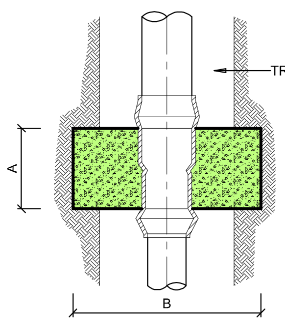
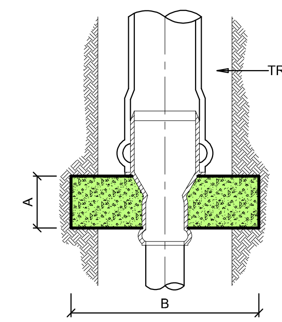
A GUIDE TO THRUST BLOCK SIZES LINE PRESSURE - 90m, PLUS ALLOWANCE FOR SURGE PRESSURE SOIL - MEDIUM LOAN				
PIPE SIZE	90° BENDS A x B	45° BENDS A x B	TEES A x B	END CAPS / SLUICE VALVES REDUCERS A x B
50mm - 90mm	0.2 x 0.2	0.2 x 0.2	0.25 x 0.25	0.25 x 0.6
110mm	0.3 x 0.3	0.3 x 0.25	0.3 x 0.3	0.3 x 0.6
125mm & 140mm	0.3 x 0.45	0.3 x 0.3	0.3 x 0.4	0.3 x 0.65
160mm	0.3 x 0.6	0.3 x 0.4	0.3 x 0.45	0.3 x 0.7
200mm	0.45 x 0.7	0.3 x 0.7	0.45 x 0.6	0.45 x 0.8
250mm	0.6 x 0.9	0.6 x 0.6	0.45 x 0.8	0.45 x 0.85
315mm	0.6 x 1.3	0.6 x 0.9	0.6 x 0.9	0.6 x 1.0
355mm	0.8 x 1.5	0.6 x 1.2	0.6 x 1.4	0.6 x 1.4
400mm	1.0 x 1.6	1.0 x 1.2	0.8 x 1.5	0.8 x 1.5

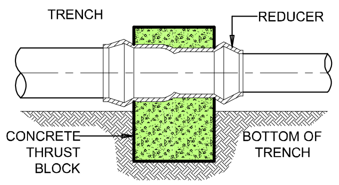
SIZES IN METRES



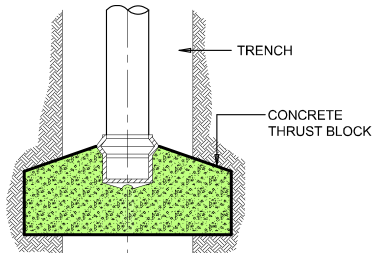
REDUCER 1: PLAN
(NOT TO SCALE)



REDUCER 2: PLAN
(NOT TO SCALE)



REDUCER:
END ELEVATION
(NOT TO SCALE)



PLAN: TYPICAL DETAIL OF A PERMANENT
THRUST BLOCK AT AN END CAP
(NOT TO SCALE)

TABLE SHOWING ALLOWABLE LONGITUDINAL BENDING (ANGLE A) OVER 6m PIPE LENGTHS (SEE DIAGRAM) (INCLUDING ALLOWANCE FOR JOINT DEFLECTION)					
	4	6	9	12	16
50mm	35°	35°	30°	30°	30°
63mm	33°	33°	28°	28°	28°
75mm	27°	27°	23°	23°	23°
90mm	23°	23°	18°	18°	18°
110mm	16°	16°	12°	12°	12°
125mm	15°	15°	11°	11°	11°
140mm	14°	14°	10°	10°	10°
160mm	11°	11°	9°	9°	9°
200mm	8°	8°	7°	7°	7°
250mm	6°	6°	5°	5°	5°
315mm	3°	3°	3°	3°	3°
355 & 400mm	2°	2°	2°	2°	2°

