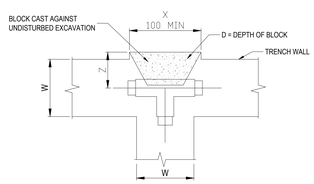


THRUST BLOCK FOR 45° BEND

SCALE : NTS

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE 900 kPa X (mm)	900 kPa A (m²)	1350 kPa X (mm)	1350 kPa A (m²)	1800 kPa X (mm)	1800 kPa A (m²)
500	1600	650	0,91	900	1,20	1450	1,58
350	1400	500	0,64	700	0,97	1000	1,28
300	1200	450	0,49	650	0,74	850	0,98
250	1000	350	0,34	550	0,51	700	0,68
200	800	300	0,22	450	0,33	550	0,44
150	600	250	0,13	350	0,91	450	0,25
90&100	400	150	0,06	250	0,09	300	0,11
75	300	100	0,03	150	0,05	200	0,06
50	200	100	0,02	100	0,02	150	0,03

1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE.
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES.
3. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS.
4. Z SHALL BE THE MINIMUM OF X/2 OR W/2.
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR FROM CONCRETE.
6. THRUST BLOCKS AT PUDDLE FLANGES SHALL BE REINFORCED. DESIGN TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
7. USE 10 MPa/19 mm CONCRETE.

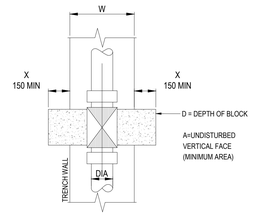


THRUST BLOCK FOR TEE

SCALE : NTS

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE 900 kPa X (mm)	900 kPa A (m²)	1350 kPa X (mm)	1350 kPa A (m²)	1800 kPa X (mm)	1800 kPa A (m²)
500	1600	750	1,20	1400	2,30	1900	2,50
350	1400	600	0,84	950	1,25	1300	1,60
300	1200	550	0,64	800	0,96	1100	1,27
250	1000	450	0,44	700	0,67	900	0,89
200	800	350	0,29	550	0,43	700	0,57
150	600	300	0,16	400	0,24	550	0,32
90&100	400	200	0,07	300	0,11	350	0,14
75	300	150	0,04	200	0,06	300	0,08
50	200	100	0,02	150	0,03	200	0,04

1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE.
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES.
3. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS.
4. Z SHALL BE THE MINIMUM OF X/2 OR W/2.
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR FROM CONCRETE.
6. THRUST BLOCKS AT PUDDLE FLANGES SHALL BE REINFORCED. DESIGN TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
7. USE 10 MPa/19 mm CONCRETE.

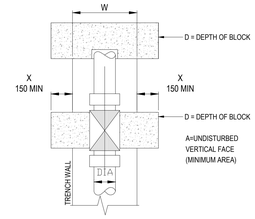


THRUST BLOCK FOR GATE VALVE

SCALE : NTS

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE 900 kPa X (mm)	900 kPa A (m²)	1350 kPa X (mm)	1350 kPa A (m²)	1800 kPa X (mm)	1800 kPa A (m²)
500	700	800	1,05	1250	2,30	1700	2,50
350	550	650	0,85	1050	1,25	1400	1,60
300	500	500	0,64	850	0,96	1150	1,27
250	450	350	0,45	600	0,67	850	0,89
200	400	250	0,29	400	0,43	600	0,57
150	350	150	0,16	200	0,24	350	0,32
90&100	300	150	0,07	150	0,11	150	0,14
75	250	150	0,04	150	0,06	150	0,08
50	200	150	0,02	150	0,03	150	0,04

1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE.
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES.
3. X - DIMENSION SHALL BE 150mm MINIMUM.
4. THE BLOCK DEPTH SHALL BE MEASURED FROM THE PIPE AXIS DOWNWARDS.
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR OF CONCRETE.
6. THRUST BLOCKS AT PUDDLE FLANGES SHALL BE REINFORCED. DESIGN TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
7. USE 10 MPa/19 mm CONCRETE.

