



Project No: 150362/2/CPG 17

CONSTRUCTION OF THE LOSKOP REGIONAL BULK WATER SUPPLY SCHEME IN
THEMBISILE HANI LOCAL MUNICIPALITY – WORK PACKAGE 2 - BULK PIPELINE FROM
PUMP STATION 4 to 10 ML RAW WATER RESERVOIR

UNIK-DIPHATSE JOINT VENTURE

PROJECT NO: 150362/2/CPG17

CONSTRUCTION OF THE LOSKOP REGIONAL BULK WATER SUPPLY SCHEME IN THEMBISILE
HANI LOCAL MUNICIPALITY – WORK PACKAGE 2 (BULK PIPELINE FROM PUMP STATION 4
TO 10 ML RAW WATER RESERVOIR.

TENDER DOCUMENT FOR TARGETED ENTERPRISES CIBD 4CE

ISSUED BY: UNIK-DIPHATSE Joint VENTURE

Building 10, Pinewood office Park,
Riley rd., Woodmead

CONTACT: Ruan vd Berg
0795034443
siteagent1.sa@unikconst.com

Name of Tenderer _____

CIBD Registration _____

CSD Registration _____

Eligibility criteria

It shall be a condition of tender that Targeted Enterprises include in their tender submissions the following documentation:

- Proof of the Tenderer's B-BBEE contributor level.
- Proof that the Tenderer is an EME or QSE entity.
- Proof that the Tenderer is registered on National Treasury's CSD.
- Proof that the Tenderer is registered with the CIDB in class 4 CE or higher.
- Proof that the Tenderer is compliant with the COID Act.
- Proof that the Tenderer is tax compliant.
- Proof that the Tenderer is from the Project Area(s) which Targeted Enterprises will be given preference for subcontracting opportunities

SUB-CONTRACT TENDER TERMS AND CONDITIONS

This Tender and Subcontract Agreement is subject to the conditions of the Main Contract, which are The Conditions of Contract, Part 1: General Conditions shall be those forming the General Conditions of the "conditions of Contract for Construction", as prepared by "The South African Institute of Civil Engineering", "General Conditions of Contract for Construction Works Third Edition (2015)". These General Conditions are subject to the variations and additions set out in the section of this contract entitled "Particular Conditions of Contract"

The Subcontractor Acknowledges that he has been given reasonable opportunity of inspecting the provisions of the Main Contract in so far as they relate or apply to this Subcontract and he shall be deemed to be fully informed regarding those provisions.

The Subcontractor shall observe, perform and comply with the provisions of the Main Contract in so far as they relate or apply to this Subcontract and are not inconsistent with the express provisions of this Subcontract as if the same were set out severally herein. In the event of any inconsistency the express provisions of this Subcontract shall take precedence over provisions of the Main Contract.

Any terms and conditions which the Subcontractor may seek to impose in addition to or at variance with the foregoing shall be of no force or effect unless specifically agreed to in writing by the Main Contractor.

In the interpretation of the provisions of the Main Contract in so far as they relate or apply to this Subcontract, the Contractor shall have like powers, rights and responsibilities in relation to this Subcontract as the Employer and/ or Engineer and/ or the Employer's or Engineer's duly appointed agent has in relation to the Main Contract and the Subcontractor shall have like powers, rights and responsibilities in relation to the Contractor as the Contractor has in relation to the Employer and/ or Engineer and/ or the Employer's or Engineer's duly appointed agent.

PRICING INSTRUCTIONS

1. All activities must be invoiced on a monthly basis, based on the completion of the activity but not exceeding the allocated budget that has been priced for that activity.
2. Payment will be based on the completion of activities provided that reasonable progress towards the completion of the activity within the estimated budget is demonstrated.
3. The total price for the activities shall not be exceeded without the prior written approval and agreement of the Client.
4. The Schedule of Activities and the Bills of Quantities comprises items covering the service provider's profit and costs of general liabilities and includes costs of all services.
5. All rates and amounts must be completed by hand in black Ink.
6. The schedule items covering the service provider's profit or general liabilities and the construction of temporary and permanent risk.
7. Although the tenderer is at liberty to insert a rate at his own choice for each item in the schedule, his attention is drawn to the fact that the employer has the right, under various circumstances, to payment for additional work carried out and that the Employer's Agent is obliged to base his assessment and the payment to be paid for such additional work on the rates inserted in the schedule by the tenderer.
8. The prices and rates to be inserted in the schedule of quantities are to be the full inclusive prices to be the employer for the work described under several items. The prices shall be exclusive of Value Added Tax (VAT). Such prices shall cover all costs and expenses that may be required in and for the work described, and shall cover the cost of all general risks, liabilities and obligations set forth or implied in the document on which the tender is based.
9. In the event of the tenderer failing to price any item it will be construed that the tenderer has made adequate allowance under other items for all labour, material and costs required, for the exclusion, not only for the quantum of work covered by the unpriced item, but also for any increase in the said quantum which may have to be undertaken during the course of the contract.
10. For the purposes of this Schedule of Activities and Bills of Quantities, the following words shall have the meanings hereby assigned to them:
 - Unit: The unit of measurement for each item of Service provided as defined in the Standardized, Project or Particular Specifications.
 - Quantity (Qty): The number of units of work/service provision for each item.
 - Rate: The payment per unit of work/provision of services at which the Tenderer Tenders to do the work.
 - Amount: The quantity of an item multiplied by the Tendered rate of the (same) item.
 - Sum: An amount Tendered for an item, the extent of which is described in the schedule of activities, the scope of works or elsewhere, but of which the

WORKS INSURANCE

The Sub-Contractor will effect and keep in force Policies issued by an Insurance Company covering:

- 2.1 Public Liability Insurance.
- 2.2 Common Law Liability Insurance in respect of all employees not covered in terms of the Occupational Health and Safety Act Insurance requirements.
- 2.3 All Risks Insurance covering the physical loss or damage to the plant, tools, equipment and materials etc. used or intended for use in the performance of this Sub-Contract. The Sub-Contractor will on request forthwith produce to UNIK-DIPHATSE JV conclusive evidence of your compliance with the above requirements. Should you fail to effect and keep in force the above Insurances then without prejudice to UNIK-DIPHATSE JV other rights in terms of this Sub-Contract or in law, we shall be entitled so to do and to recover the cost of so doing from you.

You hereby indemnify UNIK-DIPHATSE JV against and hold UNIK-DIPHATSE JV harmless for all and any claims by or on behalf of or relating to your workmen, employees, agents, visitors and all third parties without limitation in respect of injury or damage whatsoever nature or kind in any way arising out of or connected with the execution of the sub-contract works and howsoever arising.

The Sub-Contractor raising an insurance claim will be responsible for the Insurance Excesses (Deductibles). The Sub-Contractor is free to inspect any Policies held by UNIK-DIPHATSE JV by making prior arrangements during normal office hours.

JURIDICTION

The Sub-Contractor and his employees, agents and visitors on the contract site and all plant, equipment and materials caused to be brought thereon at your instance shall at all times be subject to the jurisdiction, directives and instructions of the UNIK-DIPHATSE Project Manager Mr. Jaco Grobler or a representative authorized by UNIK-DIPHATSE JV.

SITE SAFETY

The Sub-Contractor will comply with the provisions of the Compensation for Occupational Injuries and Diseases Act (1993), Occupational Health and Safety Act (1993) and all municipal regulations and by laws applicable to his work as well as any safety related instructions which may be issued by UNIK-DIPHATSE JV from time to time.

The Sub-Contractor will at his cost provide his personnel with adequate protective clothing, equipment and safety hats and ensure compliance with the Site Safety Regulations and instructions given or advised to him from time to time by a UNIK-DIPHATSE JV Authorized Representative or a member of the UNIK-DIPHATSE JV Site Management team. An induction will be carried out on site for all staff.

The Sub-Contractor agrees that the following arrangements and procedures shall apply in terms of Section 37(2) of the OHAS Act (1993):

- 2.3.1 The Sub-Contractor shall:
- 2.3.2 Appoint in writing a Responsible Person for Health and Safety and lodge a copy of such appointment with UNIK-DIPHATSE JV;
 - Furnish UNIK-DIPHATSE JV with proof of appointment of Health and Safety Representative as required by the Act;
 - Ensure that the Responsible Person appointed and all employees are aware of their responsibilities in terms of the Act, and that the Sub-Contract is carried out in accordance with the provisions of the Act;
 - Ensure that all his employees have the necessary experience and training to carry out the work of the Sub-Contract.
- 2.4 The Responsible Person appointed in terms of the Act shall work, with UNIK-DIPHATSE JV and other Sub-Contractors employed on the site, on a committee established specifically to ensure that the intentions of the Act are complied with insofar as work on this project is concerned.
- 2.5 The Sub-Contractor must lodge with UNIK-DIPHATSE JV a certificate confirming registration in terms of the above Act No. 130 of 1993 within 7 (seven) days of receipt of this letter of order, together with a receipt of payments.
- 2.6 In accordance with the Occupational Health and Safety Act of 1993, the Sub-Contractor is required to peruse the attached "Agreement with Mandatory" – Marked Annexure "B" – and sign and return to the offices of UNIK-DIPHATSE JV the Acceptance by Mandatory, ensuring his undertaking to abide by the requirements, regulations and provisions of the Act of 1993.

DUE FULFILMENT

Should the Sub-Contractor, following receipt of written instruction from UNIK-DIPHATSE JV, fail within 7 working days to fulfil any of his obligations in complying with the Principal Contract, UNIK-DIPHATSE JV reserves the right to introduce such additional resources as may be required to maintain the program. Additional costs, loss or damage which may be incurred by UNIK-DIPHATSE JV implementing this condition, will be offset in the first instance against any monies due and thereafter against any guarantees or retention monies held.

PROGRAMME

As per UNIK-DIPHATSE JV Programme or any revision thereto:

Currently Programmed:

Start Date: 7 November 2023

Completion Date: 19 January 2025

The Sub-Contractor is required to execute the work described in the Tender and Appointment or as it may subsequently be modified to suit the progress of the Main Works and as UNIK-DIPHATSE JV may instruct the Sub-Contractor from time to time. The main contract completion date is set for **19 th January 2025**

TENDER BRIEFING/ CLOSING DATE AND TRAINING

Compulsory Site Inspection : 17 April 2023 @ 10am (Boardroom Package 2 Site Camp)

A tender training session will be held after the site inspection.

All queries or request for information can be directed to the responsible persons as tabled below

<u>Accounting Officer</u>	<u>Procurement Enquiries.</u>	<u>Technical Enquiries</u>
Mr Jaco Grobler Unik-Diphatse JV jacogroblersa@unikconst.co.za Tel: 011 318 0077	Mr Ruan vd Berg Unik-Diphatse JV siteagent1.sa@unikconst.co.za Tel.: 079 503 4443	Mr Jaco Grobler Unik-Diphatse JV jacogroblersa@unikconst.co.za Tel: 013 755 1190

All tenders are to be deposited into the tender box on or before the **5th May 2023** no later than **12pm**.

SITE MEETINGS

An employee of the Sub-Contractor must be available for site and other meetings and have full power for decision making on behalf of the Sub-Contractor. A Progress Report is to be submitted by the Sub-Contractor at each Weekly Site Meeting taking place on Site each Thursday at 1h00.

APPROVALS

All work carried out, materials supplied and services tendered shall be to the satisfaction of the Principal Agent, Consulting Engineers or a person designated under the Main Contract and to UNIK-DIPHATSE JV.'s satisfaction.

Certificates of Compliance signed by such designated professional will be handed to UNIK-DIPHATSE JV after the completion of the works. Final payment of monies will only be released on the receipt of this said certificate as listed below.

Commencement of application or laying of materials shall be conclusive proof that the Sub-Contractor has accepted the surfaces as suitable for the material, which he intends to apply or lay.

PLANT AND EQUIPMENT

UNIK-DIPHATSE JV accept no responsibility under any circumstance for any plant, equipment, material, site establishment and property of any description handled or stored on behalf of the Sub-Contractor, all of which will be at the sole risk of the Sub-Contractor.

Storage on site is to be provided by the Sub-Contractor at a position agreed with the UNIK-DIPHATSE JV.'s Project Manager. The Sub-Contractor will be directly responsible for the security of any plant or materials stored on site. The sub-contractor is to provide their own scaffolding/temporary lighting for the works. The sub-contractor is to make provision for Water and Electrical Power on Site. No UNIK-DIPHATSE JV plant will be available on Site for the off-loading or moving of materials which shall be provided by the Sub-Contractor.

It has been determined that the minimum Plant and Machinery requirement to conduct the works are listed in the table below.

Plant / Equipment	Capacity	Number
Excavator	30T	1
TLB		1
Watercart	18000L	1
LDV	1T	2
Material Sieve	10mm	3

DRAWINGS

All dimensions are to be checked on site before the work is put in hand and the Sub-Contractor shall ensure that he is working to the latest drawings and specification.

Before undertaking any manufacturing, delivery or work on site, the Sub-Contractor is to submit all builders' work information, shop drawings or samples as required for approval to UNIK-DIPHATSE JV. Any costs associated with drawings required in addition to the standard issue to UNIK-DIPHATSE JV for the Contract shall be for the sub-contractor's account. (1 Copy shall be issued)

The following documents will form part of this document

- | | | | |
|---|-----------------------------------|---|---|
| 1 | Layout and Long Section | - | Drawing No.'s N/3110/P4/W/9/005 rev 2 to N/3110/P4/W/9/029 rev 2. |
| 2 | Trench Detail | - | Drawing No. N/3110/RW/W/11/002 rev 1. |
| 3 | Thrust Block | - | Drawing No. N/3110/RW/W/11/003 rev 1. |
| 4 | Bedding and Column Marker Details | - | Drawing No. N/3110/RW/W/11/003 rev 1. |

DAMAGES

Any damage caused to the Main Contract Works and/or to any buildings, plant, equipment, installation materials or reticulation in on or about the said works or the site due or attributable to any act, omission or negligence by the Sub-Contractor and/or his employees and/or agents and/or visitors shall be remedied and made good at the Sub-Contractor's expense.

Any damages incurred to the existing infrastructure and or trees/landscaping will be for the account of the party responsible. Ablution facilities will be made available by the sub-contractor.

EXTRAS, MODIFICATIONS AND DETERMINATION

Notwithstanding the award to the Sub-Contractor of this Sub-Contract, it shall be subject to extras, omissions, modifications, alterations or variations in terms of the Main Contract or at UNIK-DIPHATSE JV sole instance, but no claim for any of the same will be accepted or paid by UNIK-DIPHATSE JV unless such extra, omission, modification, alteration or variation has been authorized by the UNIK-DIPHATSE JV Project Manager in writing. The Sub-Contractor will be required to provide in good time Requests for Information (RFI's) in writing to the UNIK-DIPHATSE JV Project Manager to obtain required uncertain or outstanding information. Failure by the Sub-Contractor to follow the aforementioned procedure, UNIK-DIPHATSE JV will take no responsibility for uncertain or outstanding information received late by the Sub-Contractor.

In the event of the cancellation or determination of the Main Contract in whole or in part then this Sub-Contract shall likewise be canceled or determined to the same extent, but payment subject to the provisions of all the Sub-Contract Conditions shall nevertheless, be made to you in respect of your implementation of the Sub-Contract to date of cancellation or determination without any further liability attaching to UNIK-DIPHATSE JV in terms of this Sub-Contract.

CESSION AND ASSIGNMENT

The Sub-Contractor will not cede, assign, transfer, nor make-over any of his rights or obligations under this Sub-Contract, or any portion of the Sub-Contract Works. The Sub-Contractor shall not sub-contract out or sublet any portion of the Sub-Contract Works without written consent from UNIK-DIPHATSE JV.

DEFAULT

UNIK-DIPHATSE JV will without prejudice to any other rights or remedies which we may have in terms of this Sub-Contract or in law be entitled but not obliged forthwith and at any time to determine this Sub-Contract in the event of:

- i. The Sub-Contractor being placed under a provisional or final order of sequestration, liquidation or judicial management or publishing a notice to surrender your estate, or committing an act of insolvency and/or;
- ii. The Sub-Contractor failing timeously to commence and proceed with and complete the Sub-Contract works and to remedy or replace any defective work or materials with due diligence and all of the same in a proper and workmanlike manner and all in accordance with this Sub-Contract.

WORKING HOURS

The Sub-Contractor's working hours on Site shall conform to the hours worked by UNIK-DIPHATSE JV, being 07h00 to 17h00 Mondays to Fridays and 07h00 to 15h00 on Saturday's, unless otherwise agreed.

However, it will be required for the Sub-Contractor to work full days on Fridays due to the Program and required Completion Date. Should the Sub- Contractor be required to work overtime on Saturdays or Sundays, they should inform the Project Manager 24 hours in writing in advance for him to make the required arrangements

TEMPORARY SERVICES

No claims will be entertained should an event arise in regards to temporary services. The Sub-Contractor is deemed to have allowed for all costs associated to the completion and commissioning of his works.

PAYMENT

All claims for progress payments must be made in writing to reach the UNIK-DIPHATSE JV Offices not later than the 17th of each month. Subject to the Sub-Contractors work and/or materials being certified by the Project Manager, the amounts established to be due to the Sub-Contractor, less Retention referred to in Condition 20 here below will be paid to the Sub-Contractor.

Payment shall become due to the Sub-Contractor within 14 days of the end of the month in review for the valuation. Such payment shall be made within the period stated provided UNIK-DIPHATSE JV has received payment from the Client. There will be no payment for any materials stored off site.

RETENTION

- 2.1 10% Retention shall be withheld from every Payment due to the Sub-Contractor.
- 2.2 Retention will be reduced to 5% on the receipt of practical completion certificate.
- 2.3 A further 5% will be reduced on final completion

DOMICILE

For all purposes of an incidental hereto including, but not by way of limitation, and giving of any Notice and the serving of any process, you choose domicilium citandi et executandi at your address and telefax number or e-mail address appearing on the Appointment.

IDENTIFICATION

All employees on Site are to be clearly identified, with the Company Name and their Names on their overalls or Safety Jacket.

INDULGENCE

No indulgence or relaxation by UNIK-DIPHATSE JV is to be construed as a waiver of rights under this Sub-Contract.

SITE SECURITY

UNIK-DIPHATSE JV does not take responsibility for any theft of goods on site, it is deemed that the sub-contractor pricing is all inclusive for securing all plant and equipment on site

The scope of project works

The components of the project works are given hereunder. These will be completed in respect of Civil and Electromechanical works according to the design drawings and the technical specifications.

(i) General

1. Contractor's establishment on site.
2. Accommodation of traffic.
4. Training of Temporary Workforce.

(ii) Concrete Works

1. Construction of selected portions of the pump stations
2. Construction of pipe pedestals and thrust blocks

(iii) Pipelines

1. Clear and grub and stockpile topsoil
2. Excavation of pipe trenches
3. Installation of suitable pipe bedding (insitu / imported)
4. Laying and testing of pipes
5. Backfilling of pipe
6. Installation approximately 1 km of 630 mm dia. oPVC pump main

PROJECT NO: 150362/2/CPG 17

CONSTRUCTION OF THE LOSKOP REGIONAL BULK WATER SUPPLY SCHEME IN
THEMBISILE HANI LOCAL MUNICIPALITY – WORK PACKAGE 2 (CONSTRUCTION OF
BULK DISTRIBUTION PIPELINES)

BILL OF QUANTITIES

CPG 17 (CIDB 4)

ITEM NO.	REF	DESCRIPTION	UNIT	QUANT	RATE	AMOUNT
A 1	SABS 1200 A	PRELIMINARY & GENERAL				
A1.1	8.3	FIXED-CHARGE AND VALUE RELATED ITEMS				
A1.1.1	8.3.1	Contractual Requirements (Insurance Workmans compensation)	Sum	1,0		
A1.2	8.4	TIME-RELATED ITEMS				
A1.2.7	8.4.3	Supervision for Duration of Construction	Sum	1,0		
A1.2.15		Allowance for the supply of safety apparel (safety boots, reflectors, vests, orange overalls bearing the EPWP logo and large EPWP logo on the back and safety gloves for all targeted labour and medicals)	Sum	1,0		
Total : PRELIMINARY & GENERAL						

SCHEDULE 13 : CONSTRUCTION OF PIPELINES

13	SABS 1200DB	<u>SITE CLEARANCE</u>				
13,1	PSC 4.1	a) Clear and Grub	m	1100		
	SABS 1200DB	<u>EXCAVATION</u>				
	PSDB1.1	Excavate in all materials for trenches for 700DN pipes and smaller. Rate to include backfill, compact and dispose of surplus material				
13,2		a) Up to 1.5m deep	m ³	200		
13,3		b) over 1.5m and up to 2.5m deep	m ³	2200		

13,4		c) over 2.5m and up to 3.5m deep	m ³	50		
13,5		d) over 3.5m and up to 4.5m deep	m ³	10		
13,6	PSDB1.2	<u>Extra-over item 11.2.1 for :</u>				
		a) Hard rock excavation	m ³	525		
13,7	8.3.2c)	Excavate and dispose of unsuitable material from trench bottom (Prove)	m ³	5		
13,8	8.3.3b)	Import backfill material from designated borrow area within the free haul distance of 1.0km.	m ³	100		
13,9	8.3.3.3	Compaction in road reserves	m ³	1170		
13,10	8.3.3.4	<u>Overhaul</u>				
		a) Long overhaul in excess of 2.0km	m3.km	835		
	SABS 1200DB	<u>EXISTING SERVICES</u>				
13,11	8.3.5a)	<u>Services that intersect a trench</u>				
		a) Water and sewer pipelines	no	1		
13,12		b) Cables	no	1		
13,13	8.3.5b)	<u>Services that adjoin a trench</u>				
		a) Water and sewer pipelines	m	1		
13,14		b) Cables	m	1		
	SABS 1200LB	<u>PIPE BEDDING</u>				
		<u>Selected granular material for bedding cradle from:</u>				
13,15	8.2.1	a) Trench excavation	m3	775		
13,16		b) Commercial Sources	m3	39		
		<u>Provision of selected fill material from:</u>				
13,17	8.2.1	a) Trench excavation	m3	240		
13,18	8.2.1	b) Commercial Sources	m3	12		
	SABS 1200L	<u>STEEL PIPES</u>				
	PSL4.1	<u>Supply, lay, bed and test the following Mild Steel pipes with fusion bonded epoxy lining and coating</u>				
13,19	8.2.1	a) 650mm Dia. Plain ended pipes, Class 25 (9m Lengths)	- m	35		
	SABS 1200L	<u>PRESSURE PIPES</u>				
	8.2.1	<u>Supply, lay, bed and test the following pressure pipes:</u>	-			
13,20		a) 630mm dia. oPVC, Class 16 pipes	m	1100		
13,23	SABS	<u>Pipeline markers</u>				
		Construct and install concrete pipeline markers as per drawing		no	30	

	1200L	<u>MISCELLANEOUS</u>			
13,24	8.2.11	<u>Concrete thrust block configuration</u>			
		a) Concrete volume 0.25 - 0.5 m3	no	10	
13,25		b) Concrete volume 0.5 - 1.0 m3	no	5	
13,26		c) Concrete volume 1,0 - 1.5 m3	no	10	
	PSL 4.2	<u>Fabrication, supply, transport and install and test the following VJ couplings.</u>			
13,27		a) For 650mm pipe	no	15	
	SABS				
	1200L	<u>HDPE PIPES</u>			
	8.2.1	<u>Supply, lay, bed and test the following HDPE pipes:</u>			
13,28		a) 50mm dia. HDPE Pipe PE 100 PN12.5	m	1100	
<u>Total carried forward</u>					

FORM OF OFFER AND ACCEPTANCE

OFFER

The Main Contractor, identified in the Acceptance signature block, has solicited offers to enter into a contract in respect of the following works:

PROJECT No: 150362/2/ CPG 17 CONSTRUCTION OF THE LOSKOP REGIONAL BULK WATER SUPPLY SCHEME IN THEMBSILE HANI LOCAL MUNICIPALITY – WORK PACKAGE 2 - BULK PIPELINE FROM PUMP STATION 4 TO 10 ML RAW WATER RESERVOIR.