PIPE SIZE - ALLOWABLE ANGLE (A) PER PIPE CLASS

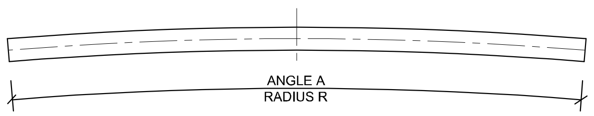
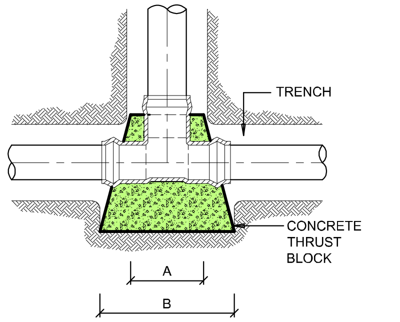
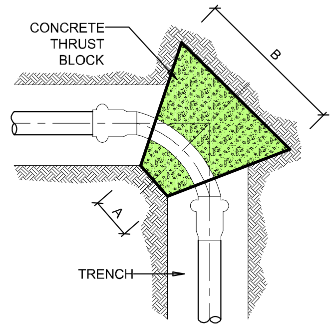


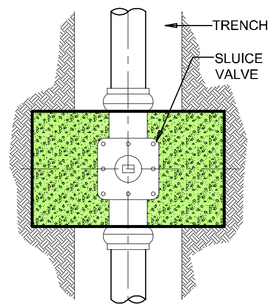
DIAGRAM SHOWING ALLOWABLE
LONGITUDINAL BENDING ANGLE
NOT TO SCALE



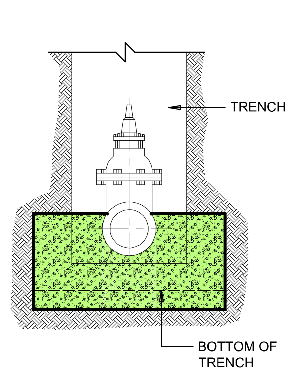
PLAN : TEE
(NOT TO SCALE)



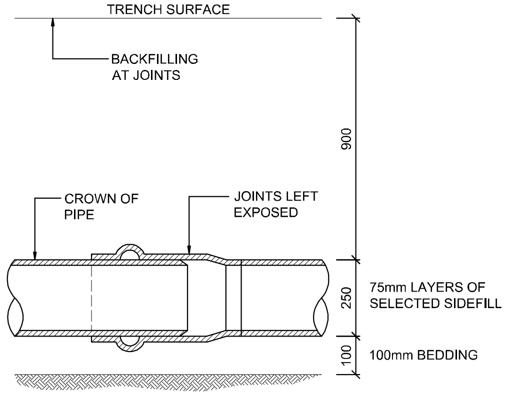
PLAN: BEND
(NOT TO SCALE)



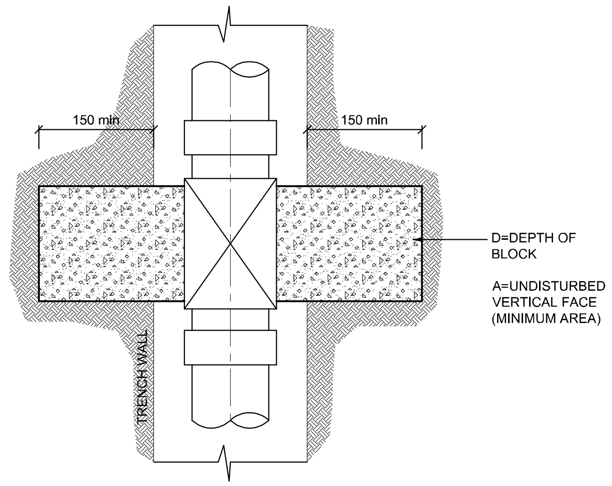
ISOLATING
VALVE: PLAN
(NOT TO SCALE)



