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

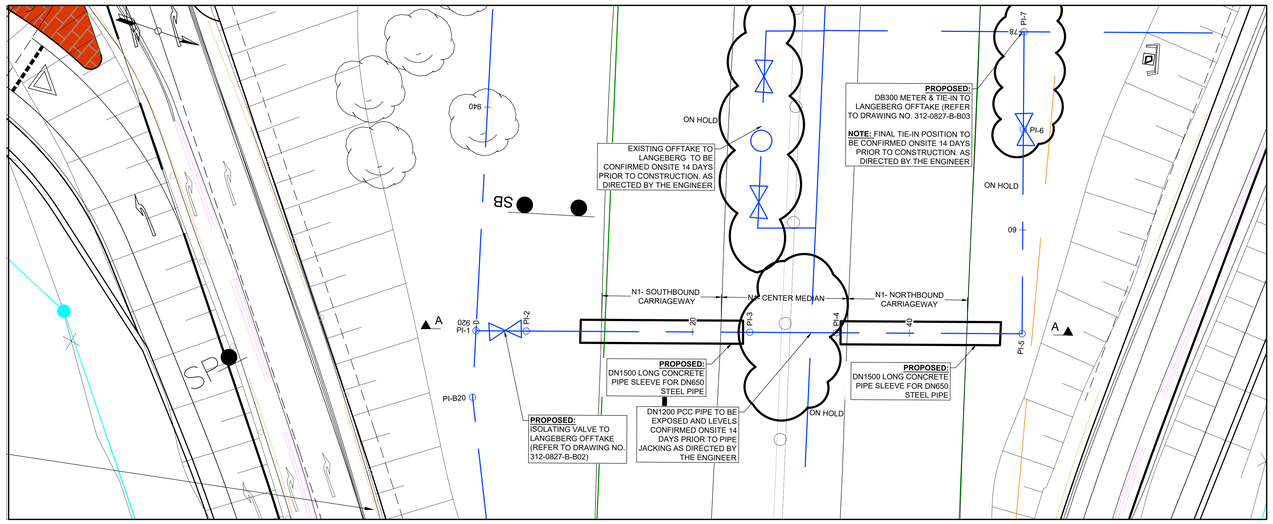
NOTE:
1. ALL SERVICES DEPICTED ON THE PLAN & LONG SECTION ARE APPROXIMATE POSITIONS OF EXPECTED SERVICES OBTAINED FROM SERVICE PROVIDERS RECORDS THAT MAY BE ENCOUNTERED BY THE CONTRACTOR ALONG THE ROUTE. ALL SERVICES ARE TO BE TRACED AND PROVED IN CONJUNCTION WITH EACH SERVICE PROVIDER AND NOT LESS THAN 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

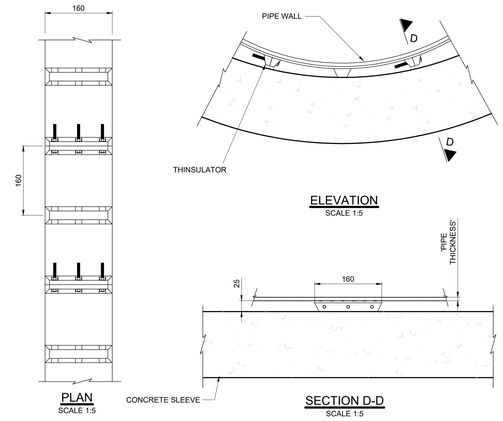
NAME	Y	X	Z	DESCRIPTION
NR 100-21	25604.38	3745911.22	102.694	
NRB 88-21	25750.53	3746017.85	98.321	
NRB 87-21	25985.93	3746203.51	97.06	
NRB 86-21	26229.32	3746381.61	97.219	

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.

