

EMALAHLENI LOCAL MUNICIPALITY



CONSTRUCTION OF DOORNPOORT PUMPING MAIN AND PUMPSTATION – PHASE 1

CONTRACT: ELM 24/2022

CONSTRUCTION OF
PUMPING WATER MAIN

A3 - BOOK OF DRAWINGS

NOVEMBER 2022

ENQUIRIES : Tshegofatso Malebye

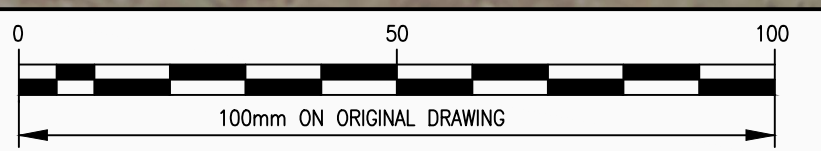


Tel: 012 751 1168
Cell: 082 597 5054
mail: Masebenza@lefatsheinfra.co.za
info@lefatsheinfra.co.za

WILLOW WOOD OFFICE PARK
CNR 3RD AVENUE & CEDAR ROAD, BROADACRES



COORDINATE LIST				
BENCHMARKS				
WC29				
BENCHMARK	Y-Coord	X-Coord	Z	Description
GCP01	-29349.12	2861932.03	1451.059	12MM IRON PEG IN CONCRETE
GCP04	-23278.87	2862992.81	1624.951	12MM IRON PEG IN CONCRETE
T1	-23224.22	2862837.91	1626.836	16MM IRON PEG IN CONCRETE
T2	-23560.78	2862980.88	1621.909	12MM IRON PEG IN TAR
TR319-REF	-27679.72	2863311.87	1560.600	WIT102
NRB8-18	-27093.42	2864302.63	1567.203	ZE-ER



LEGEND:

EXISTING WATER

NEW BULK WATER PUMPING MAIN

PIPE CHAINAGE

PIPE NODE AND NUMBER

AIR VALVE

SCOUR

BULK WATER METER

GRAVITY BULK WATER MAIN

NOTES:

EXISTING SERVICES SHOWN ARE FOR INDICATIVE PURPOSES ONLY THE ACTUAL POSITION TO DETERMINED ON SITE.

No.	AMENDMENTS	APPROVED	DATE

CONSULTANT DETAILS

LEFATSHE

INFRASTRUCTURE SERVICES

Tel: 012 751 1168

Cell: 082 597 5054

mail: Masebenza@lefatsheinfra.co.za

info@lefatsheinfra.co.za

WILLOW WOOD OFFICE PARK

CNR 3RD AVENUE & CEDAR ROAD, BROADACRES

DESIGNED	T. Malebye
DRAWN	T. Malebye
CHECKED	M. Matyeka
APPROVED	M. Matyeka

APPROVED	NAME:
	SIGNATURE:
	DATE:

PROJECT

KLARINET AND SIYANQOBA BULK WATER SUPPLY

DRAWING DESCRIPTION

BULK WATER PUMPING MAIN

LAYOUT PLAN : SHEET 1

CLIENT DETAILS

LOCAL GOVERNMENT

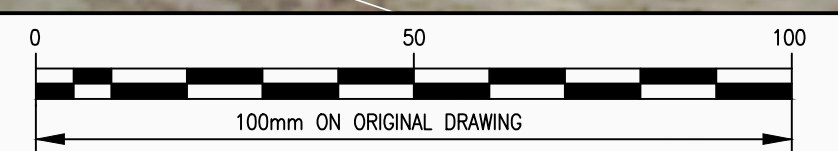
SCALE
1:1 000
ON
ORIGINAL
A1
DRAWING



RECORD DRAWING			
CONTRACT No.	CONTRACT DESCRIPTION	CERTIFIED	DATE
CERTIFIED RECORD DRAWING FOR CONTRACT :			
ENGINEER DATE			

PRIVATE DRAWING No.	REVISION
PM01-LAY-001	V1



COORDINATE LIST BENCHMARKS WG29				
BENCHMARK	Y—Coord	X—Coord	Z	Description
GCP01	-29349.12	2861932.03	1451.059	12MM IRON PEG IN CONCRETE
GCP04	-23278.87	2862992.81	1624.951	12MM IRON PEG IN CONCRETE
T1	-23224.22	2862837.91	1626.836	16MM IRON PEG IN CONCRETE
T2	-23560.78	2862980.88	1621.909	12MM IRON PEG IN TAR
TR319-REF	-27679.72	2863311.87	1560.600	WIT102
NRB8-18	-27093.42	2864302.63	1567.203	ZE-ER



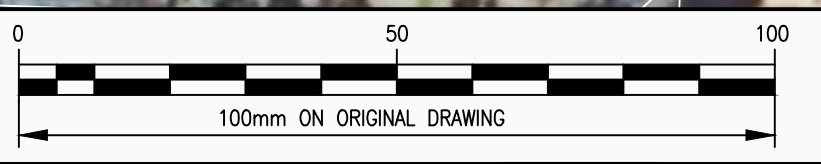
CONSULTANT DETAILS				DESIGNED		T. Molebye		APPROVED		PROJECT		CLIENT DETAILS		RECORD DRAWING					
No.	AMENDMENTS	APPROVED	DATE	DRAWN	T. Malebye	NAME:	KLARINET AND SIYANQOBA BULK WATER SUPPLY						SCALE	CONTRACT No.	CONTRACT DESCRIPTION			CERTIFIED	DATE
				CHECKED	M. Matyeka	SIGNATURE:	DRAWING DESCRIPTION						1:1 000						
				APPROVED	M. Matyeka	DATE:							ON						
<div><p>Tel: 012 751 1168 Cell: 082 597 5054 mail: Masebenza@lefatshainfra.co.za info@lefatshainfra.co.za</p><p>WILLOW WOOD OFFICE PARK CNR 3RD AVENUE & CEDAR ROAD, BROADACRES</p></div>						BULK WATER PUMPING MAIN LAYOUT PLAN : SHEET 3					ORIGINAL A1 DRAWING		CERTIFIED RECORD DRAWING FOR CONTRACT : <div>-----ENGINEER-----DATE-----</div>				PRIVATE DRAWING No. PM01-LAY-003	REVISION V1	



PM01-LAY-003

PM01-LAY-005

COORDINATE LIST				
BENCHMARKS				
WC29				
BENCHMARK	Y-Coord	X-Coord	Z	Description
GCP01	-29349.12	2861932.03	1451.059	12MM IRON PEG IN CONCRETE
GCP04	-23278.87	2862992.81	1624.951	12MM IRON PEG IN CONCRETE
T1	-23224.22	2862837.91	1626.836	16MM IRON PEG IN CONCRETE
T2	-23560.78	2862980.88	1621.909	12MM IRON PEG IN TAR
TR319-REF	-27679.72	2863311.87	1560.600	WIT102
NRB8-18	-27093.42	2864302.63	1567.203	ZE-ER



No.	AMENDMENTS	APPROVED	DATE

Tel: 012 751 1168
Cell: 082 597 5054
mail: Masebenza@lefatsheinfra.co.za
info@lefatsheinfra.co.za

WILLOW WOOD OFFICE PARK
CNR 3RD AVENUE & CEDAR ROAD, BROADACRES

CONSULTANT DETAILS	
DESIGNED	T. Malebye
DRAWN	T. Malebye
CHECKED	M. Matyeka
APPROVED	M. Matyeka

APPROVED	
NAME:
SIGNATURE:
DATE:

PROJECT

KLARINET AND SIYANQOBA BULK WATER SUPPLY

DRAWING DESCRIPTION

BULK WATER PUMPING MAIN
LAYOUT PLAN : SHEET 4

CLIENT DETAILS

SCALE	
1:1 000	ON
ORIGINAL	A1
DRAWING	

RECORD DRAWING			
CONTRACT No.	CONTRACT DESCRIPTION	CERTIFIED	DATE
CERTIFIED RECORD DRAWING FOR CONTRACT :			
----- ENGINEER ----- DATE -----			

PRIVATE DRAWING No.		REVISION
PM01-LAY-004		V1



COORDINATE TABLE		
WG29		
NODE	Y-Coord	X-Coord
PM01	-29511.9754	2861851.8384
PM02	-29485.3184	2861870.6740
PM03	-29394.4795	2861943.1700
PM04	-29289.3155	2862010.6282
PM05	-29167.0330	2862147.0326

LEGEND:

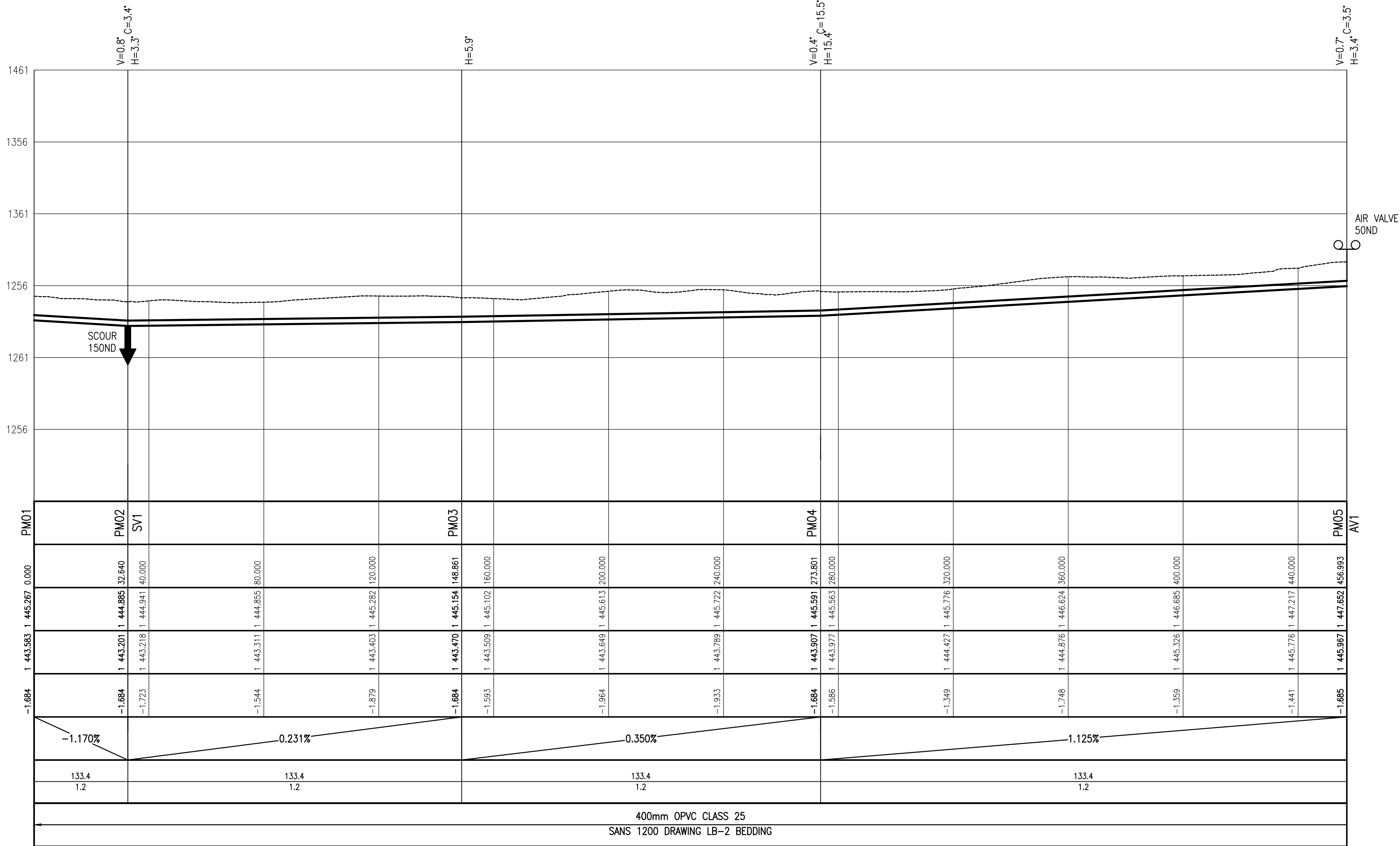
- EXISTING WATER
- NEW BULK WATER PUMPING MAIN
- PIPE CHAINAGE
- PIPE NODE AND NUMBER
- AIR VALVE
- SCOUR
- BULK WATER METER
- GRAVITY BULK WATER MAIN

NOTES:

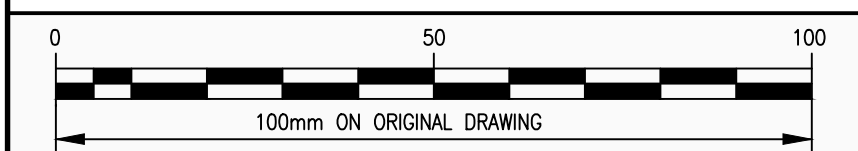
EXISTING SERVICES SHOWN ARE FOR INDICATIVE PURPOSES ONLY THE ACTUAL POSITION TO DETERMINED ON SITE.




LAYOUT PLAN

SCALE 1:1 000



NODE PM01 – NODE PM05



No.	AMENDMENTS	APPROVED	DATE	CONSULTANT DETAILS		DESIGNED	T. Malebye	APPROVED	PROJECT		CLIENT DETAILS	SCALE	RECORD DRAWING				PRIVATE DRAWING No.	REVISION
				<div><p>LEFATSHE INFRASTRUCTURE SERVICES</p><p>Tel: 012 751 1168 Cell: 082 597 5054 mail: Masebenza@lefatsheinfra.co.za info@lefatsheinfra.co.za</p><p>WILLOW WOOD OFFICE PARK CNR 3RD AVENUE & CEDAR ROAD, BROADACRES</p></div>	DRAWN	T. Malebye	NAME:	KLARINET AND SIYANQOBA BULK WATER SUPPLY			AS SHOWN ON ORIGINAL A1 DRAWING		CONTRACT No.	CONTRACT DESCRIPTION	CERTIFIED	DATE		
					CHECKED	M. Matyeka	SIGNATURE:	DRAWING DESCRIPTION										
					APPROVED	M. Matyeka	DATE:										PUMPING WATER MAIN	



COORDINATE TABLE		
WG29		
NODE	Y-Coord	X-Coord
PM05	-29167.0330	2862147.0326
PM06	-29027.7711	2862284.7614
PM07	-28888.5093	2862422.4903
PM08	-28805.3794	2862499.8444
PM09	-28751.2017	2862503.5211
PM10	-28712.1785	2862510.3329

LEGEND:

EXISTING WATER

NEW BULK WATER PUMPING MAIN

PIPE CHAINAGE

PIPE NODE AND NUMBER

AIR VALVE

SCOUR

BULK WATER METER

GRAVITY BULK WATER MAIN

NOTES:

EXISTING SERVICES SHOWN ARE FOR INDICATIVE PURPOSES ONLY THE ACTUAL POSITION TO DETERMINED ON SITE.

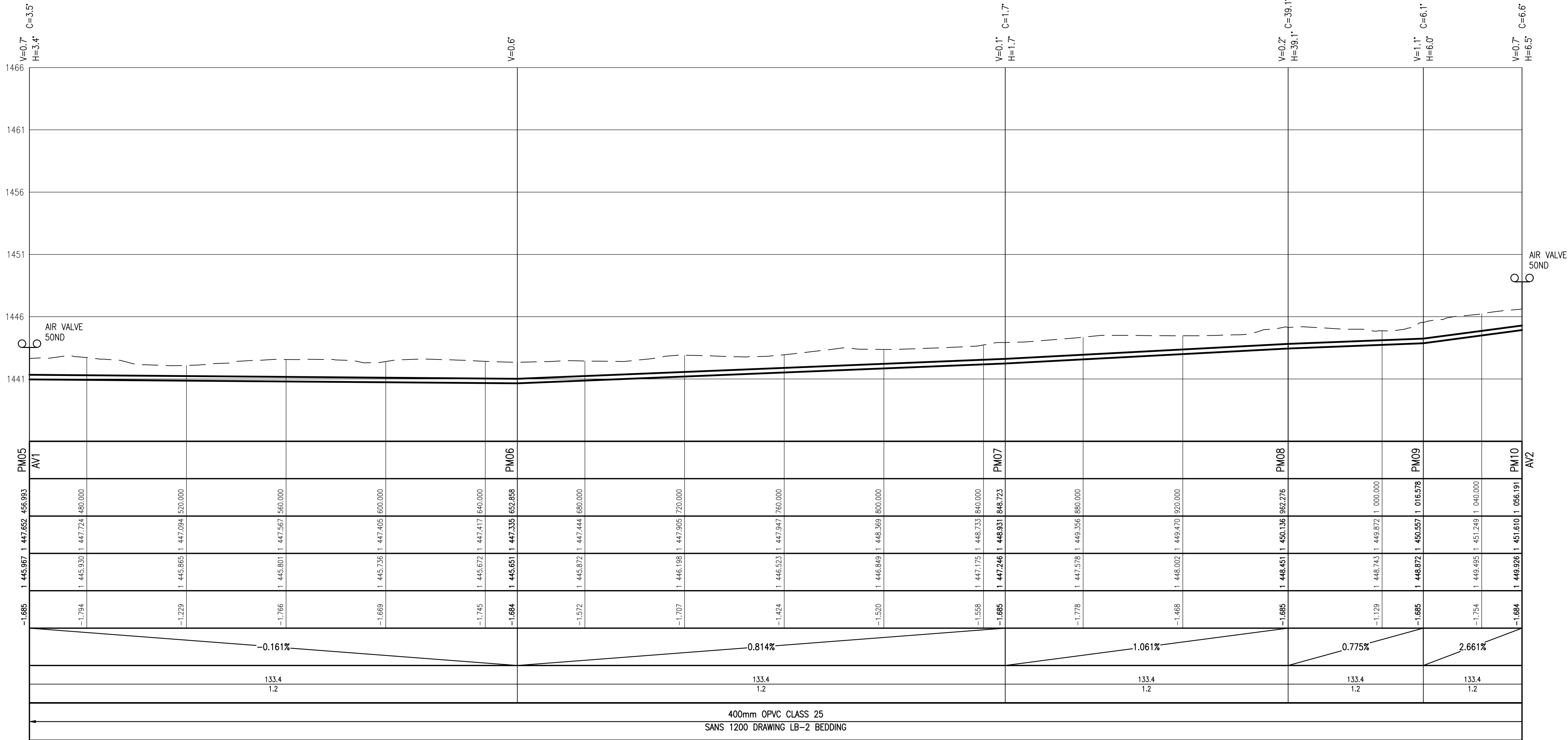
----- NGL
—— PIPELINE

SCALES:
Horizontal 1:1 000
Vertical 1:200

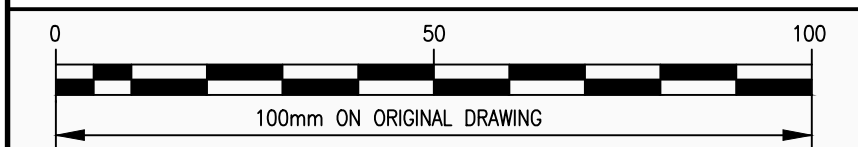
DATUM 1441.000m



REFERENCE	
DISTANCE (m)	
GROUND LEVEL	
PIPE INVERT LEVEL	
DEPTH TO INVERT	
SLOPE	
HYDRAULICS	DESIGN Q(l/s)
	DESIGN V(m/s)
CLASSIFICATION	PIPE
	BEDDING

