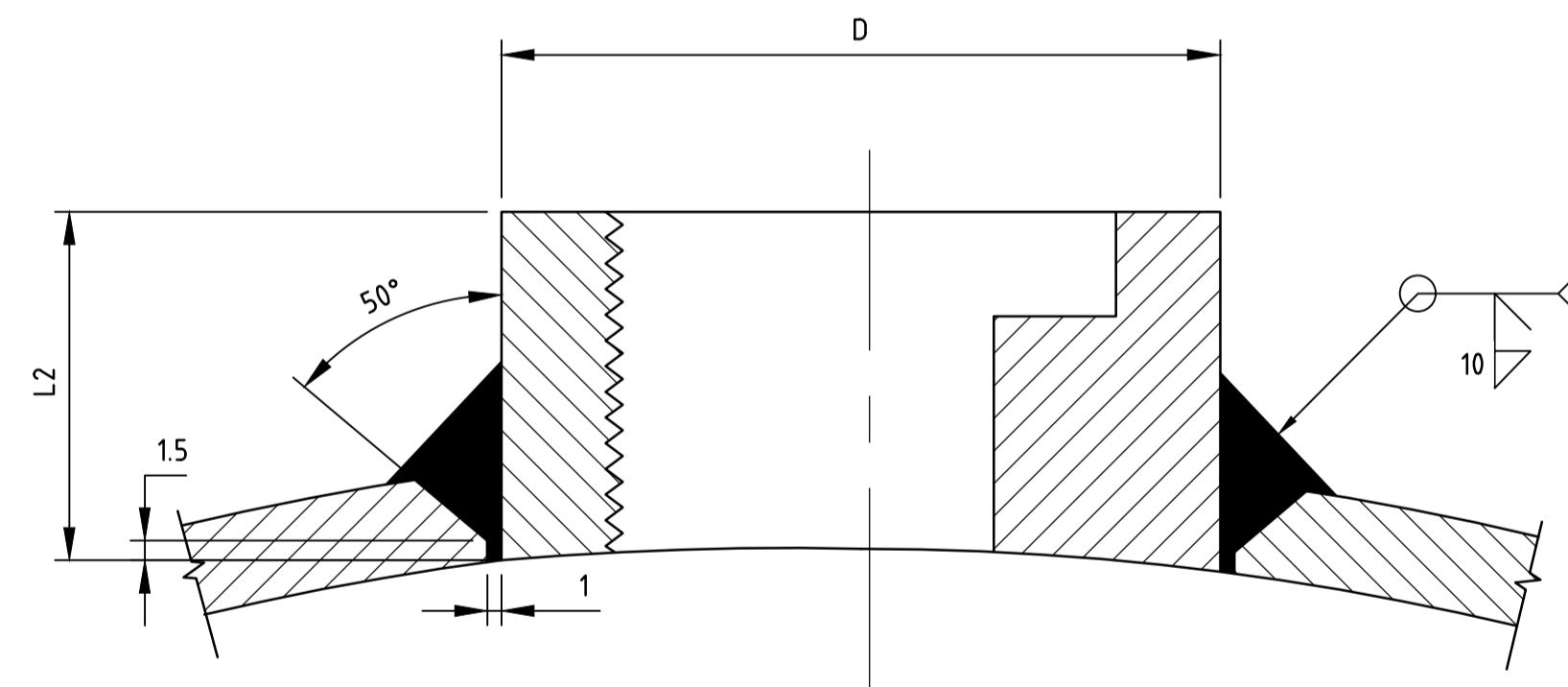
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
- ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
- ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
  - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
  - GRADE 250 - THICKNESSES GREATER THAN 8mm.
- REPAIR CEMENT MORTAR LINING 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

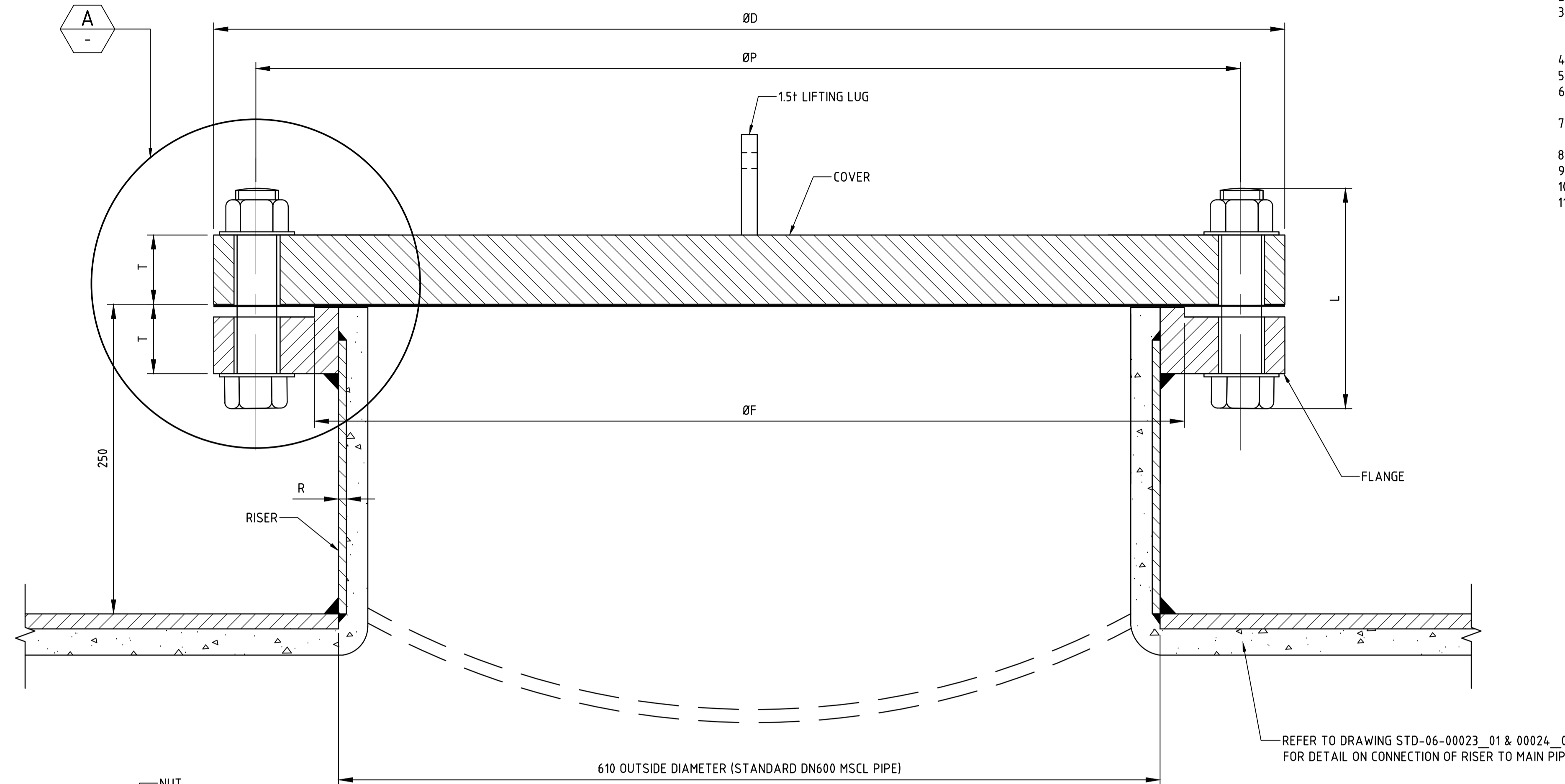


**ATTACHMENT DETAILS FOR THREADED/SOCKETED BOSSSES**  
NTS

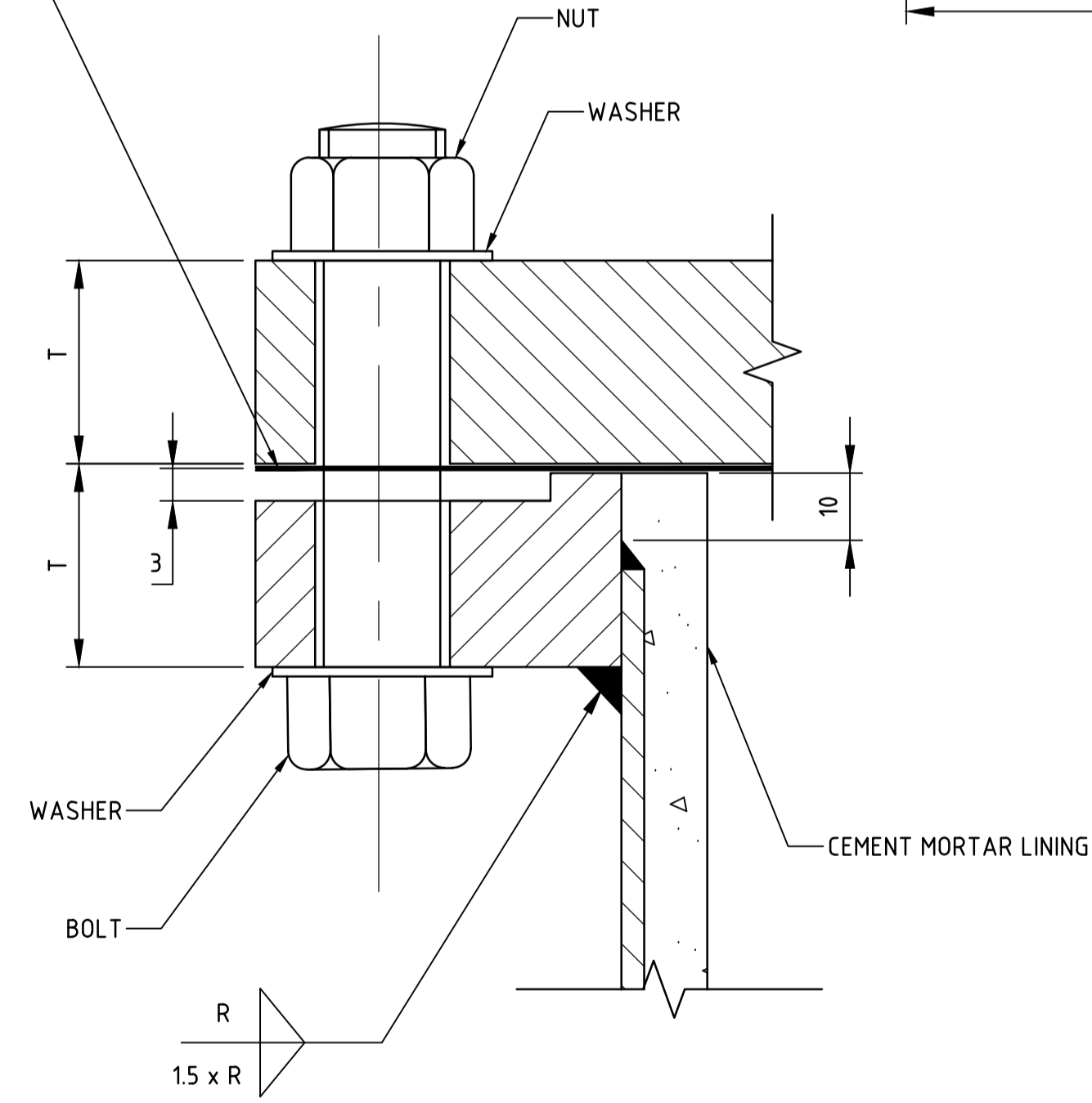
REVISION PANEL				DESIGN PANEL				SA WATER STANDARD DRAWING		TOTAL SHEETS: 1.0	
REV	DATE	DRN	APR'D	CURRENT REV AUTHORIZED	DESIGNED	10/03/22	AUTHORISED	PROJECT No:		REVISION	
1.0	15/12/22	GB	ISSUED FOR USE	M.WHITE	T.MZUNGU	10/03/22	H.HABIB	MAXIMO ID:		1.0	
CURRENT REV CONTRACTOR: GHD				CONTRACTOR:				SA Water		DRAWING NUMBER	
CURRENT REV PROJECT: 1.0				CONTRACTOR:				SA Water		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.



