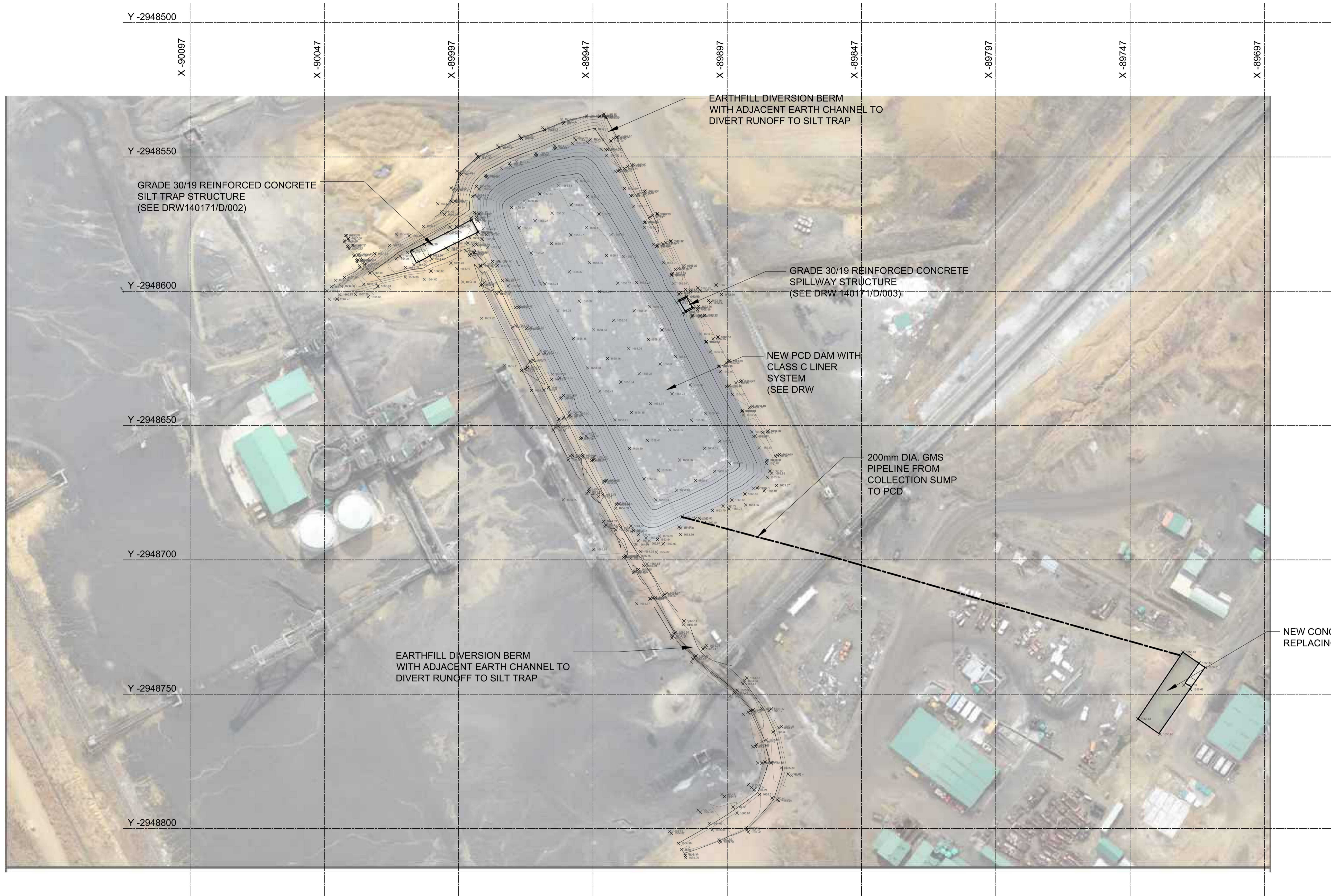


AS-BUILT

Survey by:
ESS Surveys



Rev.	Date	Description	Rev. by

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COAL
of AFRICA LIMITED

Project

MOOIPLAATS COLLIERY

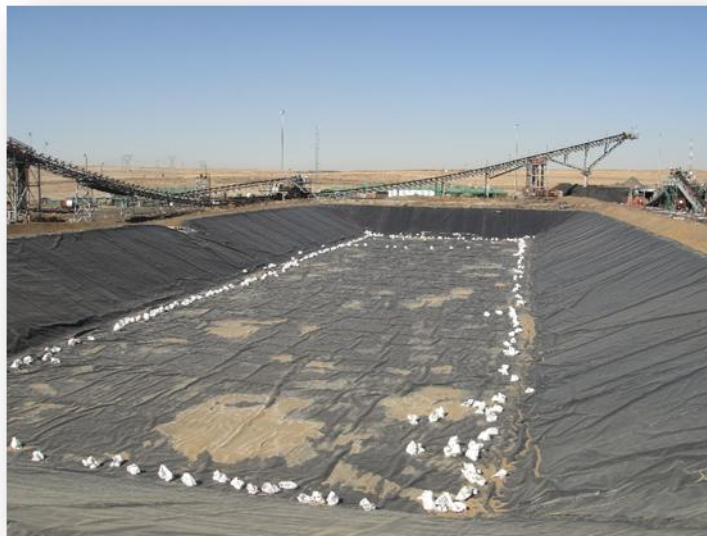
Plan Description

**SITE LAYOUT
(AS-BUILT)**

	Name	Signature
Designed	R WOOLFSON	
Drawn	R WOOLFSON	
Checked	PJ GOUWS	
Approved	PJ GOUWS	
Pr. No.		

Scale	1:750	 ORIGINAL SIZE A1
Contract No.	MP1401	
Drawing No.	140171/D/100/Z	Revision
		Z
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MP1401 – MOOPLAATS COLLIERY



CONSTRUCTION COMPLETION REPORT

PROJECT NO: 140171

OCTOBER 2015

COAL OF AFRICA LIMITED

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Reviewed By:	 PJ Gouws (PrEng)	19/10/2015 Date

Revision	Description	Date Issued	Revision By:
0	For Client Comment	19/10/2015	RW

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LIST OF ABBREVIATIONS

DSO	Dam Safety Office
DWS	Department of Water and Sanitation
EPA	Environmental Protection Agency
FSL	Full Supply Level
HDPE	High-Density Polyethylene
MAP	Mean Annual Precipitation
MLD	Million litres per day
NGL	Natural Ground Level
NOC	Non-Overspill Crest
OMC	Optimum Moisture Content
PCD	Pollution Control Dam
Pr. Eng.	Professional Engineer
RC	Reinforced Concrete
RL	Reduced Level
RLMA	Regional L-Moments Algorithm
SANCOLD	South African Committee on Large Dams
SAWS	South African Weather Service
SWMM	Storm Water Management Model
WULA	Water Use License Application

1. INTRODUCTION

1.1 Background

The Mooiplaats Colliery near Ermelo, Mpumalanga required a solution to manage storm water runoff because it is below acceptable water quality standards (Fourie, 2011). This runoff should form part of a closed dirty water system which was not the case before the start of this project.

Work had previously been carried out to construct a pollution control dam (PCD) according to recommendations made in Water & Salt Balance Study: Water Balance Analysis Report (Coetzee, 2010) by Nurizon Consulting Engineers in order to address this problem. Construction was stopped for undisclosed reasons, and the colliery was placed on care and maintenance until the PCD could be completed.

Element Consulting Engineers (Pty) Ltd was asked to re-evaluate the capacity which was recommended in the above mentioned report by Nurizon, through execution of an updated water balance model, in accordance with the Best Practice Guidelines A4: Pollution control dams by the Department of Water and Sanitation. The results of this were presented in the form of a preliminary/concept design report in August 2014 and the design was accepted and approved by Kelvin Legge (DWS).

1.2 Contract Information

Construction Commencement Date:	15 January 2015
Practical Completion Date:	29 June 2015
Contract Value (Incl. VAT):	R4 168 788.32
Contractor:	LVR Plant (Pty) Ltd
Client:	Langcarel (Pty) Ltd

2. SITE LOCATION AND DESCRIPTION

The site is a colliery, located near the town of Ermelo in Mpumalanga, which is situated on the Mooiplaats Farm). Approximate co-ordinates of the colliery are 26°39'00"S, 30°06'00"E.

The site is approximately 5km from the Eskom Camden Power Station and can be accessed via the N2 road between Ermelo and Piet Retief.

The existing PCD excavation lies between the co-disposal facility and the office area. The unlined pond is situated in the office area.



Figure 2.1: Site Location

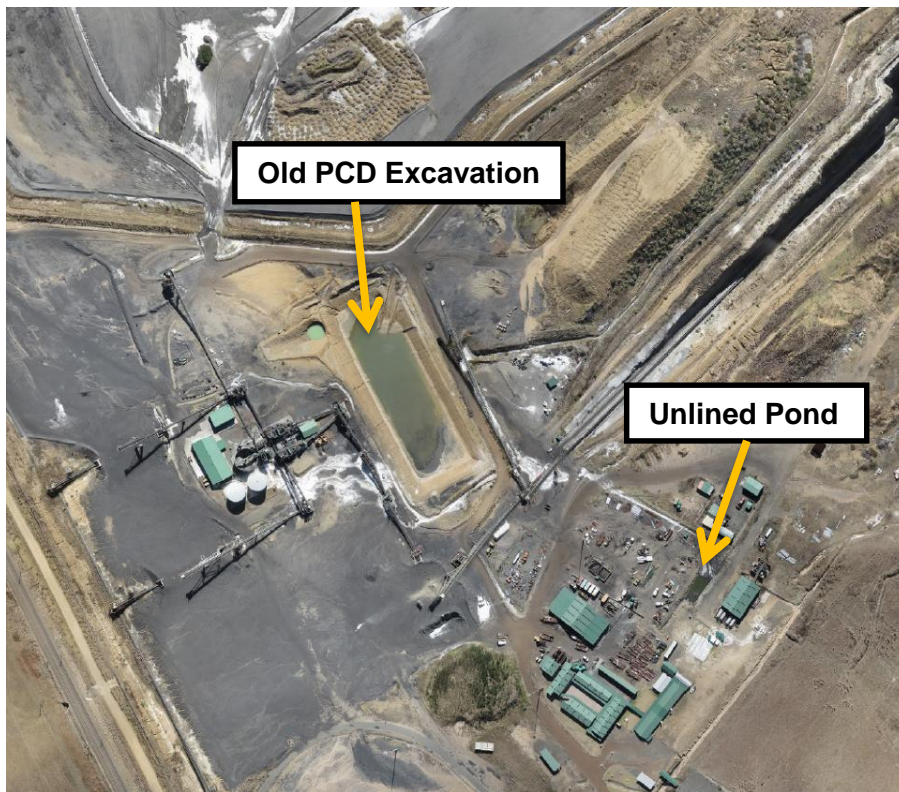


Figure 2.2: Aerial view prior to construction

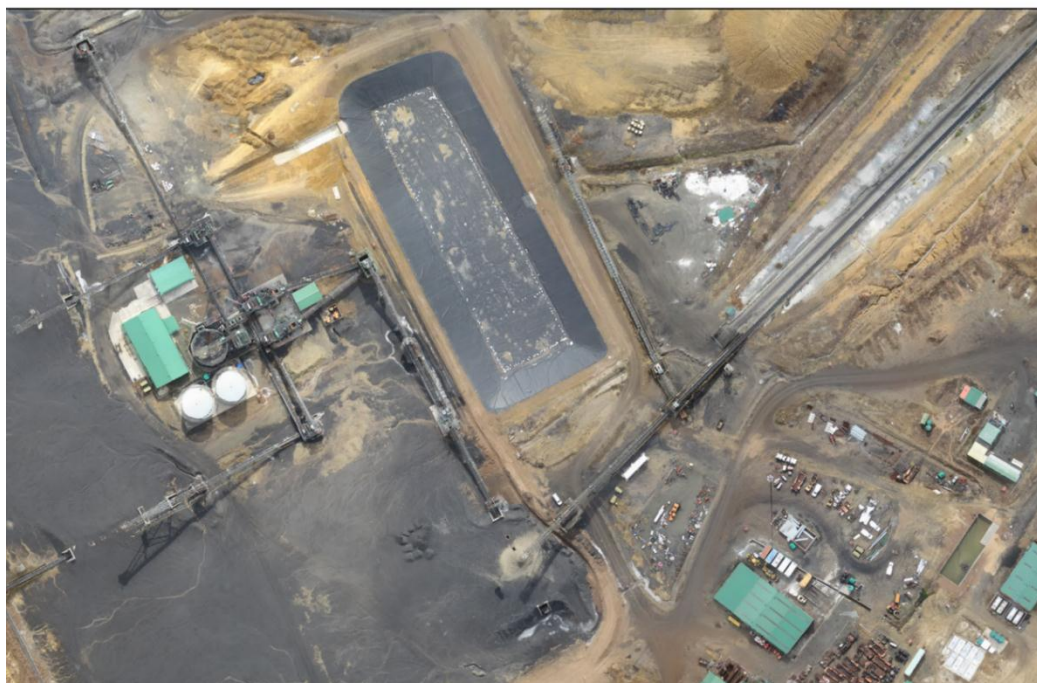


Figure 2.3: Aerial view after completion of the works

3. SCOPE OF WORK

The scope of work was as follows:

- Construction of a pollution control dam with the following liner specifications:
 - 300mm clay layer compacted to 98% standard proctor density at 2% wet of OMC (optimum moisture content)
 - 1.5mm thick HDPE (High-density polyethylene) geomembrane above the clay layer
- Construction of a reinforced concrete spillway structure
- Construction of a reinforced concrete sediment/silt trap structure
- Construction of earth fill diversion berms compacted to 98% standard proctor density at 2% wet of OMC. Side channels were to be formed alongside these berms to divert runoff towards the silt trap structure.
- A runoff channel was to be constructed upstream of the spillway to divert flow towards the drainage opportunity to the east.
- Construction of a reinforced concrete collection sump near the administration offices to capture runoff from the area downstream of the PCD. The water will then be pumped back to the PCD via a new 170m long, buried pipeline
- Install and test a pump supplied by the client for the above mentioned pipe line

4. BASIC CHARACTERISTICS OF THE WORKS

4.1 Pollution Control Dam

The existing excavation was re-sized such that the constructed, lined, PCD would have a capacity of approximately **22059 m³** at full supply level. The actual capacity at full supply level after construction was **20721m³** (see Figure 4.1).

The PCD liner system consists of a 1.5mm thick HDPE (High-density polyethylene) geomembrane directly above a 300mm clay layer compacted to 98% standard proctor density at 2% wet of OMC (optimum moisture content) which was compacted in layers of no greater than 150mm. (See Appendices for test results).

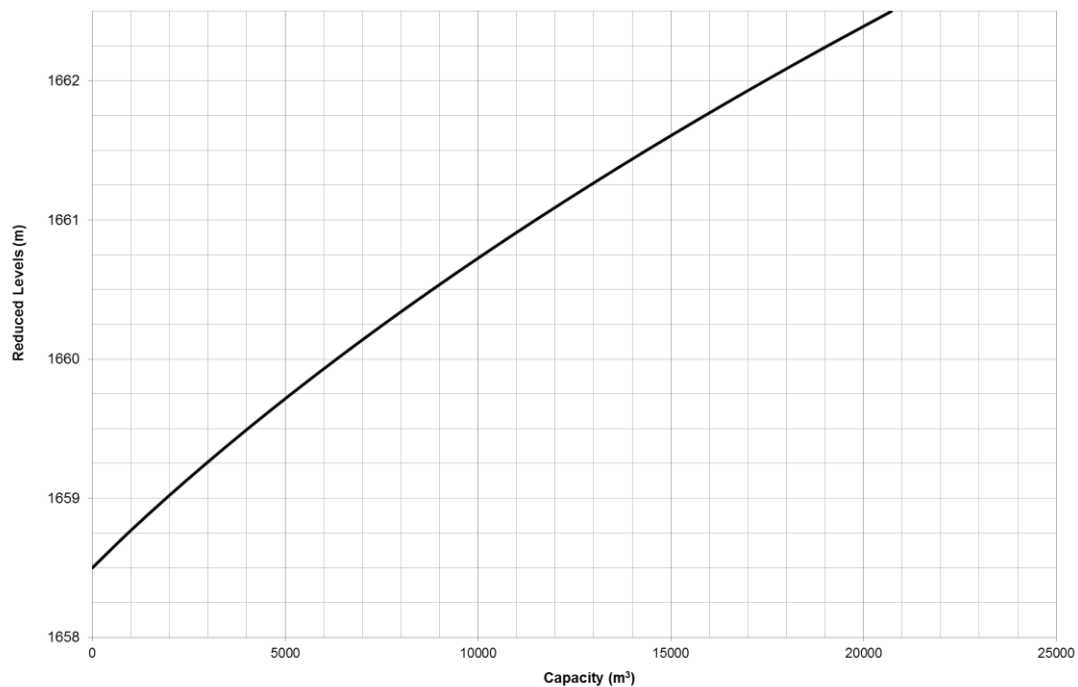


Figure 4.1: As-built stage/capacity curve of PCD

4.2 Silt Trap

The design also includes a concrete silt trap structure which allows for sediment in the surface runoff to settle before the water enters the PCD. This minimizes the quantity of silt entering the PCD, thus increasing its life span, as well as reducing the need for maintenance within the PCD which can prove difficult due to the susceptibility of HDPE lining to damage.

The silt trap also includes an access ramp which would allow for a front end loader to enter the structure for removal of sediment if necessary. This ramp was constructed with a slope of 1 in 5 which is deemed to be sufficiently flat for its purpose.

The structure was constructed using Grade 30/19 concrete.

The silt trap has a 200mm thick reinforced concrete surface bed with Ref. 617 high-tensile weld mesh at 50mm cover to the bottom of the surface bed. Similarly, the walls

of the structure are 200mm thick and have the same mesh at 50mm cover to the outside of the structure.

Construction joints were placed along the shorter dimension of the structure at 5m spacing (see attached drawings). These joints were then saw-cut and filled with a waterproofing elastic joint sealant (Sikaflex-11FC).

Construction joints between the base of the walls and the floor slab were treated with Sikadur-32N wet to dry epoxy bonding agent to facilitate the bond between the surfaces.

An overflow ledge 560mm below the top level of the walls was constructed to allow flow of water into the PCD without overtopping of the silt trap.

This overflow was designed to have an effective freeboard of 500mm and a width of 5m which is adequate to pass the 1 in 50-year flood peak. This overflow is approximately 1.5m above the base of the silt trap which will allow for silt particles to settle within the structure before water enters the PCD.

The level of this overflow is at **1663.44m**.

4.3 Spillway Structure

The *Best Practice Guidelines A4: Pollution control dams* from DWS, states that spillway sizing for pollution control dams should be carried out based on the guidelines set out in *Guidelines to Safety in Relation to Floods*. These guidelines indicate the applicable design discharge recurrence intervals to be used to determine required spillway discharge capacities; however, they are based on upstream wall heights which is not applicable in this case as the PCD is below ground level. Furthermore, according to the DSO, a dam having a wall height of less than 5m and a storage capacity of less than 50 000m³, as is the case in this situation, does not need to be registered with DWS as a dam having a safety risk (see attached confirmation letter in appendices).

Despite this, it was decided to design the spillway for the 1 in 100-year flood peak of **2.64m³/s**.

The spillway was constructed from grade 30/19 concrete. Only 500mm freeboard is required to pass the 1:100 year flood peak, although the available freeboard is higher as a result of raising the NOC levels for aesthetic reasons. The discharge capacity of the spillway was evaluated using the equation below:

$$Q = CLH^{3/2}$$

With

$$C = 1.6$$

$$L = 5\text{m}$$

$$H = 0.5\text{m}$$

Using these values, the spillway discharge capacity is **2.83m³/s** which is greater than the 1 in 100-year flood peak. It should be noted that the discharge coefficient used is that of a broad-crested weir which was deemed to be a conservative estimate of the spillway capacity. **Figure 2** shows the relationship between discharge and water level above FSL for this spillway.

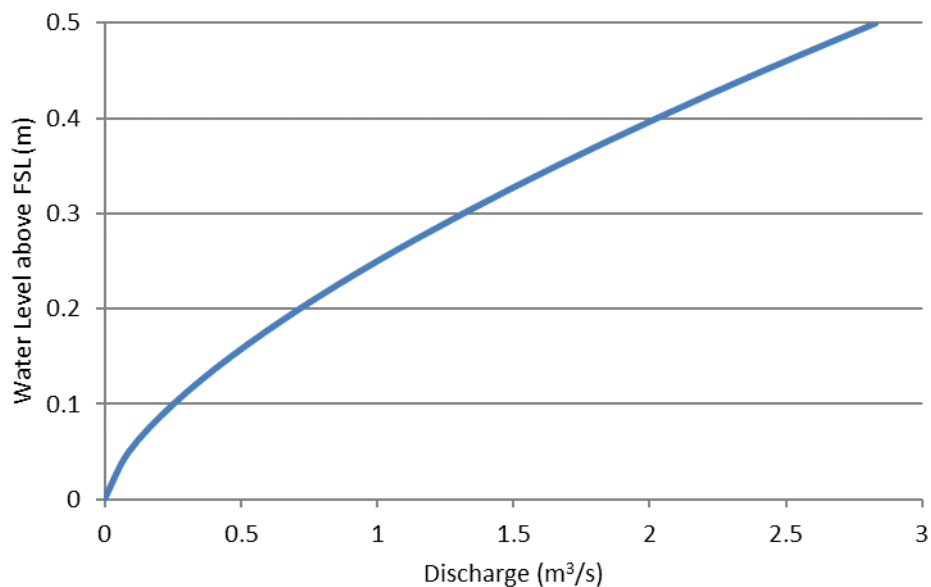


Figure 2: Spillway Discharge Curve

4.4 Spillway Runoff Channel

Discharge from the spillway due to the 1 in 100 year flood is not expected to produce runoff with significant velocities. Despite this, some erosion damage could take place. It was therefore decided during construction to make use of layer of rockfill material to line the spillway channel. This layer extends over the full width (5m) of the spillway.

4.5 Collection Pond

Sizing of the new concrete lined collection pond was done through computation of the 1 in 50 year flood runoff volume for the sub-catchment that drains into it. It was decided to line this pond with concrete for access purposes and an access ramp was also included in the design. Water collecting in this pond is to be pumped into the PCD when the water level is **1.80m** above the bottom of the pond.

The capacity of the pond was designed for the 1 in 50 year runoff volume, which would be a worst-case scenario (i.e. No pumping taking place). It should also be noted that during a significant storm event, there may have been a build-up of sediment and water in the pond prior to the start of the storm which would reduce the available capacity before spillage occurs.

In addition to this, water quality of the runoff that collects in this pond is non-compliant with the SANS 241:2006 standards as determined by testing done on samples from the area (Fourie, 2011). Concentrations of Na, SO₄ and F are significantly higher than is derisible according to these standards. As such, it can be concluded that the prevention of spillage from this pond is as important as prevention of spillage from the PCD.

The structure was constructed using Grade 30/19 concrete. As is the case with the silt trap, the surface bed of this pond was reinforced with Ref. 617 high-tensile weld mesh at 50mm cover to the bottom of the bed. The walls are 200mm thick and reinforced with Ref. 617 high-tensile weld mesh at 50mm cover to the outside of the structure. Construction joints between the base of the walls and the floor slab were treated with Sikadur-32N wet to dry epoxy bonding agent to facilitate the bond between the surfaces.

4.6 Diversion Berm with Collection Channel

Two diversion berms were constructed with adjacent channels in order to convey runoff towards the silt trap. This will reduce the quantity of sediment entering directly into the PCD, thus increasing its life-span and reducing the need for sediment removal from the PCD.

The berm slopes are protected from erosion by grass cover which is was in the process of being established at the time of writing.

The diversion berm on the North/North-Eastern side of the dam does not have a side channel along its entire length due to topographical restrictions. Channel A (Western Side of PCD) was designed to have a slope of approximately **1 in 400** while Channel B (Eastern/Northern Side of PCD) was designed to have a slope of **1 in 50**. Both of these channels terminate at a level of **1664.00m** once they reach the silt trap structure.

5. DESIGN CHANGES DURING CONSTRUCTION

- The position of the spillway was changed to make use of a more effective drainage opportunity. The spillway channel could then drain into a collection sump with a channel leading out of the mine.
- The spillway channel was originally planned to be constructed using a soilcrete layer, however it was decided that to save costs, rockfill material available on site should be used.
- The chute from the concrete silt trap leading into the PCD was originally planned to run along the slope. For ease of construction it was decided to rather construct a horizontal overflow ledge.
- The NOC of the dam was raised by approximately 780mm from the original planned level of 1664.00m. The lowest point on the dam crest is 1664.78m on the Southern side. The crest levels on the northern side of the dam were slightly higher at the start of construction and a decision was taken to raise the crest to the same level all around the dam for aesthetic reasons. As such, more freeboard is available than was required based on the design.

- The above change required that the silt trap overall levels were raised by 500mm (which reduced excavation costs) and that the diversion berm crest levels were raised by approximately 1m.

6. EXTENSION OF TIME

An extension of 28 days was granted by the Engineer. The Contractor submitted a claim dated 26 May 2015 citing the following reasons to claim for an extension of time:

1. Rainfall (as per Contract document) – 6 Days
2. 3 heavy rainfall events, each causing a delay of 3 days – 9 Days. There was a significant quantity of clay material on site that created working challenges during periods of heavy rainfall.
3. Additional work:
 - The quantity of silt in the Genset dam was underestimated and excavation took longer than expected.
 - Additional fill was required at the silt trap location.
 - Levelling of PCD crest
4. Working hours were only made known after commencement of the works.

Practical completion was granted on 24 June 2015 and therefore 15 days' worth of penalties were imposed. This amounted to **R 78,360.75** (Excl. VAT).

7. QUALITY CONTROL DURING CONSTRUCTION

The following tests were carried out during construction to ensure quality control:

- Concrete cube testing for the silt trap structure, spillway structure and collection pond.
- Compaction tests within the basin of the PCD
- Compaction tests on the diversion berms
- General foundation indicator tests were taken on the clay material obtained on site for the PCD clay layer.

8. OUTSTANDING ITEMS

- The certificate of completion was granted on condition that the Contractor completes grass establishment on the diversion berms and side channels after winter.
- This was completed by 14 October 2015.

9. CERTIFICATE OF COMPLETION

See Appendices.

**APPENDIX A:
PHOTO REPORT**

**APPENDIX B:
AS-BUILT DRAWINGS**

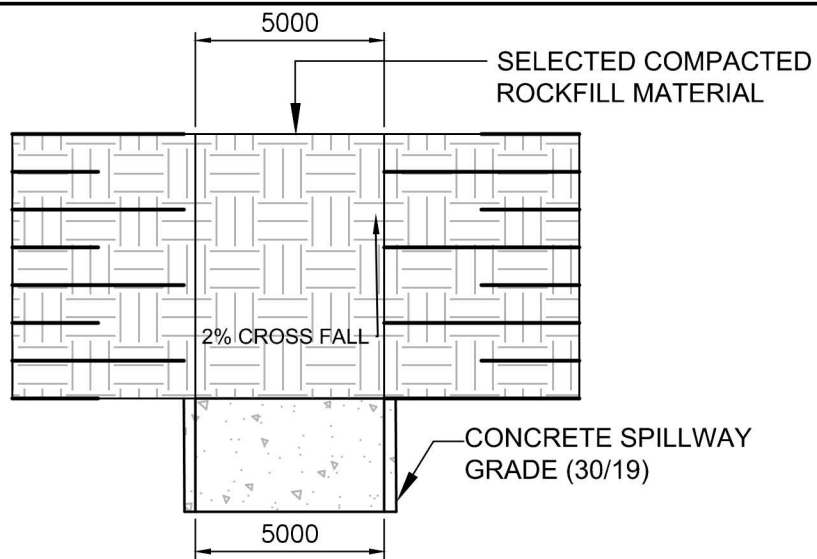
**APPENDIX C:
TEST RESULTS**

**APPENDIX D:
CERTIFICATE OF COMPLETION**

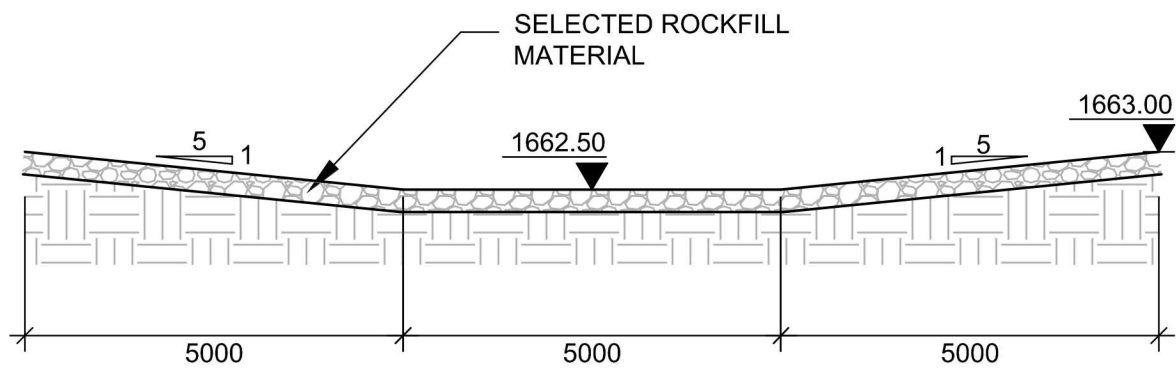
**APPENDIX E:
DWS DAM SAFETY OFFICE LETTER**

**APPENDIX F:
VARIATION ORDER FORMS**

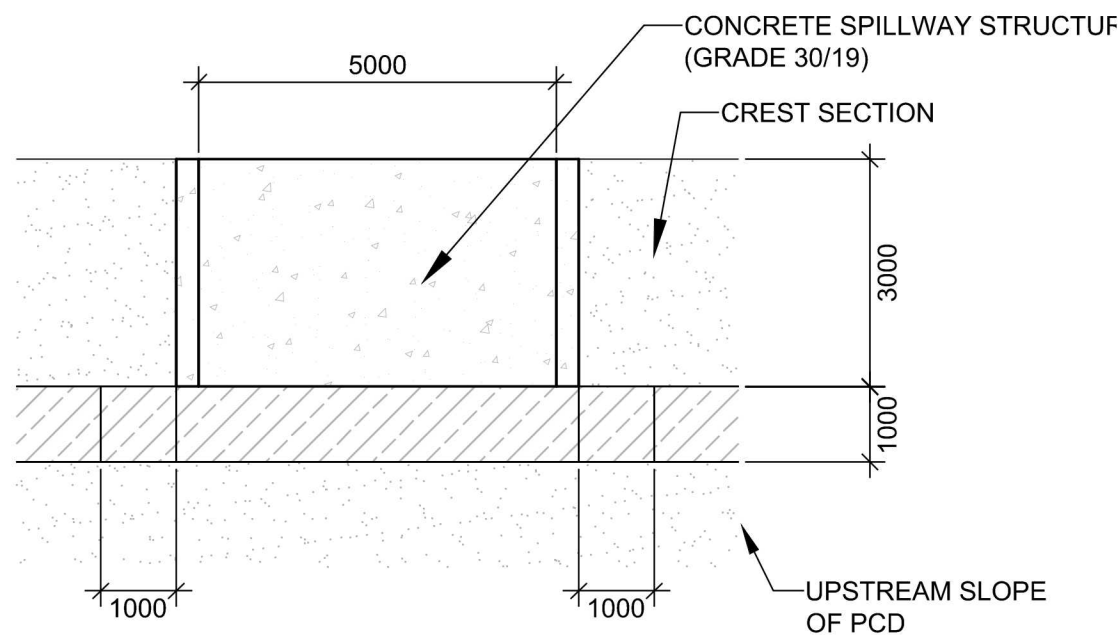
**APPENDIX G:
EXTENSION OF TIME LETTER**



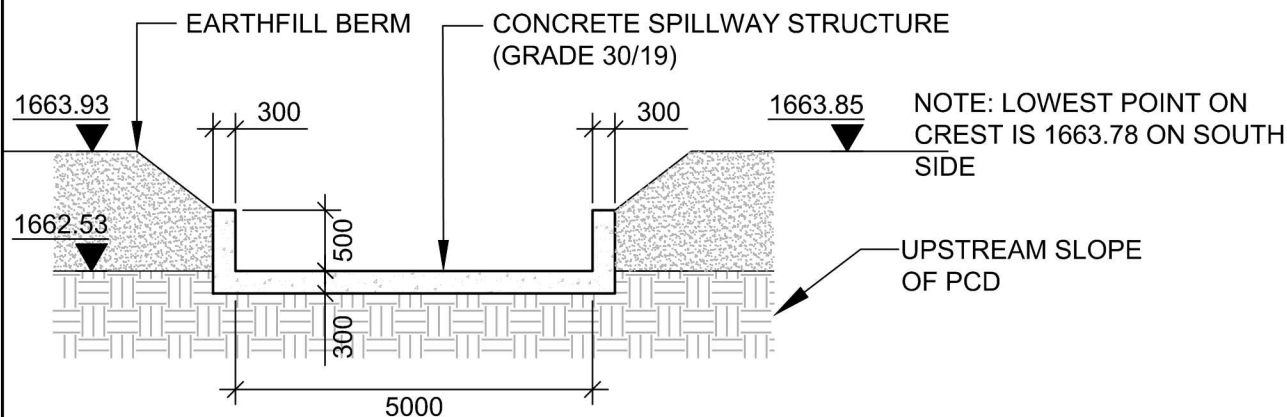
PLAN VIEW OF SPILLWAY RUNOFF CHANNEL
SCALE 1:200



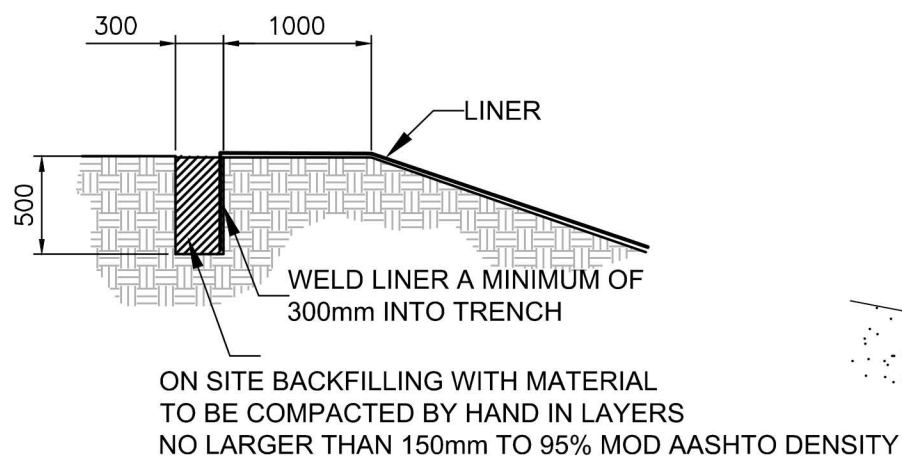
FRONT VIEW OF SPILLWAY RUNOFF CHANNEL
SCALE 1:100



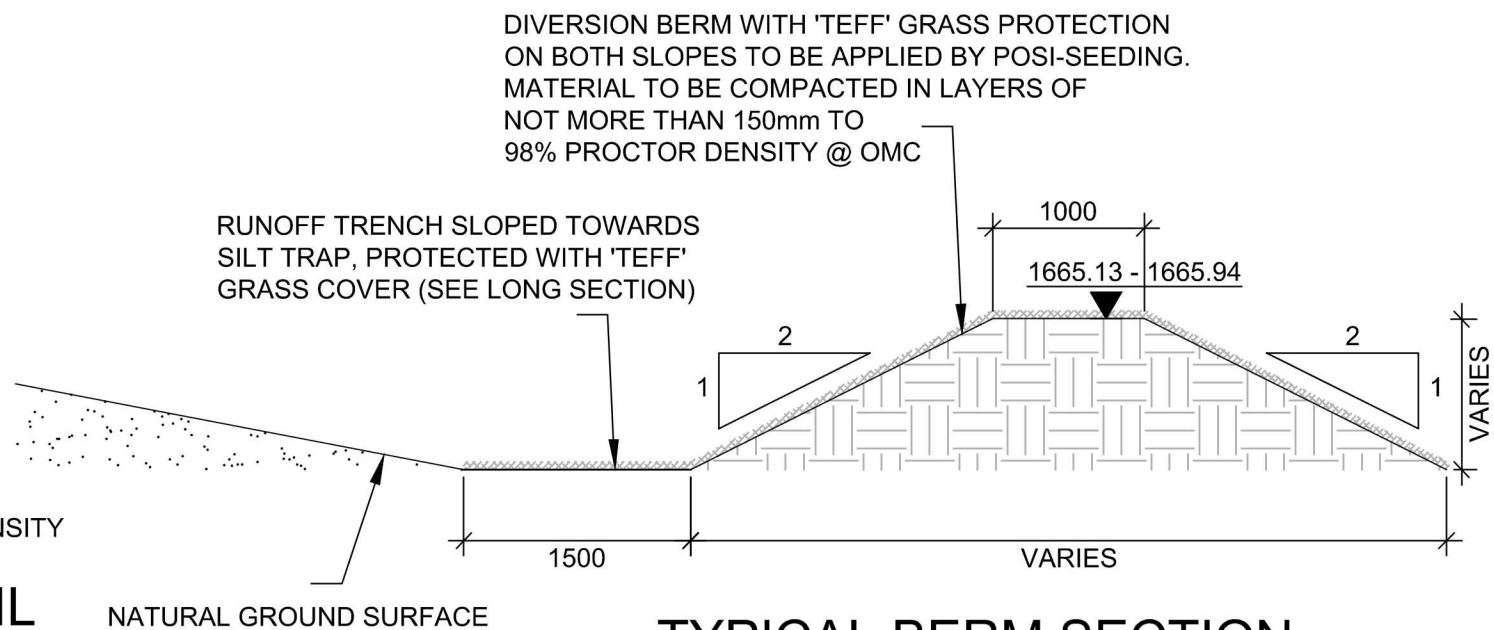
SPILLWAY PLAN VIEW
SCALE 1:100



SPILLWAY FRONT VIEW
SCALE 1:100



TYPICAL ANCHOR TRENCH DETAIL
SCALE 1:200



TYPICAL BERM SECTION
SCALE 1:50

AS-BUILT
Survey by:
ESS Surveys

Scale 0 5 10 15 20mm
ORIGINAL SIZE A3

Rev.	Date	Description	Rev. by

Client/Employer



Project

MOOPLAATS COLLIERY

Plan Description

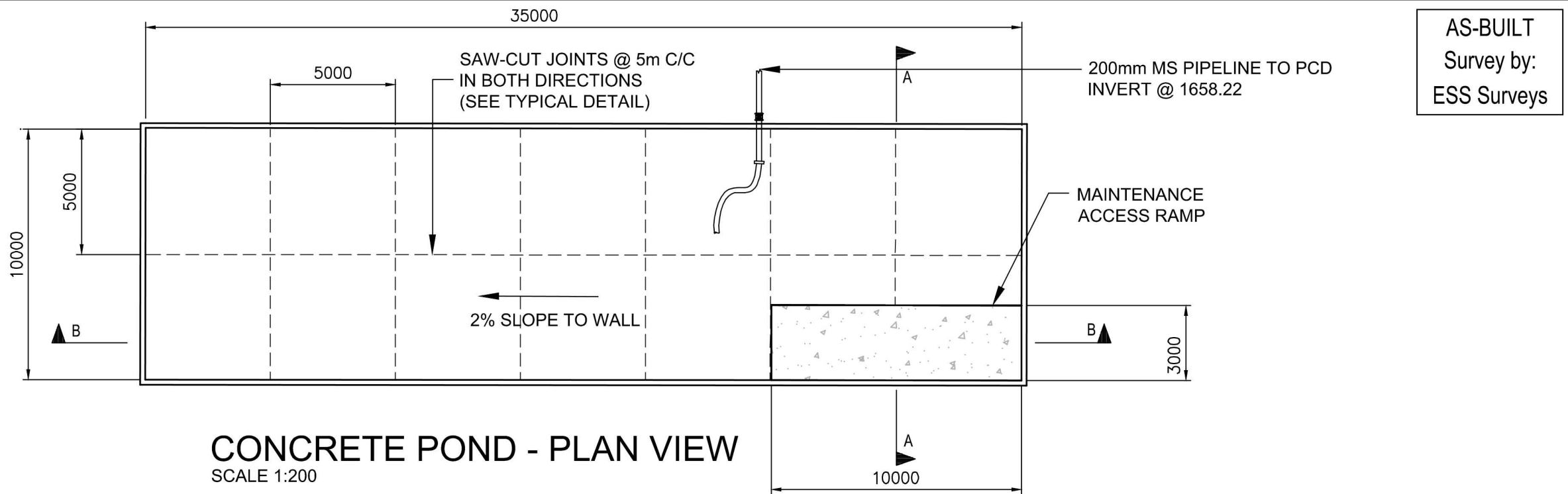
GENERAL DETAILS

	Name	Signature
Designed	R WOOLFSON	
Drawn	R WOOLFSON	
Checked	PJ GOUWS	
Approved	PJ GOUWS	
Pr. No.	880061	

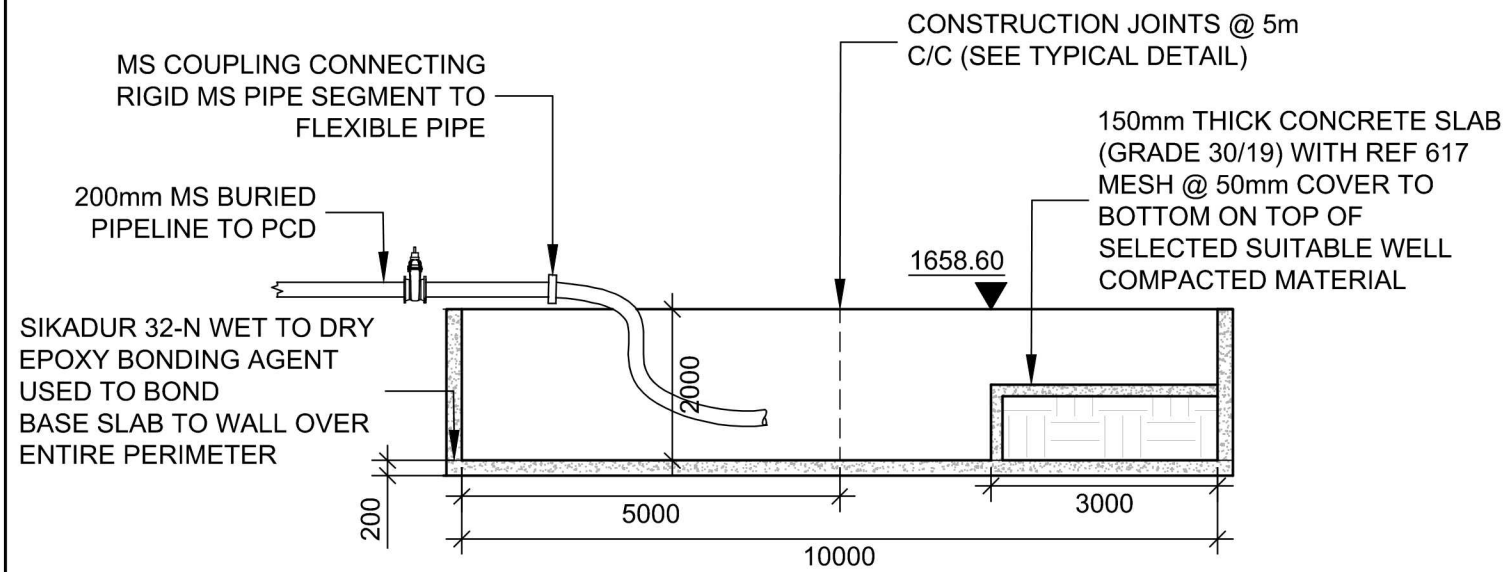
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Revision Z

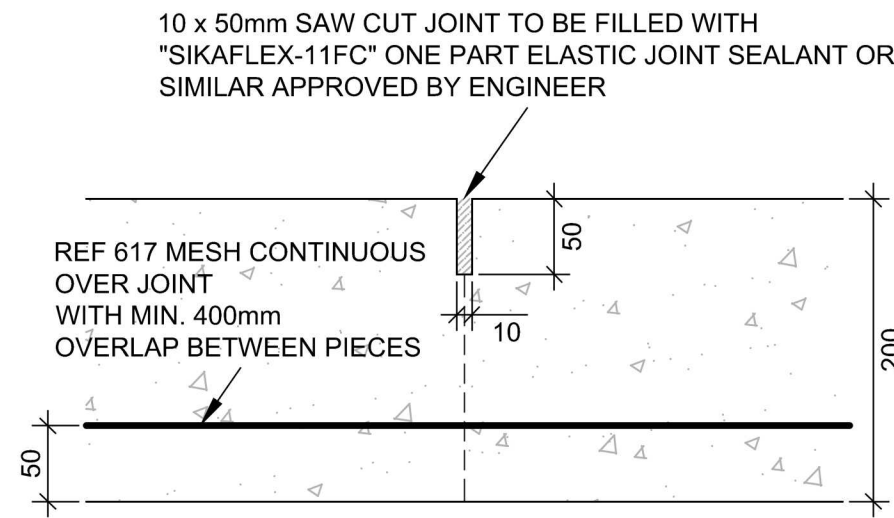
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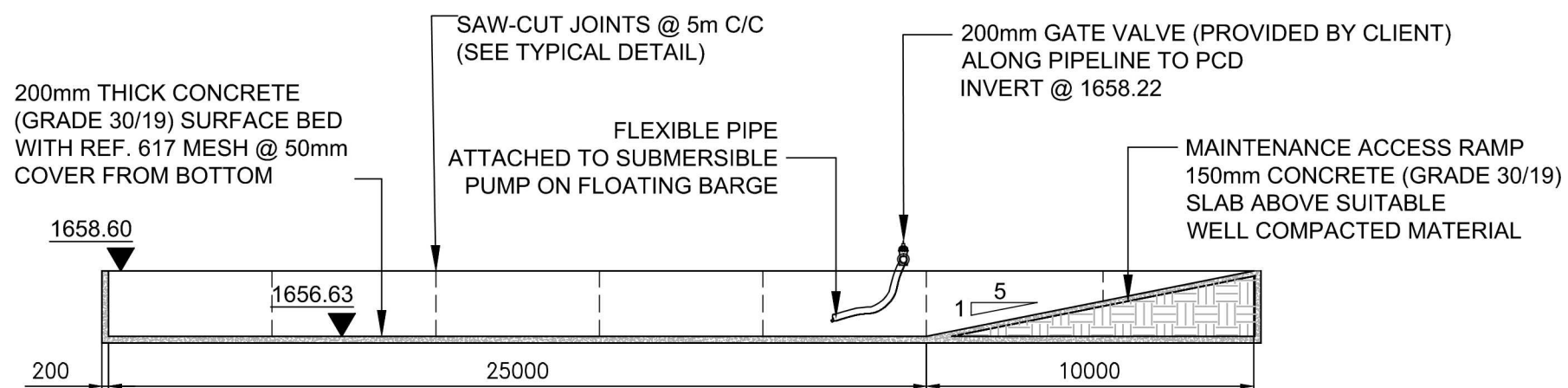
CONCRETE POND - PLAN VIEW
SCALE 1:200



