LEGEND

EXISTING:
- SEWERS CL AND M.H'S
- STORMWATER CL DRAIN
- WATER MAINS CL AND VALVES
- ELECTRICITY CL(OH)
- TELECOMMS. CL (OH)
- FIBRE OPTIC CL
- ROAD CENTERLINES
- ROAD EDGE
- ROAD RESERVE
- FENCE/BOUNDARY AND GATE

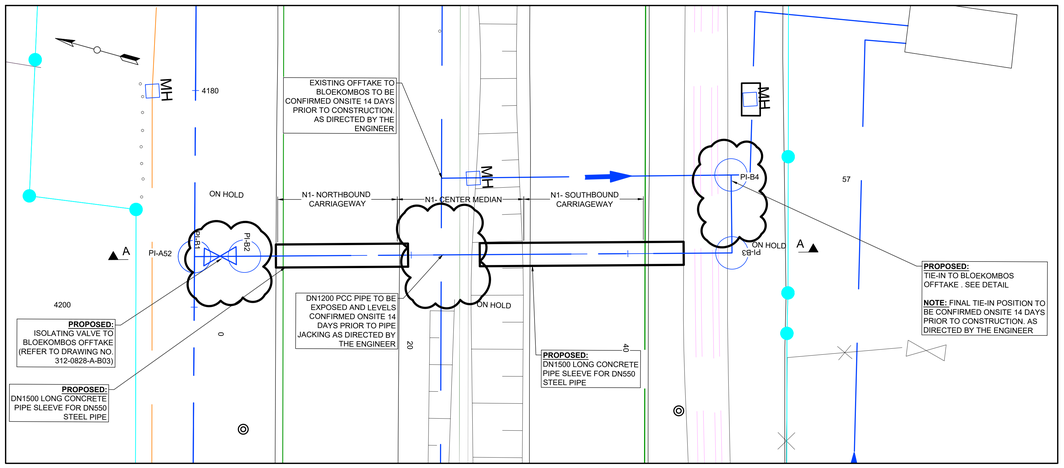
PROPOSED:
- UPGRADE ROAD EDGE
- TRANSMISSION PIPE CL
- AIR VALVE
- SCOUR VALVE
- ISOLATING VALVE
- METER

NOTE:
1. ALL SERVICES DEPICTED ON THE PLAN & LONG SECTION ARE APPROXIMATE POSITIONS OF EXPECTED SERVICES OBTAINED FROM SERVICE PROVIDERS RECORDS THAT MAY BE ENCOUNTERED BY THE CONTRACTOR ALONG THE ROUTE. ALL SERVICES ARE TO BE TRACED AND PROVED IN CONJUNCTION WITH EACH SERVICE PROVIDER AND NOT LESS THAN 14 WORKING DAYS PRIOR TO EXCAVATION TO AVOID CAUSING DAMAGE TO "EXISTING SERVICES".
2. ALL SERVICES SHOWN ON PLAN AND LONG SECTION AND ALL ADDITIONAL SERVICES PROVIDED BY THE SERVICE PROVIDER(S) SHALL BE DEFINED AS "KNOWN SERVICES". NO COMPENSATION WILL BE PAID FOR DAMAGE CAUSED TO "KNOWN SERVICES".

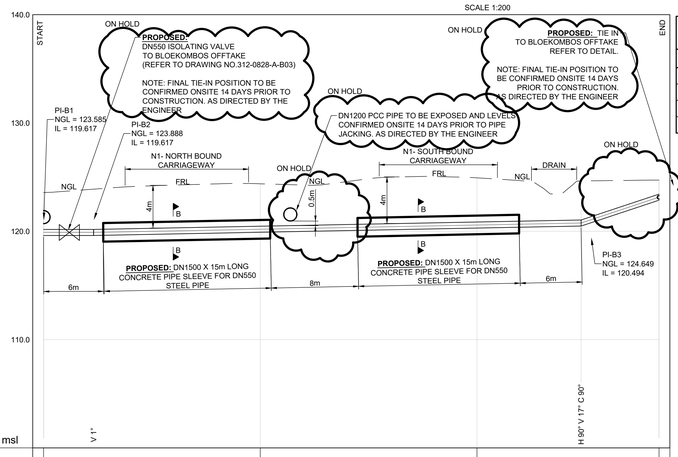
SETTING OUT CONTROL

NAME	Y	X	Z	DESCRIPTION
NRB 109-21	23073.100	3745001.530	122.863	
NRB 108-21	23348.850	3745034.070	118.569	
NRB 107-21	23646.070	3745144.180	115.052	