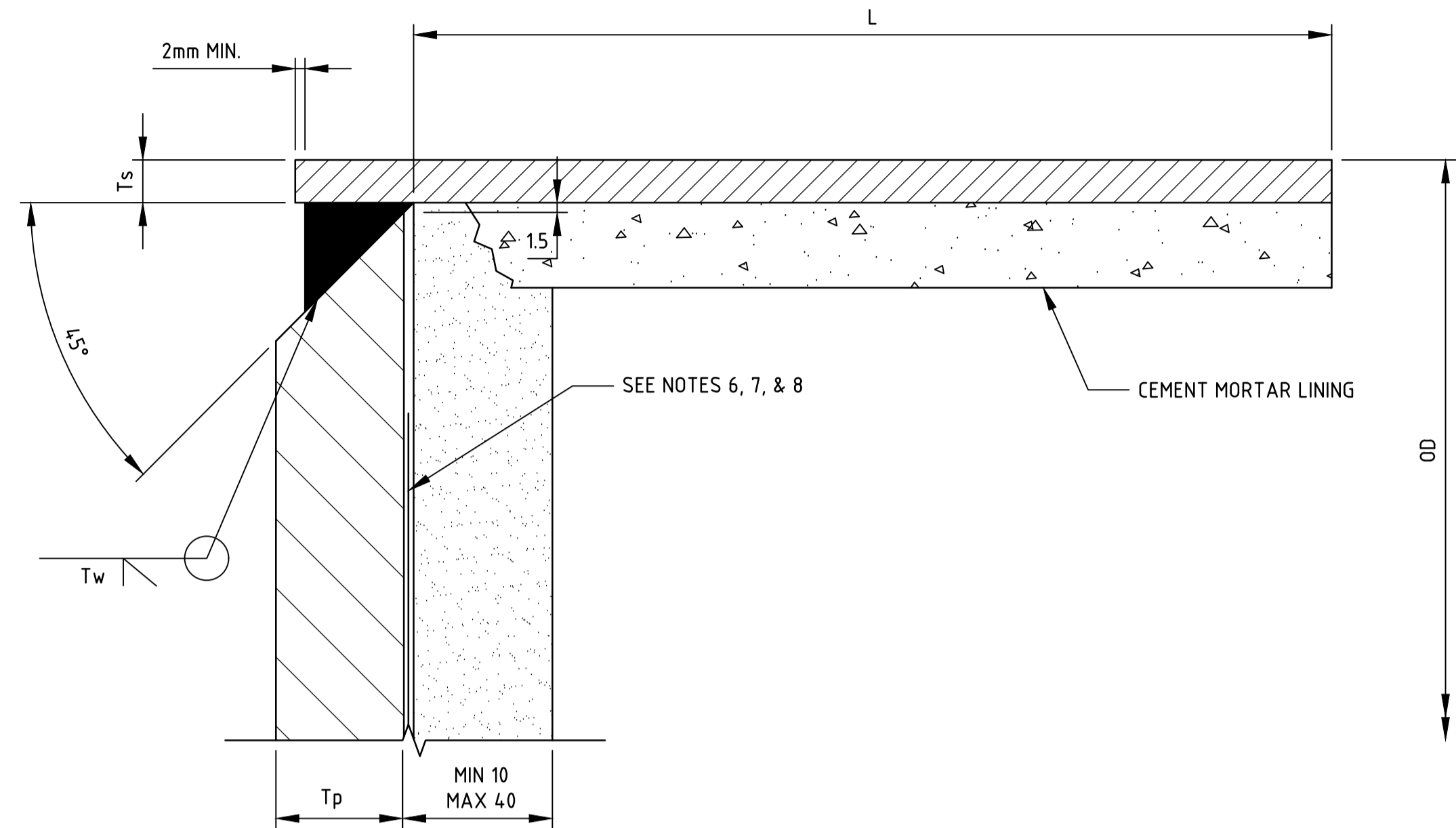
FULL FACE GASKET GLUED TO COVER FLANGE WITH TS 0800 COMPLIANT CONTACT ADHESIVE



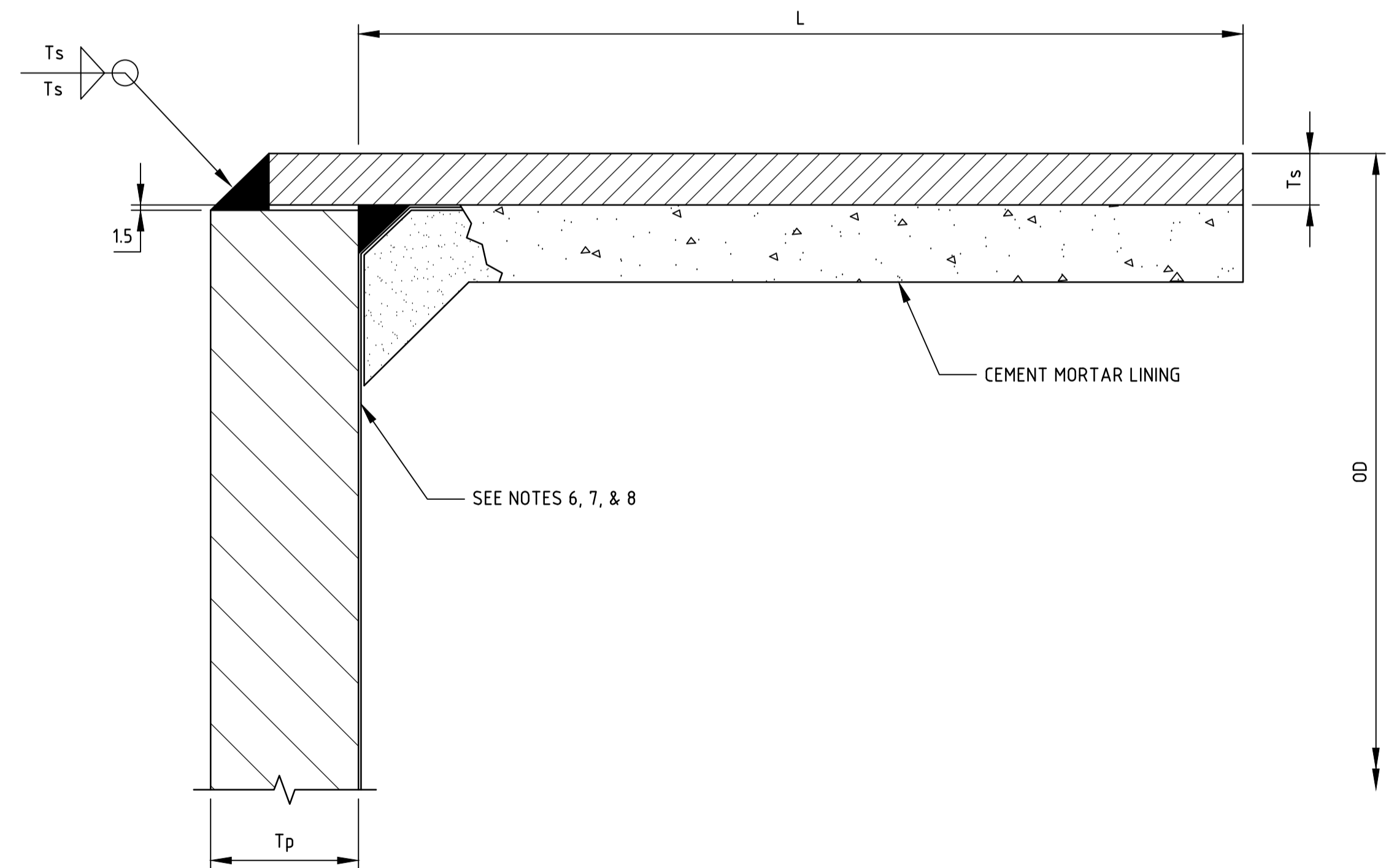
PRESSURE RATING	OUTSIDE DIAMETER OF FLANGE D (mm)	DIAMETER OF RAISED FACE F (mm)	PITCH CIRCLE DIAMETER P (mm)	NUMBER OF BOLTS N	BOLT SIZE AND THREAD O	BOLT HOLE DIAMETER V (mm)	BOLT LENGTH L (mm)	BOLT/NUT STRENGTH GRADE	COVER/FLANGE THICKNESS T (mm)	RISER THICKNESS R (mm)	GASKET TYPE	APPROX. COVER WEIGHT (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

DETAIL A  
NTS

REVISION PANEL				DESIGN PANEL				SA WATER STANDARD DRAWING				A1 TOTAL SHEETS: 1.0	
REV	DATE	DRN	APR'D	CURRENT REV AUTHORIZED	DESIGNED	10/03/22	AUTHORIZED	SA Water				PROJECT No:	
				M.WHITE	T.MZUNGU		H.HABIB	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.				MAXIMO ID:	
				SIGNATURE	G. BALDONADO		SIGNATURE					FOR MSCL PIPES	
1.0	15/12/22	GB	ISSUED FOR USE	MW	M.WHITE							CIVIL	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0				CONTRACTOR:				DRAWING NUMBER	
												STD-06-00016_01	