LAYOUT PLAN
SCALE 1:1 000

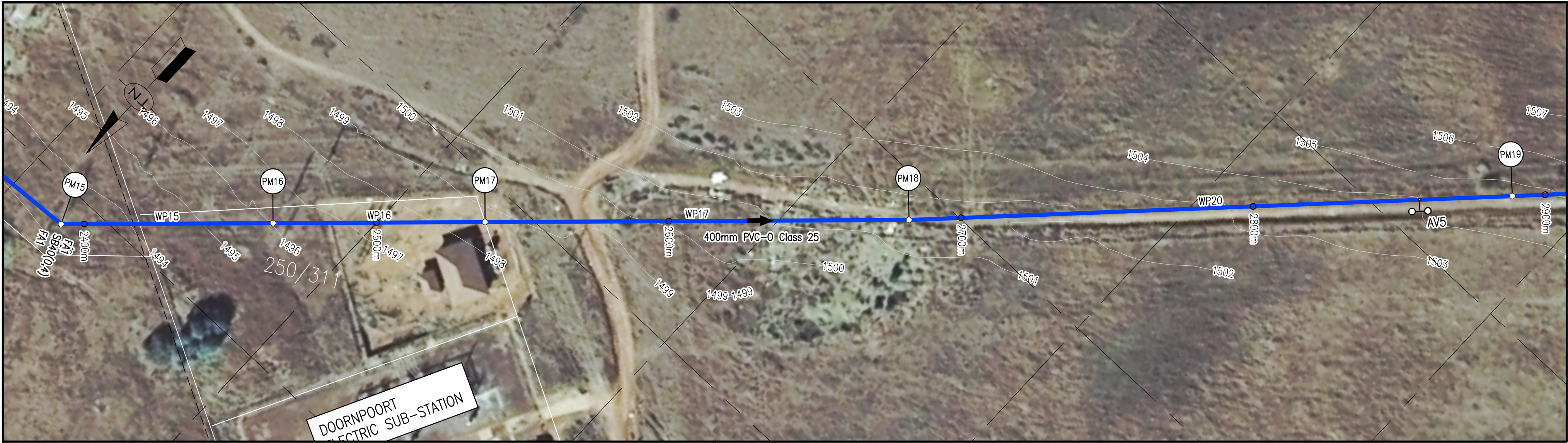


NODE PM05 – NODE PM10



No.	AMENDMENTS	APPROVED	DATE	CONSULTANT DETAILS		DESIGNED	T. Malebye	APPROVED	PROJECT		CLIENT DETAILS		SCALE	RECORD DRAWING					
				 <div>Tel: 012 751 1168 Cell: 082 597 5054 mail: Masebenza@lefatshainfra.co.za info@lefatshainfra.co.za</div> <div>WILLOW WOOD OFFICE PARK CNR 3RD AVENUE & CEDAR ROAD, BROADACRES</div>	DRAWN	T. Malebye	NAME:	KLARINET AND SIYANQOBA BULK WATER SUPPLY						CONTRACT No.	CONTRACT DESCRIPTION	CERTIFIED	DATE		
					CHECKED	M. Matyeka	SIGNATURE:	DRAWING DESCRIPTION											
					APPROVED	M. Matyeka	DATE:												
					PUMPING WATER MAIN														
LONGITUDINAL SECTION : NODE PM05 TO PM10																			

PRIVATE DRAWING No.		REVISION
PM01-LS-002		V1



COORDINATE TABLE		
WG29		
NODE	Y-Coord	X-Coord
PM15	-27378.631	2862588.6391
PM16	-27325.822	2862638.5820
PM17	-27273.013	2862688.3243
PM18	-27167.395	2862787.8091
PM19	-27022.039	2862934.5428

LAYOUT PLAN

SCALE 1:1 000

LEGEND:

- EXISTING WATER
- NEW BULK WATER PUMPING MAIN
- PIPE CHAINAGE
- PIPE NODE AND NUMBER
- AIR VALVE
- SCOUR
- BULK WATER METER
- GRAVITY BULK WATER MAIN

NOTES:

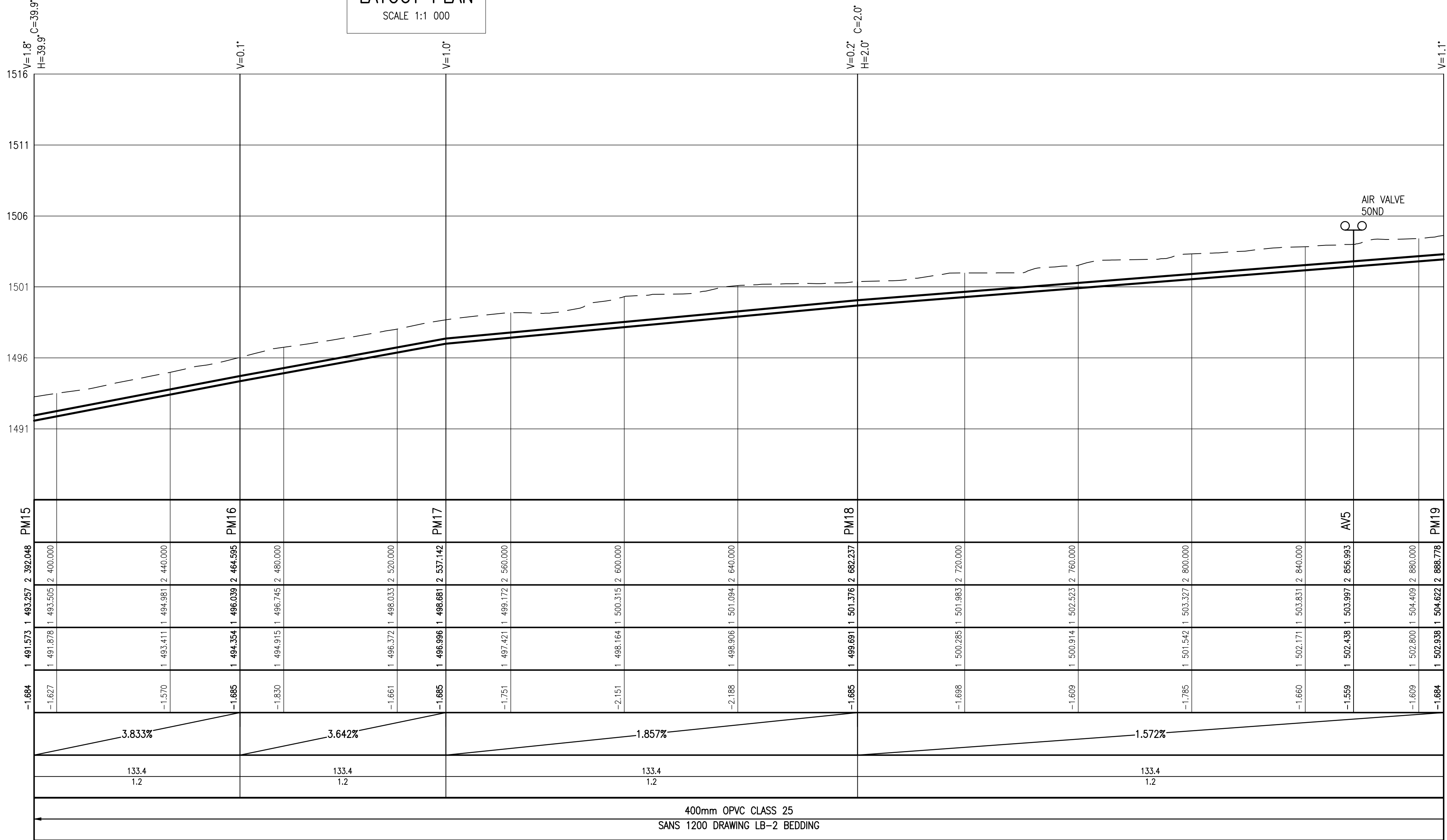
EXISTING SERVICES SHOWN ARE FOR INDICATIVE PURPOSES ONLY THE ACTUAL POSITION TO DETERMINED ON SITE.

- NGL
- PIPELINE

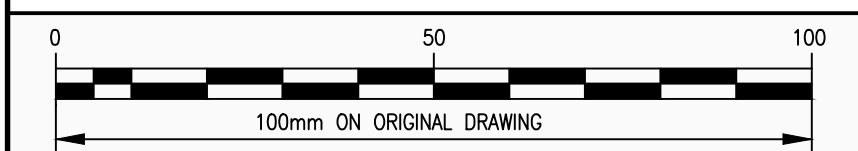
SCALES:
Horizontal 1:1 000
Vertical 1:200


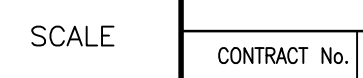
DATUM 1486.000m

REFERENCE	
DISTANCE (m)	
GROUND LEVEL	
PIPE INVERT LEVEL	
DEPTH TO INVERT	
SLOPE	
HYDRAULICS	DESIGN Q(l/s)
	DESIGN V(m/s)
CLASSIFICATION	PIPE
	BEDDING

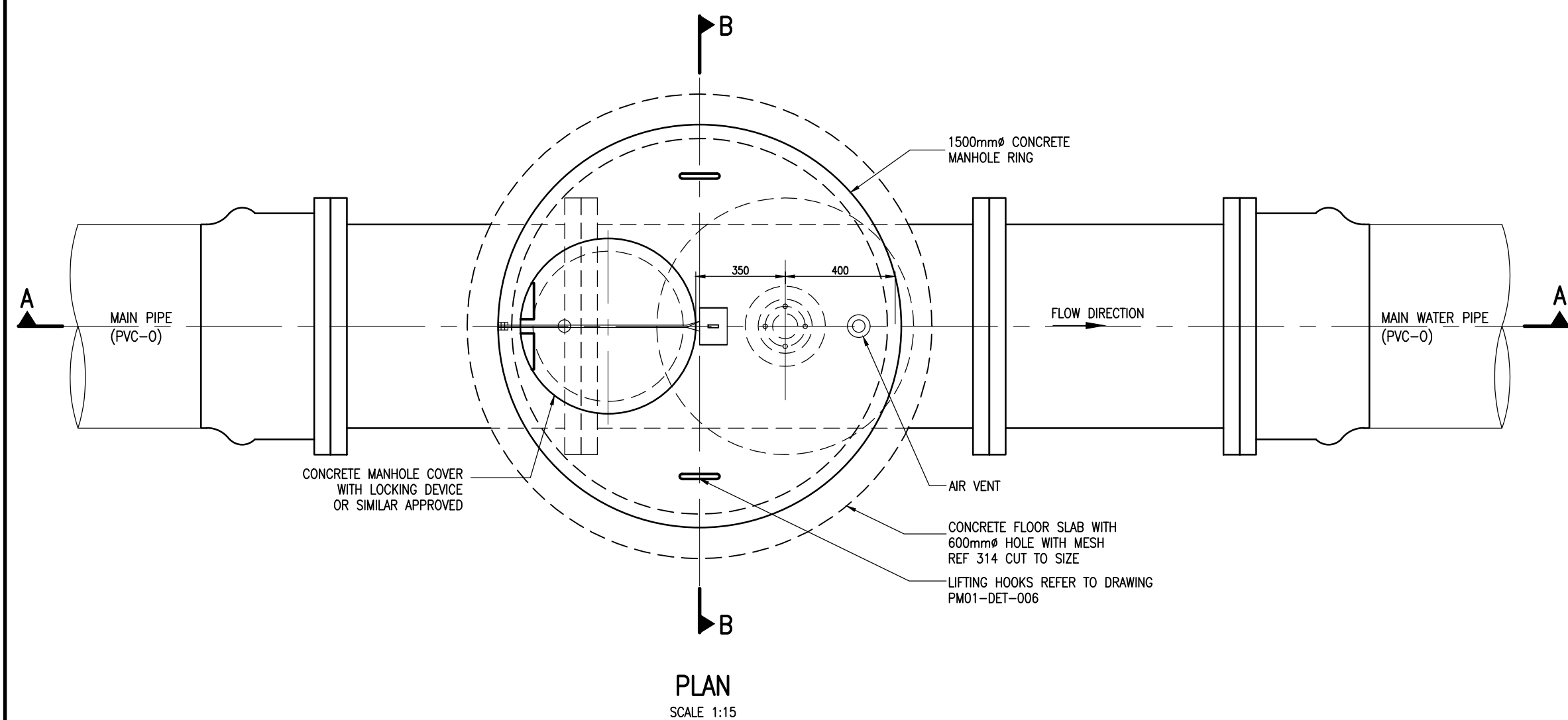


NODE PM15 – NODE PM19



No.	AMENDMENTS	APPROVED	DATE	CONSULTANT DETAILS		DESIGNED	T. Malebye	APPROVED	PROJECT		CLIENT DETAILS		SCALE	RECORD DRAWING					
				 <p>Tel: 012 751 1168 Cell: 082 597 5054 mail: masebenza@lefatsheinfra.co.za info@lefatsheinfra.co.za</p> <p>WILLOW WOOD OFFICE PARK CNR 3RD AVENUE & CEDAR ROAD, BROADACRES</p>	DRAWN	T. Malebye	NAME:	KLARINET AND SIYANQOBA BULK WATER SUPPLY			AS SHOWN ON ORIGINAL A1 DRAWING	CONTRACT No.		CONTRACT DESCRIPTION	CERTIFIED	DATE			
					CHECKED	M. Matyeka	SIGNATURE:					DRAWING DESCRIPTION							
					APPROVED	M. Matyeka	DATE:						PUMPING WATER MAIN LONGITUDINAL SECTION : NODE PM15 TO PM19						
									CERTIFIED RECORD DRAWING FOR CONTRACT :					PRIVATE DRAWING No.	REVISION				
								----- ENGINEER ----- DATE -----				PM01-LS-005		V1					

NOTE:
FINAL POSITION TO BE DETERMINED ON SITE



NOTES 1

GENERAL CONCRETE AND MISCELLANEOUS:

- ALL CONCRETE EDGES TO 25mm CHAMFERED.
- CONCRETE CHAMBERS TO CLASS 25/19, BLINDING LAYER TO CLASS 15/19.
- ALL EXPOSED METAL WORK TO BE CR12 (UNPAINTED)
- BACK FILL BELOW CHAMBER TO BE COMPACTED IN LAYERS 150mm TO 90% MOD AASHTO.
- CHECK THAT PIPE SPECIALS FIT CORRECTLY IN THE CHAMBERS BEFORE MANUFACTURE.
- PIPES TO BE CUT ON SITE SHALL BE MANUFACTURED WITH EXTRA LENGTH OF 20 PERCENT.
- THE VALVE CHAMBER LID IS TO BE DESIGNED TO CARRY EXTERNAL VEHICLE LOADS.
- ALLOW FOR 3mm THICK GASKET BETWEEN FLANGES.
- EXISTING PIPES DIMENSIONS TO BE VERIFIED BEFORE ORDERING PIPE SPECIALS AND COUPLINGS.
- PROVIDE LIFTING LUGS WHERE REQUIRED.

COORDINATE TABLE

WGS L029

Node	Y-Coord	X-Coord
AV1	-28 712.179	2 862 510.333
AV2	-29 167.032	2 862 147.033
AV3	-28 112.415	2 862 545.641
AV4	-27 513.452	2 862 580.902
AV5	-27 044.408	2 862 911.962
AV6	-26 855.843	2 863 120.800
AV7	-26 632.788	2 863 000.000
AV8	-25 756.000	2 863 760.384
AV9	-5 211.651	2 863 508.028
AV10	-24 675.210	2 863 275.443
AV11	-24 103.887	2 863 048.079
AV12	-23 319.871	2 863 000.113

NOTES 2

PIPE NOTES:

- FLANGES:
 - ALL DRILLED FLANGES TO SANS 1123 TYPE 3. FOR CLASSIFICATION REFER TO THE RELEVANT DRAWING.
 - PUDDLE FLANGES: SAME TYPE AND OD AS DRILLED FLANGES, FLAT FACED. NO DRILLING.
 - ANCHOR / TRUST FLANGES: SAME OD & " AS DRILLED FLANGES. FLAT FACED.
 - COUPLINGS BURIED IN SOIL TO BE PROTECTED IN ACCORDANCE WITH WS 9900, SECTION 13 (COATING SYSTEM PLUS PETROLATUM WRAPPING).
- CORROSION PROTECTION:
 - LINING: STEEL PIPES WILL BE PROTECTED INTERNALLY BY SOLVENT BORNE LIQUID EPOXY LINING WITH A MINIMUM THICKNESS OF 500 MICRONS.
 - COATING: EXTERNAL CORROSION PROTECTION WILL CONSIST OF A SINTAKOT 11 FUSION BONDED POLYETHYLENE COATING FOR PIPES INSTALLED UNDERGROUND. PIPES INSTALLED IN CHAMBER, RESERVOIR AND IN PUMP STATION WILL HAVE A SOLVENT FREE EPOXY COATING WITH MINIMUM THICKNESS OF 500 MICRONS.
 - FLANGE FACES: ALL FLANGES UNDERGROUND TO BE WRAPPED WITH DENSO-TAPE.

