



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/CPG19**

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 3CE**

#### **ISSUED BY: UNIK-DIPHATSE Joint VENTURE**

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

**CONTACT:** Ruan vd Berg

0795034443

[siteagent1.sa@unikconst.com](mailto: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 3 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 March 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 April 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 immediately 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 <a href="mailto:jacogroblersa@unikconst.co.za">jacogroblersa@unikconst.co.za</a> Tel: 011 318 0077	Mr Ruan vd Berg Unik-Diphatse JV <a href="mailto:siteagent1.sa@unikconst.co.za">siteagent1.sa@unikconst.co.za</a> Tel.: 079 503 4443	Mr Jaco Grobler Unik-Diphatse JV <a href="mailto:jacogroblersa@unikconst.co.za">jacogroblersa@unikconst.co.za</a> Tel: 013 755 1190

All tenders are to be deposited into the tender box on or before the **5<sup>th</sup> 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 17<sup>th</sup> 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 3)**

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		
<b>Total : PRELIMINARY &amp; GENERAL</b>						

**SCHEDULE 13 : CONSTRUCTION OF PIPELINES**

13	SABS 1200DB	<b><u>SITE CLEARANCE</u></b>				
13,1	PSC 4.1	a) Clear and Grub	m	1100		
	SABS 1200DB	<b><u>EXCAVATION</u></b>				
	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 <sup>3</sup>	200		
13,3		b) over 1.5m and up to 2.5m deep	m <sup>3</sup>	2200		
13,4		c) over 2.5m and up to 3.5m deep	m <sup>3</sup>	50		
13,5		d) over 3.5m and up to 4.5m deep	m <sup>3</sup>	10		

13,6	<b>PSDB1.2</b>	<u>Extra-over item 11.2.1 for :</u>			
		a) Hard rock excavation	m <sup>3</sup>	525	
13,7	8.3.2c)	Excavate and dispose of unsuitable material from trench bottom (Prove)	m <sup>3</sup>	5	
13,8	8.3.3b)	Import backfill material from designated borrow area within the free haul distance of 1.0km.	m <sup>3</sup>	100	
13,9	8.3.3.3	Compaction in road reserves	m <sup>3</sup>	1170	
13,10	8.3.3.4	<u>Overhaul</u>			
		a) Long overhaul in excess of 2.0km	m3.km	835	
	<b>SABS 1200DB</b>	<b><u>EXISTING SERVICES</u></b>			
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	
	<b>SABS 1200LB</b>	<b><u>PIPE BEDDING</u></b>			
		<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	
	<b>SABS 1200L</b>	<b><u>STEEL PIPES</u></b>			
	<b>PSL4.1</b>	<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	
	<b>SABS 1200L</b>	<b><u>PRESSURE PIPES</u></b>			
	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		<b><u>Pipeline markers</u></b>			
		Construct and install concrete pipeline markers as per drawing		no	30
	<b>SABS 1200L</b>	<b><u>MISCELLANEOUS</u></b>			
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	
	<b>PSL 4.2</b>	<b><u>Fabrication, supply, transport and install and test the following VJ couplings.</u></b>			
13,27		a) For 650mm pipe	no	15	
	<b>SABS 1200L 8.2.1</b>	<b><u>HDPE PIPES</u></b> <b><u>Supply, lay, bed and test the following HDPE pipes:</u></b>			
13,28		a) 50mm dia. HDPE Pipe PE 100 PN12.5	m	1100	
<b><u>Total carried forward</u></b>					

**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 THEMBISILE 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)

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



NKANGALA DISTRICT  
MUNICIPALITY

PROJECT

LOSKOP REGIONAL BULK  
WATER SUPPLY SCHEME:  
WORK PACKAGE 2

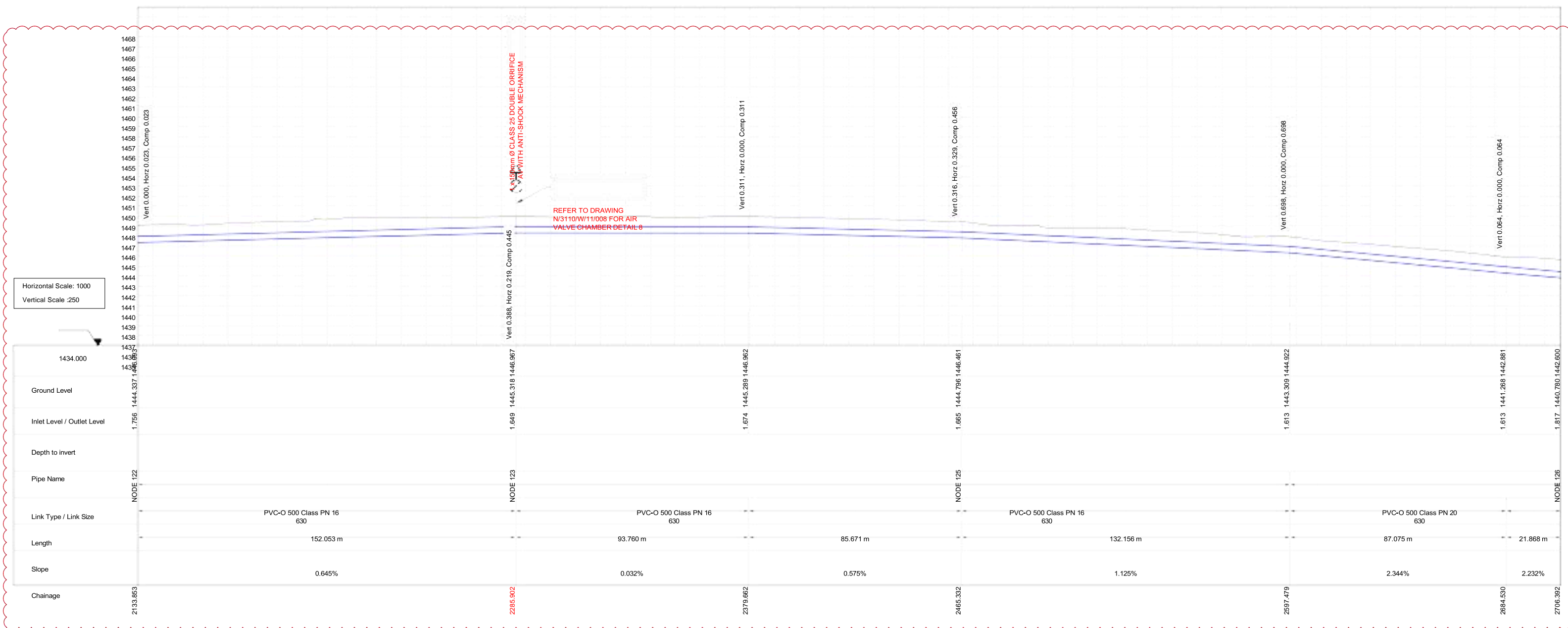
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PROPOSED BULK WATER LINE  
PUMPSTATION 4 LAYOUT 5 OF 34

SCALE 1:1000 DATE OCTOBER 2022  
PAPER SIZE A1

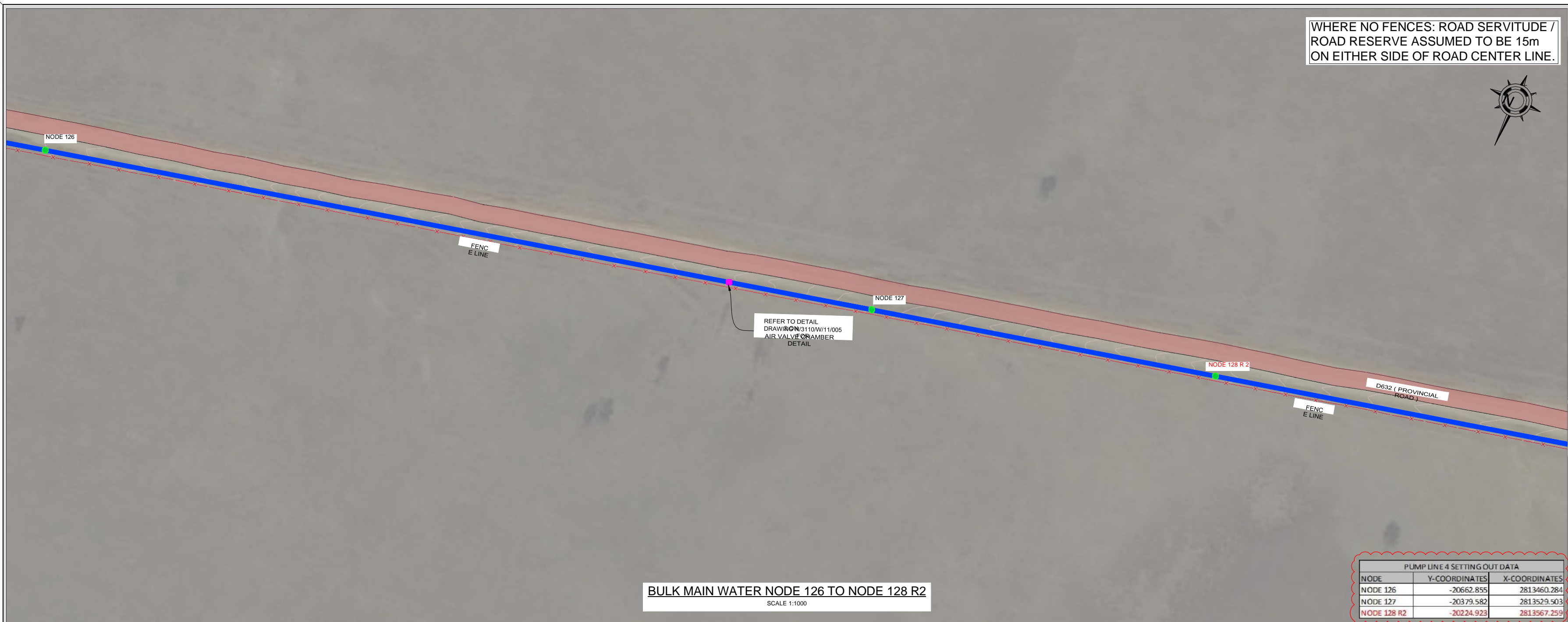
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N/3110/P4/W/9/005/R2

CLIENT DWG. NO.



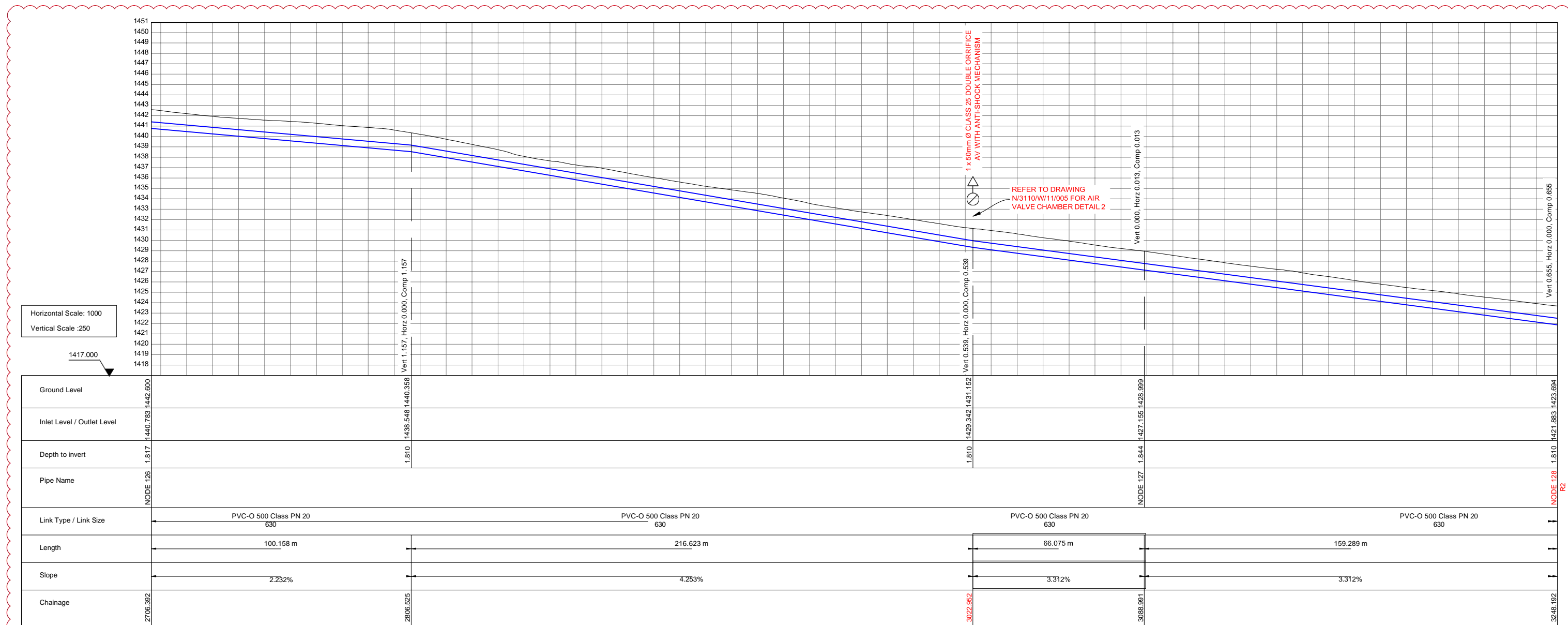
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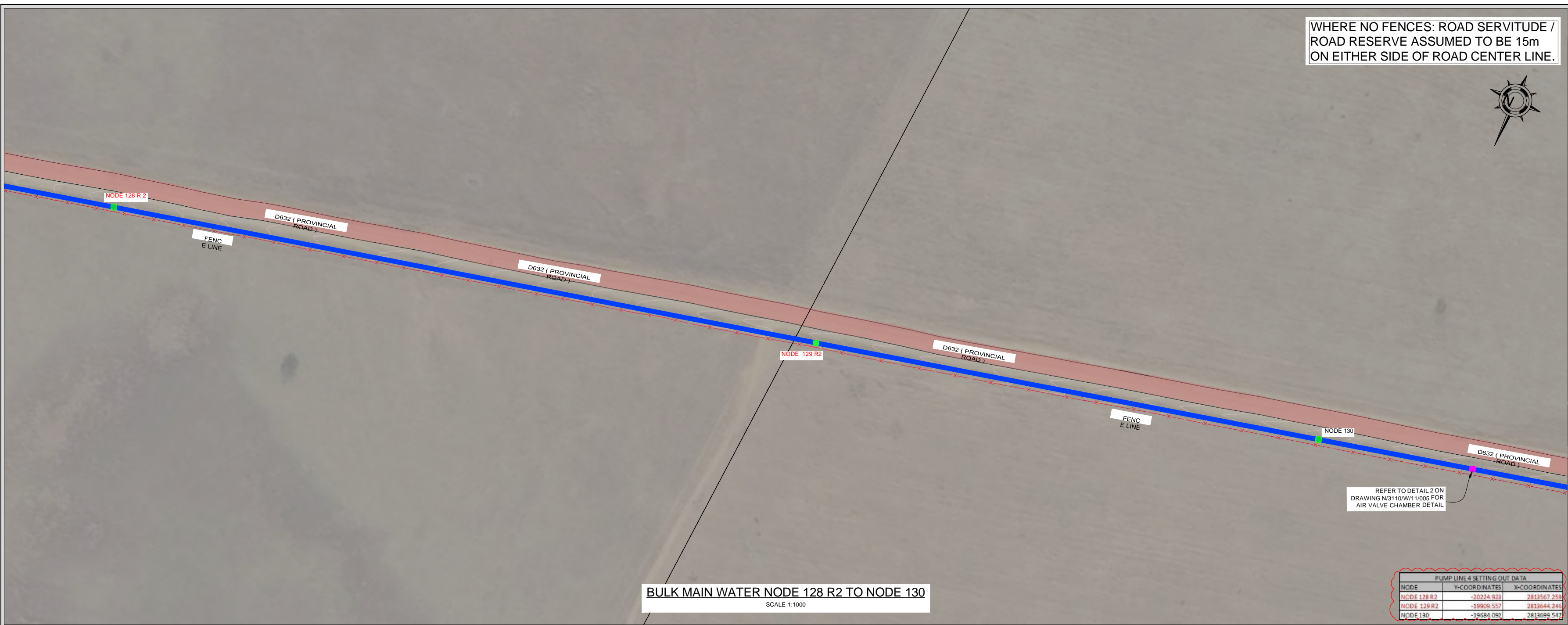