SECTION A-A
SCALE 1:100



TYPICAL JOINT DETAIL
SCALE 1:5



SECTION B-B
SCALE 1:200

Scale

0 5 10 15 20mm

ORIGINAL SIZE A3

Rev.	Date	Description	Rev. by

Client/Employer

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Project

MOOPLAATS COLLIERY

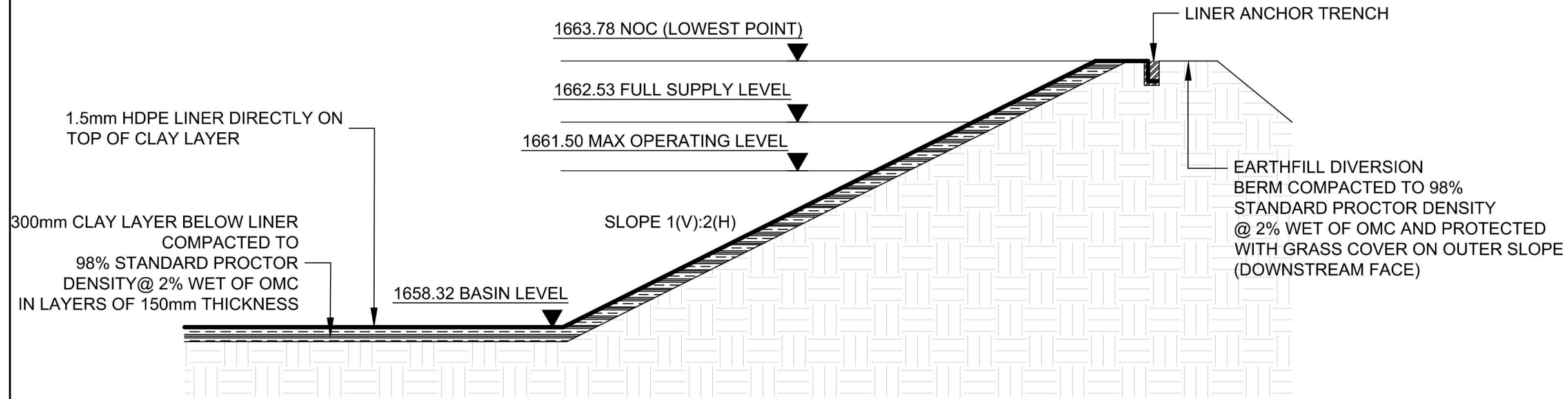
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CONCRETE LINED COLLECTION POND DETAILS

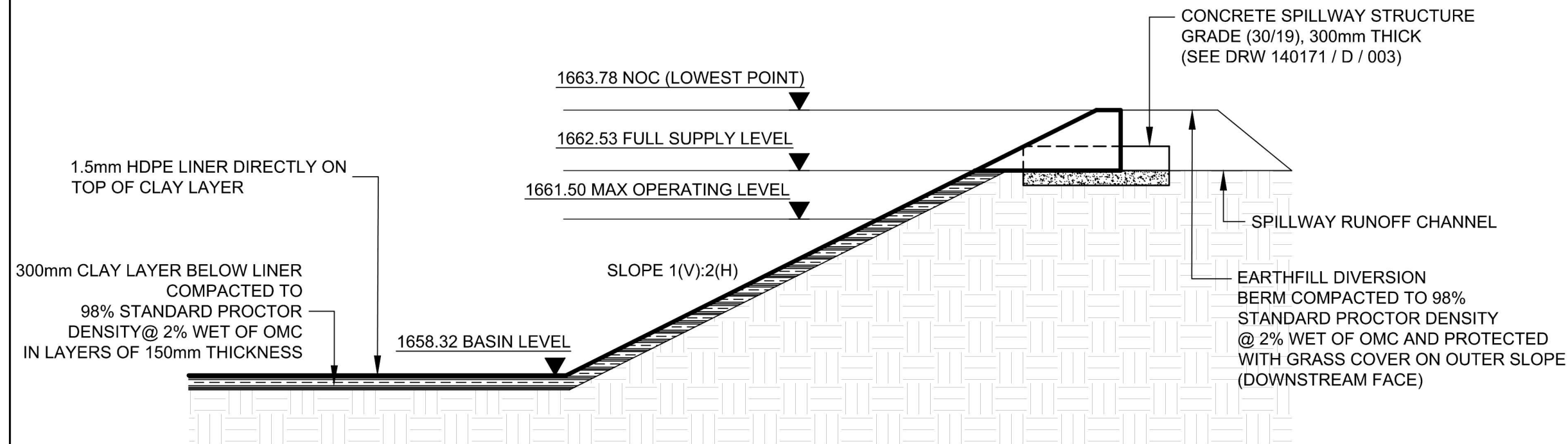
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Approved	PJ GOUWS	
Pr. No.	880061	
Contract No.	MP1401	

Drawing No.	140171 / D / 004	Revision	Z
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AS-BUILT
Survey by:
ESS Surveys



TYPICAL SECTION THROUGH PCD
SCALE 1:100



TYPICAL SECTION THROUGH SPILLWAY
SCALE 1:100

Scale
0 5 10 15 20mm
ORIGINAL SIZE A3

Rev.	Date	Description	Rev. by

Client/Employer



Project

MOOPLAATS COLLIERY

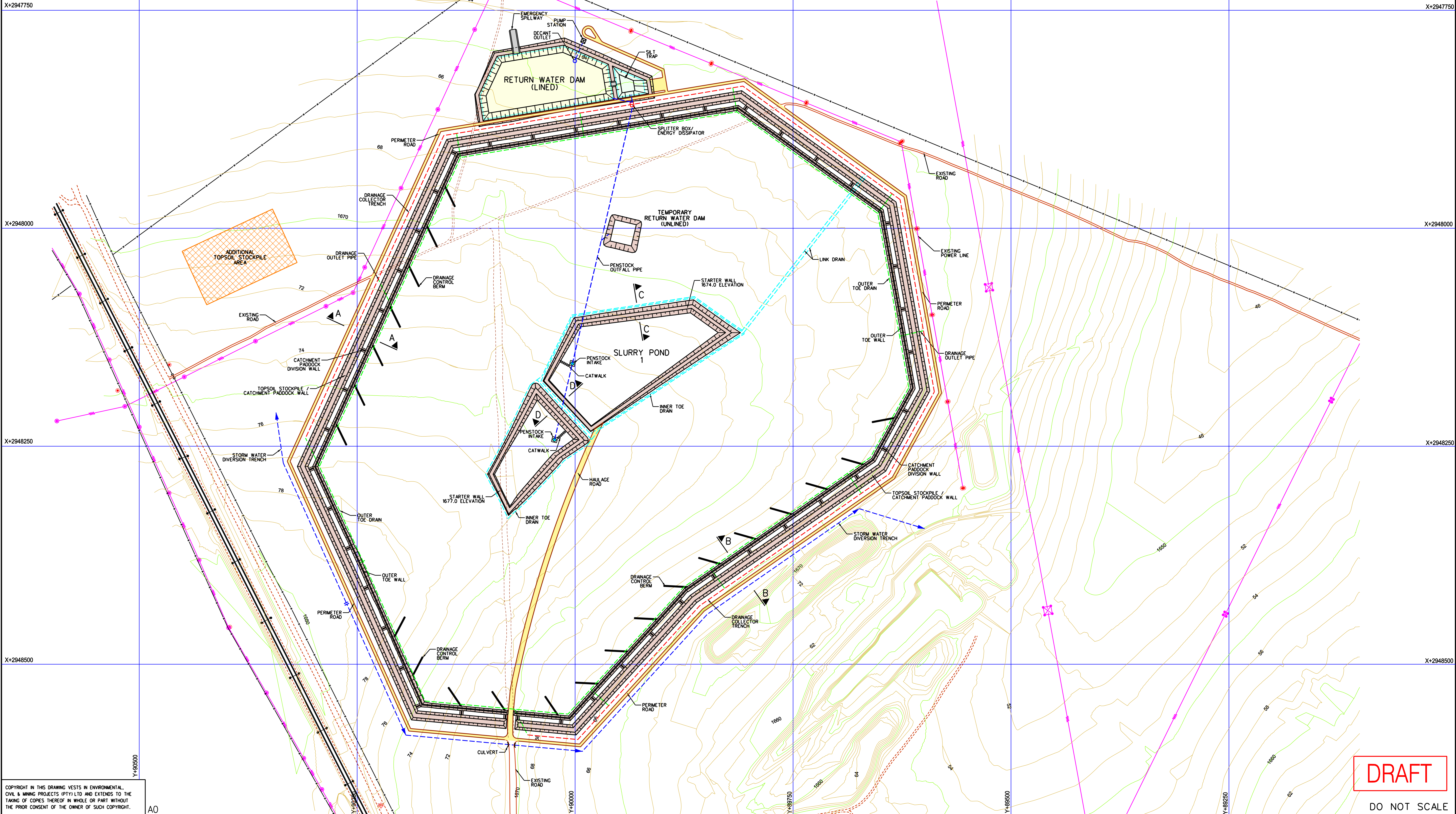
Plan Description

PCD SECTIONS

	Name	Signature
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Drawn	R WOOLFSON	
Checked	PJ GOUWS	
Approved	PJ GOUWS	
Pr. No.		

Contract No. MP1401

Drawing No. 140171 / D / 005 Revision Z



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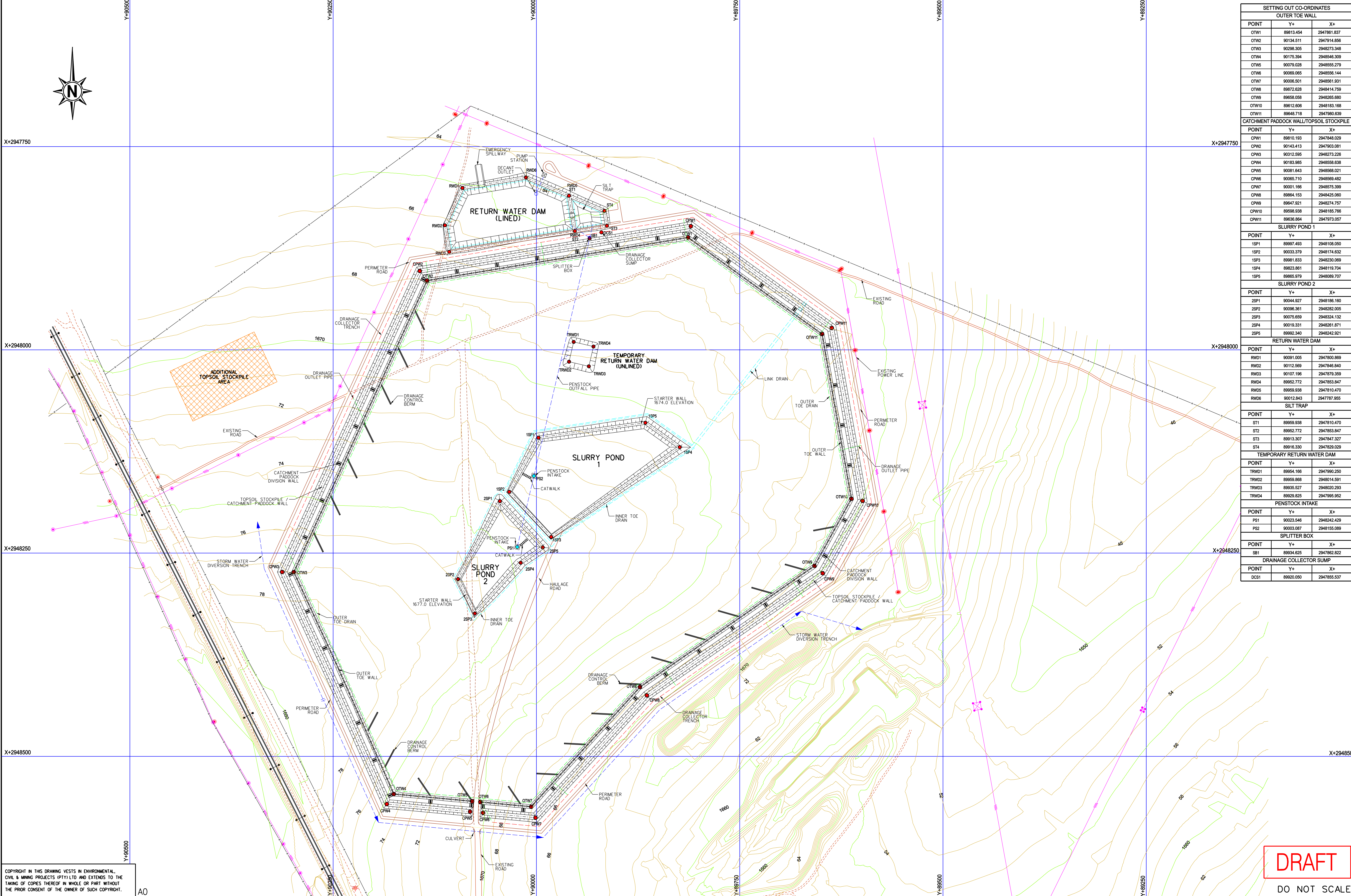
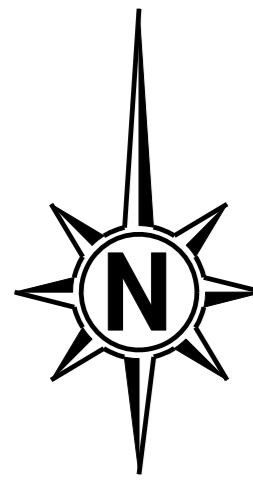
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				003	EARTHWORKS SECTIONS & DETAILS	009	CATWALK DETAILS
				004	DRAINAGE DETAILS	010	DRAINAGE PIPE DETAILS
				005	RETURN WATER DAM & SILT TRAP LAYOUT		
				006	RETURN WATER DAM & SILT TRAP DETAILS		
				007	RETURN WATER DAM SPILLWAY & TEMPORARY RETURN WATER DAM DETAILS		

ECMP
 Environmental, Civil & Mining Projects (Pty) Ltd
 Box 783697 Sandton 2146
 Tel. (011) 705 1111
 Fax. (011) 705 1908

CLIENT BADGER MINING & CONSULTING (PTY) LTD		BY	DATE
TITLE MOOIPLAATS COAL DISCARD DUMP GENERAL ARRANGEMENT		N.S.	MAR.09
DESIGNED	DRAWN	S.A.	MAR.09
CHECKED			
SCALE 1:1500	DRAWING No.	REVISION	
	T994-001	B	



SETTING OUT CO-ORDINATES		
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OTW2	90134.511	2947914.856
OTW3	90298.305	2948273.348
OTW4	90175.394	2948546.309
OTW5	90079.028	2948555.279
OTW6	90069.065	2948556.144
OTW7	90006.501	2948561.931
OTW8	89872.628	2948414.759
OTW9	89658.058	2948265.880
OTW10	89612.606	2948183.168
OTW11	89648.718	2947980.639
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CPW3	90312.595	2948273.228
CPW4	90183.985	2948558.638
CPW5	90081.643	2948568.021
CPW6	90065.710	2948569.482
CPW7	90001.186	2948575.399
CPW8	89864.153	2948425.060
CPW9	89647.921	2948274.767
CPW10	89598.938	2948185.766
CPW11	89636.864	2947973.057
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1SP2	90033.379	2948174.632
1SP3	89981.833	2948230.069
1SP4	89823.861	2948119.704
1SP5	89865.979	2948089.707
SLURRY POND 2		
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2SP4	90019.331	2948261.871
2SP5	89992.340	2948242.921
RETURN WATER DAM		
POINT	Y+	X+
RWD1	90091.005	2947800.869
RWD2	90112.569	2947848.840
RWD3	90107.196	2947879.359
RWD4	89952.772	2947853.847
RWD5	89959.936	2947810.470
RWD6	90012.843	2947787.955
SILT TRAP		
POINT	Y+	X+
ST1	89959.938	2947810.470
ST2	89952.772	2947853.847
ST3	89913.307	2947847.327
ST4	89916.330	2947829.029
TEMPORARY RETURN WATER DAM		
POINT	Y+	X+
TRWD1	89954.166	2947990.250
TRWD2	89959.888	2948014.591
TRWD3	89935.527	2948020.293
TRWD4	89929.825	2947995.962
PENSTOCK INTAKE		
POINT	Y+	X+
PS1	90023.546	2948242.429
PS2	90003.087	2948155.089
SPLITTER BOX		
POINT	Y+	X+
SBI	89934.625	2947862.822
DRAINAGE COLLECTOR SUMP		
POINT	Y+	X+
DCS1	89920.050	2947855.537

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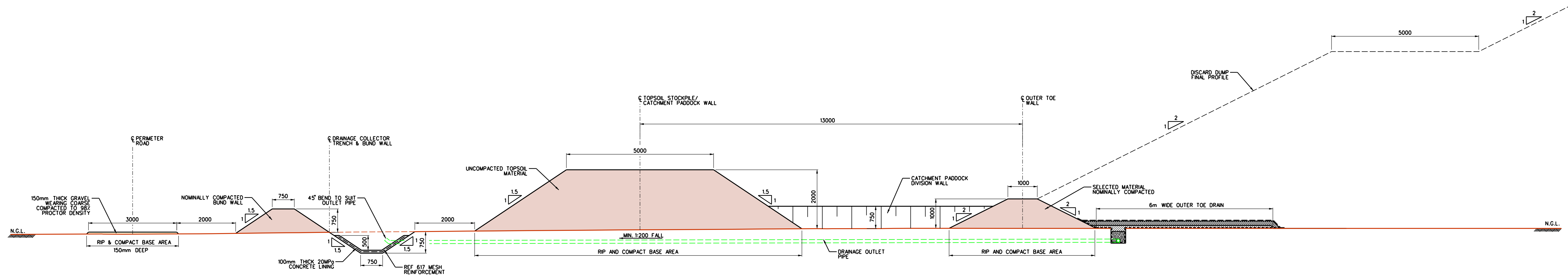
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DO NOT SCALE

REV	BY	DATE	DESCRIPTION
B	NS	02-04-09	DUMP FOOTPRINT ADJUSTED TO SUIT POWER LINES

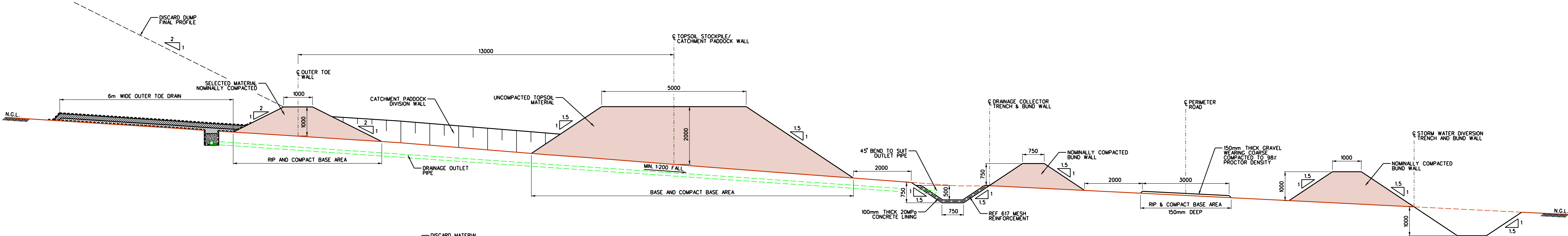
DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
001	GENERAL ARRANGEMENT		

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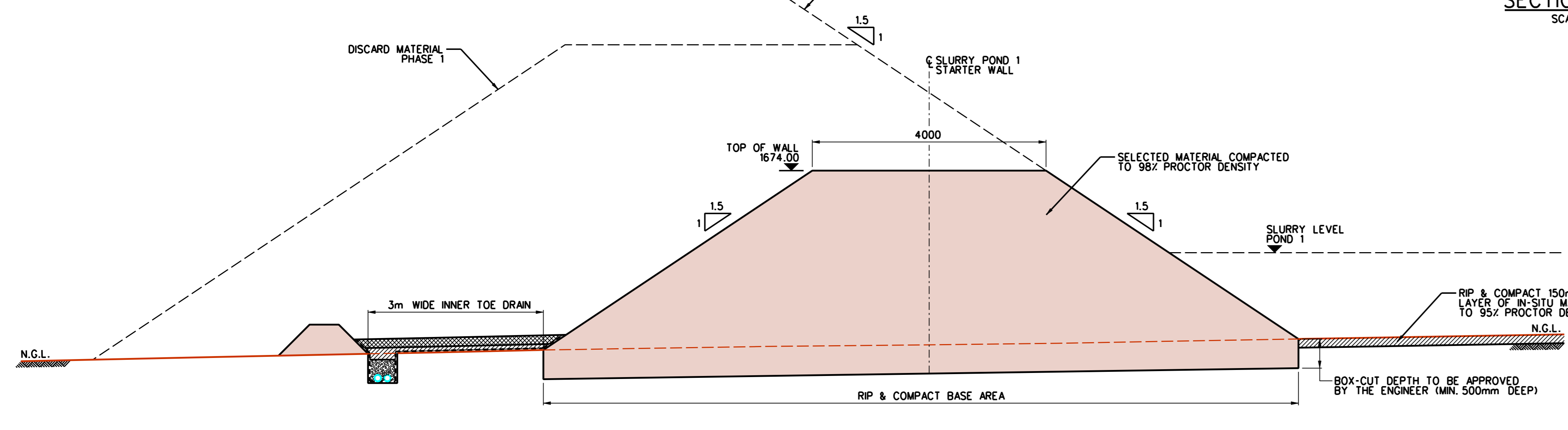
CLIENT		BY	DATE
BADGER MINING & CONSULTING (PTY) LTD		N.S.	MAR.09
TITLE		DRAWN	S.A.
MOOPLAATS COAL DISCARD DUMP SETTING OUT CO-ORDINATES			MAR.09
SCALE		CHECKED	REVISION
1:1500			B
DRAWING No.		T994-002	



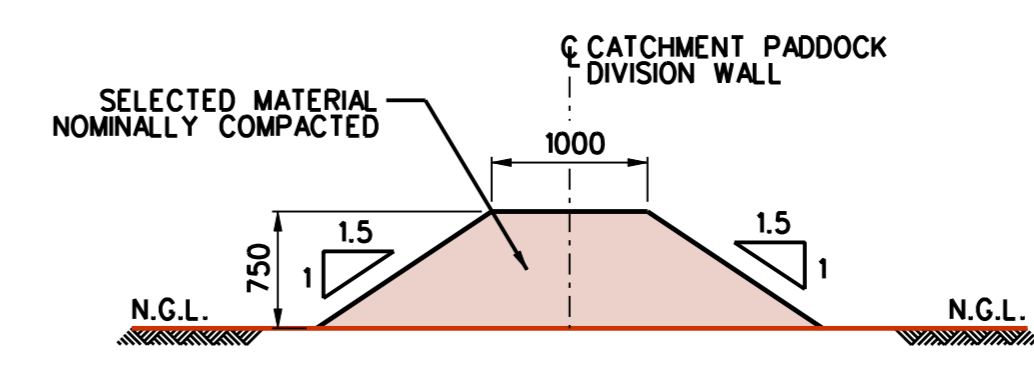
SECTION A - A
SCALE 1:50



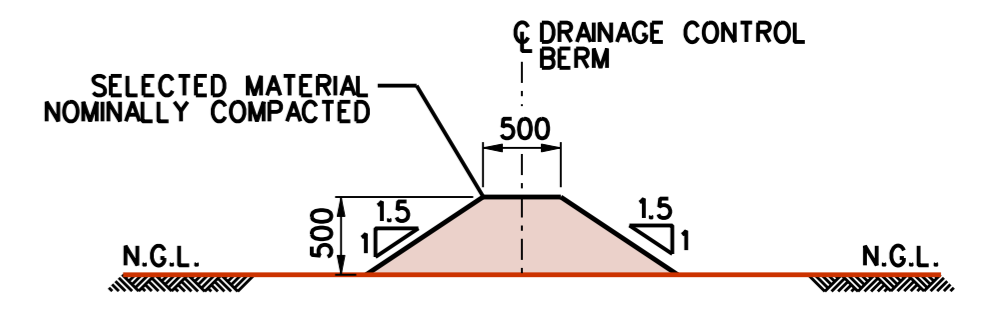
SECTION B - B
SCALE 1:50



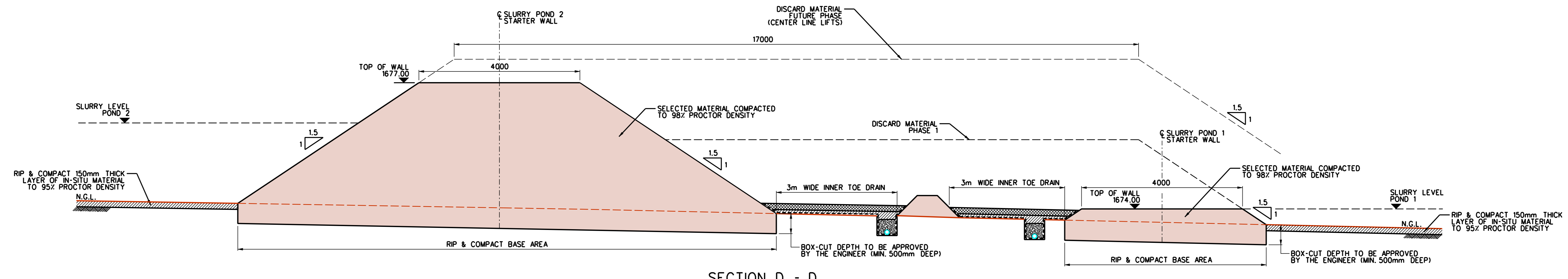
SECTION C - C
SLURRY POND 1 STARTER WALL
SCALE 1:50



TYPICAL SECTION - CATCHMENT PADDOCK DIVISION WALL
SCALE 1:50



TYPICAL SECTION - DRAINAGE CONTROL BERM
SCALE 1:50



SECTION D - D
SCALE 1:50

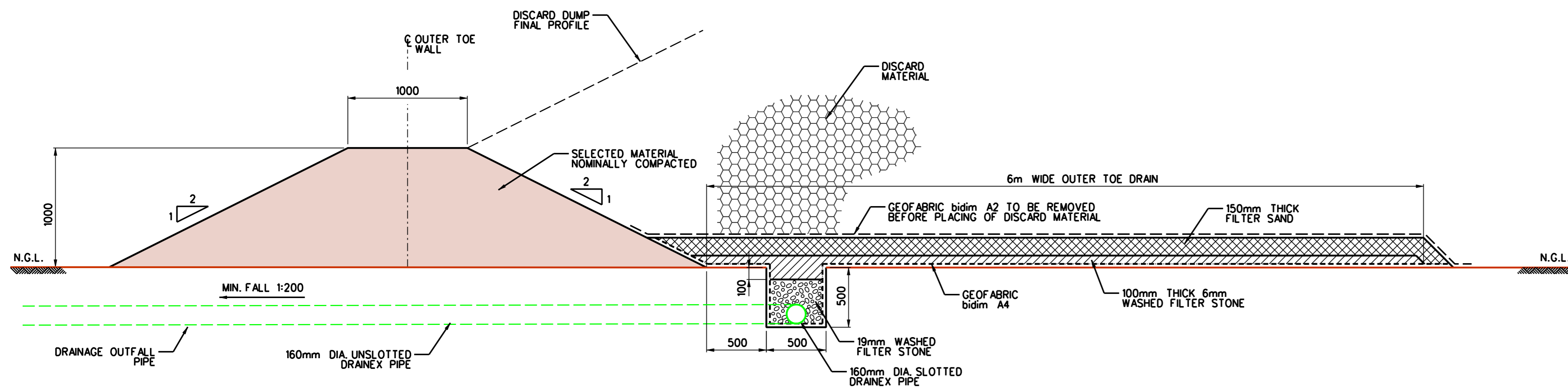
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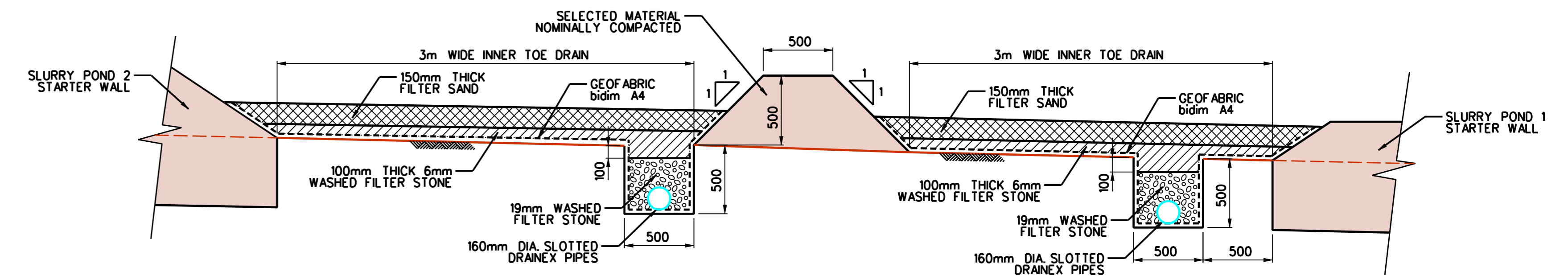
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B	NS	02-04-09	DETAILS ADDED	001	GENERAL ARRANGEMENT		
				004	DRAINAGE DETAILS		

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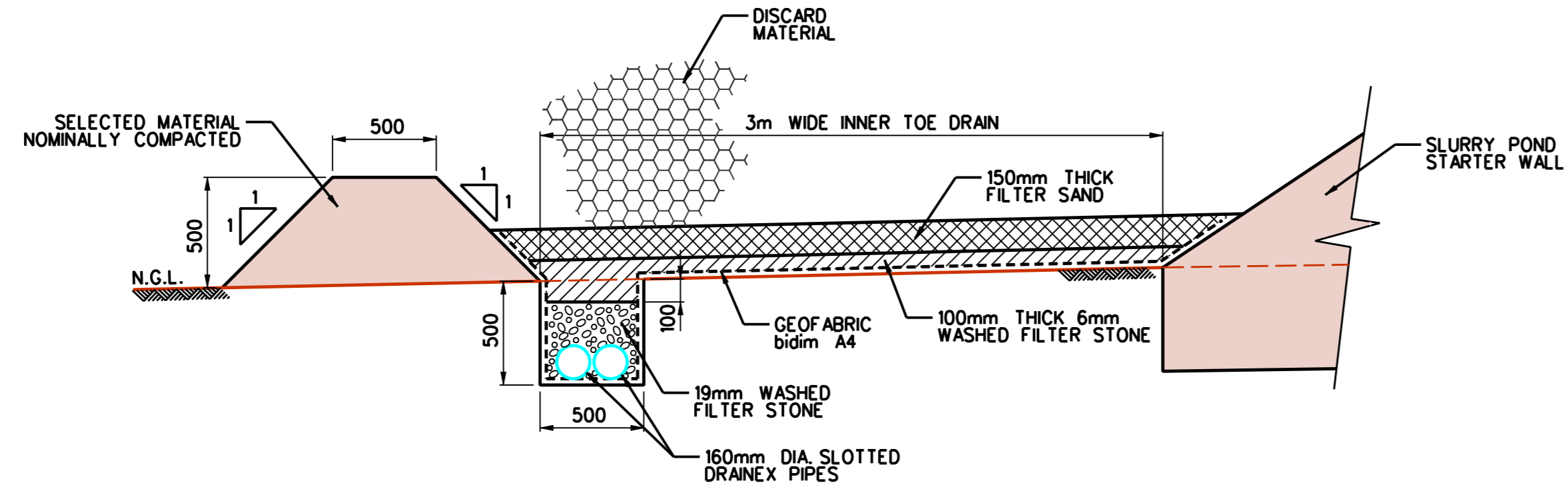
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TITLE	MOOIPLAATS COAL DISCARD DUMP EARTHWORKS SECTIONS & DETAILS	DRAWN	N.S.	CHECKED	
SCALE	A0-1:50	DRAWING No.	T994-003	REVISION	B



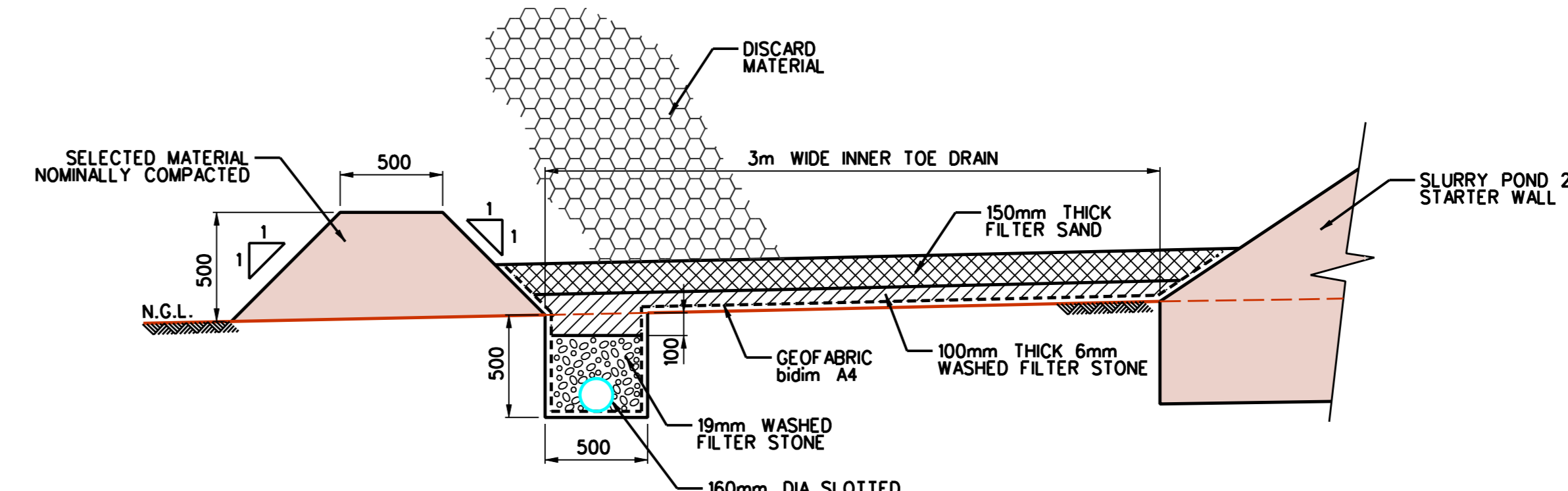
SECTION - OUTER TOE DRAIN
SCALE 1:25



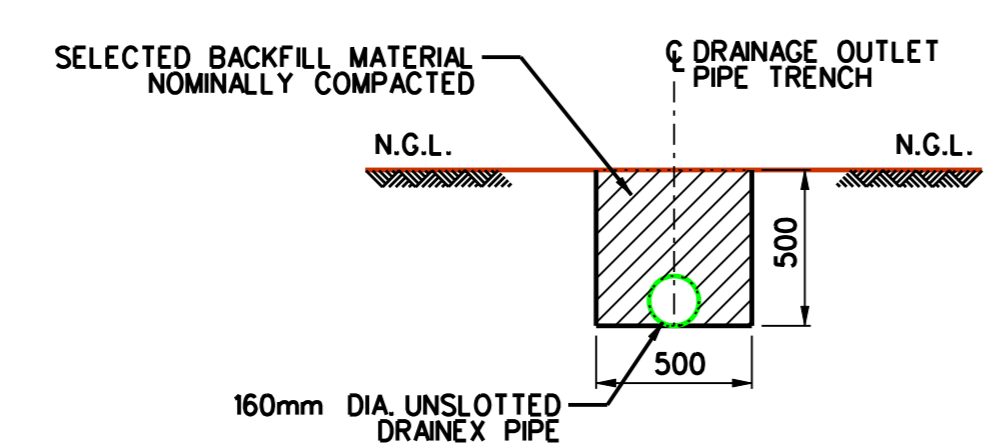
SECTION - INNER TOE DRAINS BETWEEN
SLURRY POND 1 & 2
SCALE 1:25



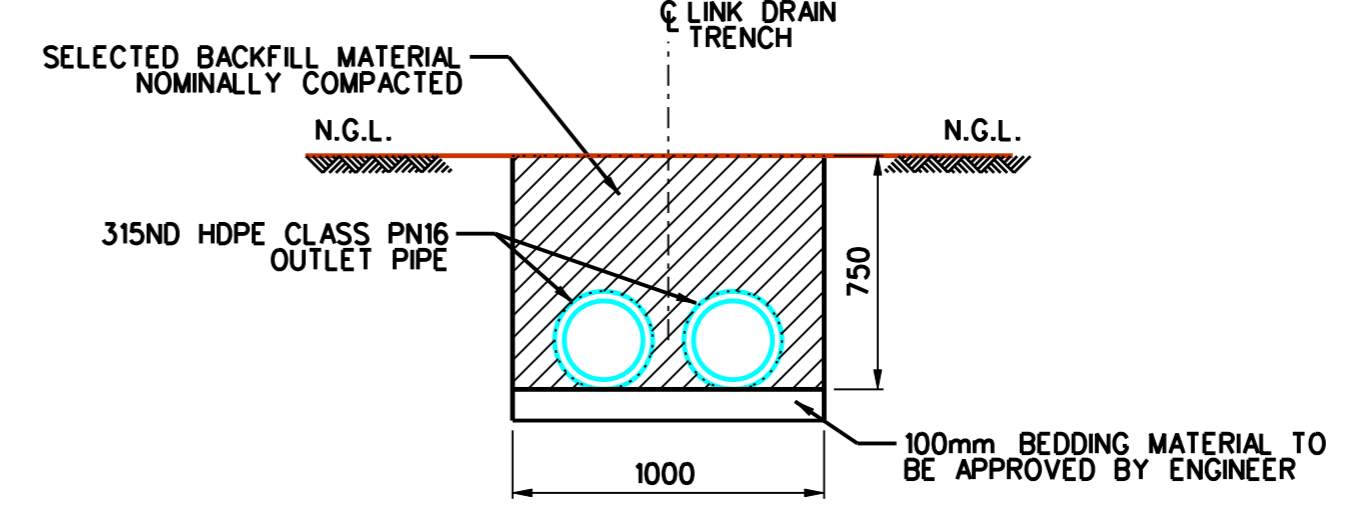
SECTION - INNER TOE DRAIN ALONG
SLURRY POND 1 PERIMETER
SCALE 1:25



SECTION - INNER TOE DRAIN ALONG
SLURRY POND 2 PERIMETER
SCALE 1:25



SECTION - DRAINAGE OUTLET PIPE
SCALE 1:25



SECTION - LINK DRAIN
SCALE 1:25

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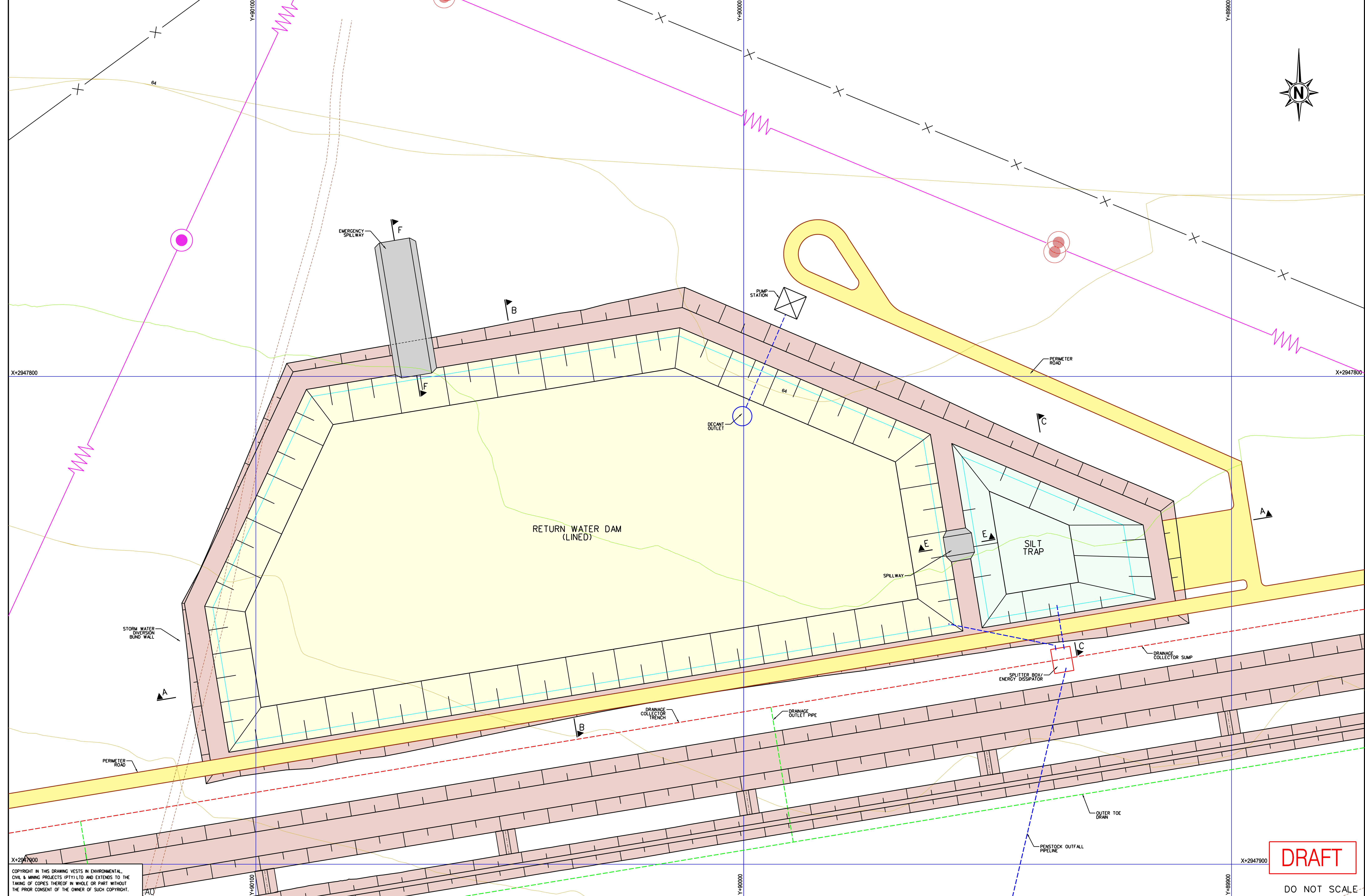
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-	-	-	-	001	GENERAL ARRANGEMENT		
-	-	-	-	003	EARTHWORKS & DETAILS		
-	-	-	-	010	DRAINAGE PIPE DETAILS		

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TITLE MOOPLAATS COAL DISCARD DUMP DRAINAGE DETAILS	DRAWN	N.S.	APR.09
	CHECKED		
	SCALE	A0:1:25	
DRAWING No. T994-004	REVISION	A	