The Tenderer, identified in the Offer signature block below, has examined the documents listed in the Tender Data and addenda thereto as listed in the Tender Schedules, and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the Tenderer, deemed to be duly authorized, signing this part of this Form of Offer and Acceptance, the Tenderer offers to perform all of the obligations and liabilities of the Contractor under the Contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the Conditions of Contract.

THE SUB-TOTAL OF THE PRICES EXCLUSIVE OF VALUE ADDED TAX IS

.....

..... Rand (in words); R..... (In figures).

THE OFFERED TOTAL OF THE PRICES INCLUSIVE OF VALUE ADDED TAX IS

.....

..... Rand (in words); R..... (In figures).

This Offer may be accepted by the Main Contractor by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document to the Tenderer before the end of the period of validity stated in the Tender Data, whereupon the Tenderer becomes the party named as the Contractor in the Conditions of Contract identified in the Contract

Signature(s)

Name(s)

Capacity

For the Tenderer

(Name and address of organization)

Tenderer

Witness 1

Witness 2

Employer

Witness 1

Witness 2

MEMORANDUM OF AGREEMENT CONCLUDED BY AND BETWEEN:

**UNIK_DIPHATSE JOINT VENTURE
(HEREINAFTER REFERRED TO AS THE DEPARTMENT)**

THIS AGREEMENT is made between (Hereinafter called the Main Contractor of the
one part, herein represented by:

.....
in his capacity as:

AND:

.....
(hereinafter called the Sub-Contractor) of the other part, herein represented by

.....
in his capacity as:
duly authorized to sign on behalf of the Contractor.

WHEREAS the Sub-contractor is the Mandatory of the Main Contractor in consequence of an agreement
between the Sub-Contractor and the Main Contractor in respect of

CONTRACT No:
.....
.....

AND WHEREAS the Main Contractor and the Sub-Contractor have agreed to enter into an agreement in terms of the
provisions of Section 37(2) of the Occupational Health and Safety amendment Act, 1993 (hereinafter referred to as the
ACT);

NOW THEREFORE the parties agree as follows:

1. The Sub-contractor undertakes to acquaint the appropriate officials and employees of the sub-contractor with all relevant provisions of the ACT and the regulations promulgated in terms thereof.
2. The Sub-contractor undertakes to fully comply with all relevant duties, obligations and prohibitions imposed in terms of the ACT and Regulations: Provided that should the Main Contractor have prescribed certain arrangements and procedures that same shall be observed and adhered to by the Sub-contractor, his officials and employees. The Sub-contractor shall bear the onus of acquainting himself/herself with such arrangements and procedures.
3. The C hereby accepts sole liability for such due compliance with the relevant duties, obligations, prohibitions, arrangements and procedures, if any, imposed by the ACT and Regulations, and the Sub-Contractor expressly absolves the Main Contractor

ATTACH THE FOLLOWING DOCUMENTS HERETO

1. For Closed Corporations

- CK1 or CK2 as applicable (Founding Statement)
- Copies of the ID's of the Directors

2. For Companies

- A copy of the Certificate of Incorporation
- Copies of the ID's of the Directors, and
- the shareholders register

3. For Joint Venture Agreements

- Copy of the Joint Venture Agreement between all the parties,
- as well as the documents in (1) or (2) of each Joint Venture member.

4. For Partnership

- Copies of the ID's of the partners

5. One-person Business / Sole trader

- Copy of ID
- Details of Tax Compliance Status from South African Revenue Service
- Duly Signed and dated original or copy of Authority of Signatory on company Letterhead
- B-BBEE STATUS LEVEL VERIFICATION CERTIFICATE (original or a copy issued by an approved body / accredited verification agency as prescribed by the National Treasury and the Department of Trade and Industry)
- Central Supplier Database [CSD] Summary

PROJECT SPECIFICATION

SITE CLEARING (SABS 1200 C)

GENERAL

The areas where work is to be carried out must be kept clean for the duration of the contract. All rubbish must be removed without delay and the site must be left clean and tidy on completion of the service.

DUMPING SITE

No dumping is allowed on site other than at the designated and approved fill areas. Dumping will only be allowed for filling sinkholes and dolines and may not be detrimental to the natural storm water drainage of the area. Only soil, rock, clean masonry and concrete rubble may be dumped in the designated dump areas.

REMOVAL OF TREES

No trees may be removed without written permission from the Main Contractor.

SABS1200DB: EARTHWORKS - PIPE TRENCHES PSDB 1

CONSTRUCTION

Free haul Distance

All haul within the site of works or within a distance of 1.0 km outside the extremities of the boundaries of the contract as indicated on the drawings shall be regarded as free haul.

Dewatering

The scheduled rates for excavation shall include dewatering of trenches.

Excavations

Extra-over item:

Only two types of excavations are defined and paid for under this contract. These items are soft excavation and hard rock excavation. No intermediate excavations will be paid for. Hard rock excavations qualifies when blasting or mechanical breaking are applied to break the rock.

SABS 1200 BEDDING (PIPES)

MATERIALS

Selected granular material

Granular materials shall be selected from trench and reservoir excavations. If the Sub-contractor elects not to apply selection of material from excavations, he shall provide suitable material from any other approved source at his own expense.

Bedding material shall be either of the following type:

a) Type A: Finally graded, composed of material with the following properties:

- i) Percentage by mass passing:
10 mm screen - 100 %
0,425 mm screen - 80 to 100 %
0,002 mm screen - 0 to 45 %
- ii) Liquid limit (LL) as determined in accordance with SABS Method 852 shall not be more than 15, when performed on all the material passing the 0,425 mm sieve.
- iii) Plasticity index (PI) as determined in accordance with SABS Method 852 shall not be more than 15, when performed on all the material passing the 0,425 mm sieve.
- iv) Linear shrinkage (LS) as determined in accordance with SABS Method 853 shall not exceed 5 %, when performed on all the material passing the 0,425 mm sieve.

b) Type B : Medium graded, composed of material with the following properties:

- i) Percentage by mass passing:
10 mm screen - 80 to 100 %
0,425 mm screen - 60 to 80 %
0,002 mm screen - 0 to 40 %
- ii) Liquid limit (LL) as determined in accordance with SABS Method 852 shall not be more than 35 %, when performed on all the material passing the 0,425 mm sieve.
- iii) Plasticity index (PI) as determined in accordance with SABS Method 852 shall not be more than 18, when performed on all the material passing the 0,10 mm sieve.
- iv) Linear shrinkage (LS) as determined in accordance with SABS Method 853 shall not exceed 7 %, when performed on all the material passing the 0,425 mm sieve.

c) Type C : Granular, composed of material with the following properties:

- i) Percentage by mass passing:
 9,5 mm screen - 100 %
 4,75 mm screen - 70 to 100 %
 0,425 mm screen - 30 to 60 %
 0,002 mm screen - 0 to 45 %
- ii) Liquid limit (LL) as determined in accordance with SABS Method 852 shall not be more than 40 %, when performed on all the material passing the 0,425 mm sieve.
- iii) Plasticity index (PI) as determined in accordance with SABS Method 852 shall not be more than 20, when performed on all the material passing the 0,425 mm sieve.
- iv) Linear shrinkage (LS) as determined in accordance with SABS Method 853 shall not exceed 10 %, when performed on all the material passing the 0,425 mm sieve.

Items a), b) and c) are conveniently summarized in the following table:

Material	PERCENTAGE BY MASS PASSING SCREENS				ATTERBERG LIMITS SHALL NOT EXCEED		
	9,5 mm	4,75 mm	0,425 mm	0,002 mm	Liquid Limit (LL) %	Plasticity Index (PI)	Linear Shrinkage (LS) %
Finely graded / A	100	100	80 - 100	0 - 45	30	15	5
Medium graded / B	100	80 - 100	60 - 80	0 - 40	35	18	7,5
Granular / C	100	70 - 100	30 - 60	0 - 35	40	20	10

Bedding

All steel pipes in the works shall be classed as “rigid” with flanged joints and shall be bedded on Class C bedding as described in sub-clause 5.2 of SABS 1200 LB, unless otherwise specified or instructed by the Main Contractor.

Backfilling of pipe trenches

No backfilling of pipe trenches on top of the selected fill layer may commence without the written consent of the Main Contractor or his Representative.

CONSTRUCTION

Waterlogged trench bottoms

- a) Where trench bottoms are too soft and water logged to permit placement and compaction of bedding material in the normal manner, such trench bottoms shall be excavated to a depth of at least 300 mm below the underside of pipes and specials for the full width and length of the trench affected.
- b) The full width and length of the trench bottom and at least 500 mm height of both sides of trench walls shall be covered by an unwoven approved geotextile, similar to Kaymat U24.

The full width and length of the trench shall thereupon be covered by a 300 mm thick layer of coarse gravel, coarse sand or 19 mm nominal size crushed stone, fully compacted within the confines of the geotextile to take the mass of the pipe filled with water and all loads on the pipe without settlement.

The free drainage layer shall be covered over the full width of the trench by a single layer of geotextile with the cloth on trench walls folded over and overlapping to completely seal off the free drainage layer against ingress of sand or fine soil particle.

Pipes shall be laid directly on the bed prepared as above and pipe bedding and selected backfill completed as specified.



- LEGEND:
- PROPOSED 630mmØ WATER MAIN
 - PROPOSED NODE
 - AIR VALVE CHAMBER
 - SCOUR VALVE
 - FENCE
 - GRAVEL ROAD
 - TEST PIT
- NOTE:
- ALL VERTICAL AND HORIZONTAL BENDS MUST BE CONSTRUCTED AS FOLLOWS:
- COMPOUND BENDS LESS THAN 1° SHOULD BE DEFLECTED AT THE PIPE JOINT
 - COMPOUND BENDS BETWEEN 1° AND 2° MUST BE DEFLECTED AT TWO CONSECUTIVE PIPE JOINTS.
- FOR CONSTRUCTION

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Rev	Description	Date	By
02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P.
01	REVISED RAW RESIVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P.

AMENDMENTS

SERVICE

WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9001-19R2.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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MBOMBELA
1200
CLIENT Tel:(013) 755 1190
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NKANGALA DISTRICT
MUNICIPALITY

PROJECT

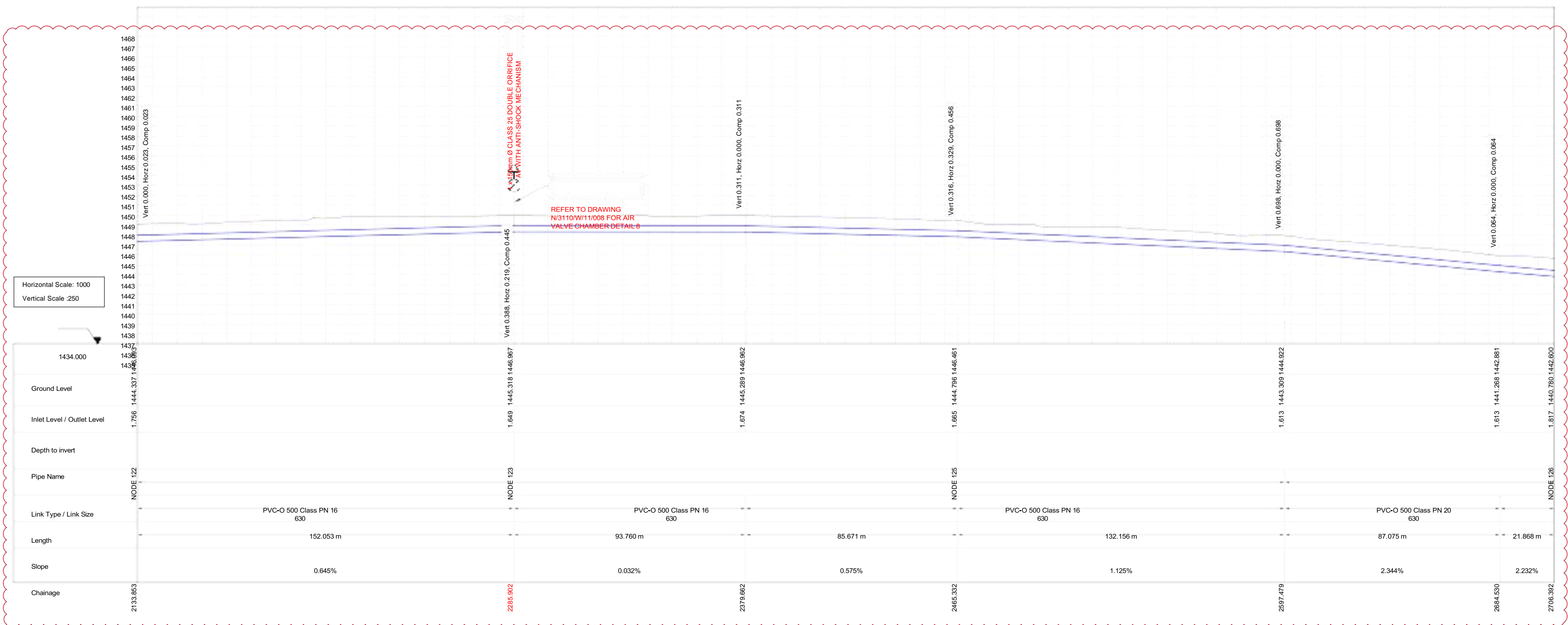
LOSKOP REGIONAL BULK
WATER SUPPLY SCHEME:
WORK PACKAGE 2

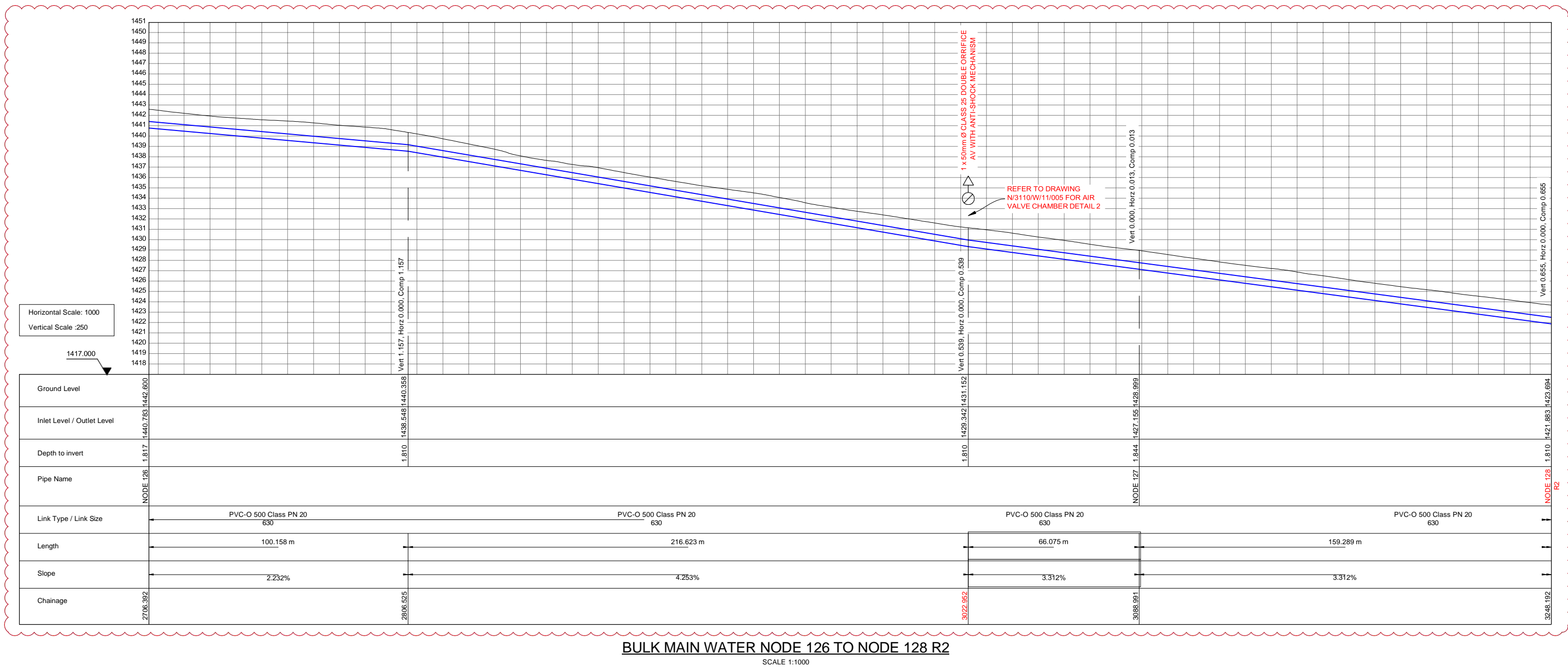
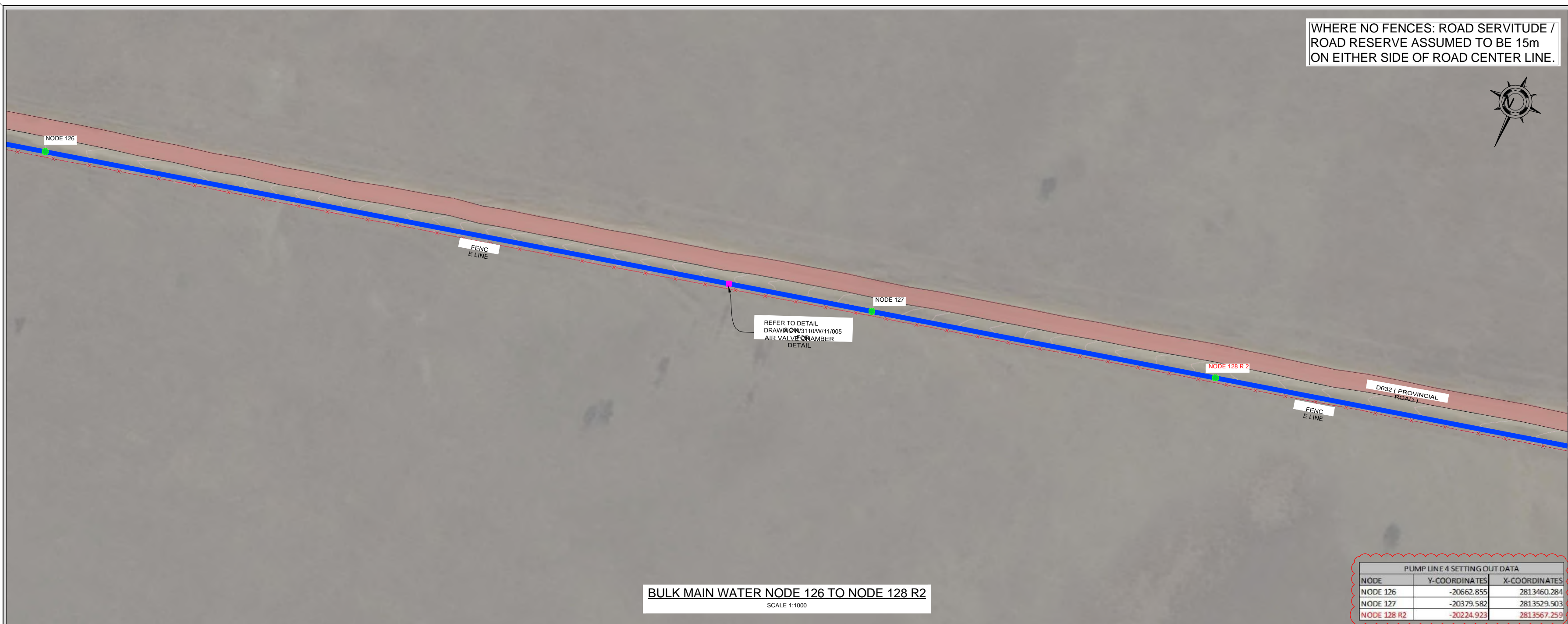
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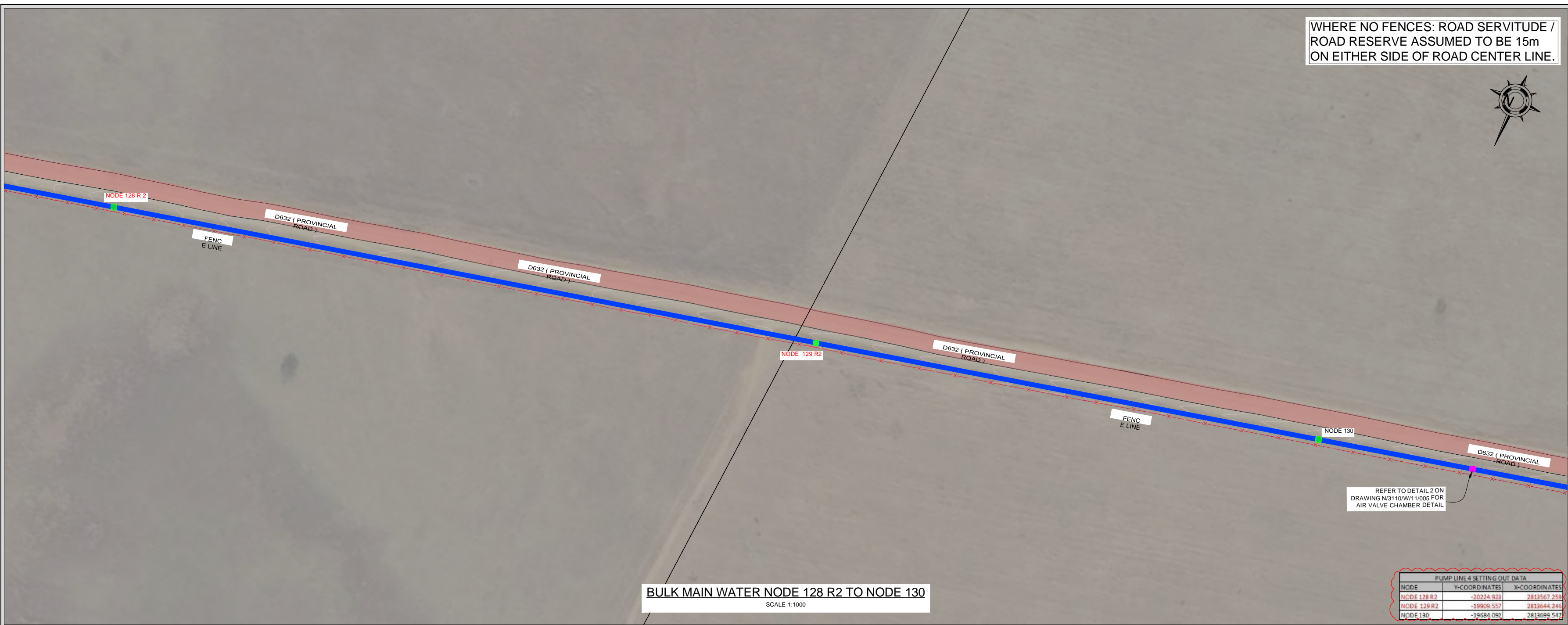
PROPOSED BULK WATER LINE
PUMPSTATION 4 LAYOUT 5 OF 34

SCALE 1:1000 DATE OCTOBER 2022
PAPER SIZE A1

CONSULTANT DWG. NO.
N/3110/P4/W/9/005/R2
CLIENT DWG. NO.