BULK MAIN WATER NODE 126 TO NODE 128 R2

SCALE 1:1000







**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 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)

**ENDECON**  
**UBUNTU (PTY) LTD**  
ENGINEERING CONSULTANTS  
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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 7 OF 34**

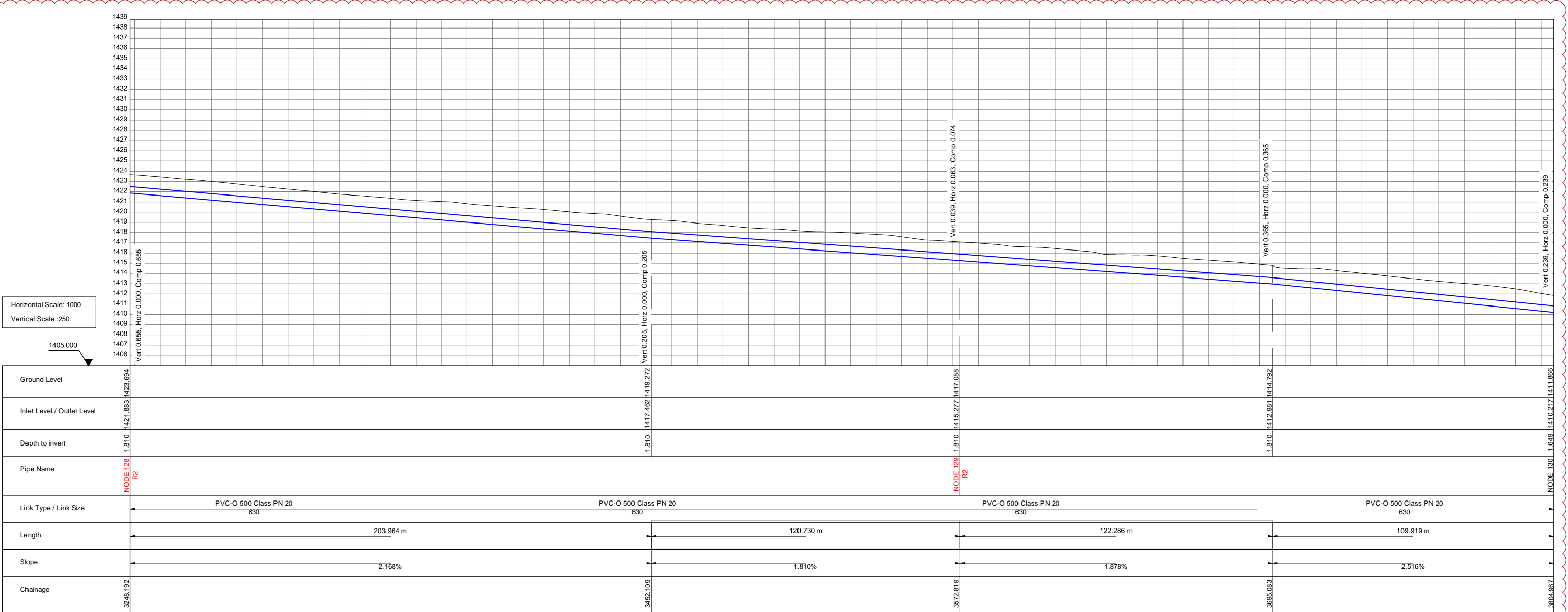
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METER

**CONSULTANT DWG. NO.**  
**N/3110/P4/W/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)

ENDECON

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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

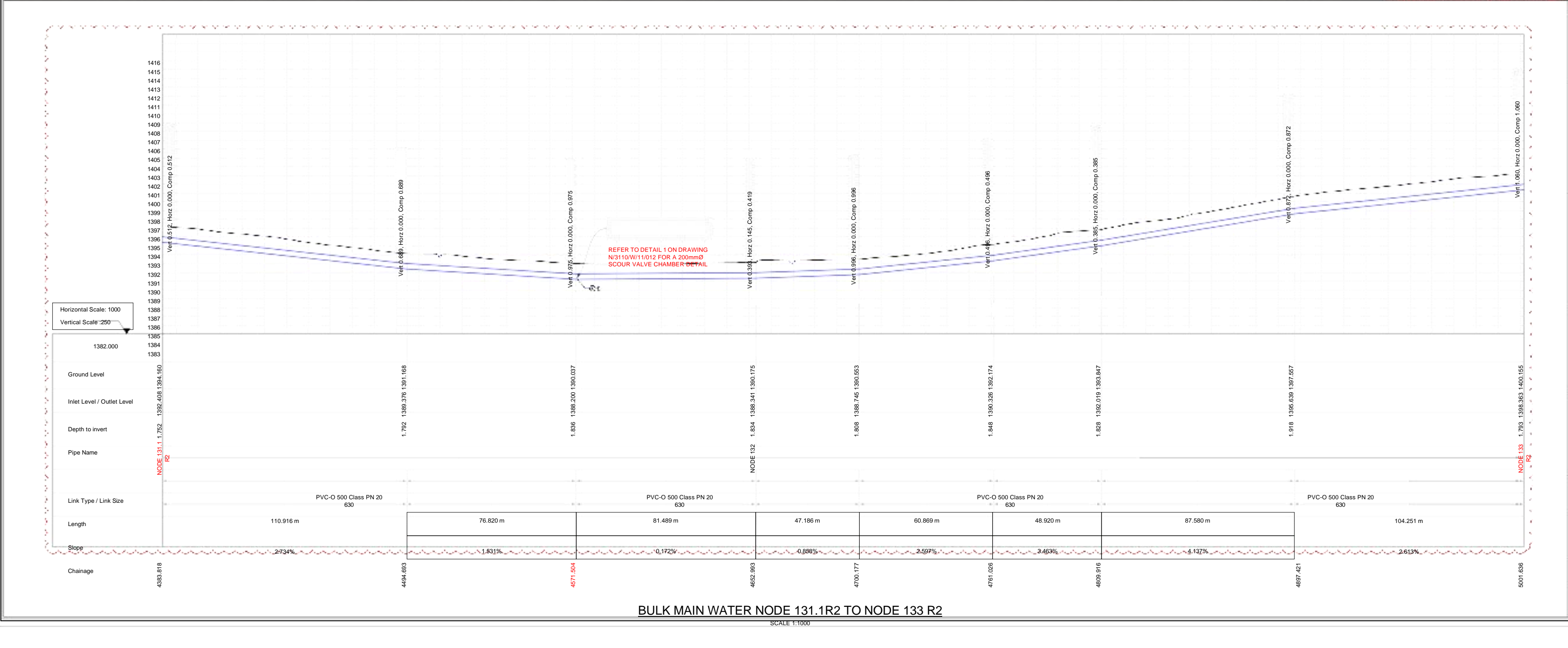
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DATE: 10 OCTOBER 2022

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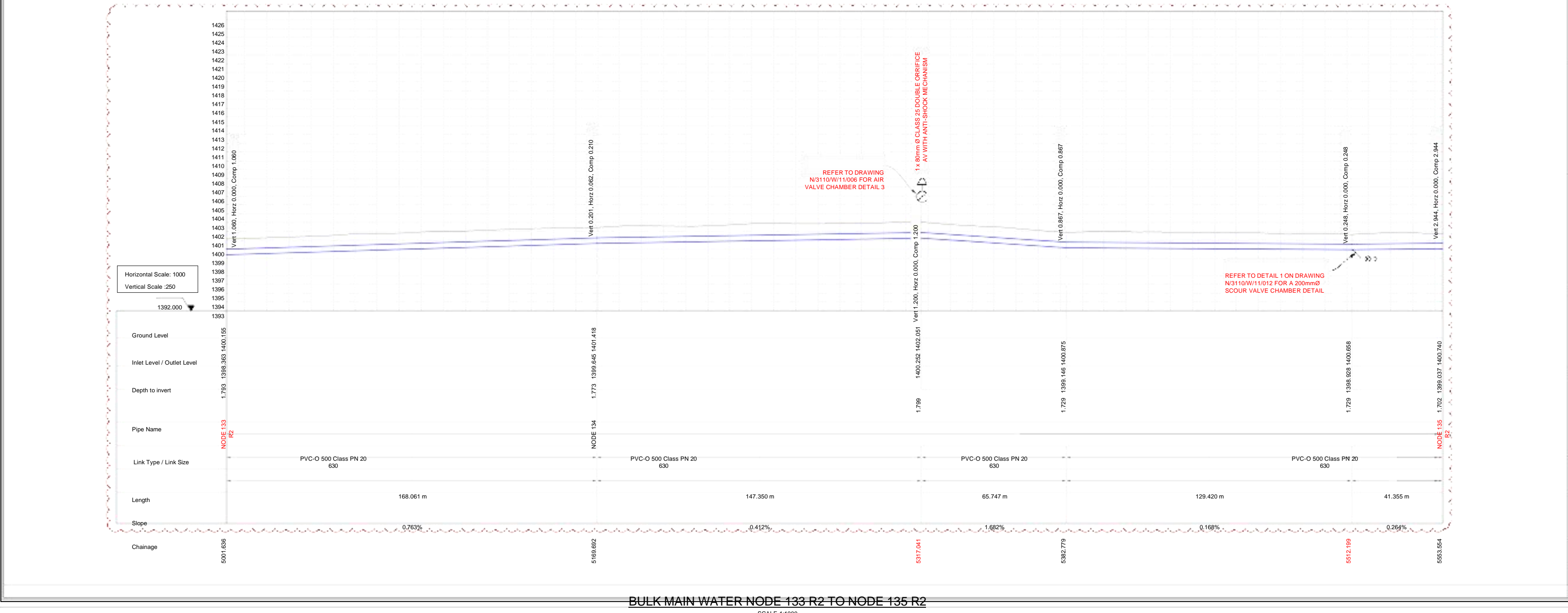
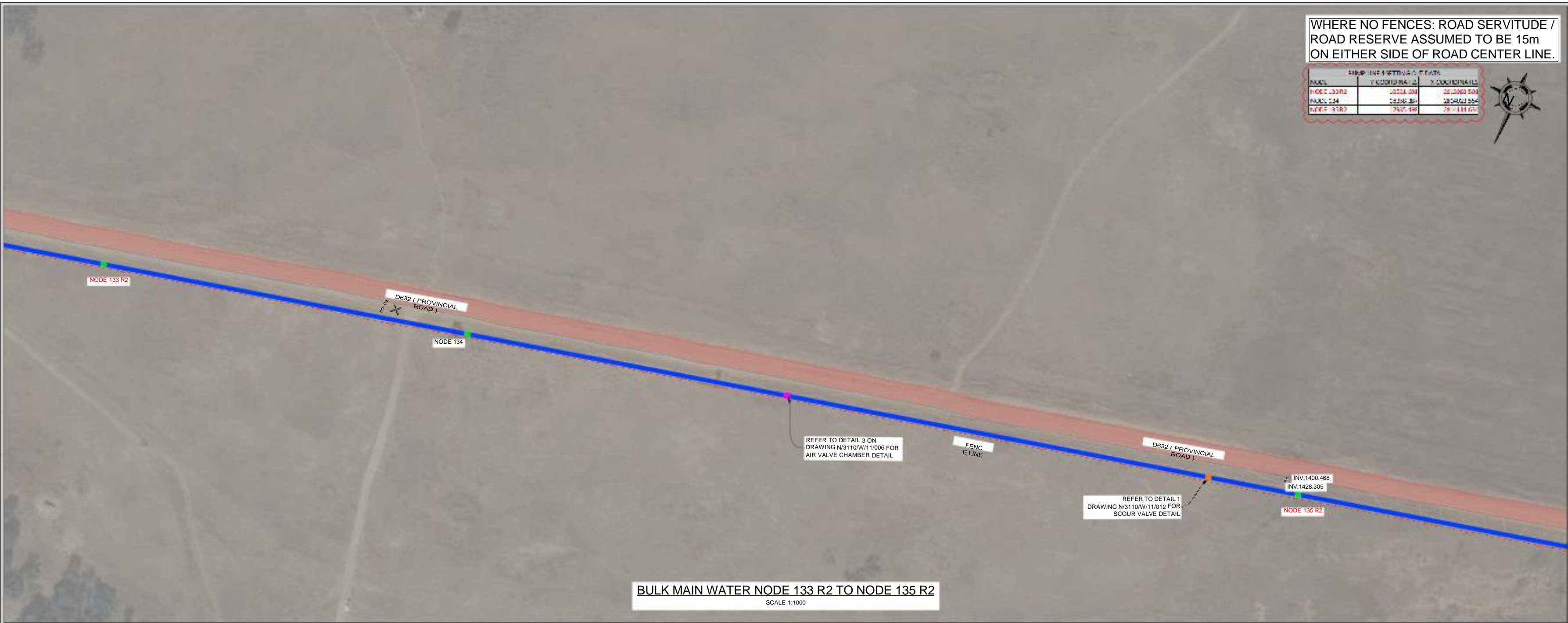
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N/3110/P4W/9/009/R2

CLIENT DWG. NO.



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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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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

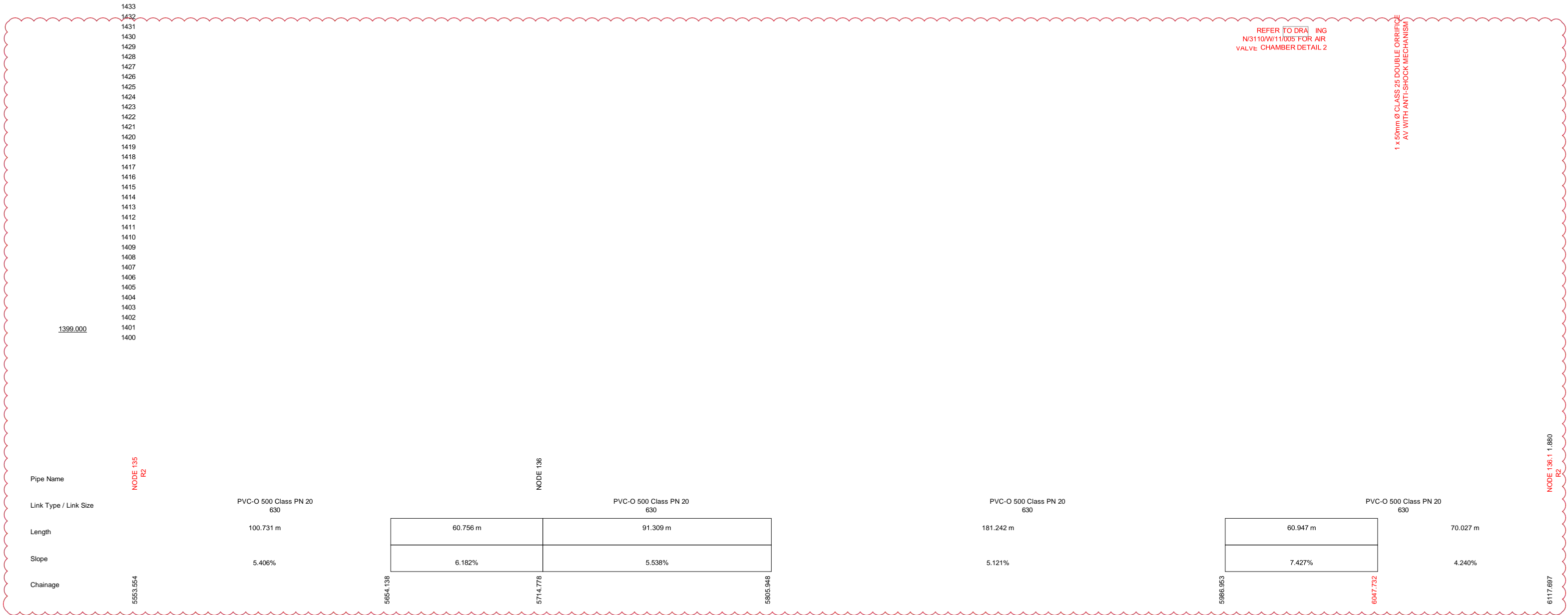
DESIGNED/ONTWERP	W.J. STRYDOM (jnr)
DRAWN/GETEKEN	M.DAVEL
CAD FILE NAME/CAD LÉER NAAM	N3110P4W9001-19R2.dwg
CHECKED/NAGESIEN	W.J. STRYDOM (jnr)
APPROVED/GOEDGEKEUR	W.J. STRYDOM (jnr)

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1200  
Tel:(013) 755 1190  
Fax:(013) 755 4904

DATE/DATUM	SEPTEMBER 2022
SCALE/SKAAL	AS SHOWN

CLIENT DWG. NO.