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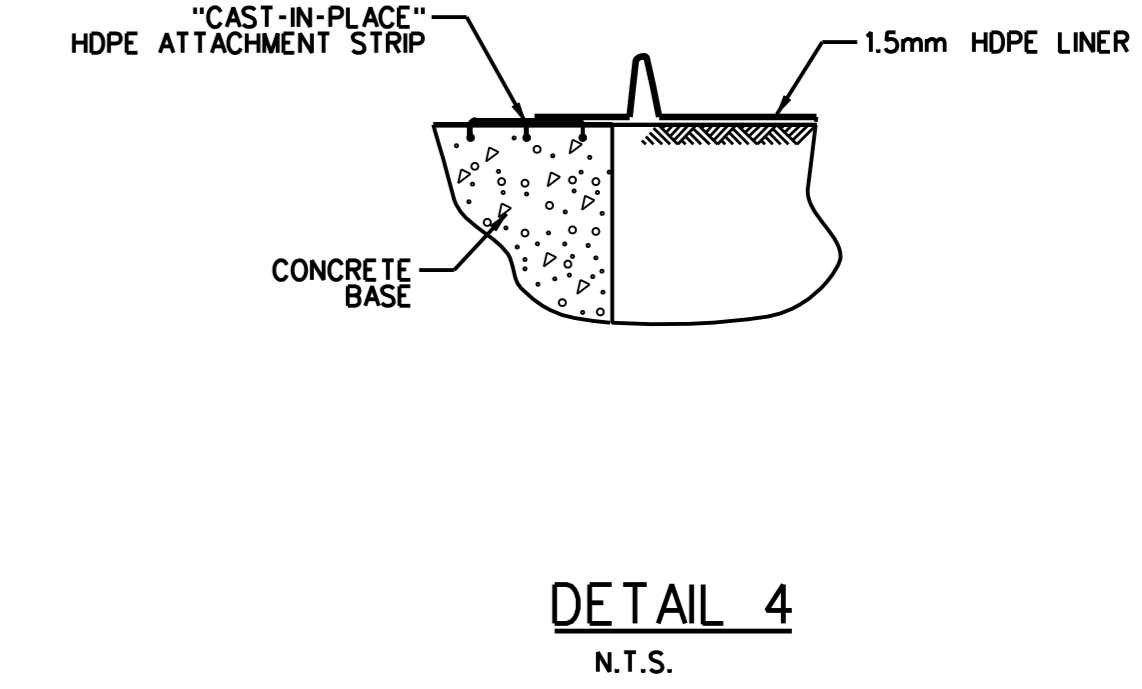
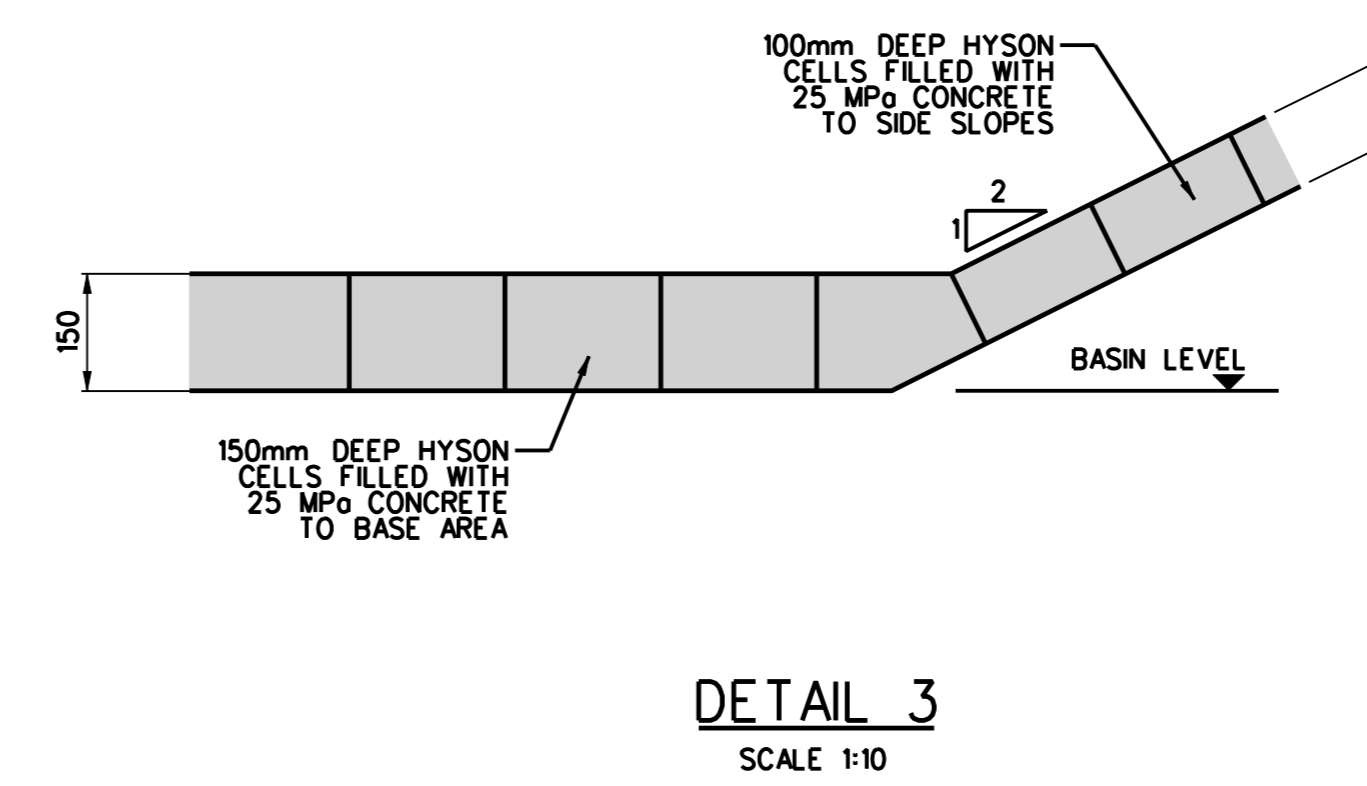
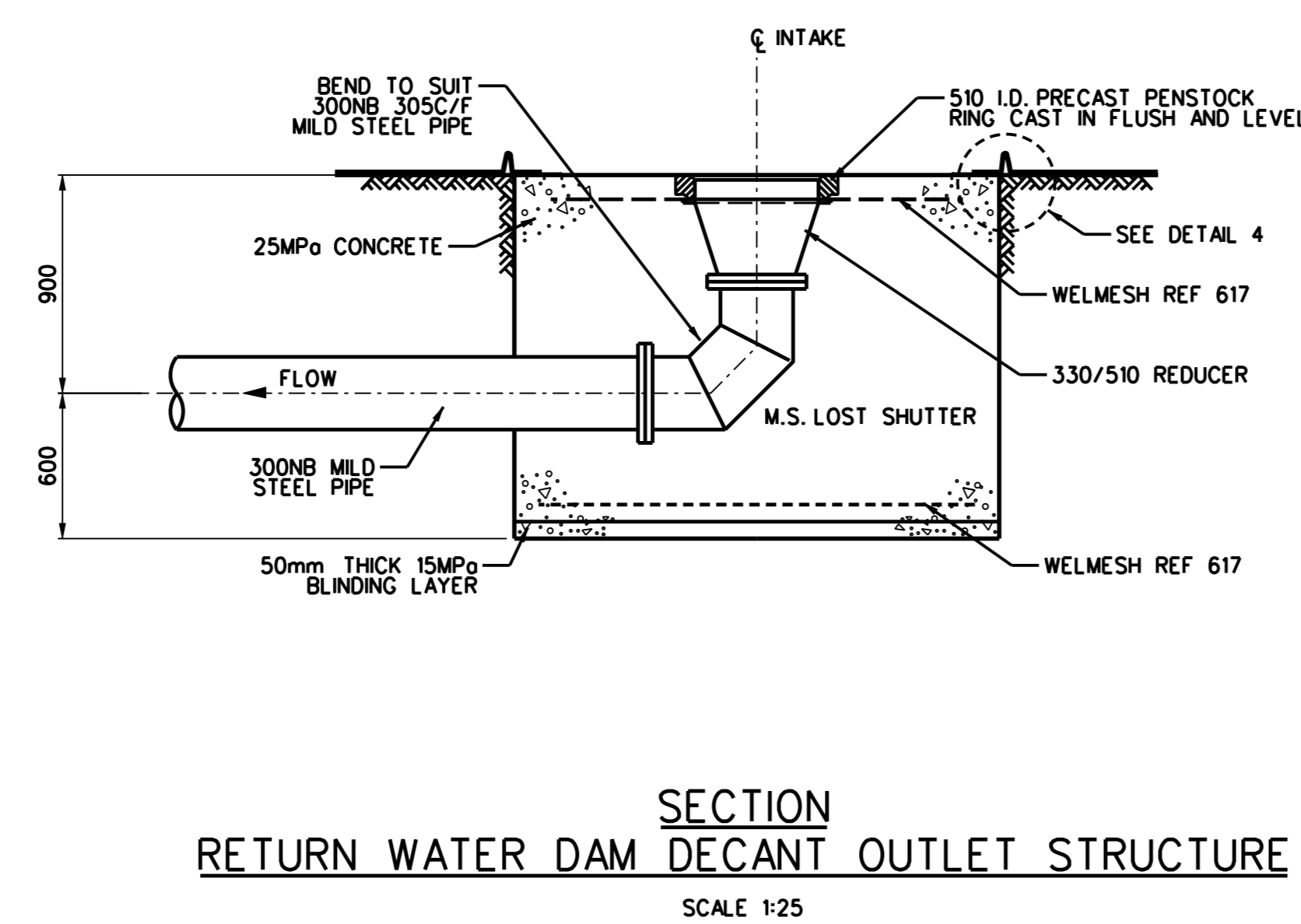
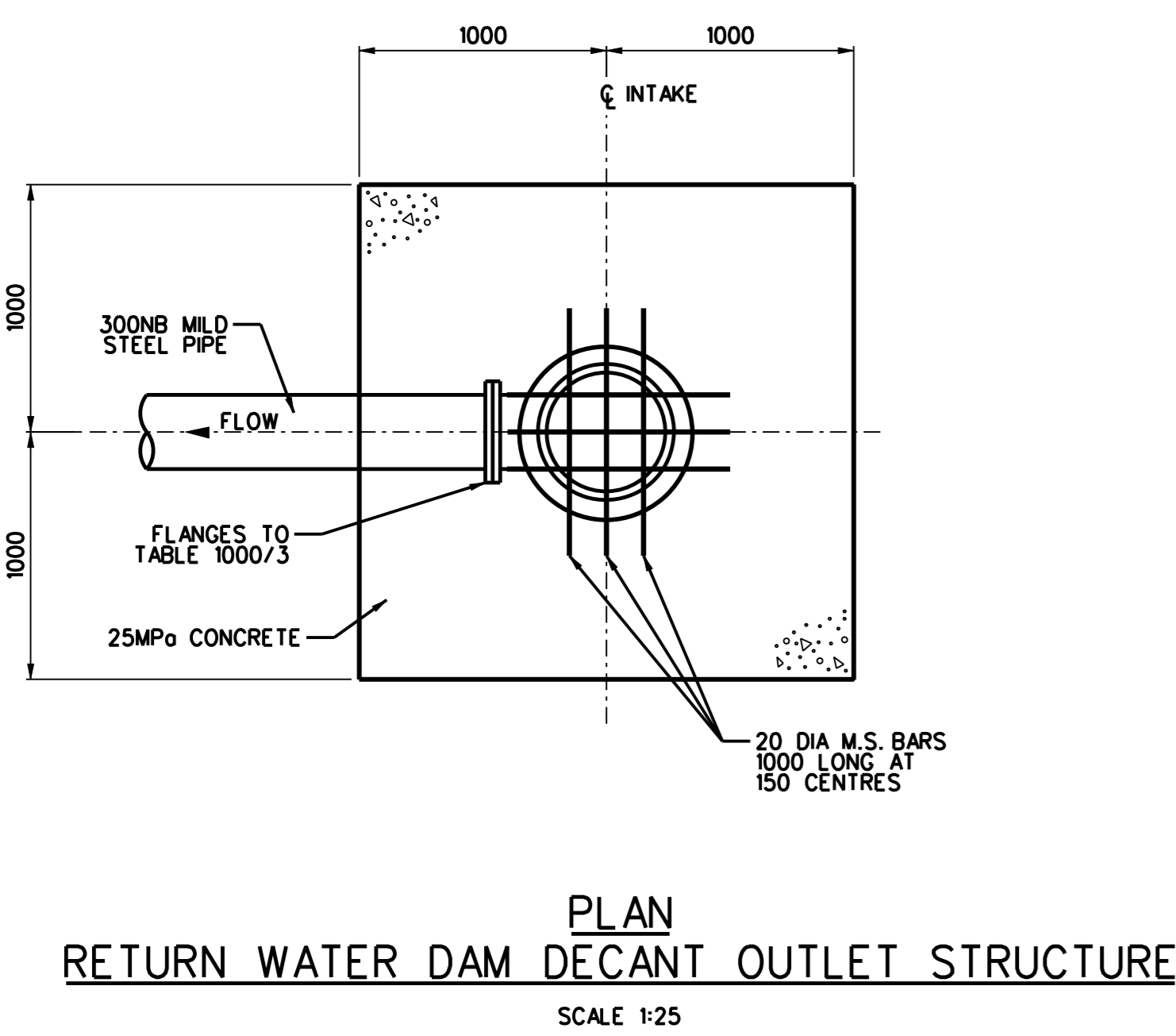
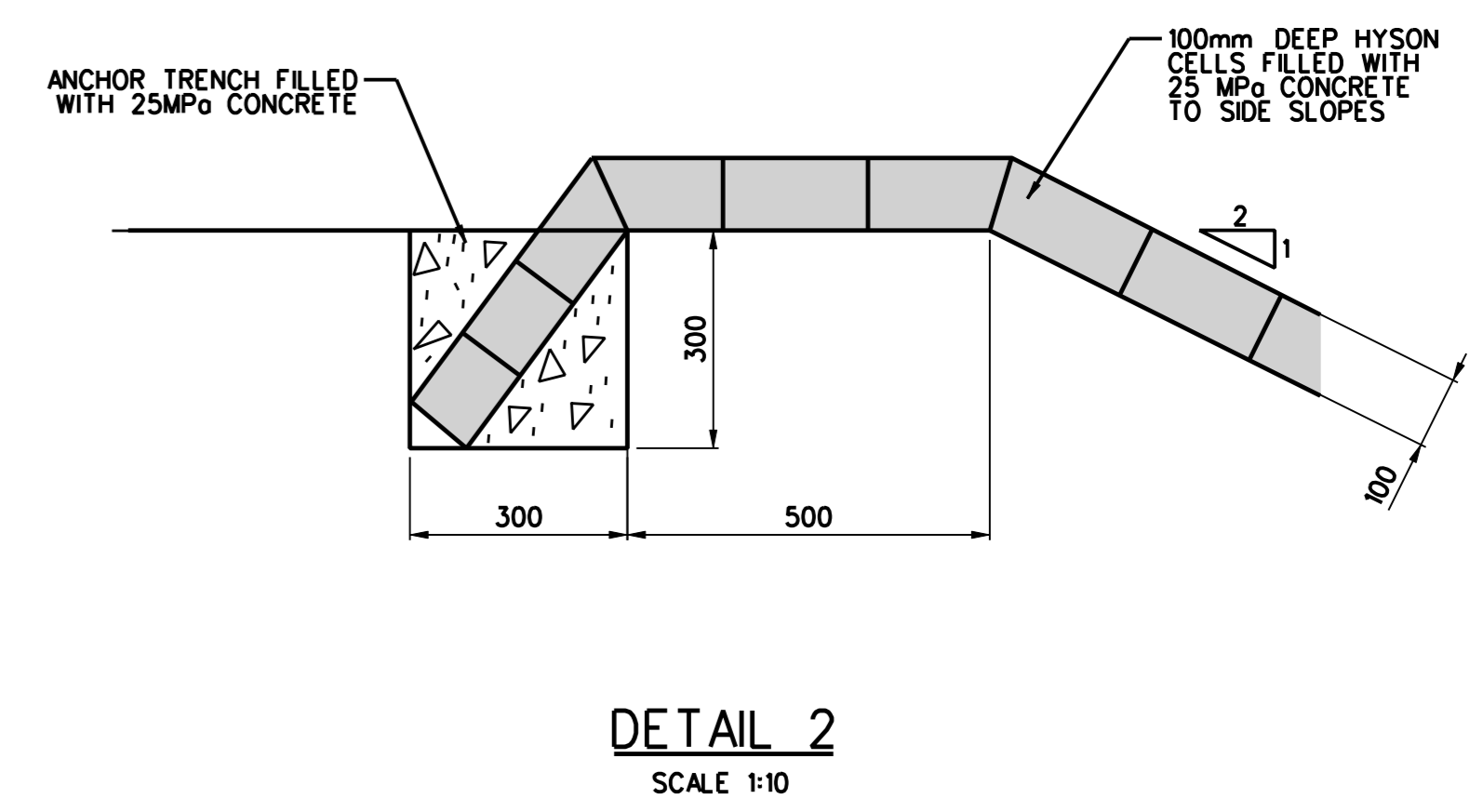
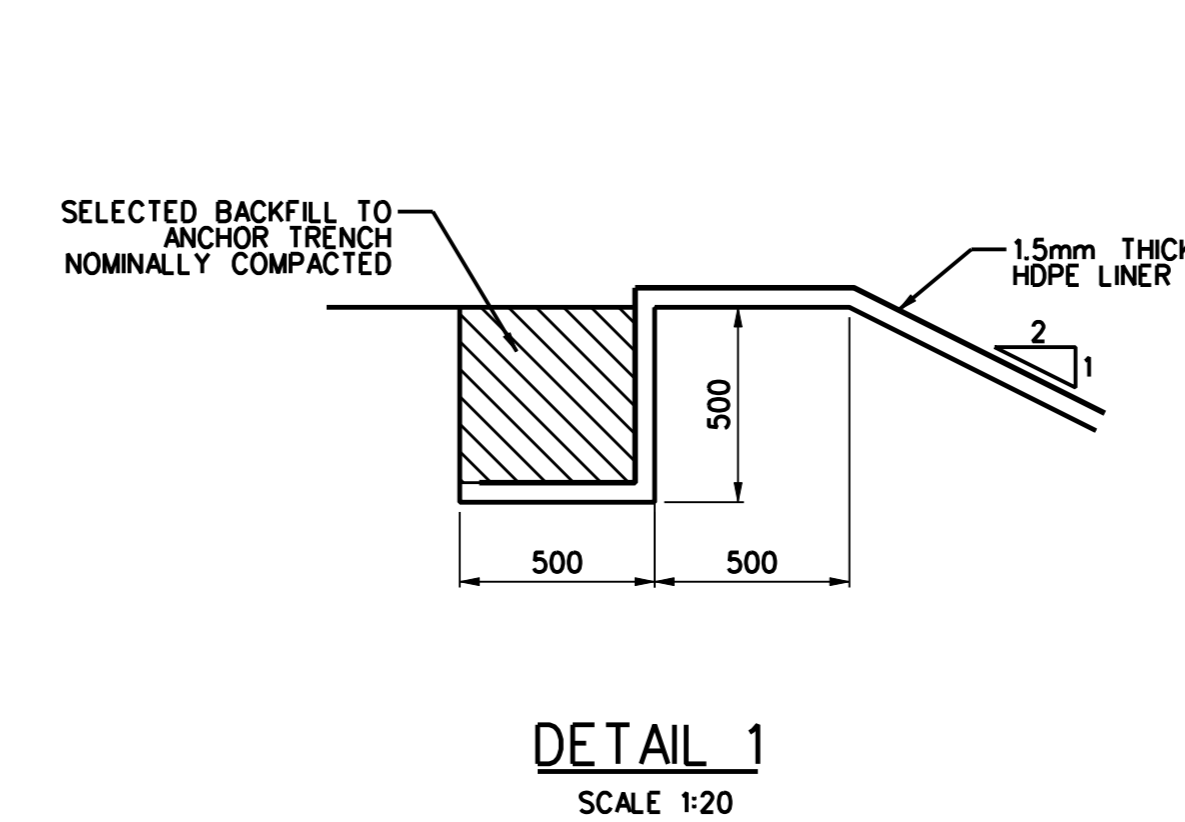
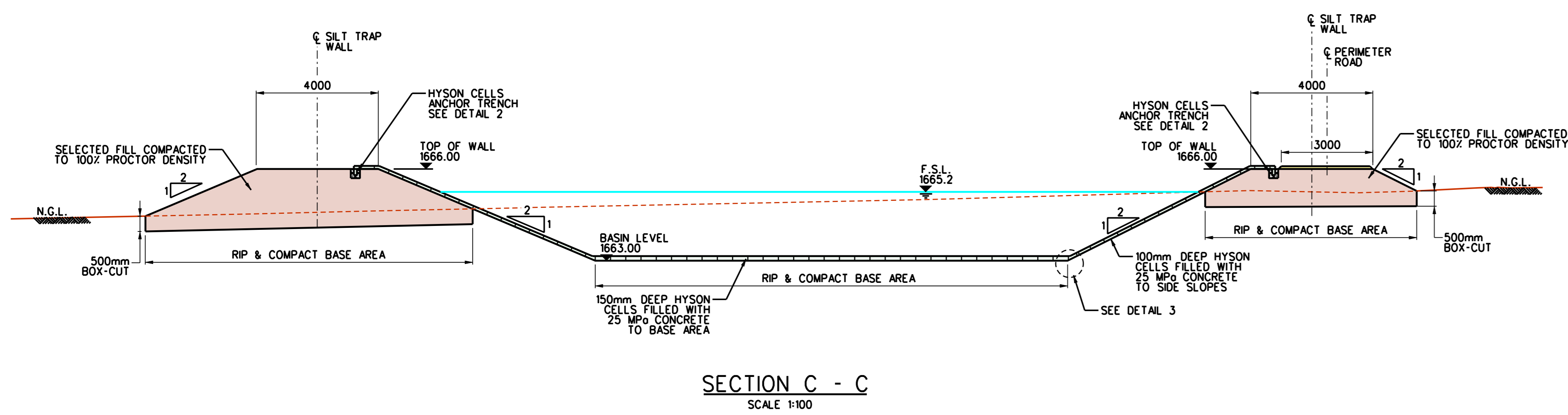
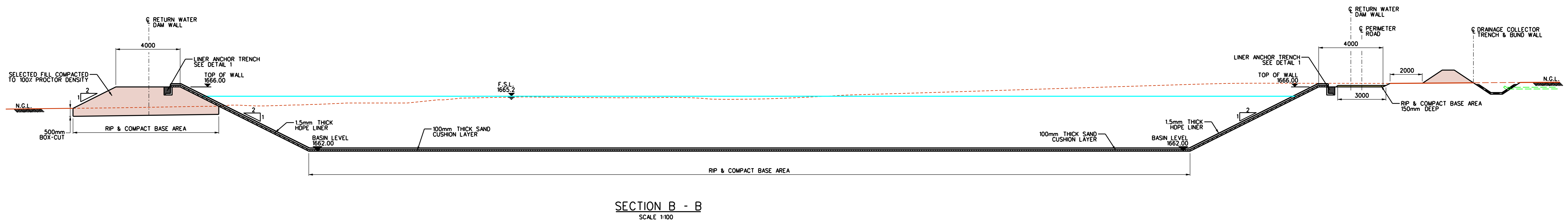
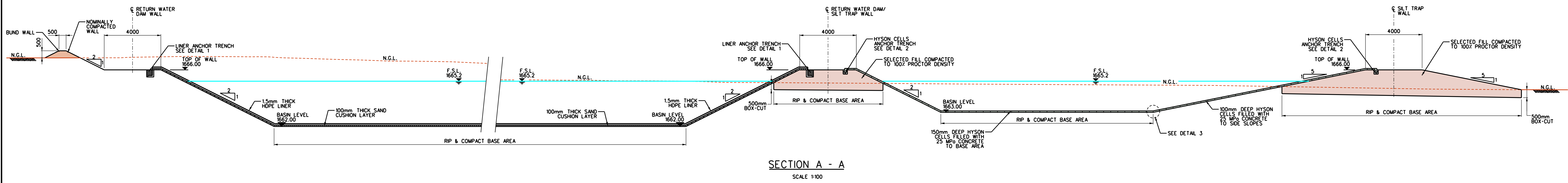
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B	SA	06-04-09	DUMP FOOTPRINT ADJUSTED TO SUIT POWER LINES	001	GENERAL ARRANGEMENT		
				006	RETURN WATER DAM & SILT TRAP DETAILS		
				007	RETURN WATER DAM SPILLWAY & TEMPORARY RETURN WATER DAM DETAILS		

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TITLE	MOOPLAATS COAL DISCARD DUMP RETURN WATER DAM AND SILT TRAP LAYOUT		N.S.	MAR.09
			S.A.	MAR.09
SCALE	1:500			
DRAWING No.	T994-005		REVISION	B



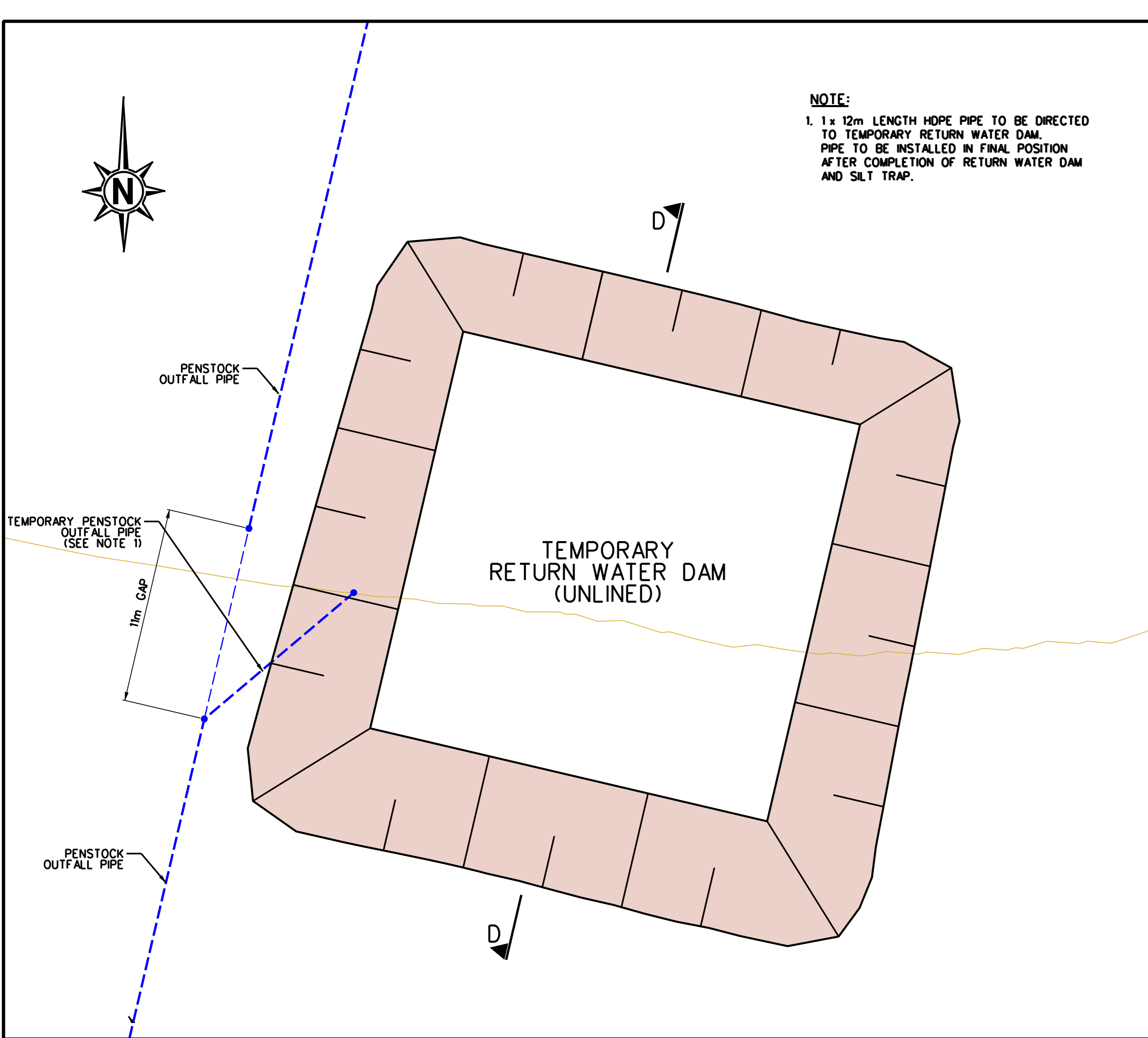
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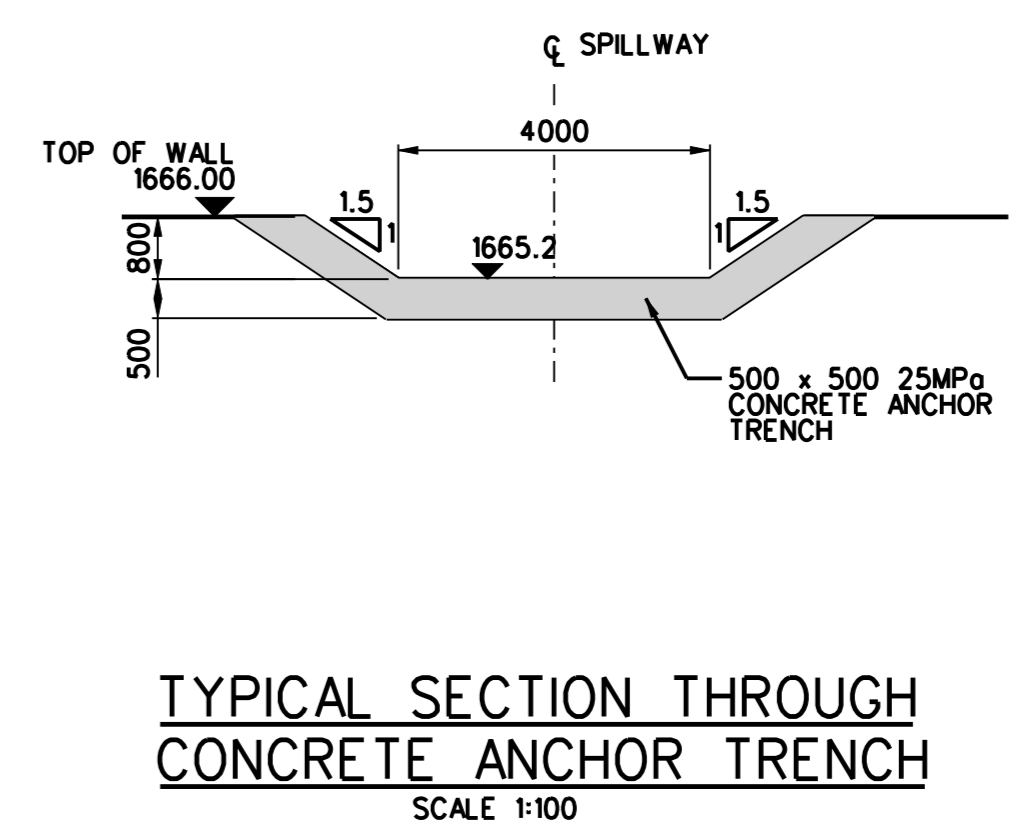
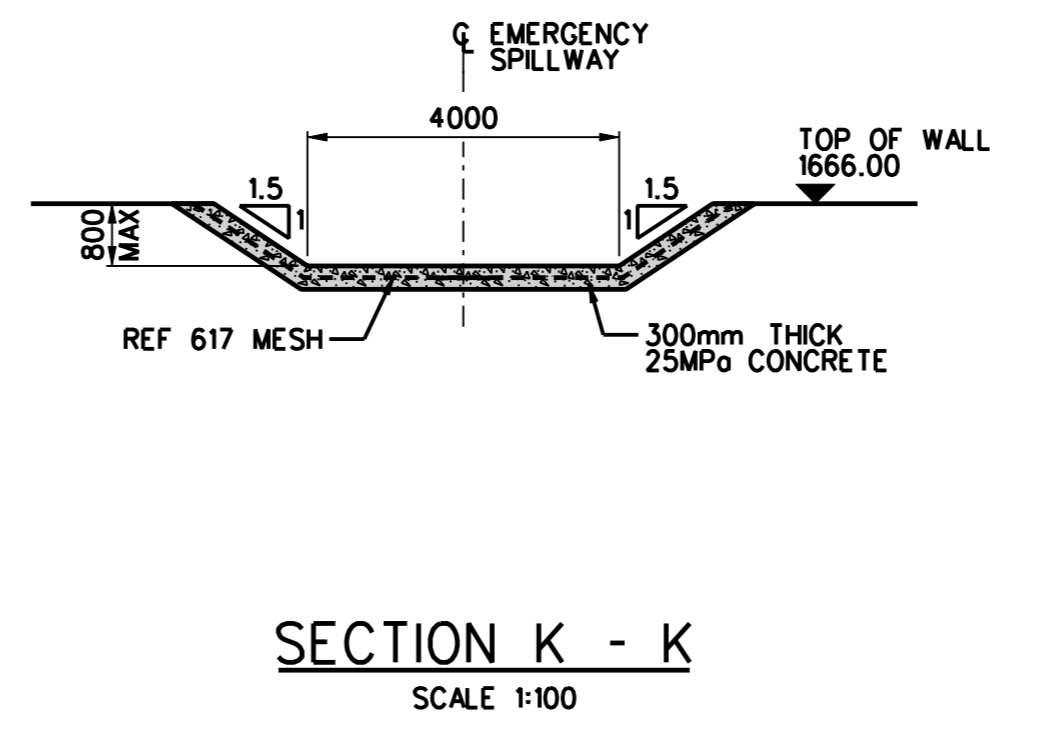
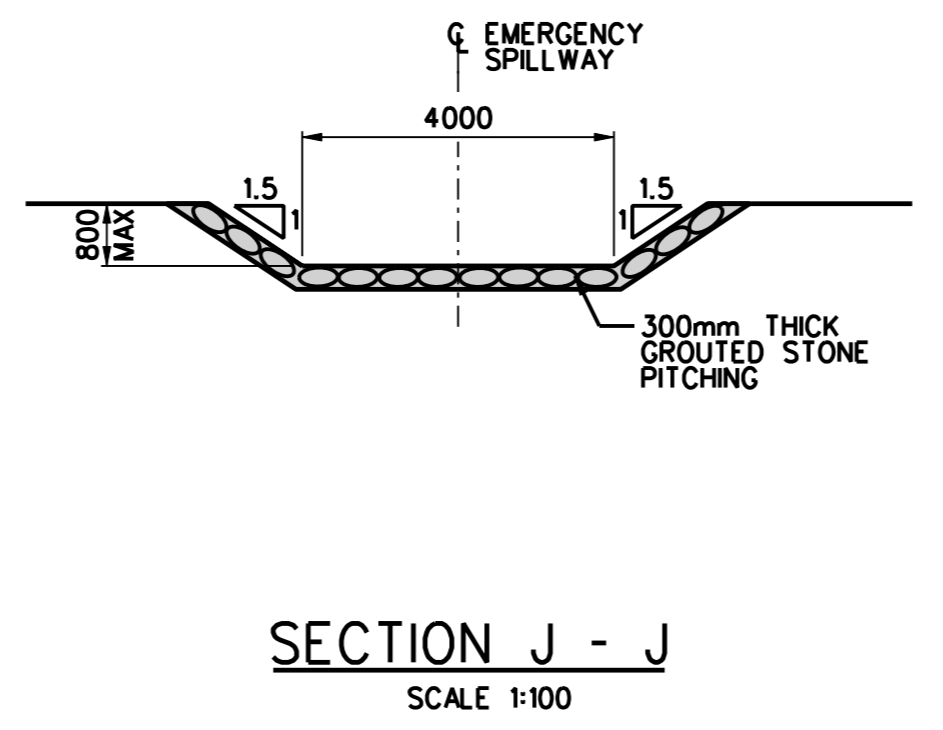
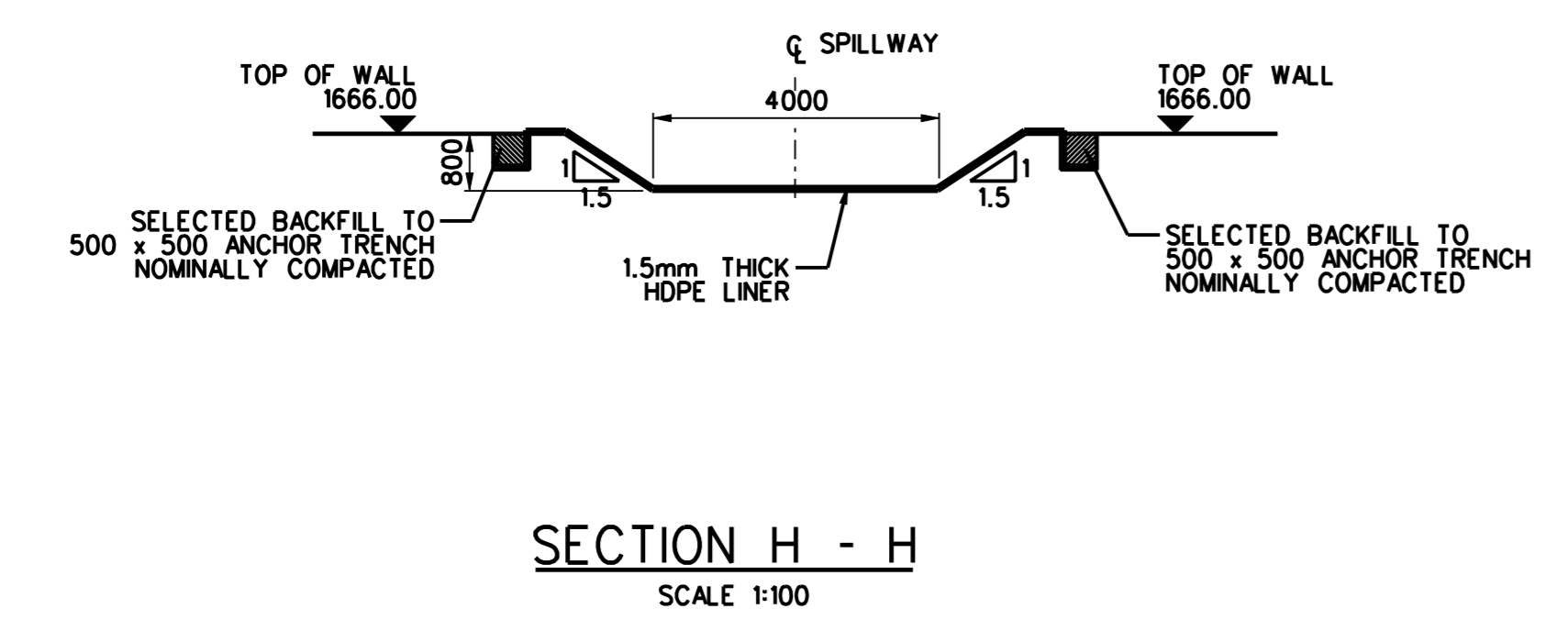
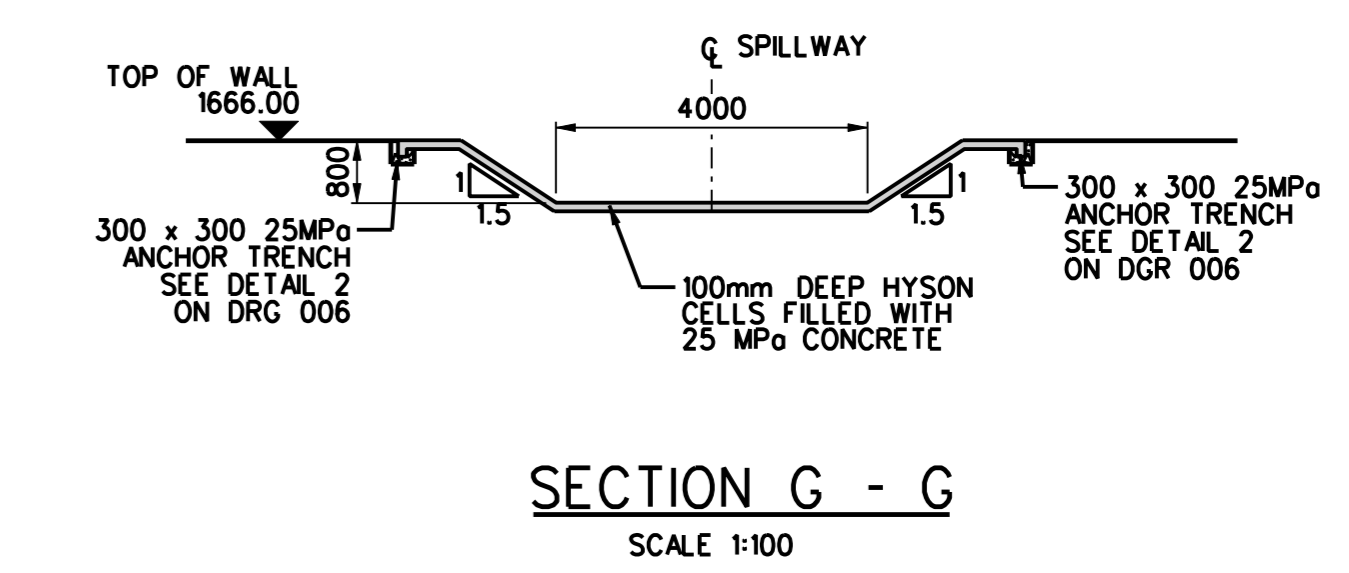
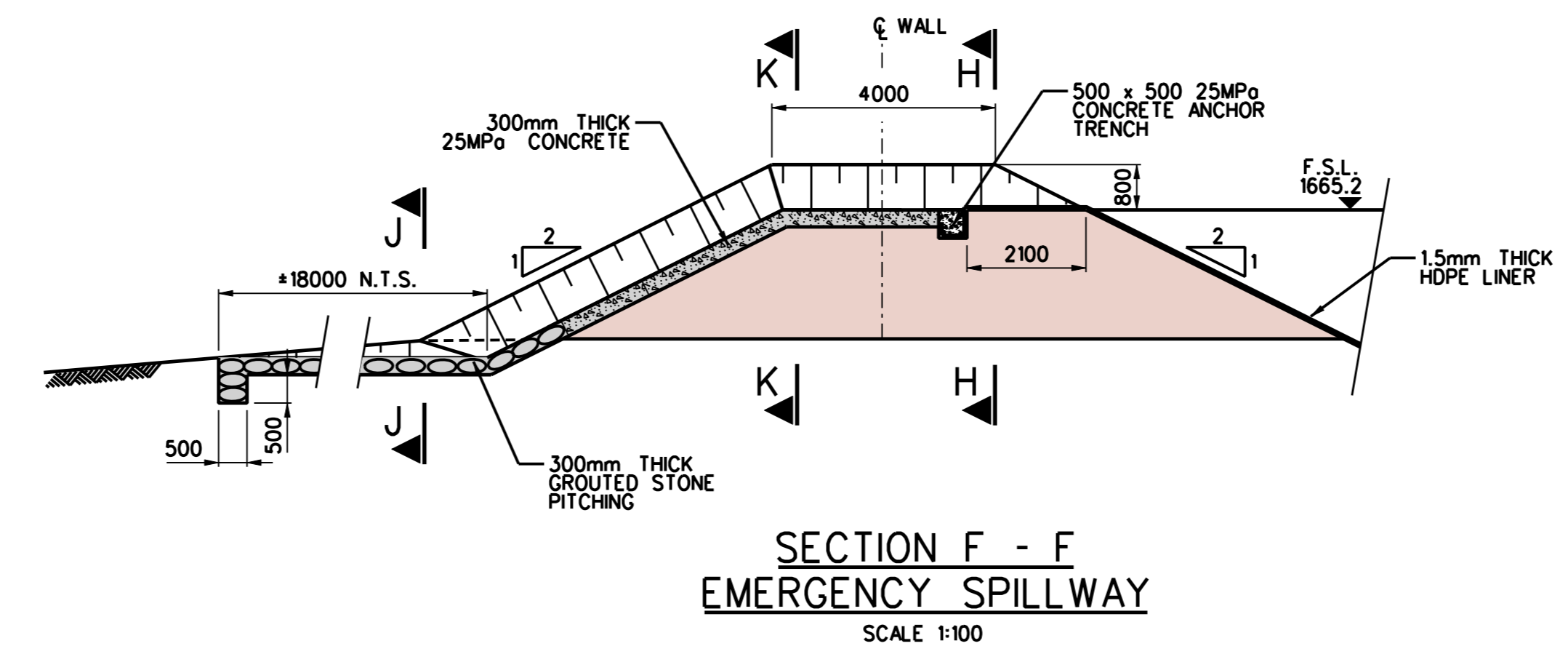
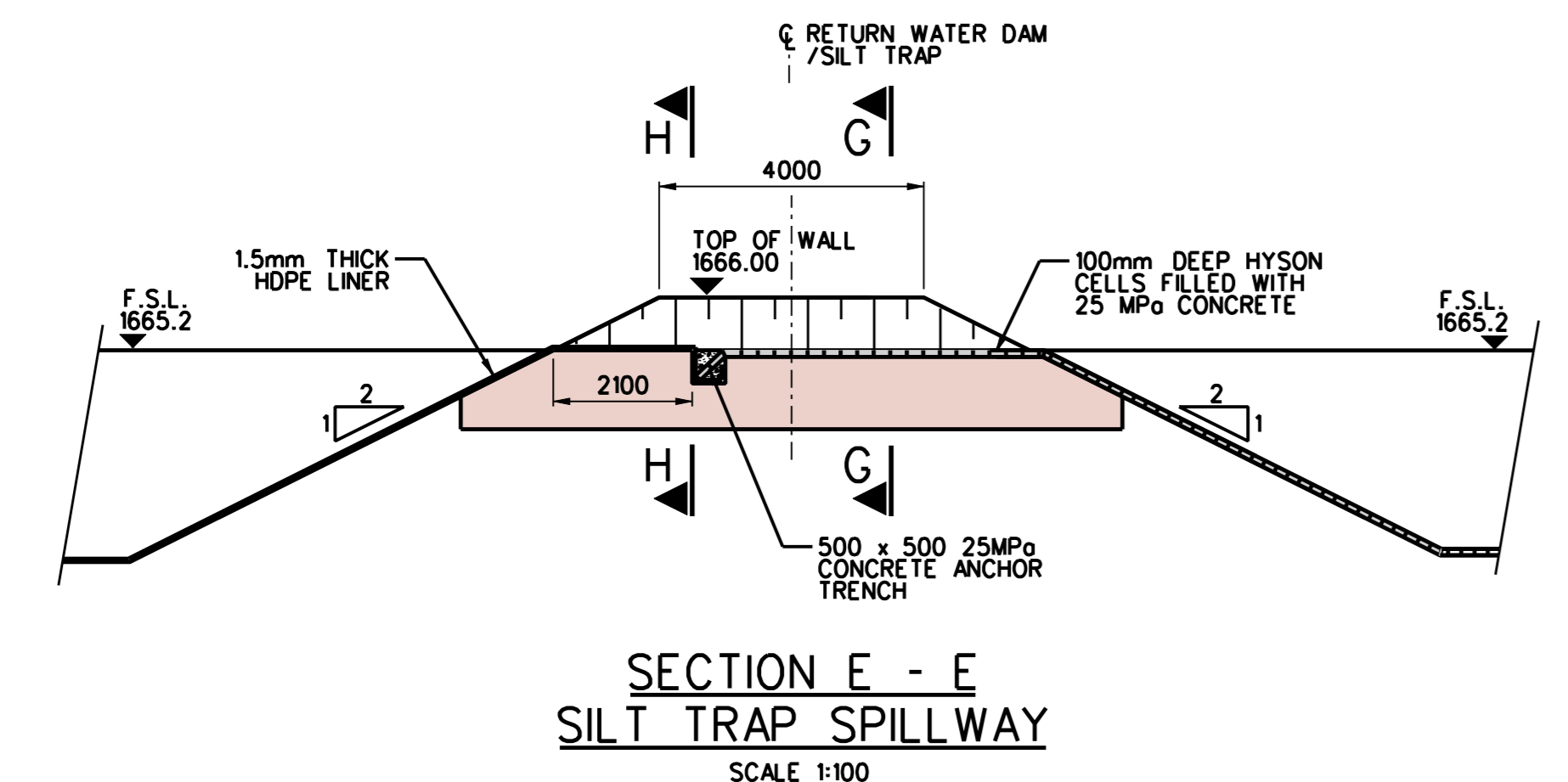
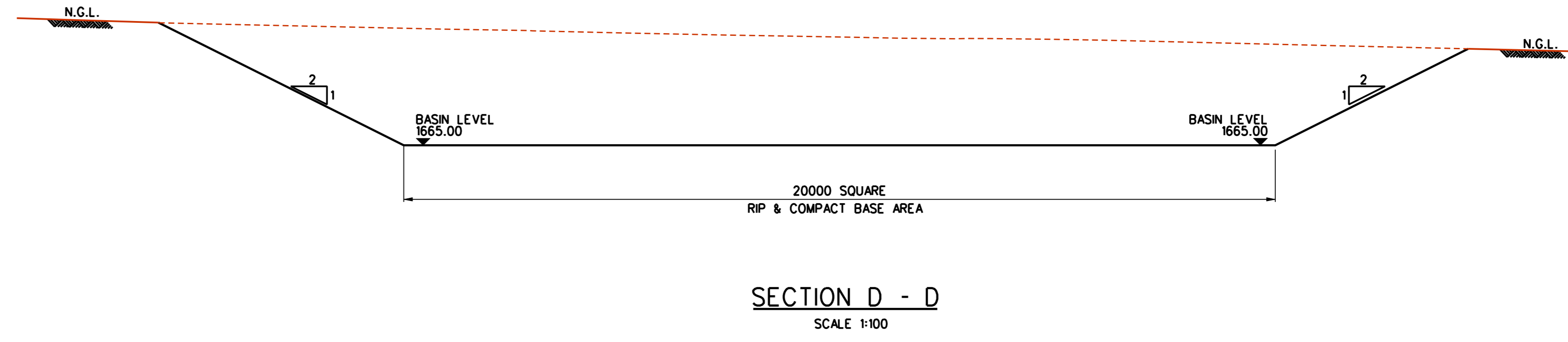
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				005	RETURN WATER DAM & SILT TRAP LAYOUT		
				007	RETURN WATER DAM SPILLWAY & TEMPORARY RETURN WATER DAM DETAILS		

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TITLE	MOOPLAATS COAL DISCARD DUMP RETURN WATER DAM AND SILT TRAP DETAILS		
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SCALE	AS SHOWN		REVISION
DRAWING No.	T994-006		A



PLAN
TEMPORARY RETURN WATER DAM (UNLINED)
SCALE 1:200



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				001	GENERAL ARRANGEMENT			BADGER MINING & CONSULTING (PTY) LTD		N.S.	APR.09
				005	RETURN WATER DAM & SILT TRAP LAYOUT				DRAWN	S.A.	APR.09
				006	RETURN WATER DAM & SILT TRAP DETAILS				CHECKED		
									SCALE	AS SHOWN	
									DRAWING No.	T994-007	REVISION
											A

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TITLE
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RETURN WATER DAM SPILLWAY
AND TEMPORARY RETURN WATER DAM
DETAILS

DESIGNED
BY
DATE

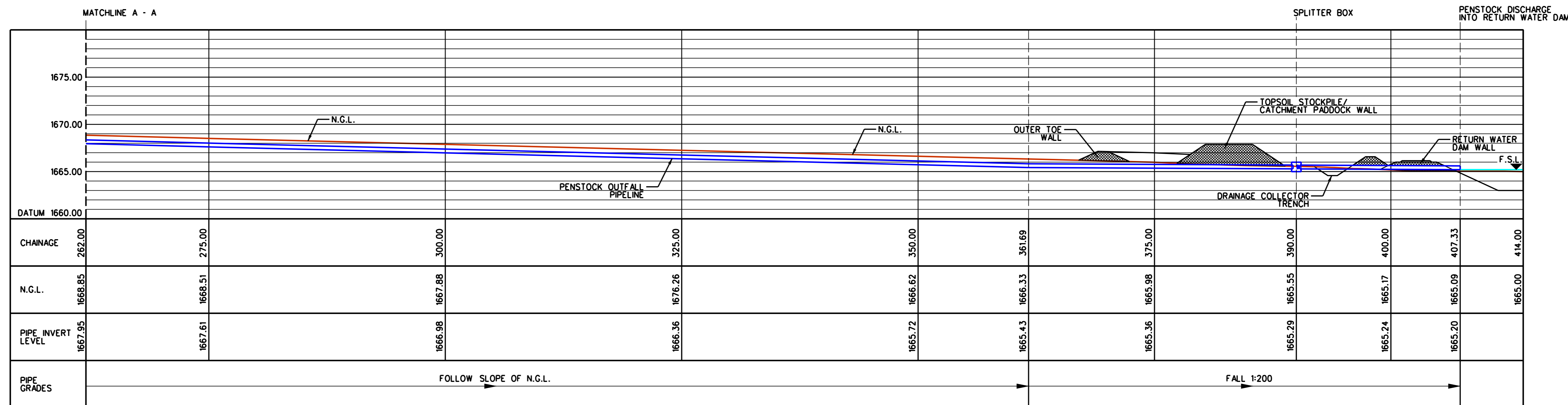
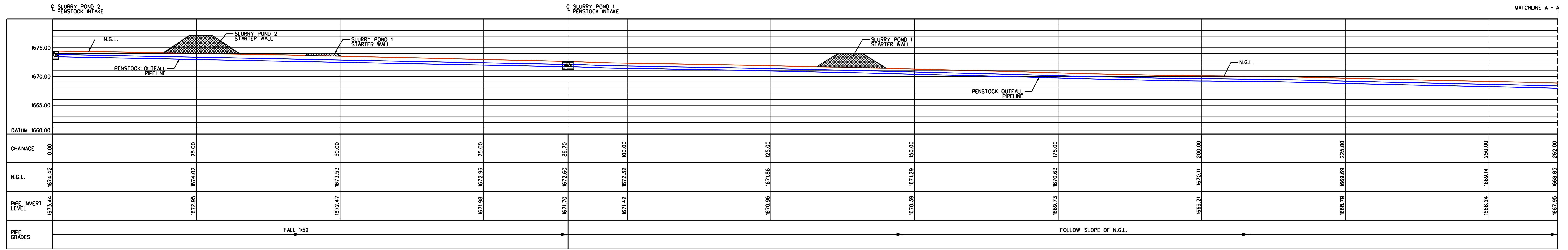
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S.A.
APR.09