LEGEND:

- PROPOSED 630mmØ WATER MAIN
- PROPOSED NODE
- AIR VALVE CHAMBER
- SCOUR VALVE
- FENCE
- GRAVEL ROAD
- TEST PIT

NOTE:

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FOR CONSTRUCTION

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02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P
01	REVISED RAW RESIVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P
Rev	Description	Date	By
AMENDMENTS			

SERVICE

WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9001-19R2.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

TITLE

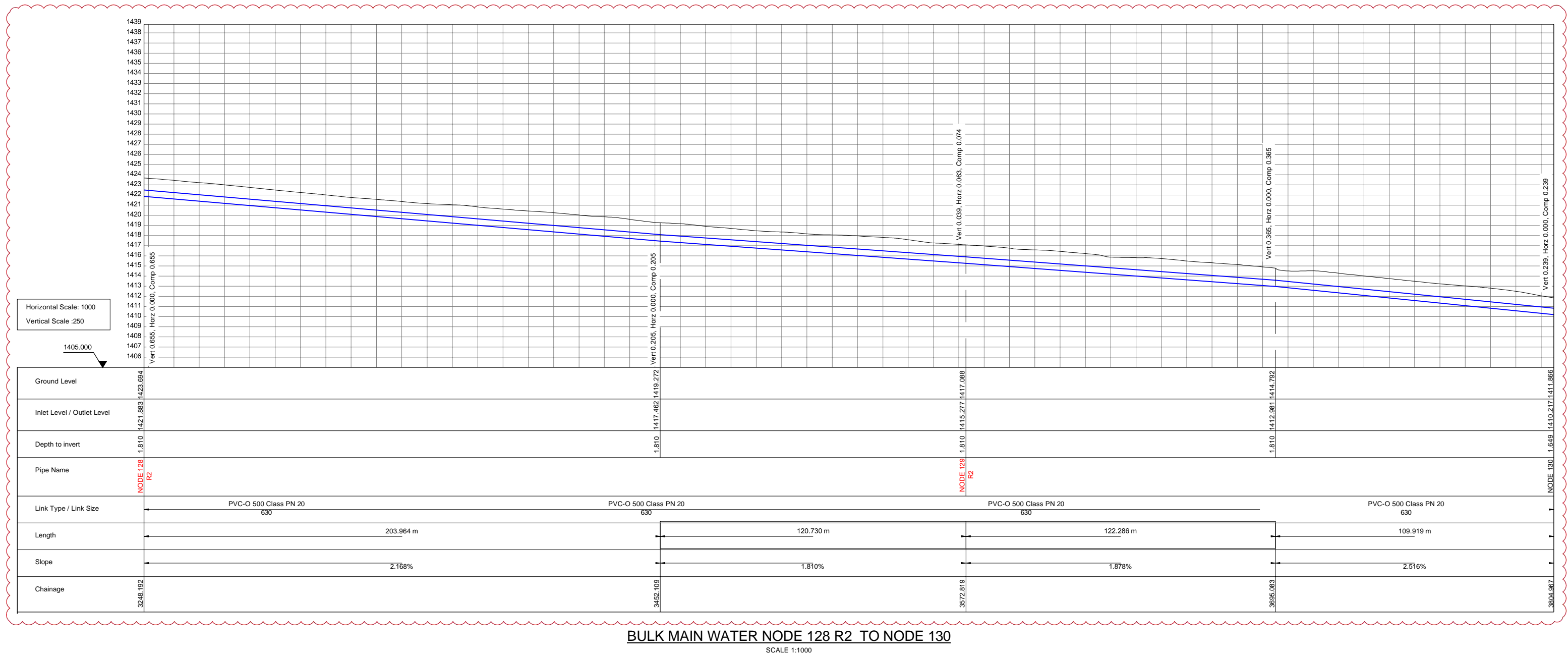
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DATE	OCTOBER 2022
SCALE	1 : 1000
PAPER SIZE	A1

SCALE REF.

CONSULTANT DWG. NO.
N/3110/P4W/9/007/R2

CLIENT DWG. NO.
-





LEGEND:

- PROPOSED 630mmØ WATER MAIN
- PROPOSED NODE
- AIR VALVE CHAMBER
- SCOUR VALVE
- FENCE
- GRAVEL ROAD
- TEST PIT

NOTE:

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02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P
01	REVISED RAW RESIVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P
Rev	Description	Date	By
AMENDMENTS			

SERVICE	
WATER	
DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9001-19R2.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

TITLE

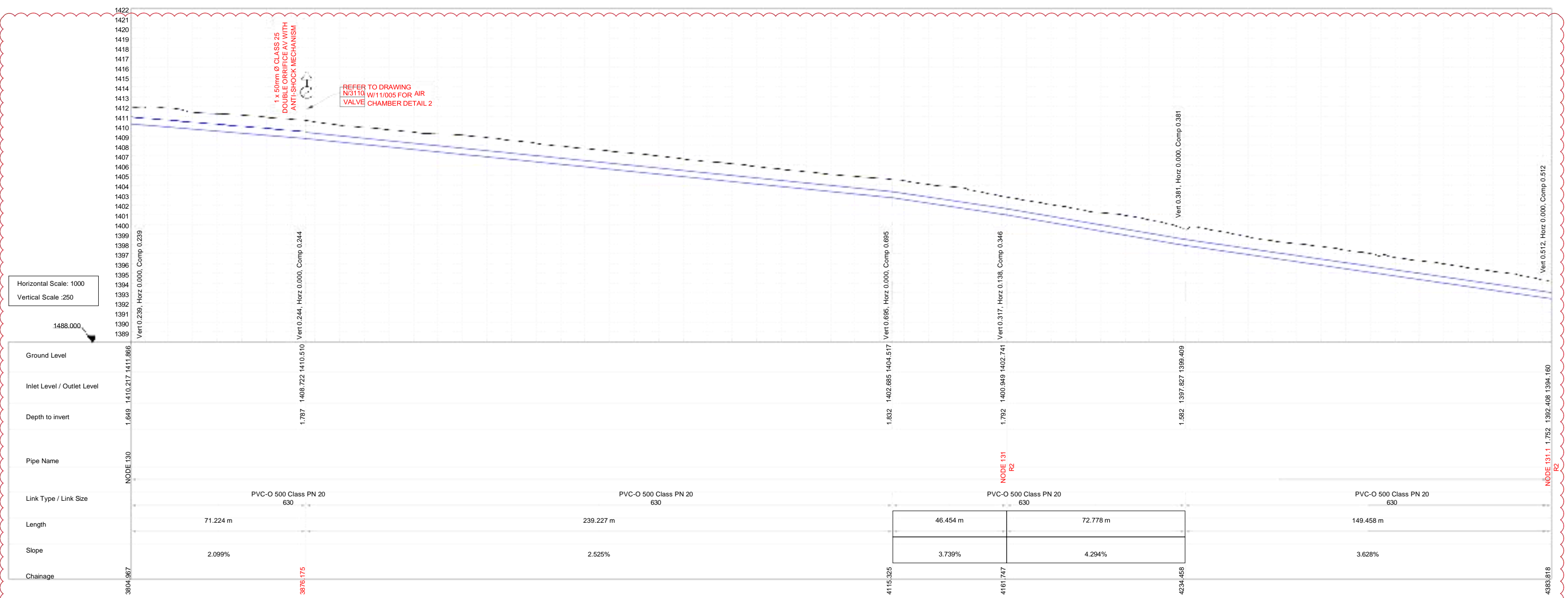
PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 8 OF 34

DATE	OCTOBER 2022
SCALE	1 : 1000
PAPER SIZE	A1



CONSULTANT DWG. NO.
N/3110/P4/W/9/008/R2

CLIENT DWG. NO.
-





LEGEND:

- PROPOSED 630mmØ WATER MAIN
- PROPOSED NODE
- AIR VALVE CHAMBER
- SCOUR VALVE
- FENCE
- GRAVEL ROAD
- TEST PIT

NOTE:

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02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P
01	REVISED RAW RESIVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P
Rev	Description	Date	By
AMENDMENTS			

SERVICE

WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9001-19R2.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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CLIENT

NKANGALA DISTRICT MUNICIPALITY

PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

TITLE

PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 9 OF 34

SCALE REF.

DATE: 10 OCTOBER 2022

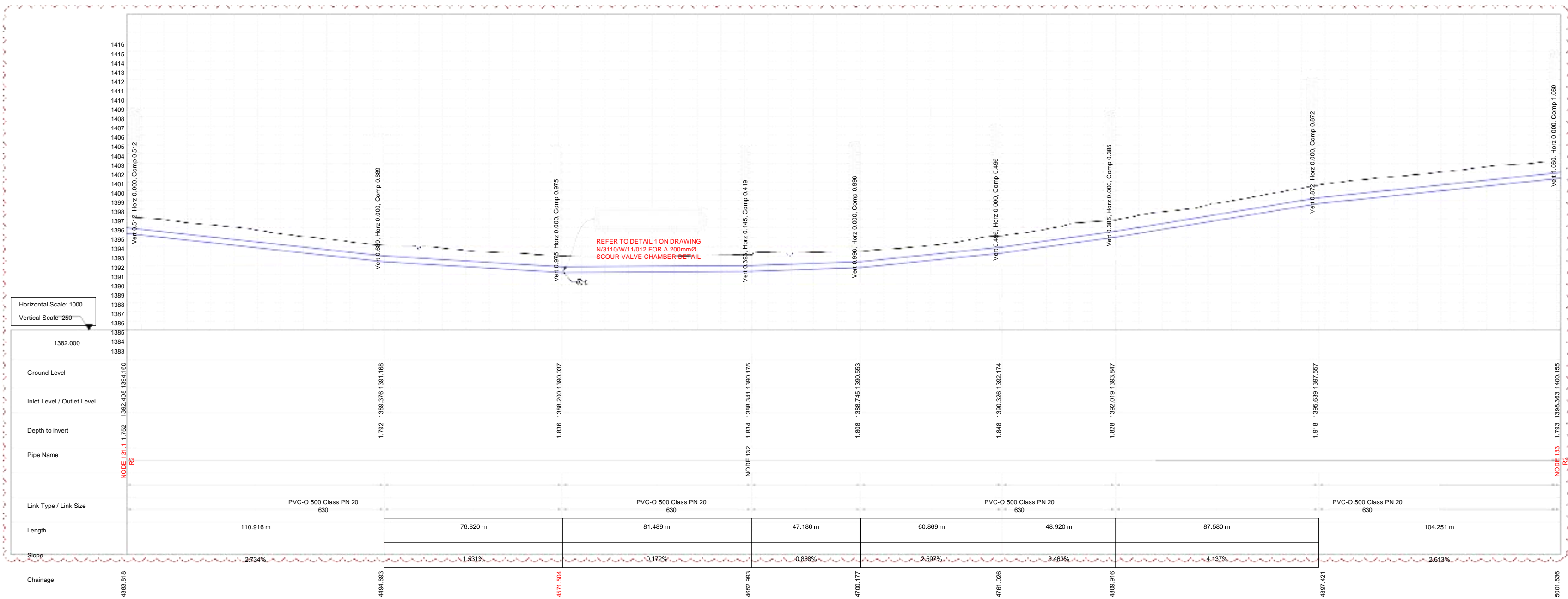
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N/3110/P4W/9/009/R2

CLIENT DWG. NO.

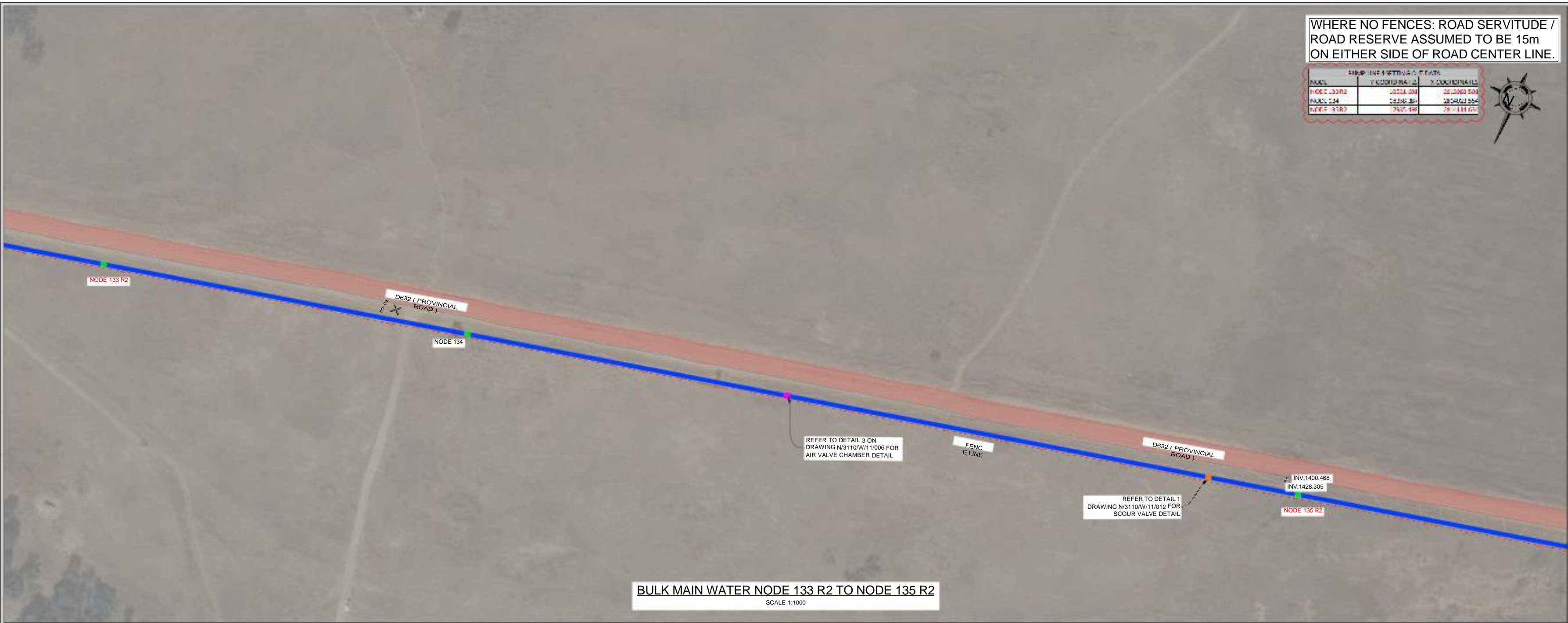
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BULK MAIN WATER NODE 131.1R2 TO NODE 133 R2

SCALE 1:1000

(REF FOLDER: X:\02 PROJECTS\3000\3100 - 3199\N3110 - LOSKOP BULK WATER SUPPLY SCHEME\1 DESIGN PHASE\F DRAWINGS\5 CONSTRUCTION\D WATER\2. WORK PACKAGE 2\D. PUMPLINES\N3110P4W9001-19R2.DWG)



LEGEND:

- PROPOSED 630mmØ WATER MAIN
- PROPOSED NODE
- AIR VALVE CHAMBER
- SCOUR VALVE
- FENCE
- GRAVEL ROAD
- TEST PIT

NOTE:

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FOR CONSTRUCTION

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02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P
01	REVISED RAW RESIVIOR POSITION (REVISE TOTAL CHAINAGE)	2022/11/09	N.P
Rev	Description	Date	By
AMENDMENTS			

SERVICE

WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9001-19R2.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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CLIENT

NKANGALA DISTRICT MUNICIPALITY

PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

TITLE

PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 10 OF 34

SCALE REF.

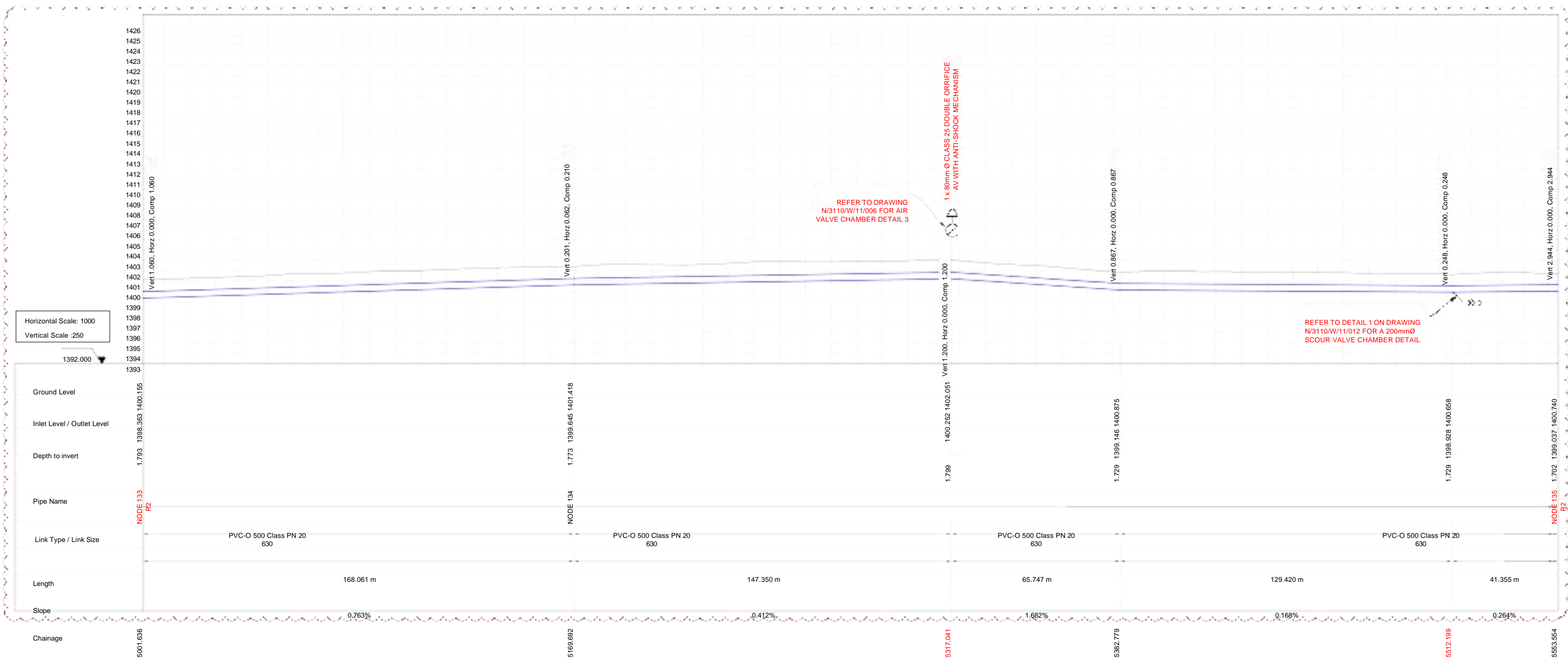
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CONSULTANT DWG. NO.

N/3110/P4W/9/010/R2

CLIENT DWG. NO.



(REF FOLDER: X:\02 PROJECTS\3000\3100 - 3199\N3110 - LOSKOP BULK WATER SUPPLY SCHEME\1 DESIGN PHASE\1 DRAWINGS\5 CONSTRUCTION\1 D WATER\2. WORK PACKAGE 2\1. PUMPLINES\N3110P4W9001-19R2.DWG)

WHERE NO FENCES: ROAD SERVITUDE /
ROAD RESERVE ASSUMED TO BE 15m
ON EITHER SIDE OF ROAD CENTER LINE.



LEGEND:

- PROPOSED 630mmØ WATER MAIN

- PROPOSED NODE

- AIR VALVE CHAMBER

- SCOUR VALVE

- FENCE

- GRAVEL ROAD

- TEST PIT

NOTE:

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CONSTRUCTED AS FOLLOWS:

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DEFLECTED AT THE PIPE JOINT

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BE DEFLECTED AT TWO CONSECUTIVE PIPE
JOINTS.

FOR CONSTRUCTION

INV:1400.468
INV:1428.305

NODE 135 R2

NODE 136

D632 (PROVINCIAL
ROAD)

REFER TO DETAIL 2 ON
DRAWING N/3110/W/11/005 FOR
AIR VALVE CHAMBER DETAIL

NODE 136.1 R2

FENCE
LINE

REVISED PIPE ROUTE & LONG SECTION			
02		2022/02/16	N.P
REVISED RAW RESIVIOR POSITION (REVISE TOTAL CHAINAGE)			
01		2022/11/09	N.P
Rev. Her.	Description Beskrywing	Date Datum	By Deur
AMENDMENTS\WYSIGING			

BULK MAIN WATER NODE 135 R2 TO NODE 136.1 R2

SCALE 1:1000

DESIGNED/ONTWERP	W.J. STRYDOM (jnr)
DRAWN/GETEKEN	M.DAVEL
CAD FILE NAME/CAD LÉER NAAM	N3110P4W9001-19R2.dwg
CHECKED/NAGESIEN	W.J. STRYDOM (jnr)
APPROVED/GOEDGEKEUR	W.J. STRYDOM (jnr)

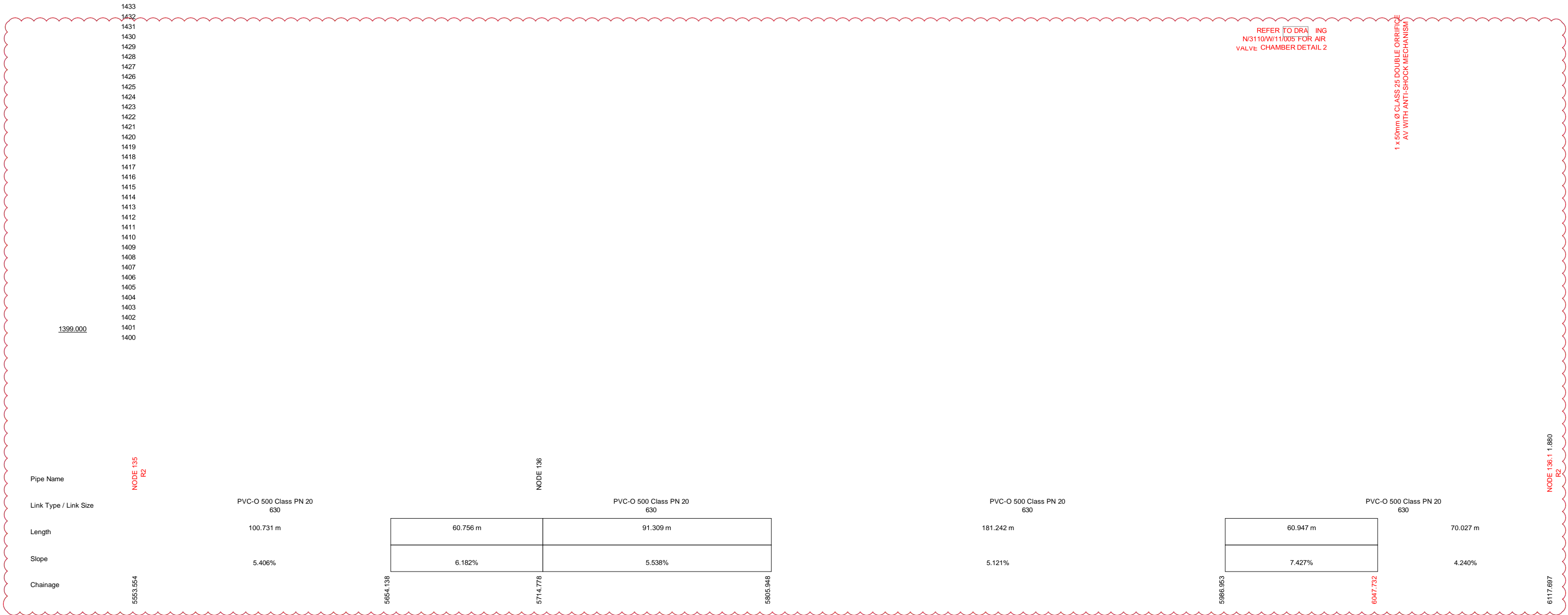
P.O. BOX 10345
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1200

Tel:(013) 755 1190
Fax:(013) 755 4904

DATE/DATUM	SEPTEMBER 2022
SCALE/SKAAL	AS SHOWN

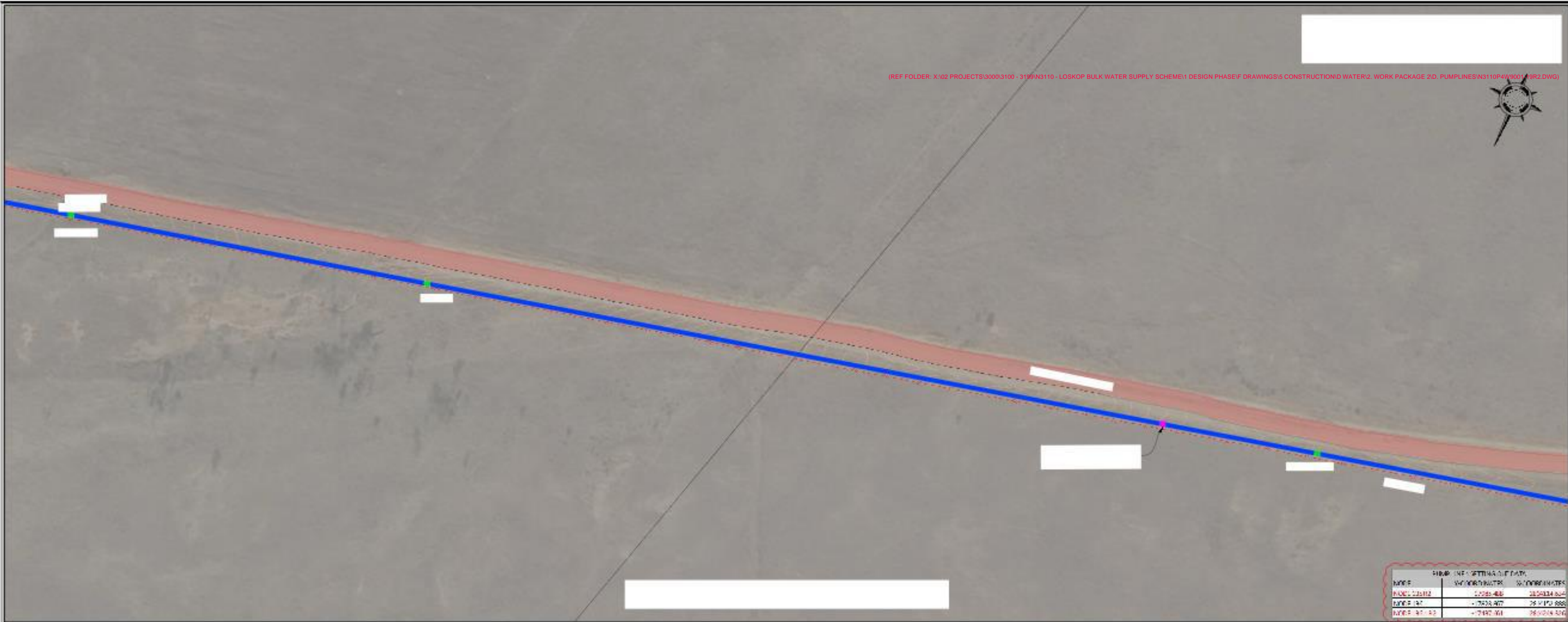
CLIENT DWG. NO.