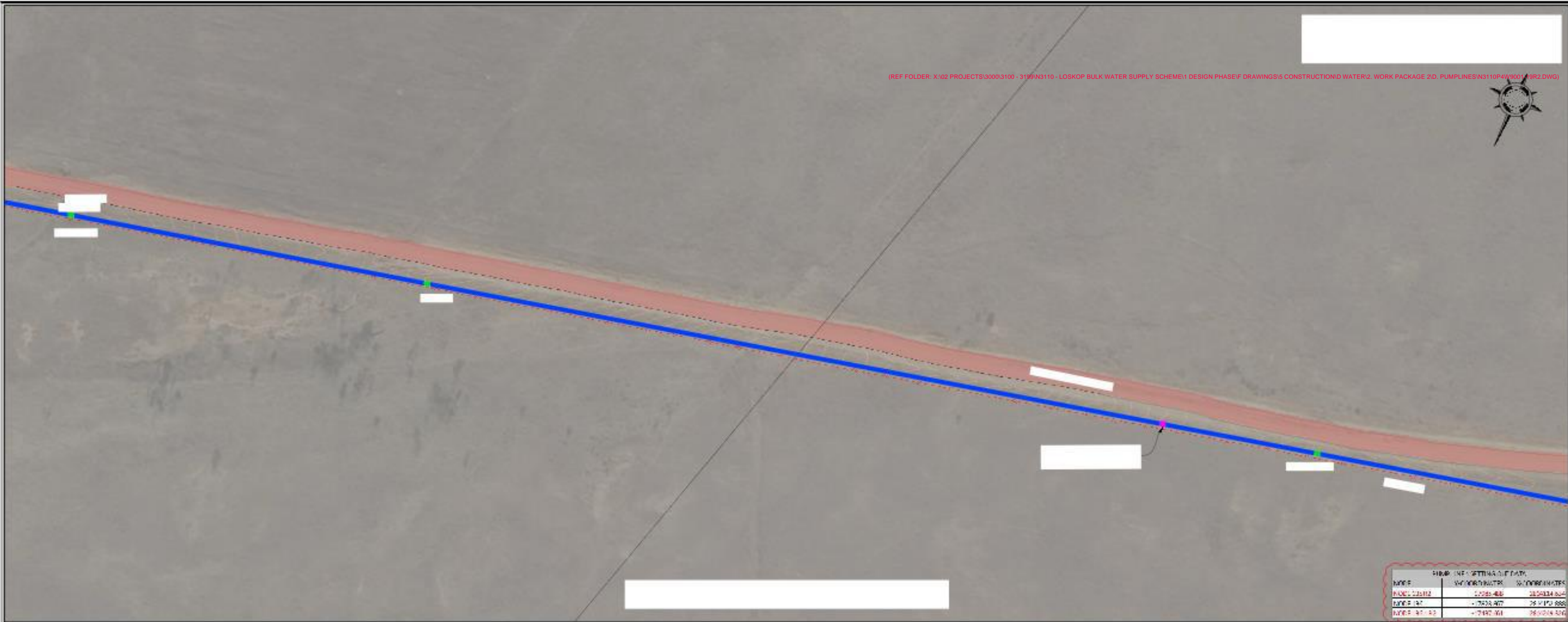
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BULK MAIN WATER NODE 135 R2 TO NODE 136.1 R2

SCALE 1:1000





SERVICE		DIENS	
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PROJECT	1000000000	PROJECT	1000000000
DATE	10/01/2010	DATE	10/01/2010
DATE	10/01/2010	DATE	10/01/2010

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SERVICE DIENS

WATER



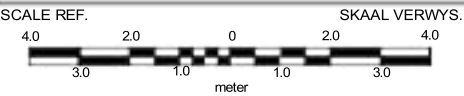
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PROJECT PROJÊK

LOSOP REGIONAL BULK  
WATER SUPPLY SCHEME:  
WORK PACKAGE 2

TITLE TITEL

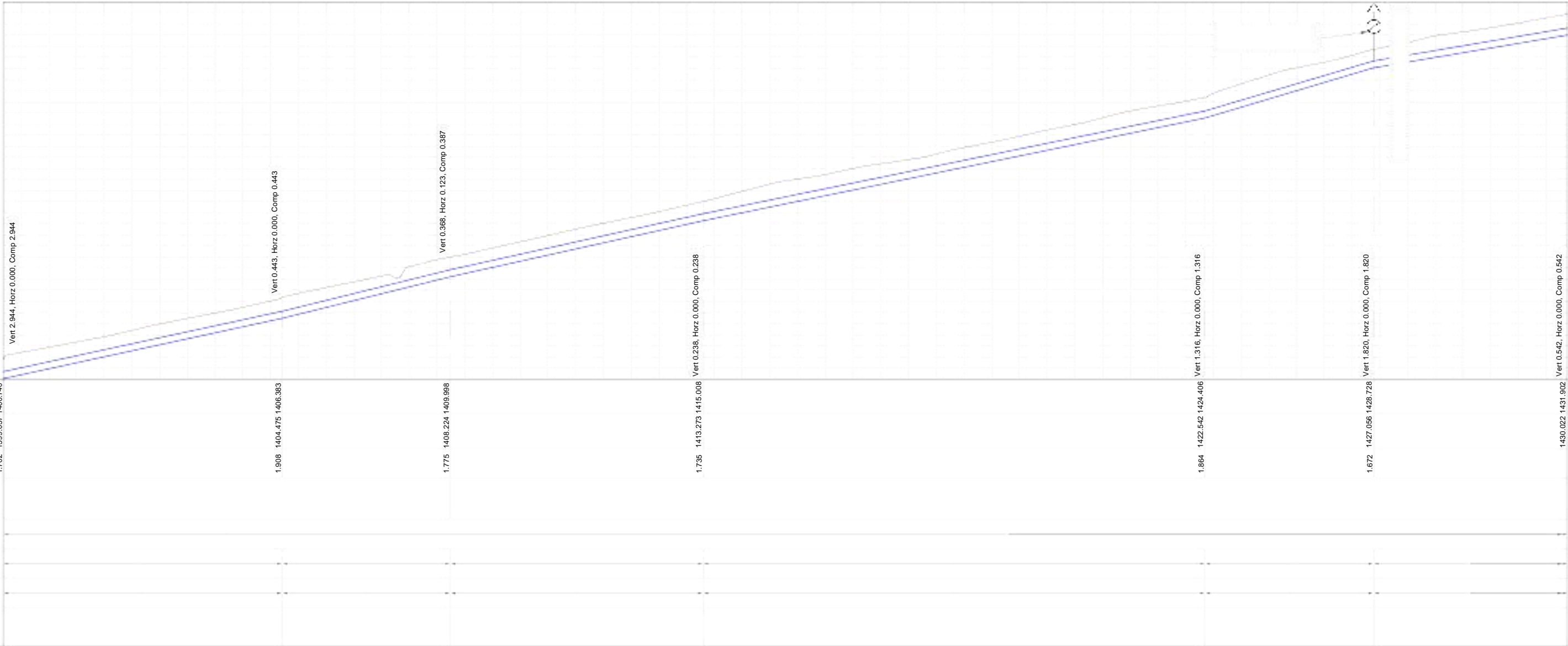
PROPOSED BULK WATER LINE  
PUMPSTATION 4 LAYOUT 11 OF 34



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

Horizontal Scale: 1000  
Vertical Scale: 250

Ground Level	1.702 1398.037 1400.740
Inlet Level / Outlet Level	1.908 1404.475 1406.363
Depth to invert	1.775 1408.224 1405.966







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

SERVICE AMENDMENTS

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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Fax:(013) 755 4904

CLIENT

NKANGALA DISTRICT MUNICIPALITY

PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

TITLE

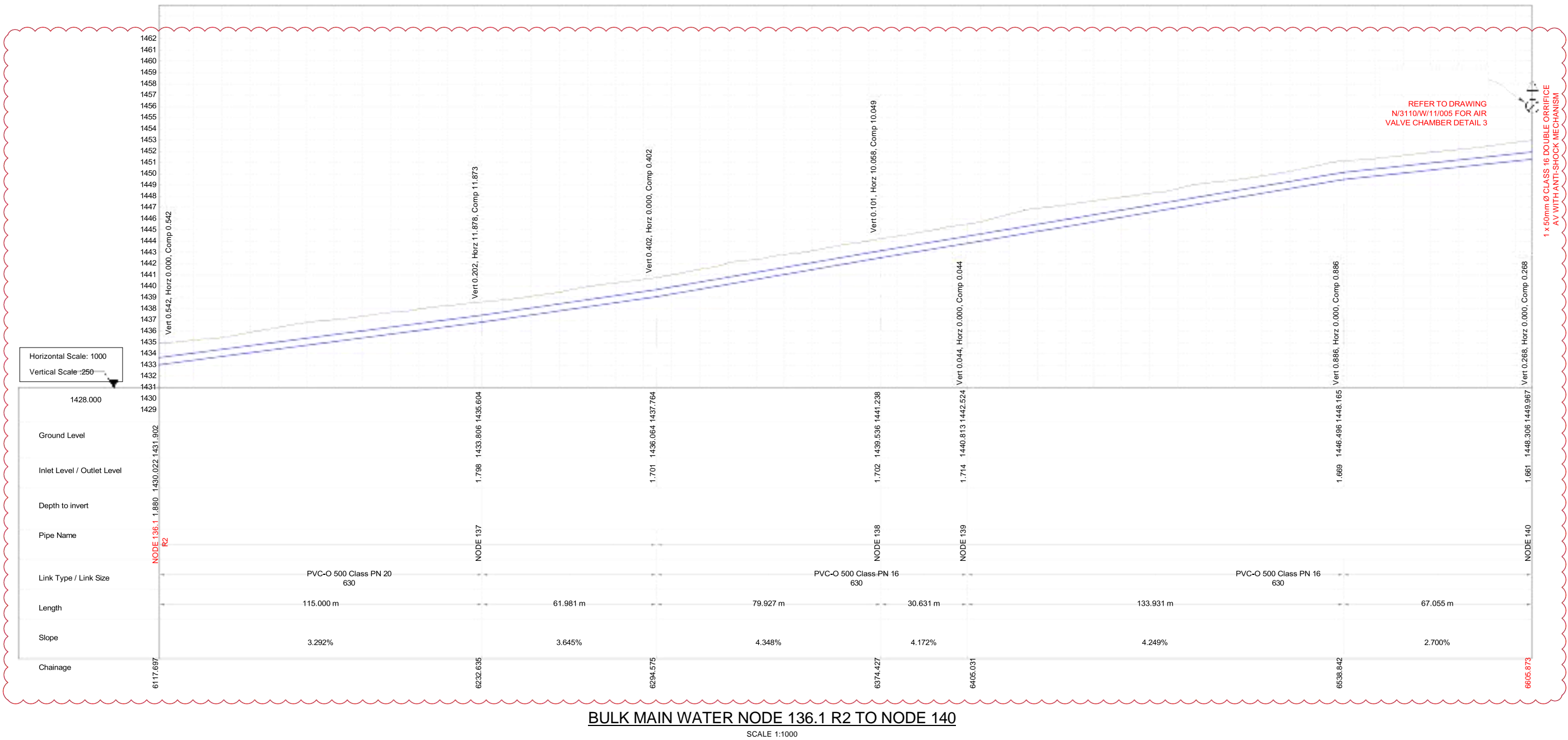
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SCALE DATE OCTOBER 2022

SCALE 1:1000 PAPER SIZE A1

CONSULTANT DWG. NO. N/3110/P4/W/9/012/R2

CLIENT DWG. NO.







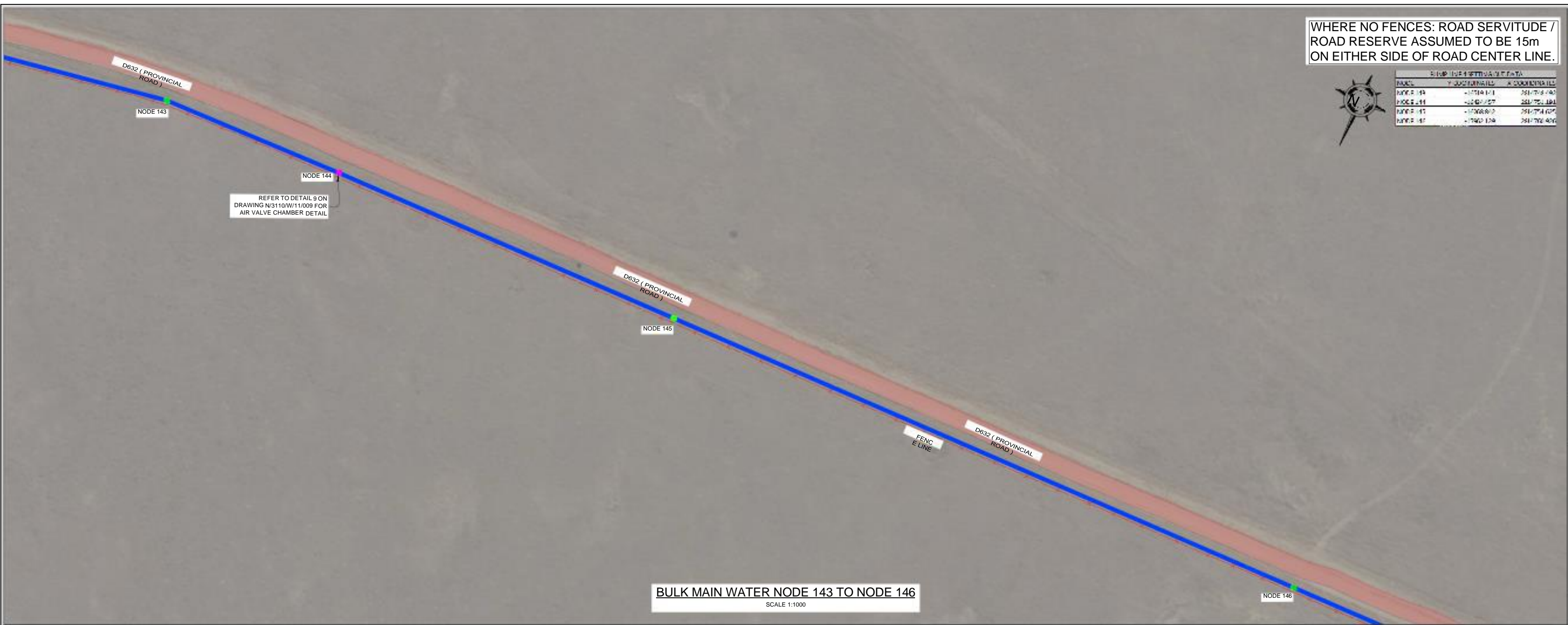


BULK MAIN WATER NODE 140 TO NODE 143  
SCALE 1:1000

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









LEGEND:

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

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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)

**ENDECON**  
**UBUNTU (PTY) LTD**  
ENGINEERING CONSULTANTS  
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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 15 OF 34