NOTE:
1. SURVEY BASED ON LO 19, SOUTH AFRICAN SURVEY GRID, WGS84 DATUM: 18 TO 20d E
2. THE ABOVE DATA IS UNIQUE TO THIS PROJECT ONLY. THE CONTRACTOR IS PROHIBITED FROM USING FOREIGN CONTROL BEACONS.



PLAN
SCALE 1:200



VER- 1: 1000
HOR- 1: 1000
DATUM : 100.000 msl

PEG DISTANCE AT CH (m)	0	20	40	57
GROUND LEVEL AT CH	123.8	124.4	124.9	124.7
INVERT LEVEL AT CH	119.6	119.9	120.3	122.9
DEPTH TO IL AT CH (m)	4.0	4.5	4.6	1.9

PI REFERENCE	PI-B1	PI-B2	PI-B3	PI-B4
PEG DISTANCE AT PI (m)	0.0	4.6	49.6	56.8
GROUND LEVEL AT PI	123.6	123.9	124.6	124.7
INVERT LEVEL AT PI	119.6	119.6	120.5	
DEPTH TO IL AT PI (m)	4.0	4.3	4.2	1.9
GRADE 1:		FLAT	51.343	3.022
PIPE DESCRIPTION	DN550 x 8mm THICK x GRADE X42, CEMENT MORTAR LINED, CEMENT MORTAR SHEATHING, CONTINUOUSLY WELDED STEEL PIPE			
CUMULATIVE LENGTH	0.00	4.62	49.62	

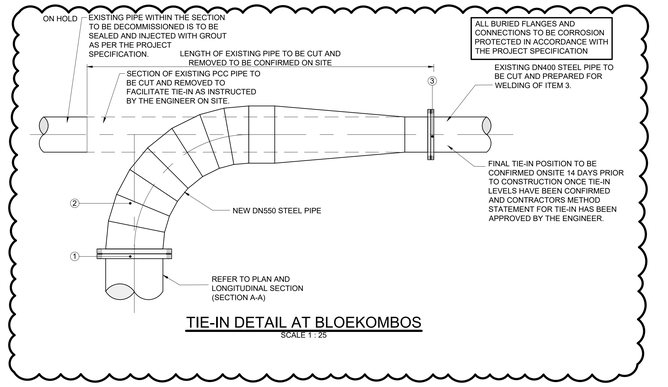
LONGITUDINAL SECTION (SECTION A-A)

SETTING OUT DATA

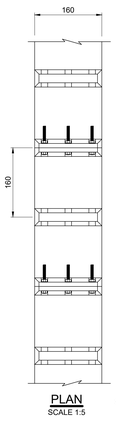
REF	Y	X
PI-B1	22975.873	3744913.014
PI-B2	22974.360	3744917.376
PI-B3	22959.612	3744959.884
PI-B4	22952.824	3744957.496

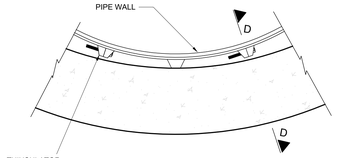
PIPEWORK AND FITTINGS SCHEDULE 1 (PN16)

ITEM NO.	DESCRIPTION	WALL THICKNESS	NO. OFF	LINING	COATING	GRADE OF STEEL
1	DN550 LOOSE FLANGE	-	1	-	-	-
2	SPECIAL: DN550 x 90° BEND AND DN550 x DN400 CONCENTRIC REDUCER, BEF AS PER DETAIL.	8mm	1	CML	CMS	X42 / GRADE C
3	DN400 LOOSE FLANGE	-	1	-	-	-