CHECKED

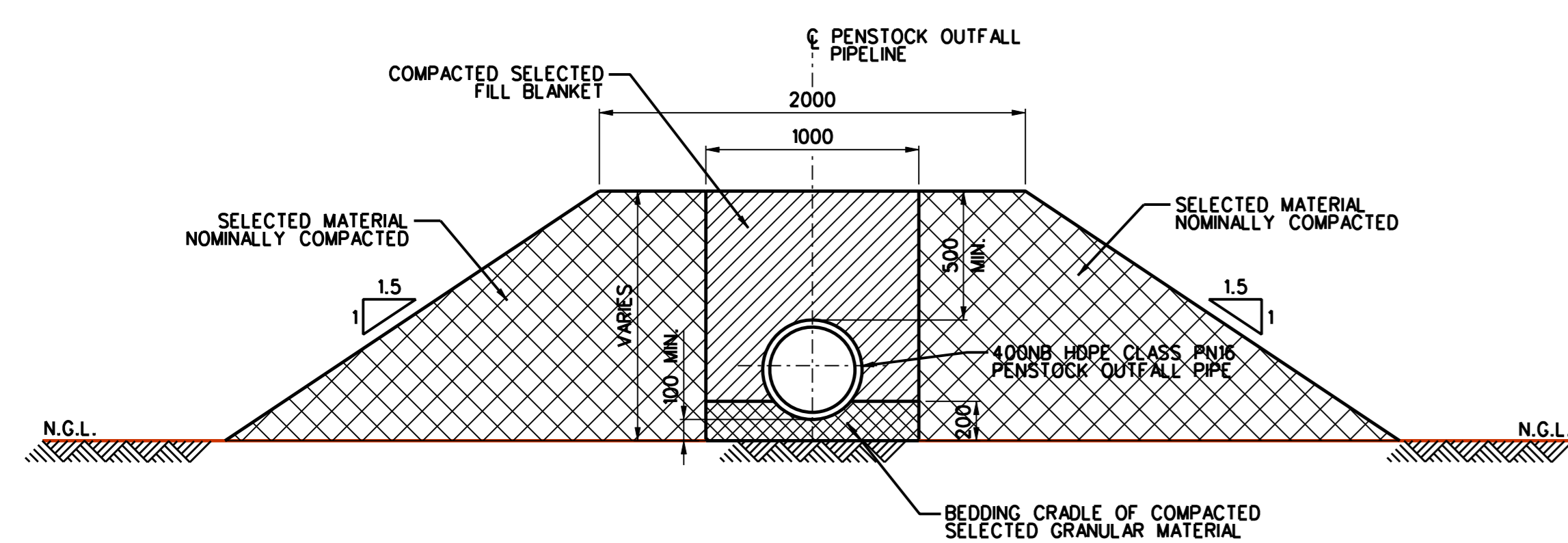
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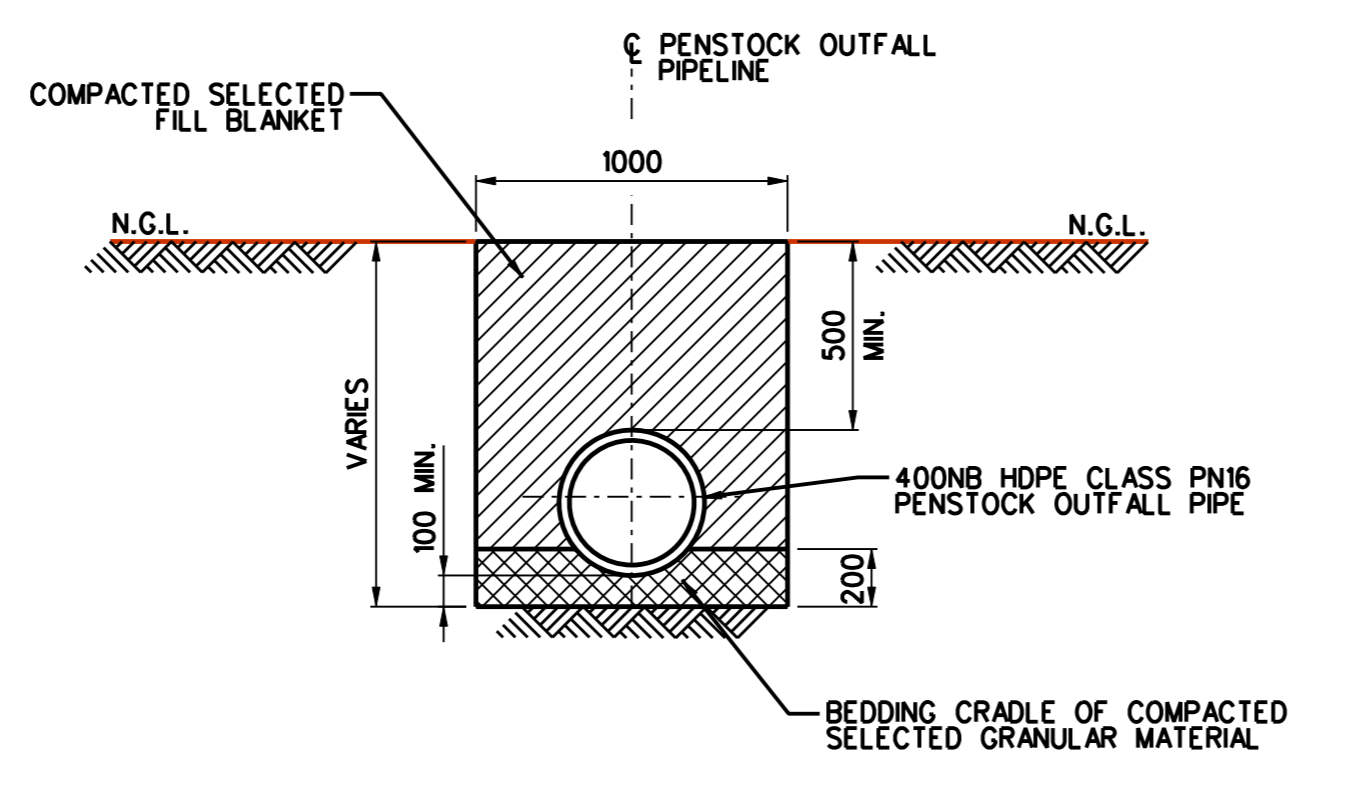
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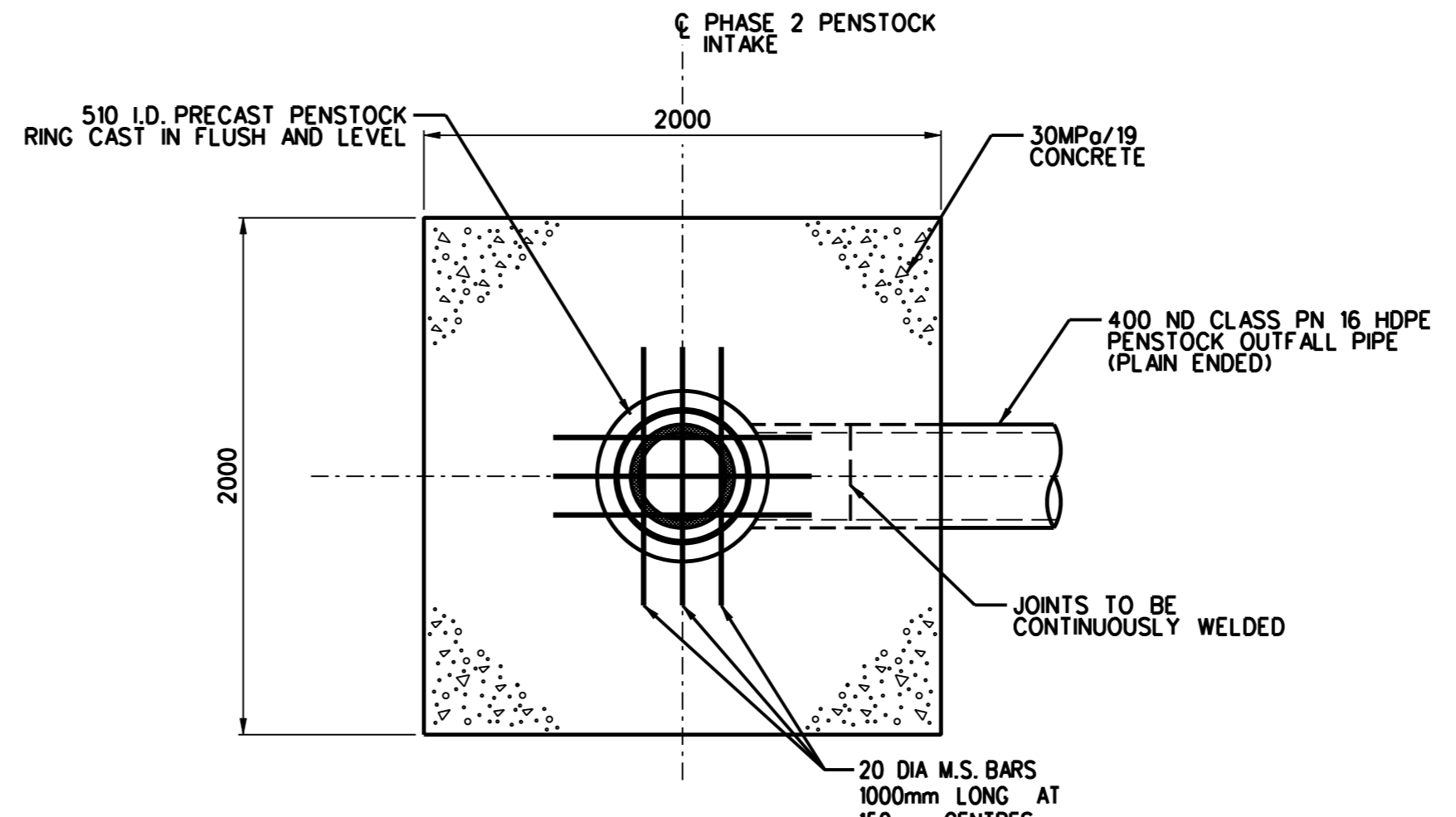
LONGITUDINAL SECTION - PENSTOCK OUTFALL PIPELINE
SCALE 1:250



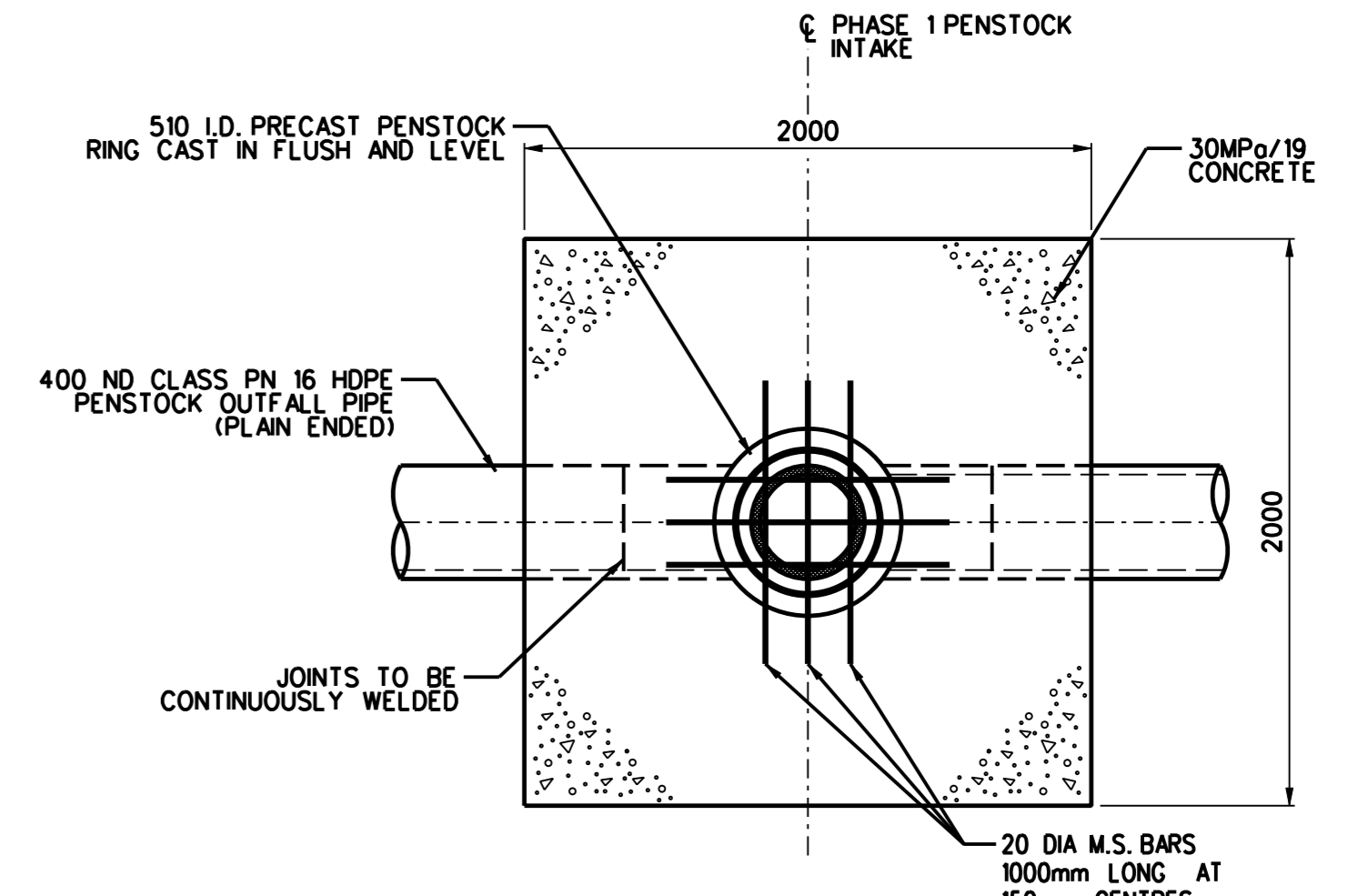
TYPICAL SECTION - PENSTOCK OUTFALL PIPELINE ABOVE N.G.L. (CLASS C BEDDING)
SCALE 1:25



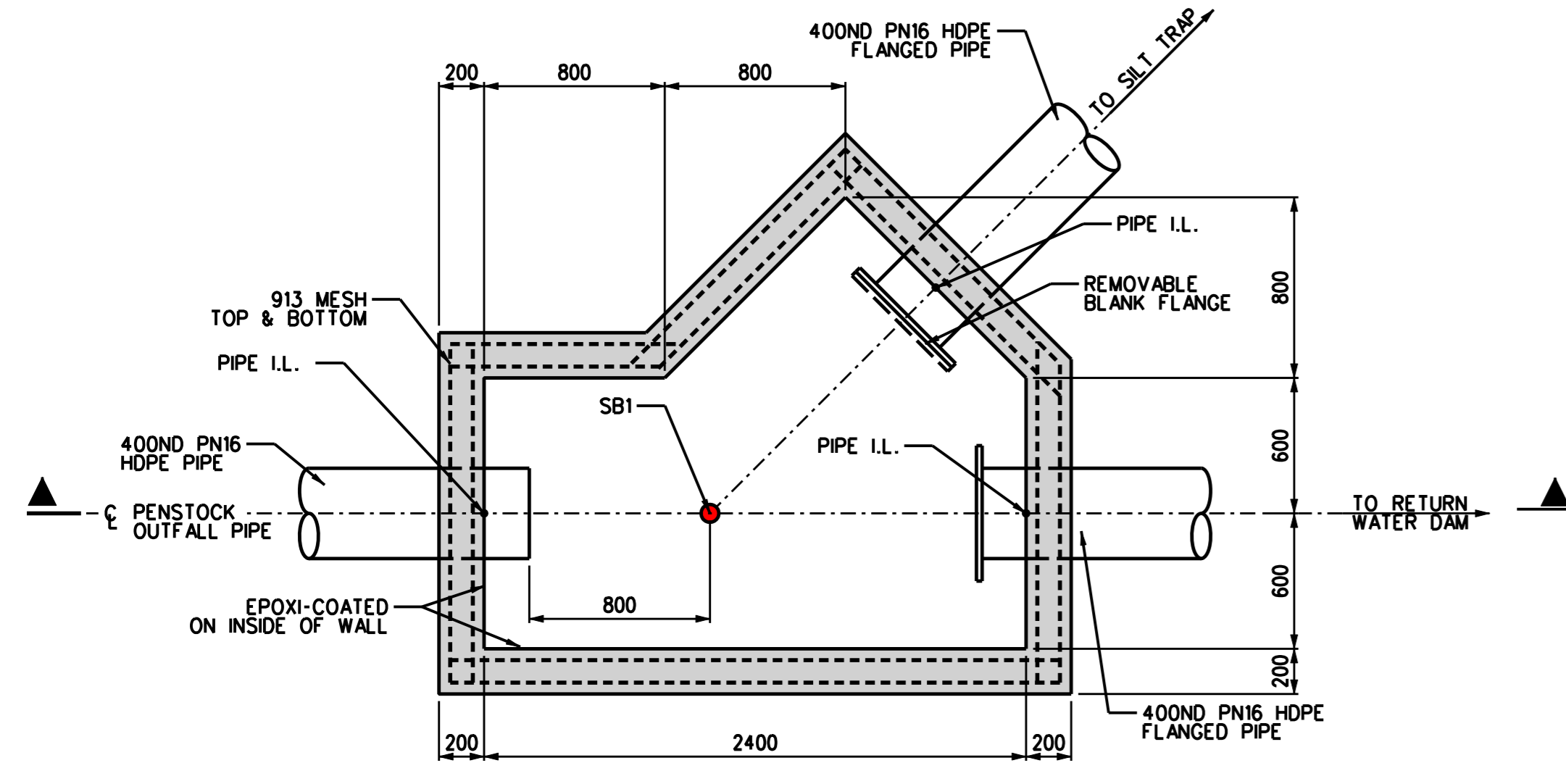
TYPICAL SECTION - PENSTOCK OUFALL PIPELINE BELOW N.G.L. (CLASS C BEDDING)
SCALE 1:25



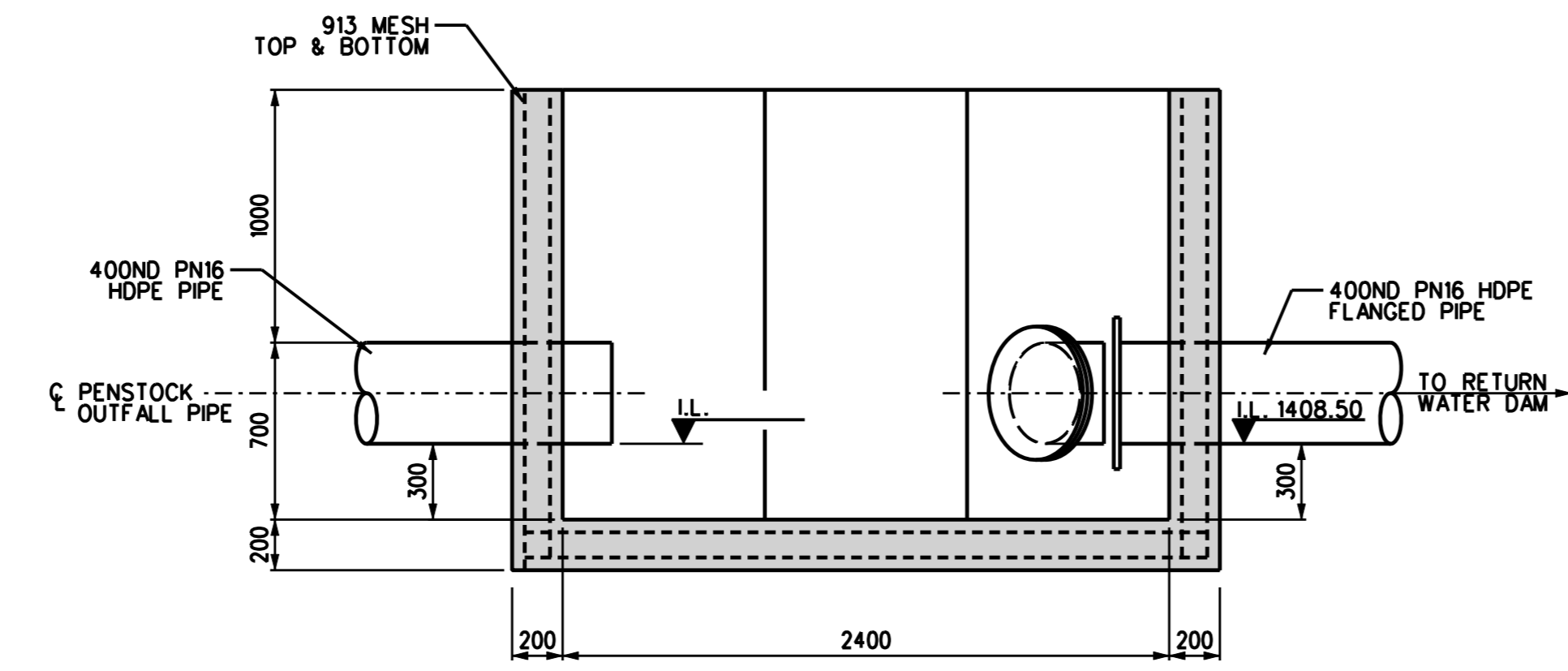
PLAN - SLURRY POND 2 PENSTOCK INTAKE
SCALE 1:25



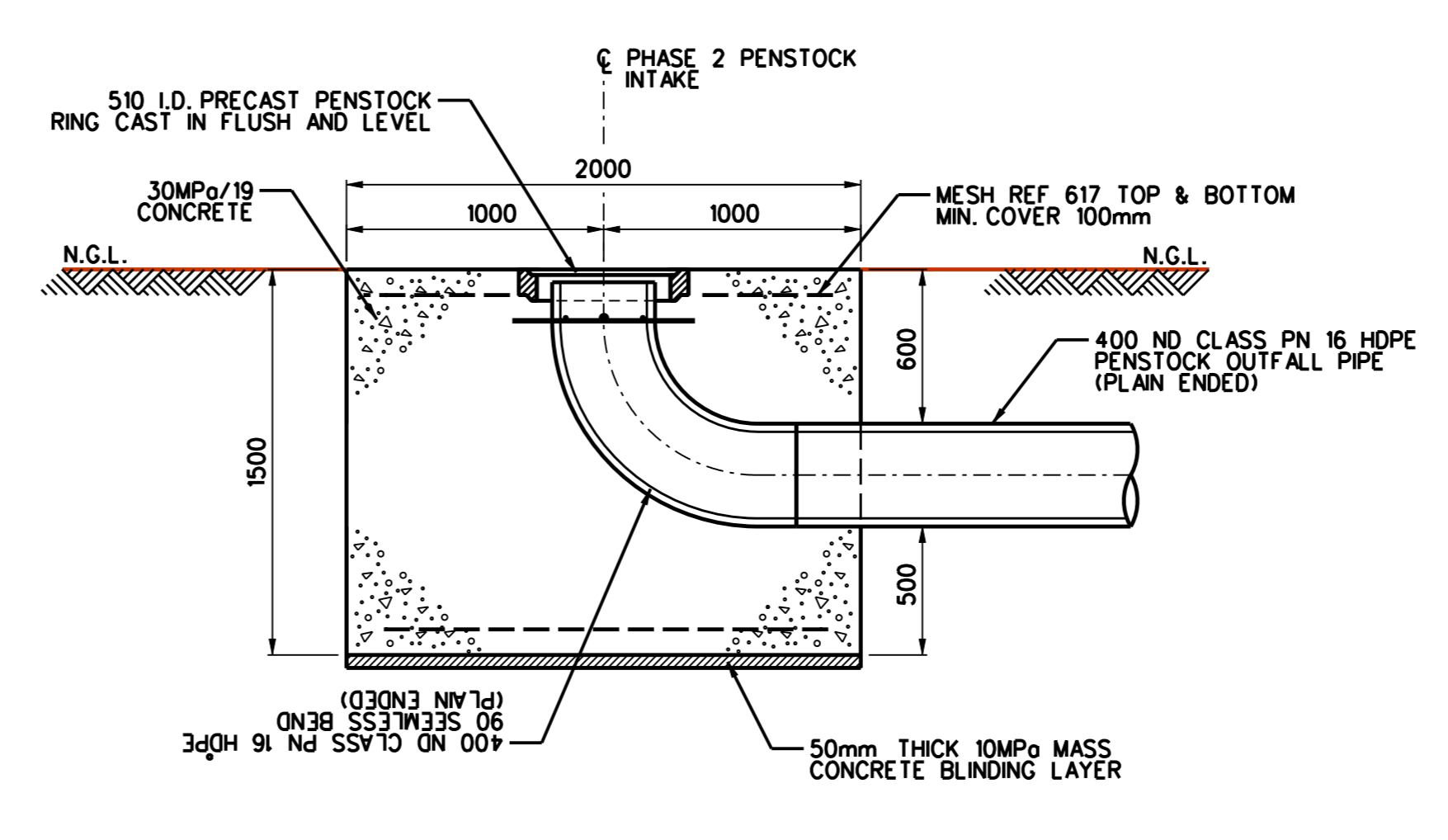
PLAN - SLURRY POND 1 PENSTOCK INTAKE
SCALE 1:25



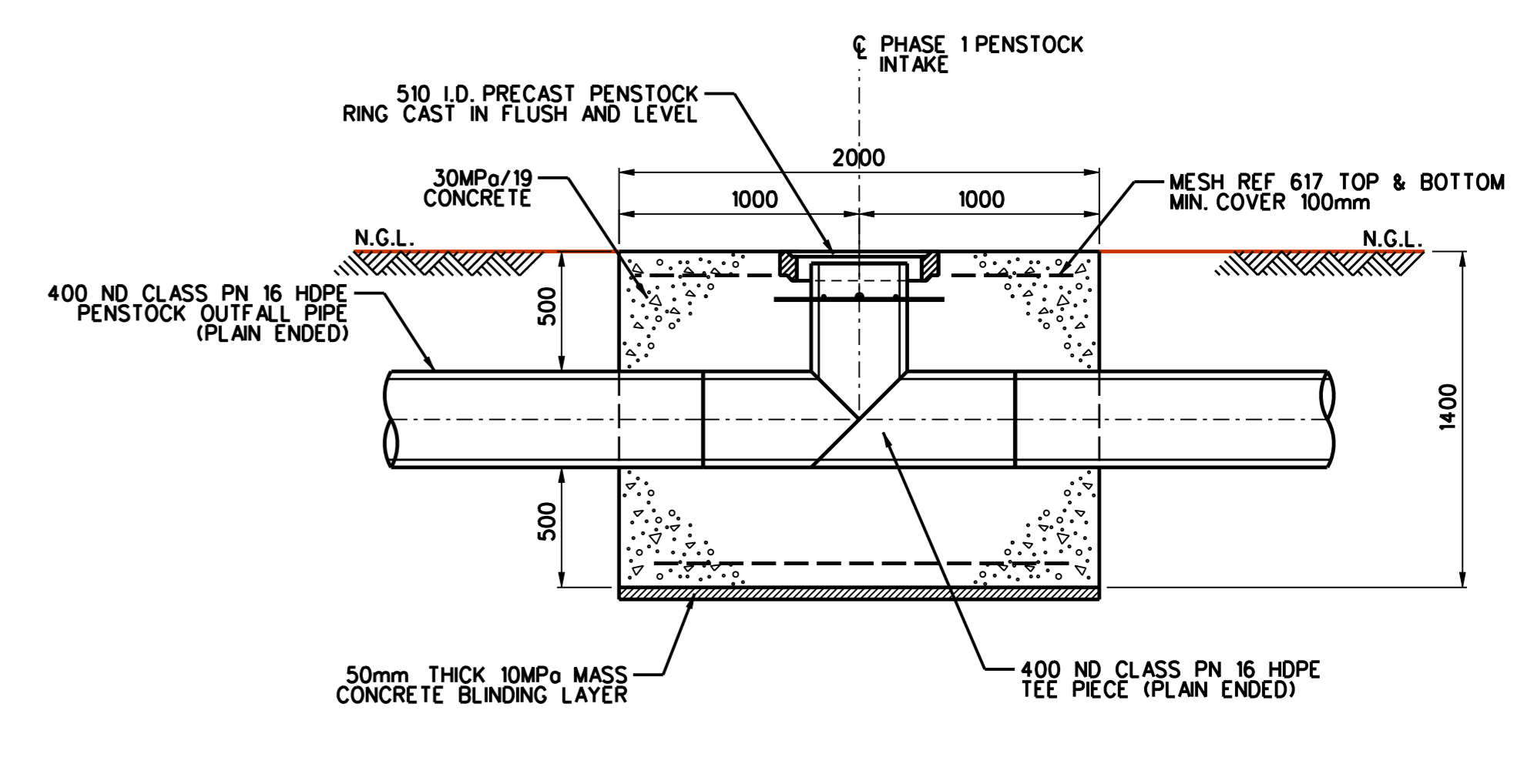
PLAN OF SPLITTER BOX
SCALE 1:25



SECTION - SPLITTER BOX
SCALE 1:25



SECTION - SLURRY POND 2 PENSTOCK INTAKE
SCALE 1:25



SECTION - SLURRY POND 1 PENSTOCK INTAKE
SCALE 1:25

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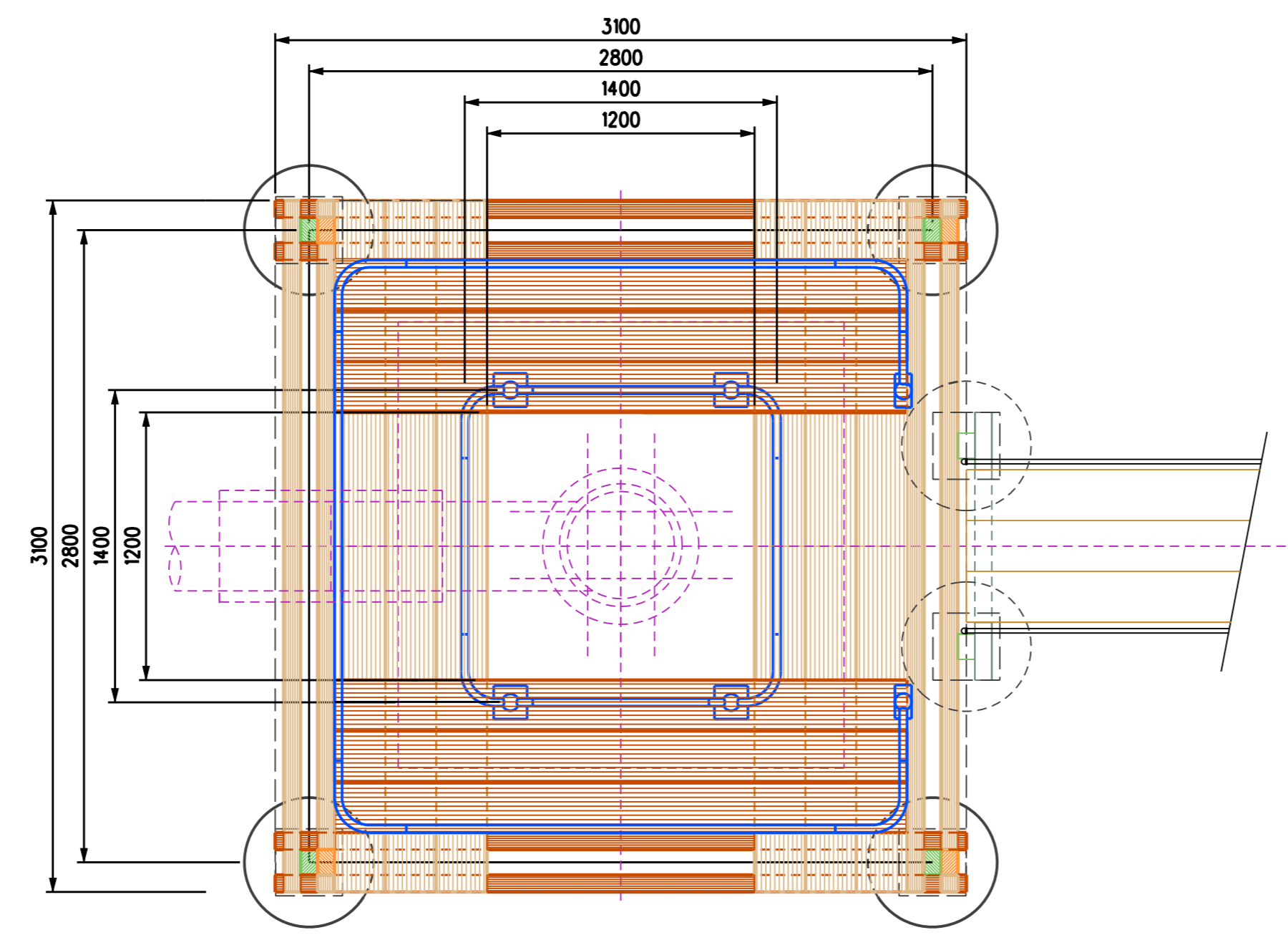
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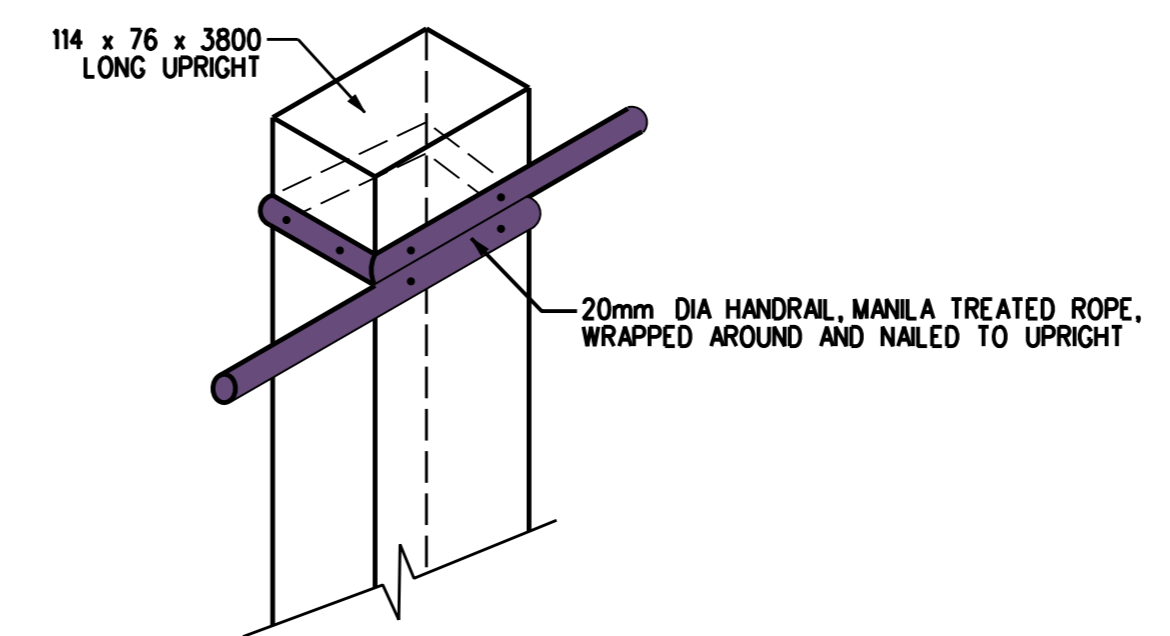
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				001	GENERAL ARRANGEMENT			BADGER MINING & CONSULTING (PTY) LTD		N.S.	MAR.09
								TITLE	DRAWN	N.S.	MAR.09
								MOOIPLAATS COAL DISCARD DUMP	CHECKED		
								PENSTOCK OUTFALL PIPELINE	SCALE	AS SHOWN	
								DETAILS	DRAWING No.	T994-008	REVISION
											B



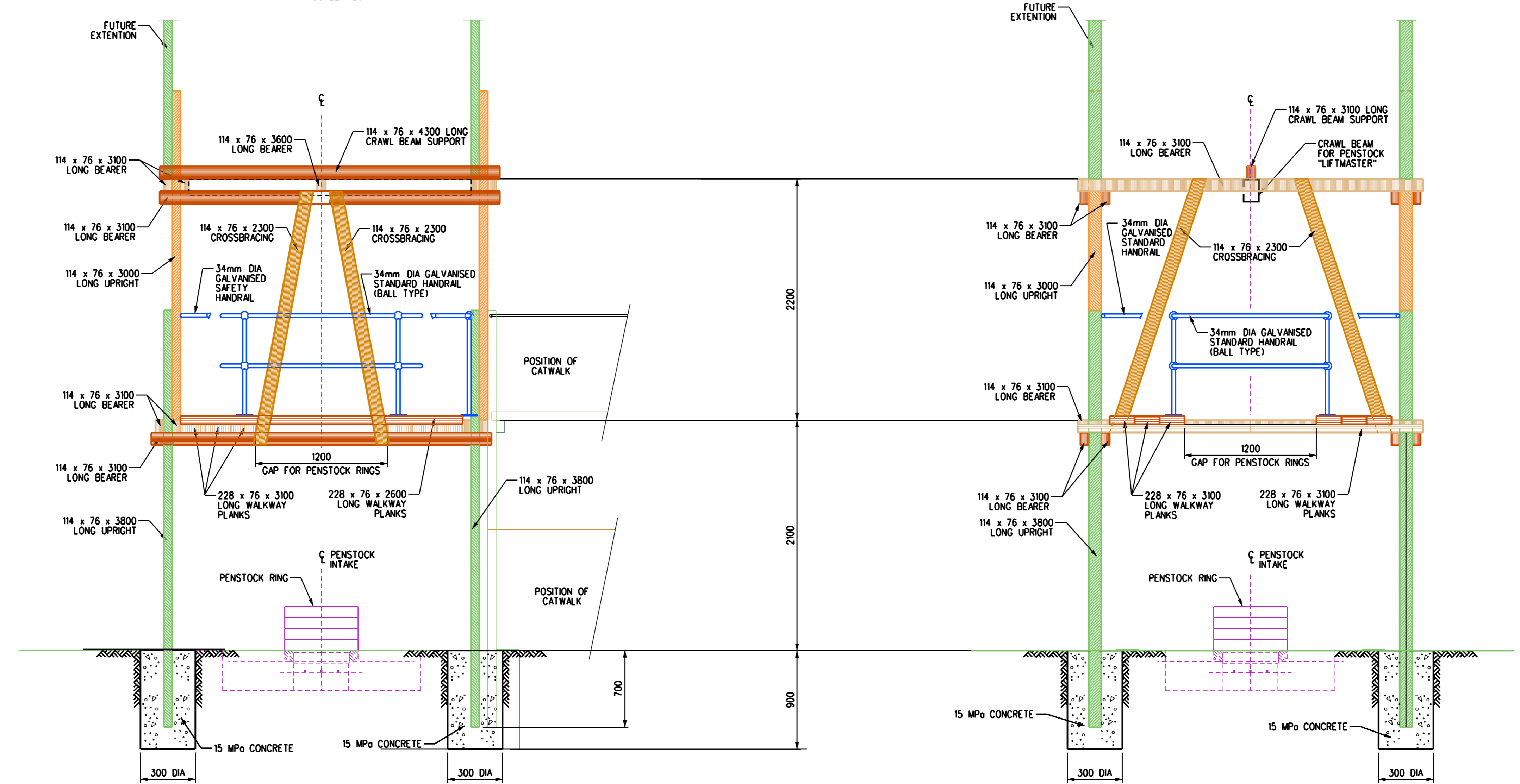
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TITLE	MOOIPLAATS COAL DISCARD DUMP PENSTOCK OUTFALL PIPELINE DETAILS
DESIGNED	N.S.
DRAWN	N.S.
CHECKED	
SCALE	AS SHOWN
DRAWING No.	T994-008
REVISION	B



PLAN - PLATFORM
AT SINGLE PENSTOCK INTAKE
SCALE 1:25

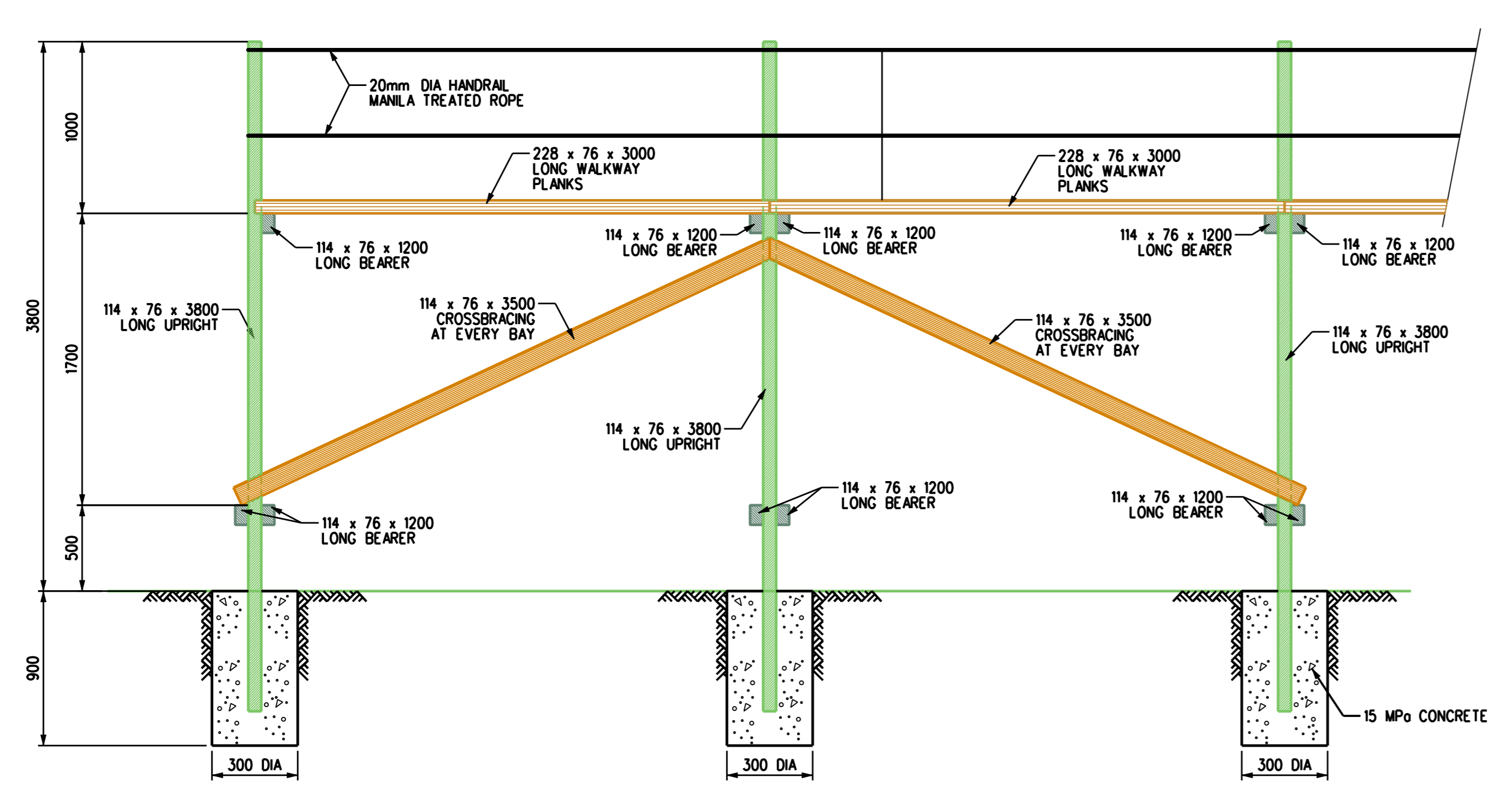


DETAIL 1
SHOWING ROPE HANDRAIL AT UPRIGHT
N.T.S.