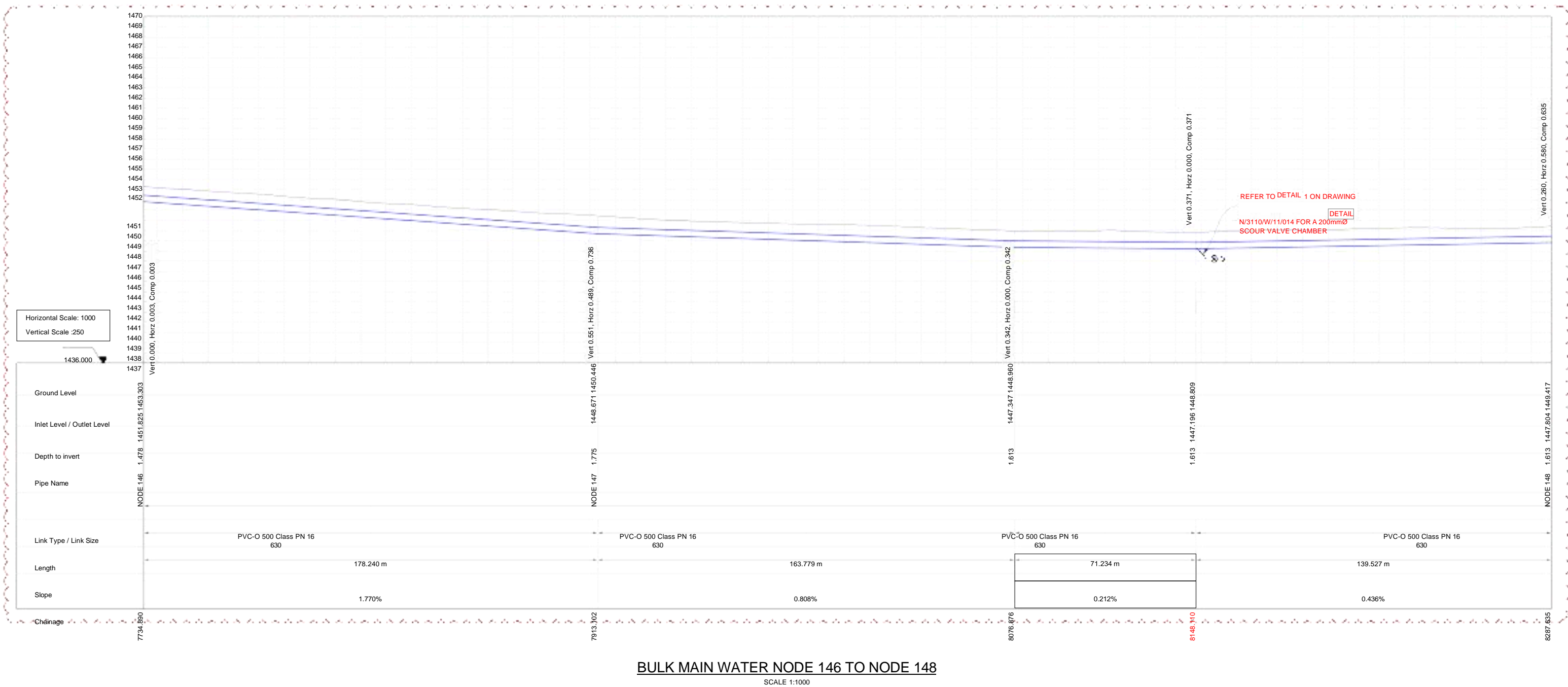
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CONSULTANT DWG. NO.

N/3110/P4/W/9/015/R2



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

CLIENT DWG. NO.	-
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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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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.

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)

**ENDECON**  
**UBUNTU (PTY) LTD**  
ENGINEERING CONSULTANTS

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1200  
Tel: (013) 755 1190  
Fax: (013) 755 4904

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**

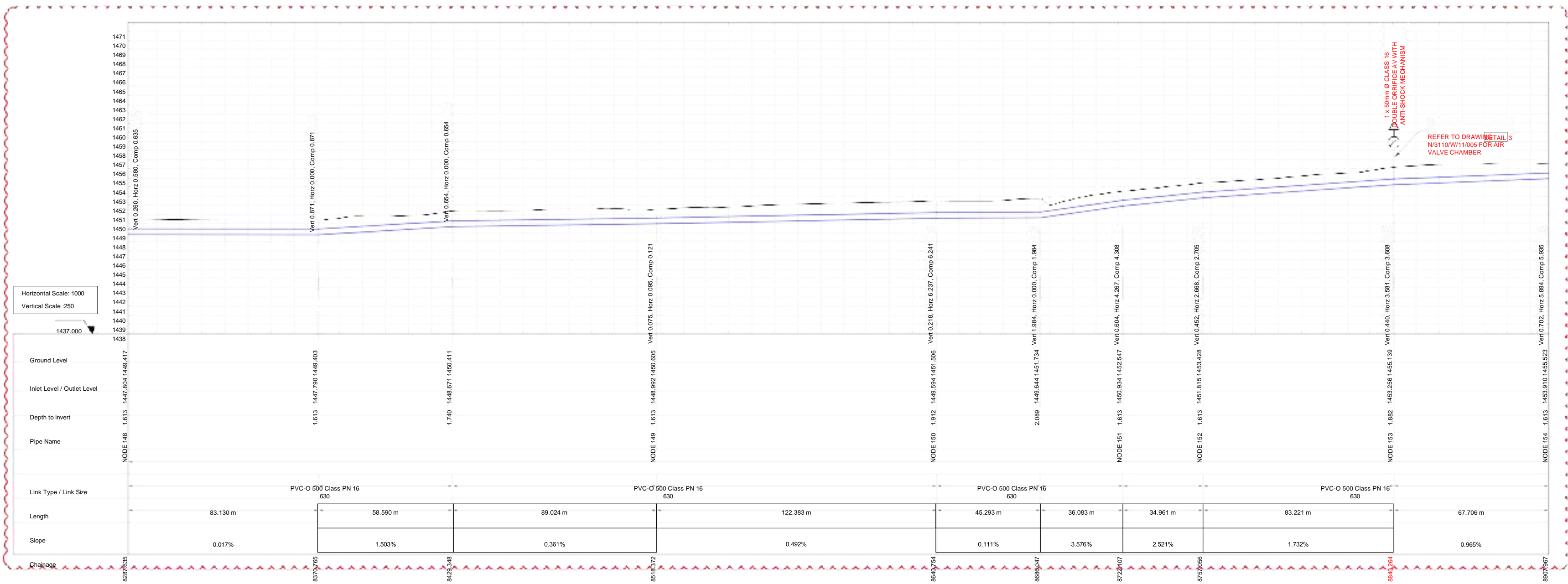
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SCALE 1:1000 PAPER SIZE A1

OCTOBER 2022

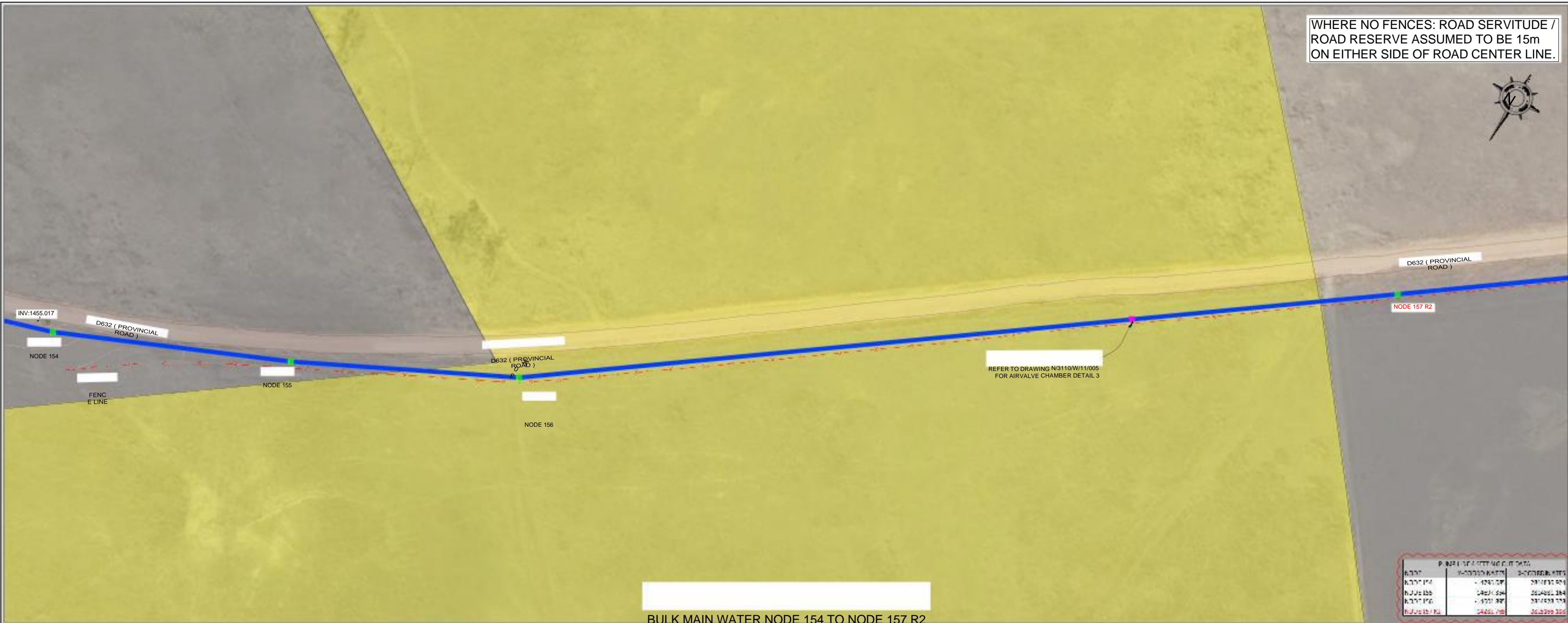
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N/3110/P4/W/9/016/R2

CLIENT DWG. NO.





(REF FOLDER: X:\02 PROJECTS\3000\3100 - 3199\N3110 - LOSKOP BULK WATER SUPPLY SCHEME\1 DESIGN PHASE\1 DRAWINGS\5 CONSTRUCTION\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:**

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)

UBUNTU (PTY) LTD  
ENGINEERING CONSULTANTS

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

CLIENT

**NKANGALA DISTRICT MUNICIPALITY**

PROJECT

**LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2**

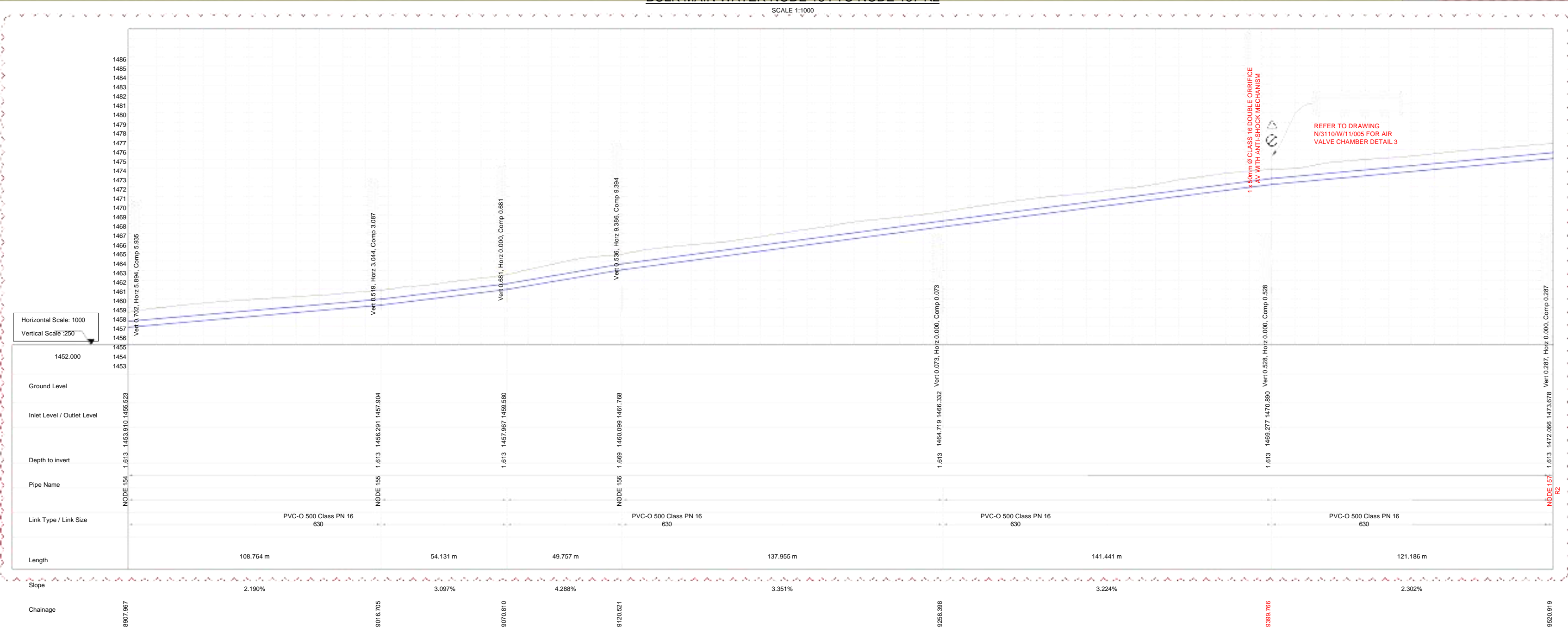
TITLE

**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.
-





SCALE 1:1000

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

CLIENT DWG. NO.

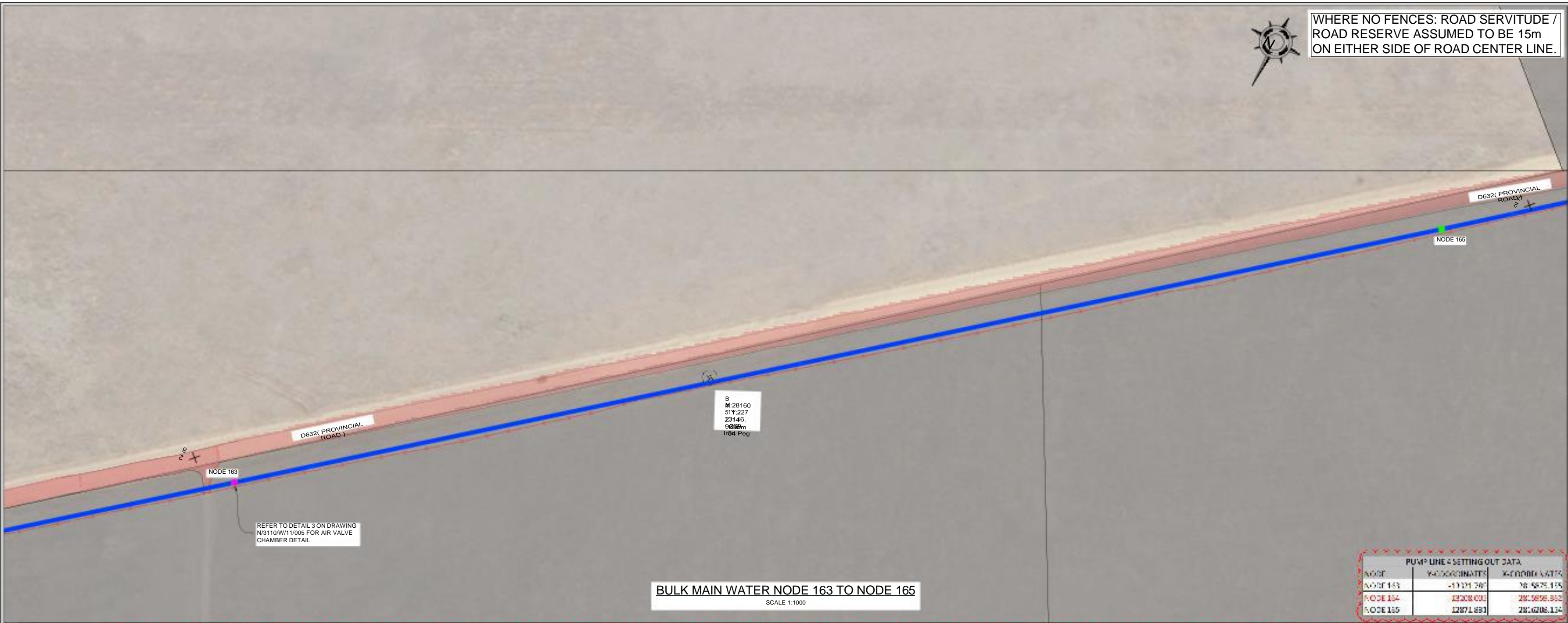
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**LEGEND:**