KLIËNT TEK. NO.



BULK MAIN WATER NODE 135 R2 TO NODE 136.1 R2

SCALE 1:1000



SHEET: 11 OF 11 (11 OF 11)		
DATE	DATE	DATE
11/01/2011	11/01/2011	11/01/2011
11/01/2011	11/01/2011	11/01/2011
11/01/2011	11/01/2011	11/01/2011

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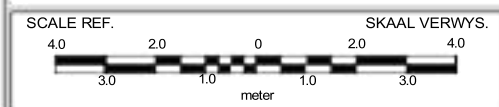
SERVICE	DIENS
WATER	



CLIENT	KLIËNT
Nkangala District Municipality	

PROJECT	PROEJ
LOSOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2	

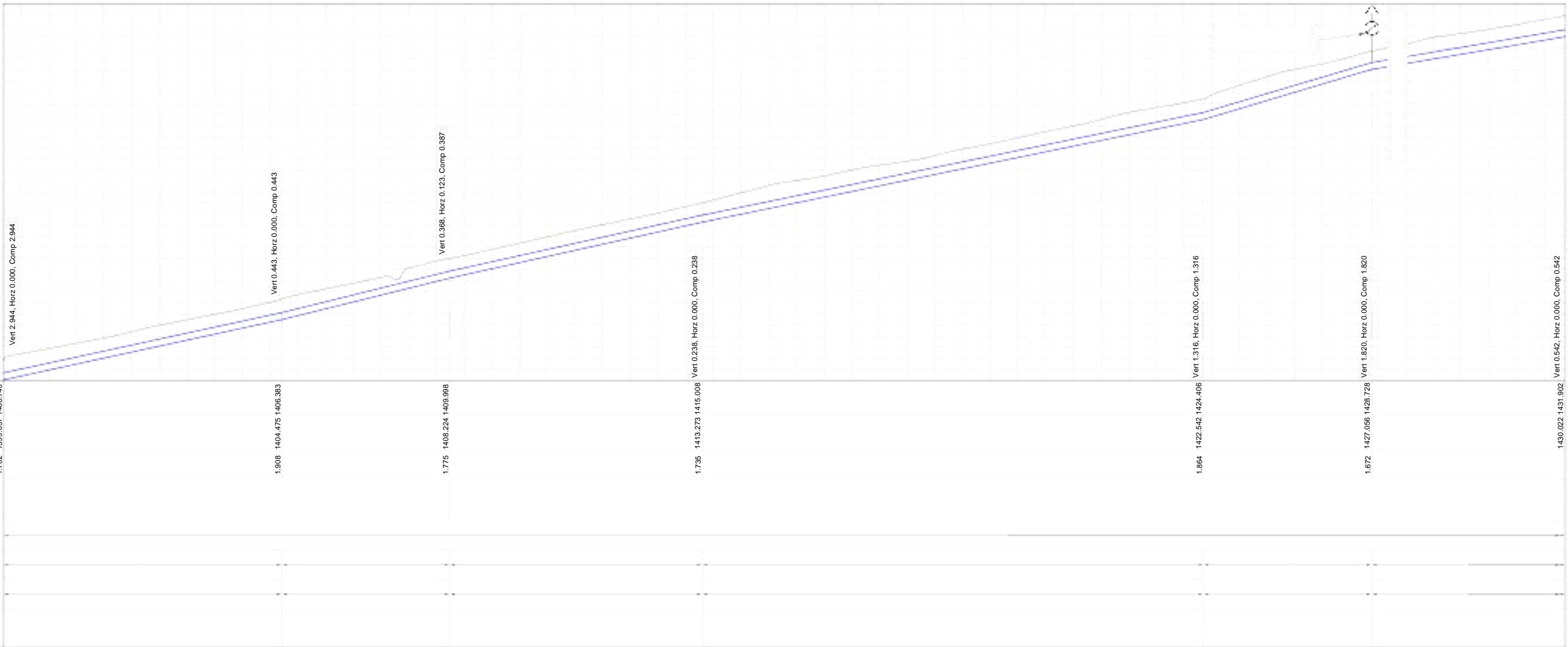
TITLE	TITEL
PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 11 OF 34	



CONSULTANT DWG. NO.	KONSULTANT TEK. NR.
N/3110/P4/W/9/011/R2	

Horizontal Scale: 1000
Vertical Scale: 250

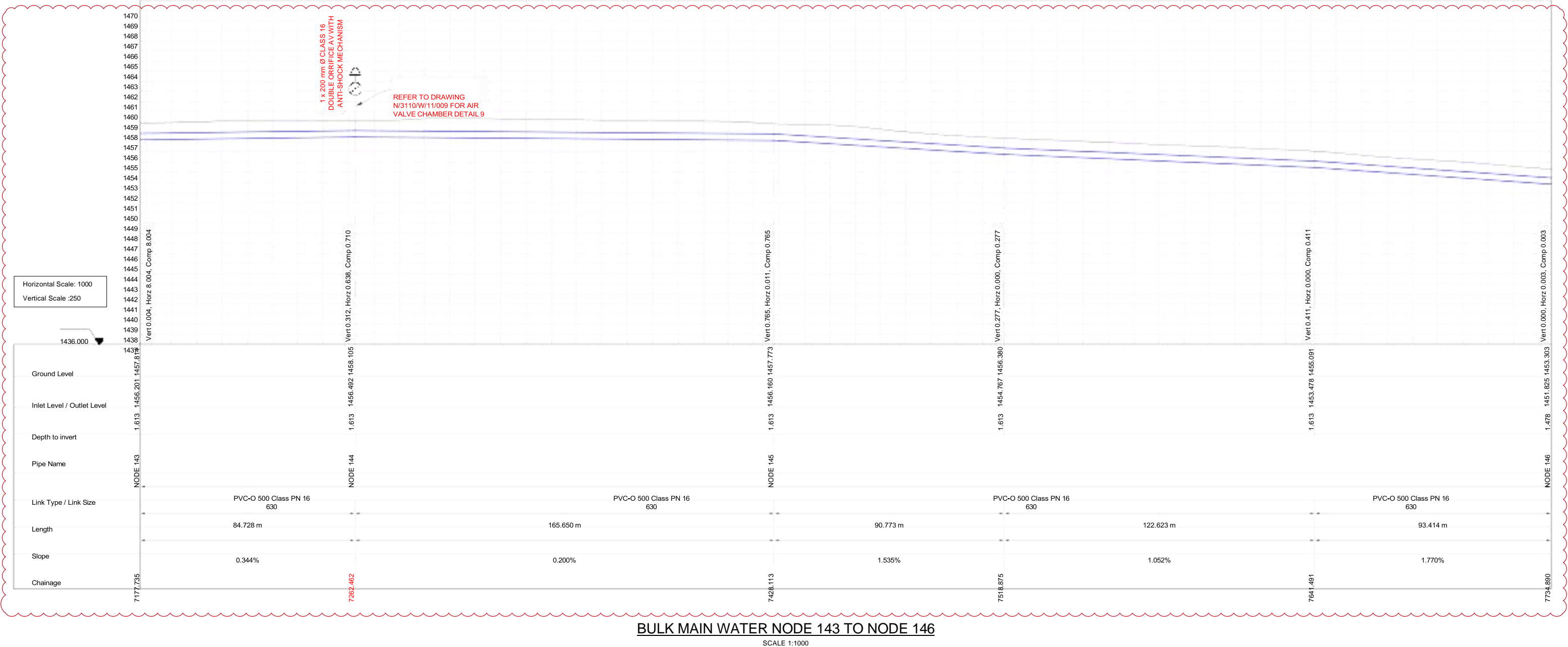
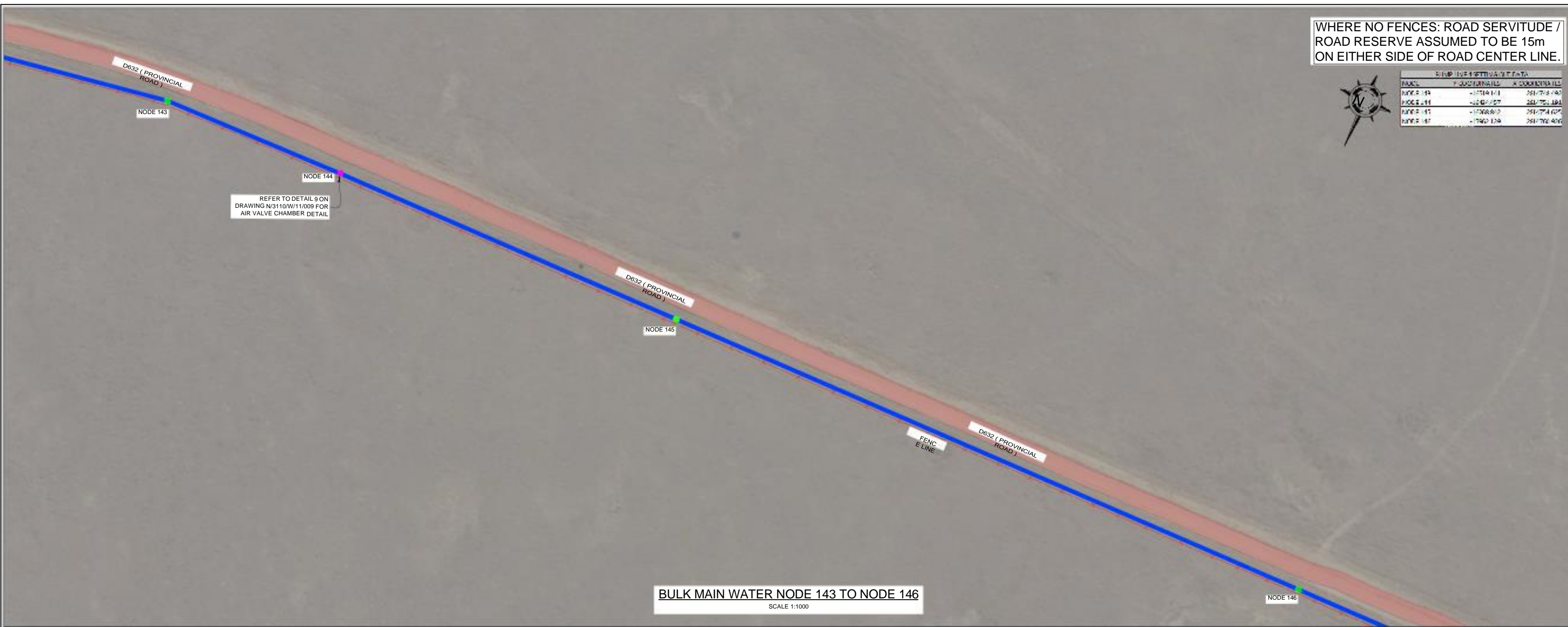
Ground Level
Inlet Level / Outlet Level
Depth to invert



BULK MAIN WATER NODE 140 TO NODE 143
SCALE 1:1000

(REF FOLDER: X:\02 PROJECTS\3000\3100 - 3199\N3110 - LOSKOP BULK WATER SUPPLY SCHEME\1 DESIGN PHASE\1 DRAWINGS\5 CONSTRUCTION\0 WATER\2. WORK PACKAGE 2\0. PUMPLINES\N3110P4W9001-19R2.DWG)

CONSULTANT DWG. NO.	N/3110/P4/W/9/013/R2
CLIENT DWG. NO.	-



CLIENT DWG. NO.	-
-----------------	---



- LEGEND:
- PROPOSED 630mmØ WATER MAIN
 - PROPOSED NODE
 - AIR VALVE CHAMBER
 - SCOUR VALVE
 - FENCE
 - GRAVEL ROAD
 - TEST PIT

NOTE:

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- COMPOUND BENDS BETWEEN 1° AND 2° MUST BE DEFLECTED AT TWO CONSECUTIVE PIPE JOINTS.

FOR CONSTRUCTION

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Rev	Description	Date	By
02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P.
01	REVISED RAW RESERVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P.

AMENDMENTS

SERVICE

WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9001-19R2.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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CLIENT

NKANGALA DISTRICT MUNICIPALITY

PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

TITLE

PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 16 OF 34

SCALE REF DATE

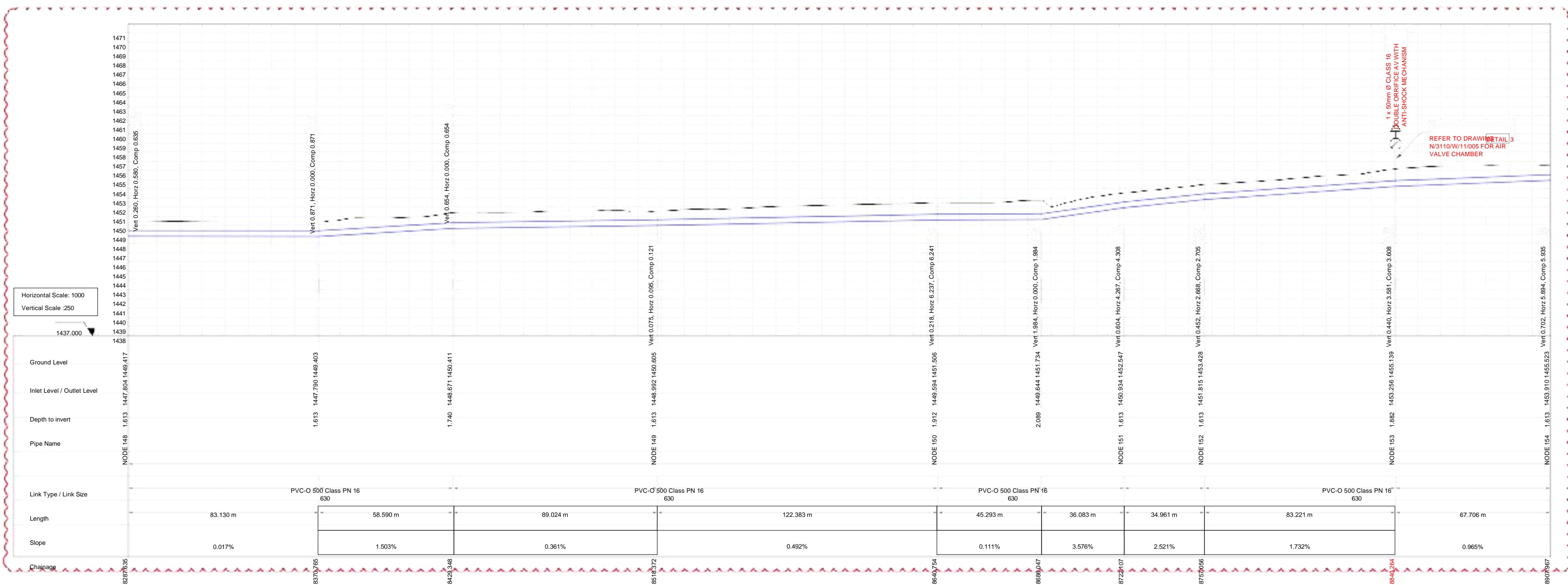
SCALE 1:1000 PAPER SIZE A1

30 10 10 30 METER

CONSULTANT DWG. NO.

N/3110/P4/W/9/016/R2

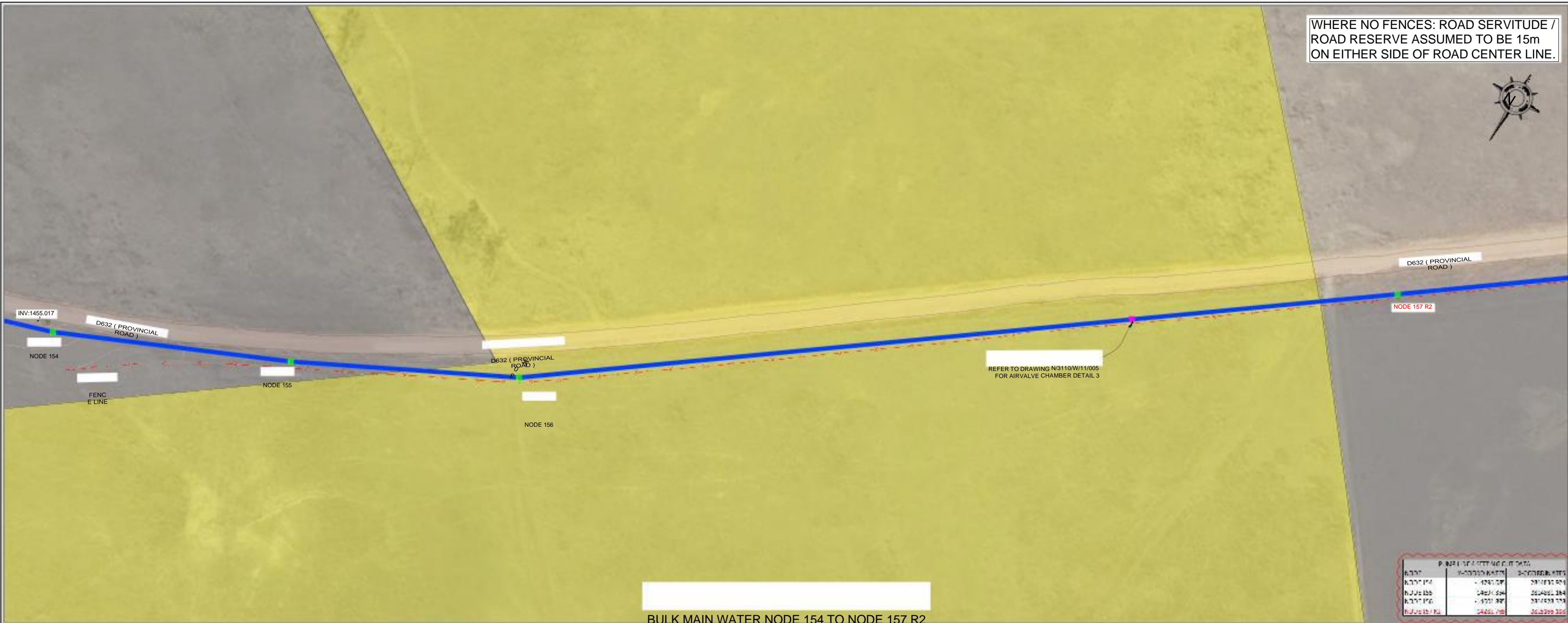
CLIENT DWG. NO.



BULK MAIN WATER NODE 148 TO NODE 154

SCALE 1:1000

(REF FOLDER: X:\02 PROJECTS\3000\3100 - 3199\N3110 - LOSKOP BULK WATER SUPPLY SCHEME\1 DESIGN PHASE\1 DRAWINGS\5 CONSTRUCTION\4 WATER\2. WORK PACKAGE 2\1. PUMPLINES\N3110P4W9001-19R2.DWG)



LEGEND:

- PROPOSED 630mmØ WATER MAIN
- PROPOSED NODE
- AIR VALVE CHAMBER
- SCOUR VALVE
- FENCE
- GRAVEL ROAD
- TEST PIT

NOTE:

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Rev	Description	Date	By
02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P.
01	REVISED RAW RESIVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P.

AMENDMENTS

SERVICE

WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9001-19R2.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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CLIENT

NKANGALA DISTRICT MUNICIPALITY

PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

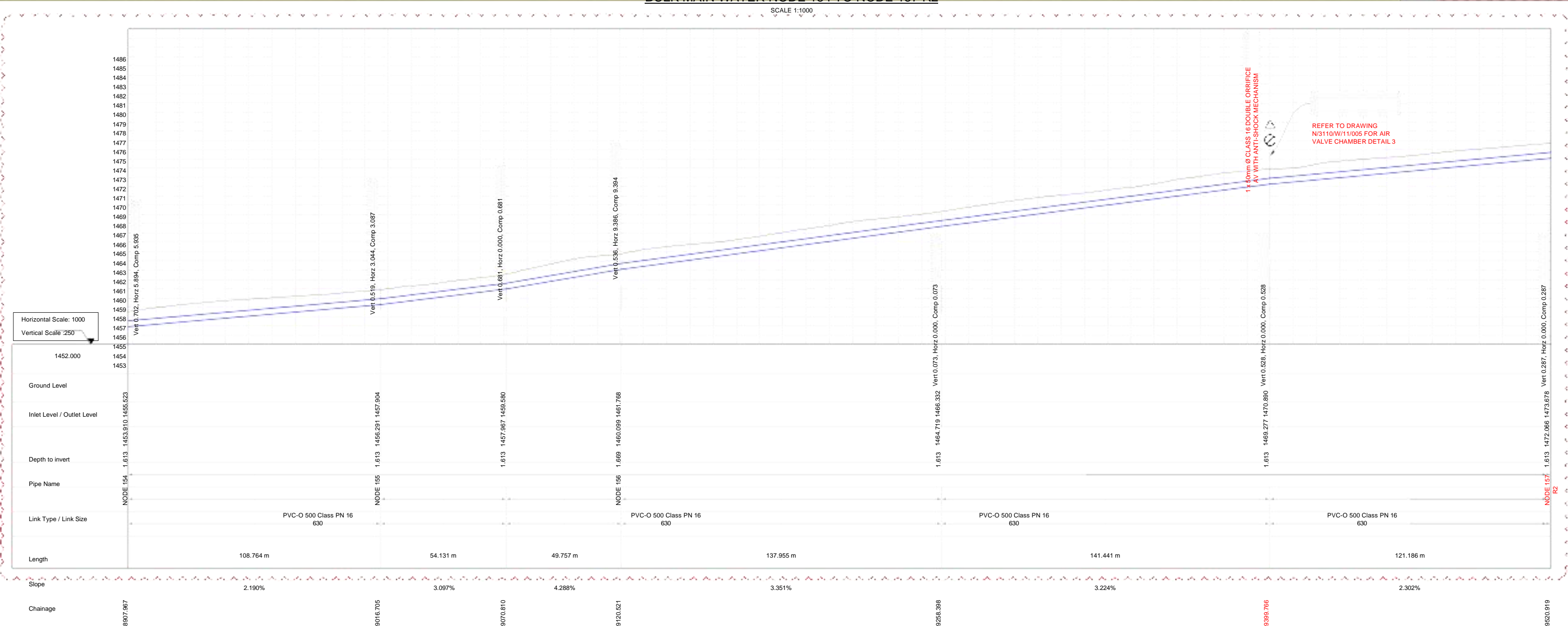
TITLE

PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 17 OF 34

SCALE REF.