NOTES 3

GENERAL NOTES:

- ALL LEVELS TO BE CONFIRMED ON SITE.
- THIS DRAWING MUST BE READ IN CONJUNCTION WITH RELEVANT ENGINEERING DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE FROM THIS DRAWING, USE ONLY CALCULATED AND WRITTEN DIMENSIONS.
- ALL EXCAVATIONS SHOULD BE INSPECTED AND APPROVED BY THE ENGINEER ON SITE.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
- ALL PIPE ITEMS ENCASED IN THE CHAMBER SHALL BE FILLED WITH ANCHOR FLANGES. PLAIN ENDED FLANGES WILL ONLY BE USED OUTSIDE THE CHAMBER.
- ALL STEEL PIPES WILL BE API 5Lx42 WITH WALL THICKNESS OF 4.5mm.
- LOOSE FLANGES WILL BE CUT AND WELDED ON SITE.
- ALL COATING AND LINING TO BE REPAIRED ACCORDING TO SPECIFICATION..
- POSITIONS OF CHAMBERS MUST BE DECIDED ON SITE ACCORDING TO TERRAIN.

ABBREVIATIONS:

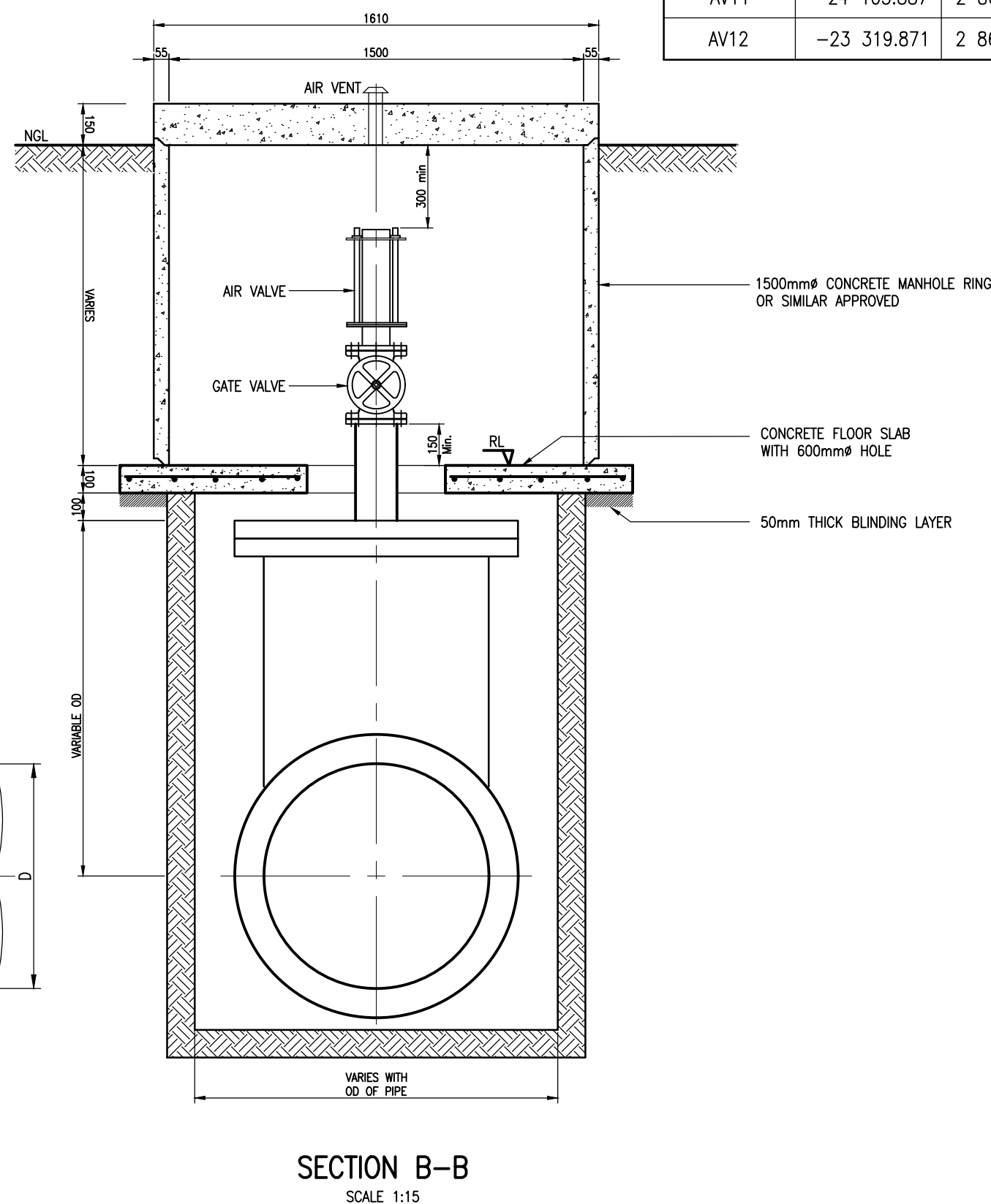
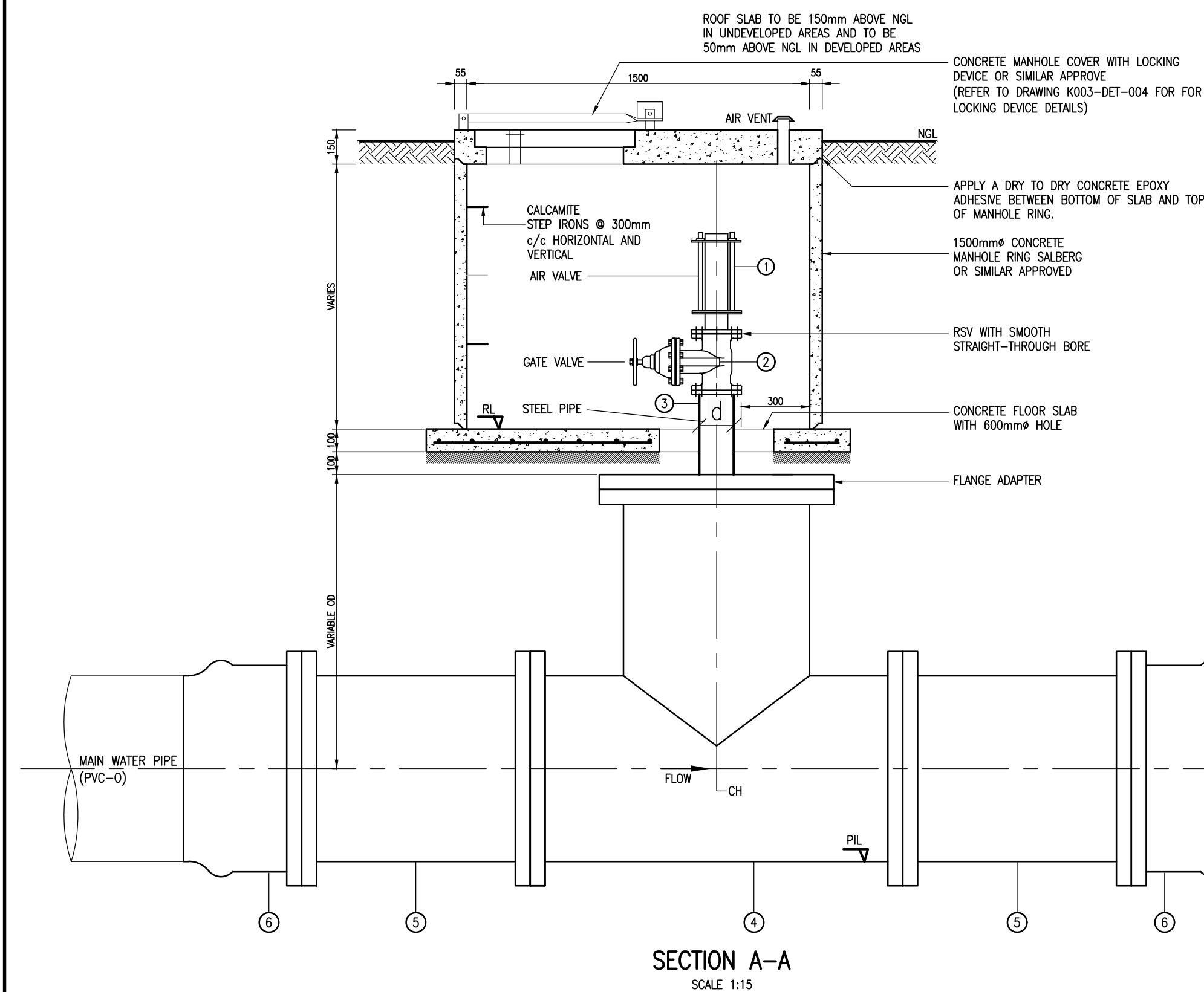
NGL - NATURAL GROUND LEVEL
PIL - PIPE INVERT LEVEL
RL - REDUCED LEVEL

PIPE SCHEDULE PER CHAMBER

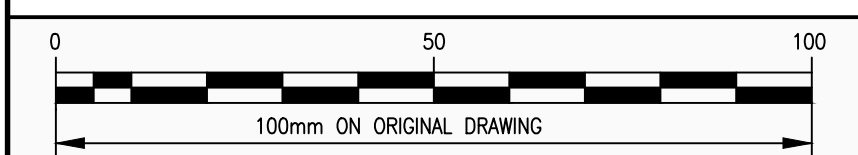
AIR VALVE	TOTAL	DIA (mm) NB	WALL THICKNESS (mm)	MATERIAL	DESCRIPTION	CORROSION PROTECTION AS SHOWN ON PIPE NOTES		
						LINING	COATING	FLANGES
①	1	50	-	MILD STEEL	DOUBLE ACTING AIR VALVE (PN40)	AS PER MANUFACTURE	AS PER MANUFACTURE	2.3
②	1	50	-	VARIES	RESILIENT SEAL GATE VALVE FLANGED (PN40)	2.1	2.2	2.3
③	1	50	4.7	HEAVY DUTY STEEL	STRAIGHT PIPE BOTH ENDS FLANGED	2.1	2.2	2.3
④	1	400	6	API 5L x42 MILD STEEL	EQUAL TEE PIECE, ALL END FLANGED	2.1	2.2	2.3
⑤	2	400	-	API 5L x42 MILD STEEL	STRAIGHT PIPE BOTH ENDS FLANGED	2.1	2.2	2.3
⑥	2	400	-	CAST IRON	SG FLANGE ADAPTOR	AS PER MANUFACTURE	AS PER MANUFACTURE	2.3

AIR VALVE CHAMBER SCHEDULE

AIR VALVE	CH (m)	NGL. (masl)	PIL (masl)	RL (masl)	D (mm)	d (mm)	PIPE CLASS (kPa)	VALVE CLASS (kPa)	REFERENCE
AV1	459.993	1447.652	1445.967	-	400	50	2500	4000	-
AV2	1056.993	1451.636	1449.957	-	400	50	2500	4000	-
AV3	1656.993	1472.514	1471.167	-	400	50	2500	4000	-
AV4	2256.993	1492.402	1490.654	-	400	50	2500	4000	-
AV5	2856.993	1503.997	1502.438	-	400	50	2500	4000	-
AV6	3140.000	1512.080	1510.395	-	400	50	2500	4000	-
AV7	3740.000	1549.558	1547.351	-	400	50	2500	4000	-
AV8	4620.962	1566.500	1564.806	-	400	50	2500	4000	-
AV9	5220.962	1552.833	1550.876	-	400	50	2500	4000	-
AV10	5820.962	1554.668	1552.957	-	400	50	2500	4000	-
AV11	6420.962	1595.824	1594.046	-	400	50	2500	4000	-
AV12	7228.804	1624.496	1622.811	-	400	50	2500	4000	-



AIR VALVE DETAIL



No.	AMENDMENTS	APPROVED	DATE

CONSULTANT DETAILS

LEFATSHE
INFRASTRUCTURE SERVICES

Tel: 012 751 1168
Cell: 082 597 5054
mail: Masebenza@lefatshainfra.co.za
info@lefatshainfra.co.za

WILLOW WOOD OFFICE PARK
CNR 3RD AVENUE & CEDAR ROAD, BROADACRES

DESIGNED	T. Malebye
DRAWN	T. Malebye
CHECKED	M. Matyeka
APPROVED	M. Matyeka

APPROVED	NAME:
	SIGNATURE:
	DATE:

PROJECT

KLARINET AND SIYANQOBA BULK WATER SUPPLY

DRAWING DESCRIPTION

WATER DETAILS

TYPICAL AIR VALVE DETAILS

CLIENT DETAILS



SCALE

AS SHOWN ON ORIGINAL A1 DRAWING

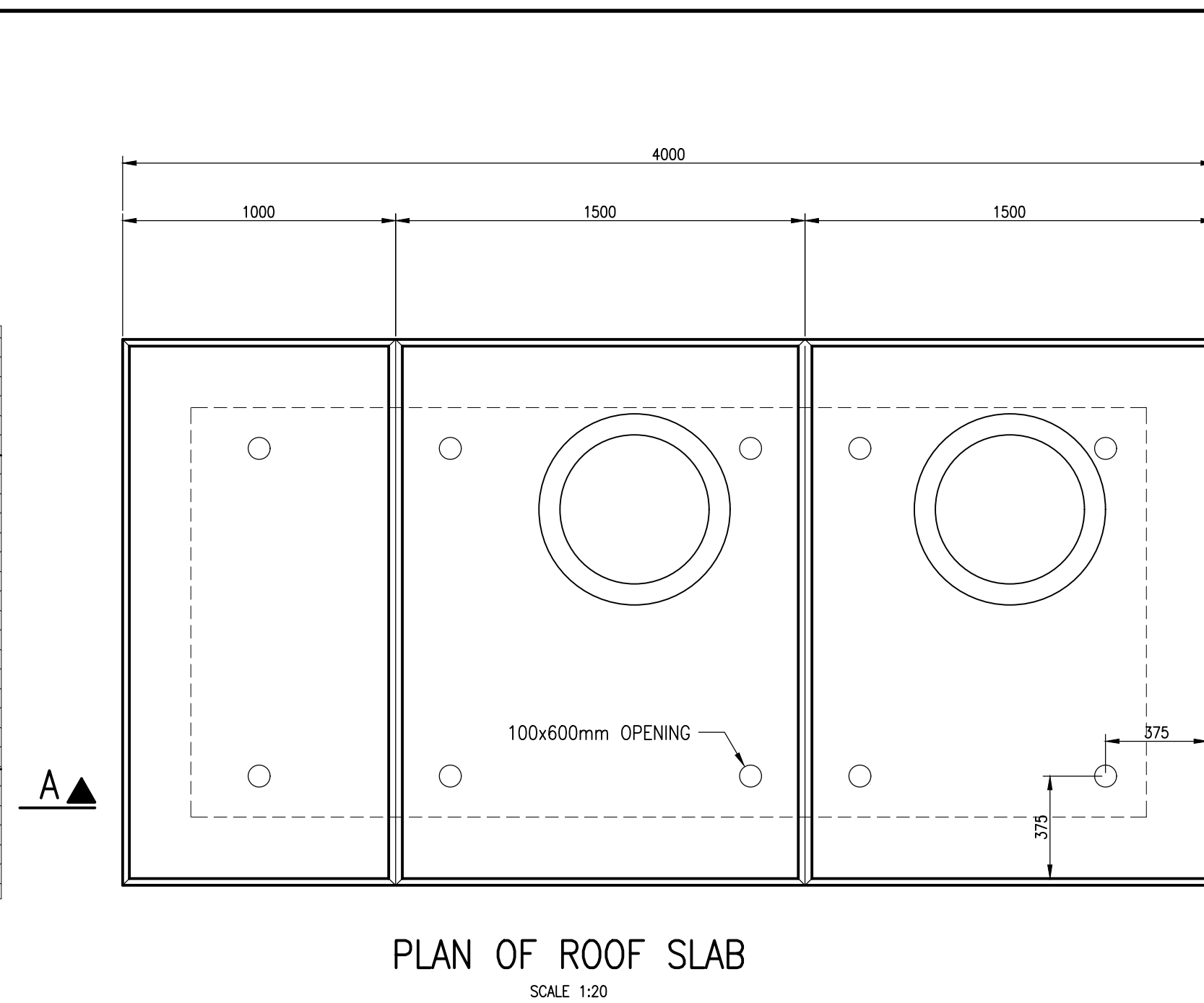
RECORD DRAWING

CONTRACT No.	CONTRACT DESCRIPTION	CERTIFIED	DATE

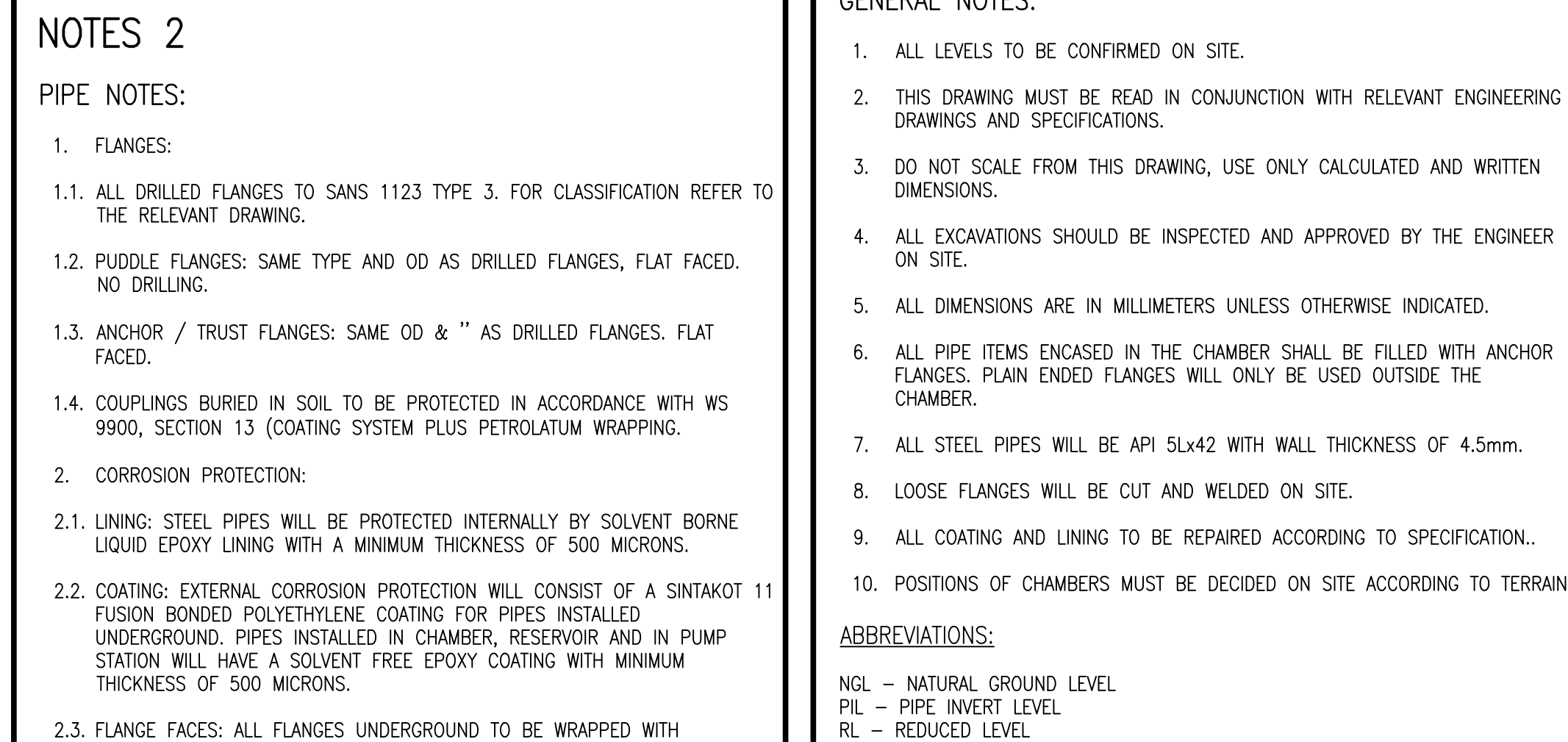
CERTIFIED RECORD DRAWING FOR CONTRACT :

ENGINEER DATE


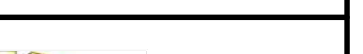
PRIVATE DRAWING No. **PM01-DET-001** REVISION **V1**



- # NOTES 1
- ## GENERAL CONCRETE AND MISCELLANEOUS:
1. ALL CONCRETE EDGES TO 25mm CHAMFERED.
 2. CONCRETE CHAMBERS TO CLASS 25/19, BLINDING LAYER TO CLASS 15/19.
 3. ALL EXPOSED METAL WORK TO BE CR12 (UNPAINTED)
 4. BACK FILL BELOW CHAMBER TO BE COMPACTED IN LAYERS 150mm TO 90% MOD AASHTO.
 5. CHECK THAT PIPE SPECIALS FIT CORRECTLY IN THE CHAMBERS BEFORE MANUFACTURE.
 6. PIPES TO BE CUT ON SITE SHALL BE MANUFACTURED WITH EXTRA LENGTH OF 20 PERCENT.
 7. THE VALVE CHAMBER LID IS TO BE DESIGNED TO CARRY EXTERNAL VEHICLE LOADS.
 8. ALLOW FOR 3mm THICK GASKET BETWEEN FLANGES.
 9. EXISTING PIPES DIMENSIONS TO BE VERIFIED BEFORE ORDERING PIPE SPECIALS AND COUPLINGS.
 10. PROVIDE LIFTING LUGS WHERE REQUIRED.



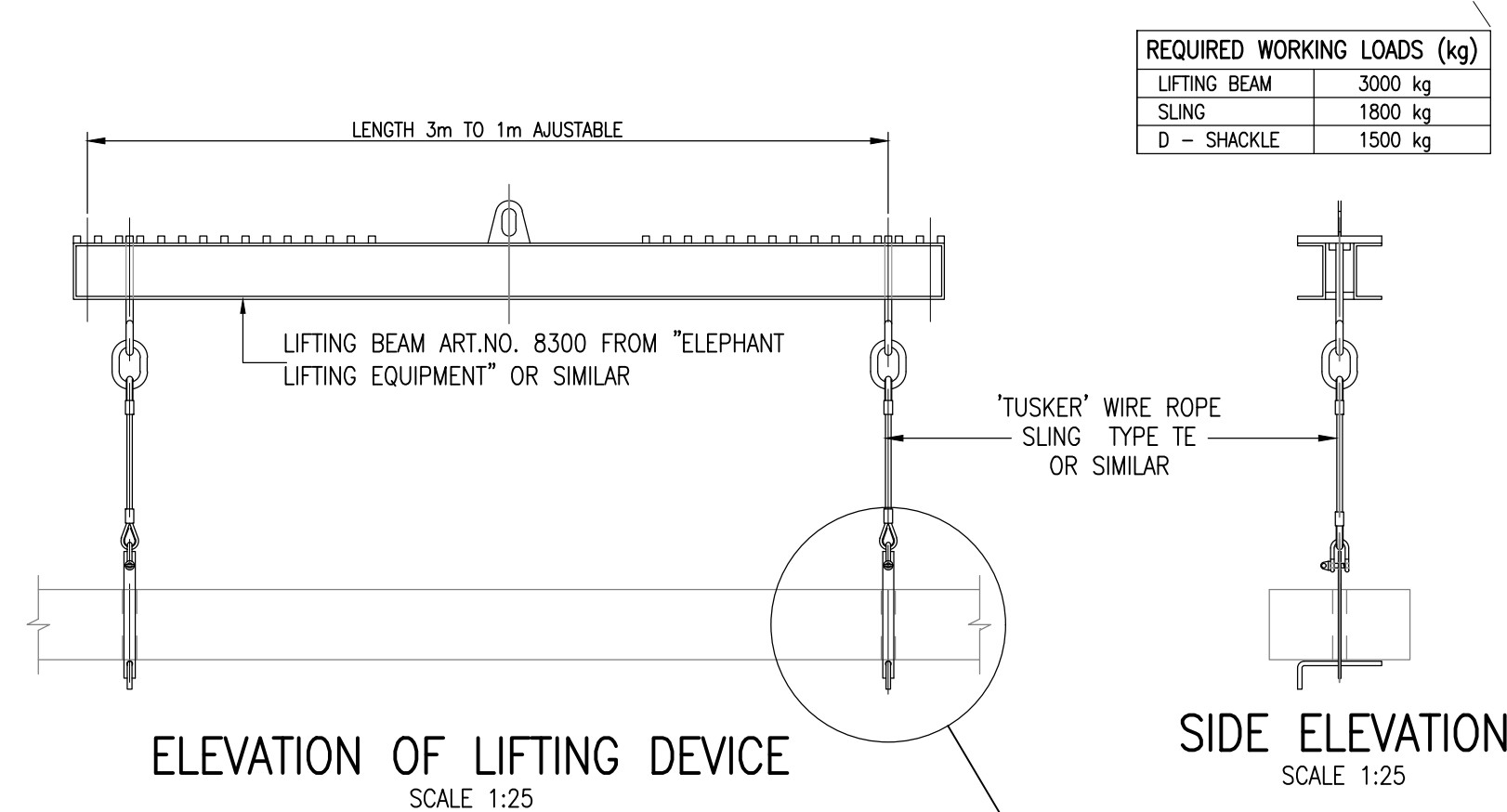
PIPE SCHEDULE PER CHAMBER								
ITEM NO	TOTAL	DIA (mm) NB	WALL THICKNESS (mm)	MATERIAL	DESCRIPTION	CORROSION PROTECTION AS SHOWN ON PIPE NOTES		
						LINING	COATING	FLANGES
①	2	400	–	CAST IRON	SG FLANGE ADAPTOR	AS PER MANUFACTURE	AS PER MANUFACTURE	2.3
②	1	400x150	6	API 5L x42 MILD STEEL	SCOUR TEE FLANGE ALL ENDS	2.1	2.2	2.3
③	1	150	6	API 5L x42 MILD STEEL	STRAIGHT PIPE WITH PUDDLE FLANGE BOTH ENDS FLANGED	2.1	2.2	2.3
④	2	150	–	VARIES	RESILIENT SEAL GATE VALVE FLANGED	AS PER MANUFACTURE	AS PER MANUFACTURE	2.3
⑤	1	150	–	COATED STEEL	DISMANTLING FLANGE ADAPTOR (PN25)	2.1	2.2	2.3
⑥	1	150	6	STEEL API 5L x42 m/s	STRAIGHT PIPE ONE END FLANGED	2.1	2.2	2.3
⑦	1	150	6	STEEL API 5L x42 m/s	STRAIGHT PIPE WITH PUDDLE FLANGE ONE END FLANGED	2.1	2.2	2.3
⑧	1	150	–	VARIES	DIFFUSER	AS PER MANUFACTURE	AS PER MANUFACTURE	2.3

CONSULTANT DETAILS				DESIGNED		APPROVED		PROJECT		CLIENT DETAILS		RECORD DRAWING						
No.	AMENDMENTS	APPROVED	DATE	 <div>Tel: 012 751 1168 Cell: 082 597 5054 mail: Masebenza@lefatshainfra.co.za info@lefatshainfra.co.za WILLOW WOOD OFFICE PARK CNR 3RD AVENUE & CEDAR ROAD, BROADACRES</div>		T. Malebye		KLARINET AND SIYANQOBA BULK WATER SUPPLY				SCALE		CONTRACT No.	CONTRACT DESCRIPTION	CERTIFIED	DATE	
				DRAWN		T. Malebye		DRAWING DESCRIPTION		AS SHOWN								
				CHECKED		M. Matyeka		PUMPING MAIN		ON								
				APPROVED		M. Matyeka		TYPICAL SCOUR VALVE DETAILS		ORIGINAL		CERTIFIED RECORD DRAWING FOR CONTRACT :				PRIVATE DRAWING No.	REVISION	
										A1		----- ENGINEER ----- DATE -----				PM01-DET-002	V1	

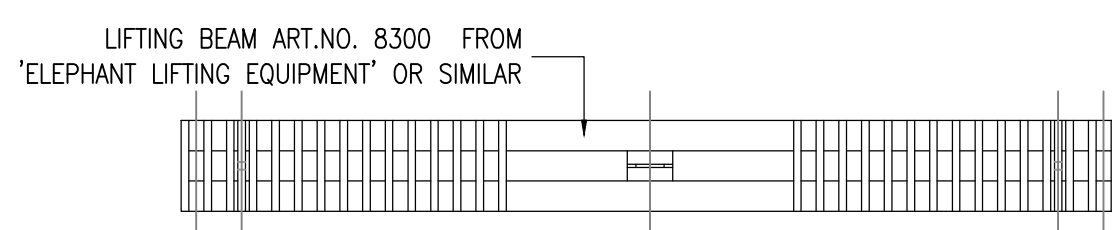


SECTION OF VERMIN
PROOF AIR VENT
SCALE 1:10

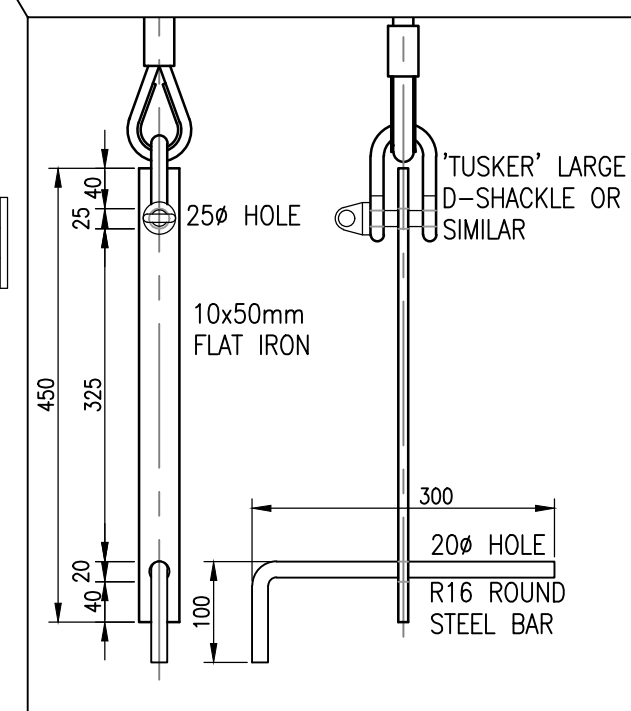
DETAIL OF VERMIN PROOF AIR VENT



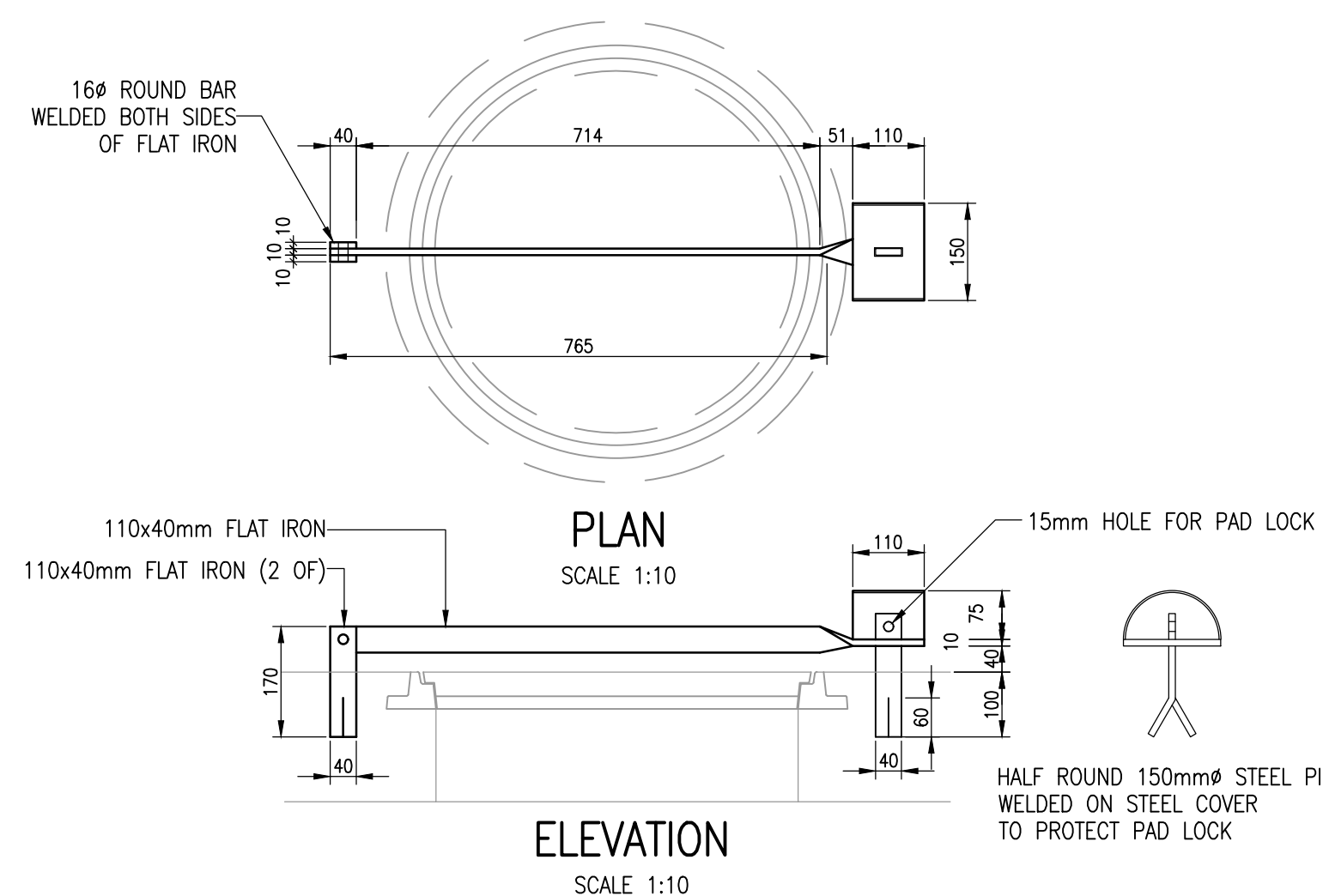
ELEVATION OF LIFTING DEVICE
SCALE 1:25



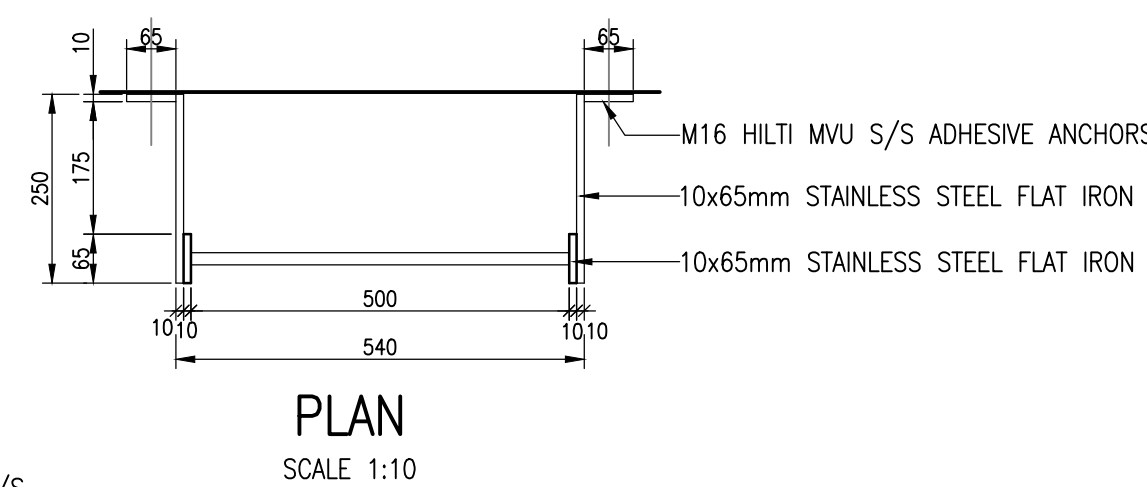
PLAN-TOP OF
ADJUSTABLE LIFTING BEAM
SCALE 1:25