- 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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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)

**ENDECON**

**UBUNTU (PTY) LTD**

ENGINEERING CONSULTANTS

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

CLIENT

**NKANGALA DISTRICT MUNICIPALITY**

PROJECT

**LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2**

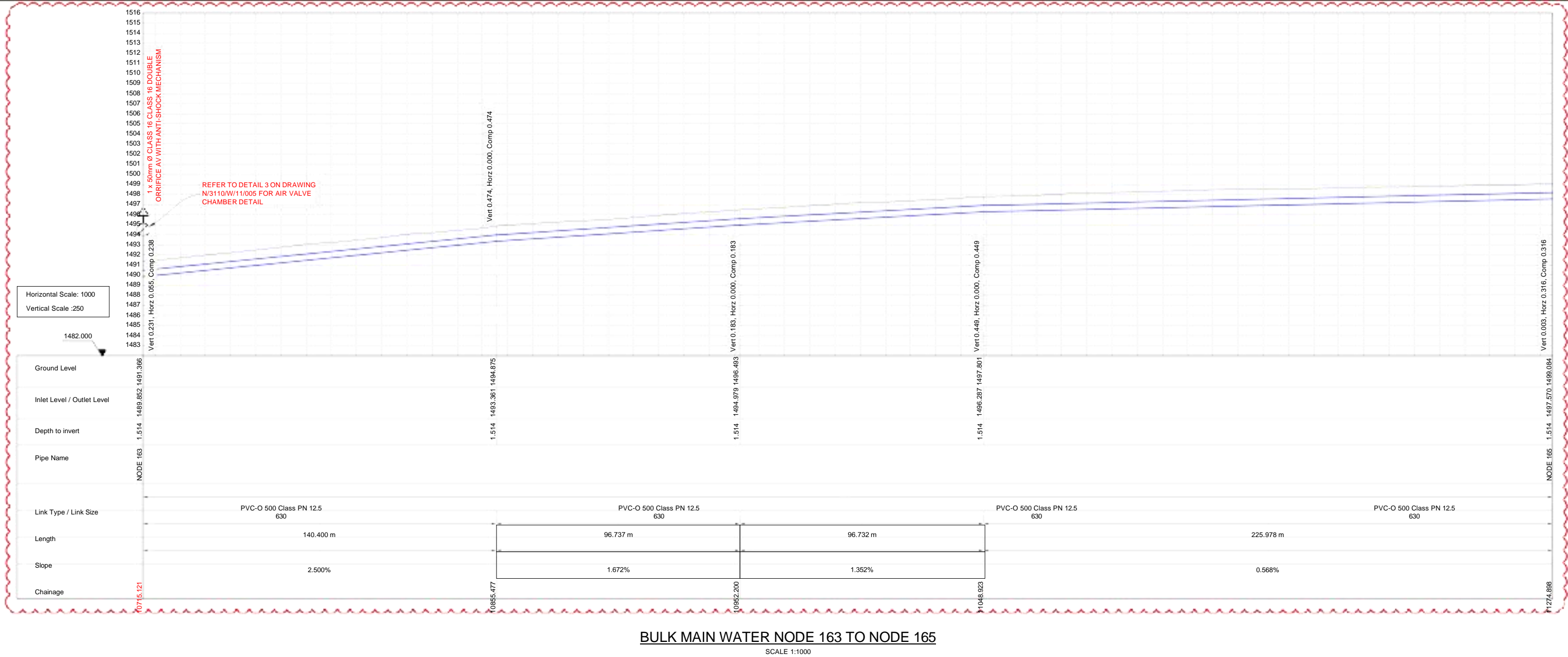
TITLE

**PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 21 OF 34**

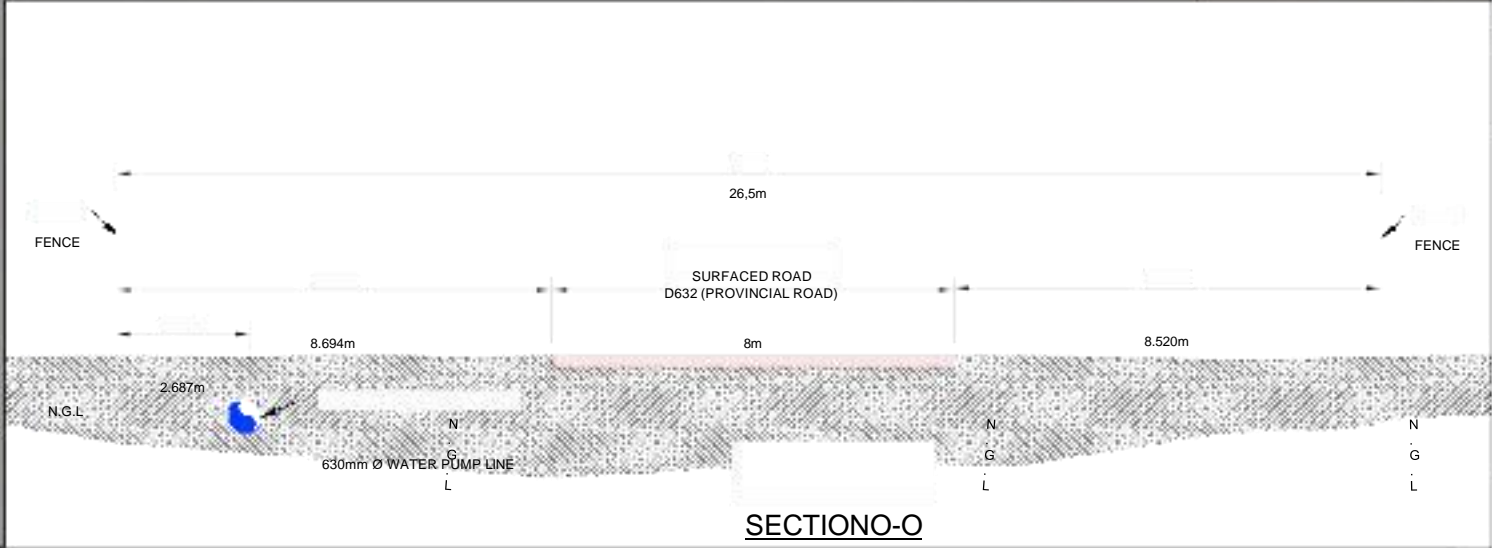
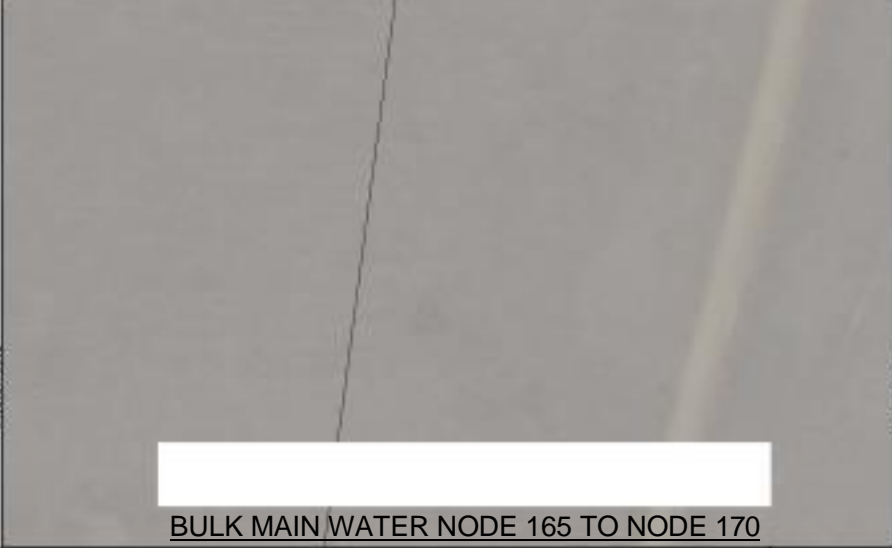
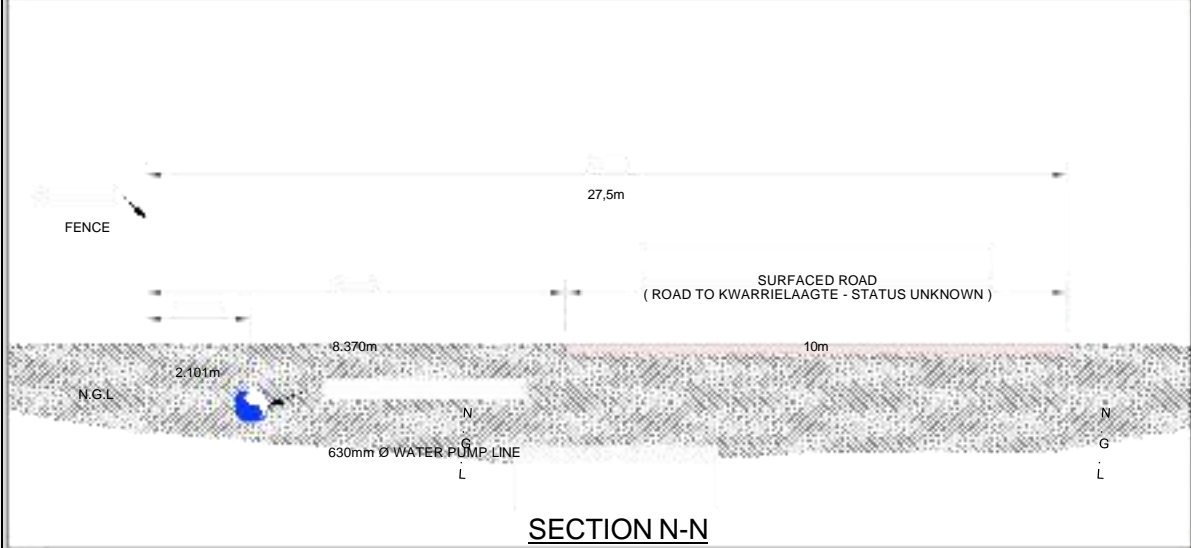
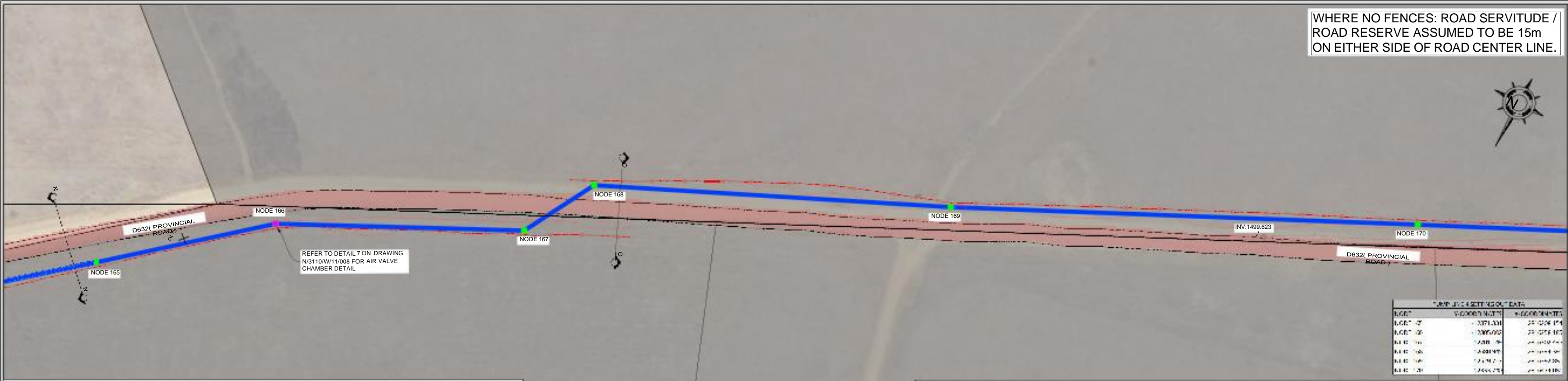
DATE	OCTOBER 2022
SCALE	1 : 1000
PAPER SIZE	A1

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

CLIENT DWG. NO.







- 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.

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
CHECKED	W.J. STRYDOM (jnr)
APPROVED	W.J. STRYDOM (jnr)

UBUNTU (PTY) LTD  
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Fax: 015 755 1904

CLIENT

NKANGALA DISTRICT MUNICIPALITY

PROJECT

LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2

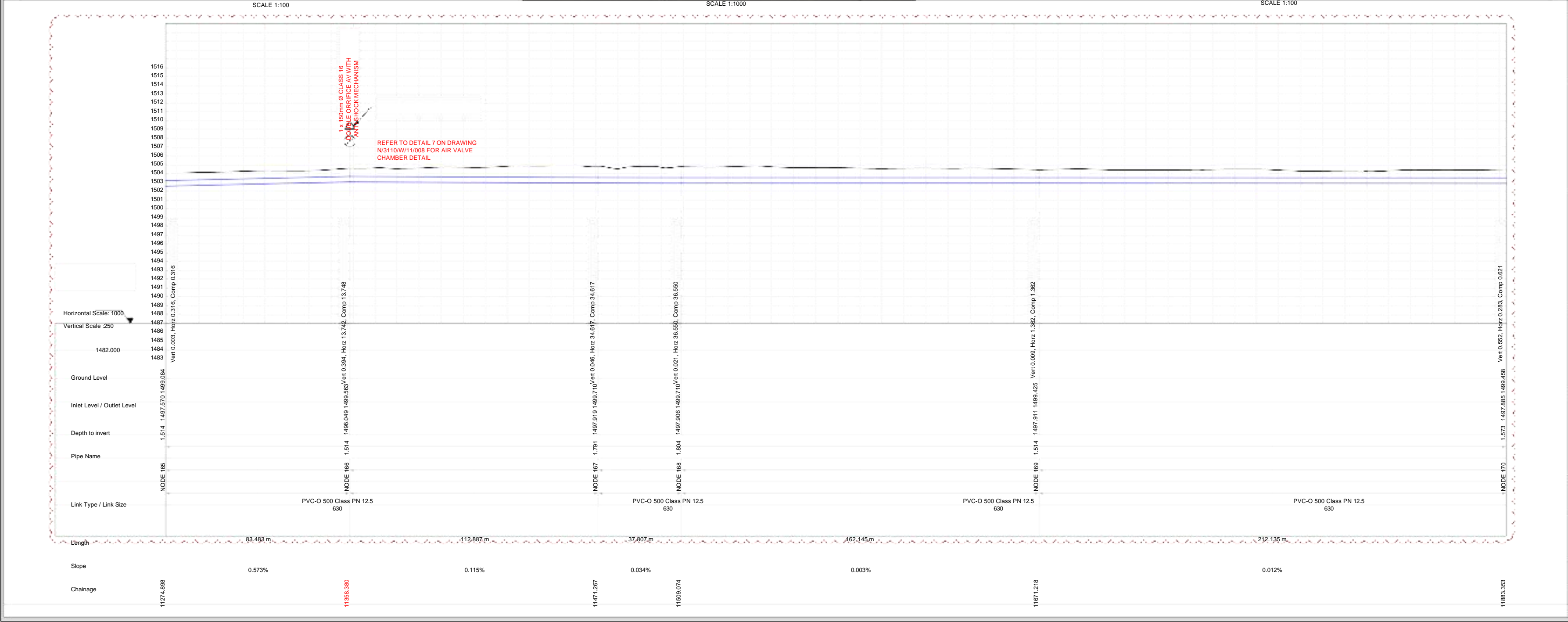
TITLE

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

SCALE 1:1000

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

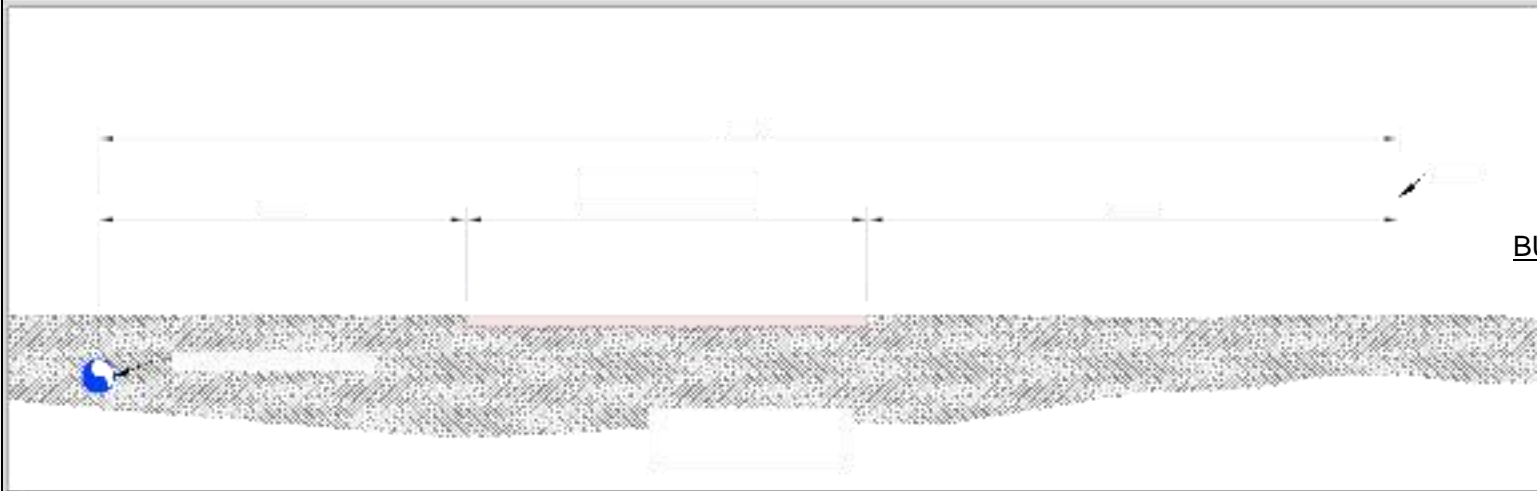
(REF FOLDER: X:\02 PROJECTS\3000\3100 - 3199\N3110 - LOSKOP BULK WATER SUPPLY SCHEME\1 DESIGN PHASE\1 DRAWINGS\5 CONSTRUCTION\1 WATER\2. WORK PACKAGE 2\1 D. PUMPLINES\N3110P4W9020-28R2.DWG)