DATE 10 OCTOBER 2022

SCALE 1 : 1000 PAPER SIZE A1



BULK MAIN WATER NODE 154 TO NODE 157 R2

SCALE 1:1000

(REF FOLDER: X:\02 PROJECTS\3000\3100 - 3199\N3110 - LOSKOP BULK WATER SUPPLY SCHEME\1 DESIGN PHASE\F DRAWINGS\5 CONSTRUCTION\D WATER\2. WORK PACKAGE 2\D. PUMPLINES\N3110P4W9001-19R2.DWG)

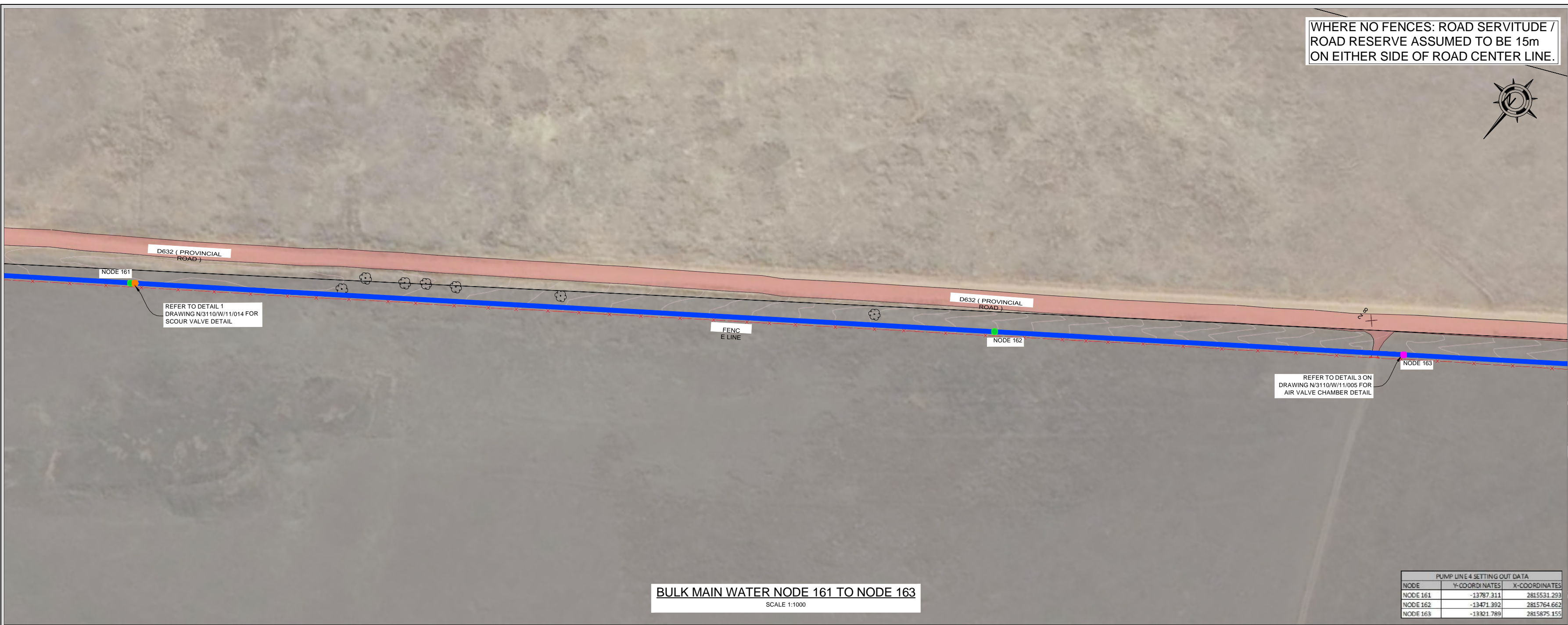
CONSULTANT DWG. NO.
N/3110/P4/W/9/017/R2
CLIENT DWG. NO.
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SCALE 1:1000

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CLIENT DWG. NO.

-



LEGEND:

- PROPOSED 630mmØ WATER MAIN
- PROPOSED NODE
- AIR VALVE CHAMBER
- SCOUR VALVE
- FENCE
- GRAVEL ROAD
- TEST PIT

NOTE:

ALL VERTICAL AND HORIZONTAL BENDS MUST BE CONSTRUCTED AS FOLLOWS:

- COMPOUND BENDS LESS THAN 1° SHOULD BE DEFLECTED AT THE PIPE JOINT
- COMPOUND BENDS BETWEEN 1° AND 2° MUST BE DEFLECTED AT TWO CONSECUTIVE PIPE JOINTS.

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Rev	Description	Date	By
02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P.
01	REVISED RAW RESIVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P.

AMENDMENTS

SERVICE

WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9001-19R2.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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CLIENT

NKANGALA DISTRICT MUNICIPALITY

PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

TITLE

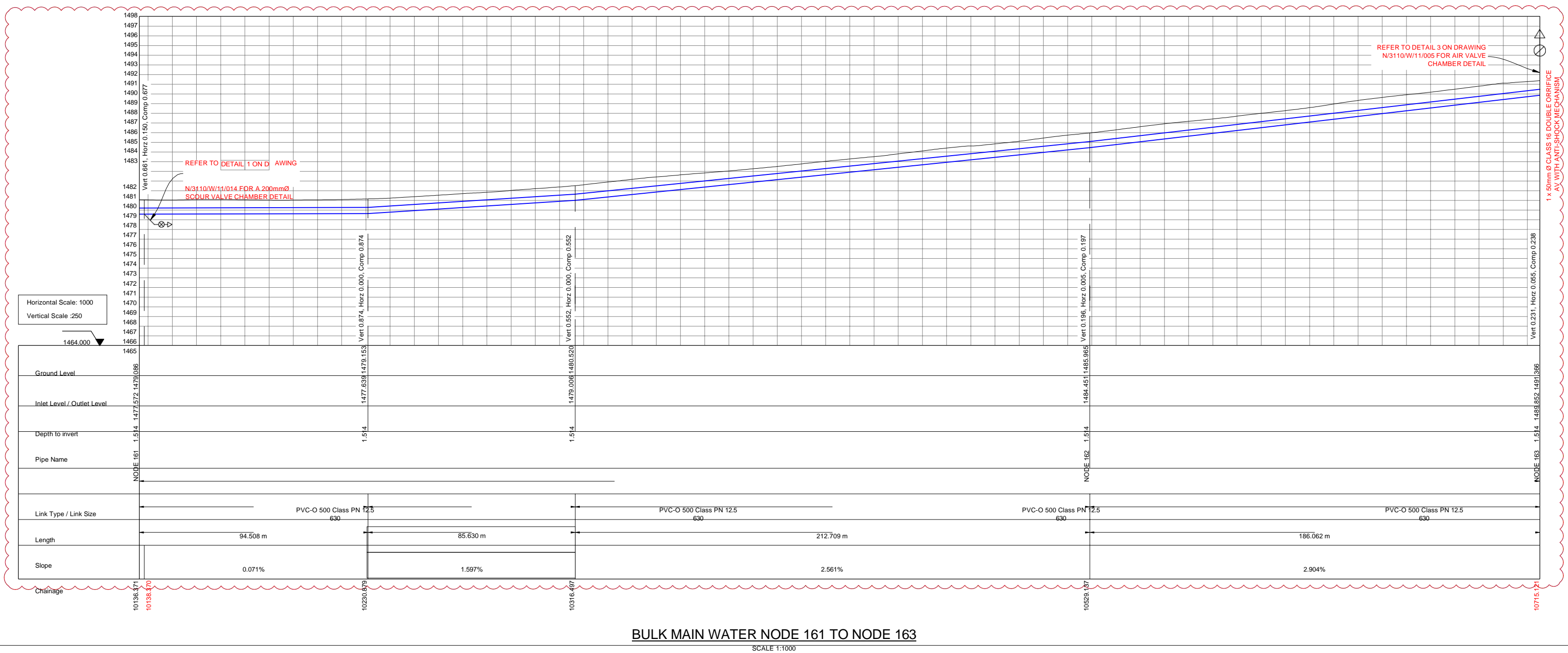
PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 19 OF 34

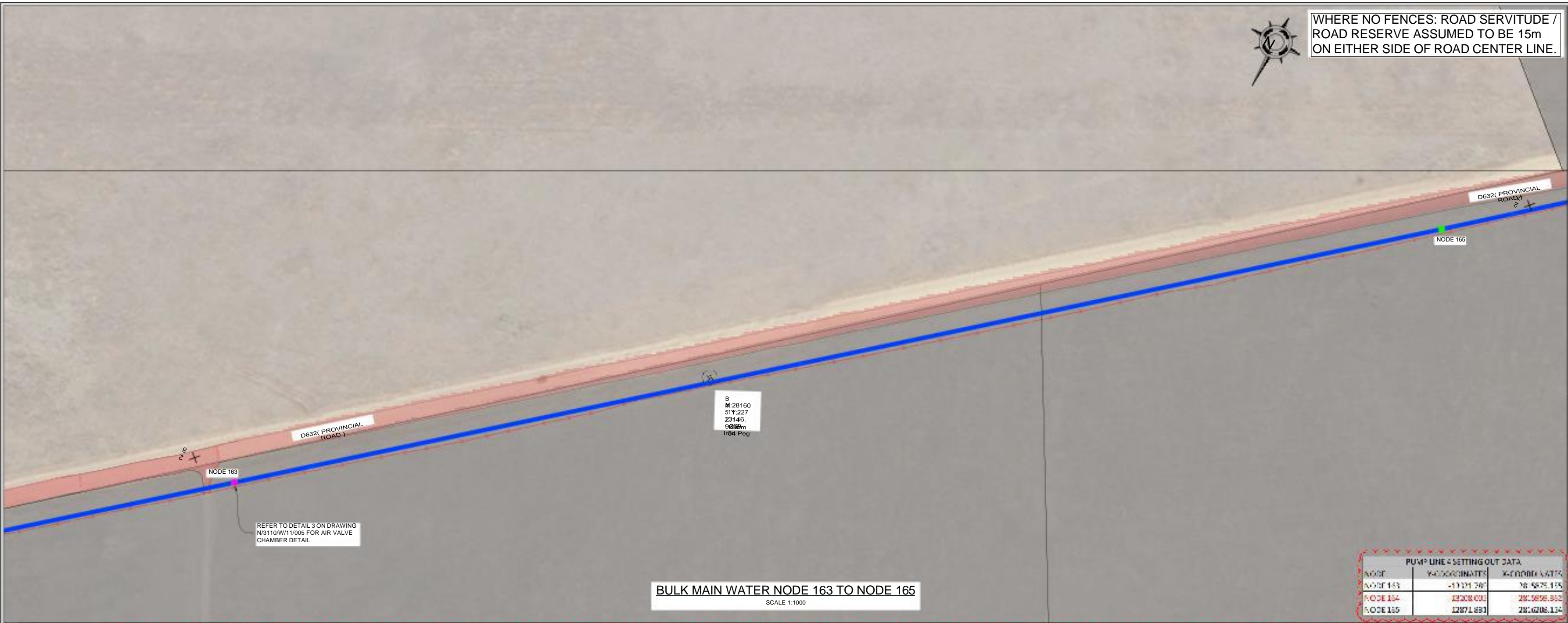
SCALE REF DATE

SCALE 1:1000 PAPER SIZE A1

CONSULTANT DWG. NO. N/3110/P4/W/9/019/R2

CLIENT DWG. NO.





- LEGEND:
- PROPOSED 630mmØ WATER MAIN
 - PROPOSED NODE
 - AIR VALVE CHAMBER
 - SCOUR VALVE
 - FENCE
 - GRAVEL ROAD
 - TEST PIT

NOTE:

ALL VERTICAL AND HORIZONTAL BENDS MUST BE CONSTRUCTED AS FOLLOWS:

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- COMPOUND BENDS BETWEEN 1° AND 2° MUST BE DEFLECTED AT TWO CONSECUTIVE PIPE JOINTS.

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02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P
01	REVISED RAW RESIVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P
Rev	Description	Date	By

AMENDMENTS

SERVICE

WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9020-2BR2.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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CLIENT

NKANGALA DISTRICT MUNICIPALITY

PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

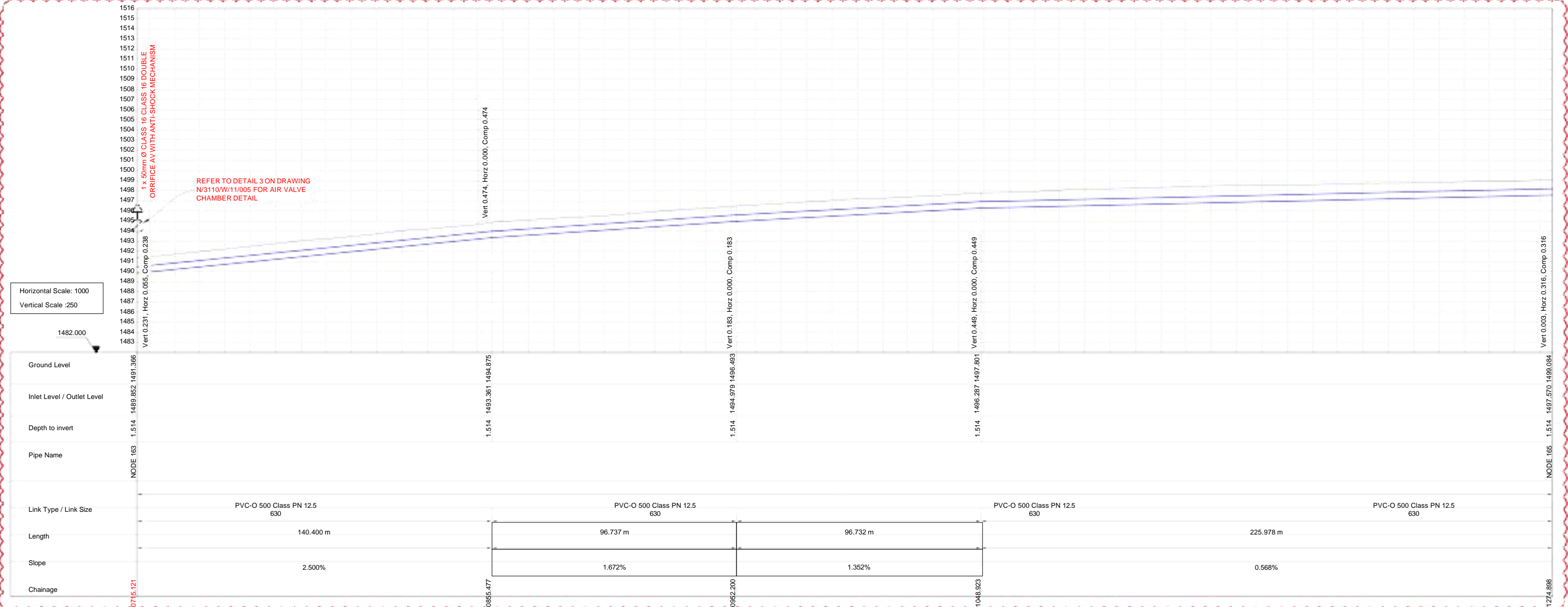
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PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 21 OF 34

DATE	OCTOBER 2022
SCALE	1 : 1000
PAPER SIZE	A1

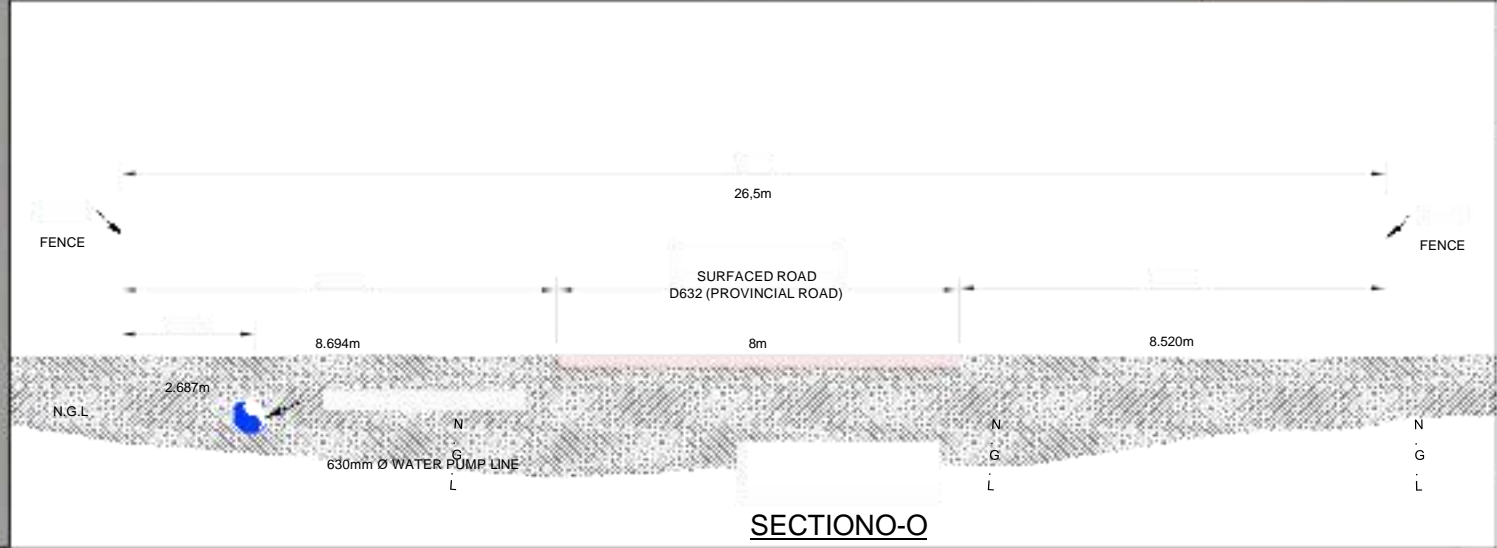
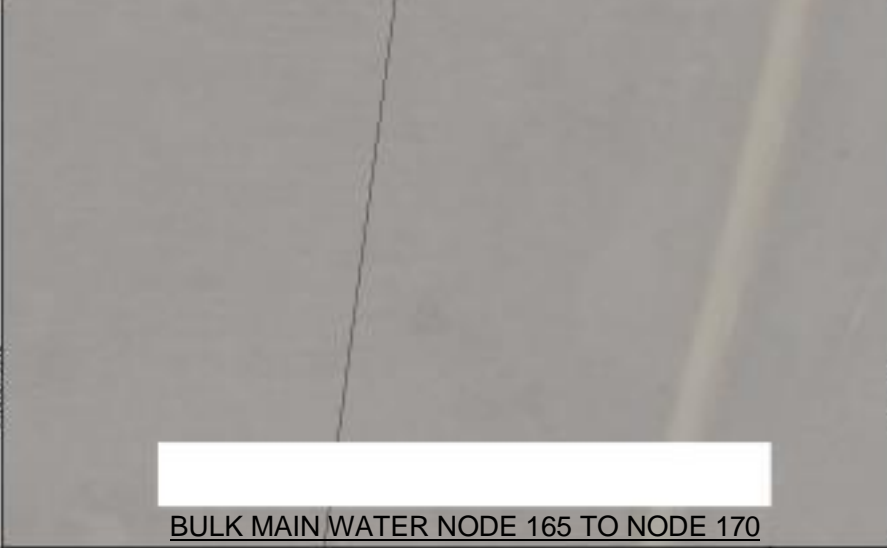
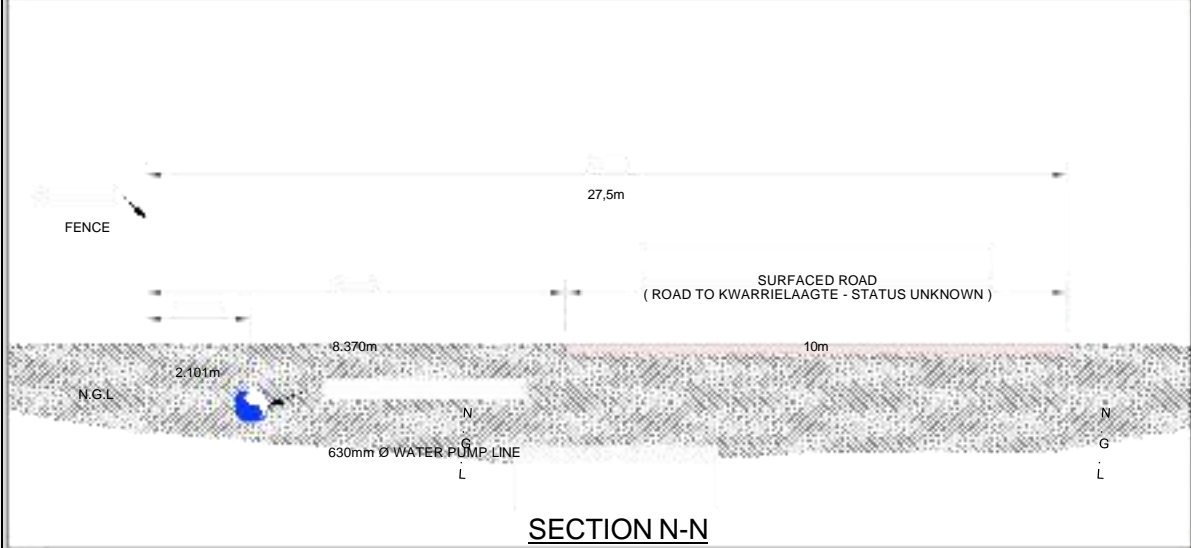
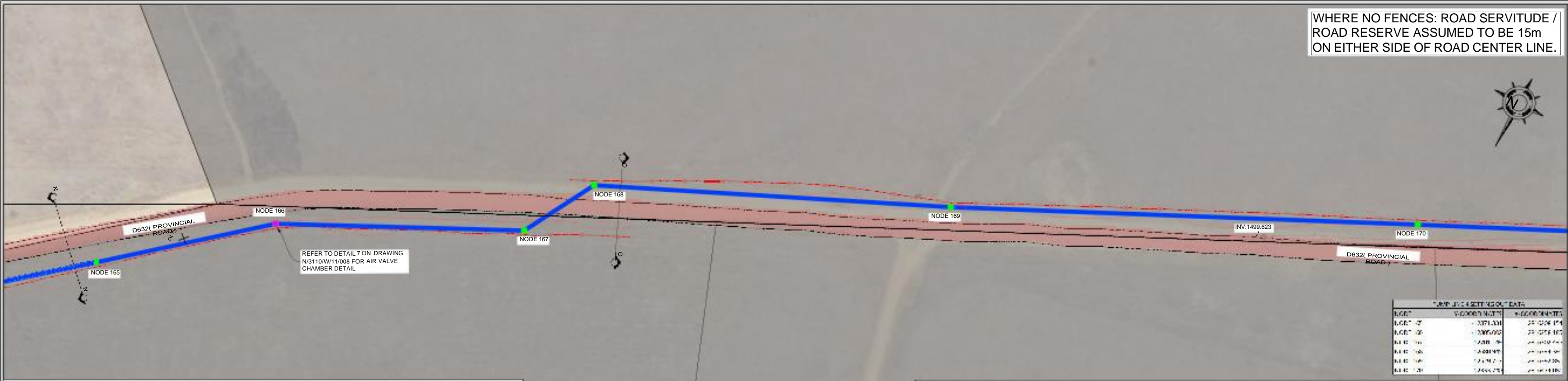
CONSULTANT DWG. NO.
N/3110/P4/W/9/020/R2

CLIENT DWG. NO.