**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	-	-

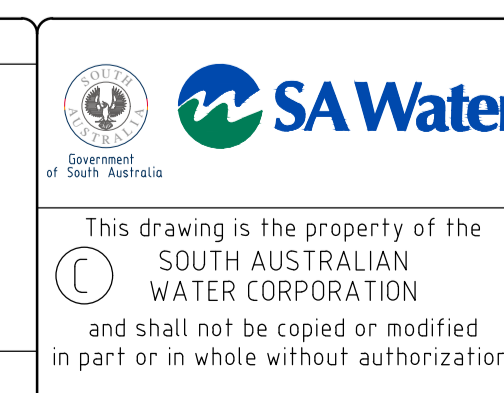
\* ROLLED PLATE

**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	

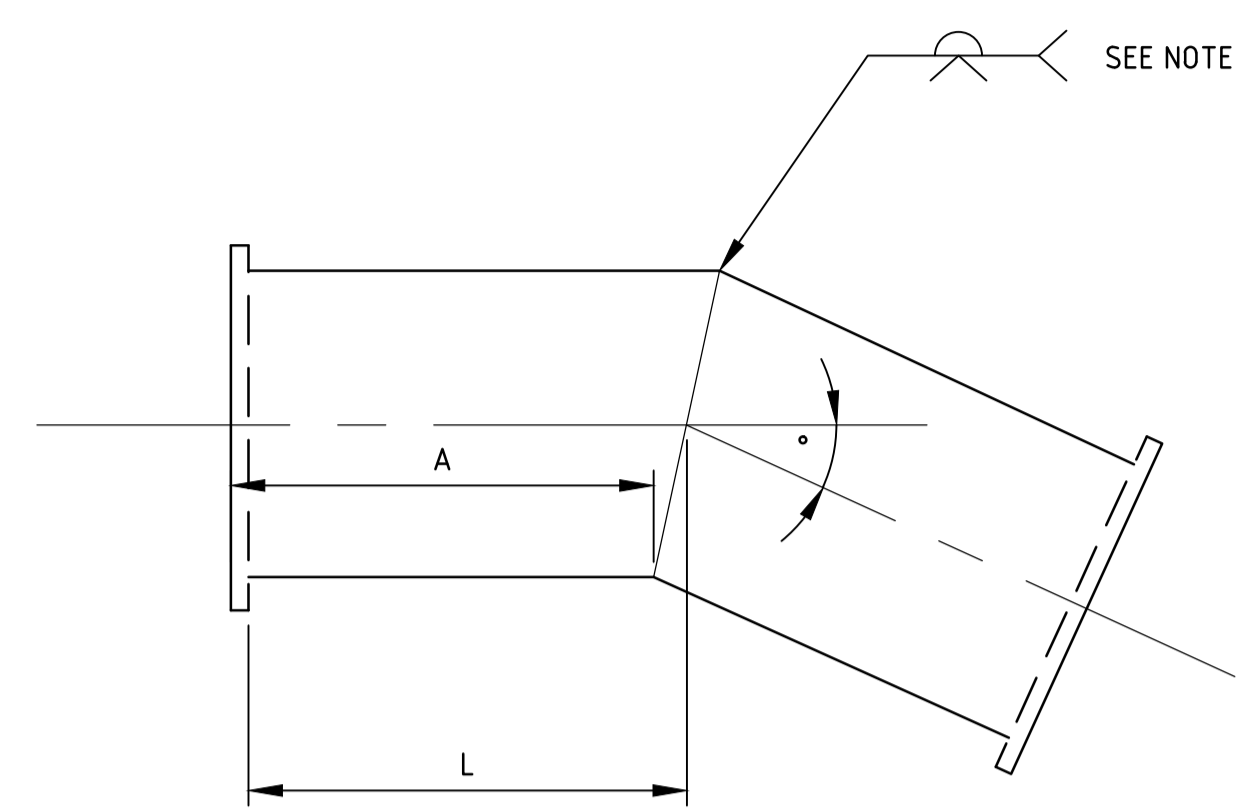
DESIGN PANEL	
DESIGNED	AUTHORISED
T.MZUNGU	H.HABIB
DRAWN	SIGNATURE
G. BALDONADO	
REVIEWED	
M.WHITE	
CONTRACTOR:	



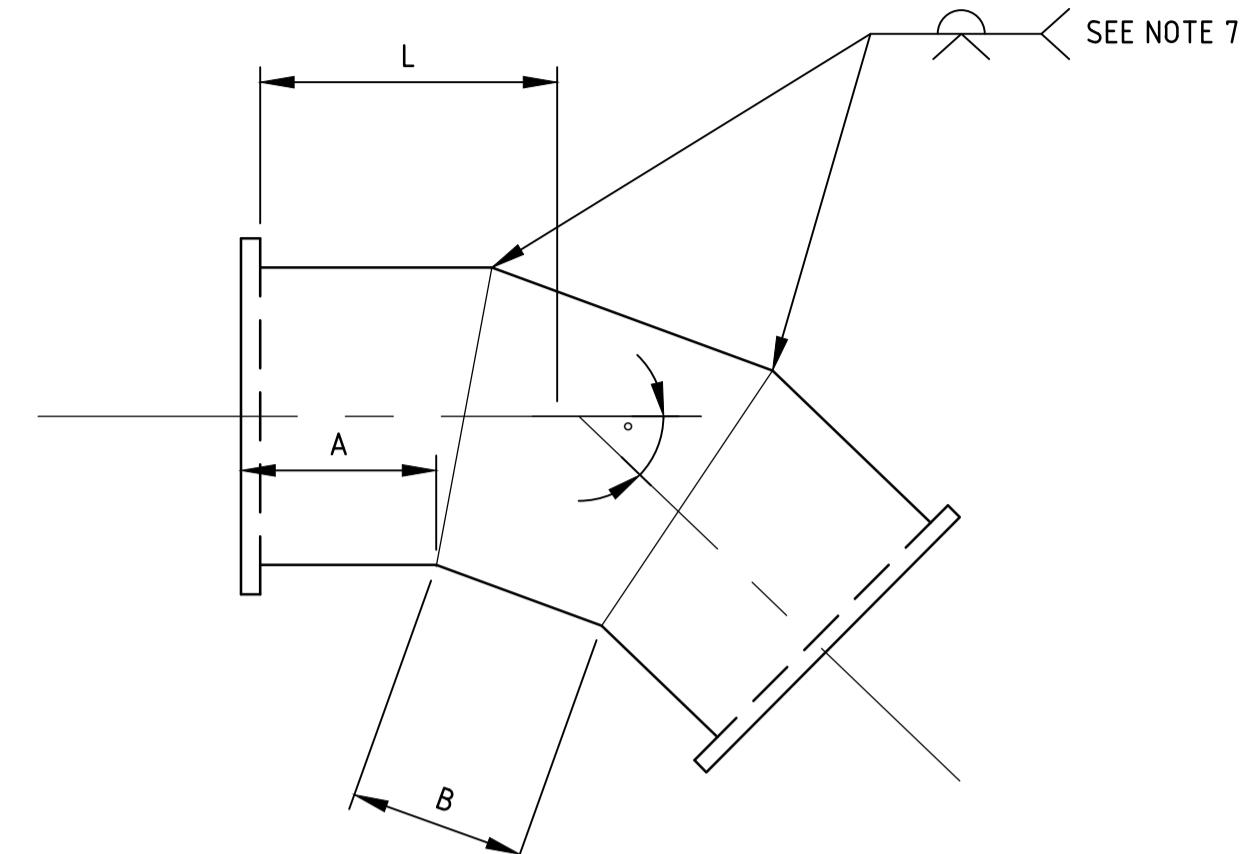
SA WATER STANDARD DRAWING  
STANDARD PIPE DETAILS WELDED END PLATES  
FOR MILD STEEL PIPES PN16, PN21, & PN35  
CIVIL