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)

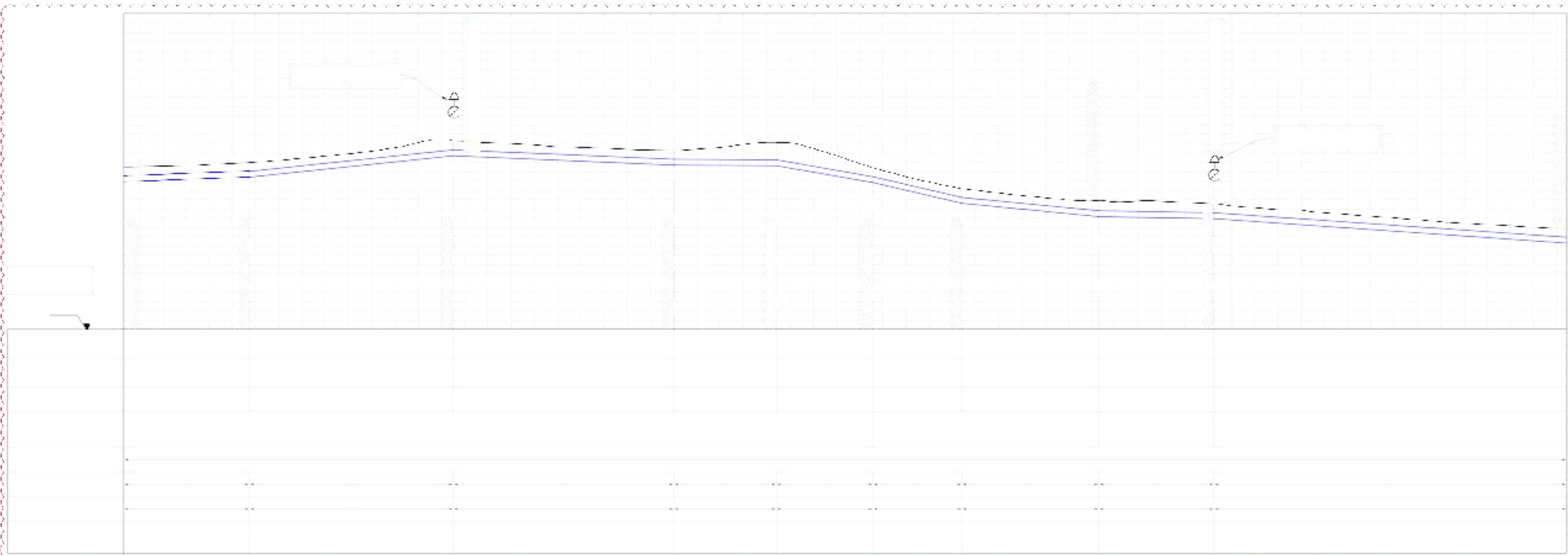


CONSULTANT DWG. NO.  
N/3110/P4/W/9/022/R2

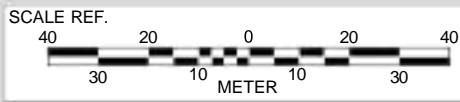
CLIENT DWG. NO.  
X -

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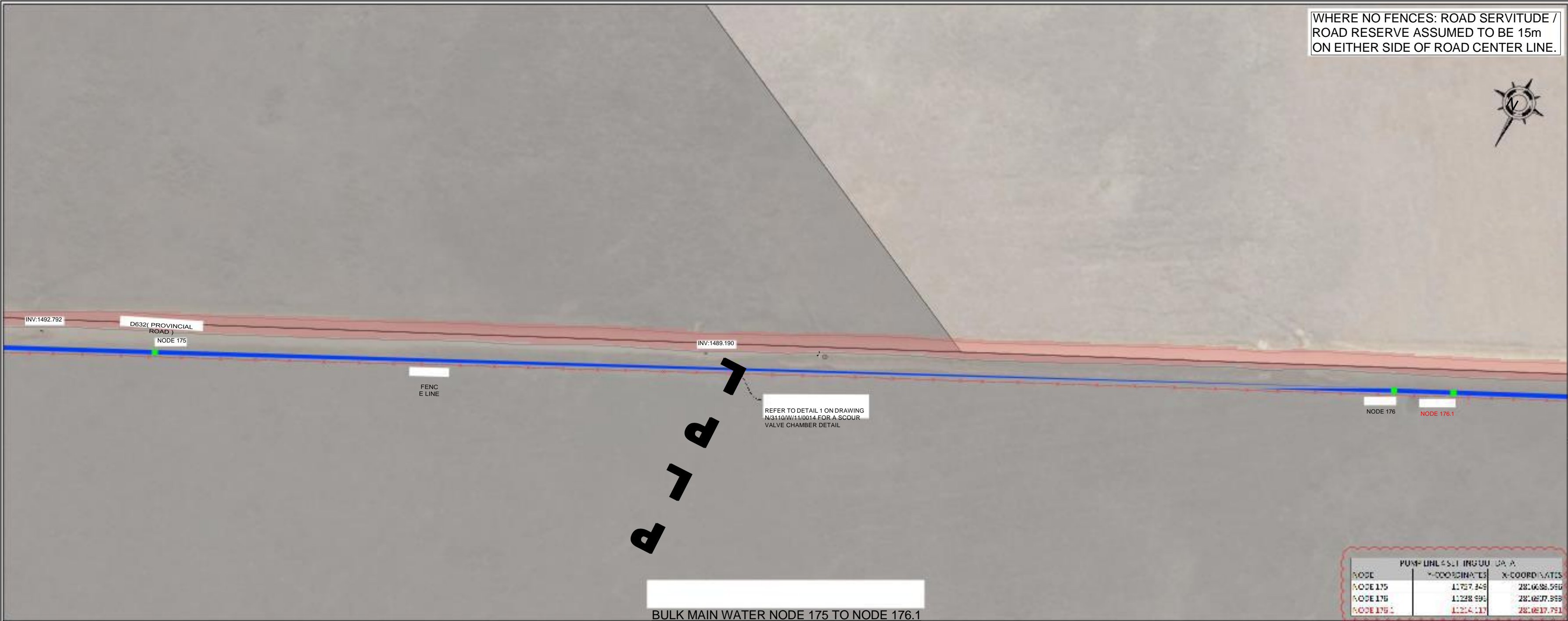
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NODE	NODE X COORDINATES	NODE Y COORDINATES
P001 LN	42331.46	24964.182
P001 S1	42333.84	24964.182
P001 S2	42335.24	24964.182
P001 S3	42336.64	24964.182
P001 S4	42338.04	24964.182
P001 S5	42339.44	24964.182



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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:
- 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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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)

UBUNTU (PTY) LTD  
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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 24 OF 34

SCALE REF.

DATE 10 OCTOBER 2022

SCALE 1:1250 PAPER SIZE A1

BULK MAIN WATER NODE 175 TO NODE 176.1

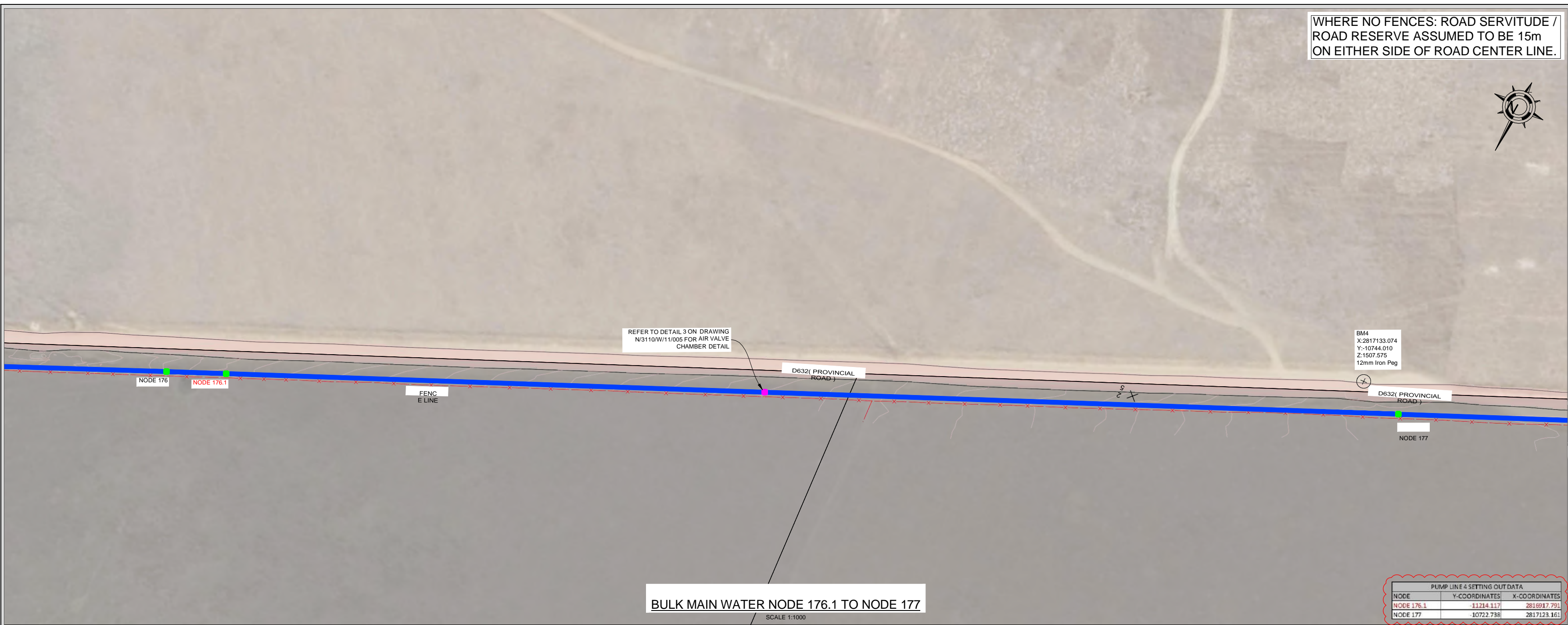
SCALE 1:1000

(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:

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

SERVICE AMENDMENTS

WATER

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

UBUNTU (PTY) LTD  
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Fax:(013) 755 4904

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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 25 OF 34

DATE

OCTOBER 2022

SCALE REF

SCALE 1:1000

PAPER SIZE

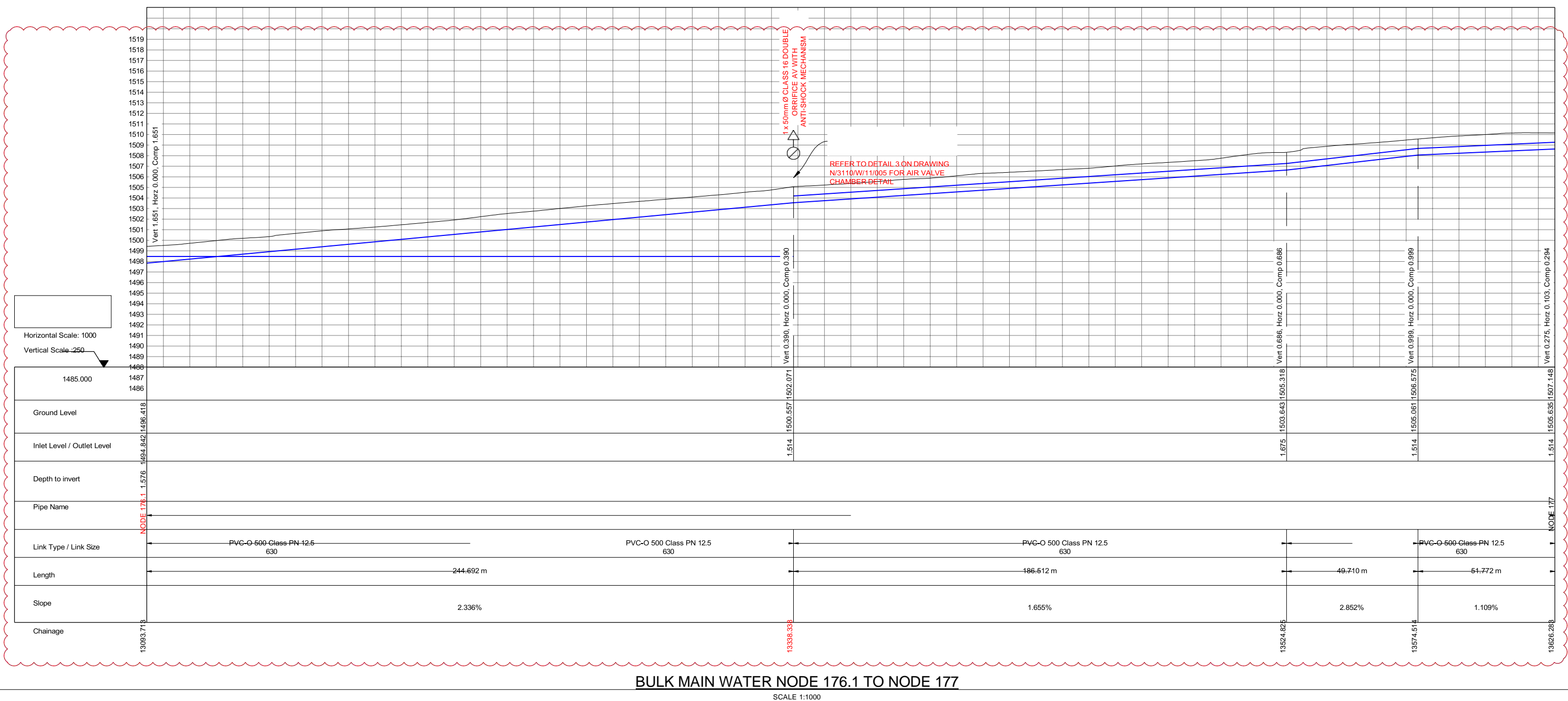
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CONSULTANT DWG. NO.