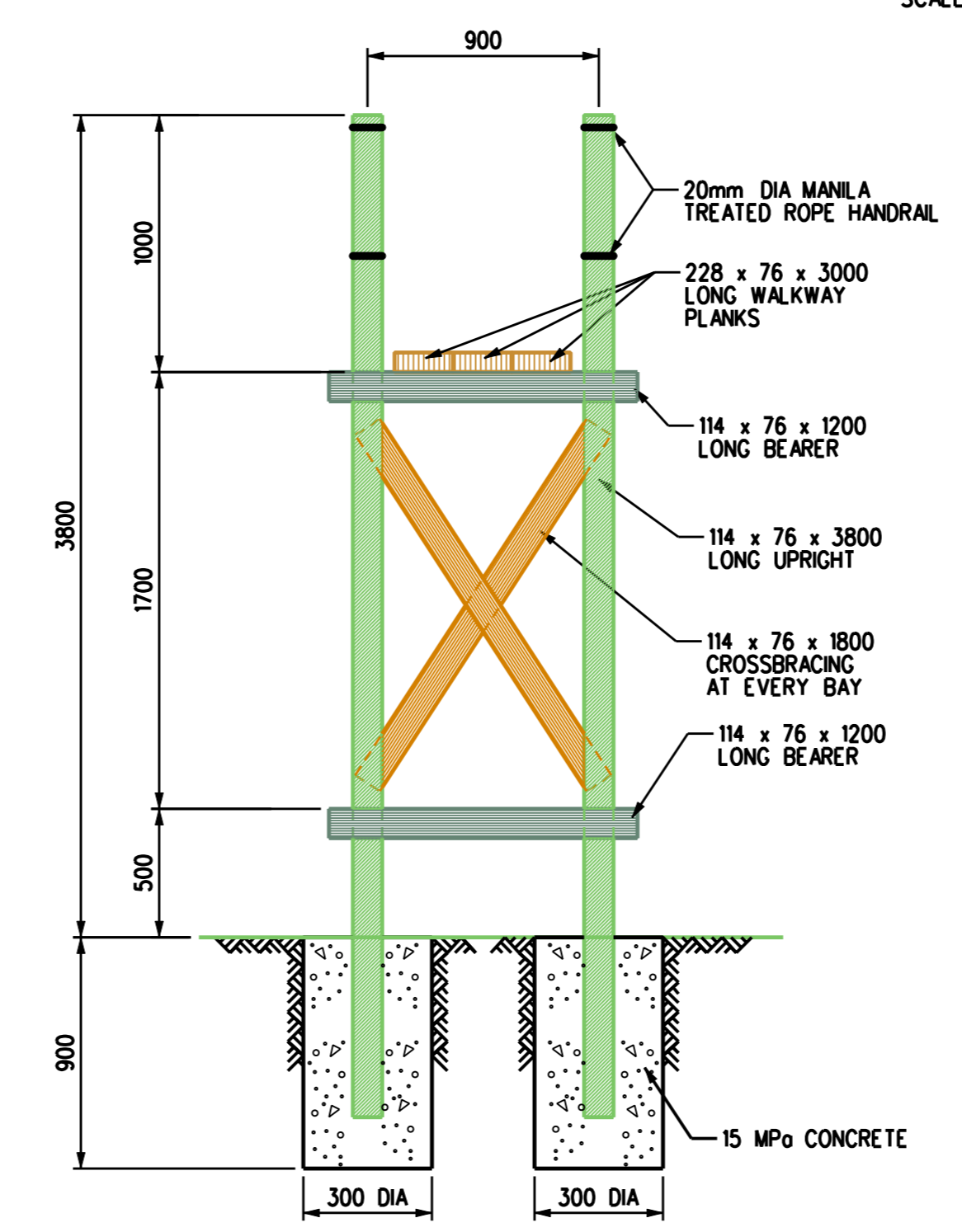


TYPICAL ELEVATION THROUGH PLATFORM
AT SINGLE PENSTOCK INTAKE
SCALE 1:25

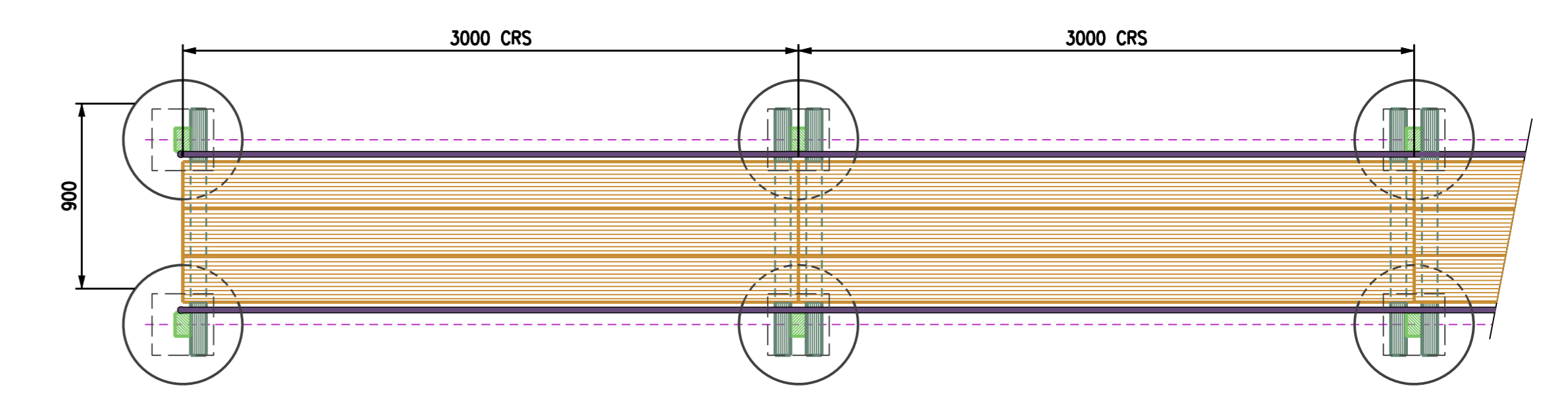
SECTION THROUGH PLATFORM
AT SINGLE PENSTOCK INTAKE
SCALE 1:25



SIDE ELEVATION - CATWALK
SCALE 1:25



TYPICAL SECTION THROUGH CATWALK
SCALE 1:25



PLAN - CATWALK
SCALE 1:25

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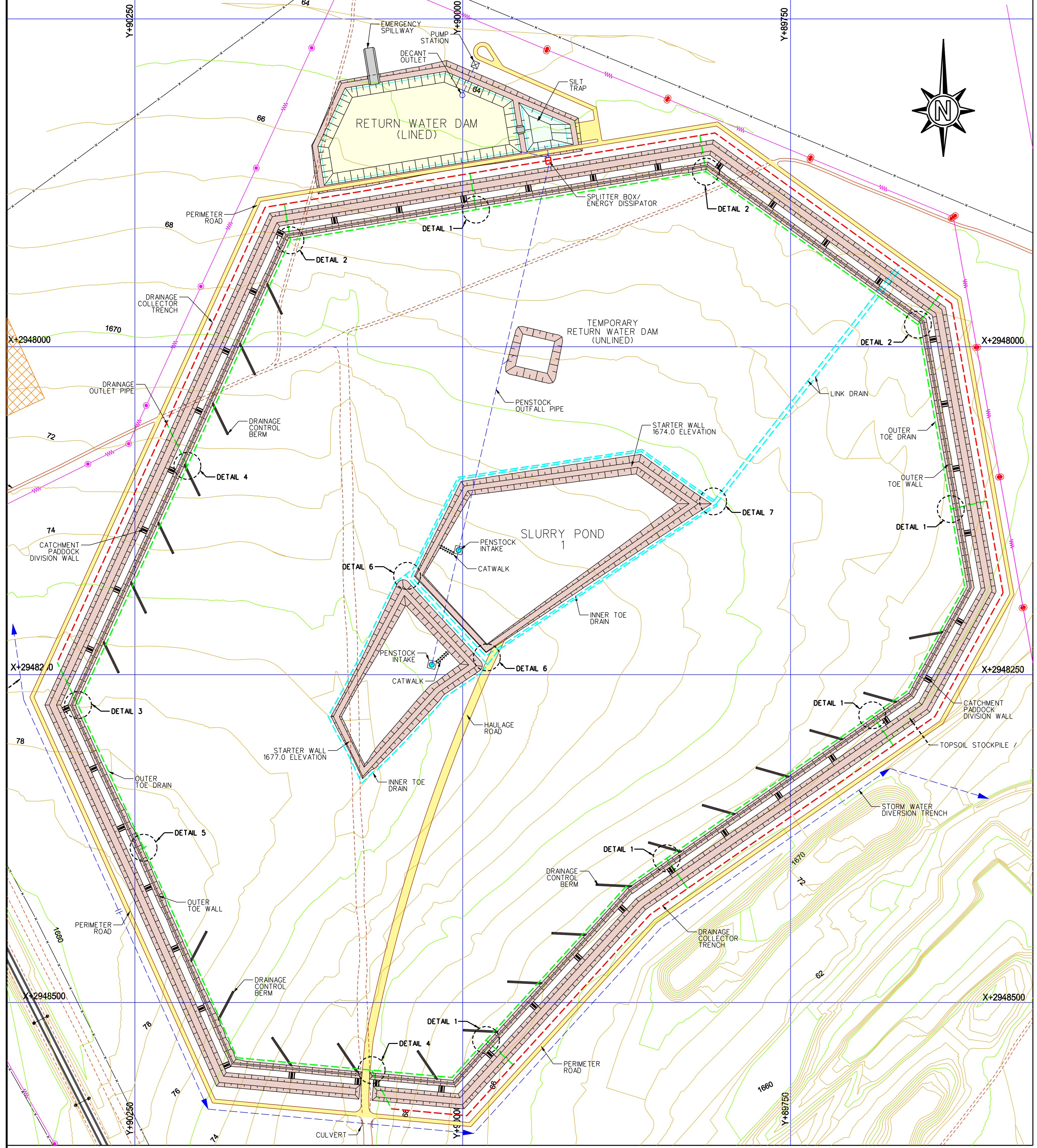
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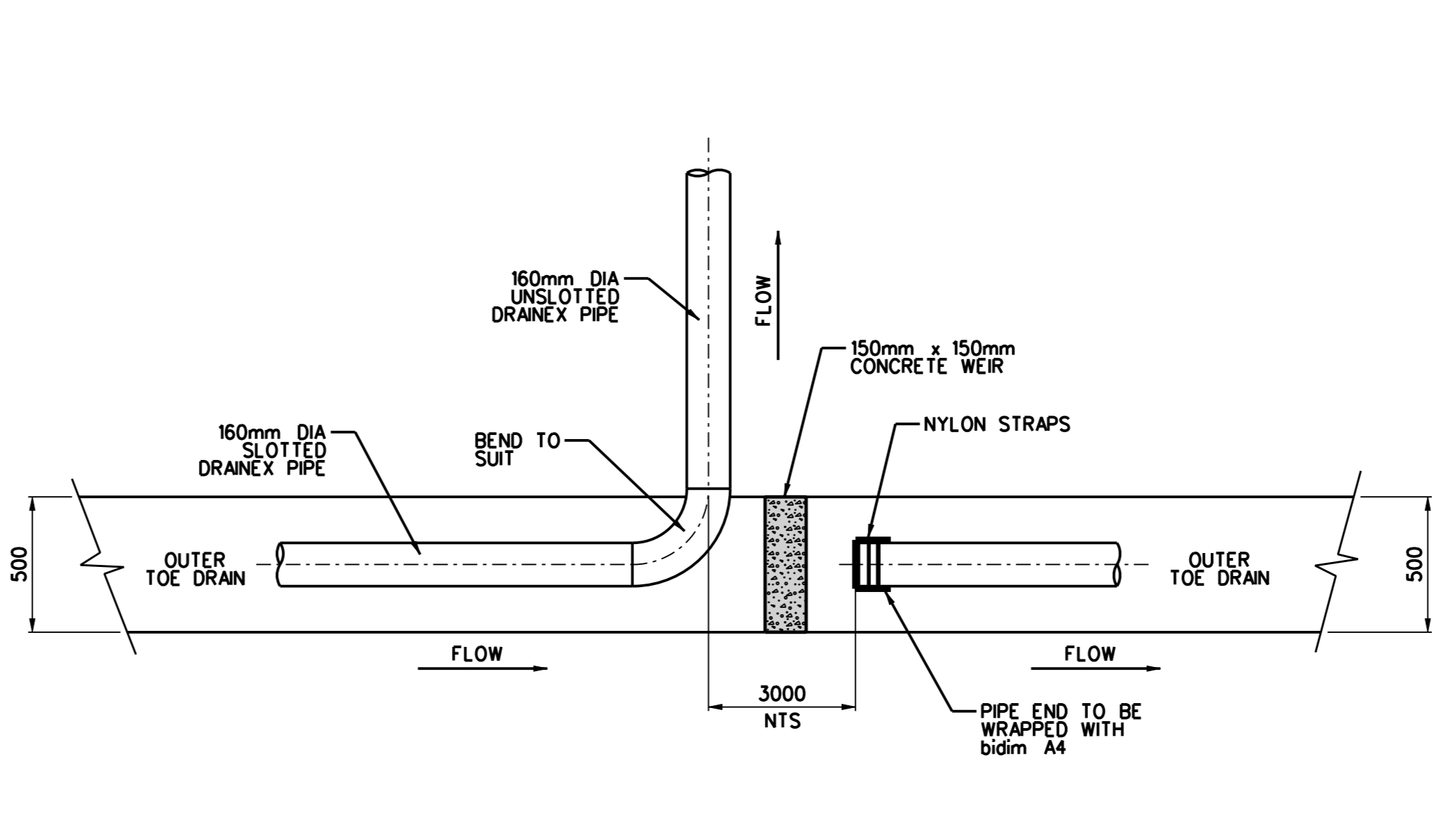
TITLE
MOOPLAATS COAL DISCARD DUMP CATWALK DETAILS

DO NOT SCALE

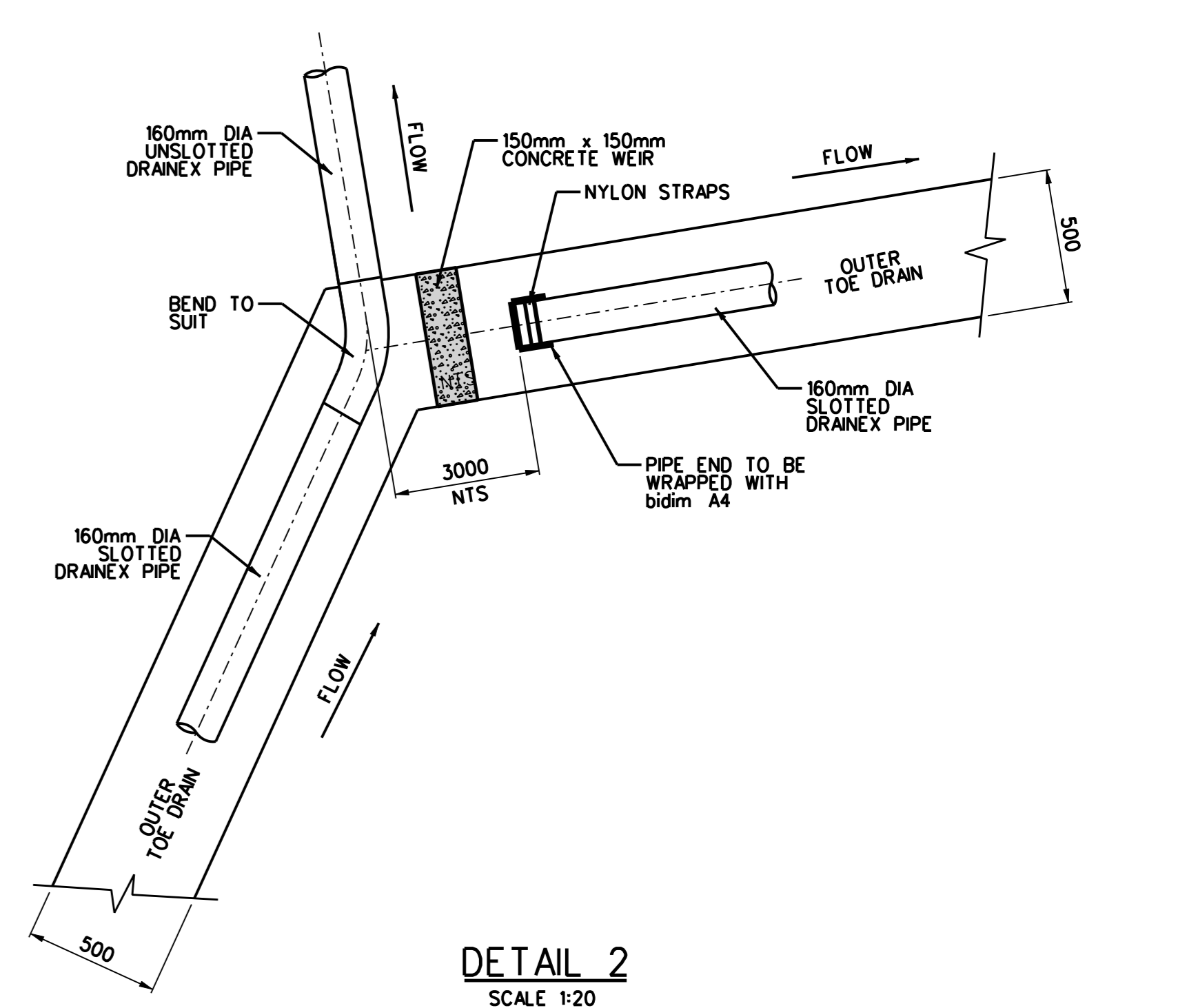
DESIGNED	BY	DATE
	N.S.	MAR.09
DRAWN	BY	DATE
	S.A.	MAR.09
CHECKED		
SCALE	AS SHOWN	
DRAWING No.	T994-009	REVISION
		A



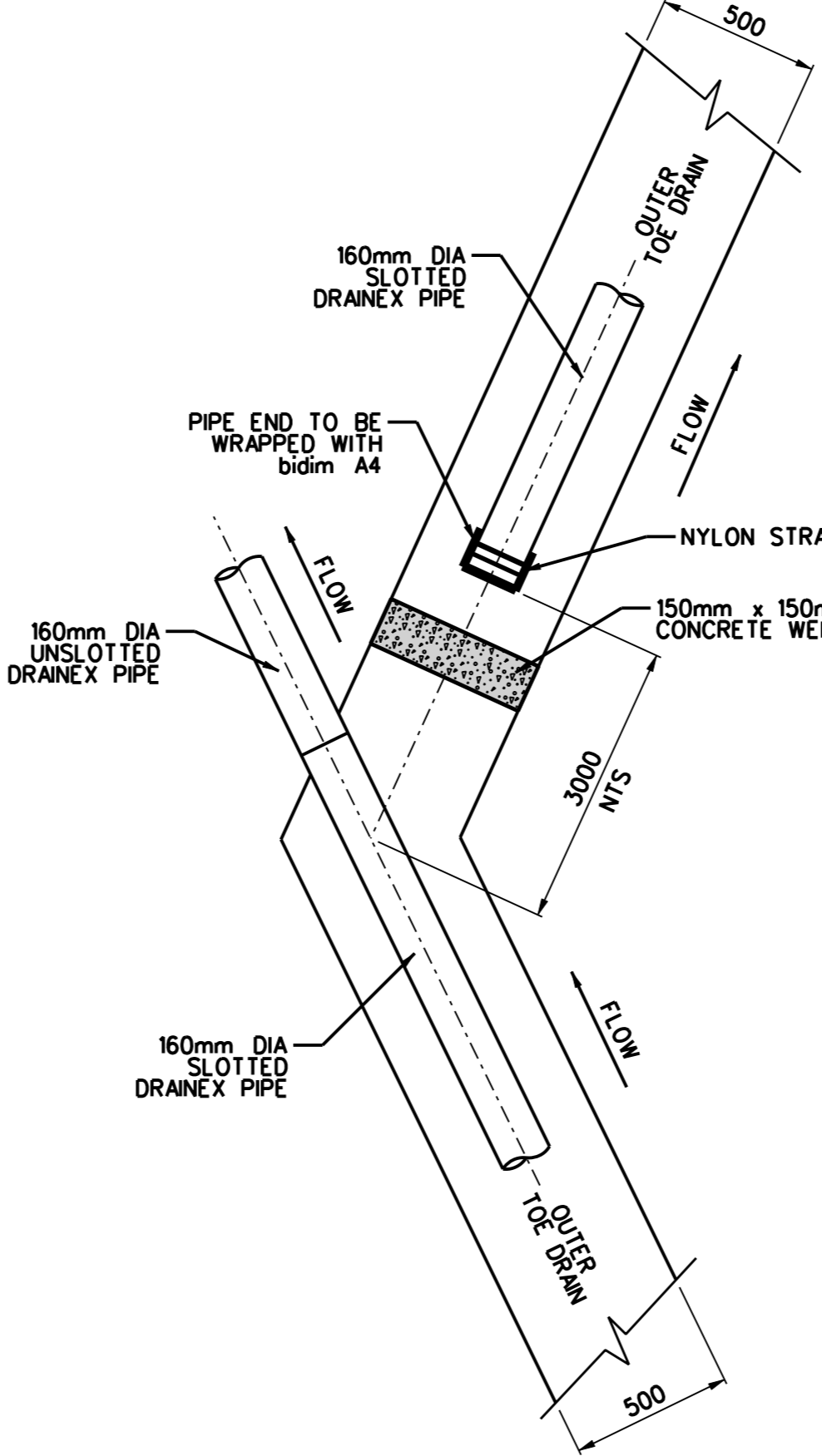
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SCALE 1:1500



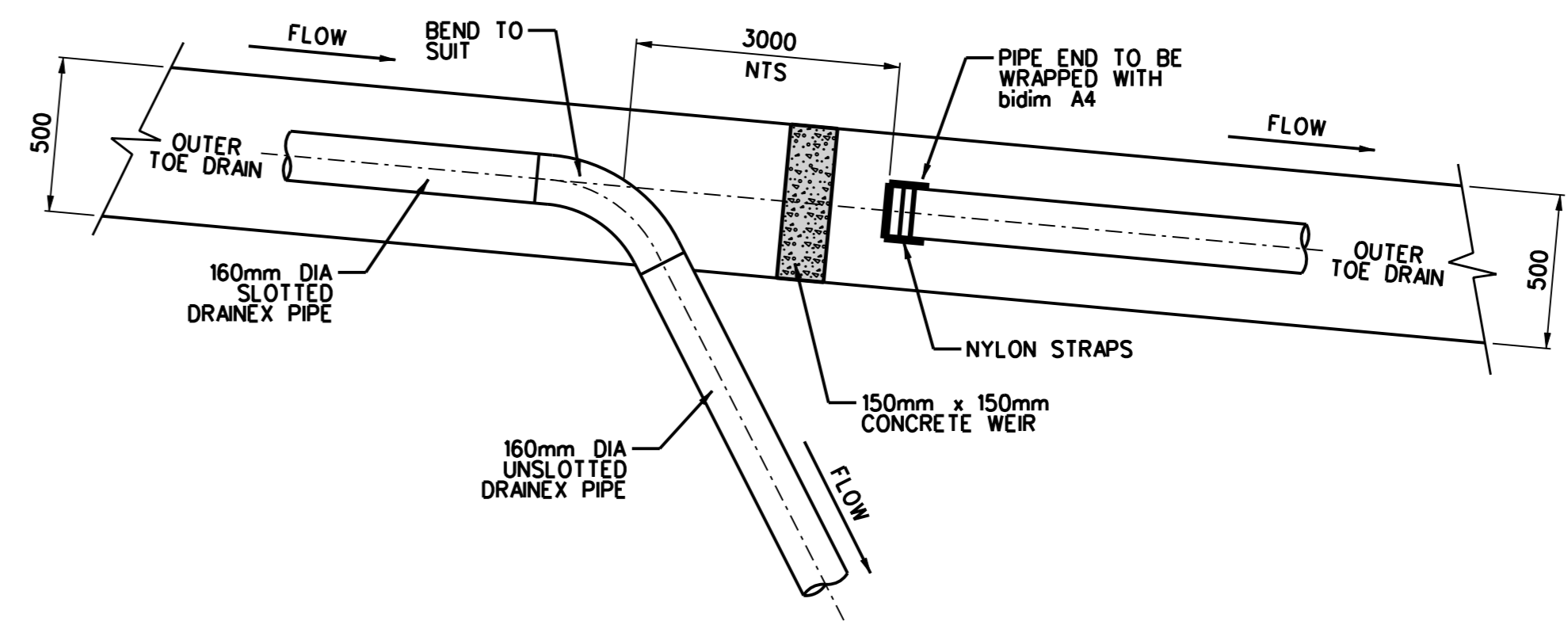
DETAIL 1
SCALE 1:20



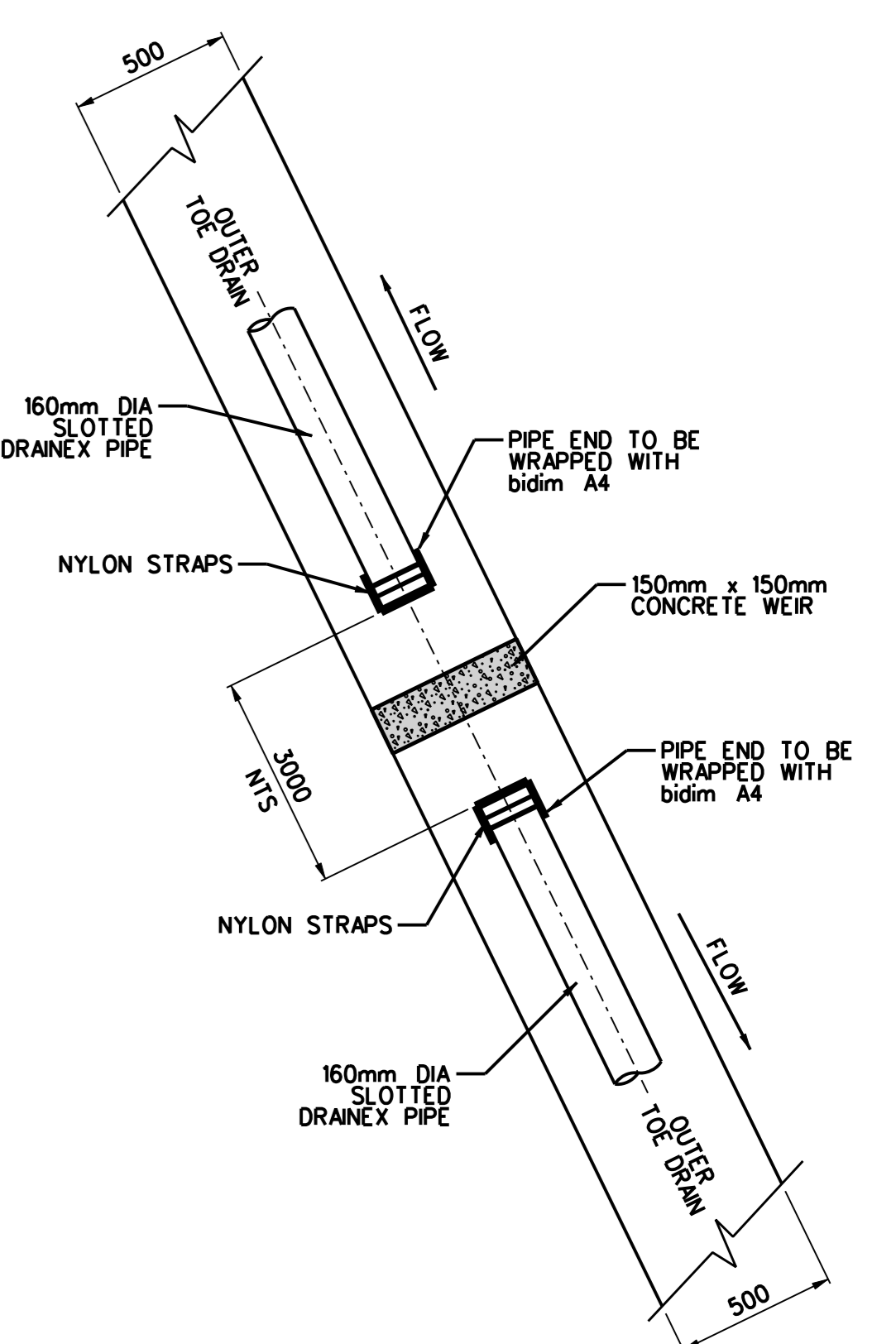
DETAIL 2
SCALE 1:20



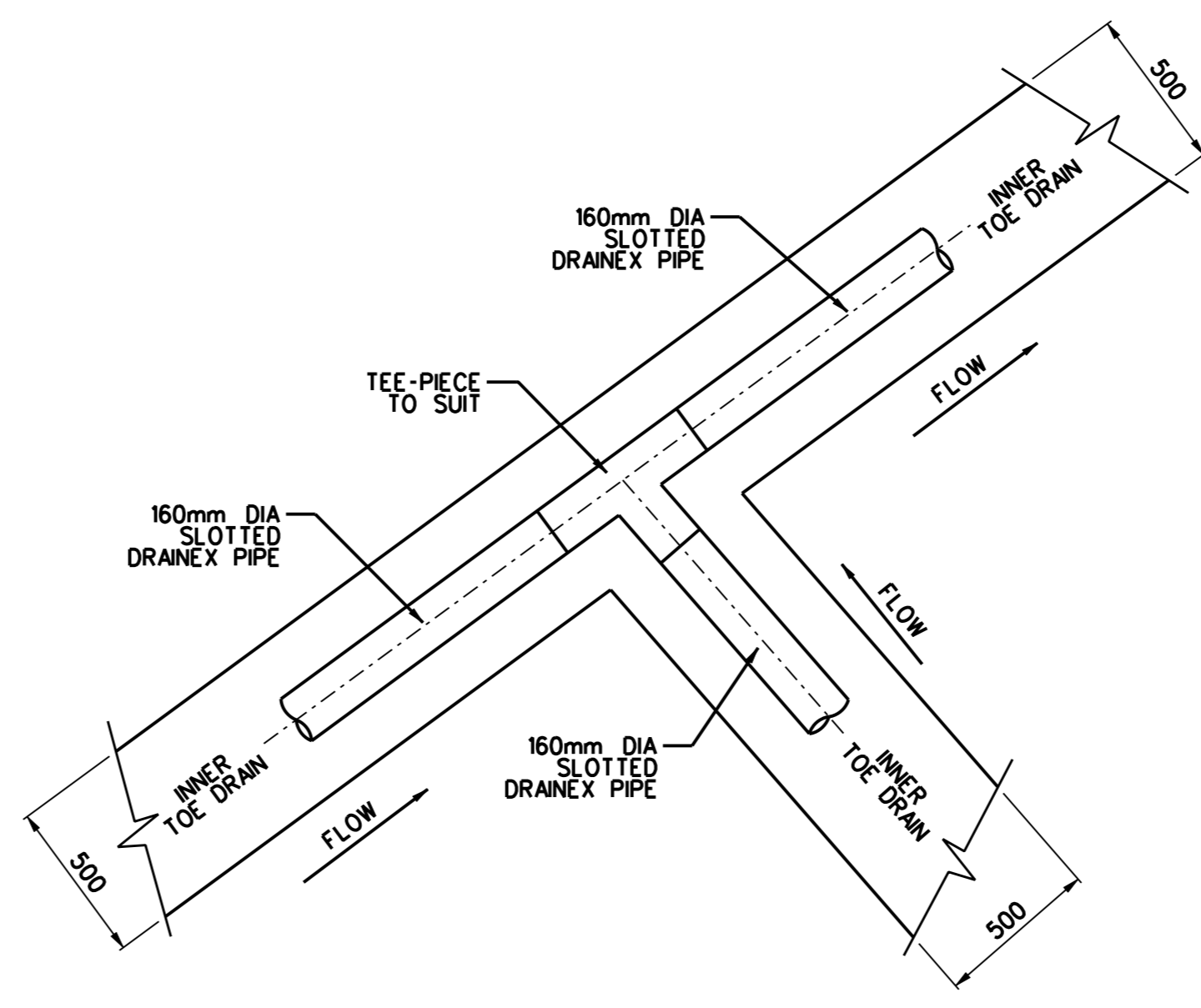
DETAIL 3
SCALE 1:20



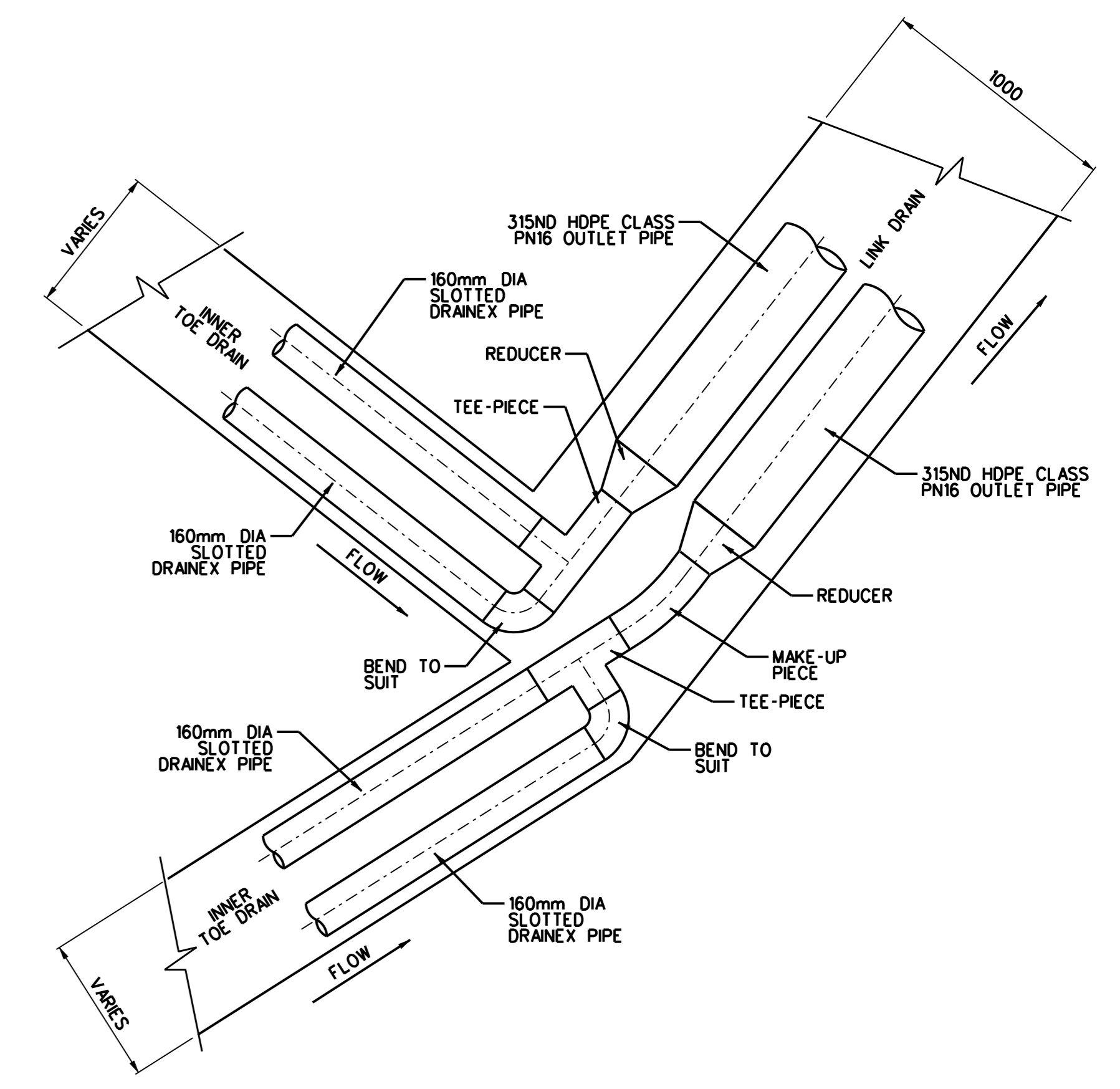
DETAIL 4
SCALE 1:20



DETAIL 5
SCALE 1:20



DETAIL 6
SCALE 1:20



DETAIL 7
SCALE 1:20

DRAFT

DO NOT SCALE

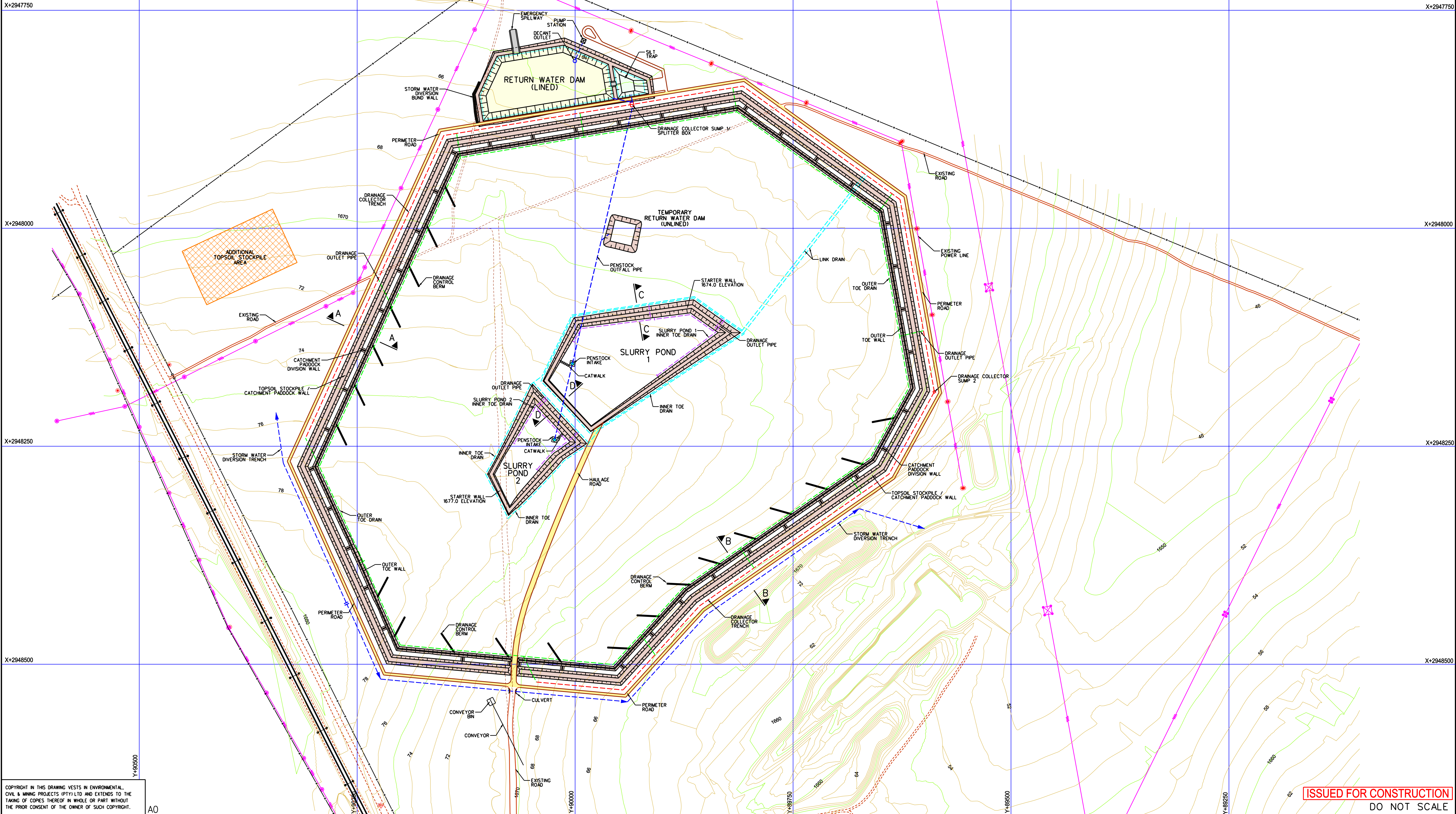
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REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
				001	GENERAL ARRANGEMENT		
				004	DRAINAGE DETAILS		

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Fax. (011) 705 1908

CLIENT BADGER MINING & CONSULTING (PTY) LTD	DESIGNED N.S.	DATE MAR.09
TITLE MOOPLAATS COAL DISCARD DUMP DRAINAGE PIPE DETAILS	DRAWN N.S.	MAR.09
CHECKED	SCALE A0-150	REVISION
DRAWING No. T994-010		A



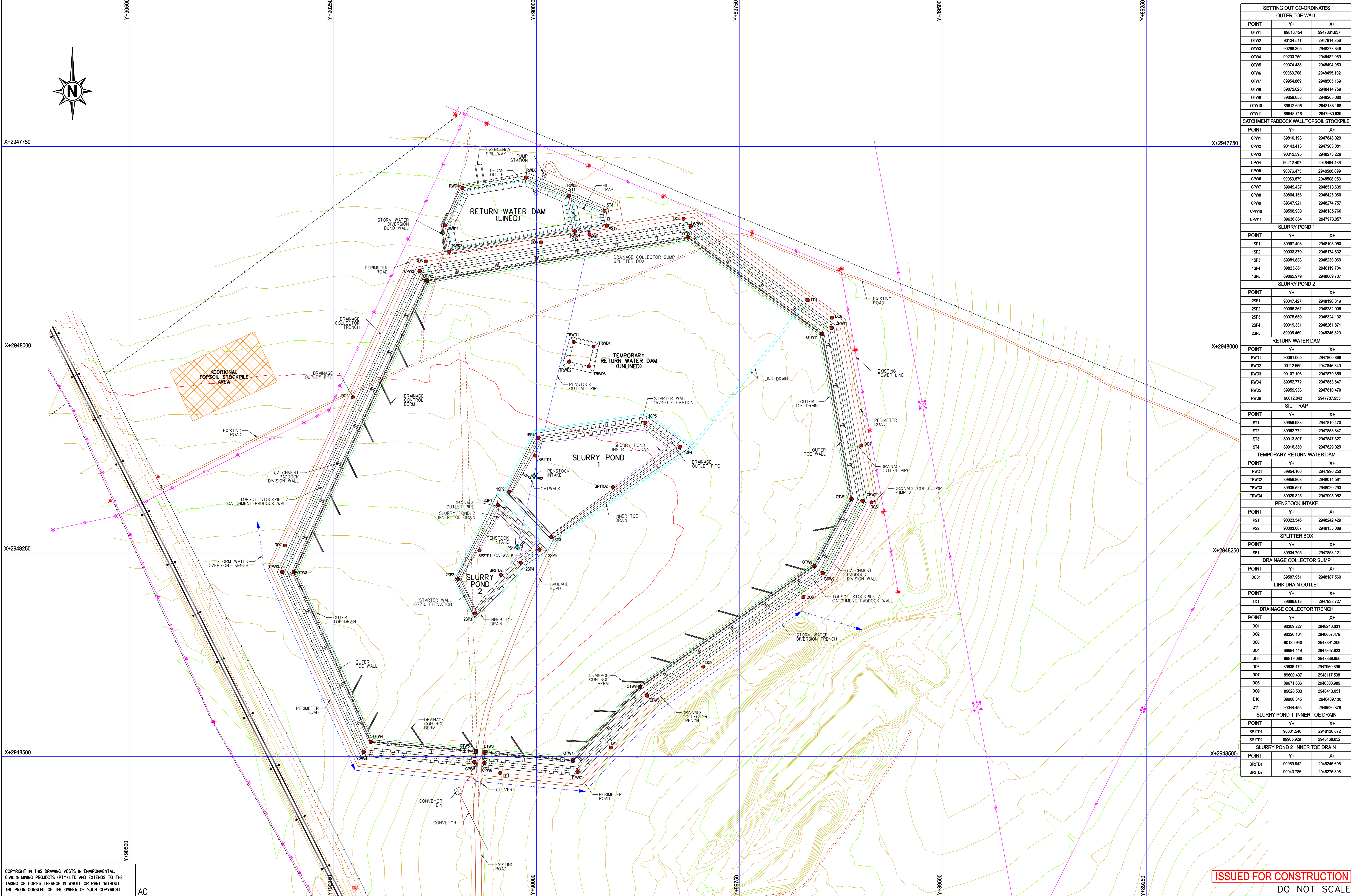
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REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
1	NS/SA	07-05-2009	DRAWING UPDATED	002	SETTING OUT CO-ORDINATES	008	PENSTOCK OUTFALL PIPELINE DETAILS
2	NS/SA	13-05-2009	SLURRY POND 2 WALL ALTERED	003	EARTHWORKS SECTIONS & DETAILS	009	CATWALK DETAILS
3	NS/SA	22-07-2009	DUMP ALTERED TO SUIT LOADING BIN	004	DRAINAGE DETAILS	010	DRAINAGE PIPE DETAILS
				005	RETURN WATER DAM & SILT TRAP LAYOUT	011	DRAINAGE COLLECTOR TRENCH LONG SECTION & DETAILS
				006	RETURN WATER DAM & SILT TRAP DETAILS	012	RETURN WATER DAM DECANT SUMP DETAILS
				007	RETURN WATER DAM SPILLWAY & TEMPORARY RETURN WATER DAM DETAILS	013	FINAL PROFILE

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CLIENT BADGER MINING & CONSULTING (PTY) LTD		BY	DATE
TITLE MOOPLAATS COAL DISCARD DUMP GENERAL ARRANGEMENT		N.S.	MAR.09
DESIGNED	DRAWN	S.A.	MAR.09
CHECKED	SCALE 1:1500		
DRAWING No. T994-001	REVISION 3		



SETTING OUT CO-ORDINATES		
OUTER TOE WALL		
POINT	Y+	X+
OTW1	89813.454	2947861.837
OTW2	90134.511	2947914.856
OTW3	90298.305	2948273.348
OTW4	90203.750	2948482.089
OTW5	90074.438	2948494.050
OTW6	90063.708	2948495.102
OTW7	89954.889	2948505.169
OTW8	89872.528	2948414.759
OTW9	89658.058	2948285.880
OTW10	89612.606	2948183.168
OTW11	89648.718	2947980.639
CATCHMENT Paddock WALL/TOPSOIL STOCKPILE		
POINT	Y+	X+
CPW1	89810.193	2947848.029
CPW2	90143.413	2947903.081
CPW3	90312.595	2948273.228
CPW4	90212.407	2948494.438
CPW5	90076.473	2948508.899
CPW6	90063.879	2948508.053
CPW7	89949.437	2948518.639
CPW8	89864.153	2948425.060
CPW9	89647.921	2948274.757
CPW10	89598.938	2948185.766
CPW11	89636.864	2947973.057
SLURRY POND 1		
POINT	Y+	X+
1SP1	89997.493	2948108.050
1SP2	90033.379	2948174.632
1SP3	89981.833	2948230.069
1SP4	89823.861	2948119.704
1SP5	89865.979	2948089.707
SLURRY POND 2		
POINT	Y+	X+
2SP1	90047.427	2948190.819
2SP2	90096.361	2948282.005
2SP3	90075.659	2948324.132
2SP4	90019.331	2948261.871
2SP5	89996.489	2948245.820
RETURN WATER DAM		
POINT	Y+	X+
RWD1	90091.005	2947800.889
RWD2	90112.569	2947848.840
RWD3	90107.196	2947878.359
RWD4	89952.772	2947853.847
RWD5	89959.938	2947810.470
RWD6	90012.843	2947787.955
SILT TRAP		
POINT	Y+	X+
ST1	89959.938	2947810.470
ST2	89952.772	2947853.847
ST3	89913.307	2947847.327
ST4	89916.330	2947829.029
TEMPORARY RETURN WATER DAM		
POINT	Y+	X+
TRWD1	89954.166	2947990.250
TRWD2	89959.888	2948014.591
TRWD3	89935.527	2948020.283
TRWD4	89929.825	2947995.952
PENSTOCK INTAKE		
POINT	Y+	X+
PS1	90023.546	2948242.429
PS2	90003.087	2948155.089
SPLITTER BOX		
POINT	Y+	X+
SB1	89934.705	2947858.121
DRAINAGE COLLECTOR SUMP		
POINT	Y+	X+
DCS1	89987.951	2948187.569
LINK DRAIN OUTLET		
POINT	Y+	X+
LD1	89988.613	2947938.727
DRAINAGE COLLECTOR TRENCH		
POINT	Y+	X+
DO1	90309.227	2948240.631
DO2	90226.164	2948057.479
DO3	90135.940	2947891.208
DO4	89994.419	2947867.823
DO5	89819.090	2947838.856
DO6	89636.472	2947960.396
DO7	89600.437	2948117.538
DO8	89671.696	2948303.989
DO9	89828.503	2948413.051
DO10	89808.345	2948489.130
DO11	90044.855	2948520.378
SLURRY POND 1 INNER TOE DRAIN		
POINT	Y+	X+
SP1TD1	90001.546	2948130.072
SP1TD2	89905.929	2948168.852
SLURRY POND 2 INNER TOE DRAIN		
POINT	Y+	X+
SP2TD1	90069.942	2948246.696
SP2TD2	90043.786	2948276.808

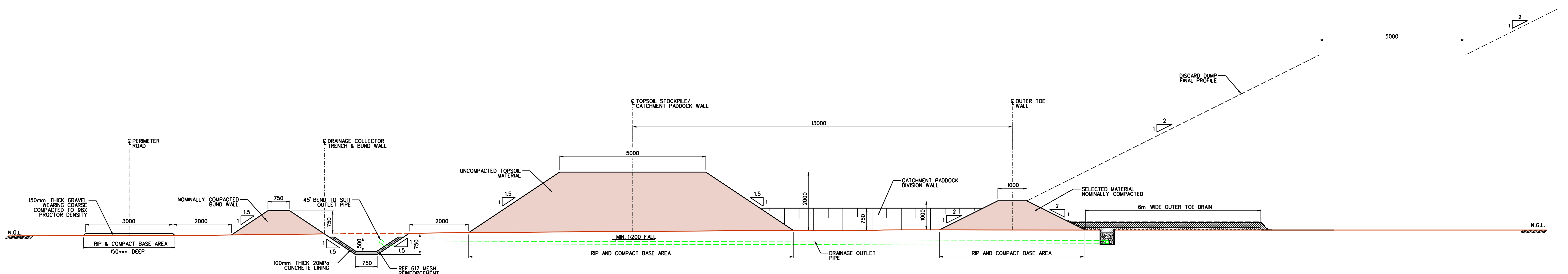
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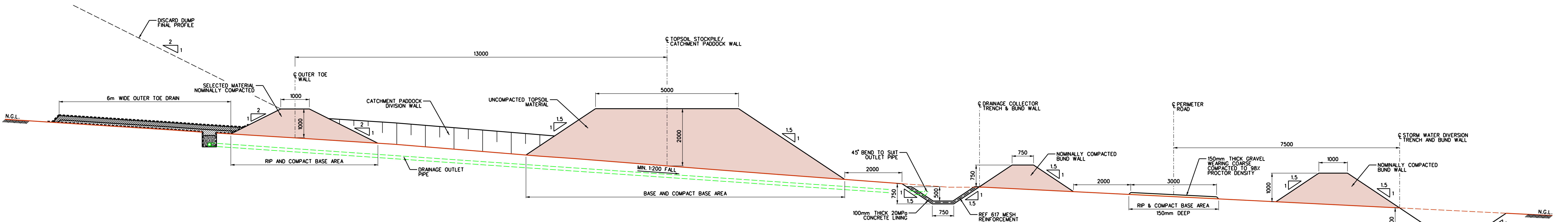
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1	NS/SA	07-05-2009	DRAWING UPDATED	001	GENERAL ARRANGEMENT		
2	NS/SA	13-05-2009	SLURRY POND 2 WALL ALTERED				
3	NS/SA	22-07-2009	DUMP ALTERED TO SUIT LOADING BIN				