BULK MAIN WATER NODE 163 TO NODE 165

SCALE 1:1000



- LEGEND:
- PROPOSED 630mmØ WATER MAIN
 - PROPOSED NODE
 - AIR VALVE CHAMBER
 - TEST PIT
 - FENCE
 - GRAVEL ROAD
 - TEST PIT

NOTE:

ALL VERTICAL AND HORIZONTAL BENDS MUST BE CONSTRUCTED AS FOLLOWS:

- COMPOUND BENDS LESS THAN 1° SHOULD BE DEFLECTED AT THE PIPE JOINT
- COMPOUND BENDS BETWEEN 1° AND 2° MUST BE DEFLECTED AT TWO CONSECUTIVE PIPE JOINTS.

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Rev	Description	Date	By
02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P.
01	REVISED RAW RESERVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P.

AMENDMENTS

SERVICE

WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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CLIENT

NKANGALA DISTRICT MUNICIPALITY

PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

TITLE

PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 22 OF 34

SCALE REF.

DATE OCTOBER 2022

SCALE 1 : 1000 PAPER SIZE A1

BULK MAIN WATER NODE 165 TO NODE 170

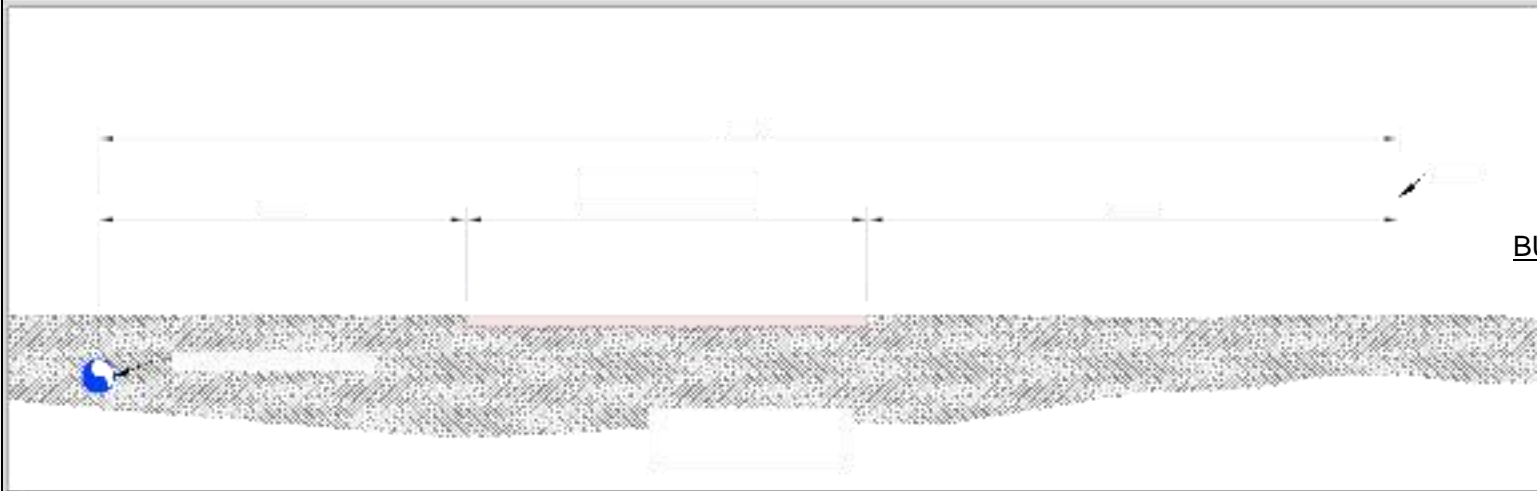
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CONSULTANT DWG. NO.	N/3110/P4/W/9/021/R2
CLIENT DWG. NO.	-

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TITLE			
PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 23 OF 34			
DATE		OCTOBER 2022	
SCALE	1 : 1000	PAPER SIZE	A1



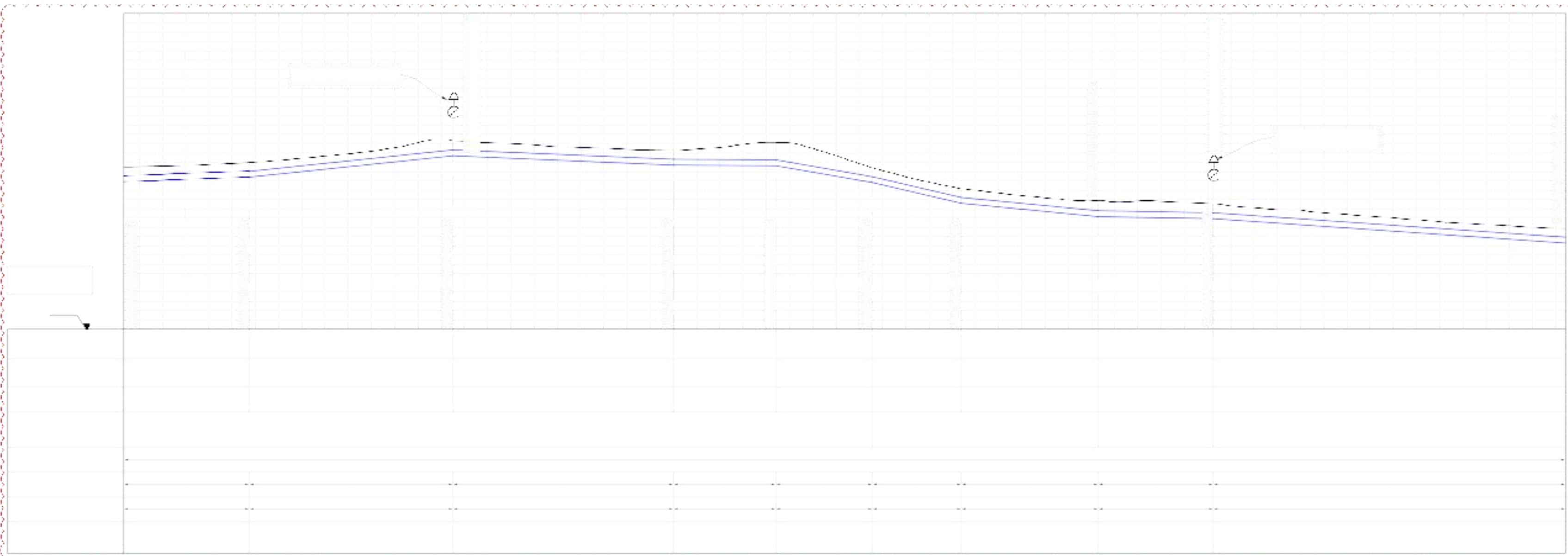
BULK MAIN WATER NODE 170 TO NODE 175

SCALE 1:1000

(REF FOLDER: X:\02 PROJECTS\3000\3100 - 3199\N3110 - LOSKOP BULK WATER SUPPLY SCHEME\1 DESIGN PHASE\5 DRAWINGS\5 CONSTRUCTION\2 WATER\2. WORK PACKAGE 2\2. PUMPLINES\N3110P4\W9020-28R2.DWG)



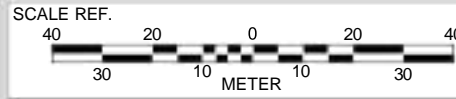
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NODE	NODE X COORDINATES	NODE Y COORDINATES
NODE 170	42331.46	24964.182
NODE 171	42444.44	24964.182
NODE 172	42555.42	24964.182
NODE 173	42666.40	24964.182
NODE 174	42777.38	24964.182
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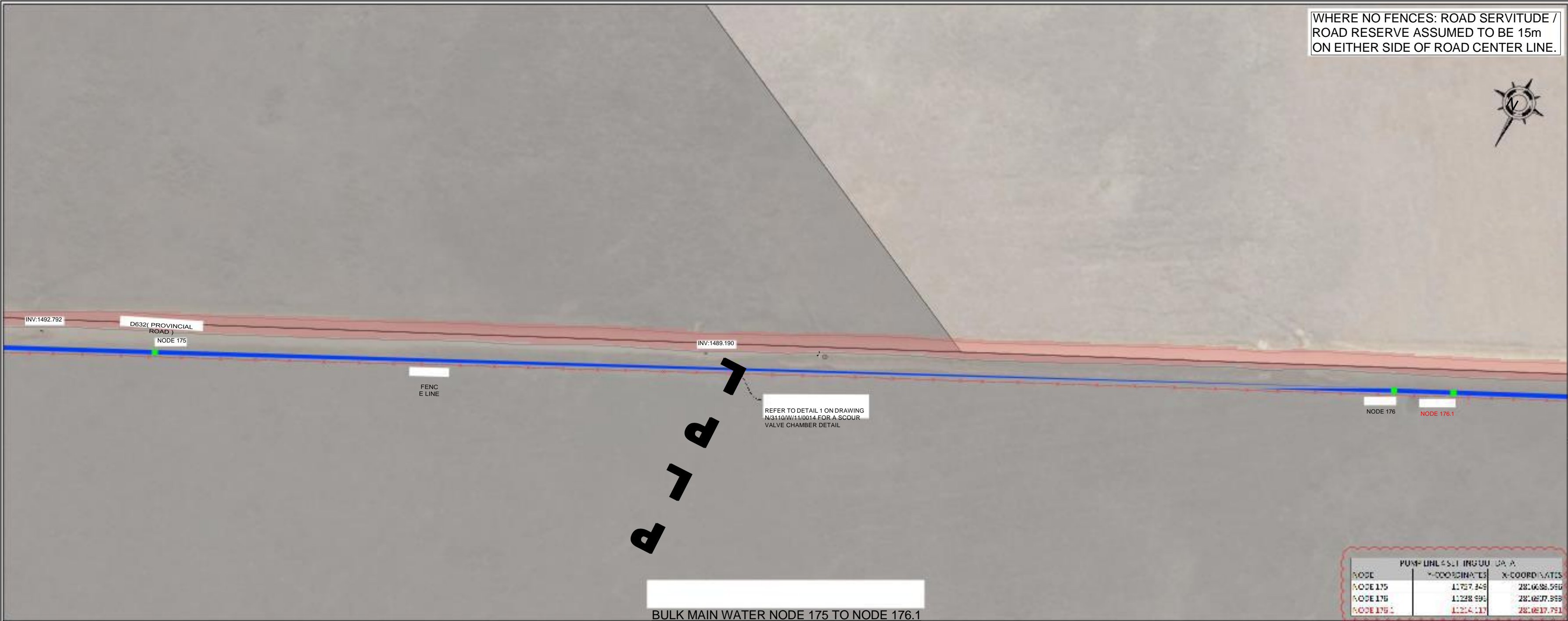


CONSULTANT DWG. NO.	N/3110/P4/W/9/022/R2
CLIENT DWG. NO.	-

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LEGEND:

- PROPOSED 630mmØ WATER MAIN
- PROPOSED NODE
- AIR VALVE CHAMBER
- TEST PIT
- FENCE
- GRAVEL ROAD
- TEST PIT

NOTE:

ALL VERTICAL AND HORIZONTAL BENDS MUST BE CONSTRUCTED AS FOLLOWS:

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02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P.
01	REVISED RAW RESIVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P.
Rev	Description	Date	By
AMENDMENTS			

SERVICE

WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9020-28R2.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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CLIENT

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PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

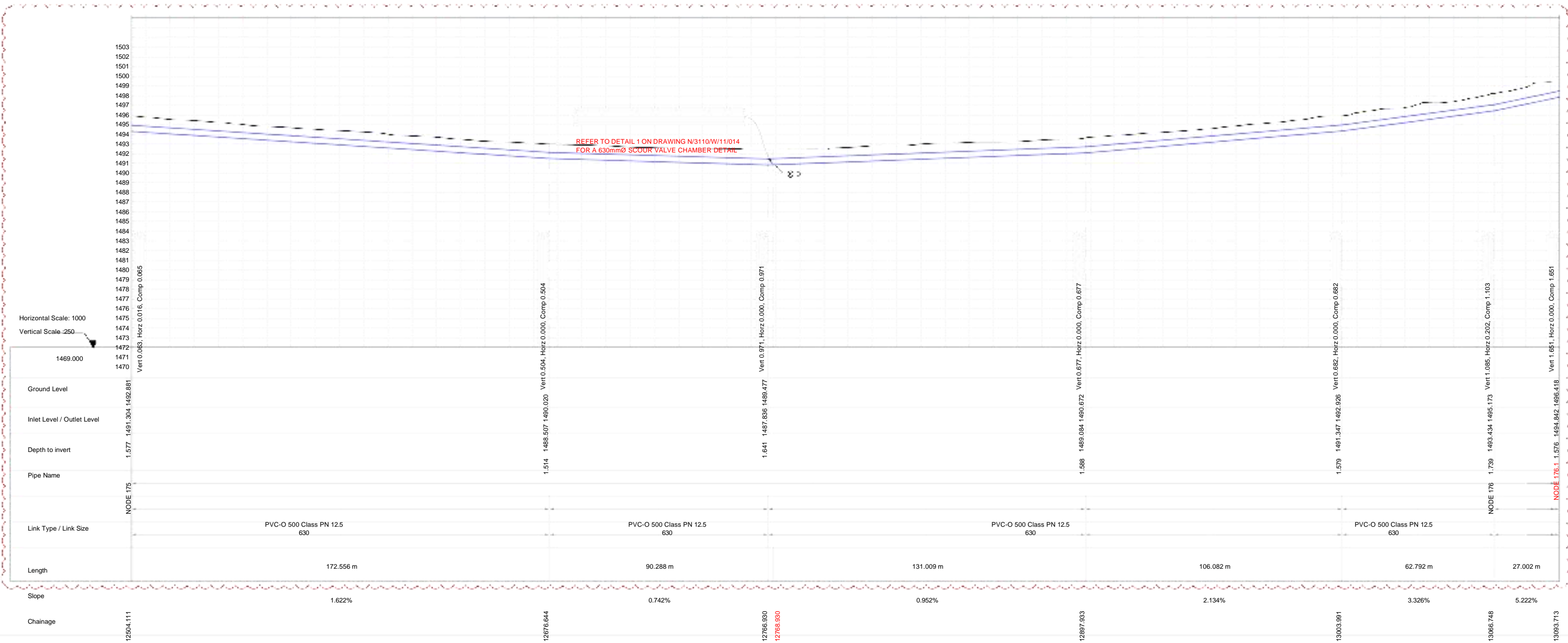
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PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 24 OF 34

SCALE REF.

DATE 10 OCTOBER 2022

SCALE 1:1250 PAPER SIZE A1



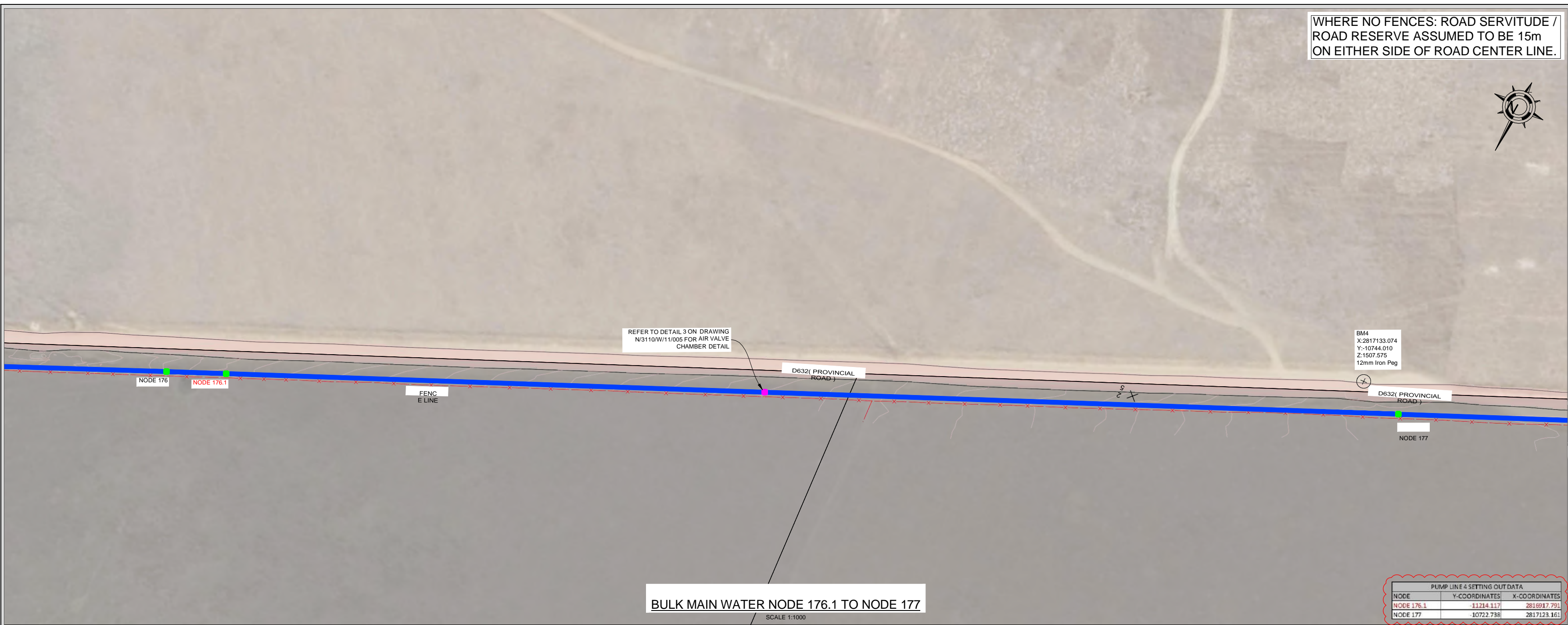
BULK MAIN WATER NODE 175 TO NODE 176.1

SCALE 1:1000

(REF FOLDER: X:\02 PROJECTS\3000\3100 - 3199\N3110 - LOSKOP BULK WATER SUPPLY SCHEME\1 DESIGN PHASE\F DRAWINGS\5 CONSTRUCTION\D WATER\2. WORK PACKAGE 2\D. PUMPLINES\N3110P4W9020-28R2.DWG)

CONSULTANT DWG. NO.
N/3110/P4/W/9/023/R2

CLIENT DWG. NO.
-



LEGEND:

- PROPOSED 630mmØ WATER MAIN
- PROPOSED NODE
- AIR VALVE CHAMBER
- TEST PIT
- FENCE
- GRAVEL ROAD
- TEST PIT

NOTE:

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Rev	Description	Date	By
02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P
01	REVISED RAW RESIVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P

SERVICE AMENDMENTS

WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9020-2BR2.dwg
CHECKED	W.J. STRYDOM (jnr)

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PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

TITLE

PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 25 OF 34

DATE

OCTOBER 2022

SCALE

1:1000

PAPER SIZE

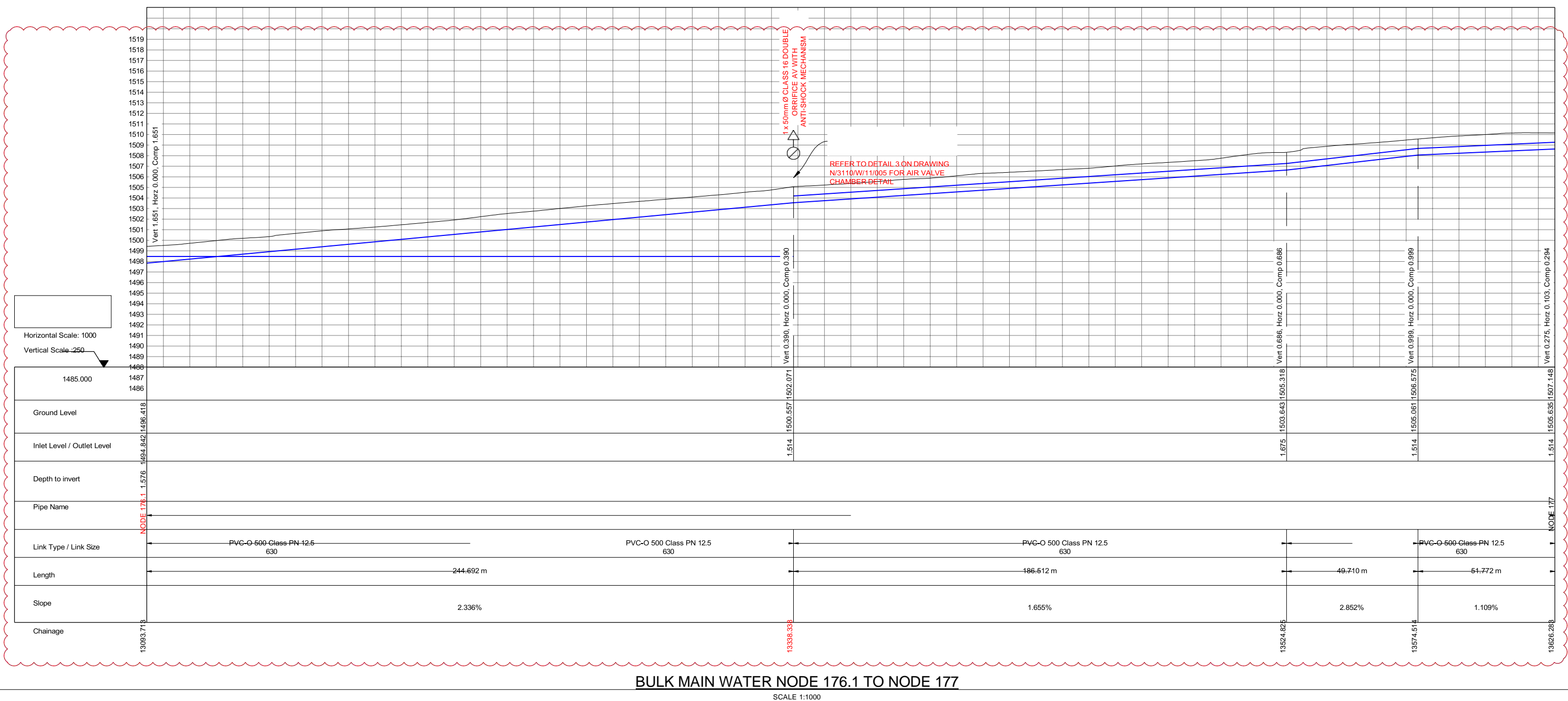
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CONSULTANT DWG. NO.

N/3110/P4/W/9/024/R2

CLIENT DWG. NO.