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

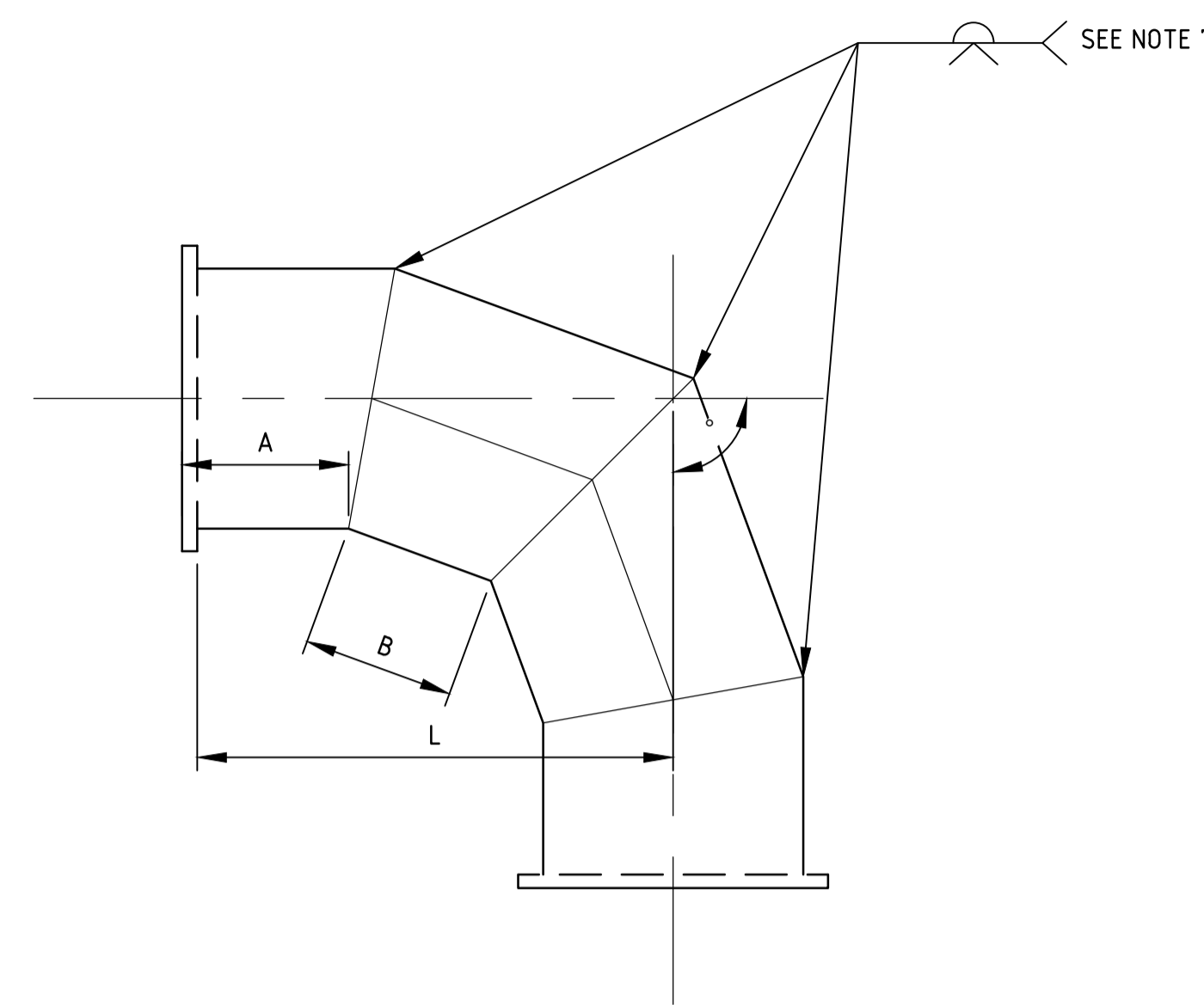




1 CUT BEND ( 225 )  
NTS



2 CUT BEND (225 < 45)  
NTS



3 CUT BEND (45 < 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
DN100	114	200	100	100	4.8			-						4.8			-						DN100						
DN150	168	200	100	100	5			-						5			-						DN150						
DN200	219	200	100	100	5			-						5			-						DN200						
DN250	273	200	100	100	5			-						5			-						DN250						
DN300	324	200	100	100	4.5	6		-						4.5	6		-						DN300						
DN350	356	200	100	100	4.5	6		-						4.5	-		8 6						DN350						
DN400	406	300	200	200	4.5	8		-						4.5	5	8	-						DN400						
DN450	457	300	200	200	4.5	5	8	-						4.5	6	-	5 10 8						DN450						
DN500	508	300	200	200	4.5	6	-	-						4.5	6	-	6 12 10						DN500						
DN550	559	300	200	200	5	6	-	-						5	6	-	6 12 10						DN550						
DN600	610	300	200	200	6	8	-	5		6		12	10		6	8	-	-						16 12 10	DN600				
DN650	660	300	200	200	6	8	-	5		8		16	12	10	8		-		6		-						16 12	DN650	
DN700	711	300	200	200	8	-		6		-		16	12		8	12	-	-		10		8	16		12	DN700			
DN750	762	300	200	200	8	9.5	-	6		8		16	12		8	12	-	-		10		16		DN750					
DN800	813	300	200	200	7	12	-	-						10	8	16	12	8	12	-	-		10		20	16	DN800		
DN900	914	300	200	200	8	12	-	-						10	20	16	12	-	-		10	8	16	12	10	20	16	DN900	
DN1000	1016	300	200	200	12	-		10		8	16	12	10	20	16	12	-	-		10	16	12	25	20	DN1000				
DN1200	1219	300	200	200	-			16	12	10	16	12	25	20	-			16	12	20	16	28	25	20	DN1200				
DN1400	1422	400	300	300	-			16	12	20	16	28	25	-			16	20		16	32		25	DN1400					
DN1600	1626	400	300	300	-			20	16	20		16	32	25	-			20	16	25	20	36	32	DN1600					
DN1800	1829	400	300	300	-			20	16	25	20	36	32	-			25	20	16	28	25	20	40	32	DN1800				
DN2000	2032	400	300	300	-			25	20	16	25	20	40	32	-			25	20	28	25	45	40	DN2000					
DN2200	2235	400	300	300	-			25	20	28	25	45	40	-			25	20	32	25	50	40	DN2200						
DN2400	2438	400	300	300	-			25	20	32	25	50	40	-			28	25	36	32	55	50	40	DN2400					

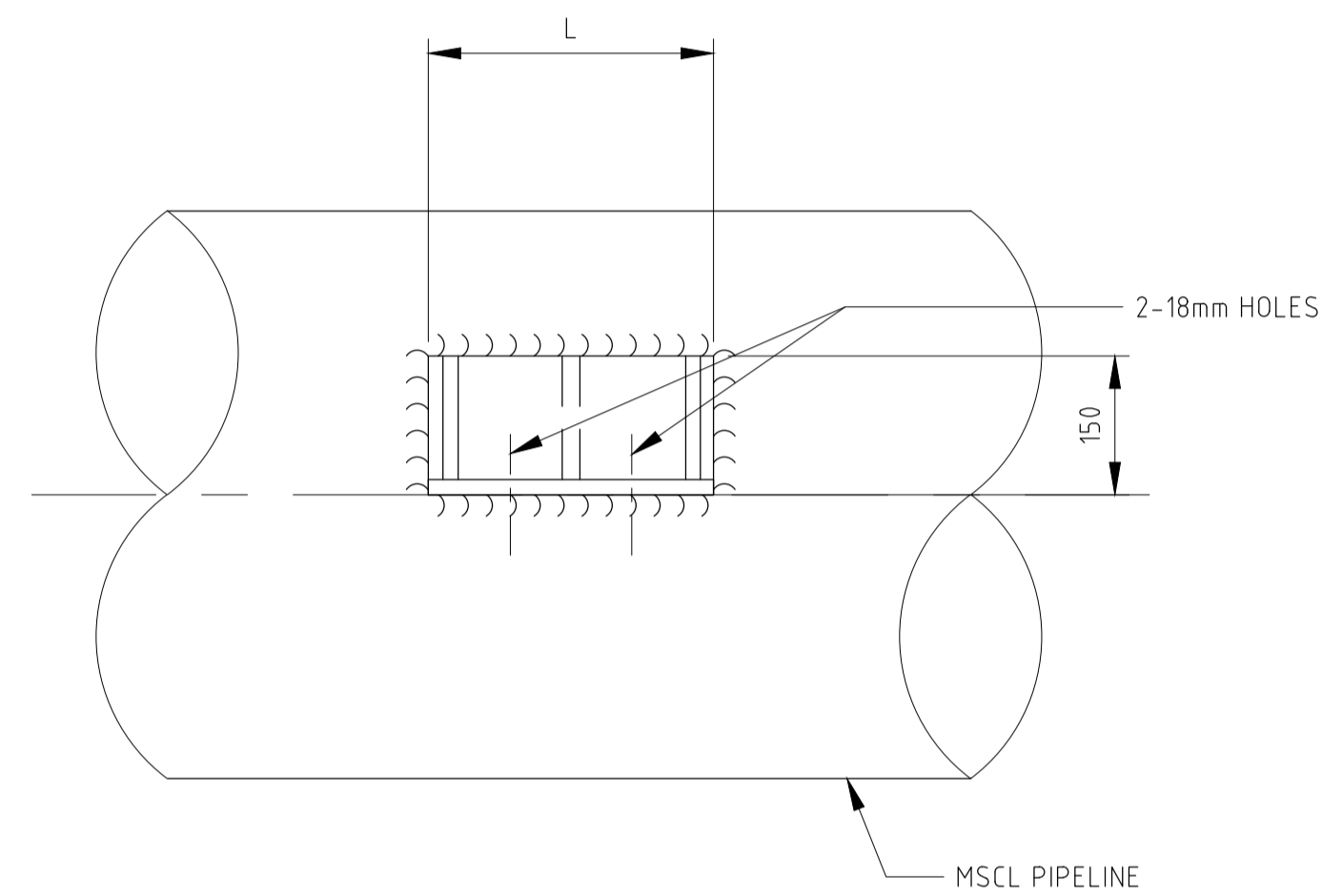
REVISION PANEL DETAILS				APR'D CURRENT REV AUTHORIZED M.WHITE SIGNATURE		DESIGN PANEL 12/04/22 AUTHORIZED H.HABIB SIGNATURE				SA WATER STANDARD DRAWING STANDARD BENDS FOR MSCL PIPES				A1 TOTAL SHEETS: 1.0 PROJECT No:	
REV	DATE	DRN	APR'D	CURRENT REV AUTHORIZED	DESIGNED	DRAWN	REVIEWED	CONTRACTOR	This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.				SUPERSEDES: DRAWING NUMBER STD-06-00018_01		
1.0	15/12/22	GB	ISSUED FOR USE	MW	T.MZUNGU	G.BALDONADO	M.WHITE		CIVIL				1.0 REVISION		
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0											