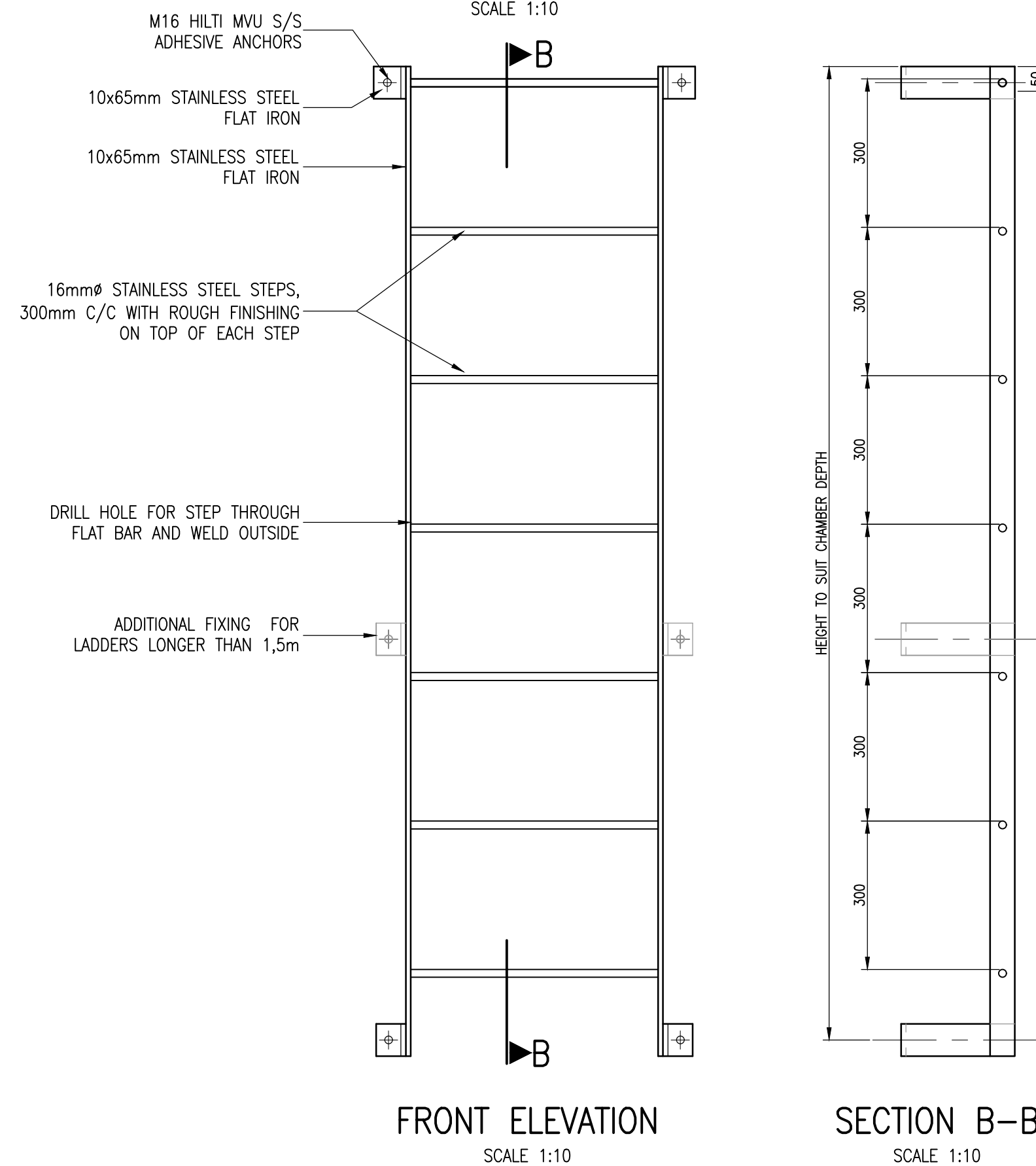
DETAIL OF LIFTING DEVICE FOR PANELS



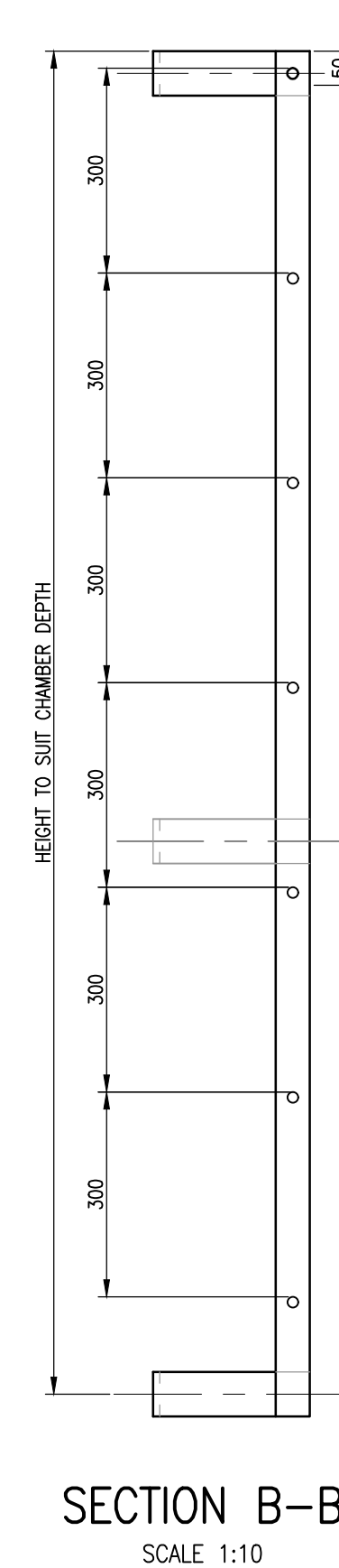
LOCKING DEVICE FOR ROUND ACCESS MANHOLE COVERS



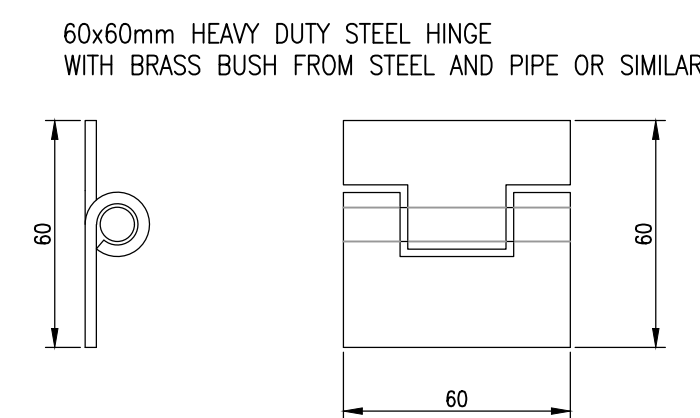
M16 MULTI-MULTI S/C



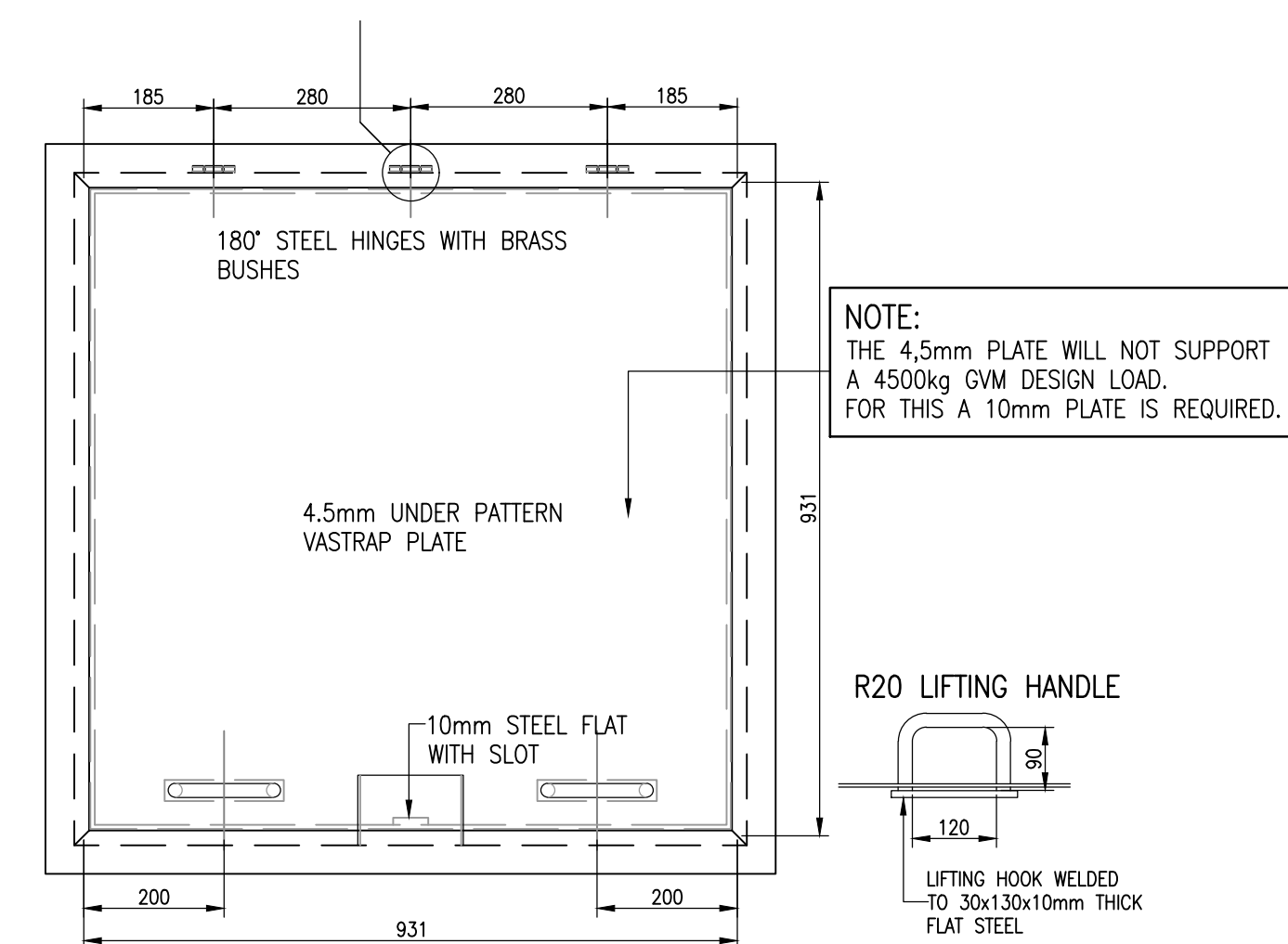
FRONT ELEVATION
SCALE 1:10



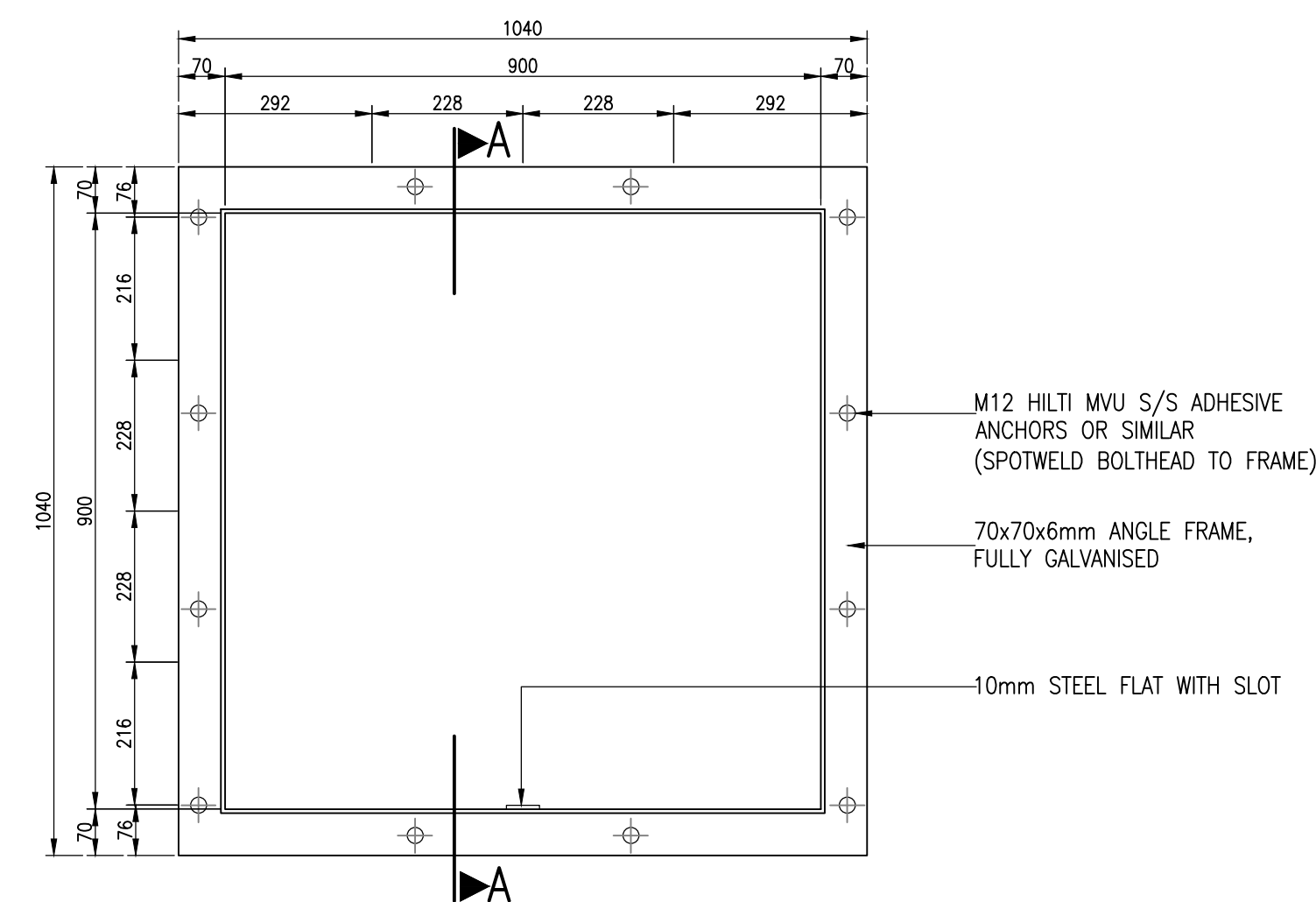
SECTION B-B
SCALE 1:10



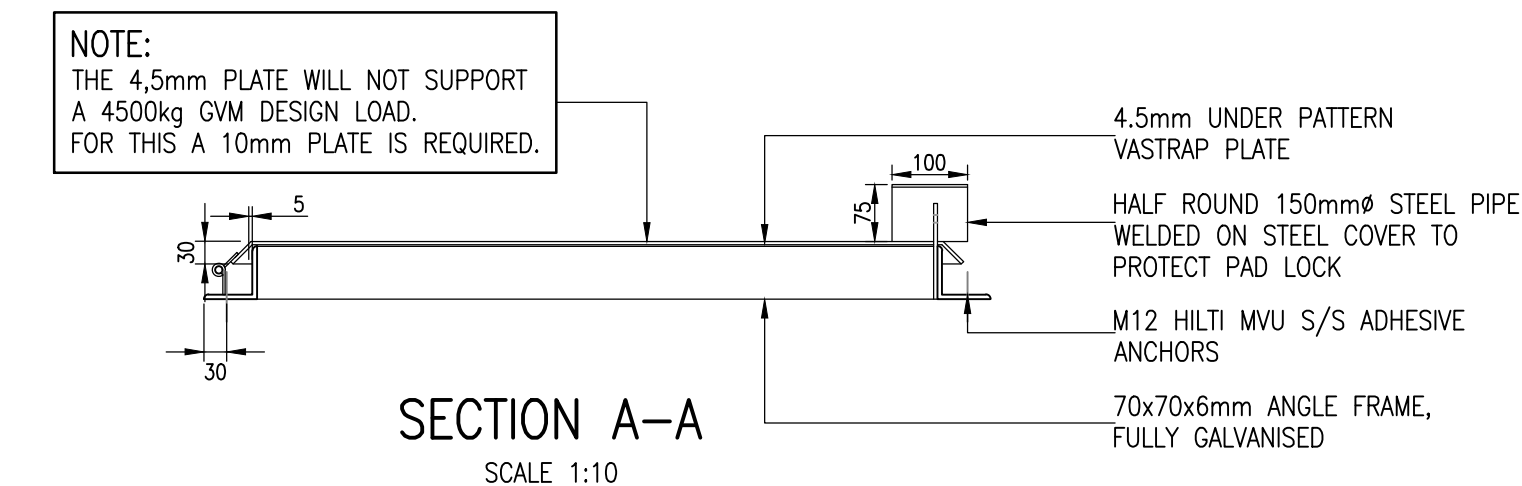
HEAVY DUTY HINGES
SCALE 1:2



PLAN WITH COVER IN POSITION
SCALE 1:10



PLAN WITH COVER REMOVED



SECTION A-A
SCALE 1:10

900x900 ACCESS MANHOLE

0 50 100
100mm ON ORIGINAL DRAWING

[illegible]

CONSULTANT DETAILS

 **LEFATSHE**
INFRASTRUCTURE SERVICES

Tel: 012 751 1168
Cell: 082 597 5054
mail: Masebenza@lefatsheinfra.co.za
info@lefatsheinfra.co.za

WILLOW WOOD OFFICE PARK
CNR 3RD AVENUE & CEDAR ROAD, BROADACRES

DESIGNED	T. Malebye
DRAWN	T. Malebye
CHECKED	M. Matyeka
APPROVED	M. Matyeka

APPROVED

NAME:

.....