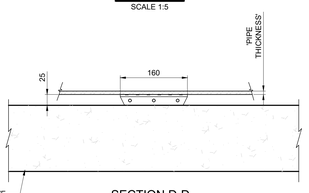


TIE-IN DETAIL AT BLOEKOMBOS
SCALE 1 : 25



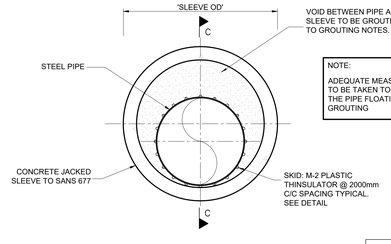


ELEVATION
SCALE 1:5

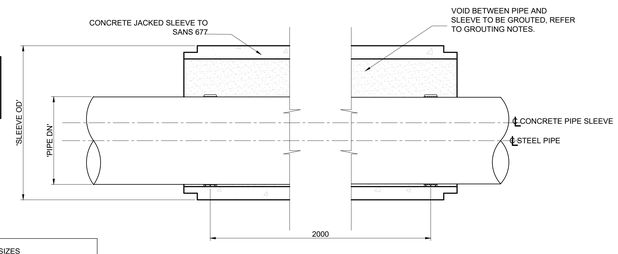


SECTION D-D
SCALE 1:5

SKID : M-2 THINSULATOR DETAIL
SCALE 1:5

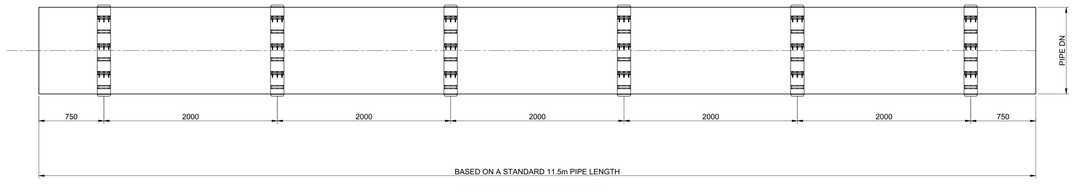


TYPICAL SECTION B-B
SCALE 1 : 25



SECTION C-C
SCALE 1 : 25

PIPE AND SLEEVE SIZES		
PIPE DN	1200	650/550
SLEEVE DN	1800	1500
SLEEVE OD	2130	1720
SLEEVE ID	1760	1462



POSITION OF SKIDS
SCALE 1 : 25

NOTE:
ALL DIMENSIONS TO BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF WORKS. REFER ANY DISCREPANCIES TO THE ENGINEER.

GENERAL NOTES

PIPEWORK

1. ALL PIPEWORK TO BE MILD STEEL IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS UNLESS OTHERWISE STATED.
2. THE CONTRACTOR SHALL VERIFY THE DIMENSIONS OF ALL PIPEWORK AND ADVISE THE ENGINEER OF ANY DISCREPANCIES PRIOR TO FABRICATION.
3. ALL PIPES GREATER THAN AND INCLUDING DN100, FITTED TO EQUIPMENT OR FITTINGS, OR WHERE SPECIFICALLY INDICATED SHALL BE FLANGED TO SANS 1123 (TABLE 3) OR BS EN 1092 : 1 WHERE SANS 1123 (TABLE 3) DOES NOT APPLY OR AS SPECIFIED ON THE DRAWINGS. SHOULD THE RESPECTIVE FLANGE DRILLING NOT BE COVERED IN THE ABOVE SPECIFICATIONS THE RESIDENT ENGINEER SHALL BE CONSULTED FOR THE APPROPRIATE SPECIFICATION, BEFORE PROCURING ANY VALVES OR FLANGES.
4. SURFACE PREPARATION FOR APPLICATION OF CORROSION PROTECTION MATERIALS SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
5. DAMAGED COATINGS AND LININGS SHALL BE REPAIRED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
6. ALL PIPEWORK AND SPECIALS TO BE COATED AND LINED AS PER THE PROJECT SPECIFICATIONS.
7. ALL JOINTS SHALL BE COATED, PROTECTED AND WRAPPED AS PER THE PROJECT SPECIFICATIONS.
8. THE PRESSURE RATINGS OF ALL PIPEWORK, FLANGES AND VALVES, SHALL BE AS INDICATED IN THE SCHEDULES OF FITTINGS.
9. ALL MILD STEEL PIPEWORK, COLLARS, WRAPPERS AND CROTCH PLATES TO BE MANUFACTURED FROM STEEL PIPE OF THE SAME GRADE AS THE MAIN PIPE.
10. ALL BENDS TO BE FABRICATED AND DIMENSIONED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
11. FOR COLLAR PLATES, PRE-DRILL 2 x 5mmØ HOLE. UPON COMPLETION OF FILLET WELDING WELD HOLES CLOSED.