**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.

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

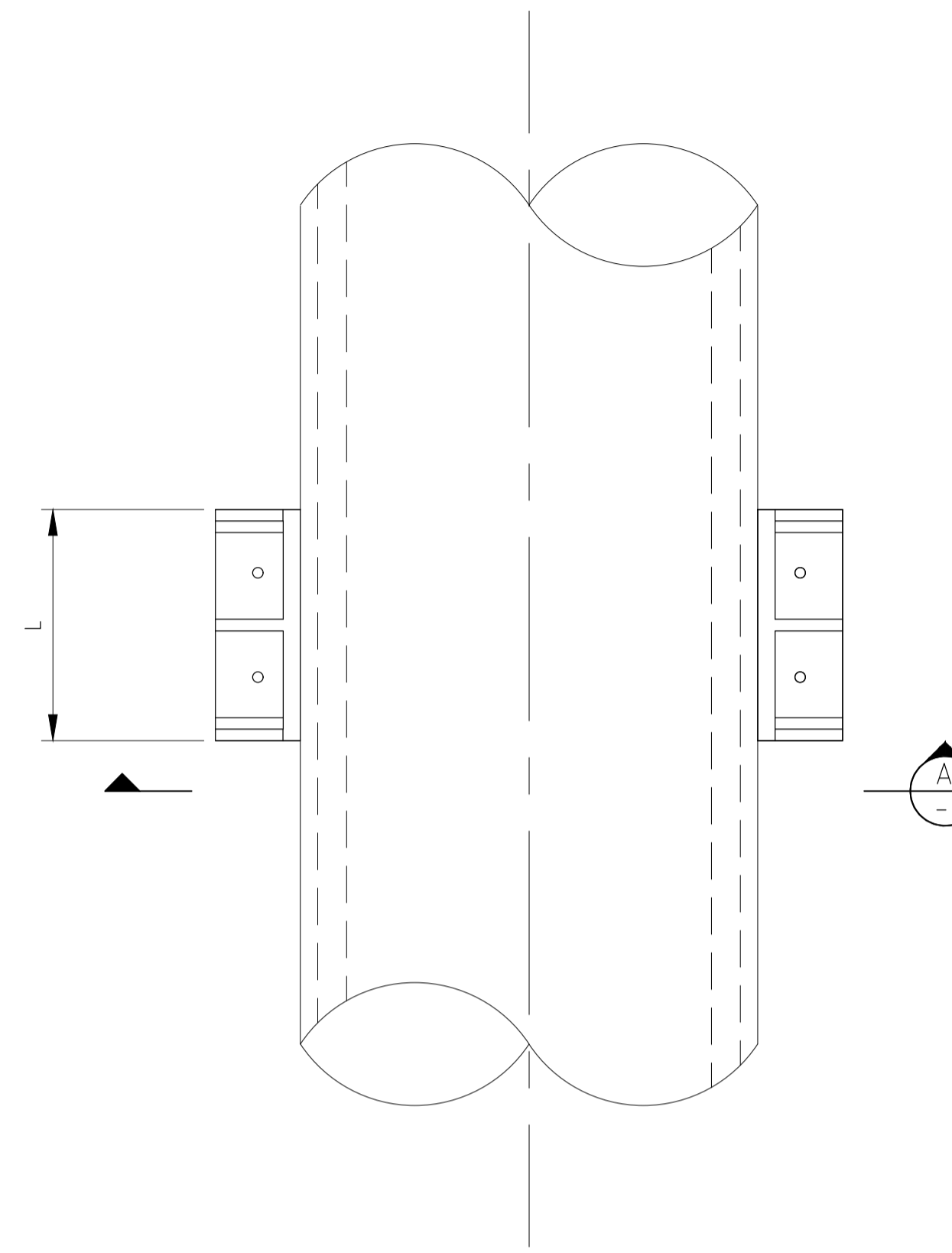
CLEATS SHALL NOT BE USED TO TRANSFER LOADS TO THRUST RESTRAINTS.