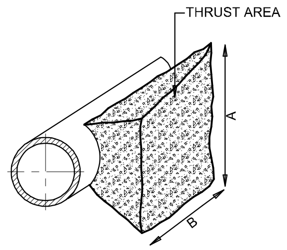
ISOLATING VALVE:
END ELEVATION
(NOT TO SCALE)

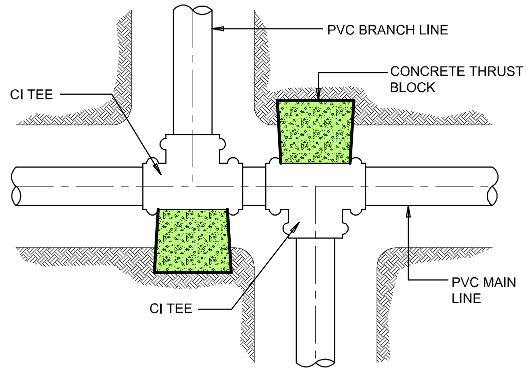


BACKFILLING AT JOINTS
(NOT TO SCALE)

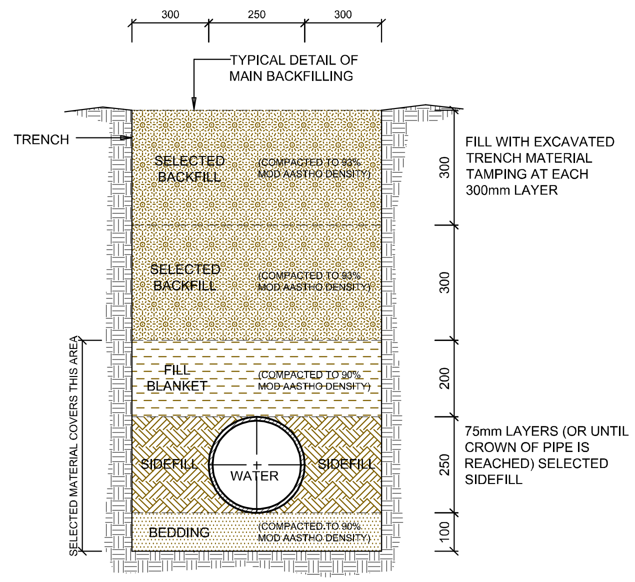


THRUST BLOCK FOR GATE VALVE
(NOT TO SCALE)





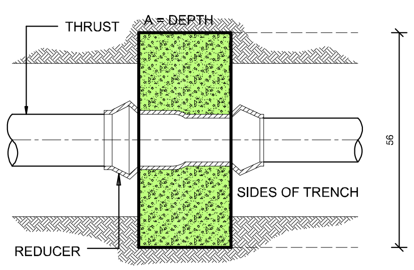
TYPICAL DETAIL OF
CROSS BRANCHING
(NOT TO SCALE)



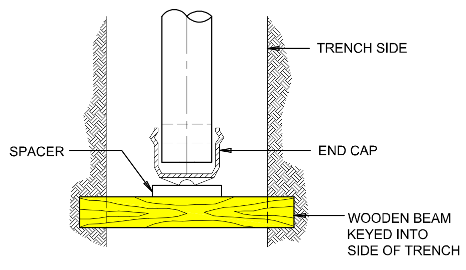
TYPICAL DETAIL OF MAIN BACKFILLING
CONSTRUCT TO SABS 1200 LB DRAWING LB-3(c)
(NOT TO SCALE)

NOMINAL DIA. ø (mm)	DEPTH OF BLOCK D (mm)	MAXIMUM TESTING PRESSURE					
		900kPa		1350kPa		1800kPa	
		X	A	X	A	X	A
		mm	m	mm	m	mm	m
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	800	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	0.07	150	0.11	150	0.14
50	200	150	0.02	150	0.03	150	0.14