SIGNATURE:

.....

DATE:

.....

PROJECT
KLARINET AND SIYANQOBA BULK WATER SUPPLY
DRAWING DESCRIPTION
WATER DETAILS: TYPICAL DETAILS OF ACCESS LADDER, LOCKING AND LIFTING DEVICE, ROOF PANE AND AIR VENT

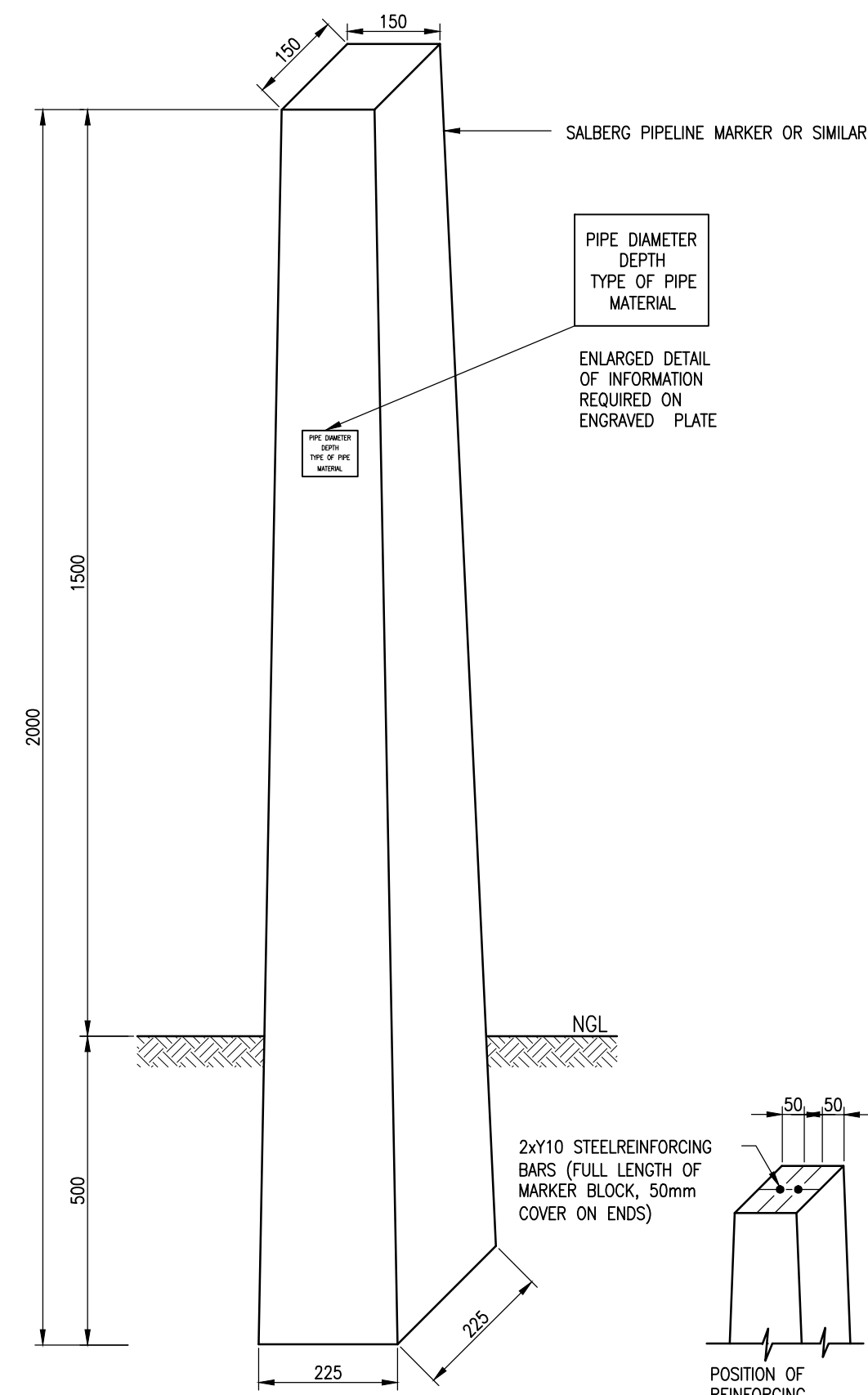
CLIENT DETAILS



SCALE
AS SHOWN ON ORIGINAL A1 DRAWING

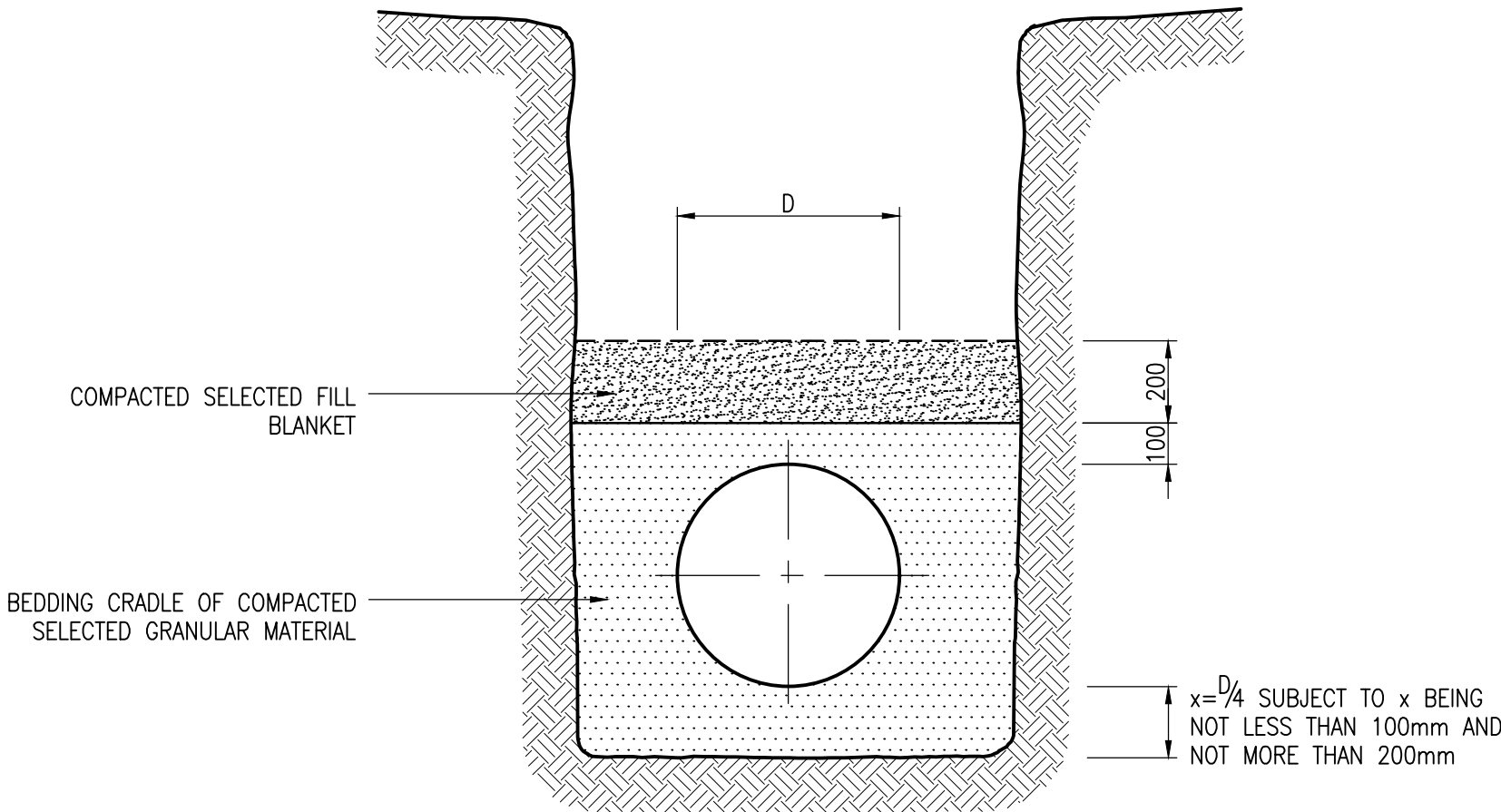
[illegible]

		REVISION
PRIVATE DRAWING No.		
PM01-DET-006	V1	



CONCRETE MARKER BLOCK TYPE 1
SCALE 1:10

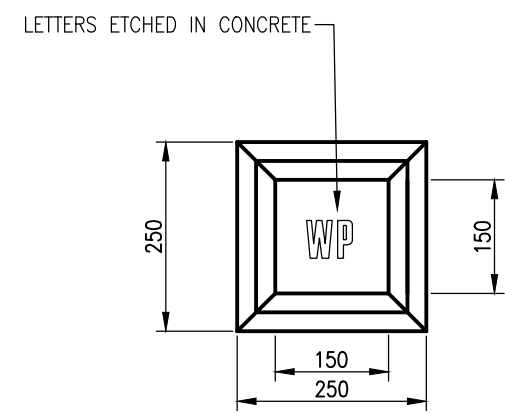
PIPE BEDDING DETAIL ACCORDING
TO SANS 1200 DRAWING LB-2 BEDDING DETAIL FOR FOR FLEXIBLE PIPES



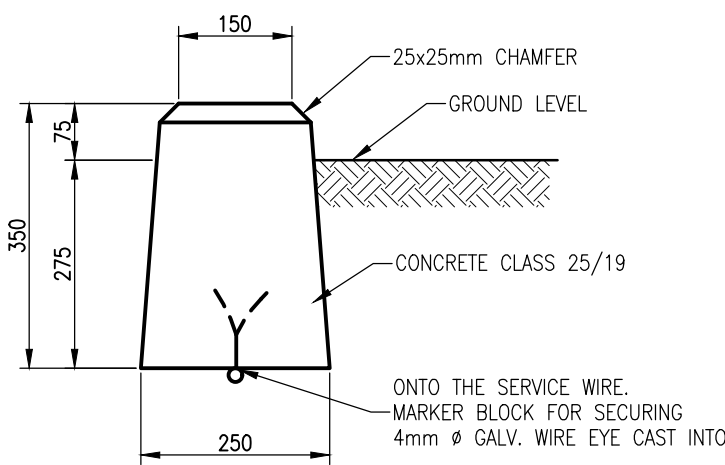
GRADING SPECIFICATION OF MATERIALS

MAIN FILL
DEPTH VARIES - COMPACTED IN 150mm LAYERS AT
OPTIMUM MOISTURE CONTENT TO 93% MOD AASHTO DENSITY
UNDER ROAD CROSSINGS STABILISED WITH 5% CEMENT
100% SMALLER THAN 150mm, P<12, CBR>15

SELECTED FILL MATERIAL
FILL COMPACTED AT OPTIMUM MOISTURE CONTENT
IN 150mm LAYERS TO 93% MOD AASHTO DENSITY
STABILISED WITH 5% CEMENT
100% THROUGH 30mm SIEVE, P<6

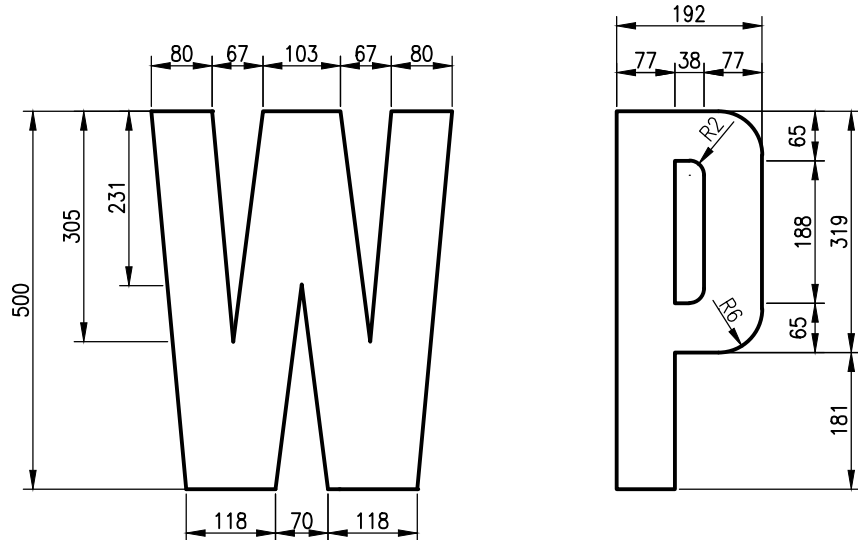


PLAN
SCALE 1:10



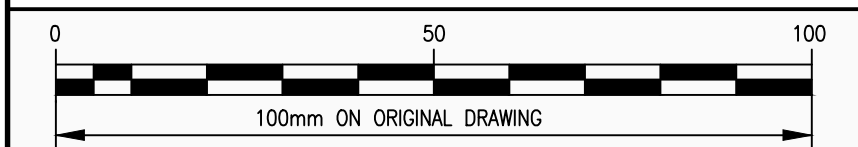
ELEVATION
SCALE 1:10



LETTERS SHALL BE A SQUARE BAR 8x8mm BEVELED TO THE SURFACE



DETAIL OF LETTERS FOR ETCHING
SCALE N.T.S.

PIPE LINE MARKER TYPE 2

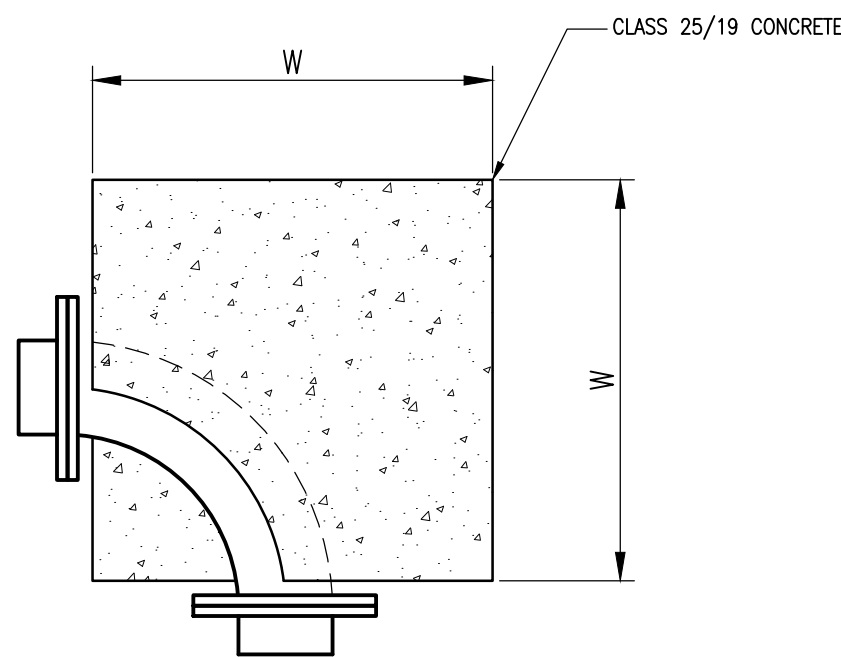


No.	AMENDMENTS	APPROVED	DATE	CONSULTANT DETAILS		DESIGNED	T. Malebye	APPROVED	PROJECT	CLIENT DETAILS	SCALE	RECORD DRAWING				PRIVATE DRAWING No. PM01—DET—007		REVISION V1
				 Tel: 012 751 1168 Cell: 082 597 5054 mail: Masebenza@lefatshinfra.co.za info@lefatshinfra.co.za WILLOW WOOD OFFICE PARK CNR 3RD AVENUE & CEDAR ROAD, BROADACRES	DRAWN	T. Malebye	NAME:	KLARINET AND SIYANQOBA BULK WATER SUPPLY		AS SHOWN ON ORIGINAL A1 DRAWING		CONTRACT No.	CONTRACT DESCRIPTION	CERTIFIED	DATE			
					CHECKED	M. Matyeka	SIGNATURE:					DRAWING DESCRIPTION WATER DETAILS PIPE MARKER AND BEDDING DETAILS	CERTIFIED RECORD DRAWING FOR CONTRACT : ----- ENGINEER ----- DATE -----					
					APPROVED	M. Matyeka	DATE:											