VALVES AND FITTINGS

12. AIR VALVES.
    12.1. DN25 TO DN50 TO BE SCREW TYPE.
    12.2. DN80 TO DN200 TO BE FLANGED TYPE.
13. BUTTERFLY VALVES.
    13.1. FLANGED U-SECTION TYPE - SIZES UP TO DN1200, HAND WHEEL OPERATED, CLOCKWISE CLOSING (SUPPLIED WITH MATCHING FLANGES, NUTS, BOLTS, WASHERS AND GASKETS). UNLESS OTHERWISE SPECIFIED.
14. RSV & WEDGE GATE VALVES:
    14.1. DN100 TO DN300, HAND WHEEL OPERATED, CLOCKWISE CLOSING (SUPPLIED WITH MATCHING FLANGES, NUTS, BOLTS, WASHERS AND GASKETS). UNLESS OTHERWISE SPECIFIED.

CONCRETE

15. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.
16. ALL EXPOSED EDGES TO BE CHAMFERED 25x25.
17. MINIMUM COVER TO ALL REINFORCING SHALL BE 50mm.
18. CONSTRUCTION JOINTS TO BE WELL CLEANED & SCABBLED TO EXPOSE FRESH AGGREGATE AND THOROUGHLY WETTED BEFORE THE NEXT LIFT IS POURED.
19. FLOOR SCREED LAID TO FALL WITH THICKNESS VARYING FROM 100 TO 50mm.
20. CONCRETE GRADE
    20.1. BLINDING : C12/15-20 UNLESS OTHERWISE STATED
    20.2. CONCRETE : C25/20-20 UNLESS OTHERWISE STATED
    20.3. SCREED : 1:3 (CEMENT/SAND)
21. FINISHES
    21.1. EXTERNAL WALLS UNEXPOSED : F1 FINISH
    21.2. EXTERNAL WALLS EXPOSED : F1 FINISH
    21.3. INTERNAL WALLS : F2 FINISH
    21.4. FLOOR : U4 FINISH
22. WHERE APPLICABLE, AIR VENTS, LIFTING HOLES, LIFTING HOOKS, STEP IRONS AND MANHOLE COVER & FRAME ARE TO BE CAST IN CONCRETE.
23. BOTTOM OF AIR INLET TO BE MINIMUM OF 200mm ABOVE NGL.
24. ACCESS LADDERS TO HAVE CAGE FROM 2.3m ABOVE CHAMBER FLOOR.
25. PRESSURE RATING IN ACCORDANCE TO SCHEDULES

ABBREVIATIONS :