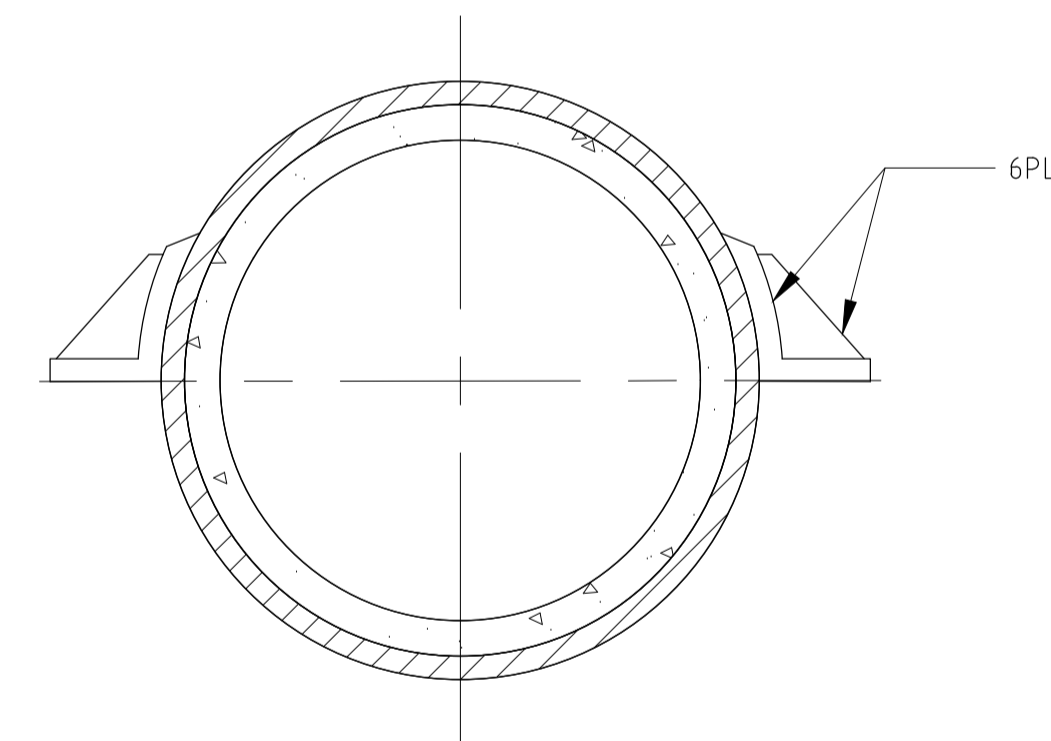
**LOCATING / STABILITY CLEAT FOR ABOVE GROUND PIPELINES ELEVATION VIEW**

NTS  
NOTE: 2 CLEATS PER SET

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

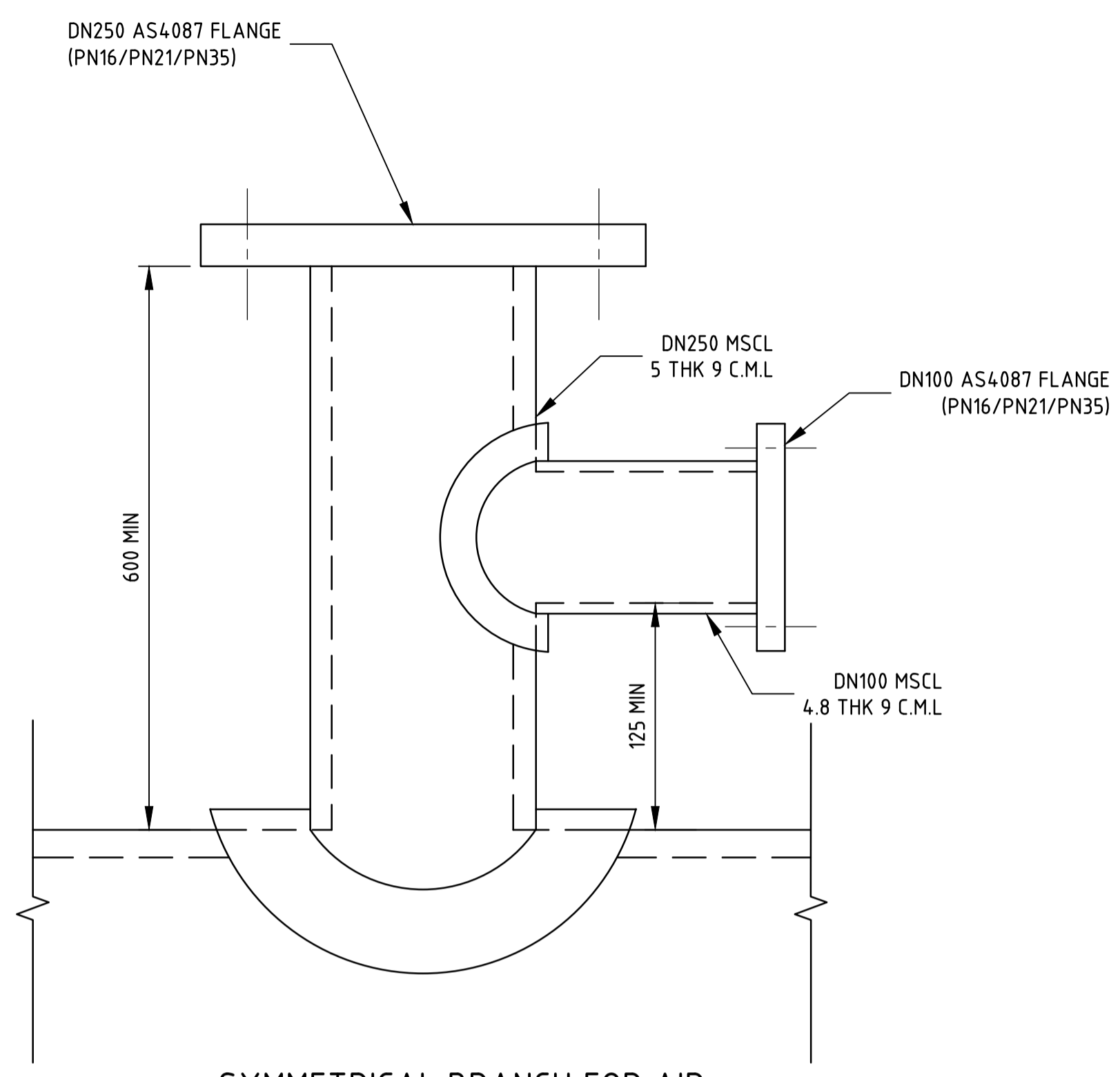


**PLAN VIEW**  
NTS

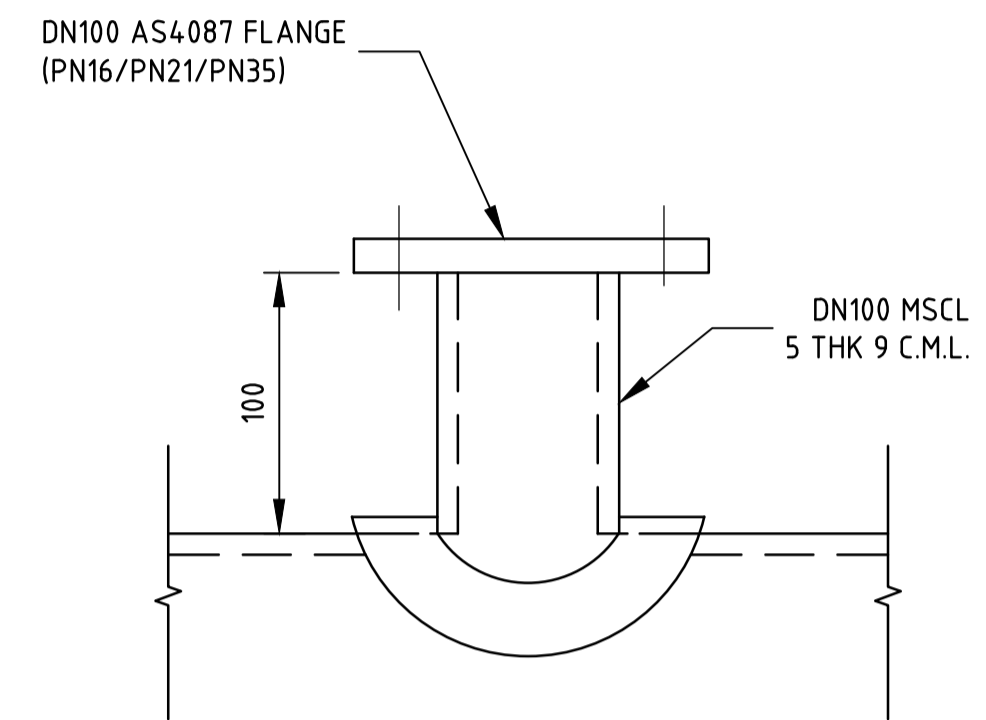


**A SECTION**  
SCALE 1:10

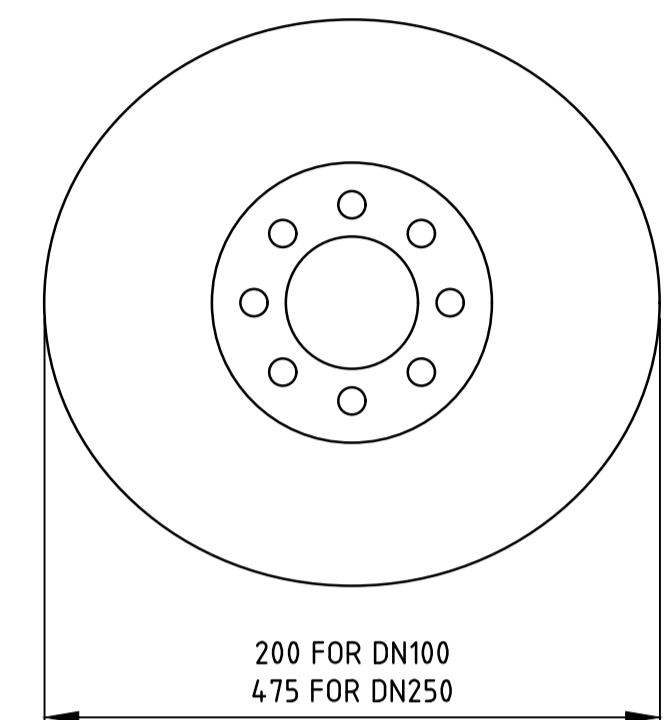
REVISION PANEL				DESIGN PANEL				SA Water Government of South Australia	SA WATER STANDARD DRAWING LOCATING / STABILITY CLEAT	CIVIL	A1 TOTAL SHEETS: 1.0 PROJECT No: _____ MAXIMO ID: _____ SUPERSEDES: _____ DRAWING NUMBER STD-06-00019_01
REV	DATE	DRN	APR'D	DESIGNED	AUTHORISED	DRAWN	SIGNATURE				
1.0	15/12/22	GB	ISSUED FOR USE	M.WHITE	H.HABIB	G. BALDONADO	M.WHITE	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.			
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0							



**SYMMETRICAL BRANCH FOR AIR VALVES & DRAINAGE OUTLETS**  
NTS



**DN100 SYMMETRICAL BRANCH**  
NTS

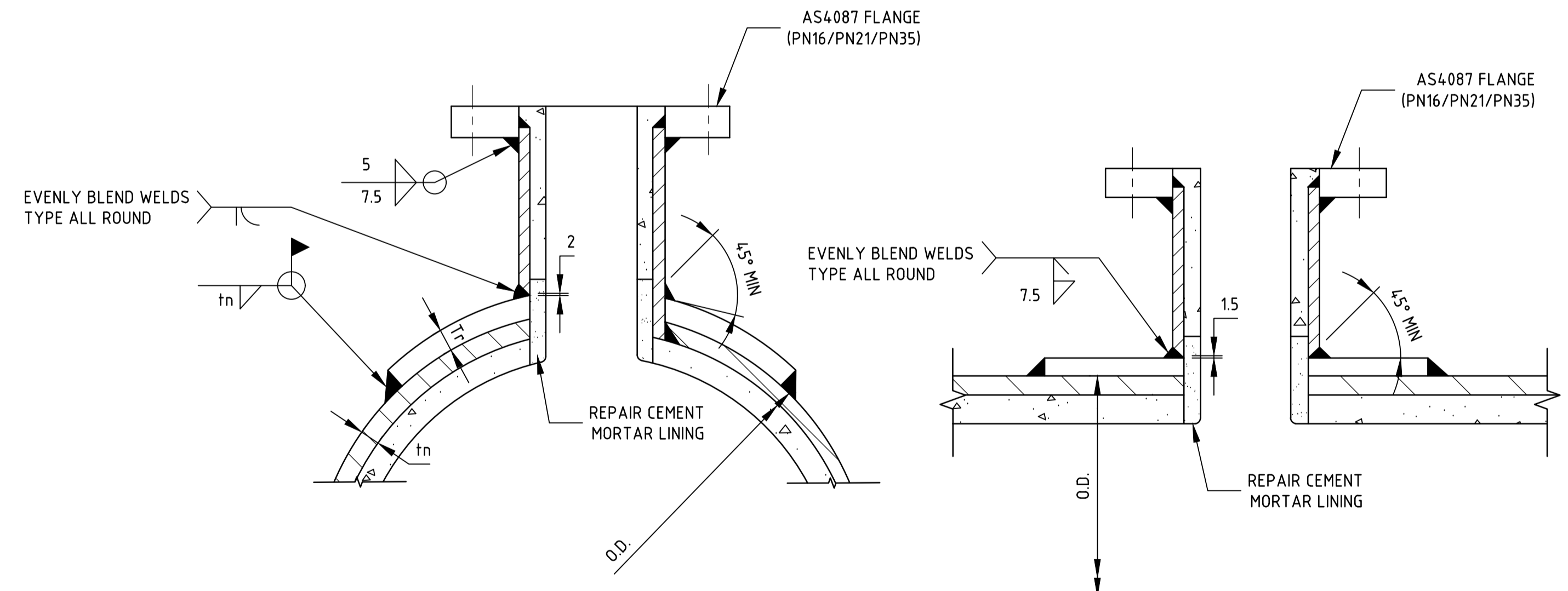


**SYMMETRICAL COMPENSATION PLATE**  
NTS

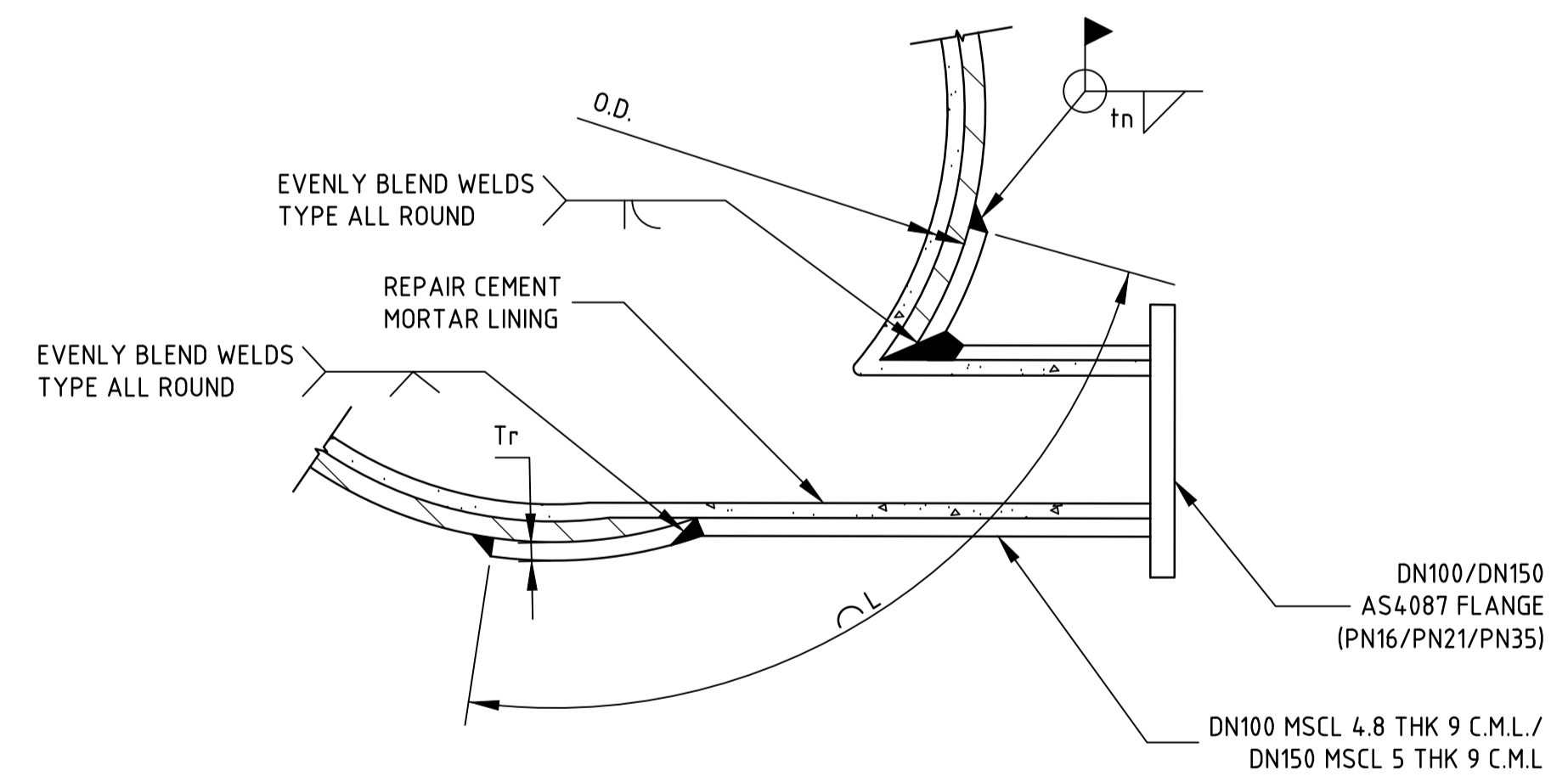
- NOTES:**
- ALL WELDING SHALL COMPLY WITH AS 4041 CLASS 2P AND TS 0420.
  - ALL NEW CARBON STEEL PIPEWORK SHALL BE MANUFACTURED TO AS 1579.
  - ALL NEW CARBON STEEL PIPES SHALL BE MINIMUM:
    - GRADE 300 - THICKNESSES UP TO AND INCLUDING 8mm.
    - GRADE 250 - THICKNESSES GREATER THAN 8mm.
  - FLANGE 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.

