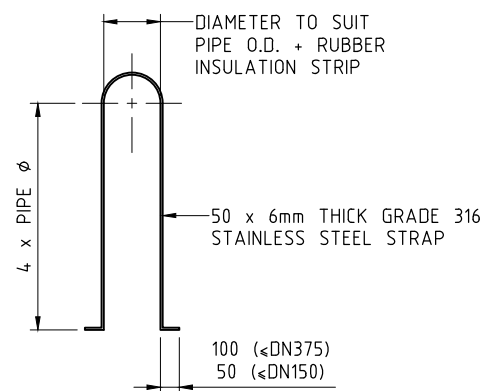
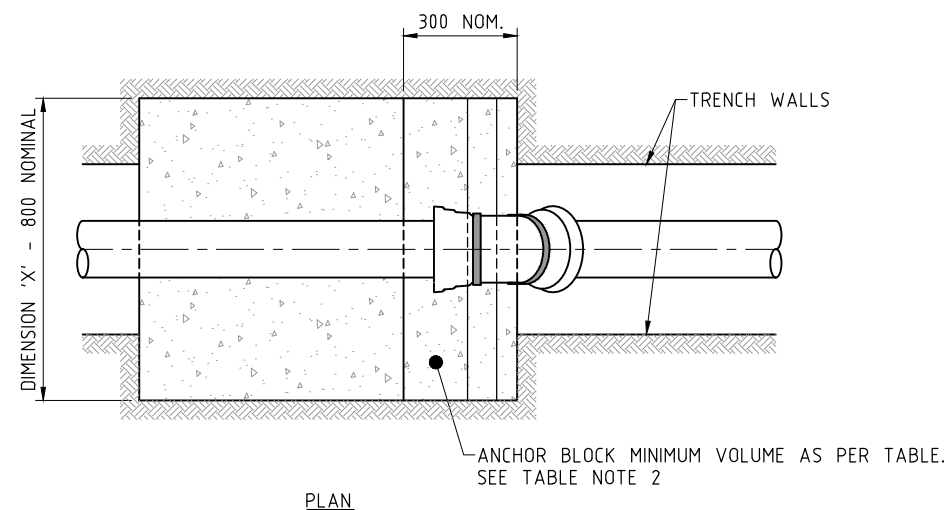
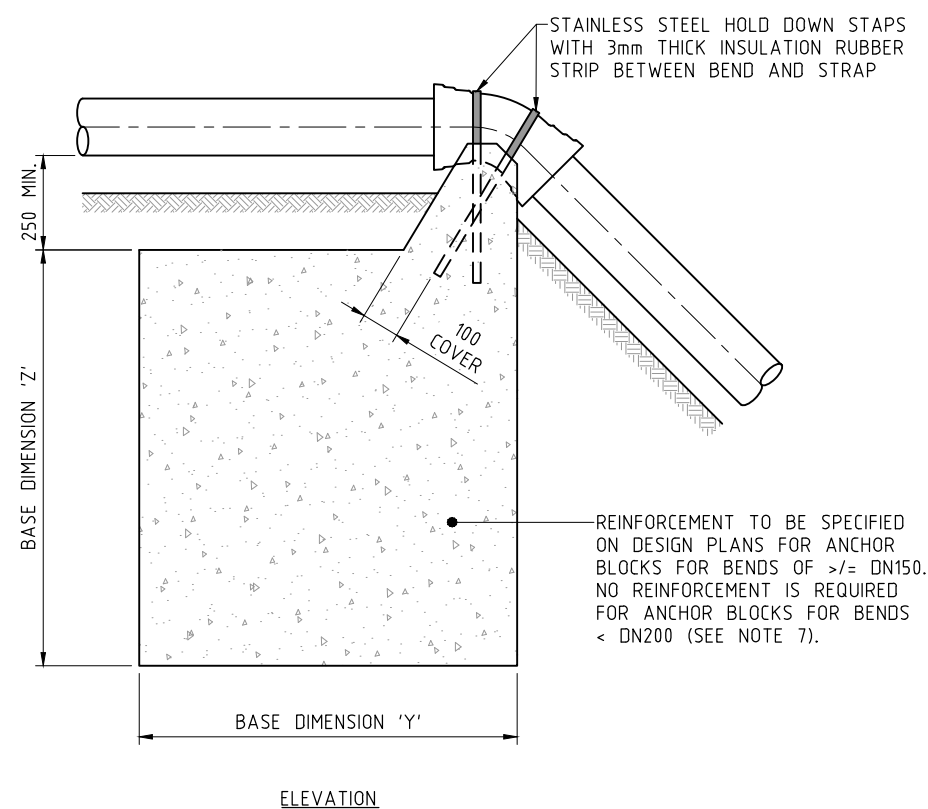