-







- LEGEND:
- PROPOSED 630mmØ WATER MAIN
 - PROPOSED NODE
 - AIR VALVE CHAMBER
 - TEST PIT
 - FENCE
 - GRAVEL ROAD
 - TEST PIT

NOTE:

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02	REVISED PIPE ROUTE & LONG SECTION	2022/02/16	N.P.
01	REVISED RAW RESIVIOR POSITION (REVISED TOTAL CHAINAGE)	2022/11/09	N.P.
Rev	Description	Date	By
AMENDMENTS			

SERVICE
WATER

DESIGNED	W.J. STRYDOM (jnr)
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9020-28R2.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

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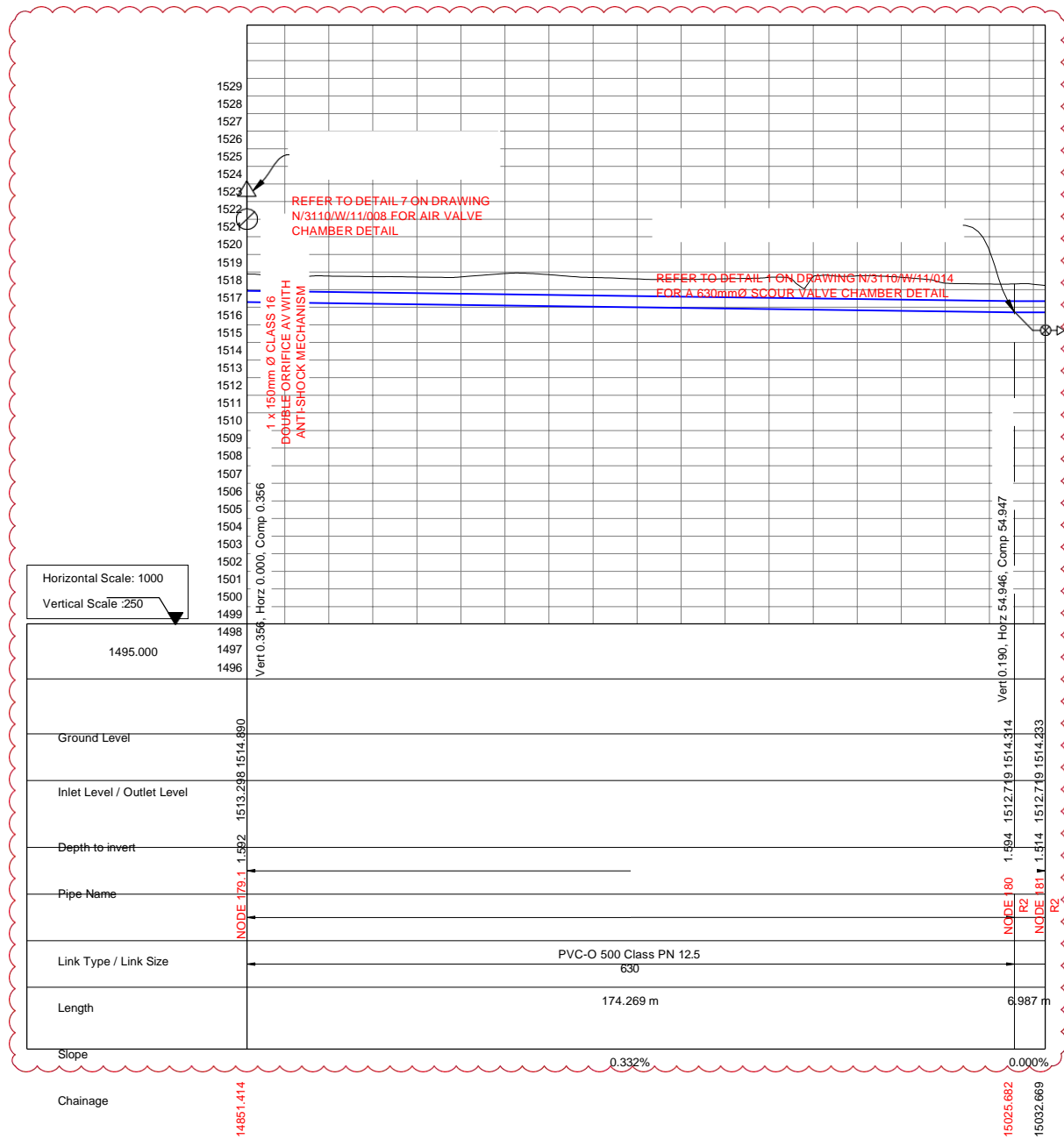
NKANGALA DISTRICT MUNICIPALITY

PROJECT
LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

TITLE
PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 28 OF 34

SCALE REF.
DATE: 10 OCTOBER 2022
SCALE: 1 : 1000 METER PAPER SIZE A1

CONSULTANT DWG. NO.
N/3110/P4/W/9/027/R2

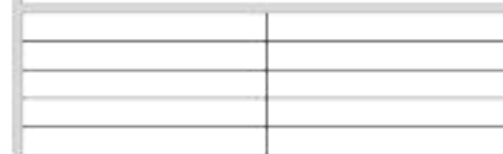
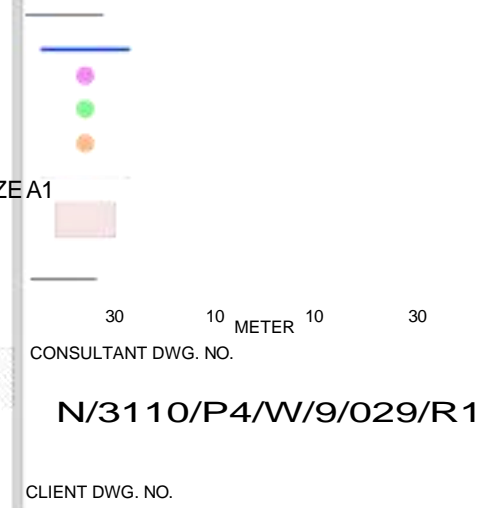
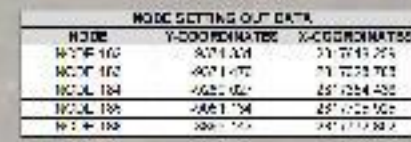


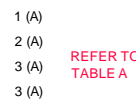
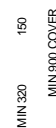
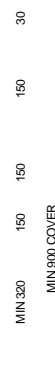
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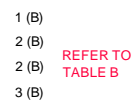
CLIENT DWG. NO.

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SCALE 1:15



SCALE 1:15



N.T.S

[illegible]

WATER

	J. LUCKHOFF
	M. DAVEL
IE	N3110RWW11002-3.dwg
	W.J. STRYDOM (jnr)
	W.J. STRYDOM (jnr)

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PROJECT

TITLE

DATE		OCTOBER 2022	
SCALE	1 : 1000	PAPER SIZE	A1

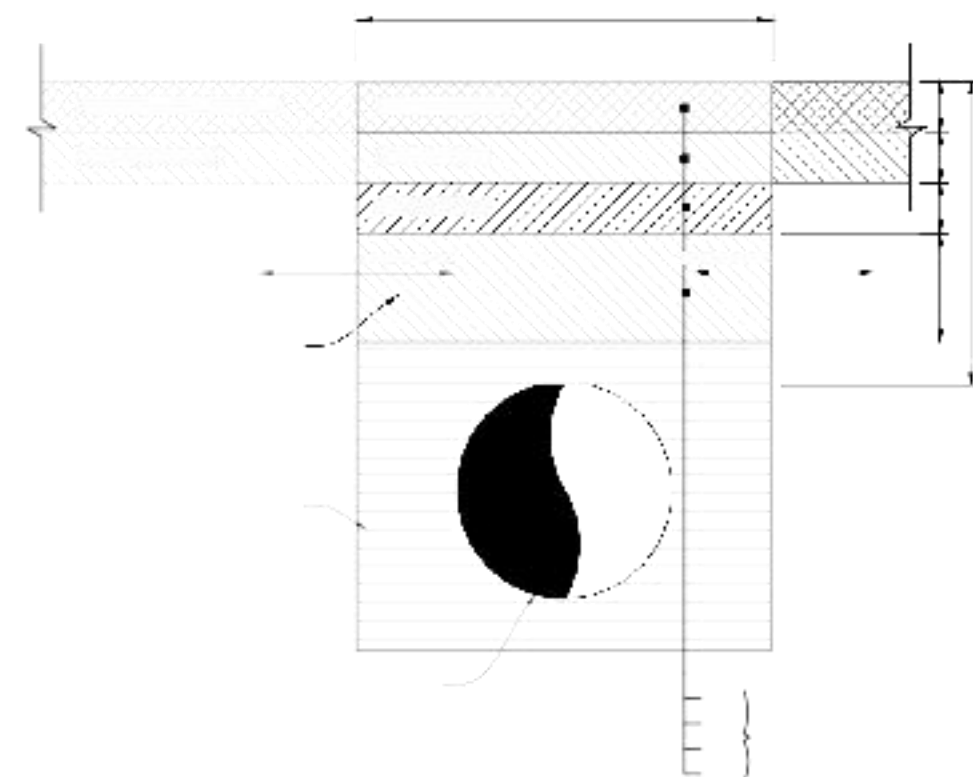
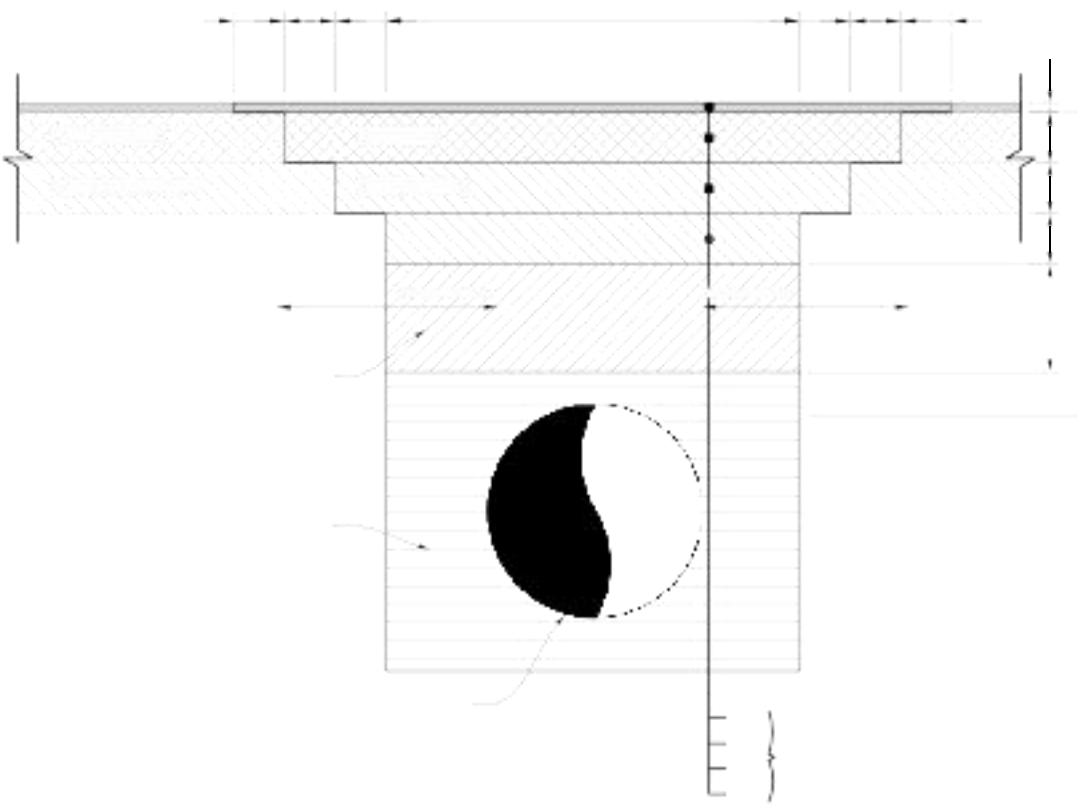
TABLE (A) N-3110 LOGICAL RESIDENTIAL BULK WATER SUPPLY SCHEME GRAVEL ROAD RENOVATING									
30mm Asphalt for surface resurfacing									
LAYER NO	LAYER THICKNESS	LAYER DESCRIPTION	DOLITE 1000	MINIMUM 100% COMPACTED IN PLACE	MINIMUM 100% COMPACTED IN PLACE	MINIMUM 100% COMPACTED IN PLACE	MINIMUM 100% COMPACTED IN PLACE	MINIMUM 100% COMPACTED IN PLACE	MINIMUM 100% COMPACTED IN PLACE
1	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
2	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
3	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
4	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
5	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
6	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
7	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
8	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
9	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
10	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%

TOP OF MANHOLE COVER

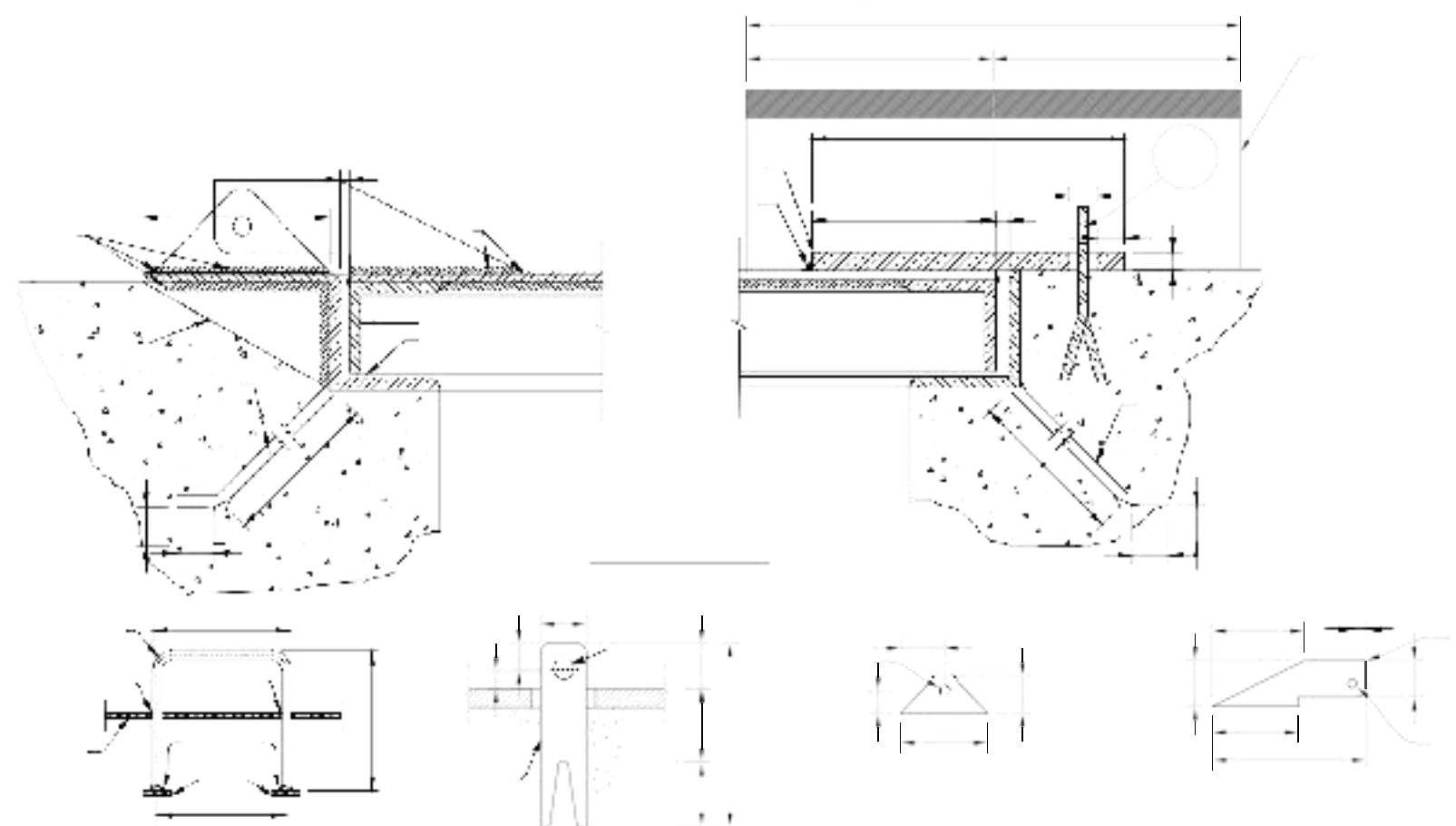
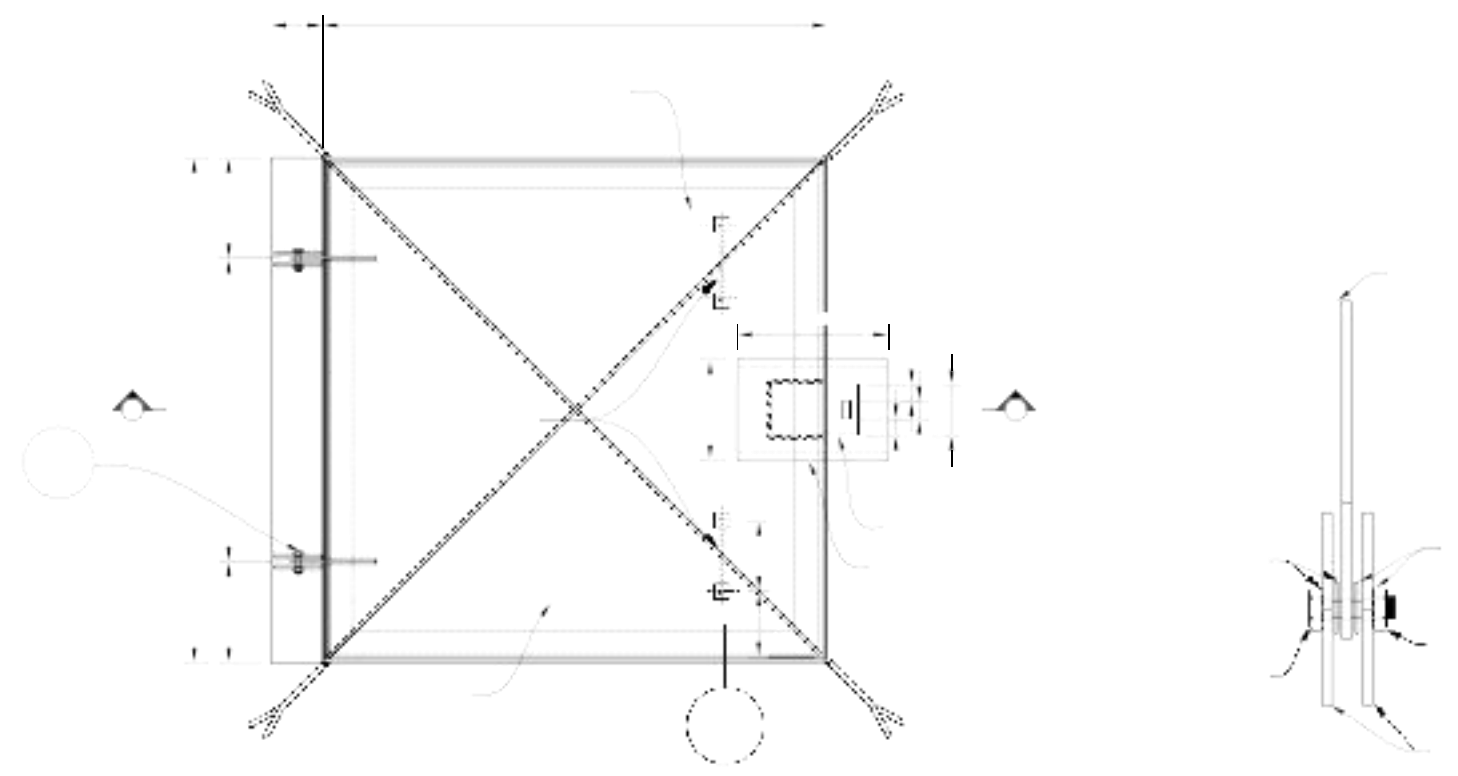
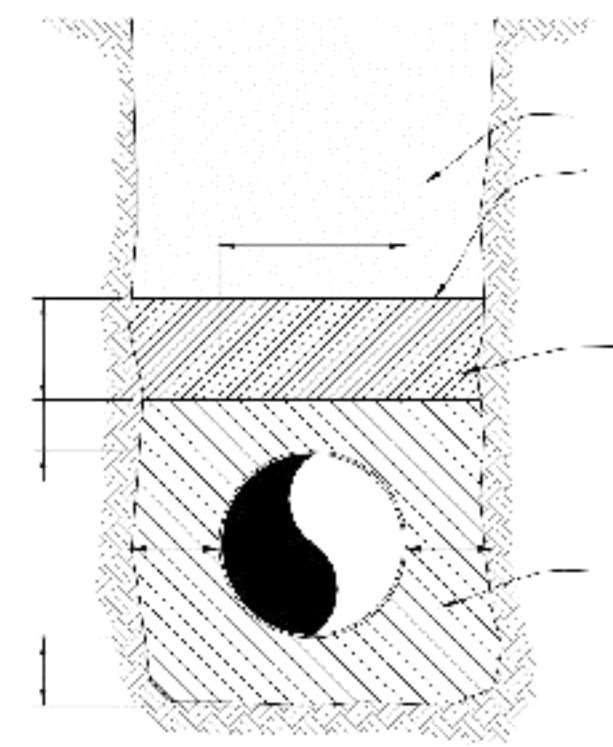
TABLE (B) N-3110 LOGICAL RESIDENTIAL BULK WATER SUPPLY SCHEME GRAVEL ROAD RENOVATING									
30mm Asphalt for surface resurfacing									
LAYER NO	LAYER THICKNESS	LAYER DESCRIPTION	DOLITE 1000	MINIMUM 100% COMPACTED IN PLACE	MINIMUM 100% COMPACTED IN PLACE	MINIMUM 100% COMPACTED IN PLACE	MINIMUM 100% COMPACTED IN PLACE	MINIMUM 100% COMPACTED IN PLACE	MINIMUM 100% COMPACTED IN PLACE
1	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
2	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
3	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
4	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
5	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
6	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
7	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
8	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
9	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%
10	100mm	Asphalt 100mm	100%	100%	100%	100%	100%	100%	100%

DETAIL 3: TYPICAL MANHOLE COVER AND FRAME DETAILS

(REF FOLDER: X:\02 PROJECTS\3000\3100 - 3199\N3110 LOGICAL BULK WATER SUPPLY SCHEME\DESIGN PHASE 1\DRAWINGS\5 CONSTRUCTION\D WATER\2. WORK PACKAGE 2.D. PUMPLINES\N3110RW11002-3.DWG)



EXTERNAL DIAMETER OF PIPE (mm)	INTERNAL DIAMETER OF PIPE (mm)	EXTERNAL DIAMETER OF PIPE (mm)	INTERNAL DIAMETER OF PIPE (mm)
100	80	150	120
200	160	300	240
400	320	600	480
800	640	1200	960



CONSULTANT DWG. NO.
N/3110/RW/W/11/002

CLIENT DWG. NO.
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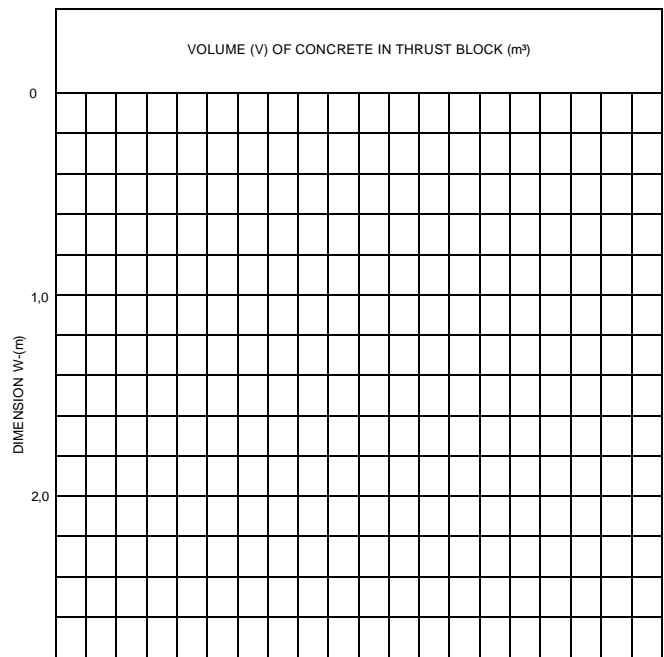
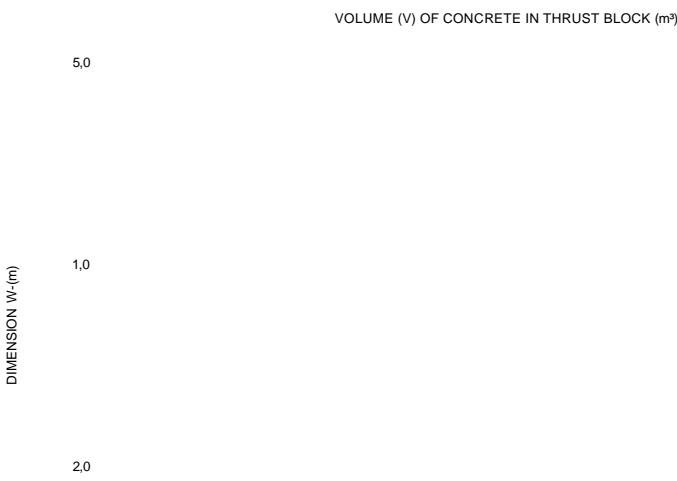
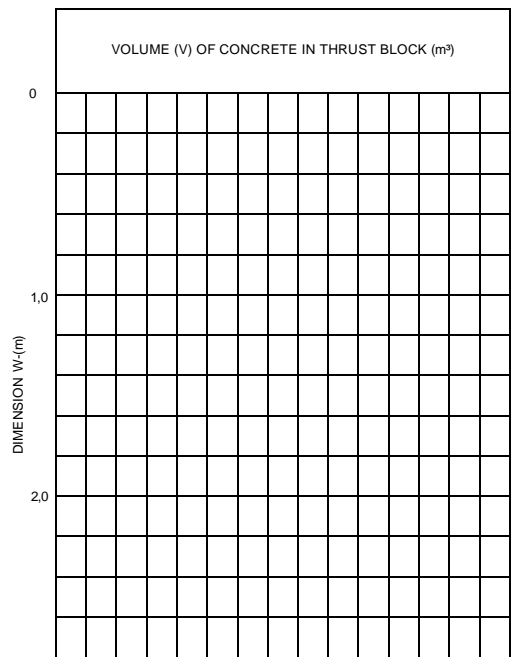
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SCALE REF.
0.75 0.25 0.25 0.75
METER

The graph illustrates the relationship between Pipe Diameter (mm) and Working Pressure (m) for three different pipe classes: CLASS 30, CLASS 60, and CLASS 90. The Y-axis represents Pipe Diameter (mm) from 100 to 500, and the X-axis represents Working Pressure (m) from 0 to 10. The curves show that for a given pipe diameter, the working pressure increases as the pipe class increases. Conversely, for a given working pressure, the pipe diameter increases as the pipe class increases.