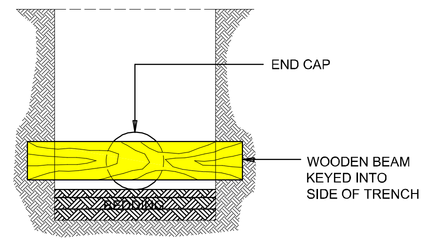
1. THIS TABLE IS VALID FOR 100 kPa EARTH BEARING PRESSURE
2. X- DIMENSION MAY BE REDUCED FOR HIGHER EARTH BEARING PRESSURES
3. X - DIMENSION SHALL BE 150mm MINIMUN
4. THE BLOCK DEPTH SHALL BE MEASURED FROM THE PIPE AXIS DOWNWARDS
5. KEEP COUPLINGS AND FLANGES 25mm CLEAR FROM CONCRETE



PLAN
REDUCER, VALVES ETC.
(NOT TO SCALE)



PLAN



END ELEVATION

TYPICAL DETAIL OF A TEMPORARY
THRUST BEAM FOR TESTING PURPOSES
(NOT TO SCALE)

NOTES / LEGEND

GENERAL

* THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL MATERIALS AND WORKMANSHIP CONFORM WITH THE DETAILS AND SPECIFICATIONS SHOWN ON THIS DRAWING, AND ALL RELEVANT SABS SPECIFICATIONS, IRRESPECTIVE OF WHETHER THE ENGINEER HAS INSPECTED THE WORKS ON SITE OR NOT.
* ALL DIMENSIONS AND LEVELS TO BE CHECKED ON SITE AND CORRELATED WITH THE ENGINEER'S DRAWINGS BEFORE CONSTRUCTION COMMENCES.
* NO SCALING WITH SCALE RULER FROM THE DRAWING IS PERMITTED. THE CONTRACTOR MUST ENSURE THAT HE GETS THE CORRECT DIMENSIONS FROM THE ENGINEER BEFORE CONSTRUCTION COMMENCES.

DRAWING NOT PRINTED TO SCALE
REDUCED FROM A1 TO A3.

ISSUE DATE:	DRAWING SIZE:	REVISION:
28 Aug 2012	A1	0

	PRELIMINARY
	INFO ONLY
X	FOR TENDER
	FOR CONSTRUCTION
	AS-BUILT

CLIENT PLAN NUMBER
LAYERS USED
U10329C-143-01-0

REFERENCE DRAWINGS

NUMBER	REVISION	DRAWING DESCRIPTION

APPROVED BY COUNCIL / CLIENT

CITY ENGINEER / CLIENT | REG. NO. | DATE

AMENDMENTS CODE

A,B,C.../ : BEFORE TENDER
0 / : TENDER DRAWING
1,2,3.../ : AFTER TENDER
Z / : AS BUILT

/A : BY CLIENT
/B : BY ARCHITECT
/C : BY MECHANICAL OR ELECTRICAL
/D : BY BVi
/E : BY OTHER ( )

DATE	INITIAL	No./CODE	REVISION DESCRIPTION
17/04/2012	MN	0	ISSUE FOR TENDER PURPOSES

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Civil, Structural & Electrical Engineers, Environmental & Project Management
Registration no. 1998/000204/07

CLIENT
KALAHARI EAST
WATER USERS
ASSOCIATION

PROJECT
WATER SUPPLY
PIPELINE TO
BOTSWANA,
MIDDELPUTS AREA

DRAWING TITLE
PIPELINE:
THRUST BLOCK &
EXCAVATION DETAILS

APPROVED BY BVi

ENGINEER/TECHNOLOGIST | REG. NO. | DATE

SCALE	NOT TO SCALE	DRAWN	G. Coetzee
DESIGNED	M. du Pessis	CHECKED	F.D. Maritz

PLAN NUMBER	REVISION NO.	DATE SAVED
LAYERS USED U10329C-143-01	0	29 Aug 2012

U10329C-143-01-1.drw