MINIMUM BLOCK VOLUME FOR ANCHORAGE OF VERTICAL COMPONENT OF THRUST

PIPE DN	TYPICAL PIPE OD	VERTICAL BENDS FOR TEST PRESSURE OF 1200kPa AND MINIMUM SOIL ALLOWABLE HORIZONTAL BEARING PRESSURE OF 50kPa (SEE NOTES)				
		DIMENSIONS	CONCRETE VOLUME m ³			
			6° BEND	11.25° BEND	22.5° BEND	45° BEND
100	122	0.06	0.13	0.26	0.47	
	X	400	800	800	800	
	Y	400	400	400	600	
	Z	400	450	800	1000	
150	177	0.13	0.28	0.54	1.00	
	X	800	800	800	800	
	Y	400	400	800	1000	
	Z	450	800	850	1250	
200	232	0.22	0.47	0.93	1.72	
	X	800	800	x	x	
	Y	400	600	x	x	
	Z	800	1000	x	x	
225	259	0.26	0.59	1.16	2.14	
	X	800	800	x	x	
	Y	400	800	x	x	
	Z	800	950	x	x	
250	286	0.31	0.72	1.41	2.61	
	X	800	800	x	x	
	Y	500	1000	x	x	
	Z	800	900	x	x	
300	345	0.48	1.05	2.05	3.79	
	X	800	800	x	x	
	Y	600	1050	x	x	
	Z	1000	1250	x	x	
375	426	0.73	1.60	3.13	5.78	
	X	800	x	x	x	
	Y	1000	x	x	x	
	Z	950	x	x	x	



TYPICAL STAINLESS STEEL STRAP DETAIL



THRUST AND ANCHOR BLOCK - VERTICAL BENDS
NOT TO SCALE

VERTICAL BEND ANCHOR BLOCK CONSTRUCTION NOTES

1. LOCATE ANCHOR BLOCK CENTRALLY AROUND BEND AND KEY ANCHOR BLOCK INTO BASE OF TRENCH A MINIMUM DEPTH OF 250mm (DIMENSION 'Z').
2. POUR BASE CONCRETE AGAINST A SOLID EXCAVATION FACE.
3. USE GRADE N32 CONCRETE FOR REINFORCED THRUST BLOCKS. GRADE N20 FOR NON-REINFORCED.
4. REINFORCEMENT IS NOT NECESSARY FOR THRUST BLOCKS WHERE BENDS ARE LESS THAN DN200.
5. KEEP CONCRETE CLEAR OF ALL BOLTS, NUTS AND PIPE JOINTS.
6. DESIGN OF ANCHOR BLOCKS AT VERTICAL BENDS INCLUDE ALLOWNACE FOR THE HORIZONTAL COMPONENT OF THRUST.
7. DESIGN PLANS TO DETAIL REINFORCING STEEL.
8. ANCHOR BLOCKS IN THE TABLE ARE DESIGNED FOR A TEST PRESUURE OF 1200kPa (122m HEAD).
9. FOR DOWNWARD VERTICAL THRUST, THE ALLOWABLE BEARING PRESSURE FOR VARIOUS SOILS MUST BE TAKEN AS TWICE THAT FOR HORIZONTAL THRUST AS SHOWN ON TWEED SHIRE COUNCIL WATER SUPPLY STANDARD DRAWING S.D.303.

TABLE NOTES

1. IN THE TABLE ABOVE THE 'x' DENOTES A DIMENSION TO BE NOMINATED BY THE DESIGNER TO SUIT THE LOCATION.
2. ANCHOR BLOCKS FOR BENDS DN200 TO DN375 ARE TO HAVE DIMENSIONS 'X', 'Y' AND 'Z' TO SUIT LOCATIONS NOMINATED BY THE DESIGNER.
3. ANCHOR BLOCKS FOR BENDS LARGER THAN DN375 INDIVIDUAL DETAILED DESIGN IS REQUIRED.
4. CALCULATION FOR BLOCK MASS IS:

$$M^3 = (Sf \times P \times A \times \sin Z \times 1000) / (Wm \times 9.8)$$
 WHERE:
 Sf SAFETY FACTOR OF 1.0
 P TEST PRESSURE 1200kPa
 A AREA OF PIPE ACTUAL OD (m²)
 Z BEND ANGLE (DEGREES)
 Wm DENSITY OF CONCRETE (2400kg/m³)
4. IN CALCULATING THE CONCRETE MASS, NO CONTRIBUTION FROM THE PIPELINE SELF WEIGHT, BACKFILL OR EMBEDMENT HAS BEEN INCLUDED.
5. BLOCK WIDTHS 'X' SHOULD BE WITHIN THE PIPELINE ALLOCATED CORRIDOR AND HAVE A NOMINAL WIDTH OF 800mm.

B	TABLE HEADER AMENDED	J.M.M.	01.03.23
A	ORIGINAL ISSUE	A.A	24.11.21
ISSUE	AMENDMENT DETAILS	INITIALS	DATE



DESIGN UNIT

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DESIGN ENGINEER	A.A.	DATE	NOV. 2021
W.W.U. MANAGER	A.B.	DATE	NOV. 2021
DRAWN	INFRASTRUCTURE DELIVERY UNIT - DESIGN		
SCALE	NOT TO SCALE		

PROJECT:	WATER SUPPLY STANDARDS	DRAWING NUMBER:	S.D.304
DRAWING TITLE:	THRUST AND ANCHOR BLOCKS FOR VERTICAL BENDS		MARCH 2023
	WATER MAINS - TEST PRESSURE 1200kPa		