ID	-	INSIDE DIAMETER	DI	-	DUCTILE IRON
CI	-	CAST IRON	F/F	-	FACE TO FACE DIMENSION
DN	-	DIAMETER NOMINAL	C/F	-	CENTER TO FACE DIMENSION
OD	-	OUTSIDE DIAMETER	FOE	-	FLANGED ONE END
MS	-	MILD STEEL	BEF	-	BOTH ENDS FLANGED
SS	-	STAINLESS STEEL	FAR	-	FLANGED ALL ROUND
FRL	-	FINAL ROAD LEVEL	LRB	-	LONG RADIUS BEND
SFE	-	SOLVENT FREE EPOXY	SRB	-	SHORT RADIUS BEND
CML	-	CEMENT MORTAR LINED	NGL	-	NATURAL GROUND LEVEL
FBE	-	FUSION BONDED EPOXY	HDGMS	-	HOT DIPPED GALVANIZED MILD STEEL
CMS	-	CEMENT MORTAR SHEATHING			



JACKING PIPE SLEEVES

1. PIPES FOR JACKING SHALL BE REINFORCED CONCRETE MANUFACTURED IN ACCORDANCE WITH SANS 677: CONCRETE NON-PRESSURE PIPES TO A 100D LOAD SPECIFICATION.
2. ALL PIPE JOINTS SHALL BE SEALED WHEN IN PLACE.
3. ALL JACKING PIPES DELIVERED TO THE SITE SHALL HAVE A CONCRETE COMPRESSIVE STRENGTH OF NOT LESS THAN 45MPa.
4. THE DESIGN OF THE PIPES SHALL BE DETERMINED BY THE CONTRACTOR TO SUIT HIS PROPOSED METHOD OF CONSTRUCTION BUT SHALL NOT BE LESS THAN THE CLASS OF PIPE OR TYPE OF PIPE STATED ON THE DRAWINGS OR DETERMINED BY THE ENGINEER.
5. HOLES SHALL BE FORMED IN THE CROWN OF EACH PIPE TO ALLOW FOR THE INJECTION OF BOTH A LUBRICANT, IF REQUIRED AND FINALLY GROUT. THE FINAL LAYOUT OF GROUT HOLES IS THE CONTRACTOR'S RESPONSIBILITY.

PIPE JOINTS

1. A BUTT JOINT SHOULD BE USED IN THE PIPES TO BE JACKED SUCH THAT APPLIED FORCES USED TO JACK THE PIPES MUST BE UNIFORMLY DISTRIBUTED AROUND THE JOINT TO AVOID DAMAGING THE JOINT.

JOINT SEALS

1. A SEAL IS REQUIRED AT EACH JOINT TO MINIMIZE INGRESS OF WATER.
2. THE CHIPBOARD PACKING USED TO DISTRIBUTE STRESSES ON THE JOINTS SHOULD BE RAKED OUT TO A DEPTH OF 25mm ON THE INSIDE ALL ROUND AND SEALED WITH A DURABLE FLEXIBLE SEALING AGENT SUCH AS BITUSEAL, THIOFLEX OR SIMILAR.

TEMPORARY STOP ENDS

1. ON COMPLETION OF PIPE JACKING AND INSTALLATION OF THE STEEL PIPE WITHIN THE CONCRETE SLEEVE, THE ENDS OF THE SLEEVE MUST BE CLOSED OF USING A DOUBLE BRICK WALL.
2. MORTAR MIX SHOULD NOT BE WEAKER THAN 1 CEMENT AND 4 SAND. A MORTAR FINISH MUST BE APPLIED TO THE OUTER BRICK. THE OUTER BRICK FACE SHOULD THEN BE SEALED WITH 2 COATS OF BITUSEAL.