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



PLAN
SCALE 1:200

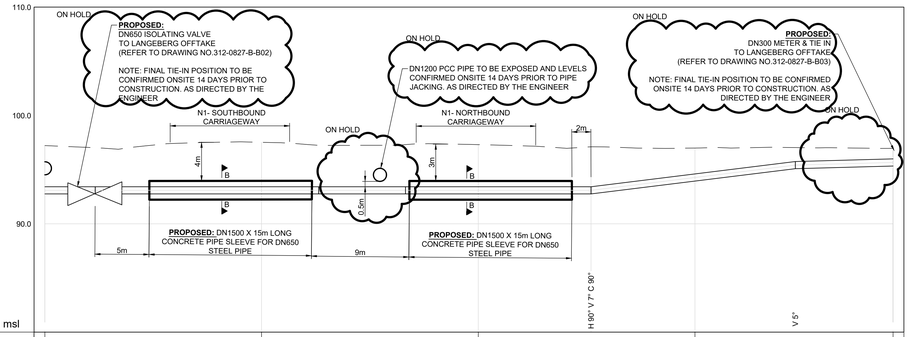


ELEVATION
SCALE 1:5

PLAN
SCALE 1:5

SECTION D-D
SCALE 1:5

SKID : M-2 THINSULATOR DETAIL
SCALE 1:5



VER- 1:1000
HOR- 1:1000

DATUM : 80.000 msl

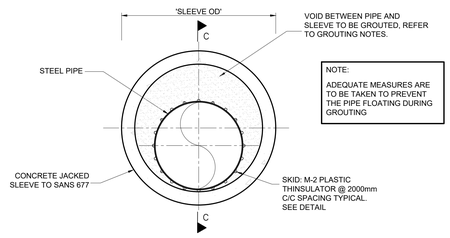
PEG DISTANCE AT CH (m)	0	20	40	60	78
GROUND LEVEL AT CH	97.2	97.5	97.3	97.0	97.0
INVERT LEVEL AT CH	92.8	92.8	92.8	93.9	95.3
DEPTH TO IL AT CH (m)	4.5	4.8	4.5	3.0	1.6

PI REFERENCE	PI-1	PI-2	PI-3	PI-4	PI-5	PI-6	PI-7
PEG DISTANCE AT PI (m)	0.0	4.6	25.3	33.3	50.4	69.3	78.3
GROUND LEVEL AT PI	97.2	97.0	97.2	97.3	97.1	97.0	97.0
INVERT LEVEL AT PI	92.8	92.8	92.8	92.8	92.8	95.1	95.3
DEPTH TO IL AT PI (m)	4.5	4.3	4.5	4.5	4.3	1.9	1.6
GRADE 1:		FLAT	FLAT	FLAT	FLAT	8.11	36.007
PIPE DESCRIPTION	DN650 x 8mm THICK x GRADE X42, CEMENT MORTAR LINED, CEMENT MORTAR SHEATHING, CONTINUOUSLY WELDED STEEL PIPE						
CUMULATIVE LENGTH	0.00	4.64	25.28	33.28	50.41	69.40	

LONGITUDINAL SECTION (SECTION A-A)

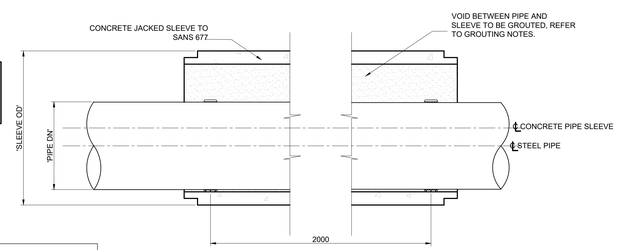
SETTING OUT DATA

REF	Y	X
PI-1	26286.377	3746503.238
PI-2	26289.367	3746499.686
PI-3	26302.658	3746483.899
PI-4	26307.810	3746477.779
PI-5	26318.839	3746464.678
PI-6	26333.270	3746476.811
PI-7	26340.181	3746482.620



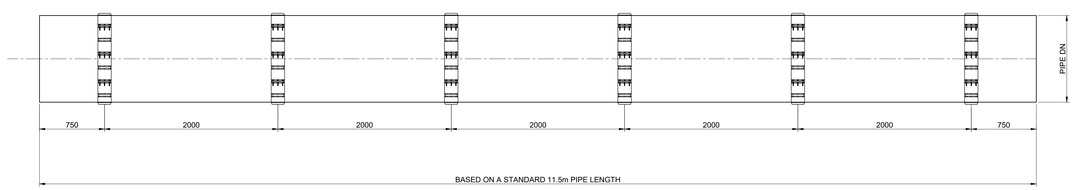
NOTE:
ADEQUATE MEASURES ARE TO BE TAKEN TO PREVENT THE PIPE FLOATING DURING GROUTING

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

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

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Tel: (012) 844 8000

SANRAL
SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD
BUILDING SOUTH AFRICA THROUGH BETTER ROADS

WESTERN REGION
1 Havenga Street
Oakdale
Bellville
7530

Private Bag X19
Bellville
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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 B - KRAAIFONTEIN TO BRACKENFELL
DN650 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.	312-0827-B-D03	VER
SANRAL DOCUMENT #	-	V1

ORIGINAL SCALE : 1 : 100