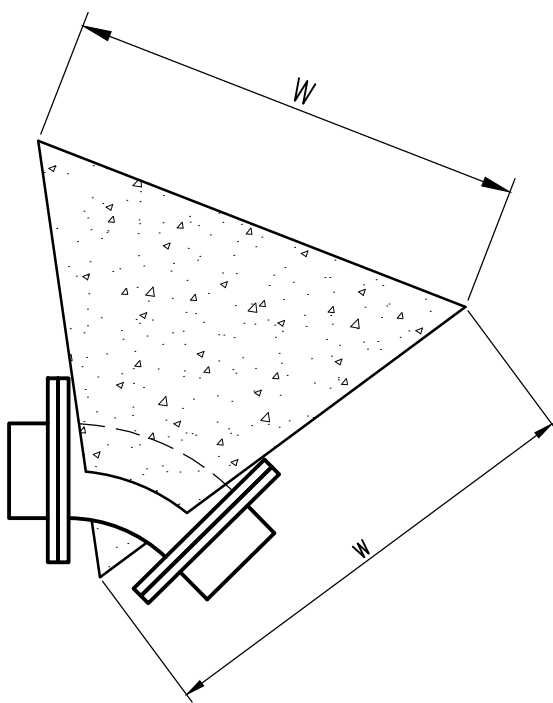
Pipe Name	Chainage	NGL	PIL	Pipe Outside Diameter	Vertical Bend	Horizontal Bend	Angle of Bend	Type of Bend	Thrust Force on Pipe Bend	Soil Bearing Capacity	Area of Thrust Block	Height of Thrust Block	Width of Thrust Block	Thrust Block Volumes	
	m	m	m	m	degrees	degrees	degrees		kN	kPa	m ²	m	m	Volume of concrete m ³	Volume of Blinding (50mm thick) m ³
400mm Dia Pump Main	32,640	1444,885	1443,201	0,4	0,8	3,3	3,4	C	24,137	100	0,241	1	0,241	0,241	0,012
	148,861	1445,154	1443,470	0,4		5,9	5,9	H	41,839	100	0,418	1	0,418	0,418	0,021
	273,801	1445,591	1443,907	0,4	0,4	15,4	15,5	C	109,484	100	1,095	1	1,095	1,095	0,055
	456,993	1447,652	1445,967	0,4	0,7	3,4	3,5	C	24,639	100	0,246	1	0,246	0,246	0,012
	962,276	1450,136	1448,451	0,4	0,2	39,1	39,1	C	267,934	100	2,679	1	2,679	2,679	0,134
	1016,578	1450,557	1448,872	0,4	1,1	6	6,1	C	42,547	100	0,425	1	0,425	0,425	0,021
	1056,191	1451,610	1449,926	0,4	0,7	6,5	6,6	C	45,882	100	0,459	1	0,459	0,459	0,023
	2392,048	1493,257	1491,573	0,4	1,8	39,9	39,9	C	236,941	100	2,369	1	2,369	2,369	0,118
	3095,319	1512,080	1510,395	0,4	1,7	17	17	C	95,789	100	0,958	1	0,958	0,958	0,048
	3220,037	1512,067	1510,383	0,4	5		5	V	28,269	100	0,283	1	0,283	0,283	0,014
	3595,069	1541,148	1539,464	0,4	1	22,1	22	C	109,988	100	1,100	1	1,100	1,100	0,055
	3855,292	1555,310	1553,625	0,4	1,7	13,2	13,3	C	62,712	100	0,627	1	0,627	0,627	0,031
	4300,013	1564,428	1562,744	0,4	2	51,5	51,5	C	225,506	100	2,255	1	2,255	2,255	0,113
	4618,923	1566,373	1564,688	0,4	3	33,8	33,9	C	149,931	100	1,499	1	1,499	1,499	0,075
	4620,962	1566,500	1564,806	0,4	4,4	34,1	34,4	C	151,990	100	1,520	1	1,520	1,520	0,076
	5576,798	1605,587	1603,898	0,4	1,4	12,5	12,6	C	45,832	100	0,458	1	0,458	0,458	0,023
	6598,220	1606,334	1604,654	0,4	0,4	19,5	19,4	C	70,058	100	0,701	1	0,701	0,701	0,035
	6696,013	1610,466	1608,781	0,4	0,8	37	37	C	128,708	100	1,287	1	1,287	1,287	0,064
	6725,840	1611,318	1609,634	0,4	0,5	8,6	8,6	C	30,256	100	0,303	1	0,303	0,303	0,015
	6747,644	1612,117	1610,432	0,4	0,3	8,2	8,2	C	28,711	100	0,287	1	0,287	0,287	0,014
	7228,804	1624,496	1622,811	0,4	0,6	19,7	19,7	C	63,477	100	0,635	1	0,635	0,635	0,032
	7235,565	1624,495	1622,810	0,4	0,9	36	36	C	114,664	100	1,147	1	1,147	1,147	0,057
	7255,859	1624,814	1623,130	0,4		17,5	17,5	H	56,327	100	0,563	1	0,563	0,563	0,028
	7396,328	1625,309	1625,309	0,4	0,8	30,2	30,2	C	95,059	100	0,951	1	0,951	0,951	0,048
	7409,364	1627,020	1625,336	0,4	0,2	46,2	46,2	C	143,139	100	1,431	1	1,431	1,431	0,072
	7519,004	1627,535	1625,851	0,4	0,2	131,5	131,5	C	331,487	100	3,315	1	3,315	3,315	0,166
TOTAL VOLUME														27,253	1,363

NOTE:

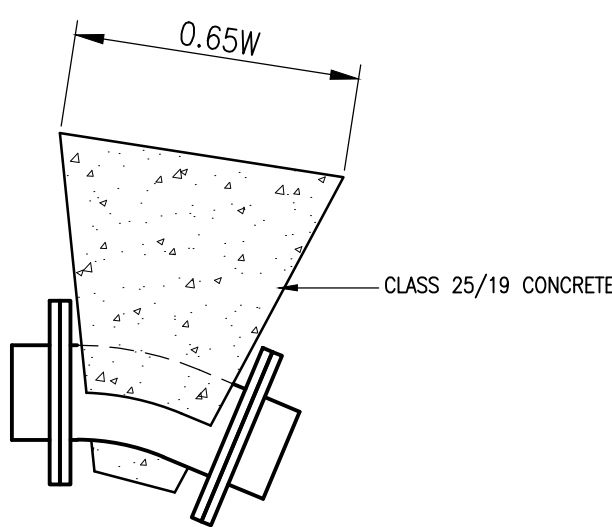
ALL CONCRETE THRUST BLOCKS AND ANCHOR BLOCKS TO BE CLASS 25mpa, 19mm STONE