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

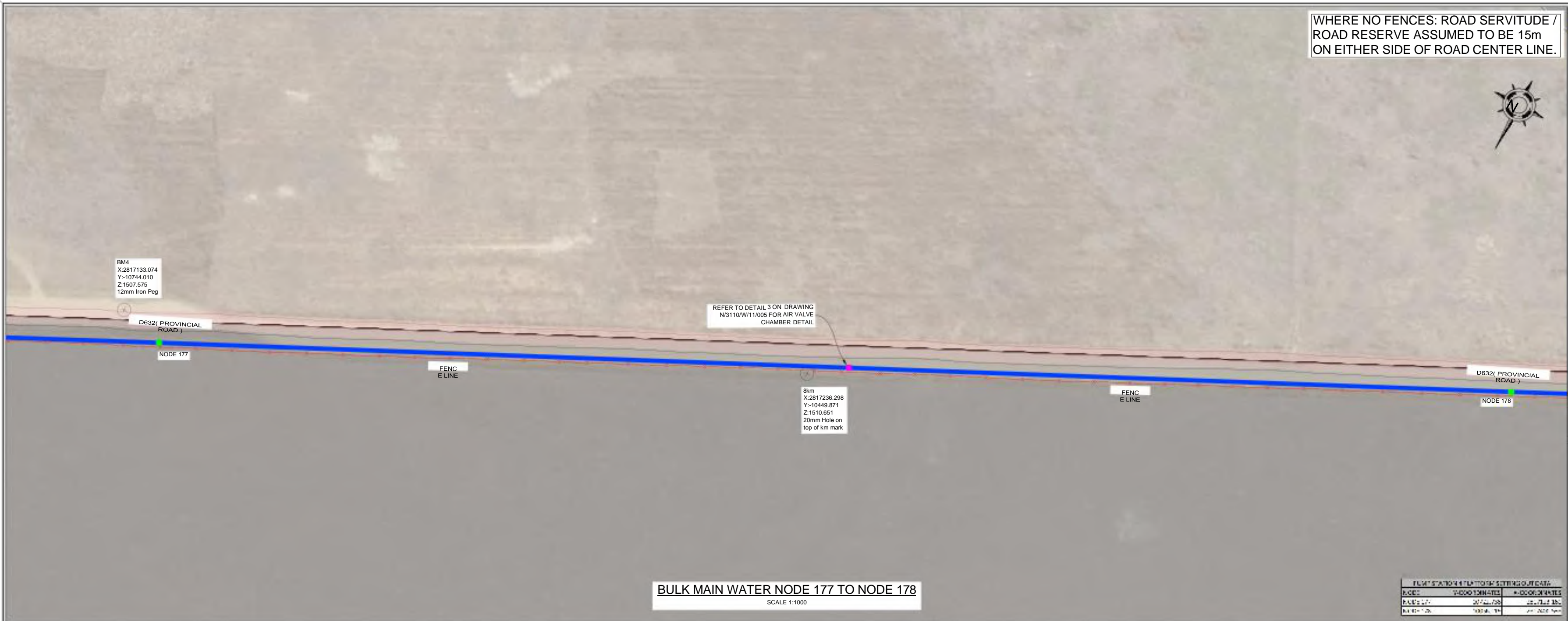
CLIENT DWG. NO.

-









LEGEND:

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

NOTE:

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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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			

## 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)
<b>ENDECON</b> <b>UBUNTU (PTY) LTD</b> ENGINEERING CONSULTANTS P.O. BOX 10345 MBOMBELA 1200 Tel:(013) 755 1190 Fax:(013) 755 4904	

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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 26 OF 34

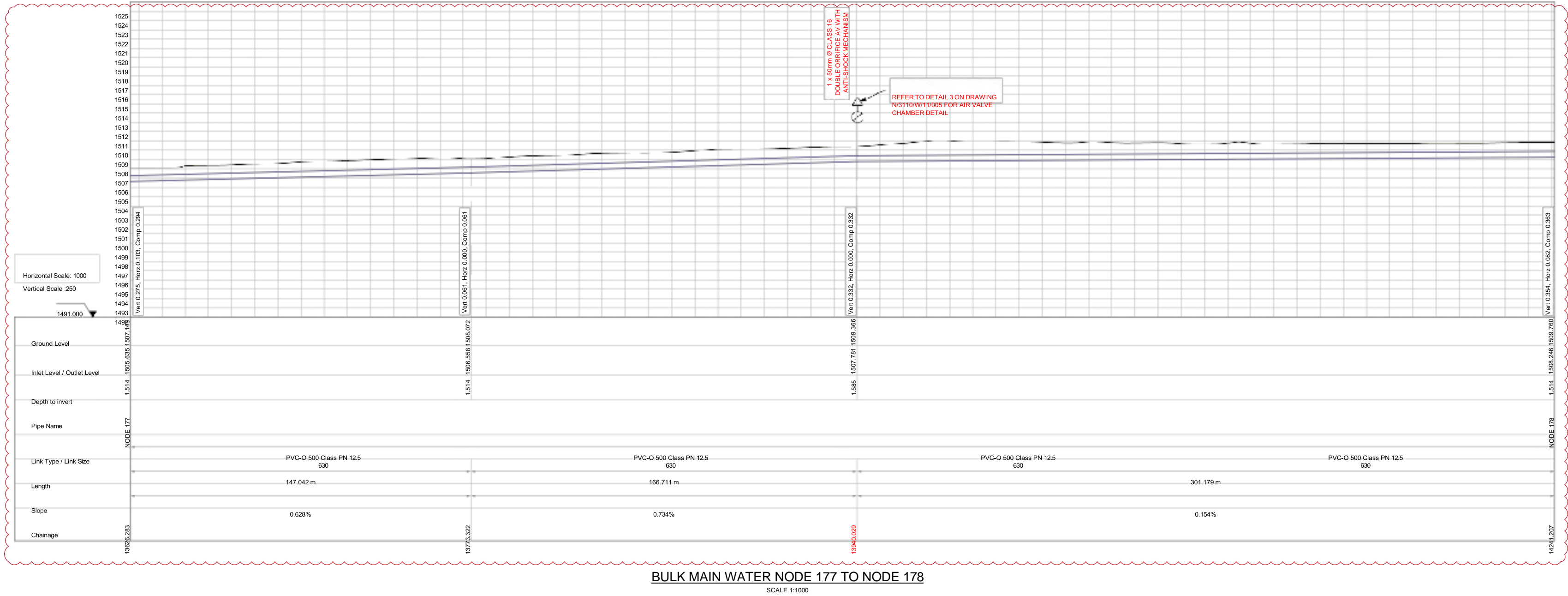
DATE: OCTOBER 2022

SCALE: 1 : 1000

PAPER SIZE: A1

CONSULTANT DWG. NO.: N/3110/P4/W/9/025/R2

CLIENT DWG. NO.:











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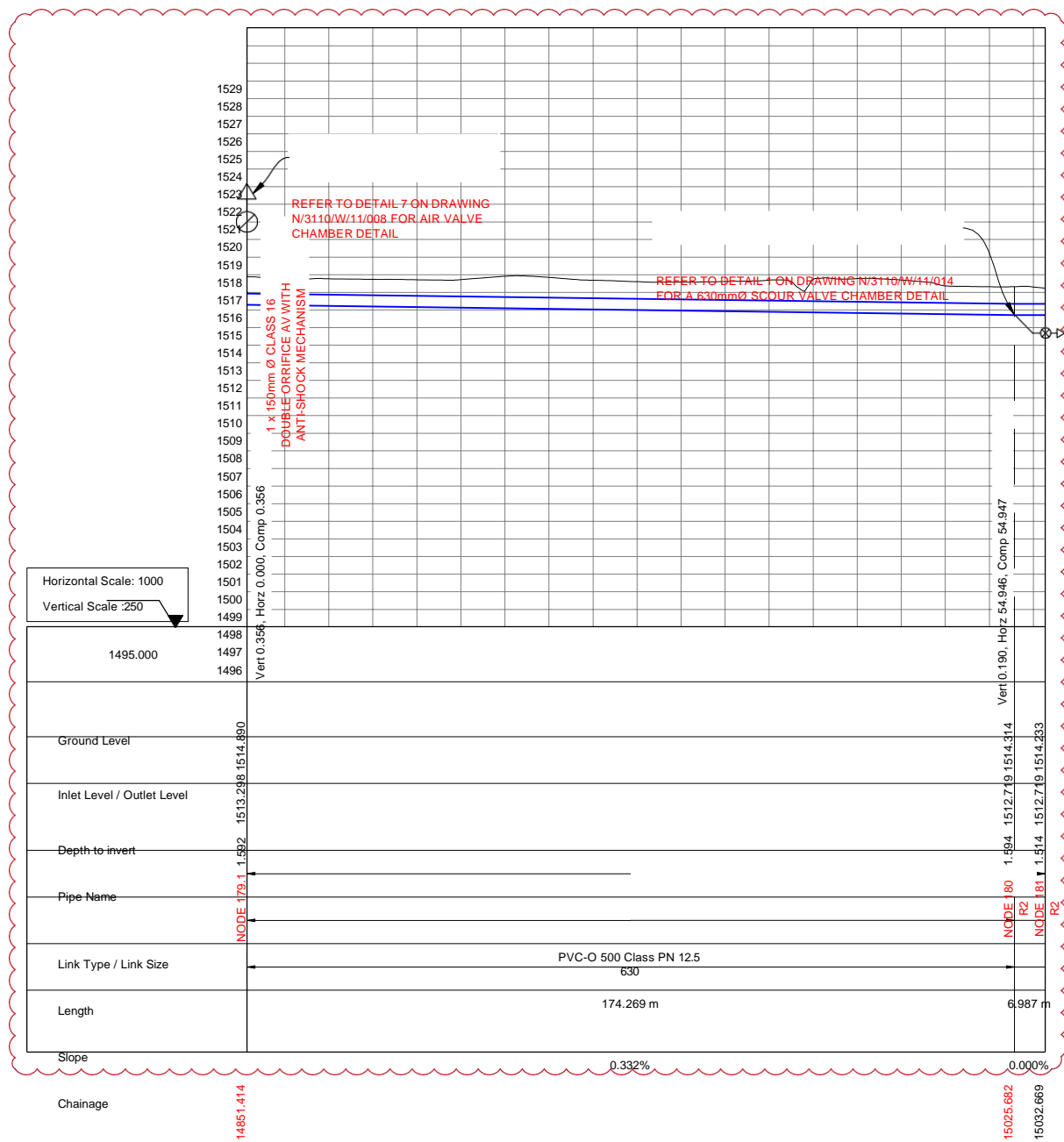
CLIENT  
  
**NKANGALA DISTRICT MUNICIPALITY**

PROJECT  
**LOSKOP REGIONAL BULK WATER SUPPLY SCHEME: WORK PACKAGE 2**

TITLE  
**PROPOSED BULK WATER LINE PUMPSTATION 4 LAYOUT 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**



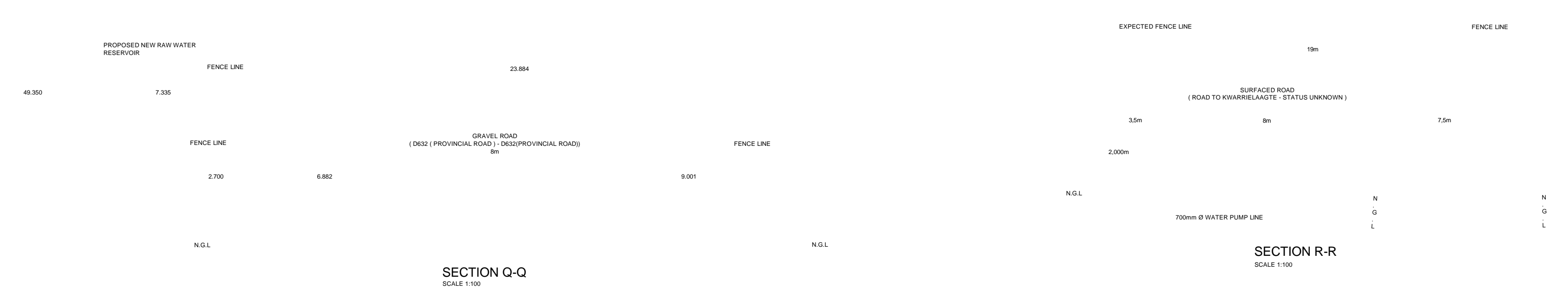


SCALE 1:1000

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

CLIENT DWG. NO.

-



- LEGEND:
- PROPOSED NEW 650mmØ WATER MAIN
  - AIR VALVE CHAMBER
  - PROPOSED NEW NODE
  - SCOUR VALVE
  - FENCE LINE
- NOTES:
- WHERE NO FENCES: ROAD SERVITUDE / ROAD RESERVE ASSUMED TO 15m ON EITHER SIDE OF ROAD CENTER LINE
  - FOR NODE COORDINATES REFER TO DRAWING N/3110/P1/W/14/001

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



FOR CONSTRUCTION

REVISE RAW RESIVIOR POSITION (REVISE TOTAL CHAINAGE)			
01	Description	2022/11/09	N.P
Rev		Date	By

AMENDMENTS	
SERVICE	
WATER	
DESIGNED	J.LUCKHOFF
DRAWN	P. MANJATE
CAD FILE NAME	N3110P4W9029-34.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

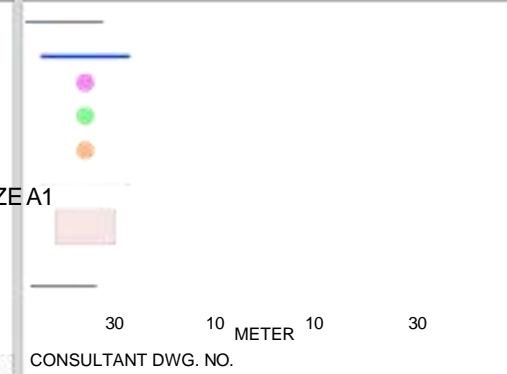
PROJECT  
LOSOP REGIONAL BULK  
WATER SUPPLY SCHEME:  
WORK PACKAGE 2

TITLE

PROPOSED BULK WATER LINE  
GRAVITY 4 LAYOUT 29 OF 34

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	1001	
	1000	

Chainage	127.44	98.806
Length	87.065 m	248.405 m
Slope	0.000	1.721%

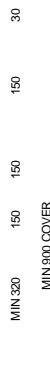


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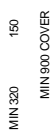
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SCALE 1:15



SCALE 1:15



N.T.S

[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)

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NKANGALA DISTRICT  
MUNICIPALITY

PROJECT

LOSKOP REGIONAL BULK WATER  
SUPPLY SCHEME: WORK PACKAGE 2

TITLE

RAW WATER GRAVITY MAIN ALONG  
CANAL ROUTE: GENERAL DETAILS:  
SHEET 1 OF 2

DATE		OCTOBER 2022	
SCALE	1 : 1000	PAPER SIZE	A1

TABLE (A) MINIMUM REQUIREMENTS FOR BULK WATER SUPPLY SCHEME GRAVEL ROAD RENOVATING									
30mm Asphalt for surface resurfacing									
LAYER NO	LAYER THICKNESS	LAYER DESCRIPTION	DOLITE 1000	MINIMUM 100% DOLITE 1000	MINIMUM 100% DOLITE 1000	MINIMUM 100% DOLITE 1000	MINIMUM 100% DOLITE 1000	MINIMUM 100% DOLITE 1000	MINIMUM 100% DOLITE 1000
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) MINIMUM LOGIC OF RESILIENT BULK WATER SUPPLY SCHEME GRAVEL ROAD RENOVATING									
30mm Thick 100% Wearing Course									
LAYER NO	LAYER THICKNESS	LAYER DESCRIPTION	DOLITE 1000	MINIMUM 100% DOLITE 1000	MINIMUM 100% DOLITE 1000	MINIMUM 100% DOLITE 1000	MINIMUM 100% DOLITE 1000	MINIMUM 100% DOLITE 1000	MINIMUM 100% DOLITE 1000
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\01\1000\BULK WATER SUPPLY SCHEME\DESIGN PHASE\DRAWINGS\5 CONSTRUCTION\D WATER\2. WORK PACKAGE 2.D. PUMPLINES\N3110RW11002-3.DWG)

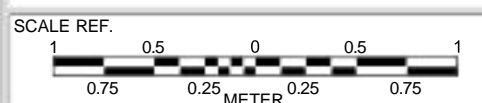
EXTERNAL DIAMETER OF PIPE		SIDE SLOPE/ANGLE	
INCH	MM	DEGREE	PERCENT
12"	305	1:1	100%
15"	381	1:1	100%
18"	457	1:1	100%
21"	533	1:1	100%
24"	609	1:1	100%

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N/3110/RW/W/11/002

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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 required pipe diameter decreases as the pipe class increases.