Pipe Diameter (mm)	CLASS 30 (m)	CLASS 60 (m)	CLASS 90 (m)
100	~0.8	~1.2	~1.6
200	~1.6	~2.4	~3.2
300	~2.4	~3.6	~4.8
400	~3.2	~4.8	~6.4
500	~4.0	~6.0	~8.0

[illegible]

ANCHOR BLOCK CAST AGAINST
UNDISTURBED EXCAVATION.

X

SIDE OF TRENCH

2

7

SIDE OF TRENCH

SIDE OF TRENCH

D = DEPTH OF BLOCK.

SCALE 1:10

90° BEND & END CAP
75MM DIA: 'W' = 0.5m MINIMUM
110MM DIA: 'W' = 0.6m MINIMUM
160MM DIA: 'W' = 0.75m MINIMUM
200MM DIA: 'W' = 0.8m MINIMUM
250MM DIA: 'W' = 0.85m MINIMUM

45 ° BEND & T-PIECE

75MM DIA: 'W' = 0.5m MINIMUM
110MM DIA: 'W' = 0.6m MINIMUM
160MM DIA: 'W' = 0.75m MINIMUM
200MM DIA: 'W' = 0.8m MINIMUM
250MM DIA: 'W' = 0.85m MINIMUM

22.5° & 11° BENDS

75MM DIA: 'W' = 0.5m MINIMUM
110MM DIA: 'W' = 0.6m MINIMUM
160MM DIA: 'W' = 0.75m MINIMUM
200MM DIA: 'W' = 0.8m MINIMUM
250MM DIA: 'W' = 0.85m MINIMUM

FOR CONSTRUCTION

[illegible]

SERVICE

WATER

DESIGNED	J. LUCKHOFF
DRAWN	M. DAVEL
CAD FILE NAME	N3110RWW11002-3.dwg
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

P.O. BOX 10345
MBOMBELA
1200
Tel:(013) 755 1190
Fax:(013) 755 4904

CLIENT

NKANGALA DISTRICT
MUNICIPALITY

PROJECT

LOSOP REGIONAL BULK WATER
SUPPLY SCHEME: WORK PACKAGE 2

TITLE

RAW WATER GRAVITY MAIN ALONG
CANAL ROUTE: GENERAL DETAILS:
SHEET 2 OF 2

DATE		OCTOBER 2022	
SCALE	AS SHOWN	PAPER SIZE	A1

PLAN: 90° BEND AND END CAP
N.T.S.

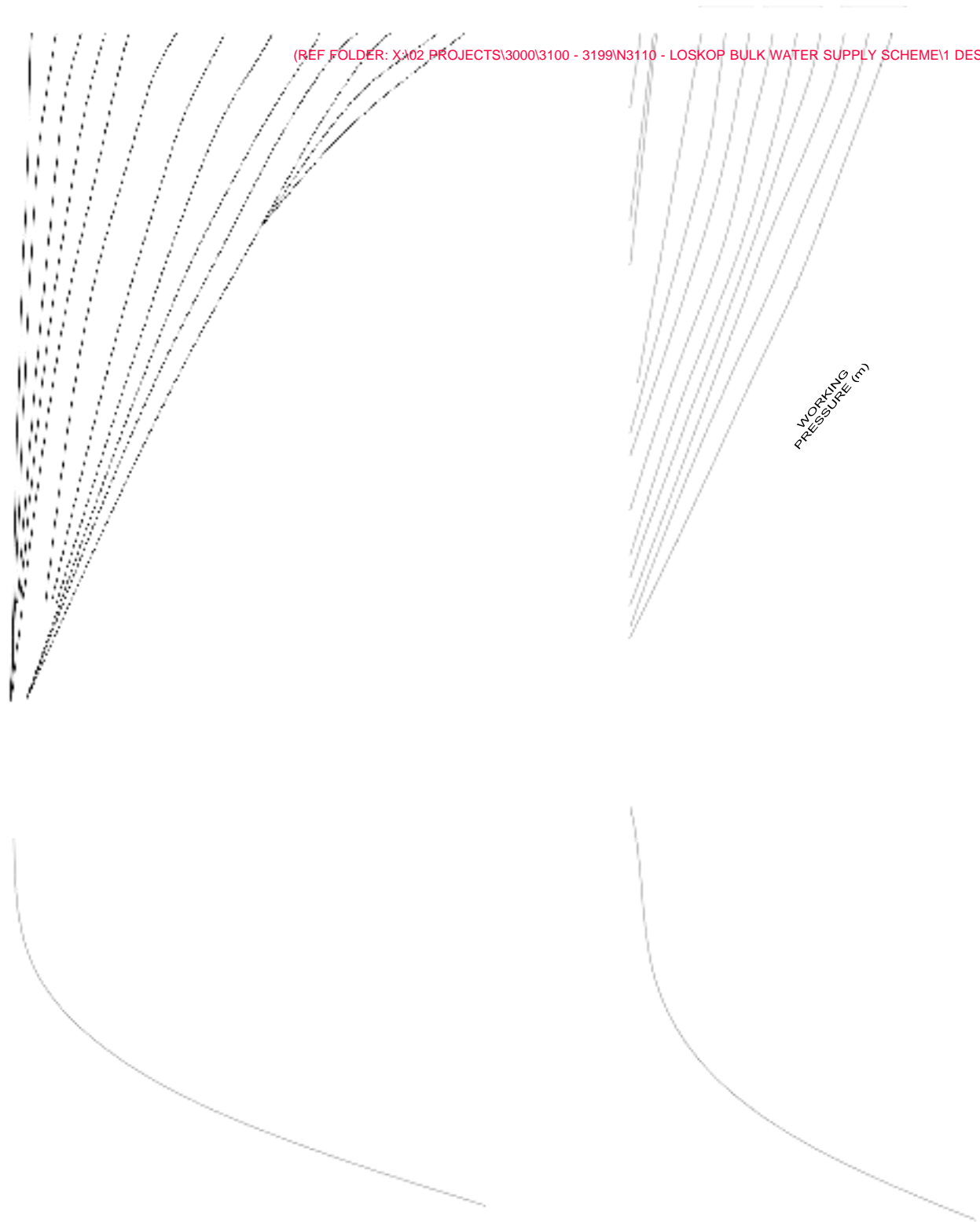
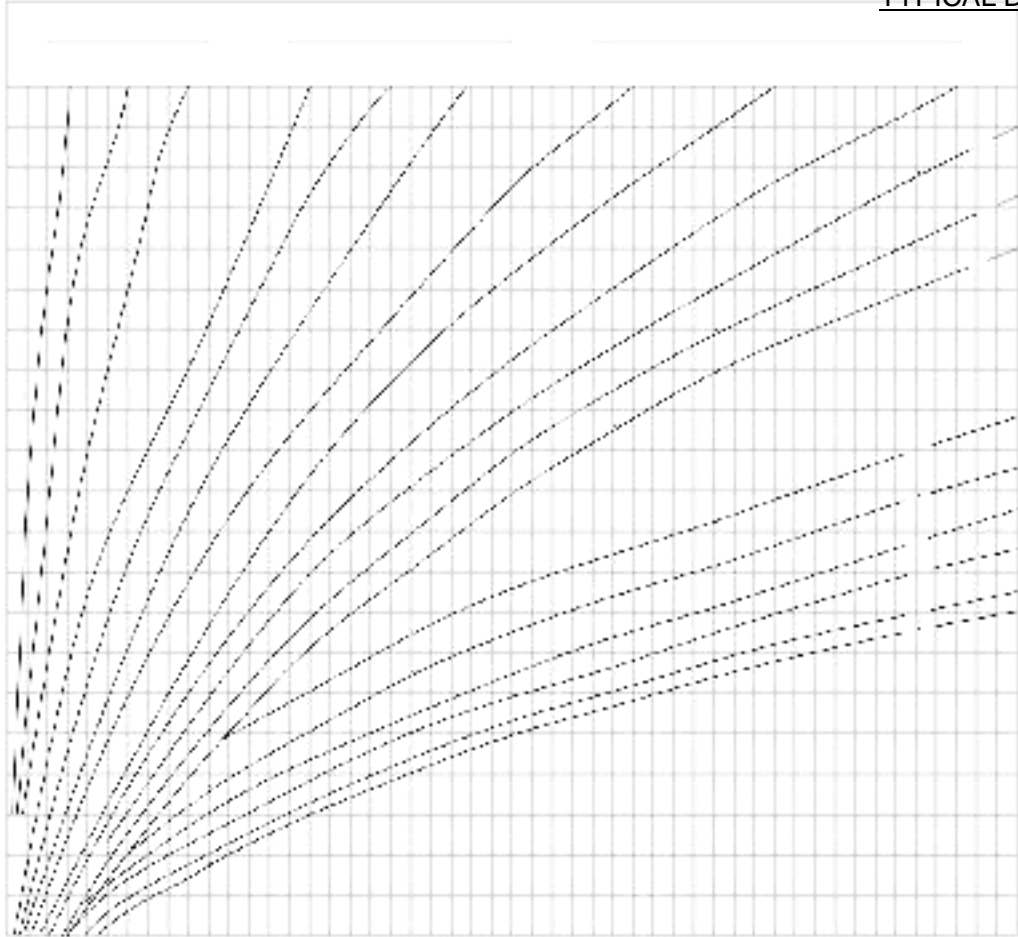
PLAN: 45° BEND AND EQUAL TEE-PIECE
N.T.S.

PLAN: 22.5° BEND
N.T.S.

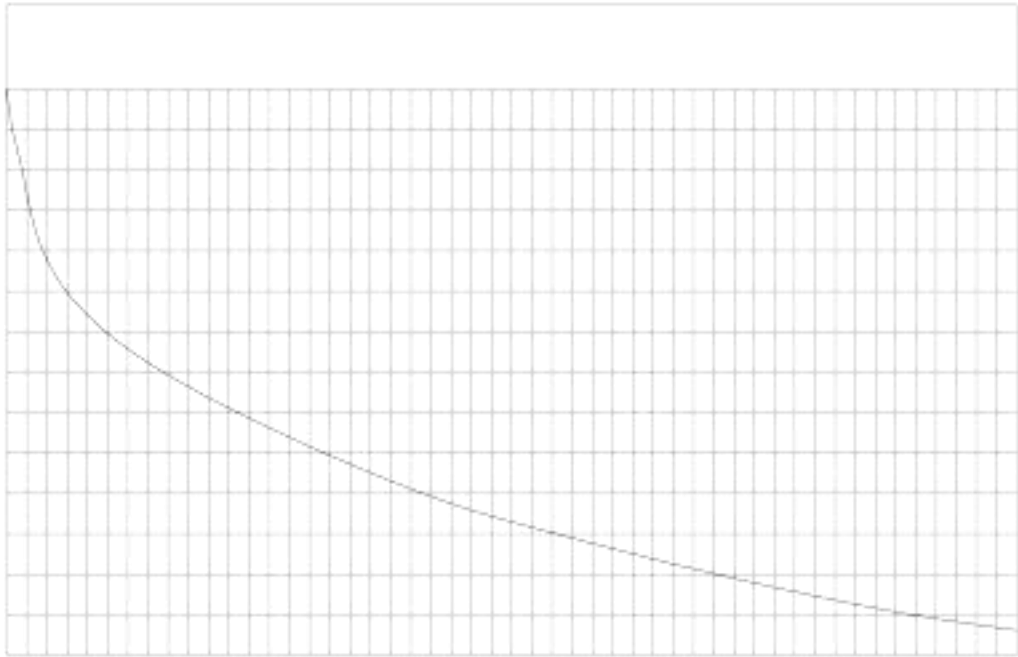
TYPICAL SECTION THROUGH
THRUST BLOCK
N.T.S.

N.T.S.

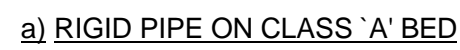
TYPICAL DETAILS OF THRUST BLOCKS



(REF FOLDER: X\02 PROJECTS\3000\3100 - 3199\N3110 - LOSKOP BULK WATER SUPPLY SCHEME\1 DESIGN PHASE\F DRAWINGS\5 CONSTRUCTION\2 WATER\2. WORK PACKAGE 2\2. PUMPLINES\N3110\RW\11002-3.DWG)



DIMENSIONS OF ANCHOR BLOCK FOR T-PIECE			
PIPE DIAMETER	E	n	z
50	300	250	50
75	475	375	75
100	650	500	100
125	825	625	125
150	1000	750	150
175	1175	875	175
200	1350	1000	200
225	1525	1125	225
250	1700	1250	250
275	1875	1375	275
300	2050	1500	300
325	2225	1625	325
350	2400	1750	350
375	2575	1875	375
400	2750	2000	400
425	2925	2125	425
450	3100	2250	450
475	3275	2375	475
500	3450	2500	500
525	3625	2625	525
550	3800	2750	550
575	3975	2875	575
600	4150	3000	600
625	4325	3125	625
650	4500	3250	650
675	4675	3375	675
700	4850	3500	700
725	5025	3625	725
750	5200	3750	750
775	5375	3875	775
800	5550	4000	800
825	5725	4125	825
850	5900	4250	850
875	6075	4375	875
900	6250	4500	900
925	6425	4625	925
950	6600	4750	950
975	6775	4875	975
1000	6950	5000	1000
1025	7125	5125	1025
1050	7300	5250	1050
1075	7475	5375	1075
1100	7650	5500	1100
1125	7825	5625	1125
1150	8000	5750	1150
1175	8175	5875	1175
1200	8350	6000	1200
1225	8525	6125	1225
1250	8700	6250	1250
1275	8875	6375	1275
1300	9050	6500	1300
1325	9225	6625	1325
1350	9400	6750	1350
1375	9575	6875	1375
1400	9750	7000	1400
1425	9925	7125	1425
1450	10100	7250	1450
1475	10275	7375	1475
1500	10450	7500	1500
1525	10625	7625	1525
1550	10800	7750	1550
1575	10975	7875	1575
1600	11150	8000	1600
1625	11325	8125	1625
1650	11500	8250	1650
1675	11675	8375	1675
1700	11850	8500	1700
1725	12025	8625	1725
1750	12200	8750	1750
1775	12375	8875	1775
1800	12550	9000	1800
1825	12725	9125	1825
1850	12900	9250	1850
1875	13075	9375	1875
1900	13250	9500	1900
1925	13425	9625	1925
1950	13600	9750	1950
1975	13775	9875	1975
2000	13950	10000	2000
2025	14125	10125	2025
2050	14300	10250	2050
2075	14475	10375	2075
2100	14650	10500	2100
2125	14825	10625	2125
2150	15000	10750	2150
2175	15175	10875	2175
2200	15350	11000	2200
2225	15525	11125	2225
2250	15700	11250	2250
2275	15875	11375	2275
2300	16050	11500	2300
2325	16225	11625	2325
2350	16400	11750	2350
2375	16575	11875	2375
2400	16750	12000	2400
2425	16925	12125	2425
2450	17100	12250	2450
2475	17275	12375	2475
2500	17450	12500	2500
2525	17625	12625	2525
2550	17800	12750	2550
2575	17975	12875	2575
2600	18150	13000	2600
2625	18325	13125	2625
2650	18500	13250	2650
2675	18675	13375	2675
2700	18850	13500	2700
2725	19025	13625	2725
2750	19200	13750	2750
2775	19375	13875	2775
2800	19550	14000	2800
2825	19725	14125	2825
2850	19900	14250	2850
2875	20075	14375	2875
2900	20250	14500	2900
2925	20425	14625	2925
2950	20600	14750	2950
2975	20775	14875	2975
3000	20950	15000	3000
3025	21125	15125	3025
3050	21300	15250	3050
3075	21475	15375	3075
3100	21650	15500	3100
3125	21825	15625	3125
3150	22000	15750	3150
3175	22175	15875	3175
3200	22350	16000	3200
3225	22525	16125	3225
3250	22700	16250	3250
3275	22875	16375	3275
3300	23050	16500	3300
3325	23225	16625	3325
3350	23400	16750	3350
3375	23575	16875	3375
3400	23750	17000	3400
3425	23925	17125	3425
3450	24100	17250	3450
3475	24275	17375	3475
3500	24450	17500	3500
3525	24625	17625	3525
3550	24800	17750	3550
3575	24975	17875	3575
3600	25150	18000	3600
3625	25325	18125	3625
3650	25500	18250	3650
3675	25675	18375	3675
3700	25850	18500	3700
3725	26025	18625	3725
3750	26200	18750	3750
3775	26375	18875	3775
3800	26550	19000	3800
3825	26725	19125	3825
3850	26900	19250	3850
3875	27075	19375	3875
3900	27250	19500	3900
3925	27425	19625	3925
3950	27600	19750	3950
3975	27775	19875	3975
4000	27950	20000	4000
4025	28125	20125	4025
4050	28300	20250	4050
4075	28475	20375	4075
4100	28650	20500	4100
4125	28825	20625	4125
4150	29000	20750	4150
4175	29175	20875	4175
4200	29350	21000	4200
4225	29525	21125	4225
4250	29700	21250	4250
4275	29875	21375	4275
4300	30050	21500	4300
4325	30225	21625	4325
4350	30400	21750	4350
4375	30575	21875	4375
4400	30750	22000	4400
4425	30925	22125	4425
4450	31100	22250	4450
4475	31275	22375	4475
4500	31450	22500	4500
4525	31625	22625	4525
4550	31800	22750	4550
4575	31975	22875	4575
4600	32150	23000	4600
4625	32325	23125	4625
4650	32500	23250	4650
4675	32675	23375	4675
4700	32850	23500	4700
4725	33025	23625	4725
4750	33200	23750	4750
4775	33375	23875	4775
4800	33550	24000	4800
4825	33725	24125	4825
4850	33900	24250	4850
4875	34075	24375	4875
4900	34250	24500	4900
4925	34425	24625	4925
4950	34600	24750	4950
4975	34775	24875	4975
5000	34950	25000	5000
5025	35125	25125	5025
5050	35300	25250	5050
5075	35475	25375	5075
5100	35650	25500	5100
5125	35825	25625	5125
5150	36000	25750	5150
5175	36175	25875	5175
5200	36350	26000	5200
5225	36525	26125	5225
5250	36700	26250	5250
5275	36875	26375	5275
5300	37050	26500	5300
5325	37225	26625	5325
5350	37400	26750	5350
5375	37575	26875	5375
5400	37750	27000	5400
5425	37925	27125	5425
5450	38100	27250	5450
5475	38275	27375	5475
5500	38450	27500	5500
5525	38625	27625	5525
5550	38800	27750	5550
5575	38975	27875	5575
5600	39150	28000	5600
5625	39325	28125	5625
5650	39500	28250	5650
5675	39675	28375	5675
5700	39850	28500	5700
5725	40025	28625	5725
5750	40200	28750	5750
5775	40375	28875	5775
5800	40550	29000	5800
5825	40725	29125	5825
5850	40900	29250	5850
5875	41075	29375	5875
5900	41250	29500	5900
5925	41425	29625	5925
5950	41600	29750	5950
5975	41775	29875	5975
6000	41950	30000	6000
6025	42125	30125	6025
6050	42300	30250	6050
6075	42475	30375	6075
6100	42650	30500	6100
6125	42825	30625	6125
6150	43000	30750	6150
6175	43175	30875	6175
6200	43350	31000	6200
6225	43525	31125	6225
6250	43700	31250	6250
6275	43875	31375	6275
6300	44050	31500	6300
6325	44225	31625	6325
6350	44400	31750	6350
6375	44575	31875	6375
6400	44750	32000	6400
6425	44925	32125	6425
6450	45100	32250	6450
6475	45275	32375	6475
6500	45450	32500	6500
6525	45625	32625	6525
6550	45800	32750	6550
6575	45975	32875	6575
6600	46150	33000	6600
6625	46325	33125	6625
6650	46500	33250	6650
6675	46675	33375	6675
6700	46850	33500	6700
6725	47025	33625	6725
6750	47200	33750	6750
6775	47375	33875	6775
6800	47550	34000	6800
6825	47725	34125	6825
6850	47900	34250	6850
6875	48075	34375	6875
6900	48250	34500	6900
6925	48425	34625	6925
6950	48600	34750	6950
6975	48775	34875	6975
7000	48950	35000	7000
7025	49125	35125	7025
7050	49300	35250	7050
7075	49475	35375	7075
7100	49650	35500	7100
7125	49825	35625	7125
7150	50000	35750	7150
7175	50175	35875	7175
7200	50350	36000	7200
7225	50525	36125	7225
7250	50700	36250	7250
7275	50875	36375	7275
7300	51050	36500	7300
7325	51225	36625	7325
7350	51400	36750	7350
7375	51575	36875	7375
7400	51750	37000	7400
7425	51925	37125	7425
7450	52100	37250	7450
7475	52275	37375	7475
7500	52450	37500	7500



TYPICAL BEDDING DETAILS



1500mm COLUMN MARKERS

E 1:10

(REF FOLDER: X:\02 PROJECTS\3000\3100 - 3199\N3110 - LOSKOP BULK WATER SUPPLY SCHEME\1 DESIGN PHASE\F DRAWINGS\5 CONSTRUCTION\D WATER\2. WORK PACKAGE 2\D. PUMPLINES\N3110\WW11004.DWG)

CONSULTANT DWG. NO.
N/3110/RW/W/11/004
CLIENT DWG. NO.
-