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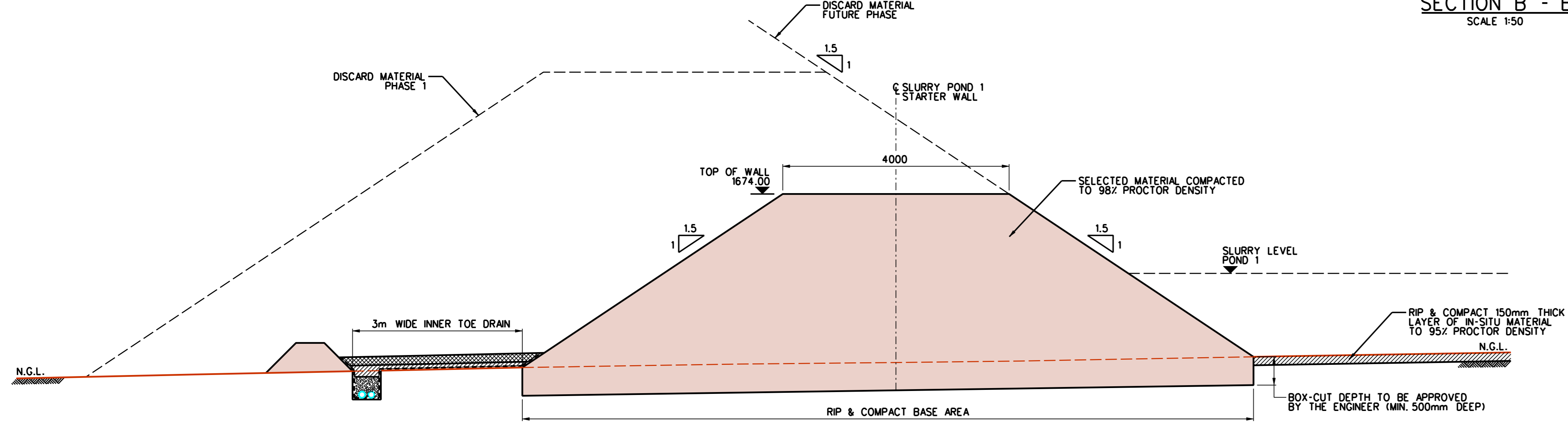
CLIENT BADGER MINING & CONSULTING (PTY) LTD		BY N.S.	DATE MAR.09
TITLE MOOPLAATS COAL DISCARD DUMP SETTING OUT CO-ORDINATES		DRAWN S.A.	
SCALE 1:1500		CHECKED	
DRAWING No. T994-002		REVISION No. 3	



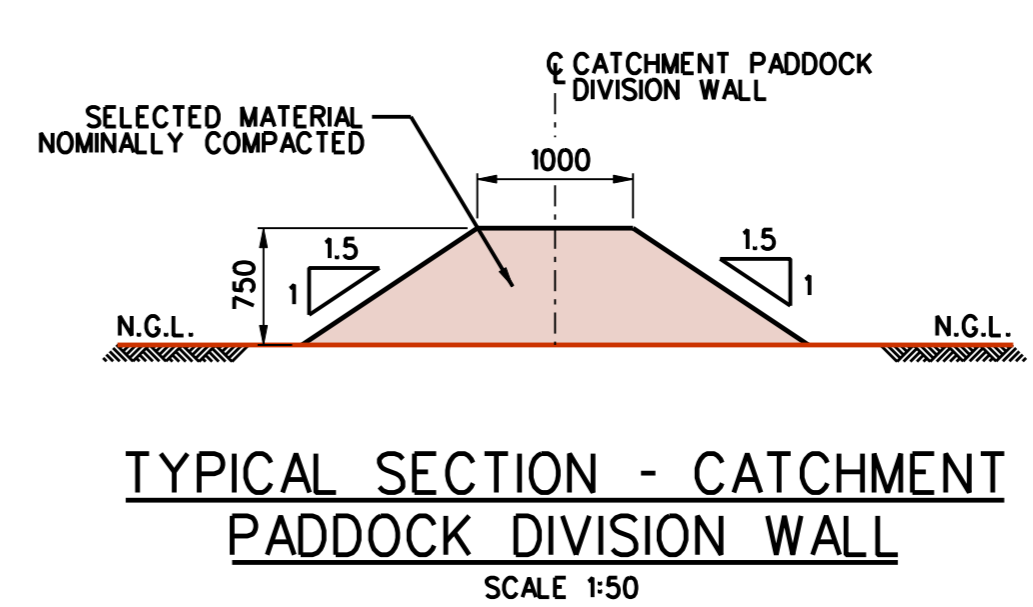
SECTION A - A
SCALE 1:50



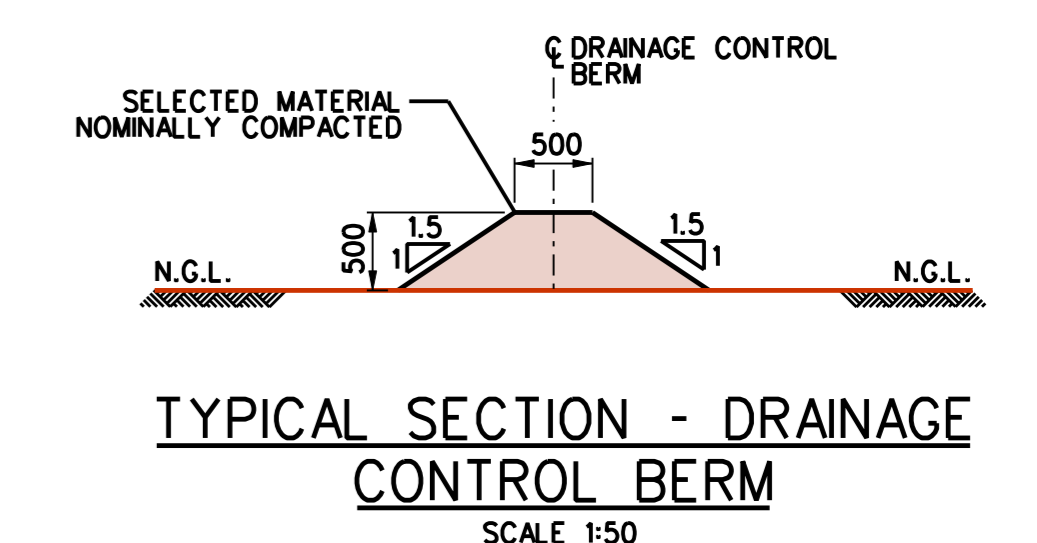
SECTION B - B
SCALE 1:50



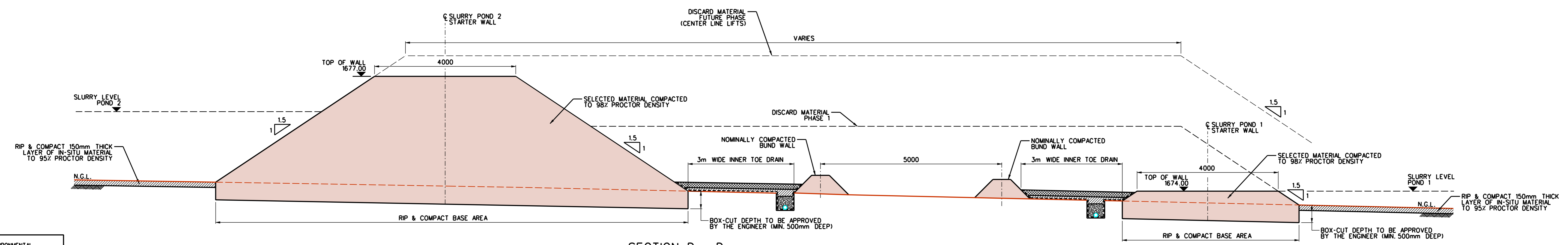
SECTION C - C
SLURRY POND 1 STARTER WALL
SCALE 1:50



TYPICAL SECTION - CATCHMENT PADDOCK DIVISION WALL
SCALE 1:50



TYPICAL SECTION - DRAINAGE CONTROL BERM
SCALE 1:50



SECTION D - D
SCALE 1:50

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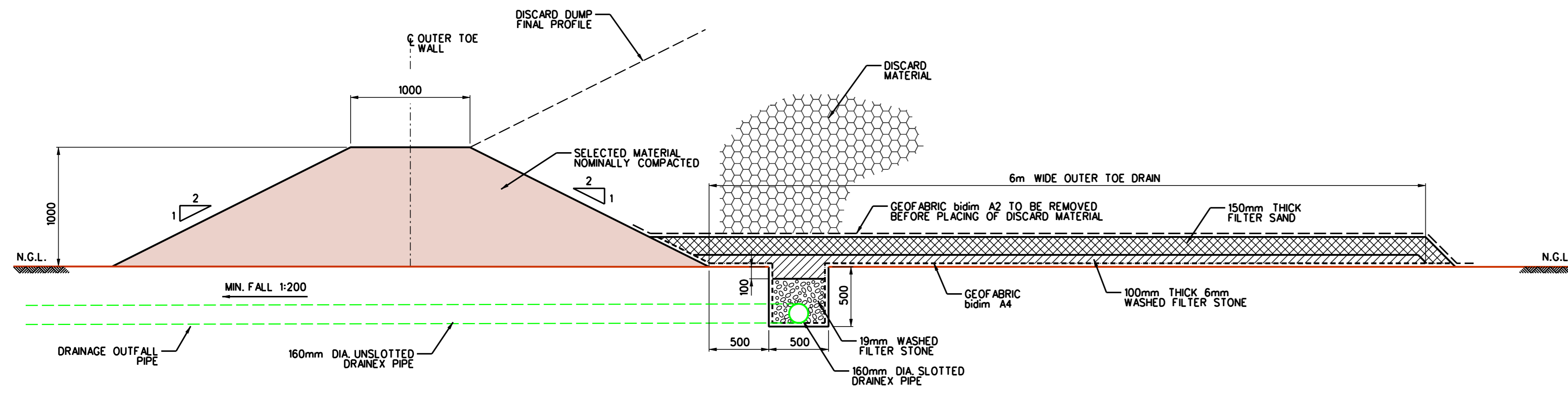
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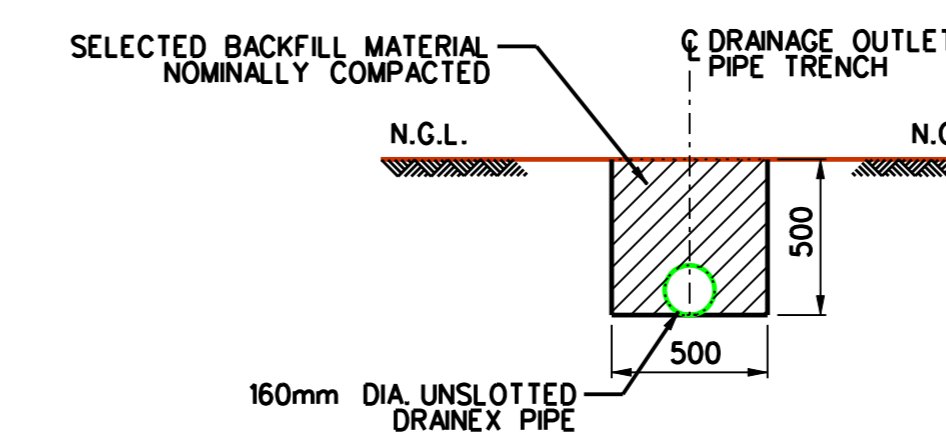
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2	NS/SA	13-05-2009	SLURRY POND 2 WALL ALTERED	004 SHT 1	DRAINAGE DETAILS		
				004 SHT 2	DRAINAGE COLLECTOR SUMP DETAILS		
				011	DRAINAGE COLLECTOR TRENCH LONG SECTION & DETAILS		

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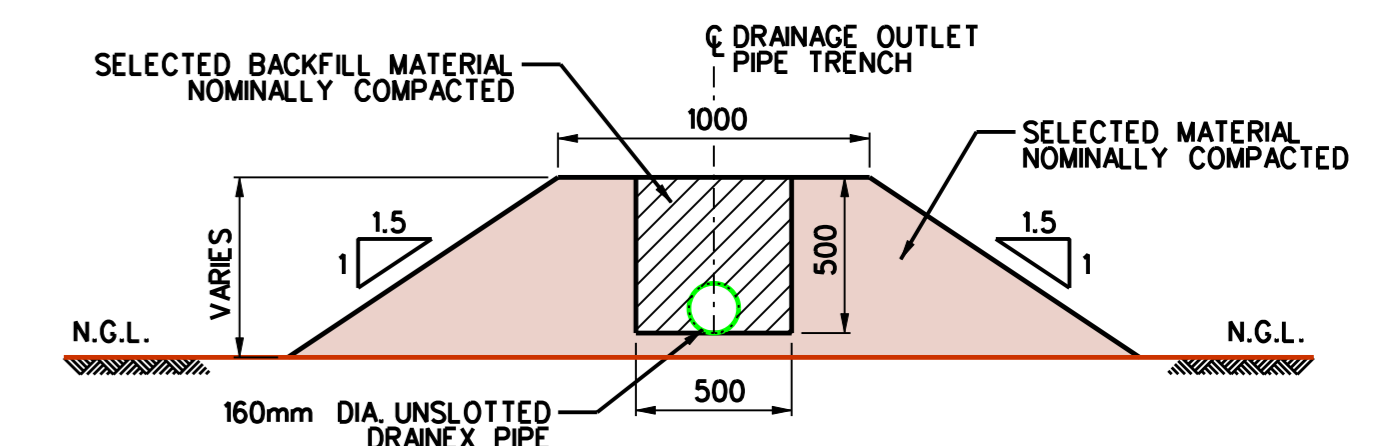
CLIENT	BADGER MINING & CONSULTING (PTY) LTD	BY	N.S.	DATE	MAR.09
TITLE	MOOIPLAATS COAL DISCARD DUMP EARTHWORKS SECTIONS & DETAILS	DRAWN	N.S.	CHECKED	
		SCALE	A0-1:50	DRAWING No.	T994-003
		REVISION			2



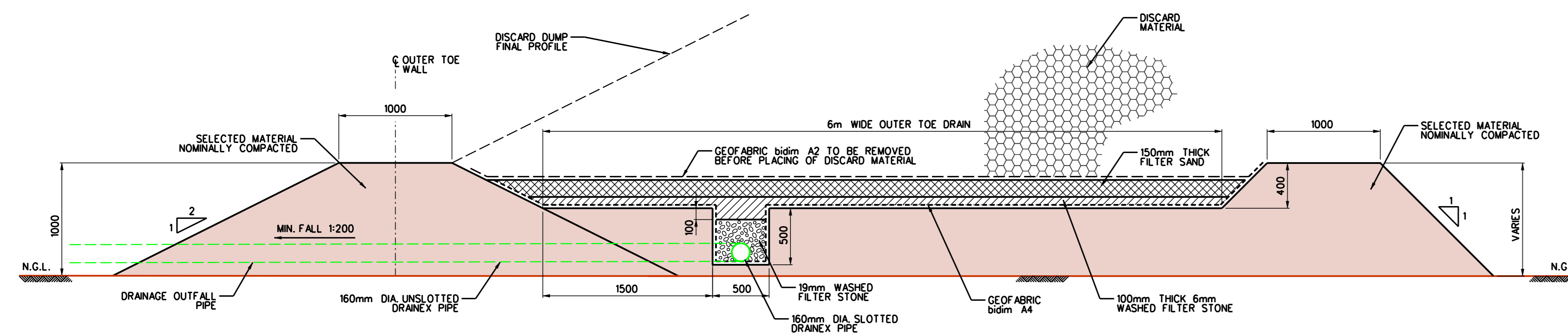
SECTION - OUTER TOE DRAIN ON N.G.L.
SCALE 1:25



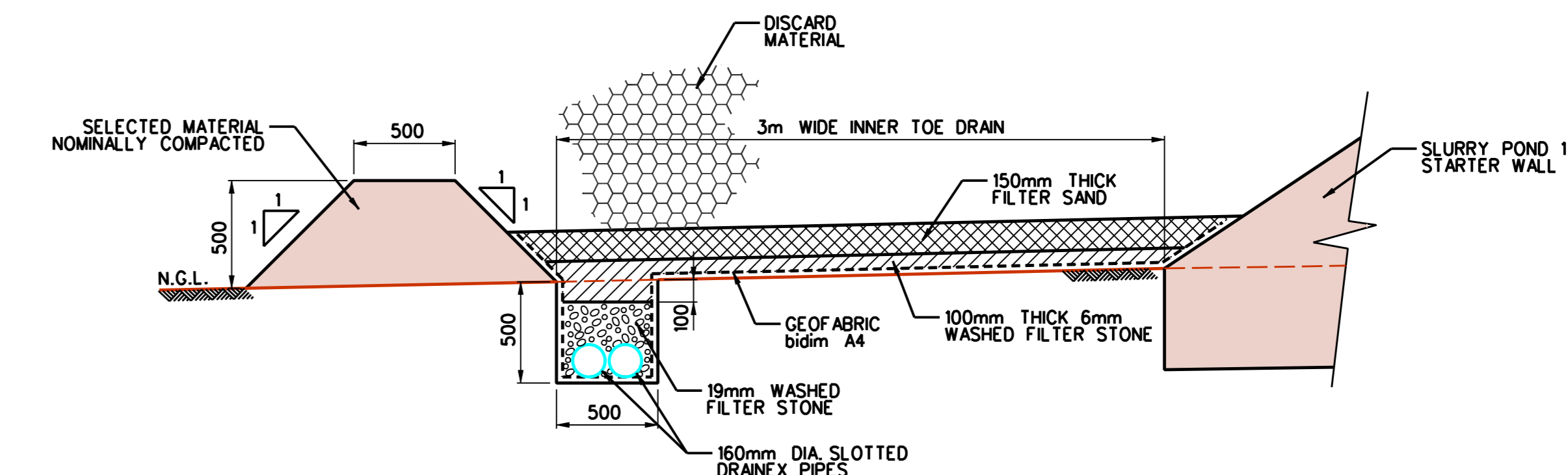
SECTION - DRAINAGE OUTLET PIPE
BELOW N.G.L.
SCALE 1:25



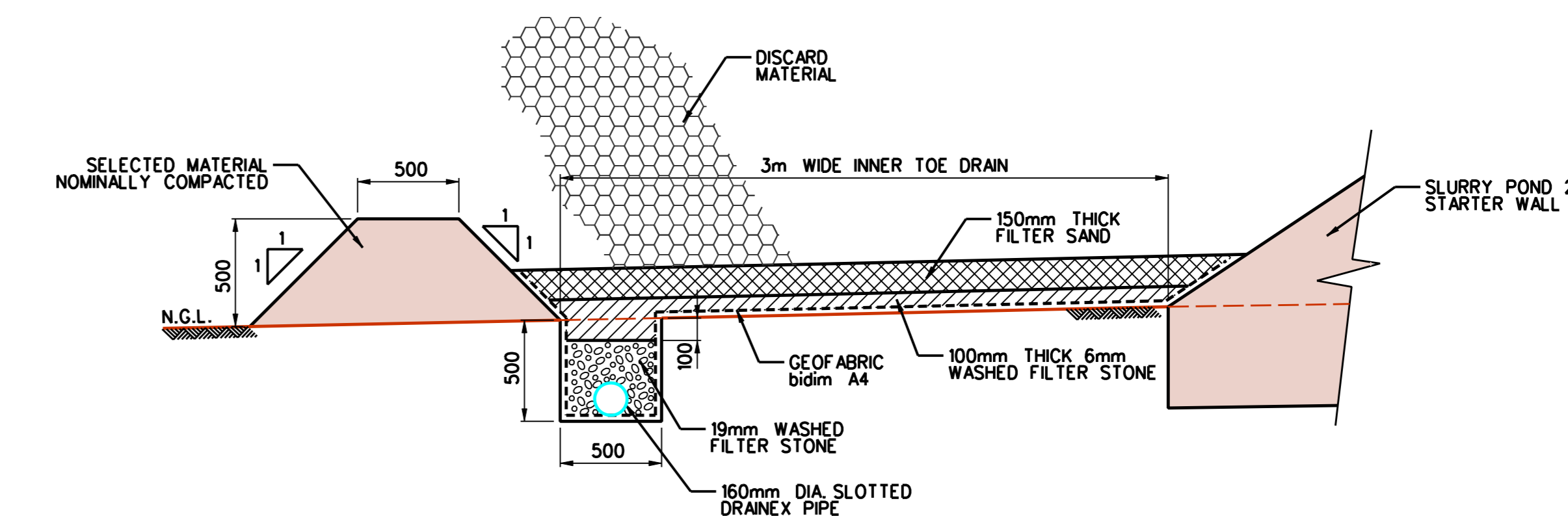
SECTION - DRAINAGE OUTLET PIPE
ABOVE N.G.L.
SCALE 1:25



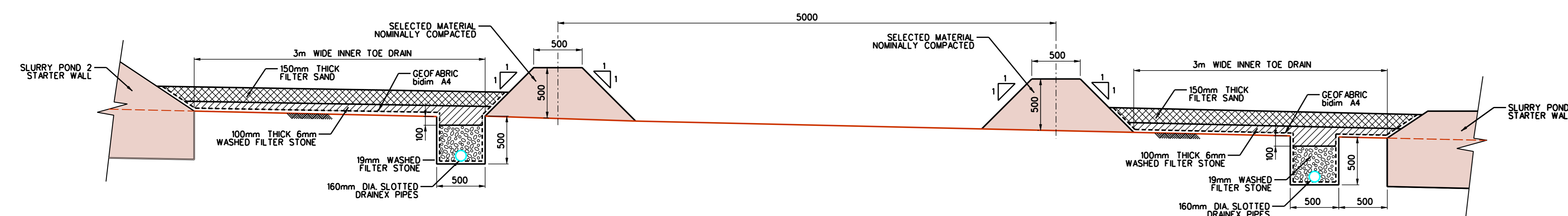
SECTION - OUTER TOE DRAIN ON PLATFORM
(BETWEEN DRAINAGE OUTLET PIPES 4 AND 7)
SCALE 1:25



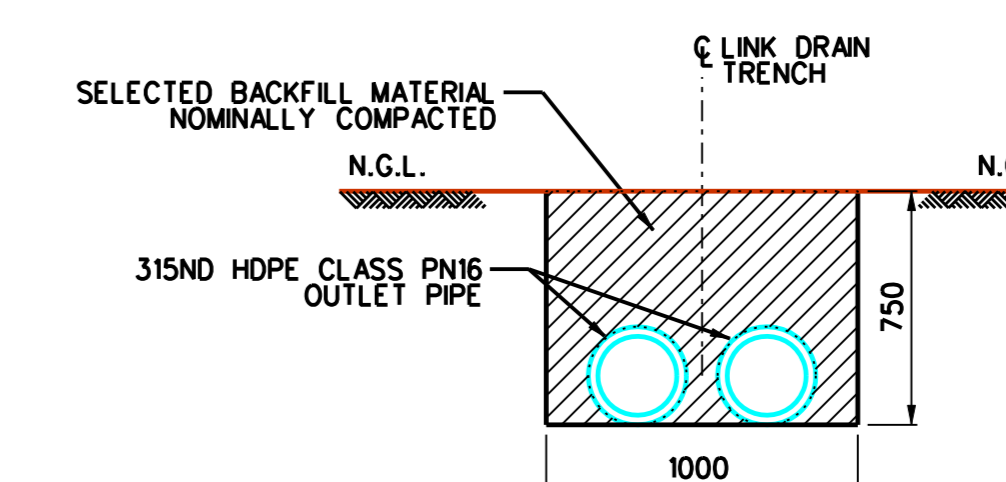
SECTION - INNER TOE DRAIN ALONG
SLURRY POND 1 PERIMETER
SCALE 1:25



SECTION - INNER TOE DRAIN ALONG
SLURRY POND 2 PERIMETER
SCALE 1:25



SECTION - INNER TOE DRAINS BETWEEN
SLURRY POND 1 & 2
SCALE 1:25



SECTION - LINK DRAIN
SCALE 1:25

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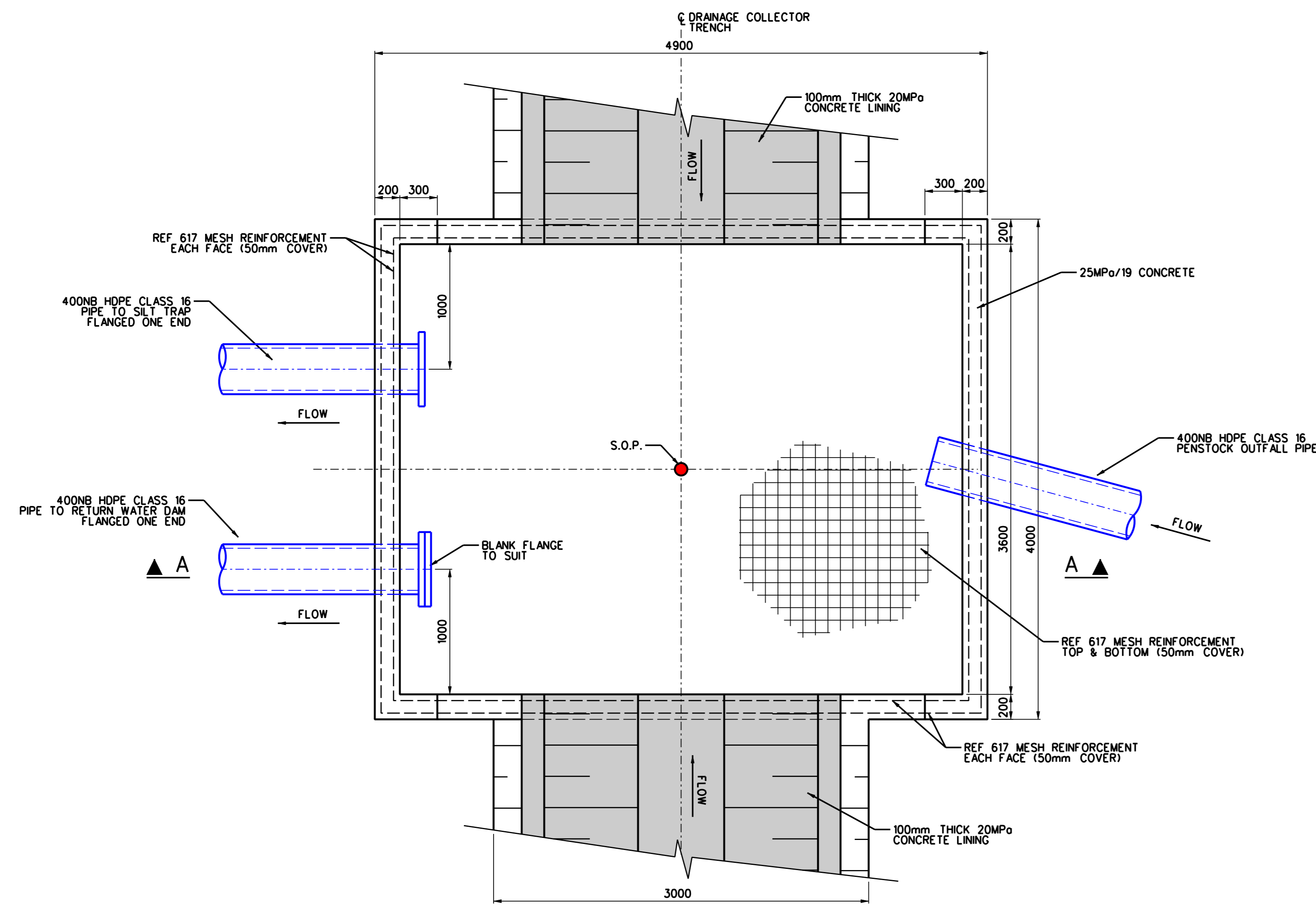
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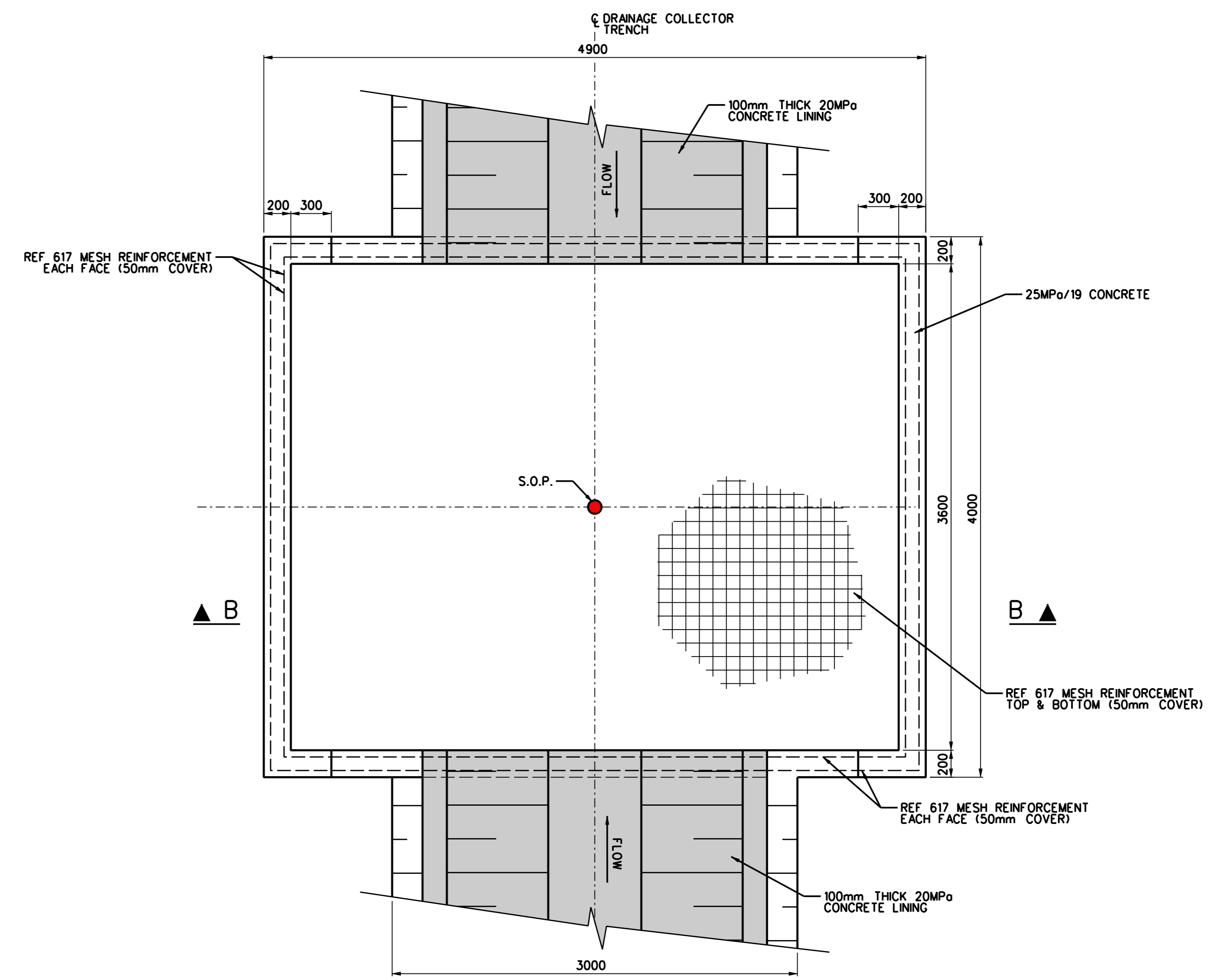
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1	NS/SA	07-05-2009	DRAWING UPDATED	003	EARTHWORKS SECTIONS & DETAILS		
2	NS/SA	13-05-2009	SLURRY POND 2 WALL ALTERED	004 SHT 2	DRAINAGE COLLECTOR SUMP DETAILS		

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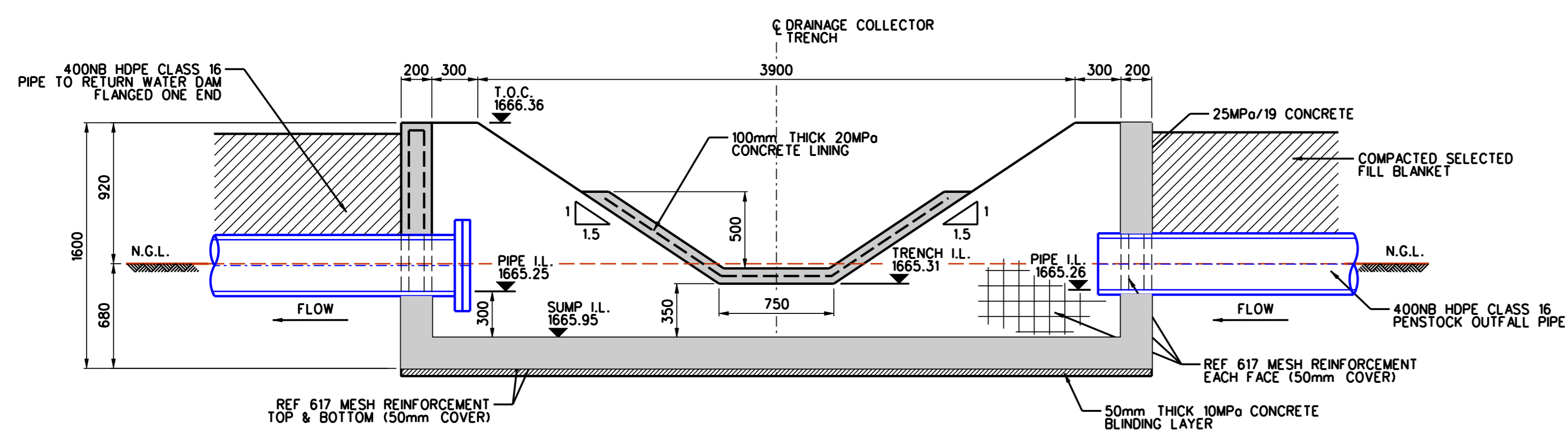
CLIENT	DESIGNED	BY	DATE
BADGER MINING & CONSULTING (PTY) LTD		N.S.	APR.09
TITLE	DRAWN	N.S.	APR.09
MOOIPLAATS COAL DISCARD DUMP DRAINAGE DETAILS			
CHECKED	SCALE	REVISION	
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DRAWING No.	T994-004 SHT.1	REVISION	2



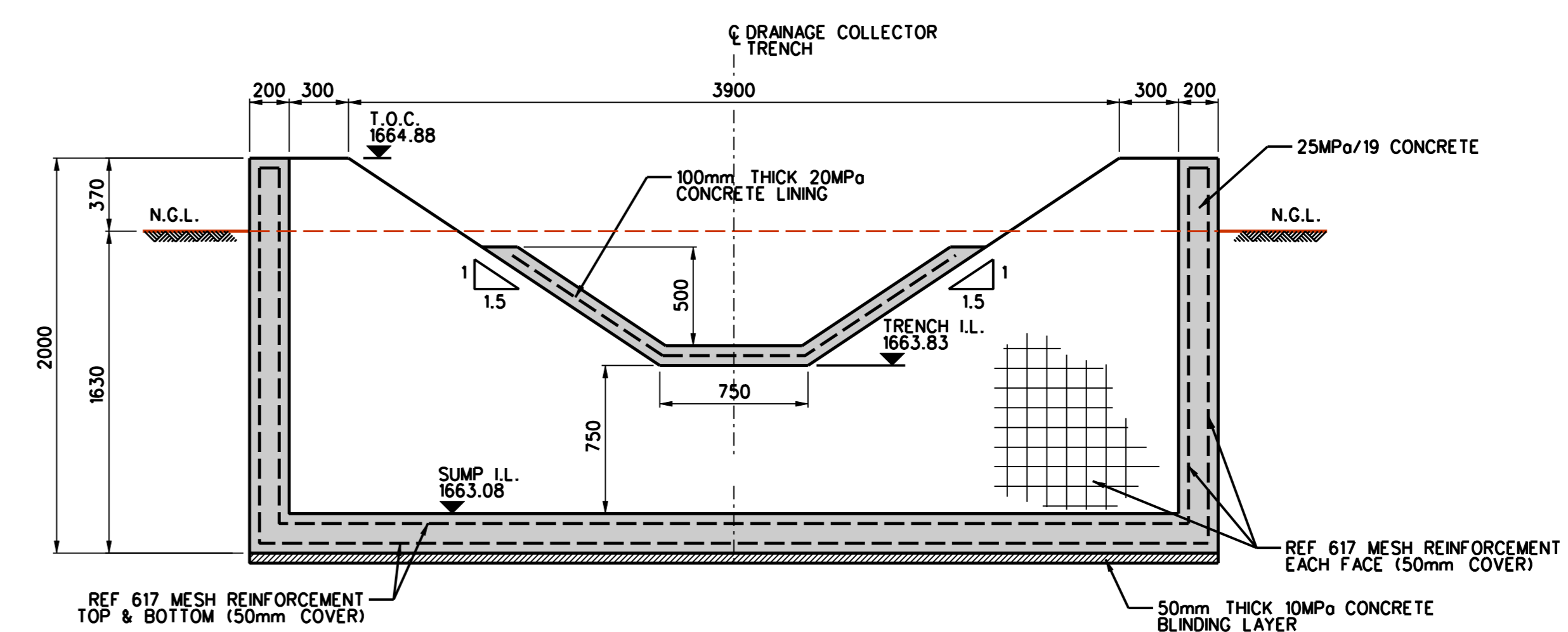
PLAN - DRAINAGE COLLECTOR SUMP 1/
SPLITTER BOX
SCALE 1:25



PLAN - DRAINAGE COLLECTOR SUMP 2
SCALE 1:25



SECTION A - A
SCALE 1:25



SECTION B - B
SCALE 1:25

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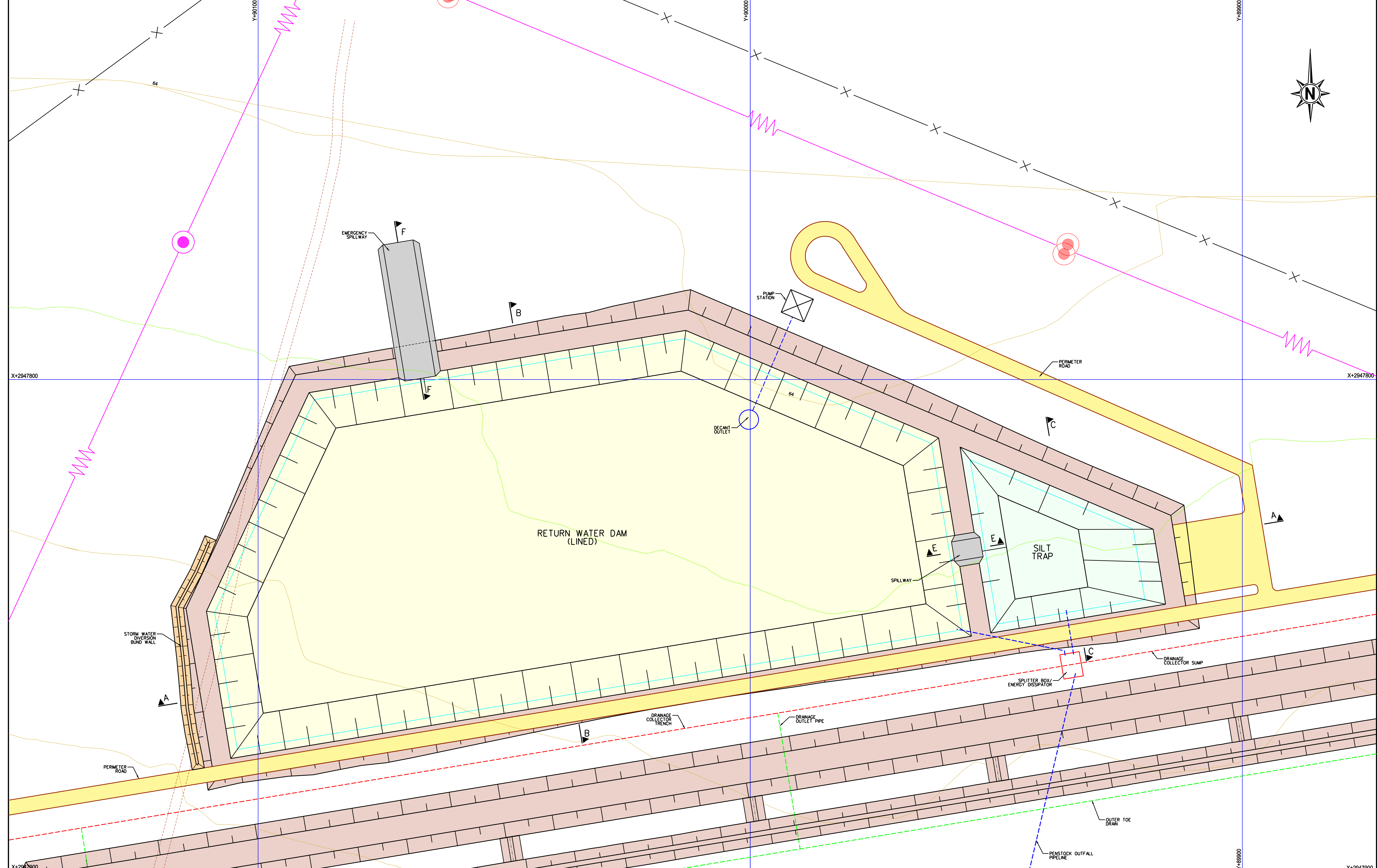
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REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
1	NS/SA	07-05-2009	DRAWING UPDATED	003	EARTHWORKS SECTIONS & DETAILS		
				004 SHT 1	DRAINAGE DETAILS		
				011	DRAINAGE COLLECTOR TRENCH LONG SECTION & DETAILS		

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CLIENT		BY	DATE
BADGER MINING & CONSULTING (PTY) LTD		N.S.	APR.09
TITLE		DRAWN	DATE
MOOPLAATS COAL DISCARD DUMP DRAINAGE COLLECTOR SUMP DETAILS		N.S.	APR.09
DRAWING No.		SCALE	REVISION
T994-004 SHT.2		A0-1:25	1



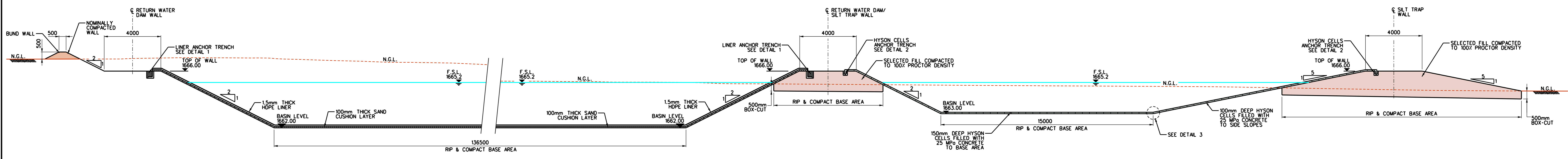
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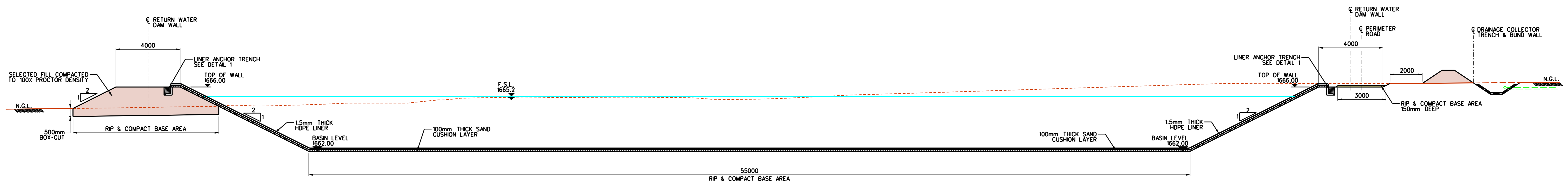
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1	NS/SA	07-05-2009	DRAWING UPDATED	001	GENERAL ARRANGEMENT		
				006	RETURN WATER DAM & SILT TRAP DETAILS		
				007	RETURN WATER DAM SPILLWAY & TEMPORARY RETURN WATER DAM DETAILS		
				012	RETURN WATER DAM DECANT SUMP DETAILS		

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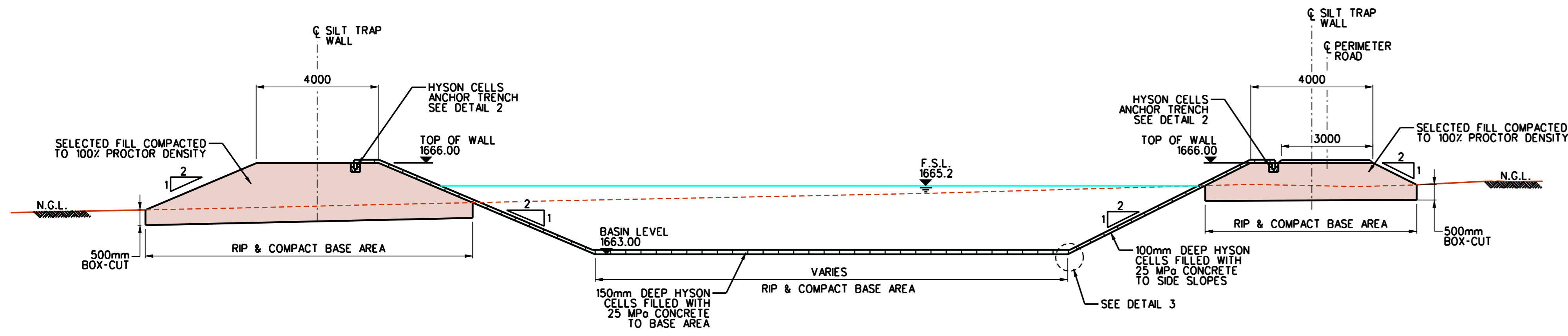
CLIENT BADGER MINING & CONSULTING (PTY) LTD	BY N.S.	DATE MAR.09
TITLE MOOPLAATS COAL DISCARD DUMP RETURN WATER DAM AND SILT TRAP LAYOUT	DRAWN S.A.	MAR.09
SCALE 1:250	CHECKED	
DRAWING No. T994-005	REVISION 1	