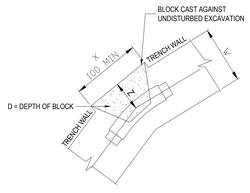


THRUST BLOCKS FOR GATE VALVE AND END CAP AT END CAP POSITIONS

SCALE : NTS

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE 900 kPa X (mm)	900 kPa A (m²)	1350 kPa X (mm)	1350 kPa A (m²)	1800 kPa X (mm)	1800 kPa A (m²)
500	700	800	1,05	1250	2,30	1700	2,50
350	550	650	0,85	1050	1,25	1400	1,60
300	500	500	0,64	850	0,96	1150	1,27
250	450	350	0,45	600	0,67	850	0,89
200	400	250	0,29	400	0,43	600	0,57
150	350	150	0,16	200	0,24	350	0,32
90&100	300	150	0,07	150	0,11	150	0,14
75	250	150	0,04	150	0,06	150	0,08
50	200	150	0,02	150	0,03	150	0,04

1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE.
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES.
3. X - DIMENSION SHALL BE 150mm MINIMUM.
4. THE BLOCK DEPTH SHALL BE MEASURED FROM THE PIPE AXIS DOWNWARDS.
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR OF CONCRETE.
6. THRUST BLOCKS AT PUDDLE FLANGES SHALL BE REINFORCED. DESIGN TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
7. USE 10 MPa/19 mm CONCRETE.



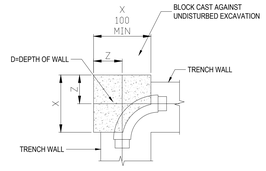
THRUST BLOCK FOR 22½° AND 11¼° BEND

(X AND A TO BE HALVED FOR 11¼° BENDS)

SCALE : NTS

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE 900 kPa X (mm)	900 kPa A (m²)	1350 kPa X (mm)	1350 kPa A (m²)	1800 kPa X (mm)	1800 kPa A (m²)
500	200	450	0,51	550	0,86	650	1,10
350	1400	300	0,32	400	0,50	500	0,65
300	1200	250	0,25	350	0,38	450	0,50
250	1000	200	0,18	300	0,26	350	0,35
200	800	150	0,11	250	0,17	300	0,22
150	600	100	0,06	200	1,00	250	0,13
90&100	400	100	0,04	100	0,04	150	0,06
75	300	100	0,03	100	0,03	100	0,03
50	200	100	0,02	100	0,02	100	0,02

1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS
4. Z SHALL BE THE MINIMUM OF X/2 OR W/2
5. KEEP COUPLINGS AND FLANGES CLEAR FROM CONCRETE.
6. THRUST BLOCKS AT PUDDLE FLANGES SHALL BE REINFORCED. DESIGN TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
7. USE 10 MPa/19 mm CONCRETE.

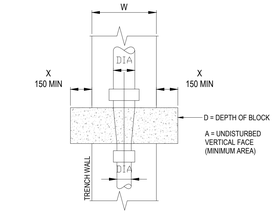


THRUST BLOCK FOR 90° BEND

SCALE : NTS

NOMINAL DIAMETER Ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE 900 kPa X (mm)	900 kPa A (m²)	1350 kPa X (mm)	1350 kPa A (m²)	1800 kPa X (mm)	1800 kPa A (m²)
500	2000	1300	2,30	1800	3,50	2500	2,77
400	1600	1000	1,60	1500	2,40	2000	3,20
350	1400	900	1,25	1350	1,90	1750	2,45
300	1200	750	0,90	1150	1,35	1550	1,81
250	1000	650	0,63	950	0,94	1250	1,26
200	800	500	0,40	750	0,60	1000	0,81
150	600	400	0,23	600	0,34	750	0,46
90&100	400	250	0,10	400	0,15	500	0,20
75	300	200	0,06	300	0,09	400	0,12
50	200	150	0,03	200	0,04	250	0,05

1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS
4. Z SHALL BE THE MINIMUM OF X/2 OR W/2
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR FROM CONCRETE.
6. THRUST BLOCKS AT PUDDLE FLANGES SHALL BE REINFORCED. DESIGN TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
7. USE 10 MPa/19 mm CONCRETE.

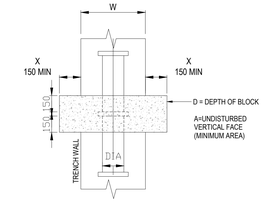


THRUST BLOCK FOR REDUCER

SCALE : NTS

NOMINAL DIAMETER Ø 1 (mm)	NOMINAL DIAMETER Ø 2 (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE 900 kPa X (mm)	900 kPa A (m²)	1350 kPa X (mm)	1350 kPa A (m²)	1800 kPa X (mm)	1800 kPa A (m²)
500	450/400	900	500	0,64	600	0,97	750	1,27
350	300/250	750	300	0,43	450	0,64	600	0,85
300	250/200	700	250	0,35	400	0,53	550	0,71
250	200/150	650	250	0,29	350	0,43	450	0,57
200	150/100	600	200	0,22	300	0,32	400	0,43
150	100/75	500	150	0,12	200	0,18	250	0,24
90&100	75/50	400	150	0,06	150	0,08	150	0,11
75	50	300	100	0,03	150	0,04	150	0,05