Pipe Diameter (mm)	CLASS 30 (m)	CLASS 60 (m)	CLASS 90 (m)
100	~0.5	~0.3	~0.2
200	~1.0	~0.6	~0.4
300	~1.5	~0.9	~0.6
400	~2.0	~1.2	~0.8
500	~2.5	~1.5	~1.0

The graph is a coordinate system with a grid. The vertical axis is labeled 'PIPE DIAMETER (mm)' and has major tick marks at 100, 200, 300, 400, and 500. The horizontal axis is labeled 'WORKING PRESSURE (MPa)' and has major tick marks at 0, 1, 2, and 3. The horizontal axis is also divided into four classes: CLASS 30 (0 to 30), CLASS 60 (30 to 60), CLASS 90 (60 to 90), and CLASS 120 (90 to 120). A diagonal line is drawn from the bottom-left towards the top-right, labeled 'WORKING PRESSURE (MPa)'.

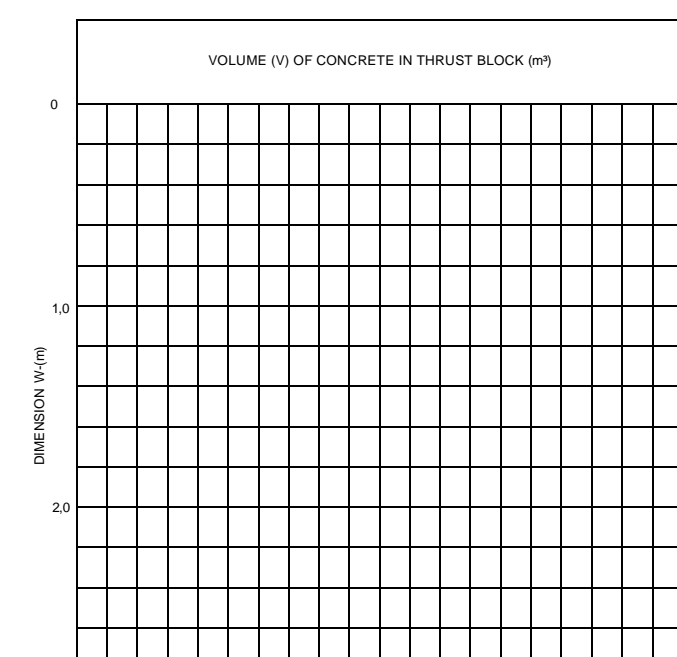
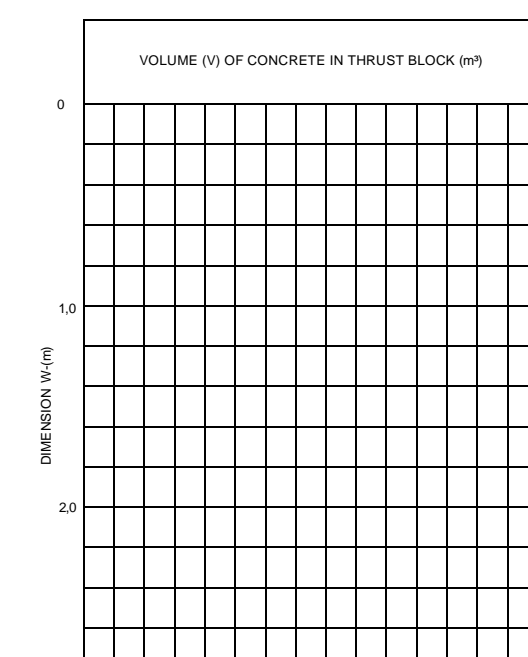
[illegible]

Diagram illustrating a trench cross-section. The diagram shows a trench with an anchor block cast against the undisturbed excavation. The labels indicate the following components:

- ANCHOR BLOCK CAST AGAINST UNDISTURBED EXCAVATION.
- X
- SIDE OF TRENCH
- Z
- D = DEPTH OF BLOCK.

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

[illegible]

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

CLIENT

NKANGALA DISTRICT  
MUNICIPALITY

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

DATE		OCTOBER 2022	
SCALE	AS SHOWN	PAPER SIZE	A1

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

TYPICAL SECTION THROUGH  
THRUST BLOCK  
N.T.S.

VARIES

MIN

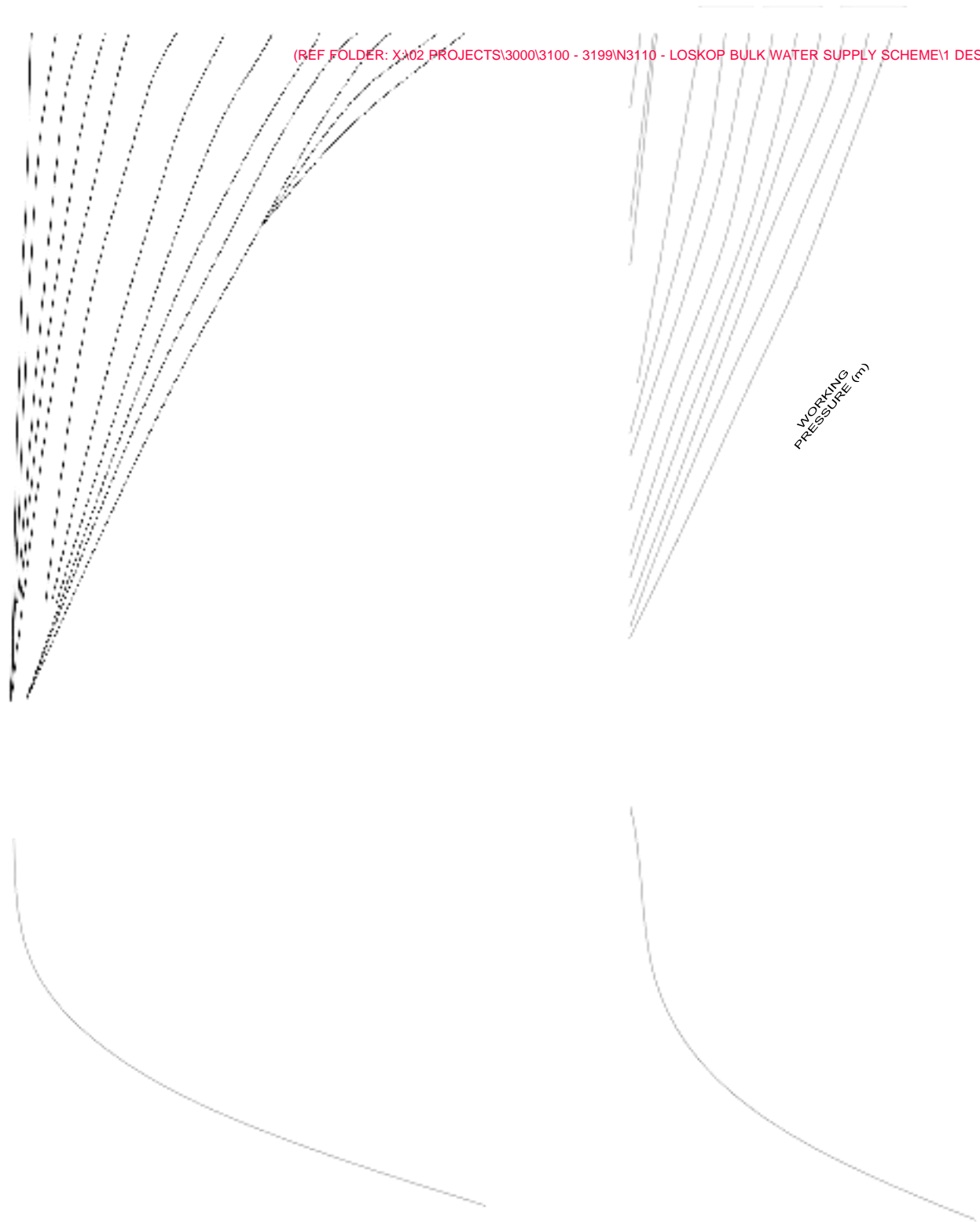
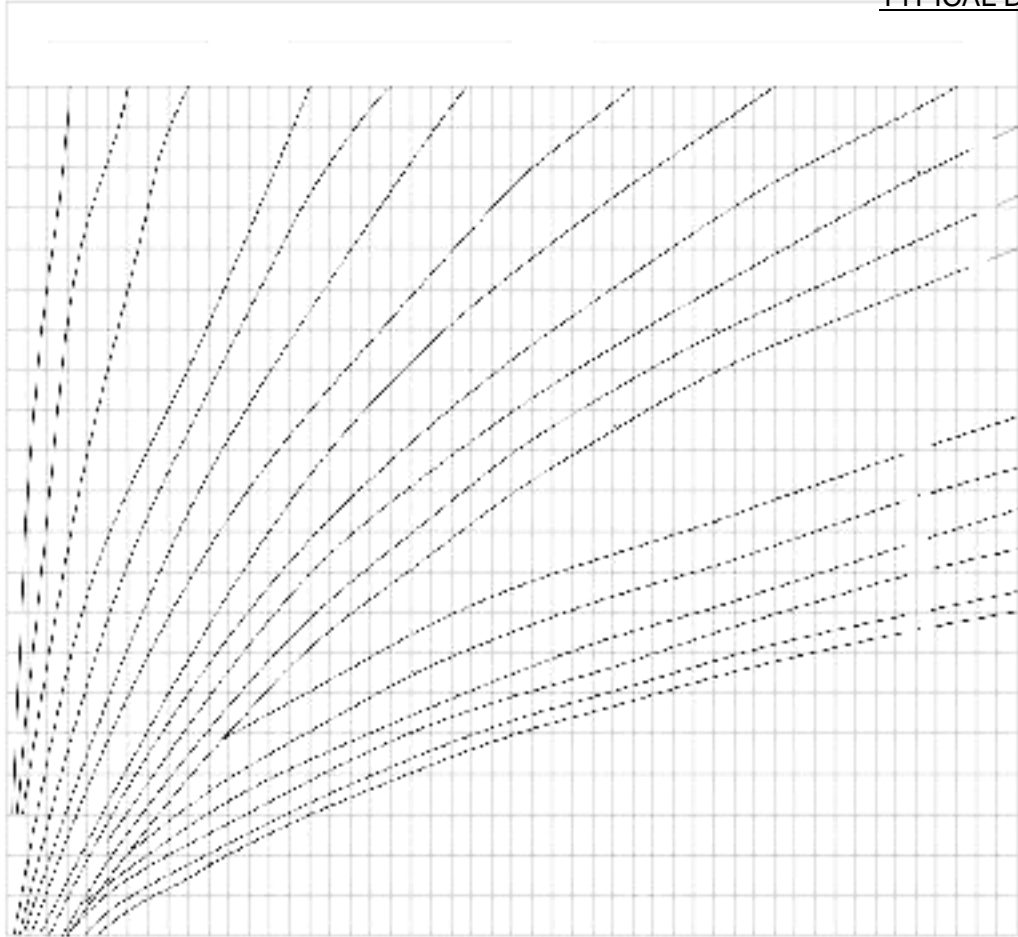
W/2

VARIES

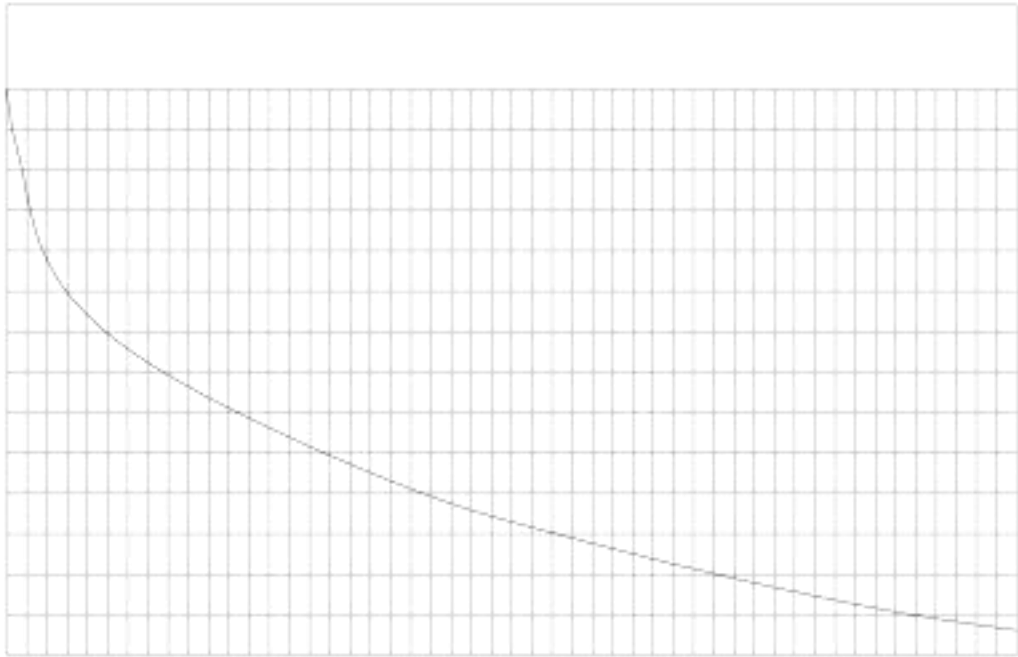
CLASS 25/19  
CONCRETE



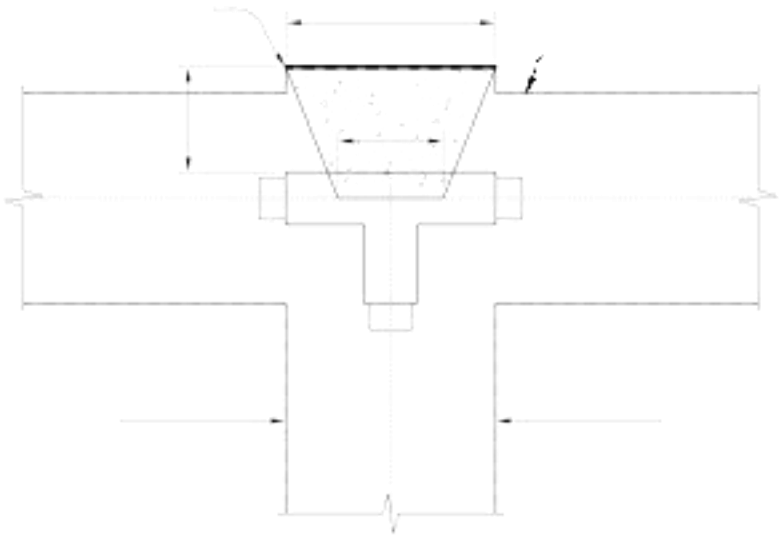
TYPICAL DETAILS OF THRUST BLOCKS



(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\RW11002-3.DWG)



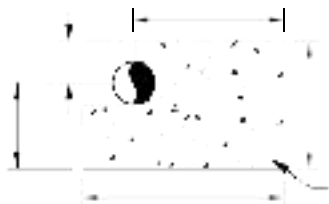
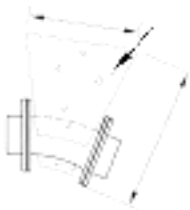
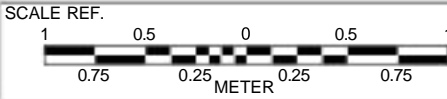
DIMENSIONS OF ANCHOR BLOCK FOR T-PIECE			
PIPE DIAMETER	E	n	7
50	300	250	500
75	475	375	750
100	650	500	1000
125	825	625	1250
150	1000	750	1500
175	1175	875	1750
200	1350	1000	2000
225	1525	1125	2250
250	1700	1250	2500

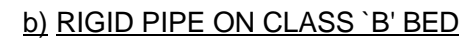
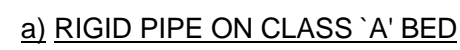


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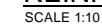
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## TYPICAL BEDDING DETAILS



--

E 1:10

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