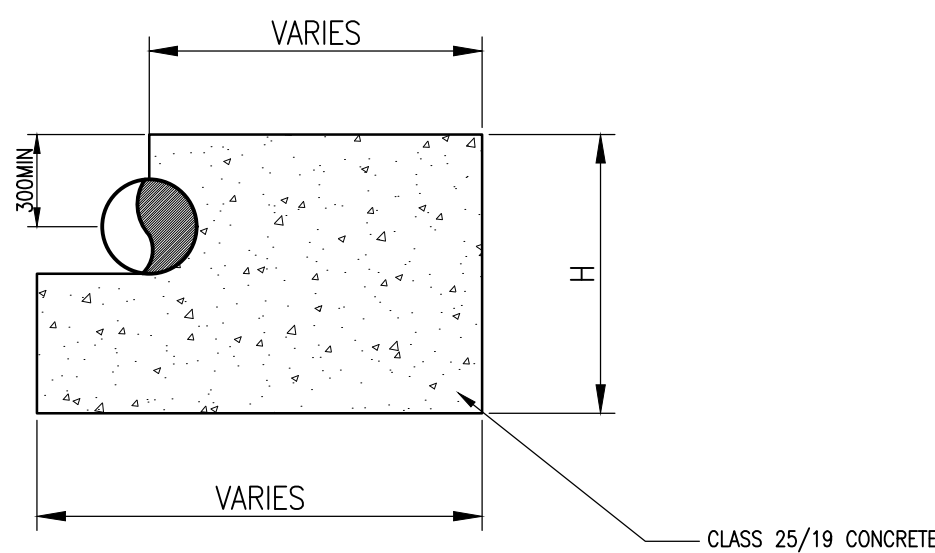
PLAN 90° BEND



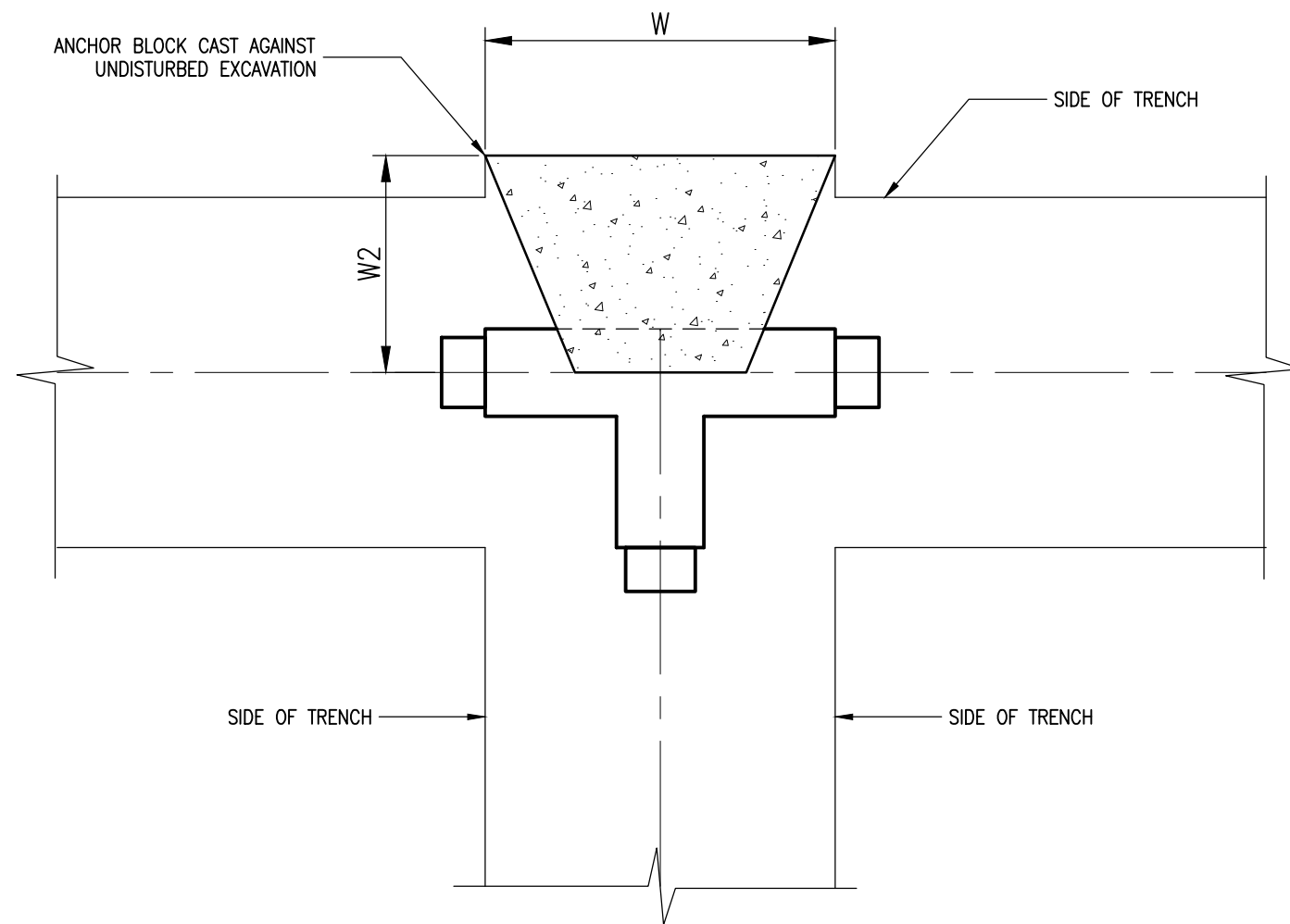
PLAN 45° BEND AND
EQUAL TEE-PIECE



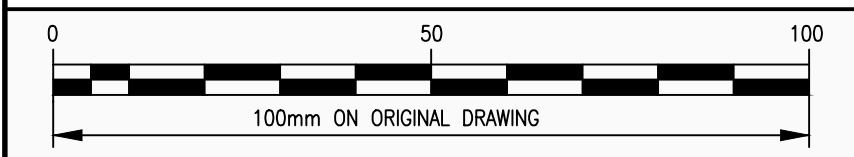
PLAN 22.5° BEND





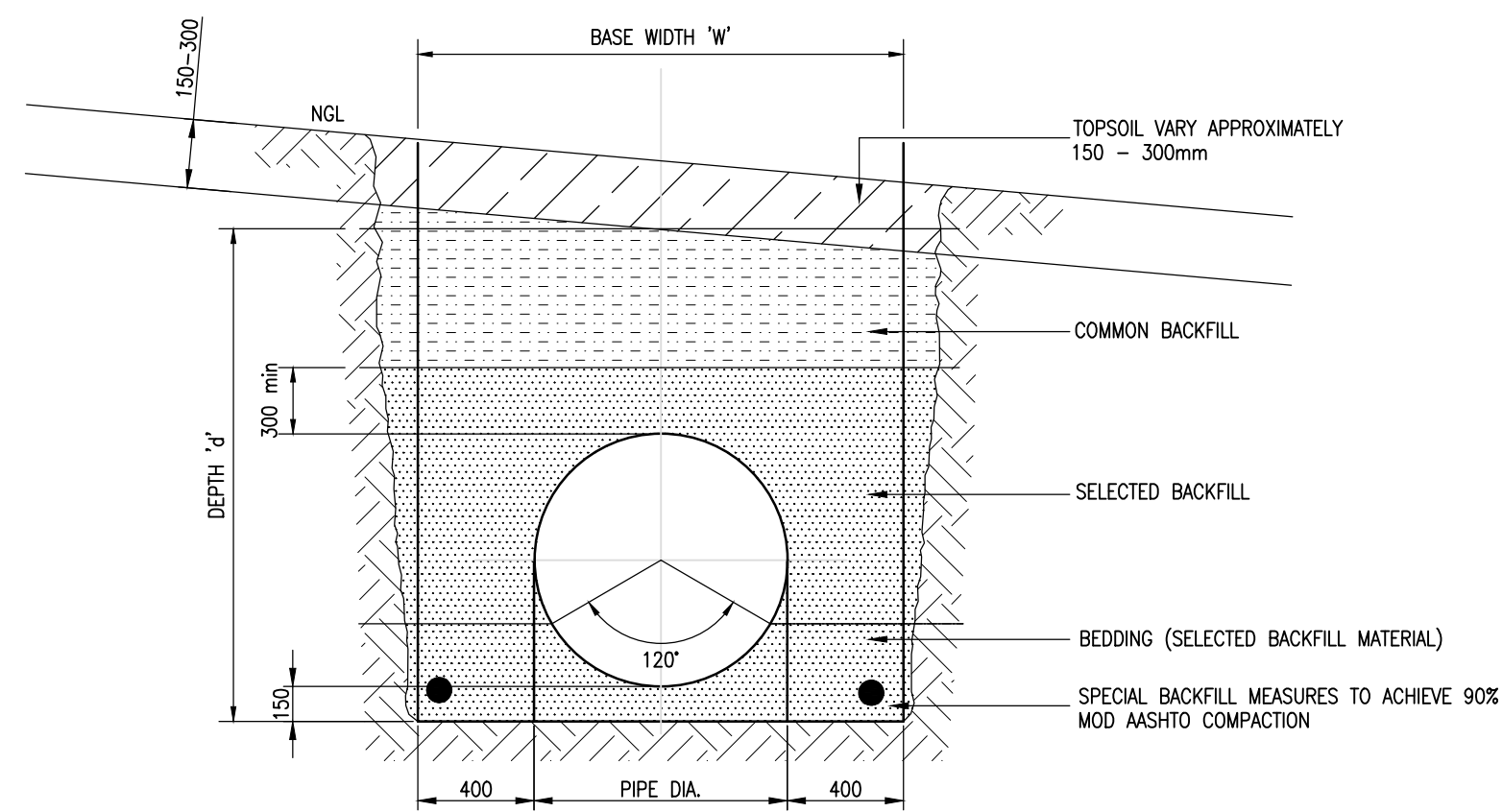
TYPICAL SECTION THROUGH
THRUST BLOCK



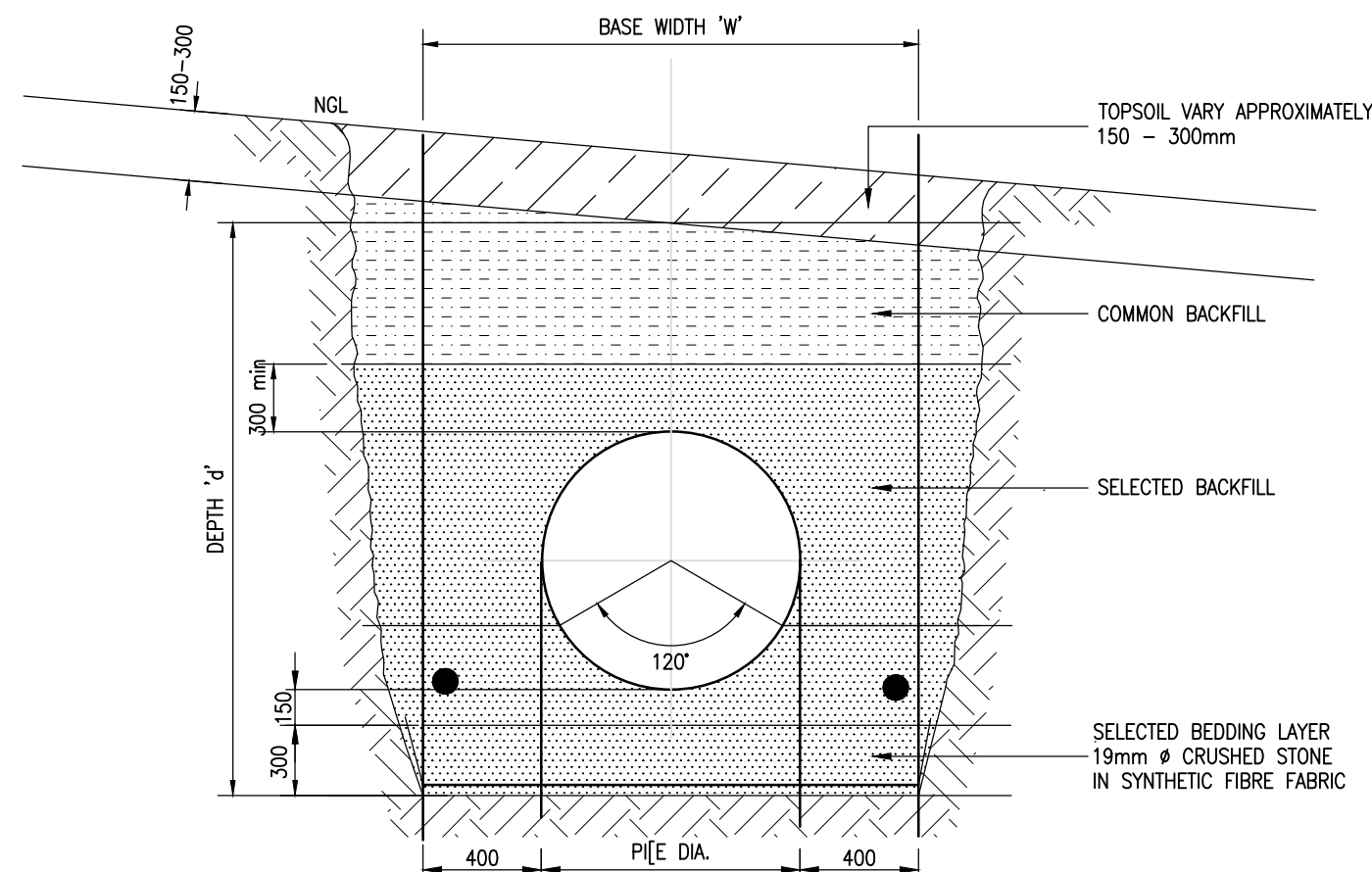
TYPICAL T-PIECE INSTALLATION
DETAIL



No.	AMENDMENTS	APPROVED	DATE	CONSULTANT DETAILS		DESIGNED	T. Malebye	APPROVED	PROJECT		CLIENT DETAILS	SCALE	RECORD DRAWING				PRIVATE DRAWING No.	REVISION
				 <div>Tel: 012 751 1168 Cell: 082 597 5054 mail: Masebenza@lefatsheinfra.co.za info@lefatsheinfra.co.za WILLOW WOOD OFFICE PARK CNR 3RD AVENUE & CEDAR ROAD, BROADACRES</div>	DRAWN	T. Malebye	NAME:	KLARINET AND SIYANQOBA BULK WATER SUPPLY			AS SHOWN ON ORIGINAL A1 DRAWING		CONTRACT No.	CONTRACT DESCRIPTION	CERTIFIED	DATE		
					CHECKED	M. Matyeka	SIGNATURE:	PUMPING WATER DETAILS THRUST BLOCKS AND ANCHOR BLOCKS DETAILS										
					APPROVED	M. Matyeka	DATE:					CERTIFIED RECORD DRAWING FOR CONTRACT : ENGINEER DATE						
																PM01-DET-008	V1	



TYPICAL PIPE TRENCH SECTION
NOT TO SCALE



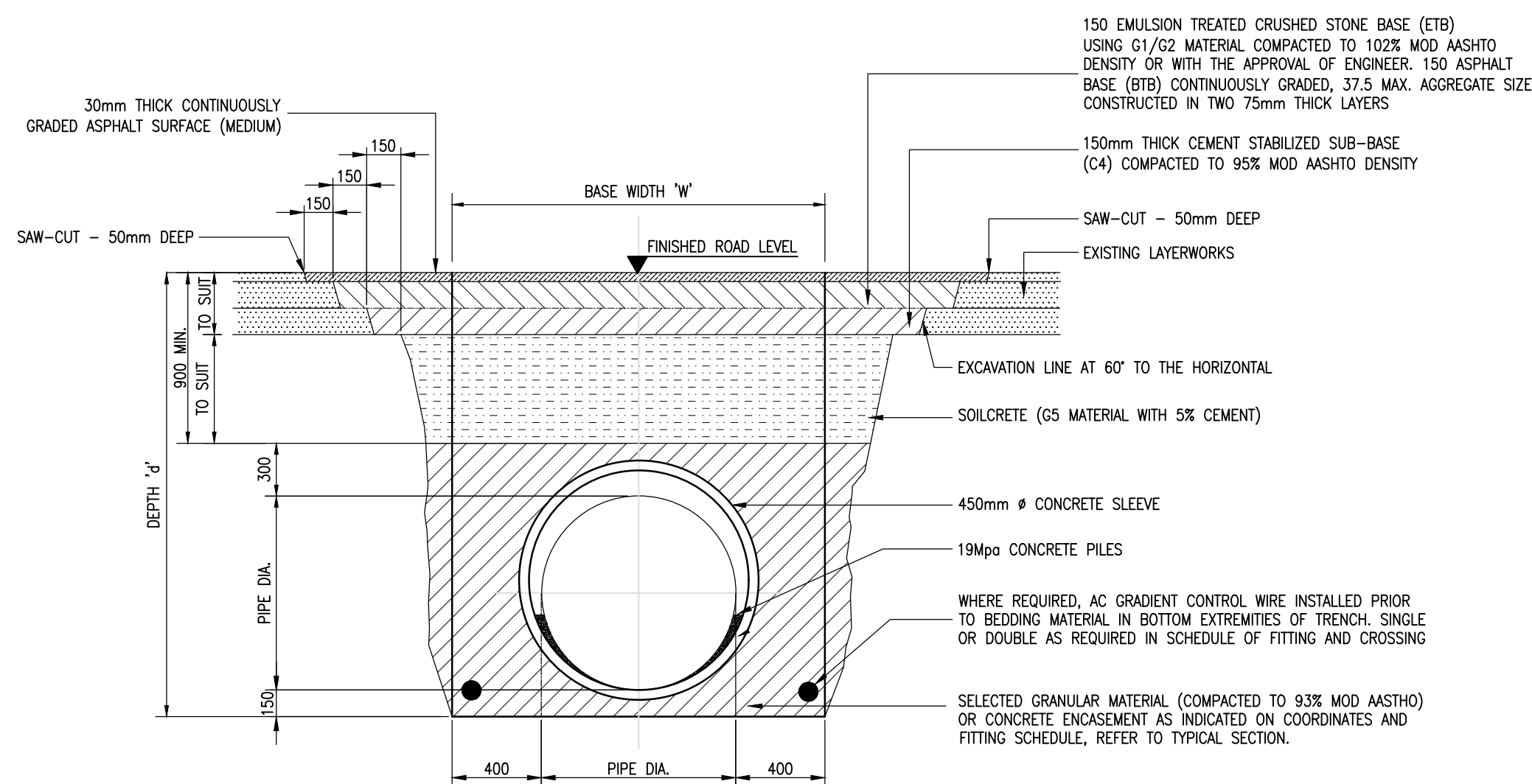
PIPE TRENCH SECTION FOR
UNSTABLE TRENCH BOTTOM
NOT TO SCALE

NOTES:

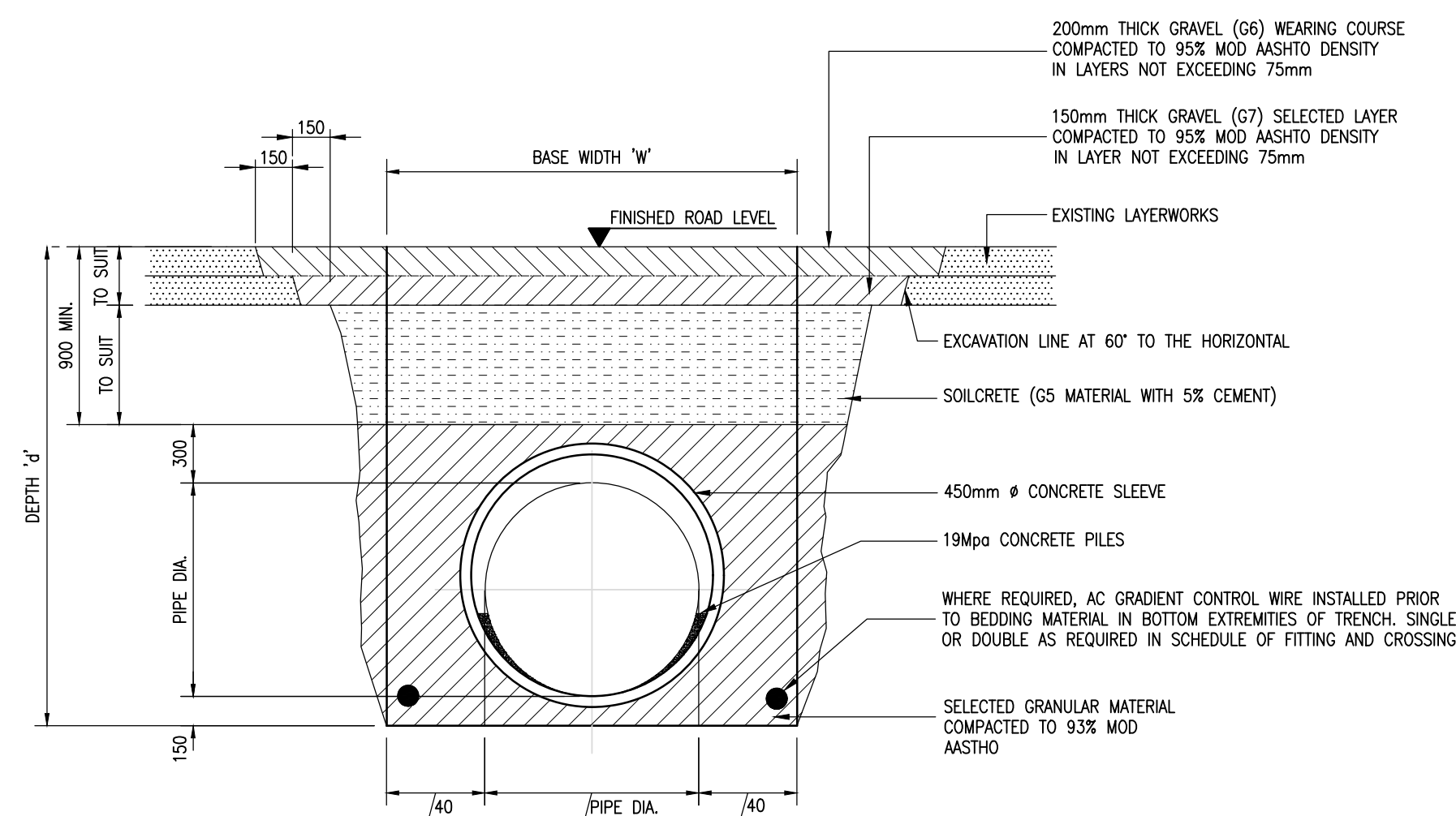
COMPACTION:
SELECTED MATERIAL - 90% MOD AASHTO
MAIN FILL - 87% MOD AASHTO

NOTES:

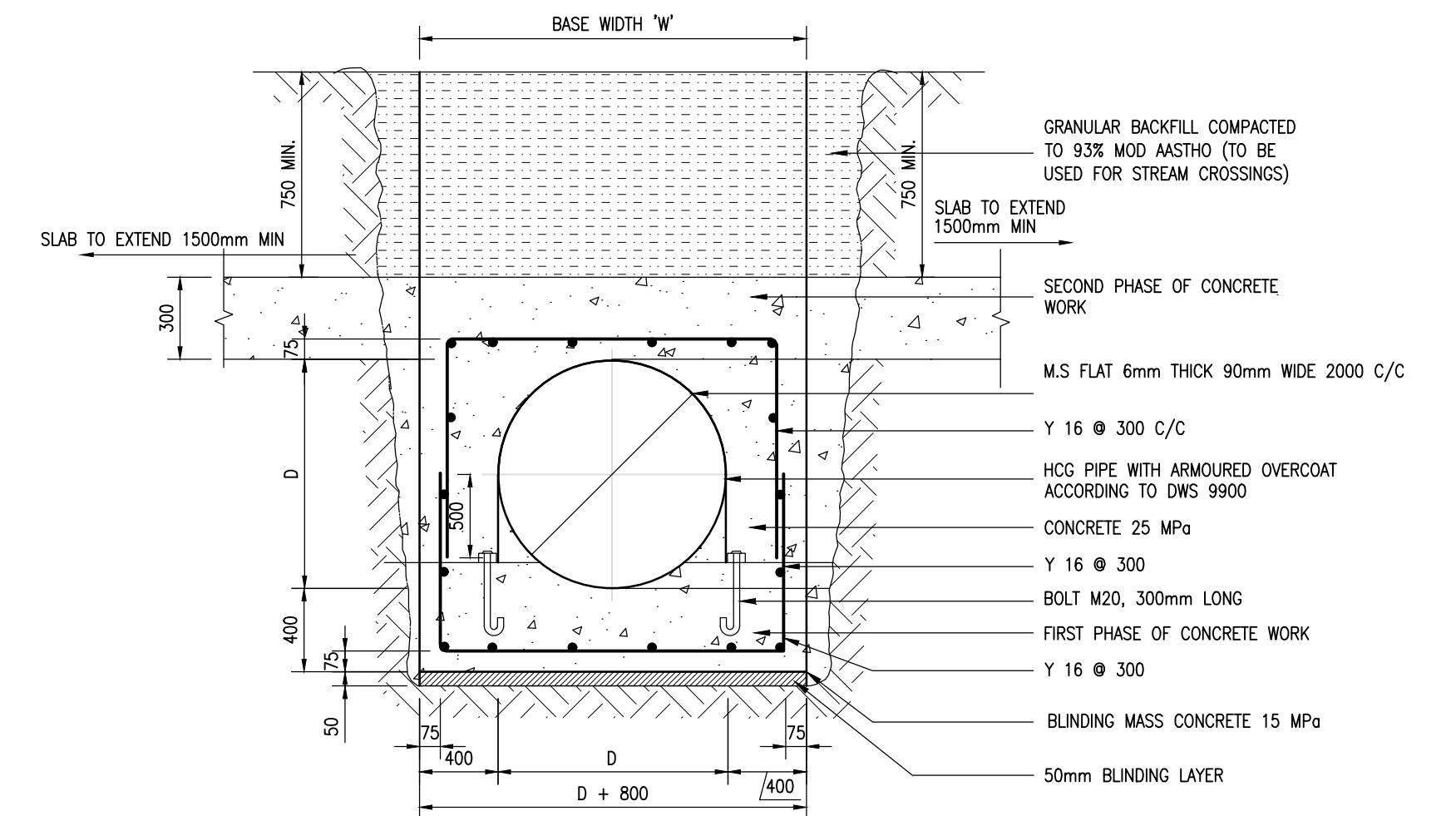
1. SYNTHETIC FIBER FILTER FABRIC (GEOTEXTILES) GRADE 2, MINIMUM OVERLAP 300mm.
2. FOR MATERIAL BELOW TRENCH BOTTOM COMPRISING GRAVEL AND BOULDER DEPOSITS, RIP AND COMPACT THE IN-SITU MATERIAL TO 90% MOD AASHTO OVER A DEPTH OF 200mm ON INSTRUCTION FROM THE ENGINEER.
3. 'W' AND 'd' ARE THE DIMENSIONS TO BE USED FOR MEASURING OF VOLUMETRIC QUANTITIES.



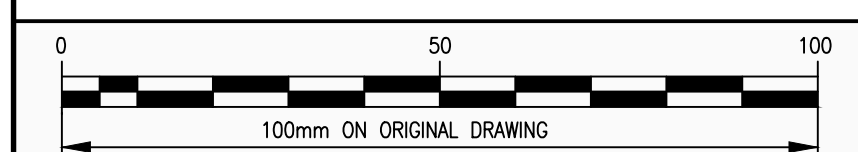
PIPE TRENCH SECTION FOR
TERTIARY ASPHALT SURFACED ROADS
NOT TO SCALE





PIPE TRENCH SECTION FOR
GRAVEL SURFACED ROADS
NOT TO SCALE



TYPICAL SECTION OF A STREAM/ROAD CROSSING
CONCRETE ENCASEMENT DETAIL
NOT TO SCALE



No.	AMENDMENTS	APPROVED	DATE	CONSULTANT DETAILS		DESIGNED	T. Malebye	APPROVED	PROJECT	CLIENT DETAILS	SCALE	RECORD DRAWING					
				<div><p>Tel: 012 751 1168 Cell: 082 597 5054 mail: Masebenza@lefatshinfra.co.za info@lefatshinfra.co.za</p><p>WILLOW WOOD OFFICE PARK CNR 3RD AVENUE & CEDAR ROAD, BROADACRES</p></div>	DRAWN	T. Malebye	NAME:	DRAWING DESCRIPTION		AS SHOWN ON ORIGINAL A1 DRAWING		CONTRACT No.	CONTRACT DESCRIPTION	CERTIFIED	DATE		
					CHECKED	M. Matyeka	SIGNATURE:										
							DATE:										
					APPROVED	M. Matyeka											
PUMPING WATER DETAILS												CERTIFIED RECORD DRAWING FOR CONTRACT :				PRIVATE DRAWING No.	REVISION
TYPICAL PIPE CROSSING DETAILS												ENGINEER DATE				PM01-DET-009	V1