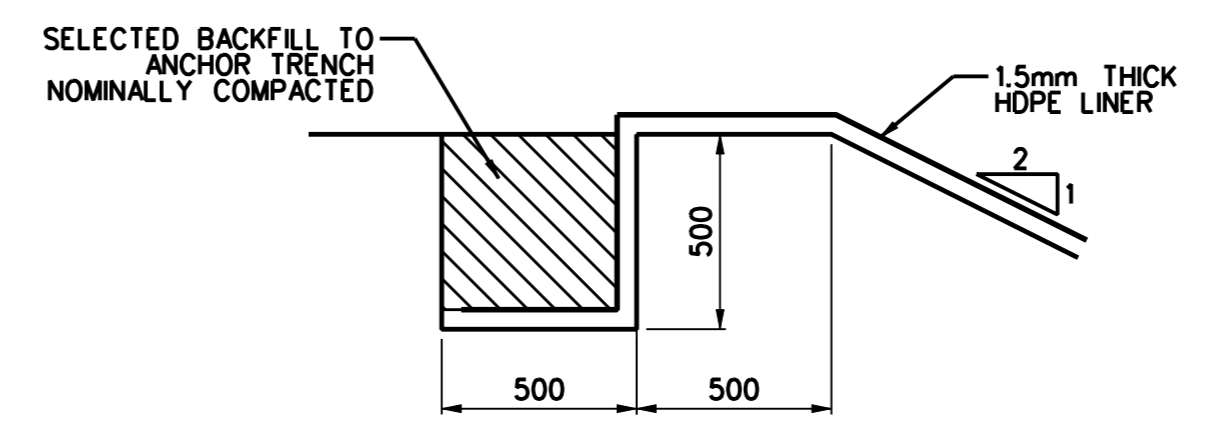
SECTION A - A
SCALE 1:100



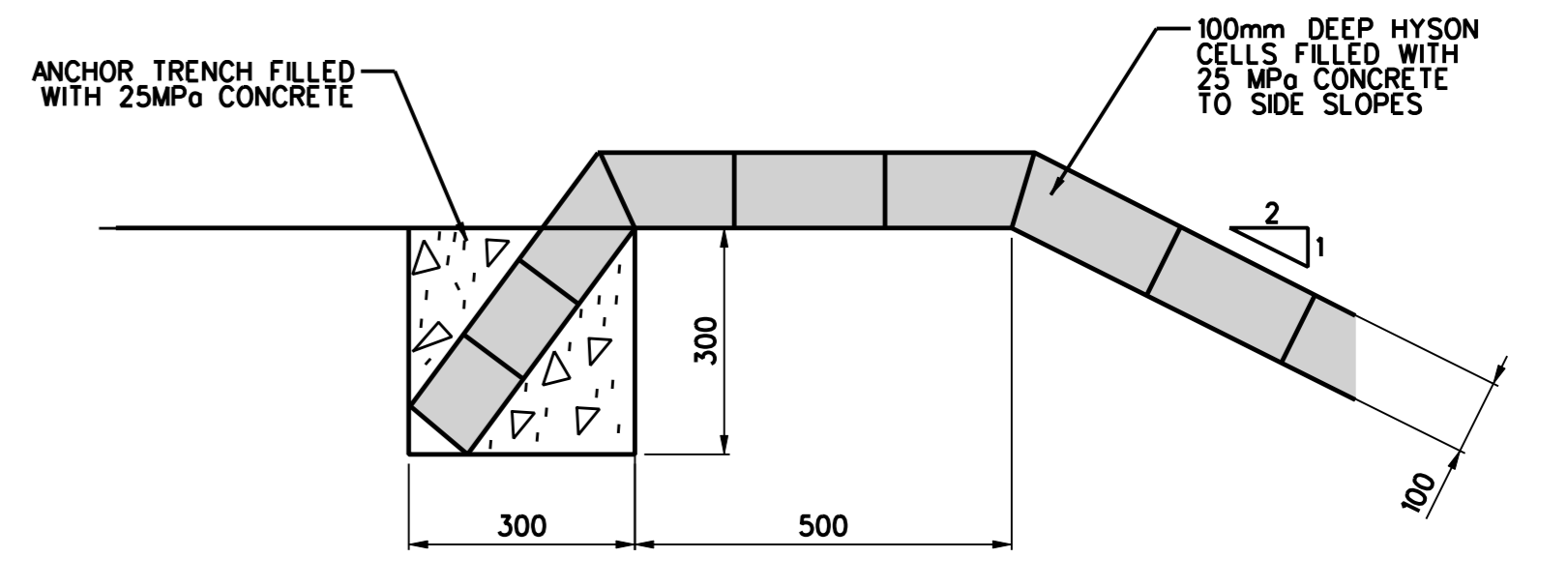
SECTION B - B
SCALE 1:100



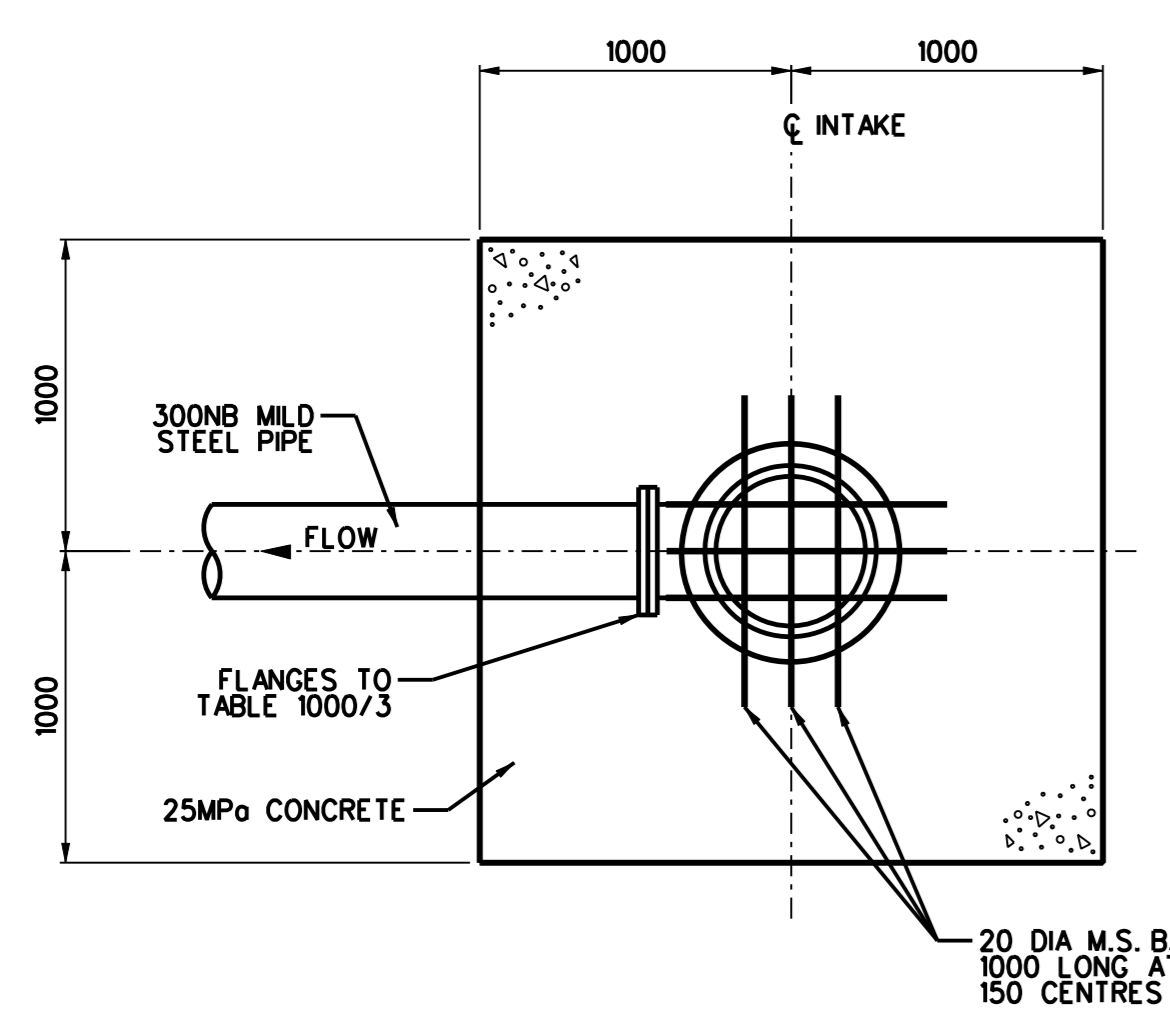
SECTION C - C
SCALE 1:100



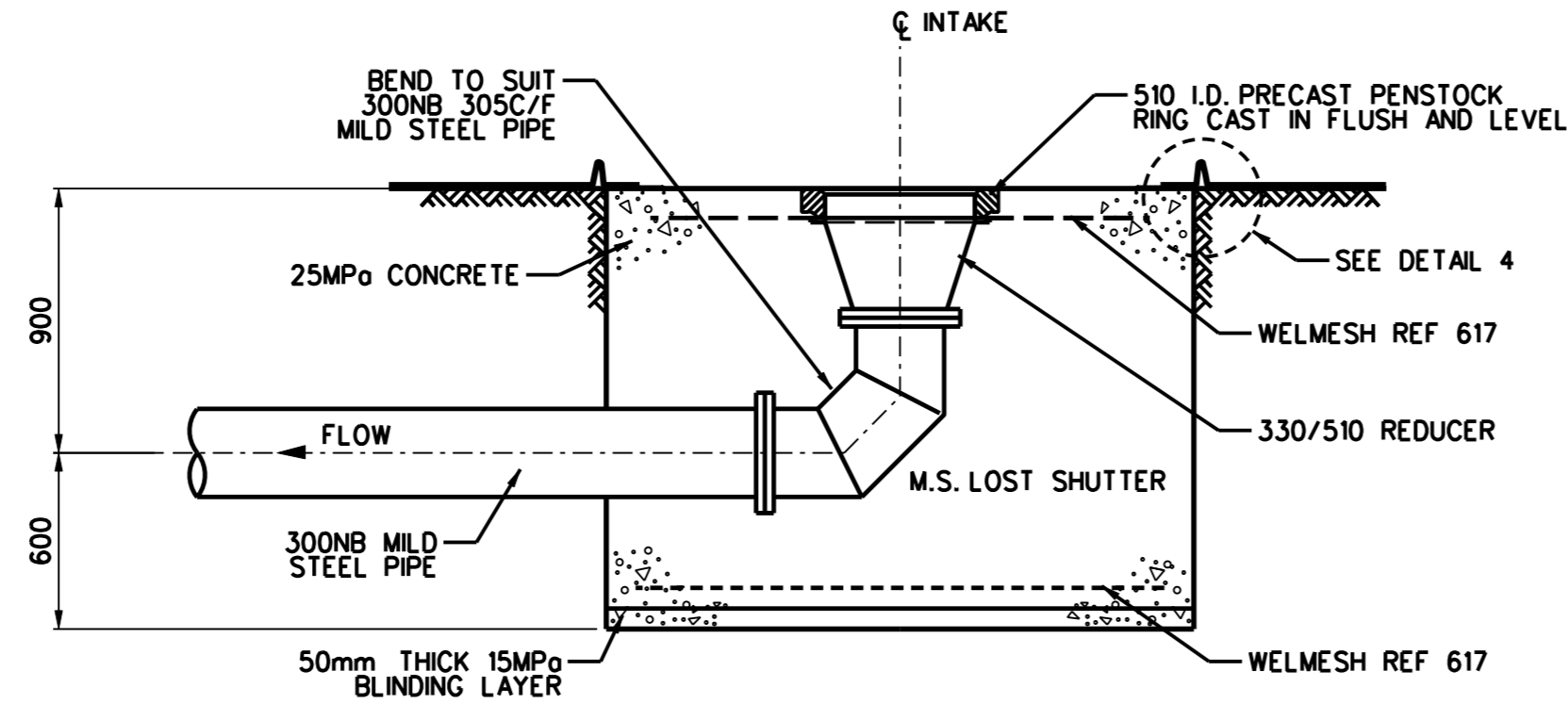
DETAIL 1
SCALE 1:20



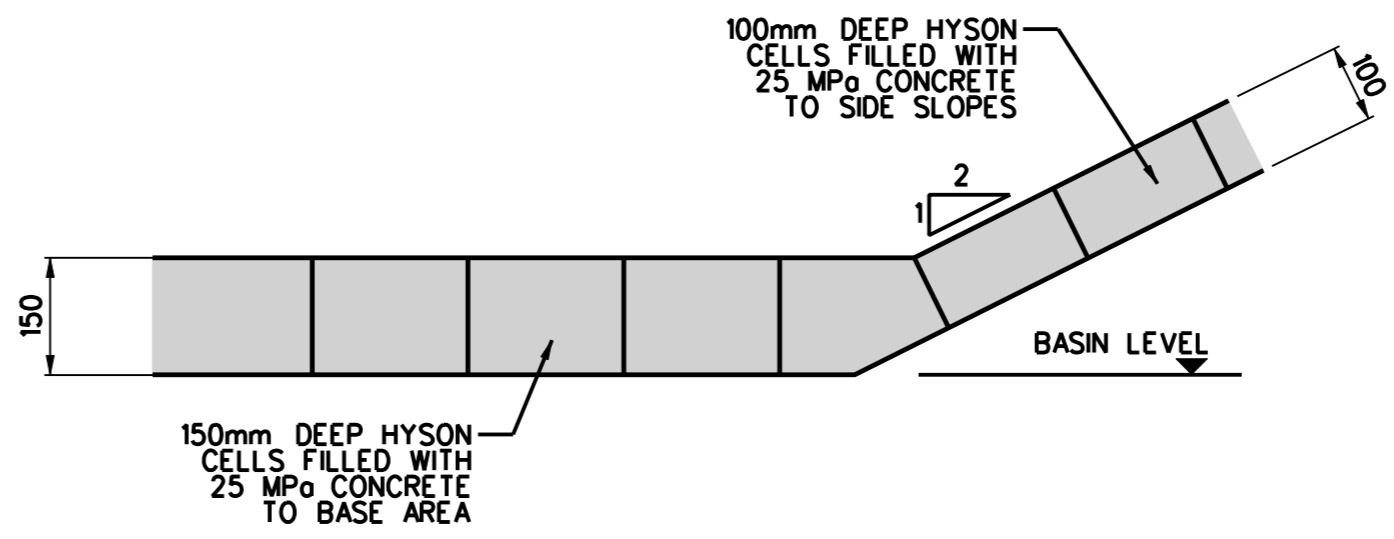
DETAIL 2
SCALE 1:10



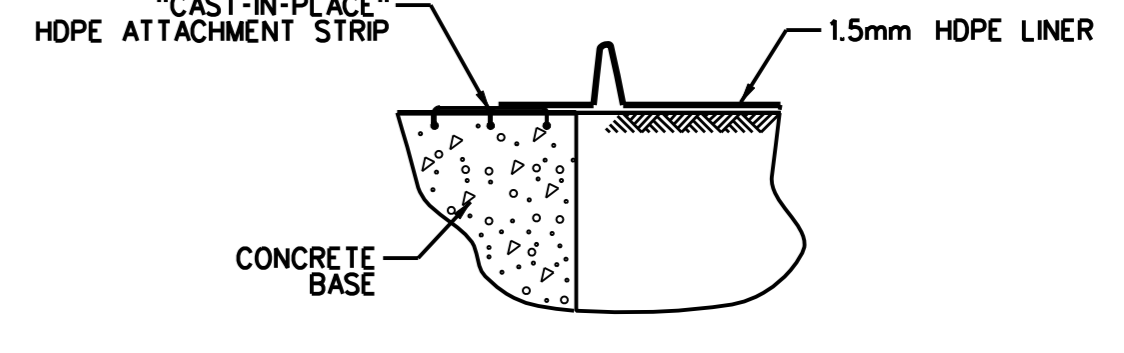
PLAN
RETURN WATER DAM DECANT OUTLET STRUCTURE
SCALE 1:25



SECTION
RETURN WATER DAM DECANT OUTLET STRUCTURE
SCALE 1:25



DETAIL 3
SCALE 1:10



DETAIL 4
N.T.S.

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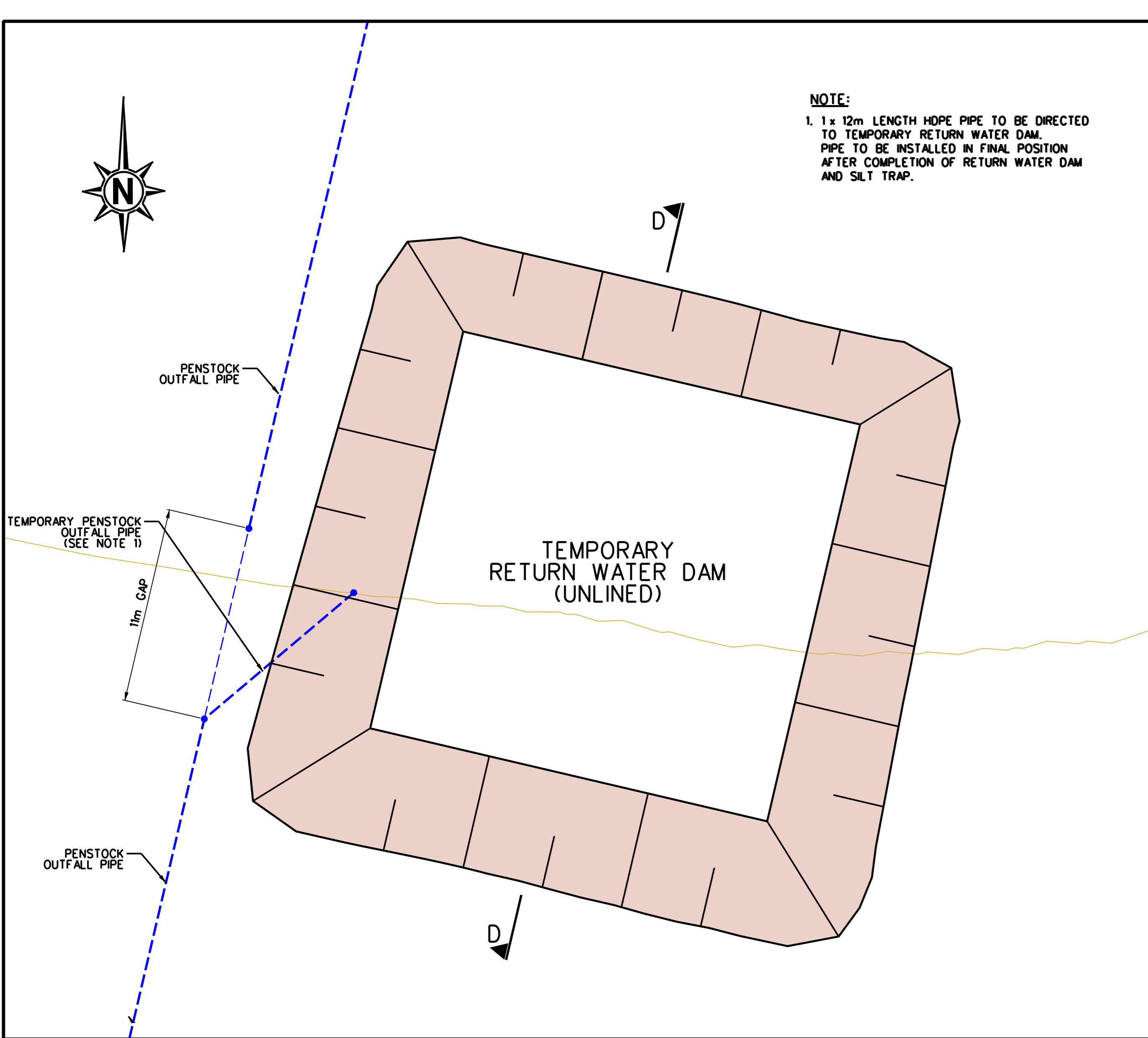
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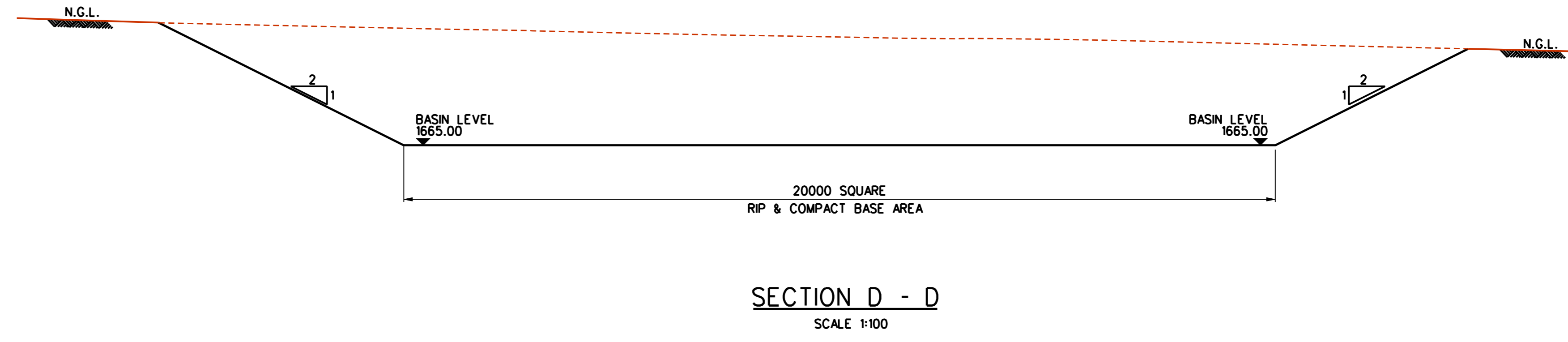
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1	NS/SA	07-05-2009	DRAWING UPDATED	001	GENERAL ARRANGEMENT		
				005	RETURN WATER DAM & SILT TRAP LAYOUT		
				007	RETURN WATER DAM SPILLWAY & TEMPORARY RETURN WATER DAM DETAILS		
				012	RETURN WATER DAM DECANT SUMP DETAILS		

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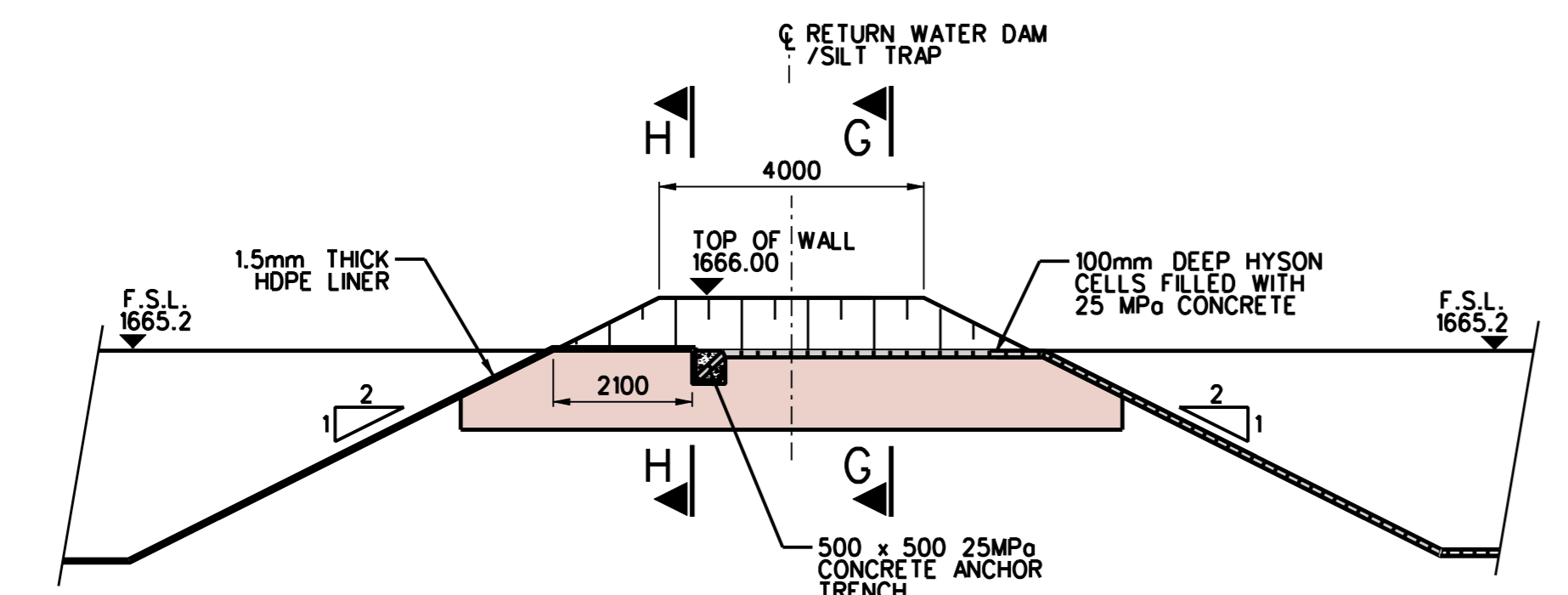
CLIENT		BY		DATE	
BADGER MINING & CONSULTING (PTY) LTD		N.S.		APR.09	
TITLE		DRAWN		S.A.	
MOOPLAATS COAL DISCARD DUMP RETURN WATER DAM AND SILT TRAP DETAILS		CHECKED			
SCALE AS SHOWN		DRAWING No.		REVISION	
		T994-006		1	



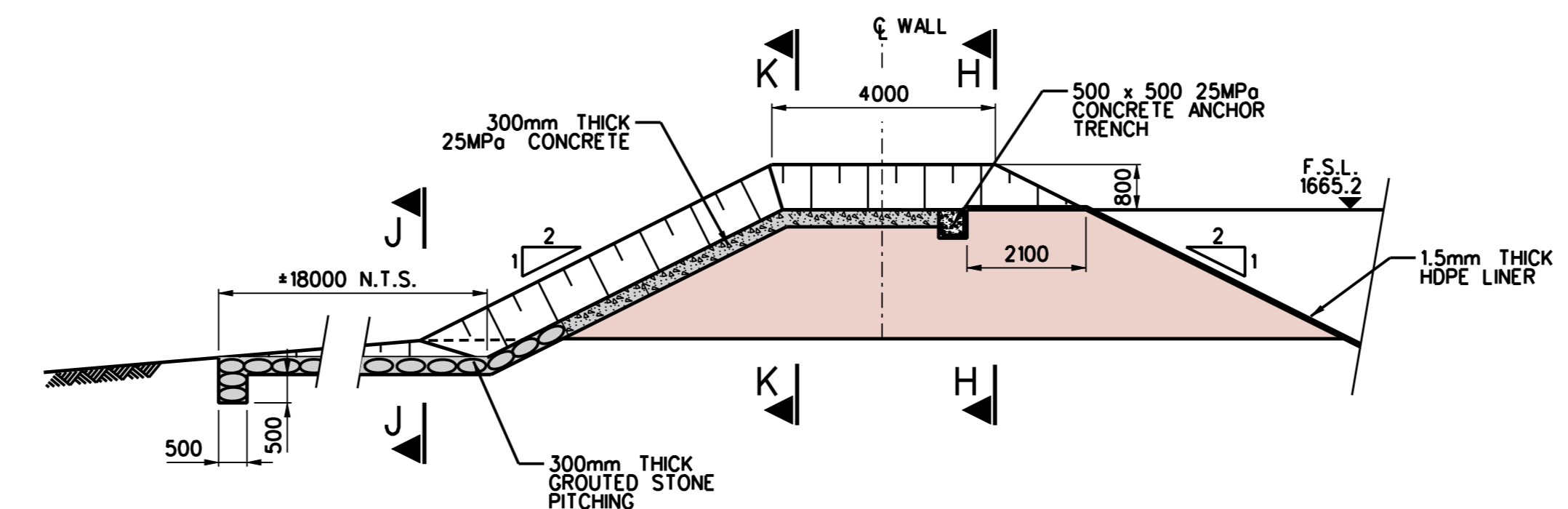
PLAN
TEMPORARY RETURN WATER DAM (UNLINED)
SCALE 1:200



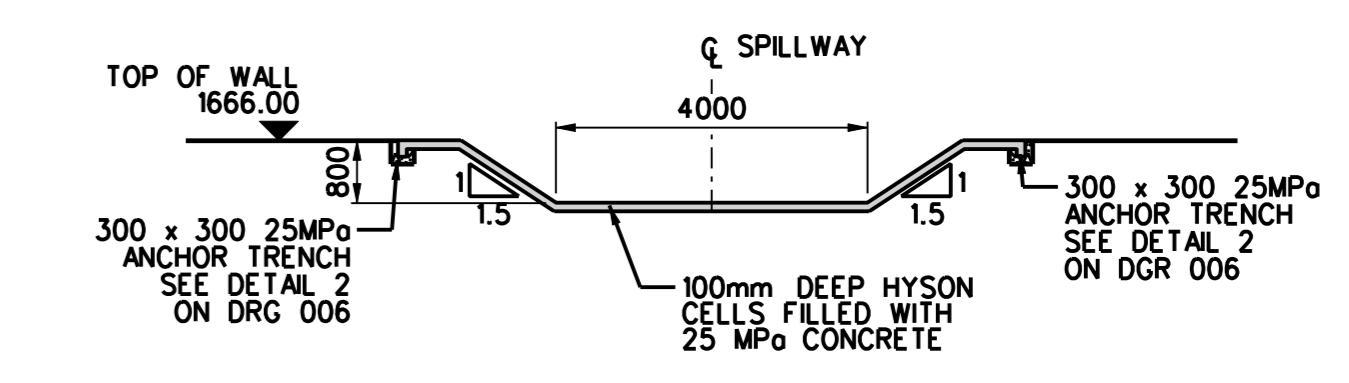
SECTION D - D
SCALE 1:100



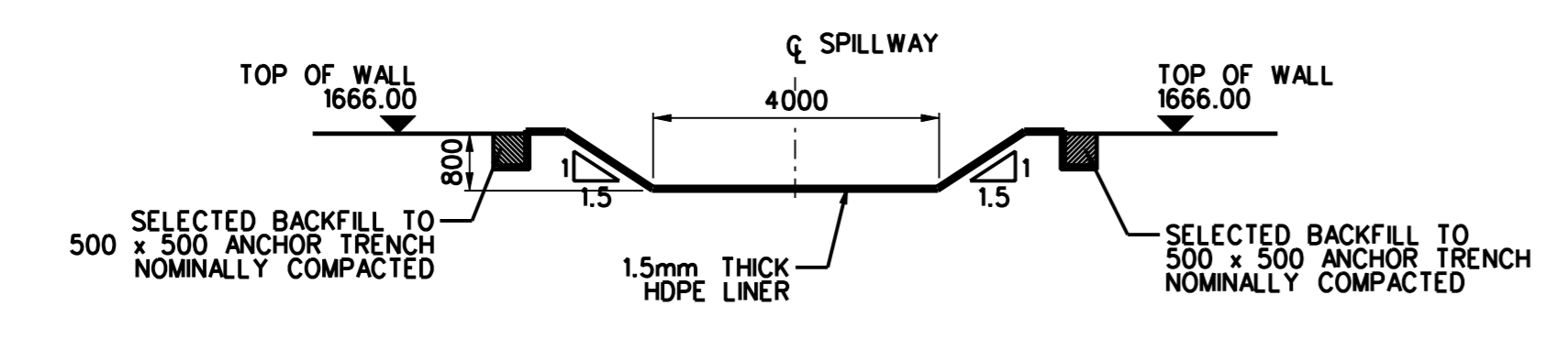
SECTION E - E
SILT TRAP SPILLWAY
SCALE 1:100



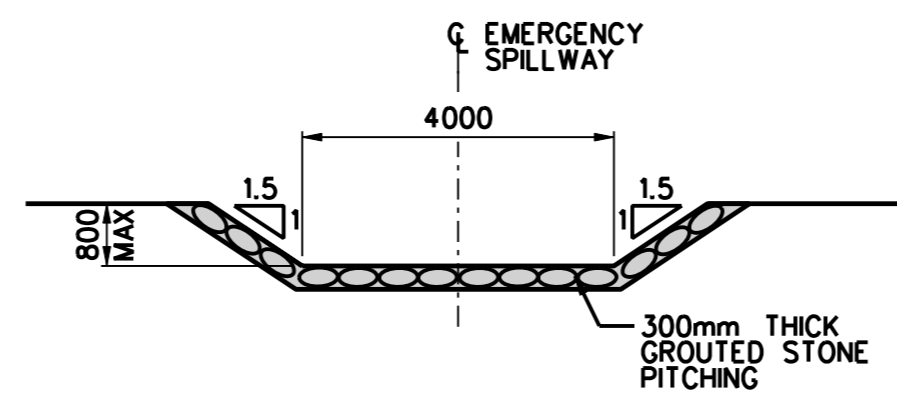
SECTION F - F
EMERGENCY SPILLWAY
SCALE 1:100



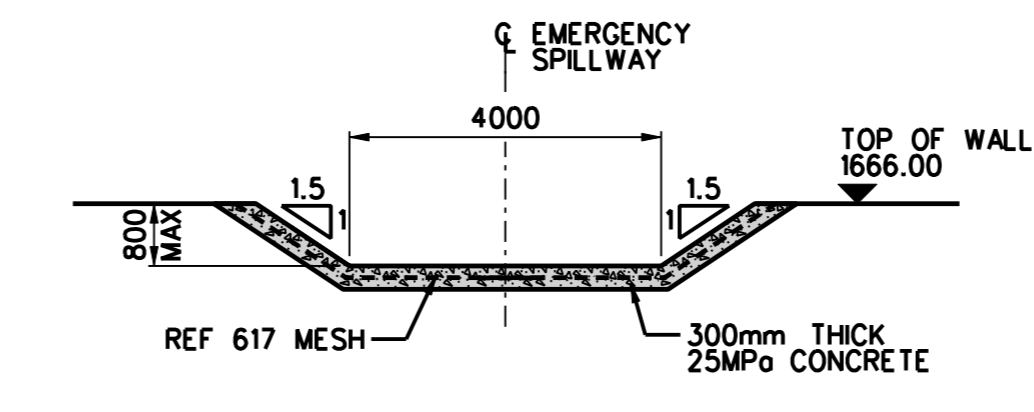
SECTION G - G
SCALE 1:100



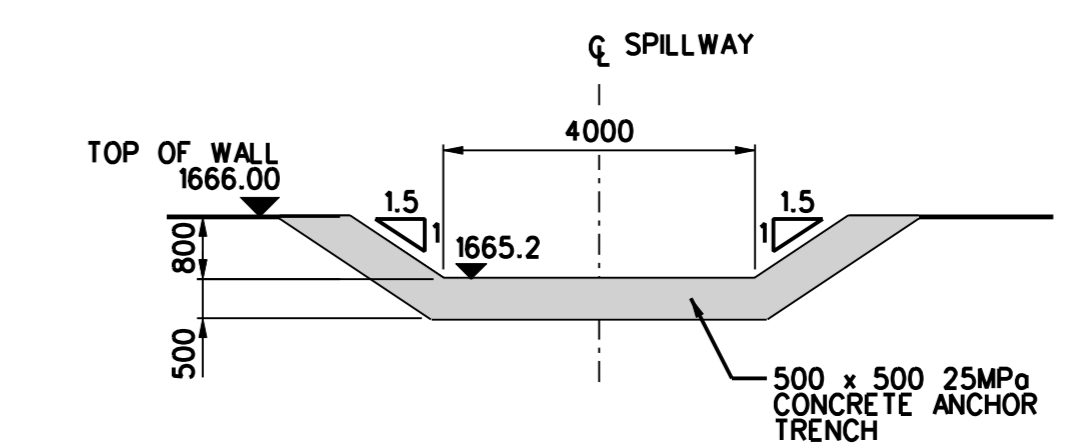
SECTION H - H
SCALE 1:100



SECTION J - J
SCALE 1:100



SECTION K - K
SCALE 1:100



TYPICAL SECTION THROUGH
CONCRETE ANCHOR TRENCH
SCALE 1:100

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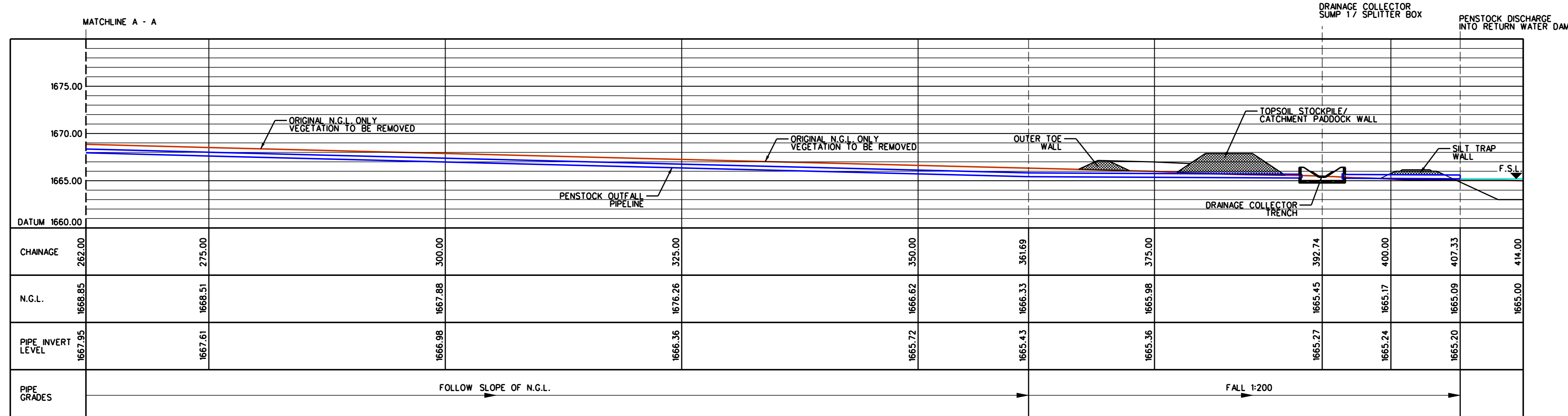
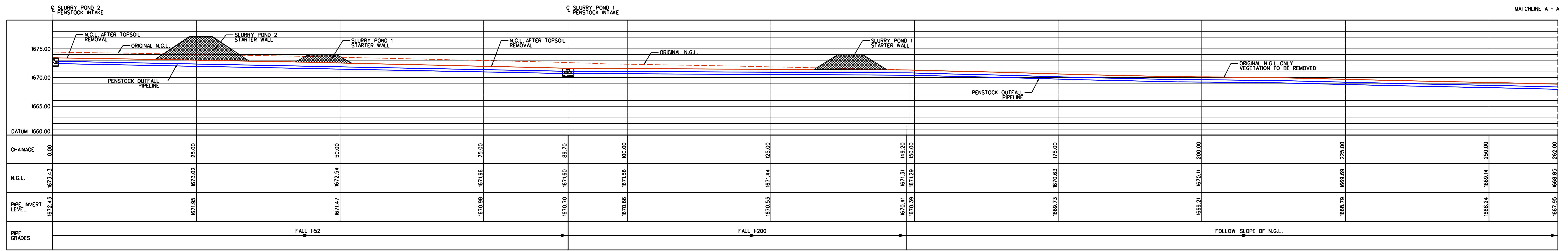
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DO NOT SCALE

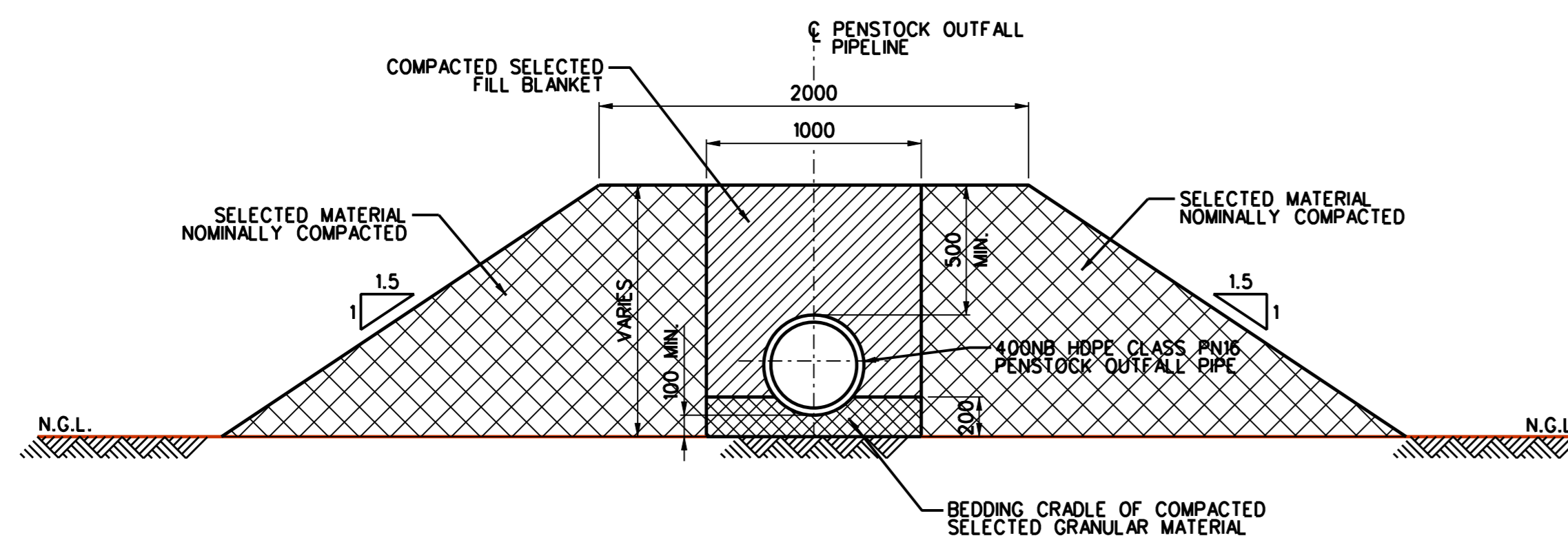
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				005	RETURN WATER DAM & SILT TRAP LAYOUT				DRAWN	S.A.	APR.09
				006	RETURN WATER DAM & SILT TRAP DETAILS				CHECKED		
									SCALE	AS SHOWN	
									DRAWING No.	T994-007	REVISION
											1

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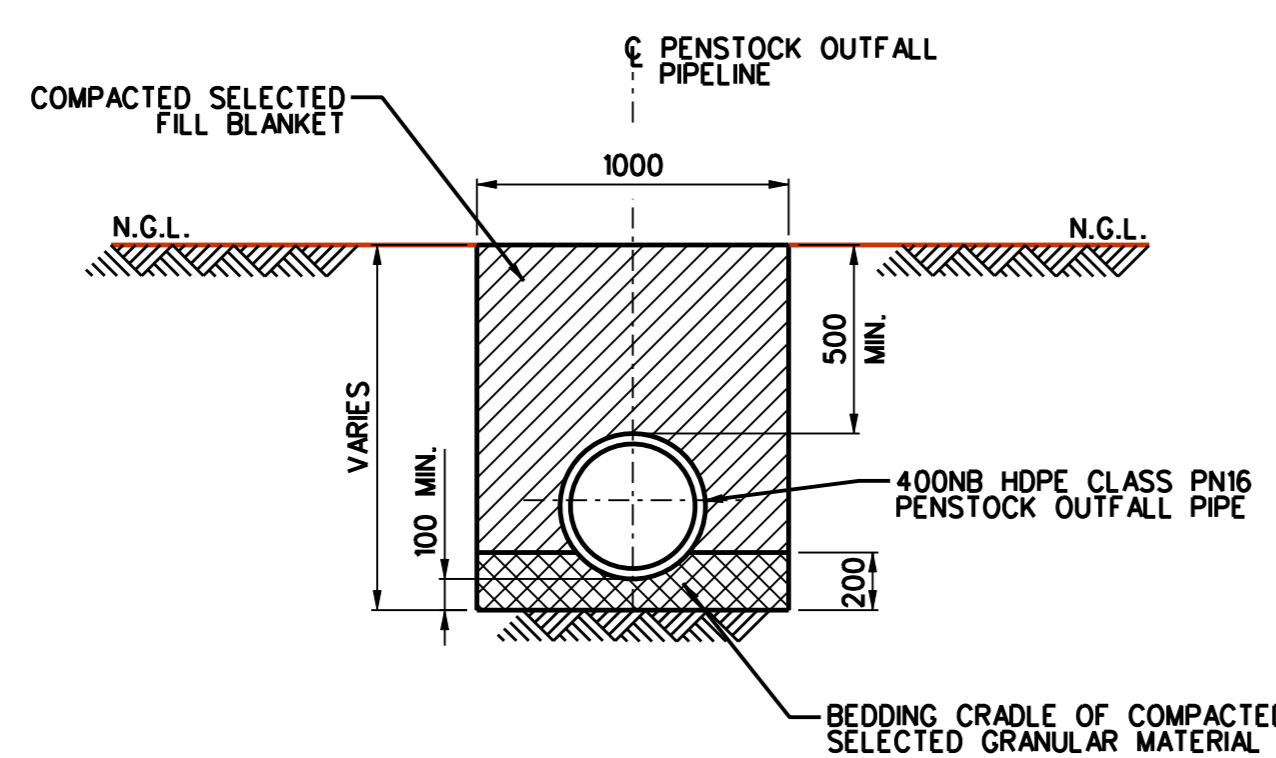
CLIENT
BADGER MINING & CONSULTING (PTY) LTD
TITLE
MOOPLAATS COAL DISCARD DUMP
RETURN WATER DAM SPILLWAY
AND TEMPORARY RETURN WATER DAM
DETAILS
DRAWING No. T994-007
REVISION 1



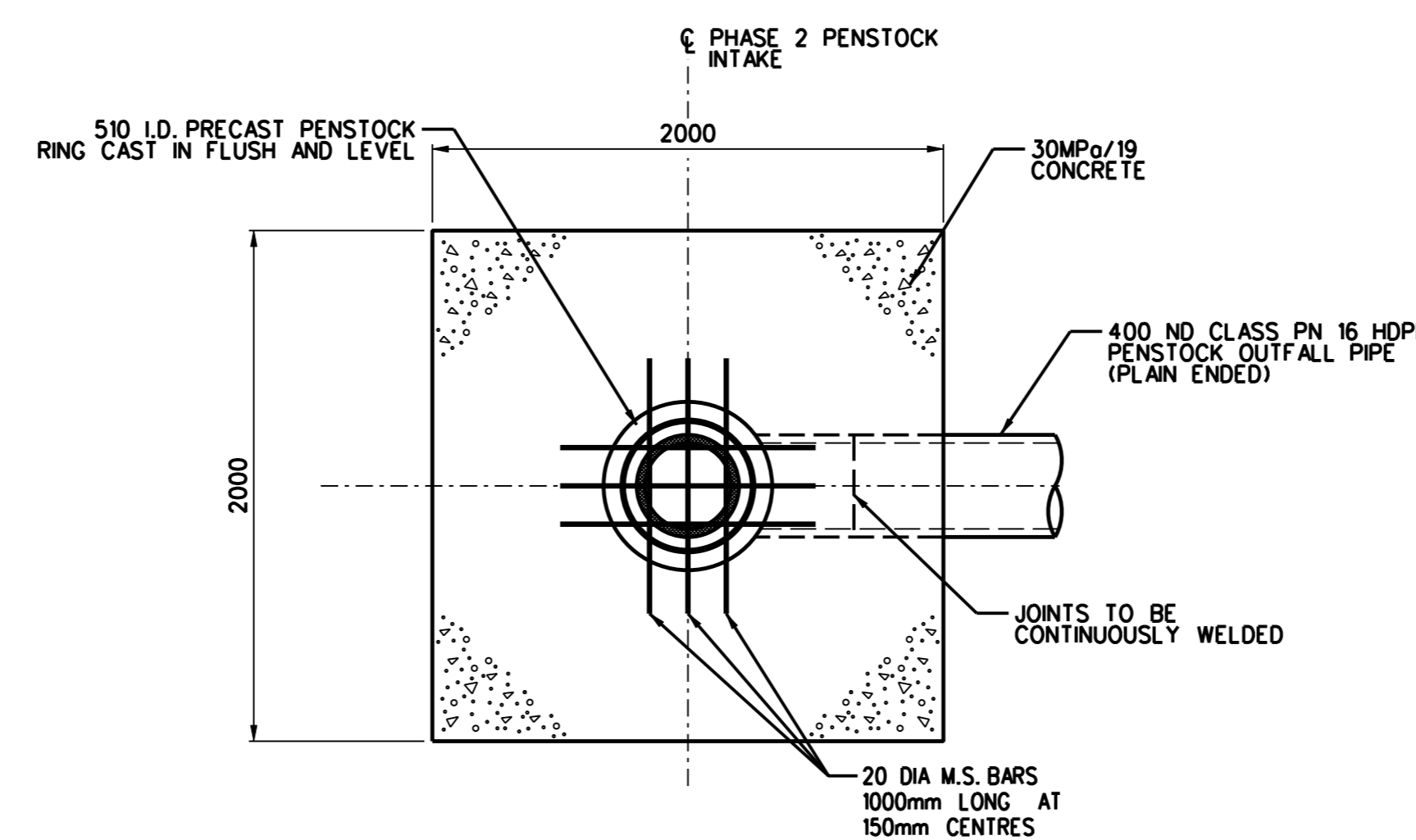
LONGITUDINAL SECTION - PENSTOCK OUTFALL PIPELINE
SCALE 1:250



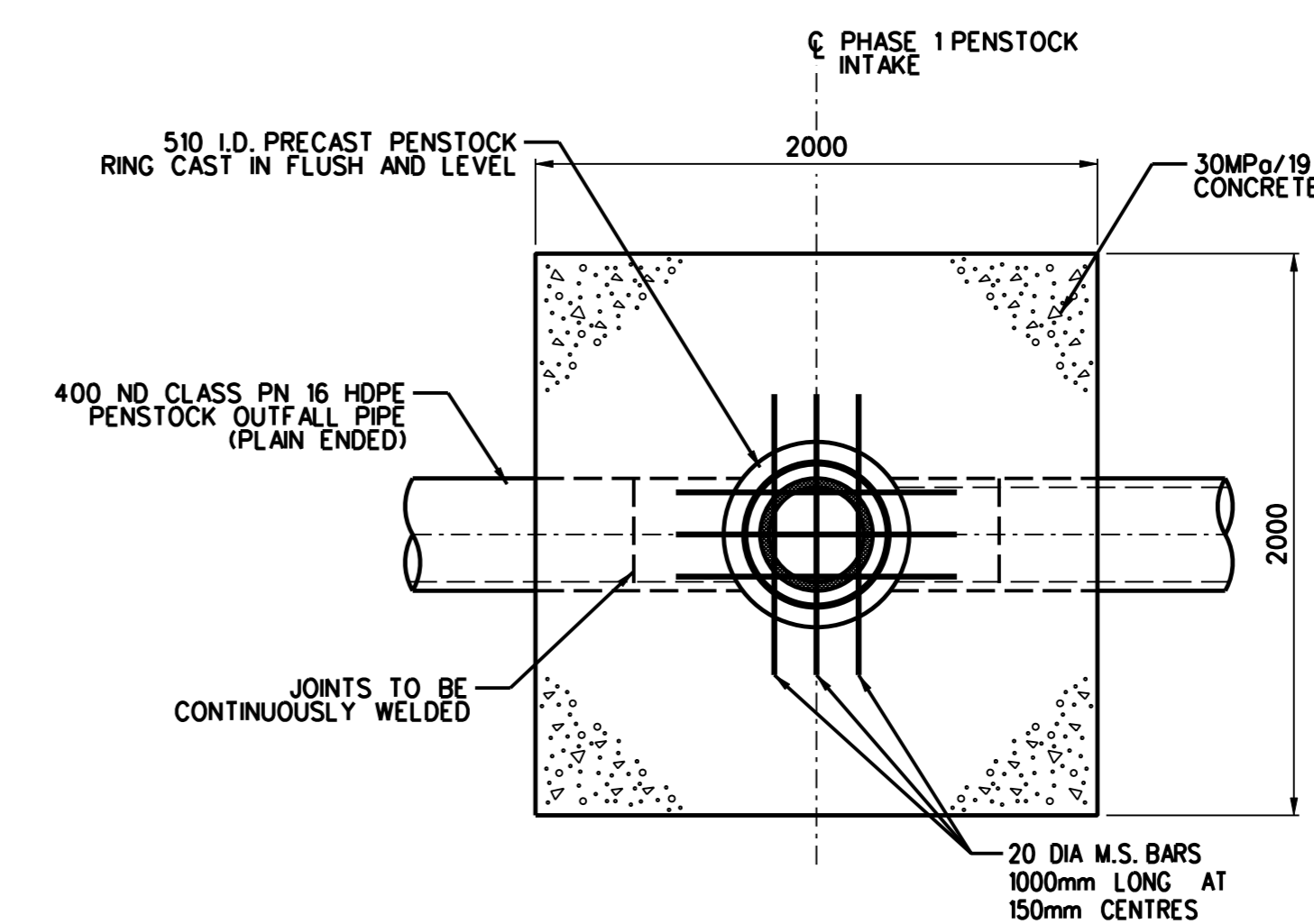
TYPICAL SECTION - PENSTOCK OUTFALL PIPELINE ABOVE N.G.L. (CLASS C BEDDING)
SCALE 1:25