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

MAIN PIPE	O.D. (mm)	L (mm)		THICKNESS OF COMPENSATION PLATE Tr (mm)		
		DN100	DN150	PN16	PN21	PN35
250	273	-	-	5	5	5
300	324	-	-			
350	356	530	-			
400	406	555	-			6
450	457	580	-			
500	508	605	775	6	8	
550	559	625	800			
600	610	650	825			
650	660	670	850			
700	711	690	875	8	10	
750	762	710	895			
800	813	725	920			
900	914	760	960	8	-	
1000	1016	795	1005			
1050	1067	815	1025	10	-	
1200	1219	860	1080			

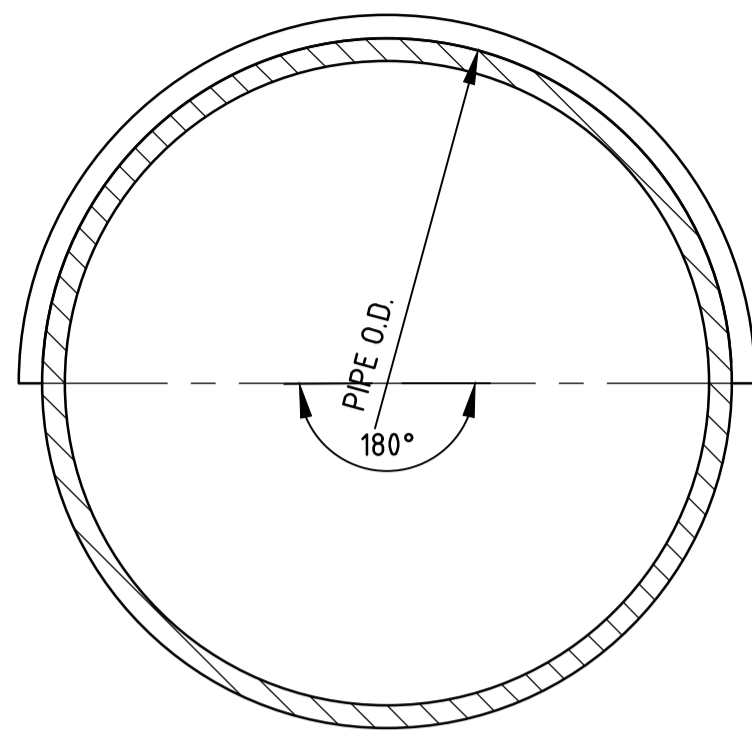


**WELD DETAILS**  
NTS

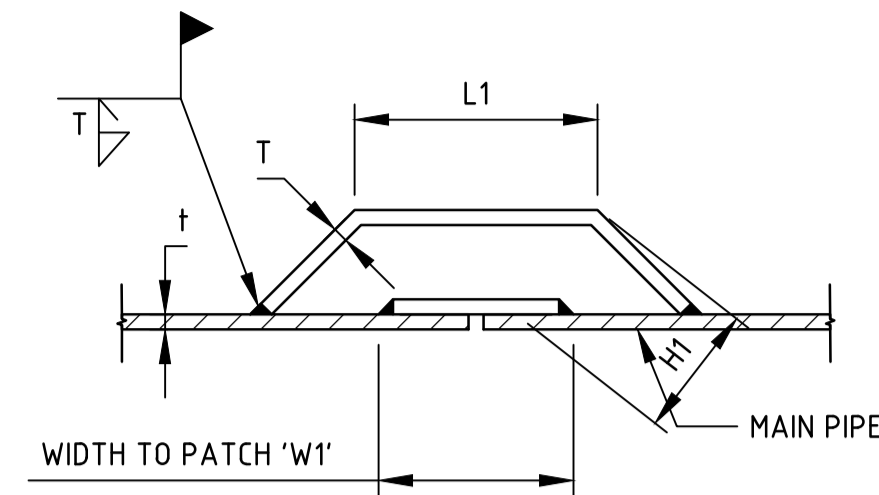


**DN100/DN150 TANGENTIAL BRANCH**  
NTS

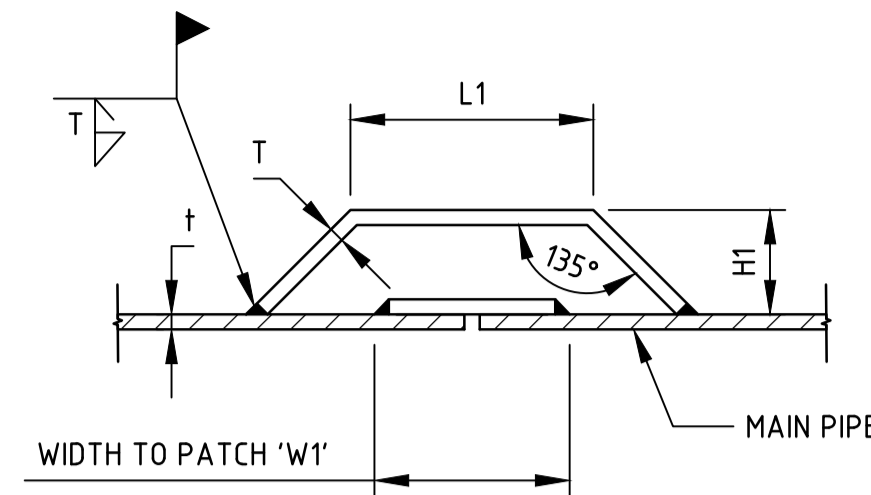
REVISION PANEL				DESIGN PANEL				SA WATER STANDARD DRAWING		A1	
REV	DATE	DRN	APR'D	DESIGNED	AUTHORISED	SA Water		TOTAL SHEETS:		1.0	
				T.MZUNGU	H.HABIB			PROJECT No:		1.0 REVISION	
				G.BALDONADO				MAXIMO ID:			
				M.WHITE				SUPERSEDES:			
1.0	15/12/22	GB	ISSUED FOR USE	M.WHITE				DRAWING NUMBER		STD-06-00020_01	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0				CIVIL			