GROUTING NOTES

1. WHEN THE JACKED PIPE SLEEVE IS IN ITS FINAL POSITION A STABILIZED CEMENT/BENTONITE GROUT OF COMPRESSIVE STRENGTH AT 28 DAYS EQUAL TO 5MPa SHALL BE INJECTED TO FILL ALL VOIDS BETWEEN THE JACKED PIPE SLEEVE AND THE SURROUNDING MATERIAL, OTHER THAN IF THE MATERIAL TO BE JACKED THROUGH IS HARD ROCK. IN THIS INSTANCE THE GROUT MUST COMPRISE CEMENT/SAND WITH A 28 DAY COMPRESSIVE STRENGTH OF 5MPa.
2. ALL HOLES IN THE JACKED PIPE SLEEVE SHALL BE SEALED WITH AN APPROVED SEALANT. GROUTING PRESSURES SHOULD NOT EXCEED 50kN/m².
3. THE ALLOWABLE OVERBREAK FOR CALCULATION OF GROUTING VOLUME IS 75mm.
4. THE VOID BETWEEN THE STEEL PIPE AND JACKED SLEEVE IS TO BE FILLED WITH 15MPa SAND:CEMENT GROUT IN CONTROLLED STAGES.
5. THE PIPE IS NOT TO BE FILLED WITH WATER PRIOR TO GROUTING AND CURING OF THE SLEEVE TO ONE THIRD THE DEPTH OF THE PIPE.
6. THE PIPE IS TO BE FULL OF WATER DURING THE GROUTING OF THE TOP TWO THIRDS OF THE PIPE TO PREVENT FLOTATION OF THE PIPE.
7. GROUTING SHALL BE DONE IN STAGES TO PREVENT FLOTATION OF THE PIPE.
8. SLEEVE ENDS TO BE CLOSED WITH BRICK WALL OR ALTERNATIVE METHODS AS DIRECTED BY THE ENGINEER.

ANY ALTERNATIVE METHODS OF PREVENTING FLOTATION ARE TO BE APPROVED BY THE ENGINEER PRIOR TO GROUTING.

SKID NOTES

THE SKID DETAILS SHOWN ON THIS DRAWING ARE TO BE USED AS A GUIDE ONLY. THE CONTRACTOR IS TO PROVIDE THEIR PREFERRED DESIGN WITH A METHOD STATEMENT FOR THE PIPE JACKING TO THE ENGINEER PRIOR TO CONSTRUCTION, FOR APPROVAL.



No.	DATE	REVISION	CONSULT. ENG.
V1	23/11/2023	ORIGINAL VERSION	

CONSTRUCTION RECORD (AS-BUILT)
WORKS CONTRACT ENGINEER
Name :
Prof. Reg. No. :
Date
SANRAL PROJECT MANAGER
Name :
Date :

HEAD OFFICE
48 Tambotie Avenue
Val de Grace
Pretoria
0184

PO Box 415
Pretoria 0001
South Africa

Tel: (012) 844 8000

SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD
Reg.No.1998/009884/30
BUILDING SOUTH AFRICA THROUGH BETTER ROADS

WESTERN REGION
1 Havenga Street
Oakdale
Bellville
7530

Private Bag X19
Bellville
7535

Tel: (021) 957 4600

ACCEPTANCE

THIS ACCEPTANCE IS FOR PROCEDURAL AND ADMINISTRATIVE REVIEW PURPOSES ONLY AND DOES NOT ATTRACT LEGAL LIABILITY OR LIABILITY OF ANY KIND FROM WHATSOEVER CAUSE OR HOWEVER ARISING

for the SA NATIONAL ROADS AGENCY SOC LTD.
Date:

PROJECT DESCRIPTION
THE CAPACITY IMPROVEMENT OF THE NATIONAL ROUTE 1 SECTION 1 FROM OLD OAK INTERCHANGE (KM 18.90) TO KOELENOFF INTERCHANGE (KM 33.00)

DRAWING DESCRIPTION
N1 - WEMMERSHOEK PIPELINE RELOCATION
SECTION A - KOELENHOF TO KRAAIFONTEIN
DN550 PLAN, LONGITUDINAL SECTION & N1 PIPE JACKING DETAILS

SCALE : AS SHOWN | SHEET 1 OF 1

PROJECT NUMBER	N.001-010-2021/1	
DRAWING LOCATION DATA	START	END
ROUTE	N01	N01
SECTION	01	01
DRAWING km DISTANCE	18.90	33.00
DRAWING TYPE	ROADS-UTILITIES	
BRIDGE/STRUCTURE No.	-	
CONSULTANT DRAWING No.	312-0828-A-D03	VER
SANRAL DOCUMENT #	-	V1