1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE.
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. HALF OF THE DEPTH OF THE BLOCK SHALL BE BELOW THE PIPE AXIS
4. X- DIMENSION SHALL BE 150mm MINIMUM
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR OF CONCRETE
6. THRUST BLOCKS AT PUDDLE FLANGES SHALL BE REINFORCED. DESIGN TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
7. USE 10 MPa/19 mm CONCRETE.



THRUST BLOCK FOR FLANGES

SCALE : NTS

PIPE NOMINAL DIAMETER (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE 900 kPa X (mm)	900 kPa A (m²)	1350 kPa X (mm)	1350 kPa A (m²)	1800 kPa X (mm)	1800 kPa A (m²)
300	500	500	0,64	850	0,96	1150	1,27
250	450	350	0,45	600	0,67	850	0,89
200	400	250	0,29	400	0,43	600	0,57
150	350	150	0,16	200	0,24	350	0,32
100	300	150	0,07	150	0,11	150	0,14
75	250	150	0,04	150	0,06	150	0,08
50	200	150	0,02	150	0,03	150	0,04

1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE.
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. X - DIMENSION SHALL BE 150mm MINIMUM.
4. THE BLOCK DEPTH SHALL BE MEASURED FROM THE PIPE AXIS DOWNWARDS
5. THRUST BLOCKS AT PUDDLE FLANGES SHALL BE REINFORCED. DESIGN TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
6. USE 10 MPa/19 mm CONCRETE.

NOTES

1. DO NOT SCALE DRAWING - ONLY DIMENSIONS SHOWN TO BE USED.
2. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS, DIMENSIONS AND LEVELS ON THE SITE AND NOTIFY THE NEC SUPERVISOR OF ANY VARIATIONS BEFORE CONSTRUCTION.
3. ALL LEVELS ARE IN METERS TO MEAN SEA LEVEL.
4. DRAWINGS MUST BE READ IN CONJUNCTION WITH PROJECT SPECIFICATIONS AND GENERAL NOTES DRAWINGS.
5. IF APPLICABLE, DRAWINGS SHALL BE READ IN CONJUNCTION WITH ARCHITECT'S DRAWINGS AND ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER.

LOCALITY



LEGEND

SYMBOL	DESCRIPTION

NO.	DESCRIPTION	BY	CHKD	APPD	DATE
E2	FOR TENDER	RR	HVDM	HVDM	18 07 25
E1	FOR TENDER	RR	HVDM	HVDM	26 06 25

REVISIONS

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ZUTARI
IMPACT. ENGINEERED.

CONTRACTOR / CONSULTANT

TITLE	NAME	SIGN	DATE
DRAWN	I. SEBOLA		18 07 25
CHECKED	H. VAN DER MERWE		18 07 25
DESIGNED	I. SEBOLA		18 07 25
CHECKED	H. VAN DER MERWE		18 07 25

PR.ENG. / PR.TECH./PR. ARCH

NAME	H. VAN DER MERWE	DATE
SIGNATURE		18 07 25

REG. NUMBER 2012720225

TITLE Pr. TechEng

TRANSNET NATIONAL PORTS AUTHORITY

TITLE	NAME	SIGN	DATE
DRAWN			
CHECKED			
DESIGNED			
CHECKED			

PR.ENG. / PR.TECH./PR. ARCH

NAME		DATE
SIGNATURE		
REG. NUMBER		
SCALE	AS SHOWN	

TRANSNET

Transnet National Ports Authority

TRANSNET SOC Ltd : REG No. 1990/000900/30
NEWARK ROAD
RICHARDS BAY TEL: 035 788 0067
PO BOX 181, RICHARDS BAY 3900, SOUTH AFRICA

PROJECT / AREA / ASSET / SUBJECT/DRAWING TITLE

PORT OF RICHARDS BAY

PORT ROADS REHABILITATION & UPGRADE
(REPAIRS TO PORT ROADS)
WATER THRUST BLOCK DETAILS

PAPER SIZE	TRANSNET DRW. NO.	REV.
A0	TBC	E2
	PROJECT DRG. NO.	REV.
	1006614-DRG-20-UR-CC-D004	T2