**TOP BAND**  
NTS



**TOP BAND**  
NTS

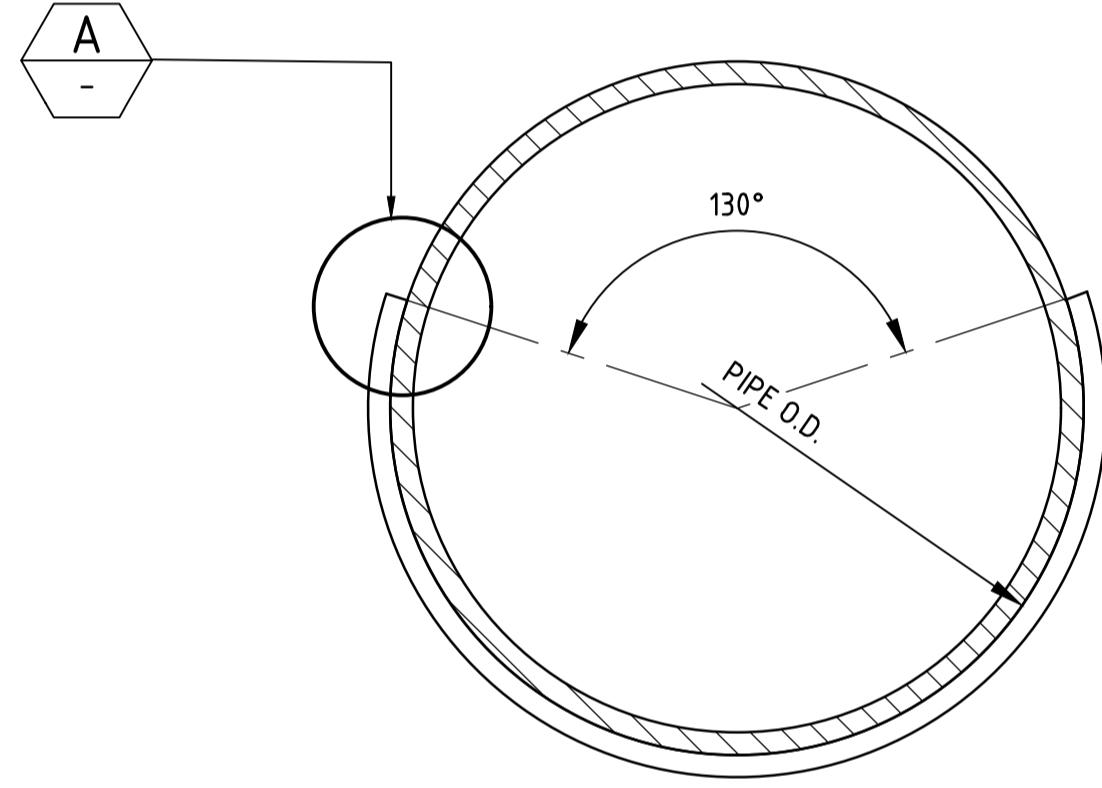


**BOTTOM BAND**  
NTS

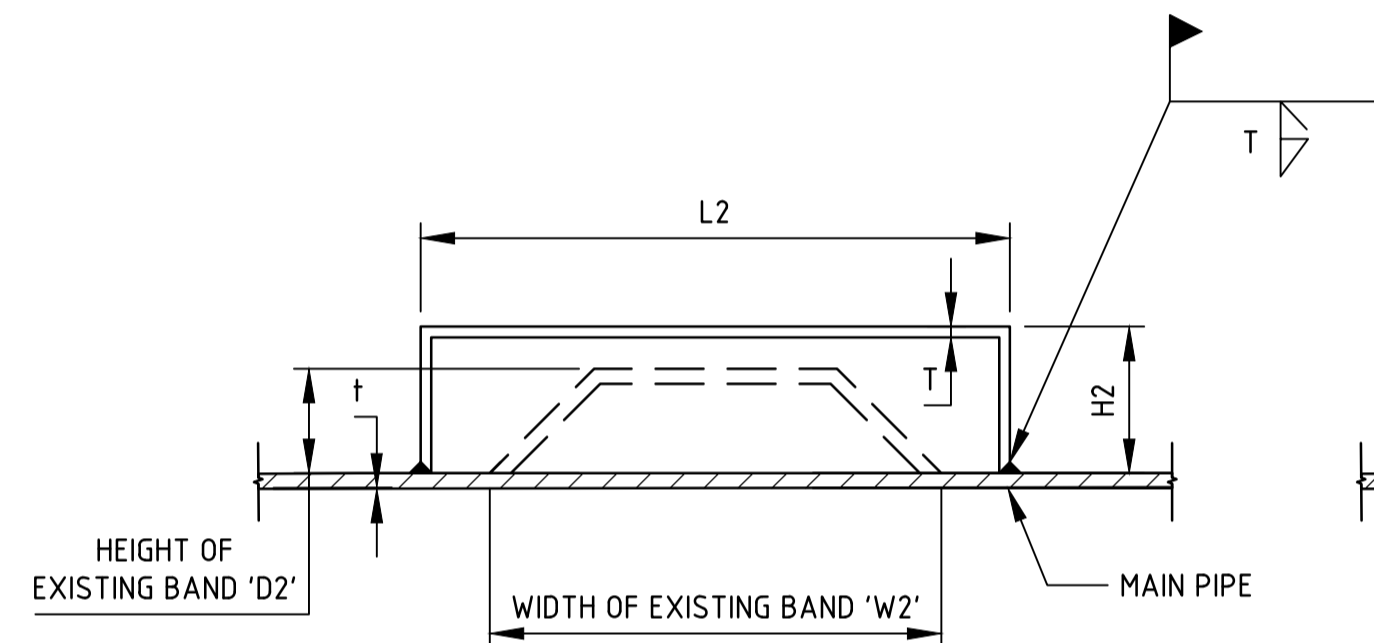
**TYPE 1 PATCH BAND**

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

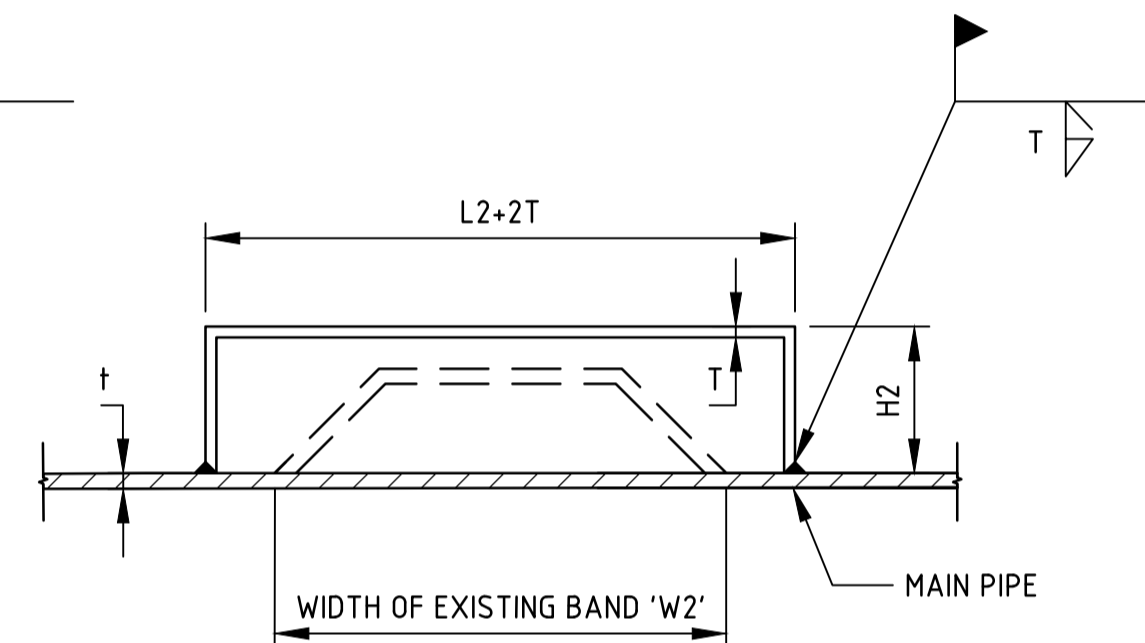
TYPE 1 PATCH	
WIDTH OF BREACH W1 (mm)	WIDTH OF PATCH L1 (mm)
50	100
50 < W1	100
100 < W1	250



**BOTTOM BAND**  
NTS



**TOP BAND**  
NTS



**BOTTOM BAND**  
NTS

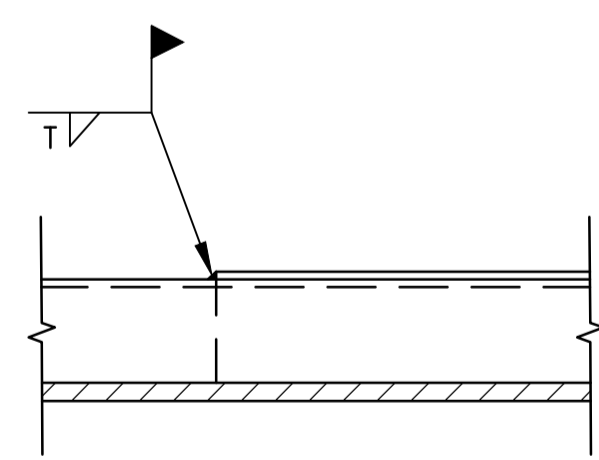
**TYPE 2 PATCH BAND**

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

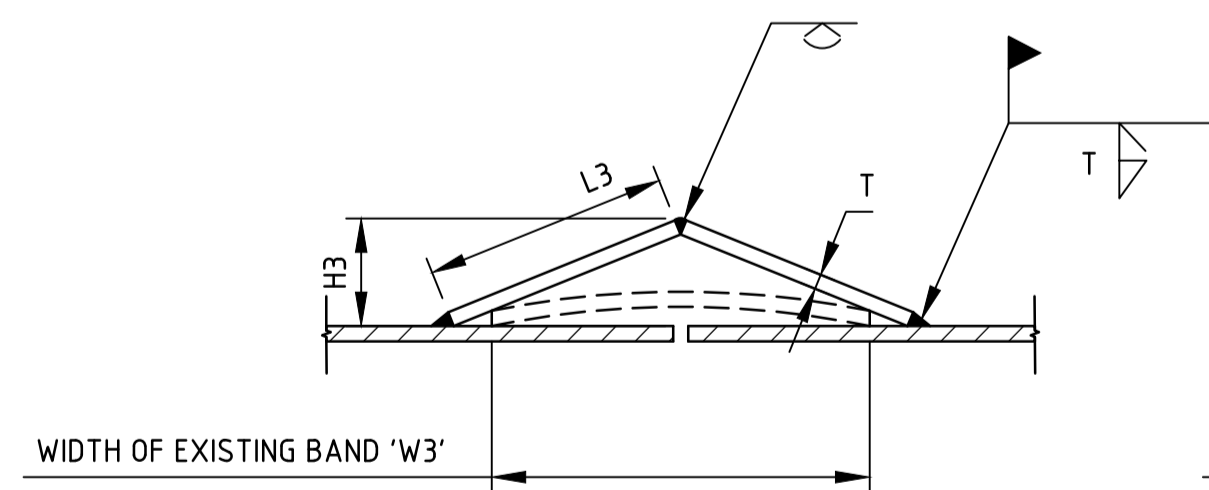
TYPE 2 PATCH	
WIDTH OF EXISTING BAND W2 (mm)	WIDTH OF PATCH BAND L2 (mm)
100	150
100 < W2	200
200 < W2	300
300 < W2	400

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

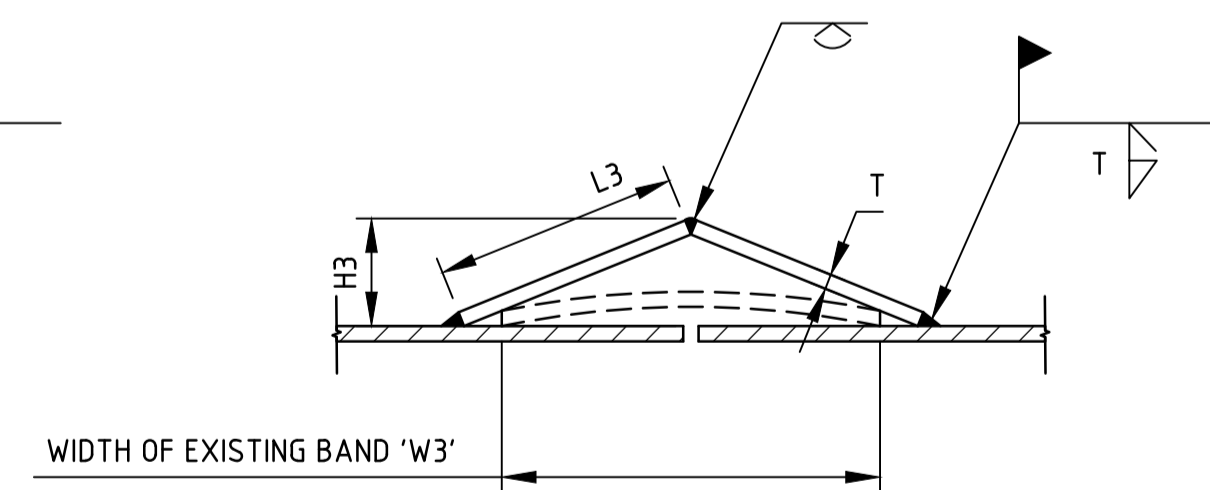
MAIN PIPE		MINIMUM BAND THICKNESS T		
DN	OD (mm)	PN16 (mm)	PN21 (mm)	PN35 (mm)
DN100	114	5	5	5
DN150	168	5	5	5
DN200	219	5	5	5
DN250	273	5	5	5
DN300	324	5	5	5
DN350	356	5	5	5
DN400	406	5	5	5
DN450	457	5	5	6
DN500	508	5	5	6
DN550	559	5	5	N/A
DN600	610	5	5	
DN650	660	5	5	
DN700	711	5	6	
DN750	762	5	6	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



**PATCH BAND LAP  
DETAIL**  
NTS



**TOP BAND**  
NTS



**BOTTOM BAND**  
NTS

**TYPE 3 PATCH BAND**

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

REVISION PANEL				DESIGN PANEL				SA WATER STANDARD DRAWING		A1	
REV	DATE	DRN	APR'D	DESIGNED	12/04/22	AUTHORISED	12/04/22	PIPE PATCH BANDS		TOTAL SHEETS: 1.0	
				T.MZUNGU		H.HABIB		CIVIL		PROJECT No:	
				G.BALDONADO						MAXIMO ID:	
				M.WHITE						SUPERSEDES:	
1.0	15/12/22	GB	ISSUED FOR USE	M.WHITE						DRAWING NUMBER	
CURRENT REV CONTRACTOR: GHD				CURRENT REV PROJECT: 1.0						STD-06-00021_01	