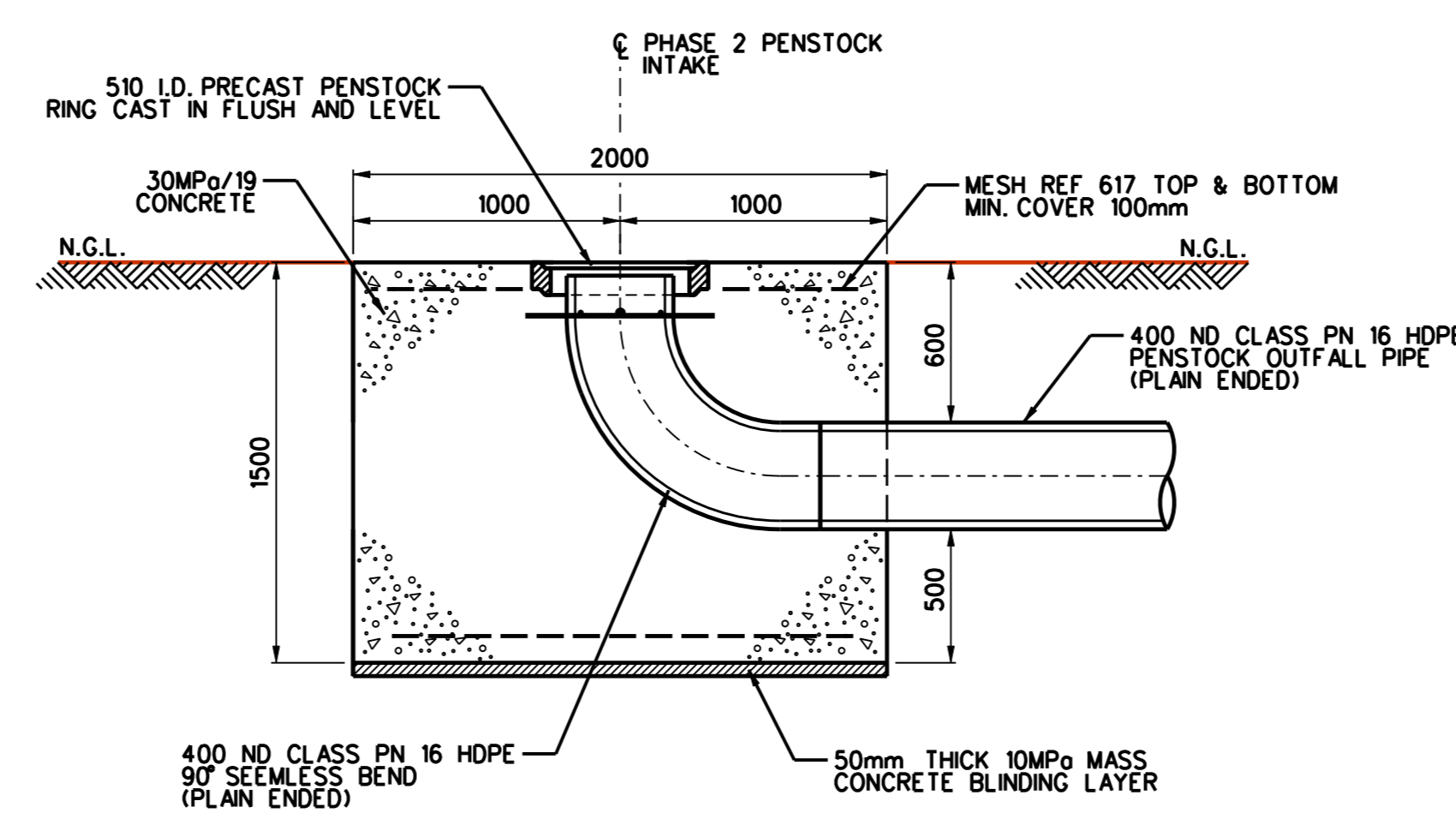
TYPICAL SECTION - PENSTOCK OUTFALL PIPELINE BELOW N.G.L. (CLASS C BEDDING)
SCALE 1:25



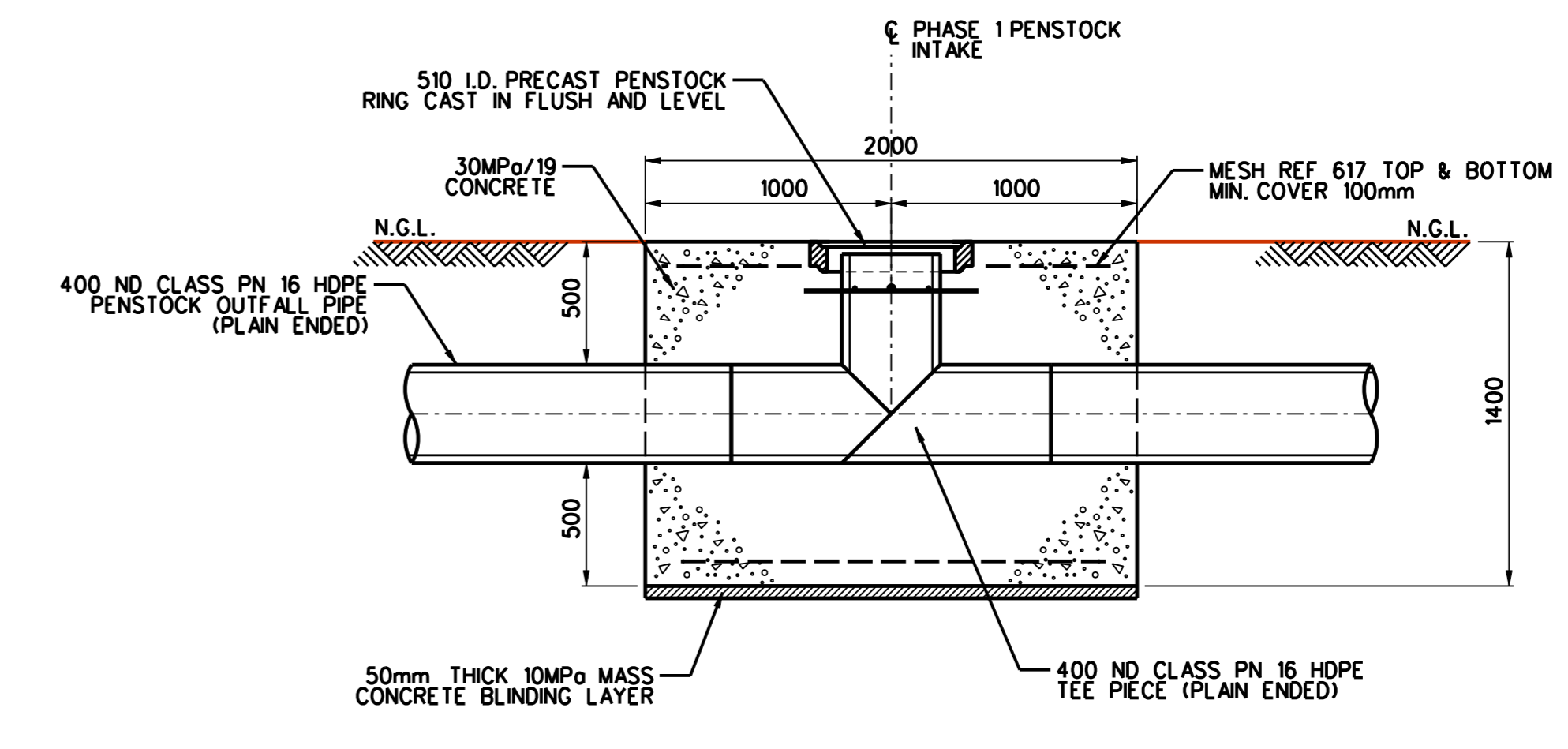
PLAN - SLURRY POND 2 PENSTOCK INTAKE
SCALE 1:25



PLAN - SLURRY POND 1 PENSTOCK INTAKE
SCALE 1:25



SECTION - SLURRY POND 2 PENSTOCK INTAKE
SCALE 1:25



SECTION - SLURRY POND 1 PENSTOCK INTAKE
SCALE 1:25

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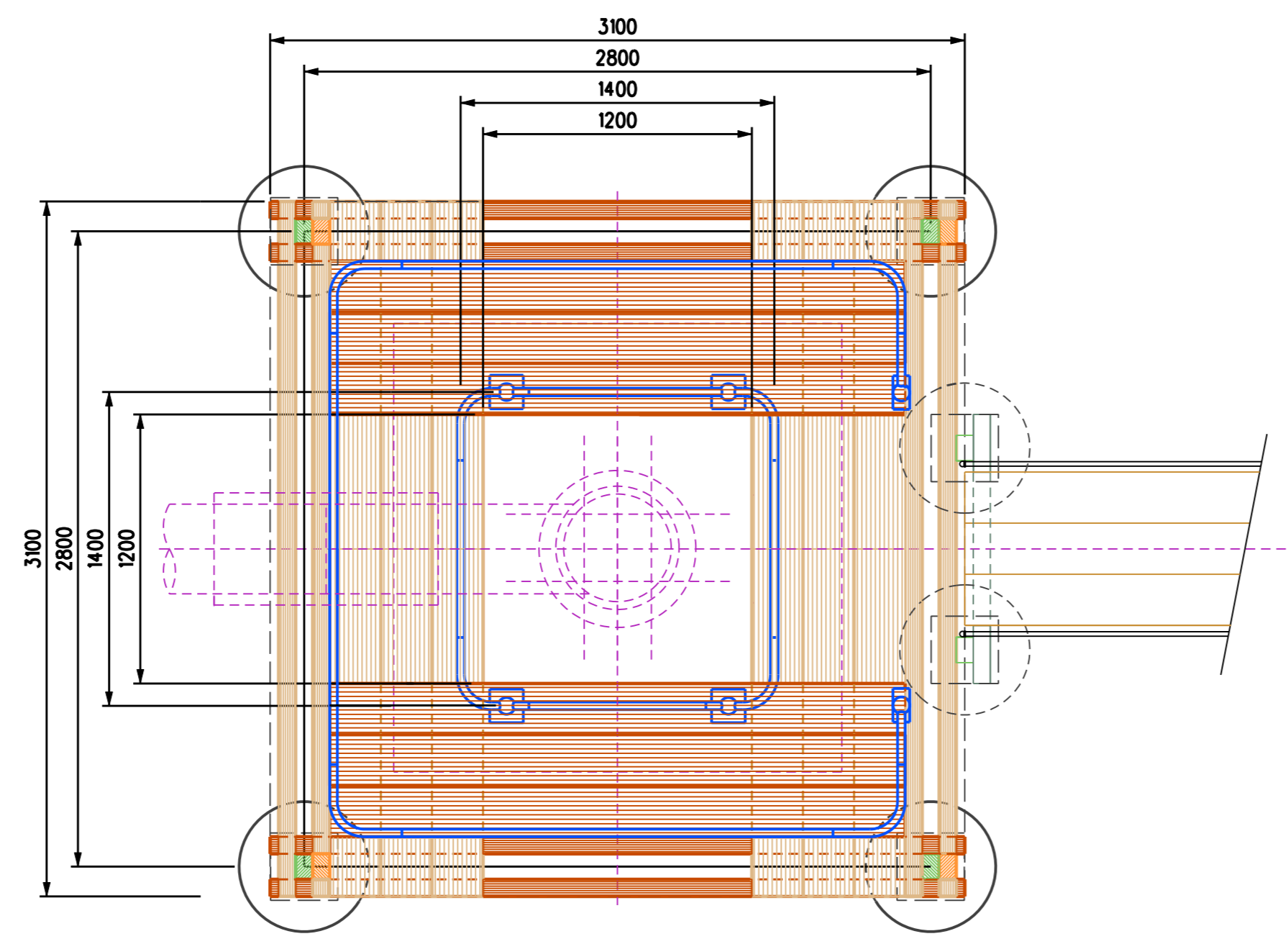
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DO NOT SCALE

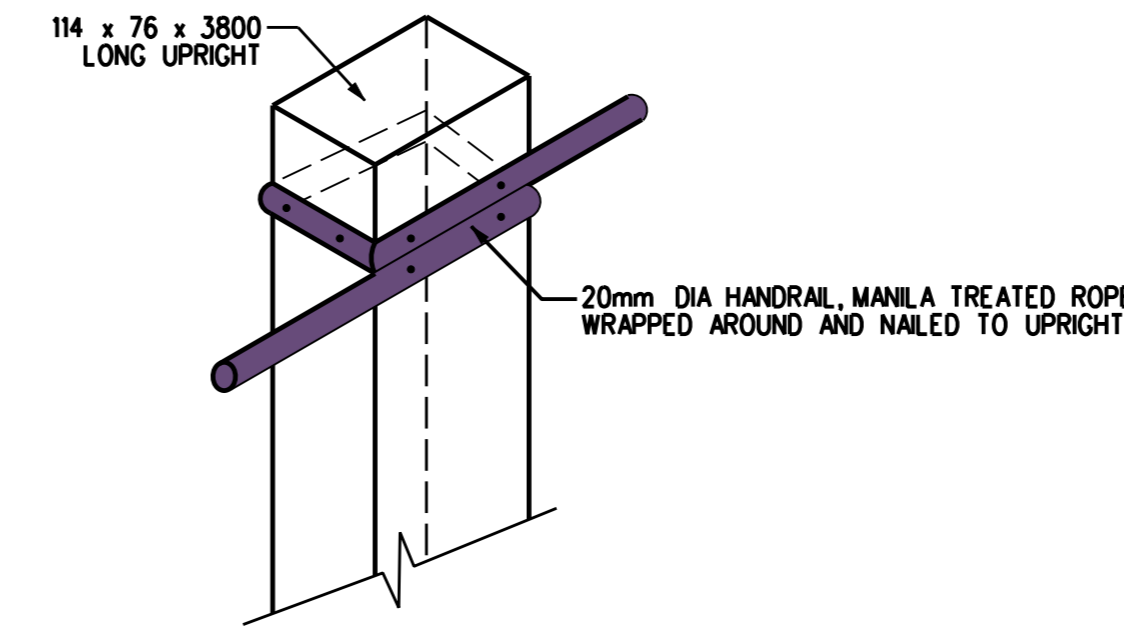
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1	NS	24-04-09	PENSTOCK PIPE I.L. ALTERED	001	GENERAL ARRANGEMENT		
				004 SHT 1	DRAINAGE DETAILS		
				004 SHT 2	DRAINAGE COLLECTOR SUMP DETAILS		
				011	DRAINAGE COLLECTOR TRENCH LONG SECTION & DETAILS		

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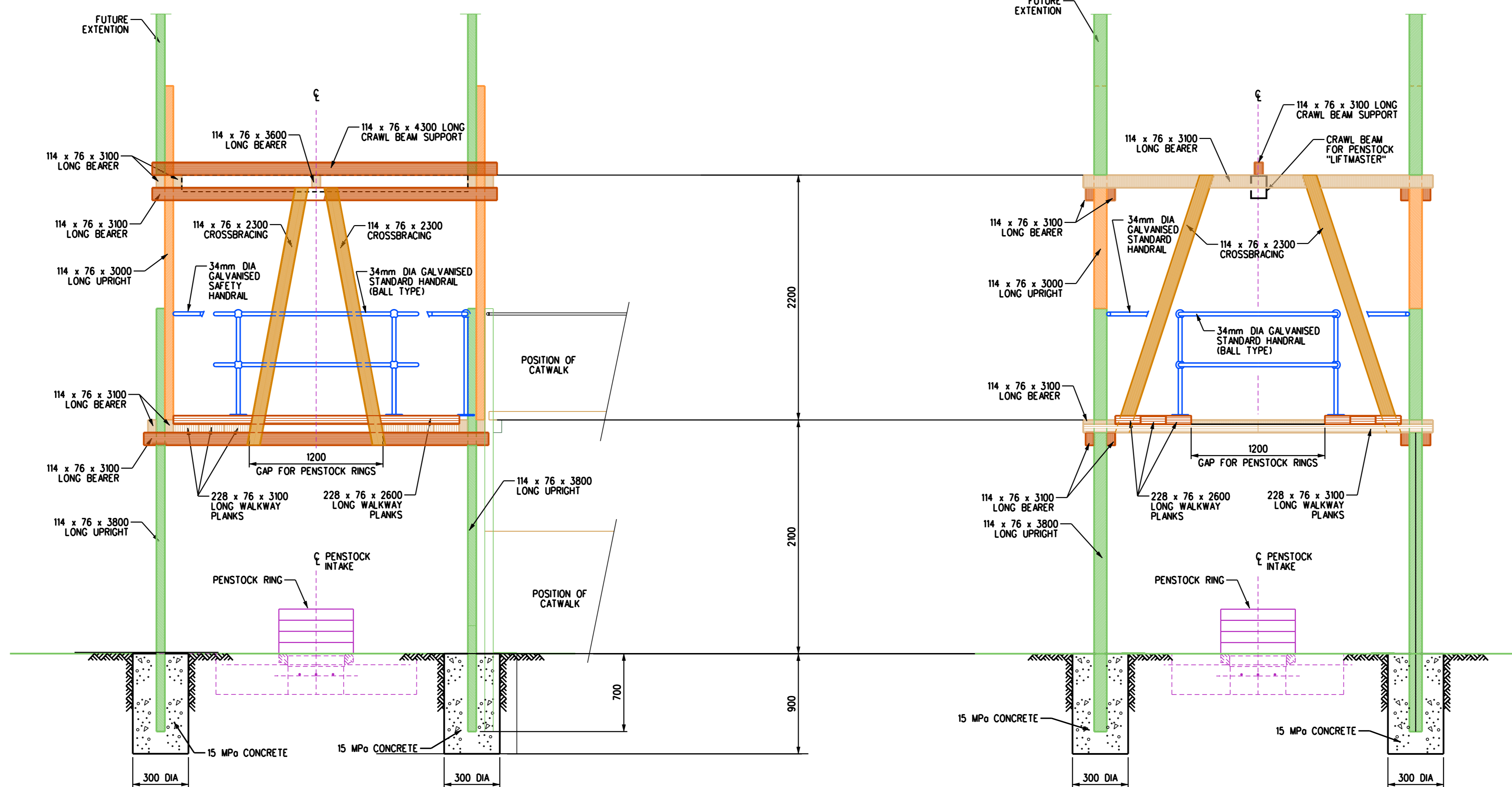
CLIENT BADGER MINING & CONSULTING (PTY) LTD	DESIGNED	BY N.S.	DATE MAR.09
TITLE MOOPLAATS COAL DISCARD DUMP PENSTOCK OUTFALL PIPELINE DETAILS	DRAWN	N.S.	MAR09
CHECKED	SCALE	AS SHOWN	REVISION
DRAWING No.	T994-008		1



PLAN - PLATFORM
AT SINGLE PENSTOCK INTAKE
SCALE 1:25

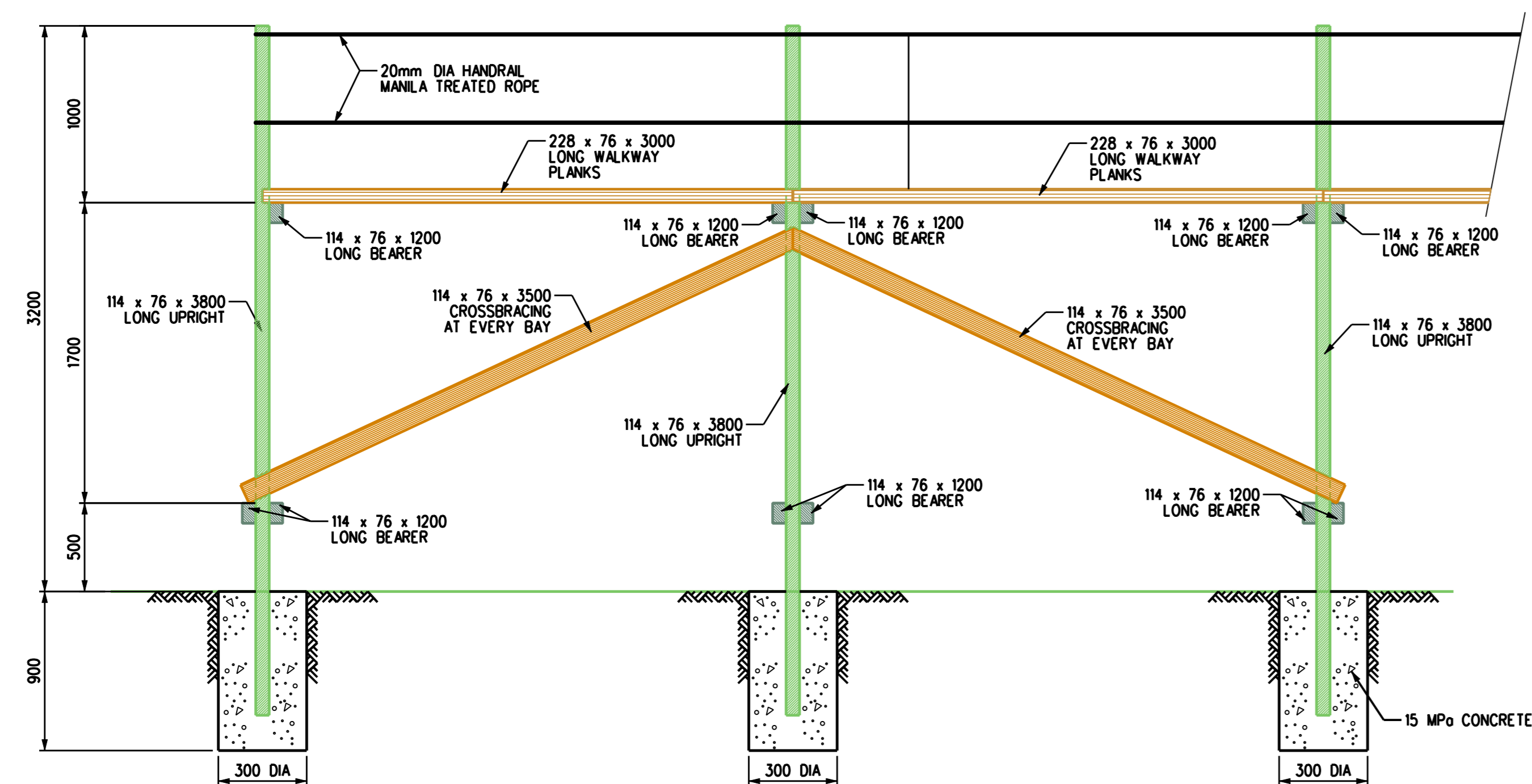


DETAIL 1
SHOWING ROPE HANDRAIL AT UPRIGHT
N.T.S.

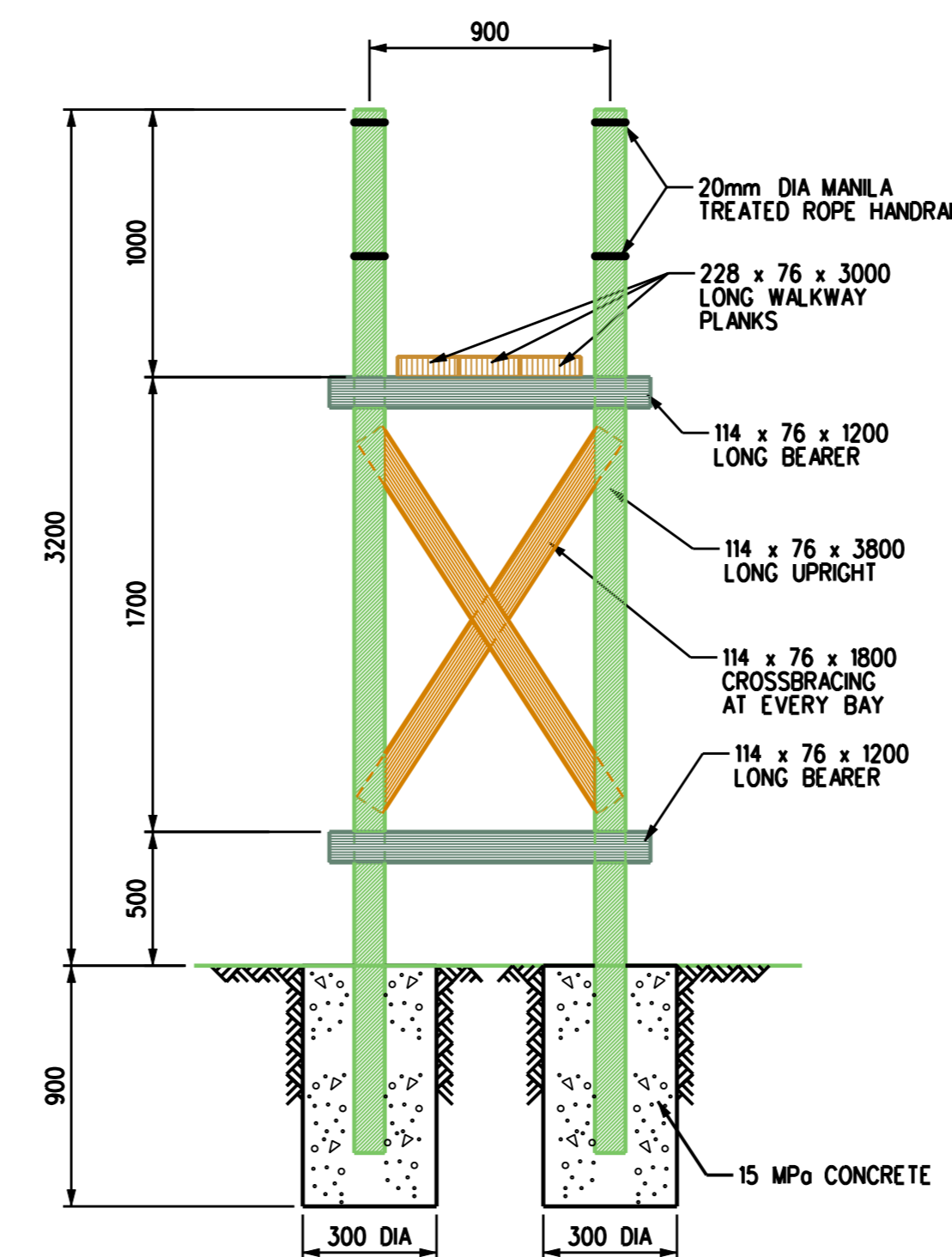


TYPICAL ELEVATION THROUGH PLATFORM
AT SINGLE PENSTOCK INTAKE
SCALE 1:25

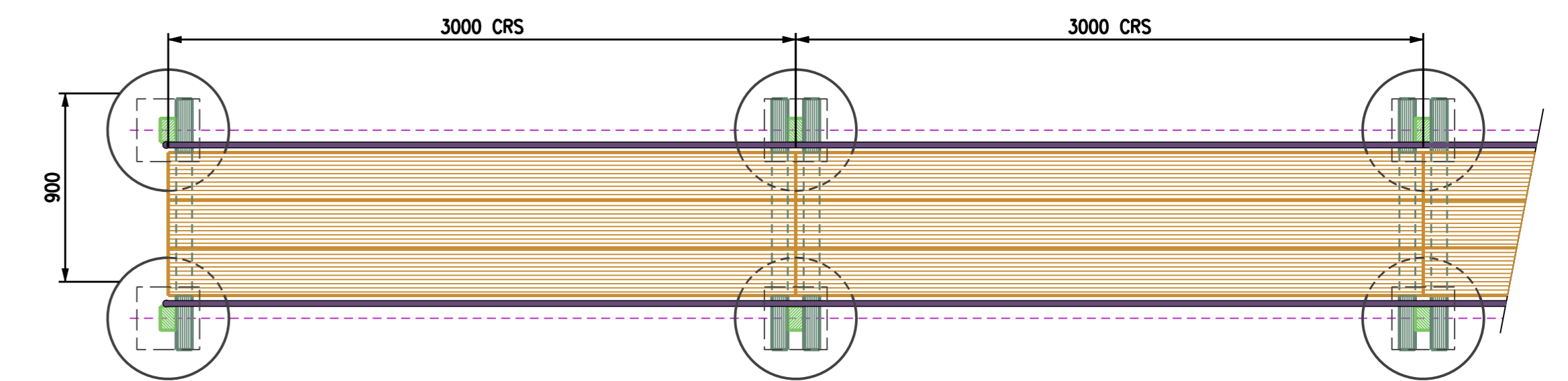
SECTION THROUGH PLATFORM
AT SINGLE PENSTOCK INTAKE
SCALE 1:25



SIDE ELEVATION - CATWALK
SCALE 1:25



TYPICAL SECTION THROUGH CATWALK
SCALE 1:25



PLAN - CATWALK
SCALE 1:25

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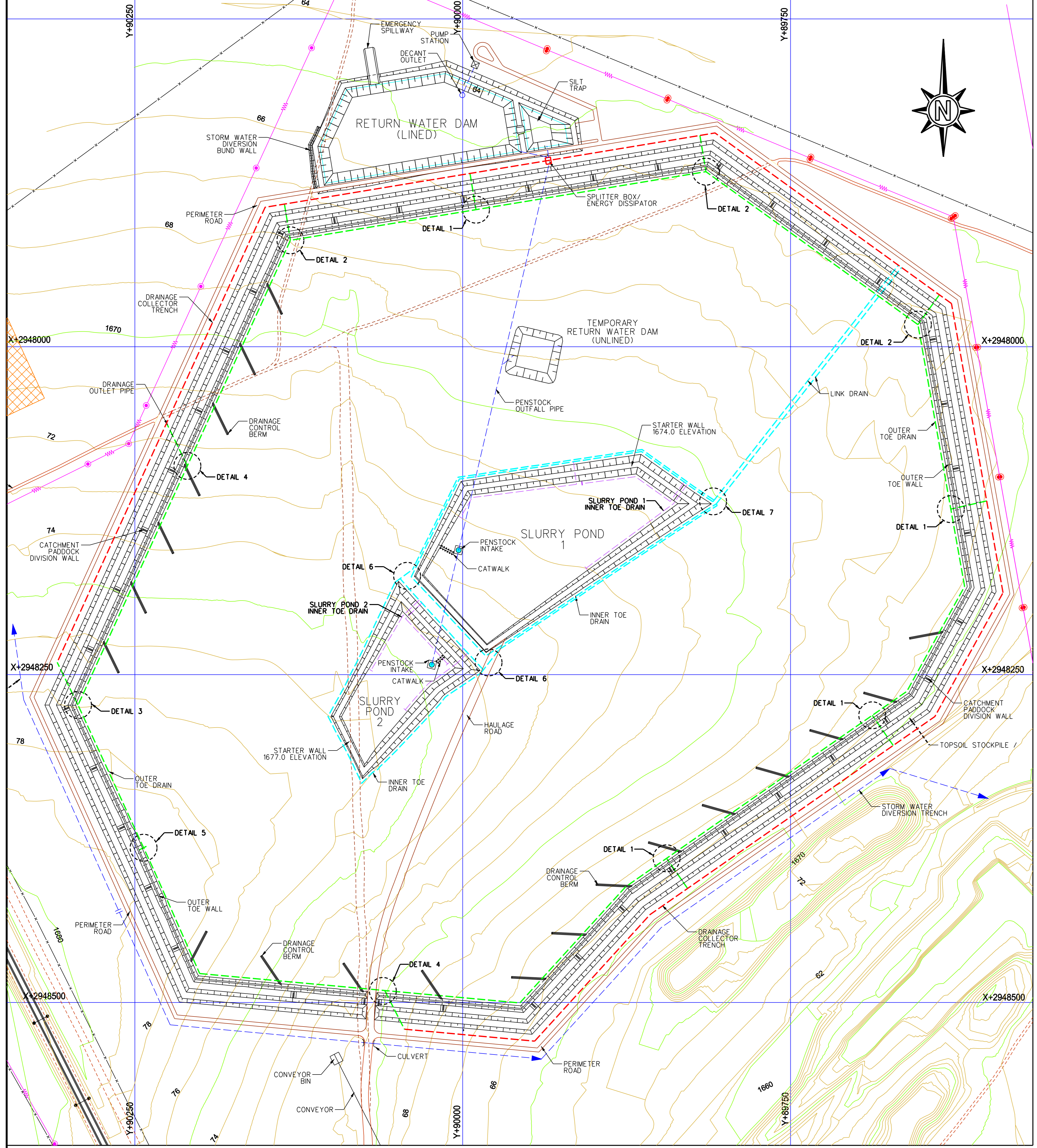
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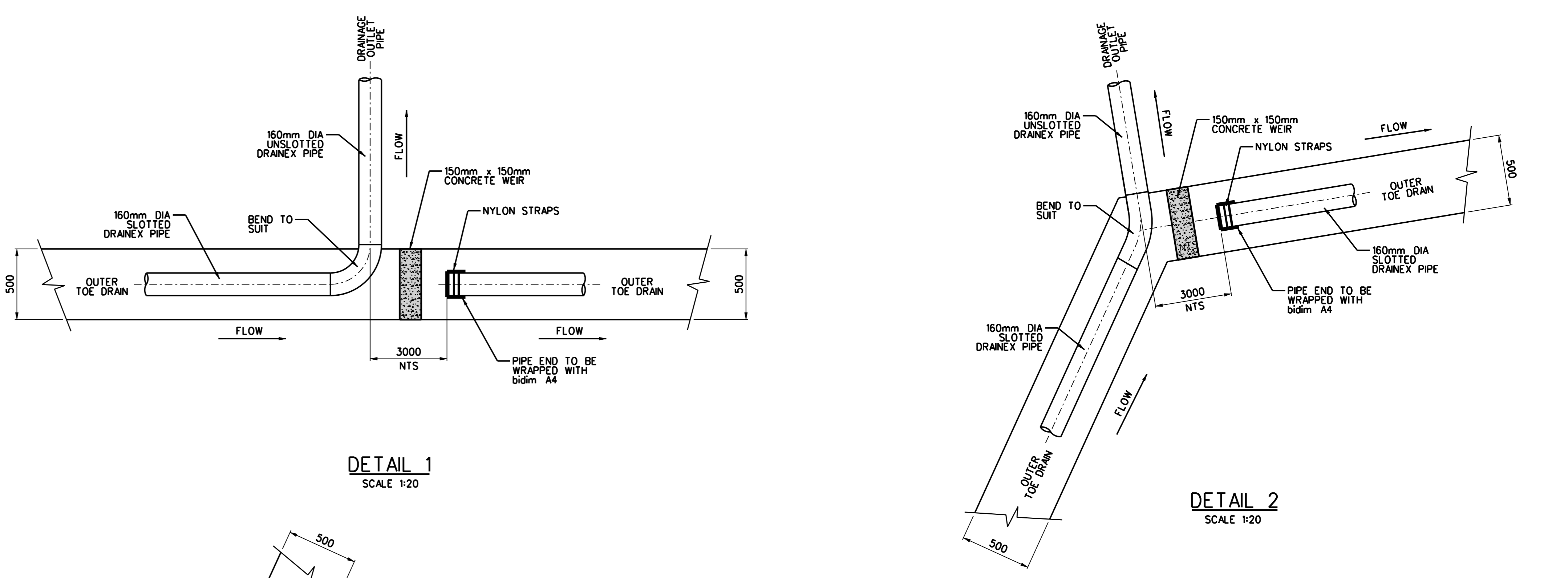
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1	NS/SA	07-05-2009	DRAWING UPDATED	001	GENERAL ARRANGEMENT		
2	NS/SA	13-05-2009	SLURRY POND 2 WALL ALTERED				

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CLIENT BADGER MINING & CONSULTING (PTY) LTD		BY	DATE
TITLE MOOPLAATS COAL DISCARD DUMP CATWALK DETAILS		N.S.	MAR.09
DESIGNED	DRAWN	S.A.	MAR.09
CHECKED	SCALE AS SHOWN		
DRAWING No.	T994-009	REVISION	2

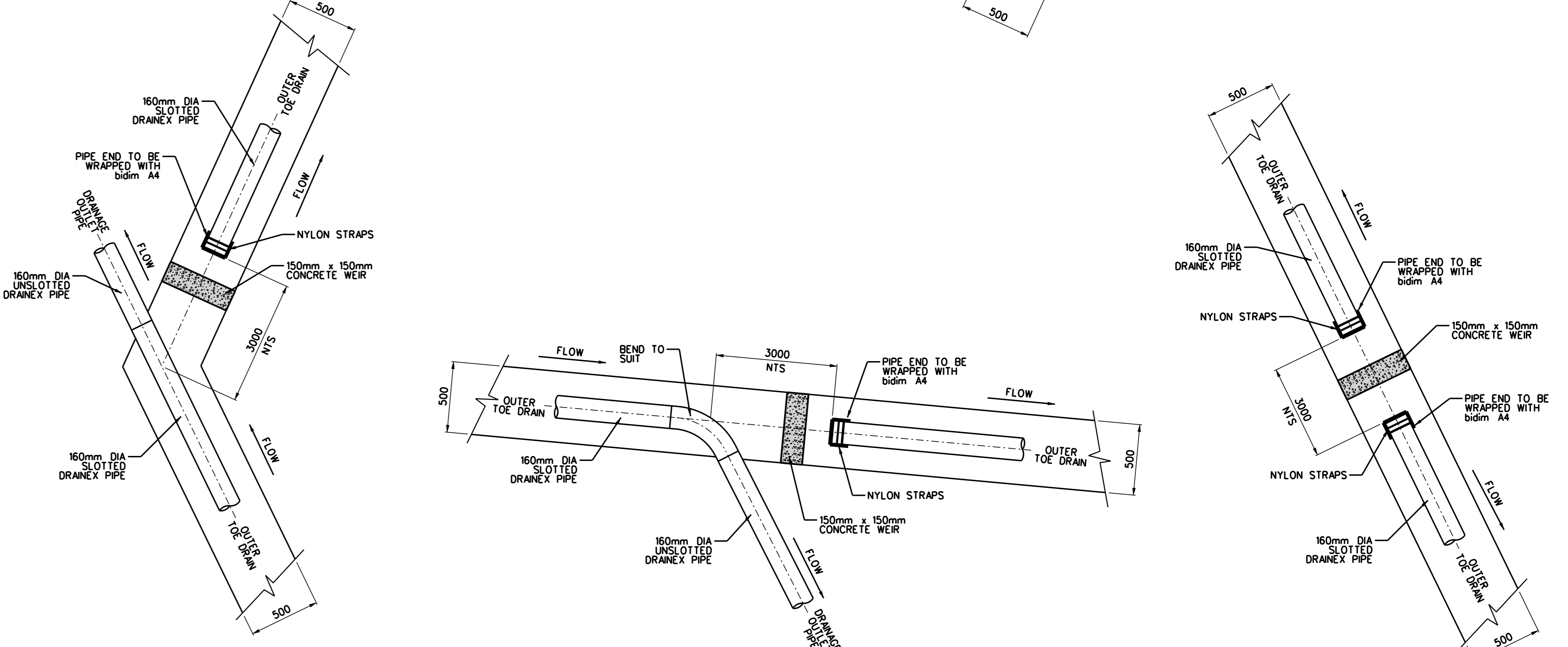


PLAN
SCALE 1:1500



DETAIL 1
SCALE 1:20

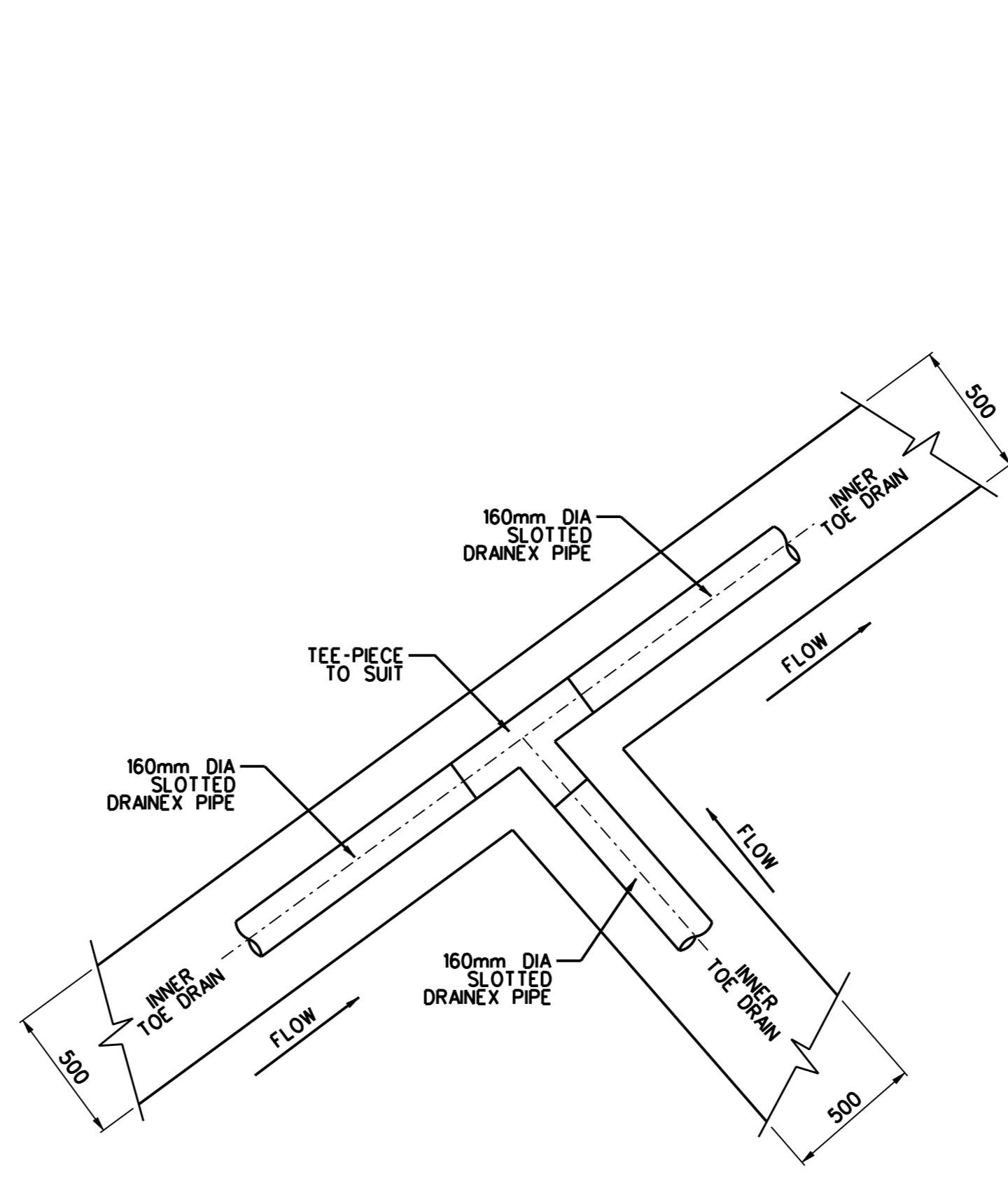
DETAIL 2
SCALE 1:20



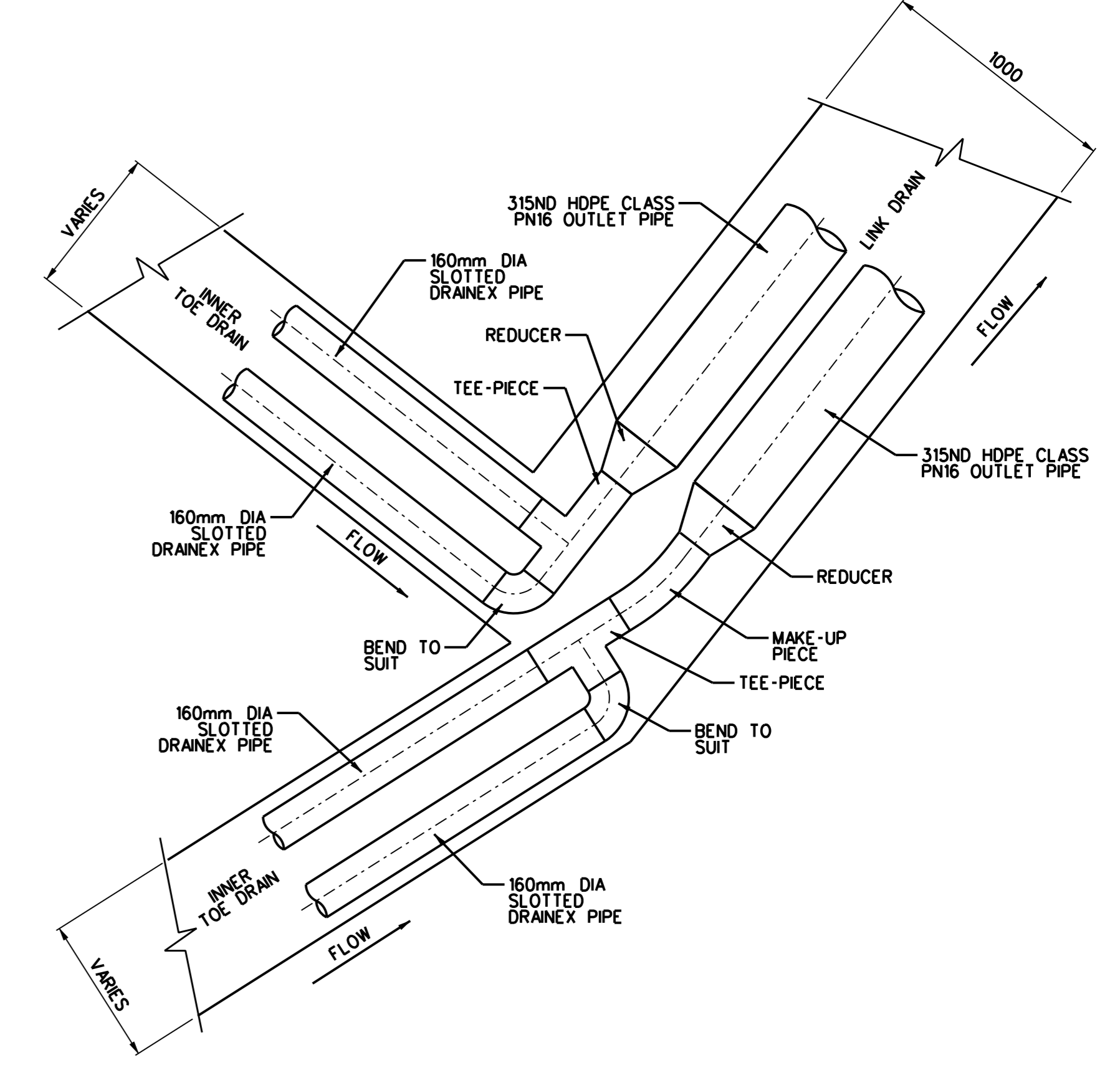
DETAIL 3
SCALE 1:20

DETAIL 4
SCALE 1:20

DETAIL 5
SCALE 1:20



DETAIL 6
SCALE 1:20



DETAIL 7
SCALE 1:20

ISSUED FOR CONSTRUCTION

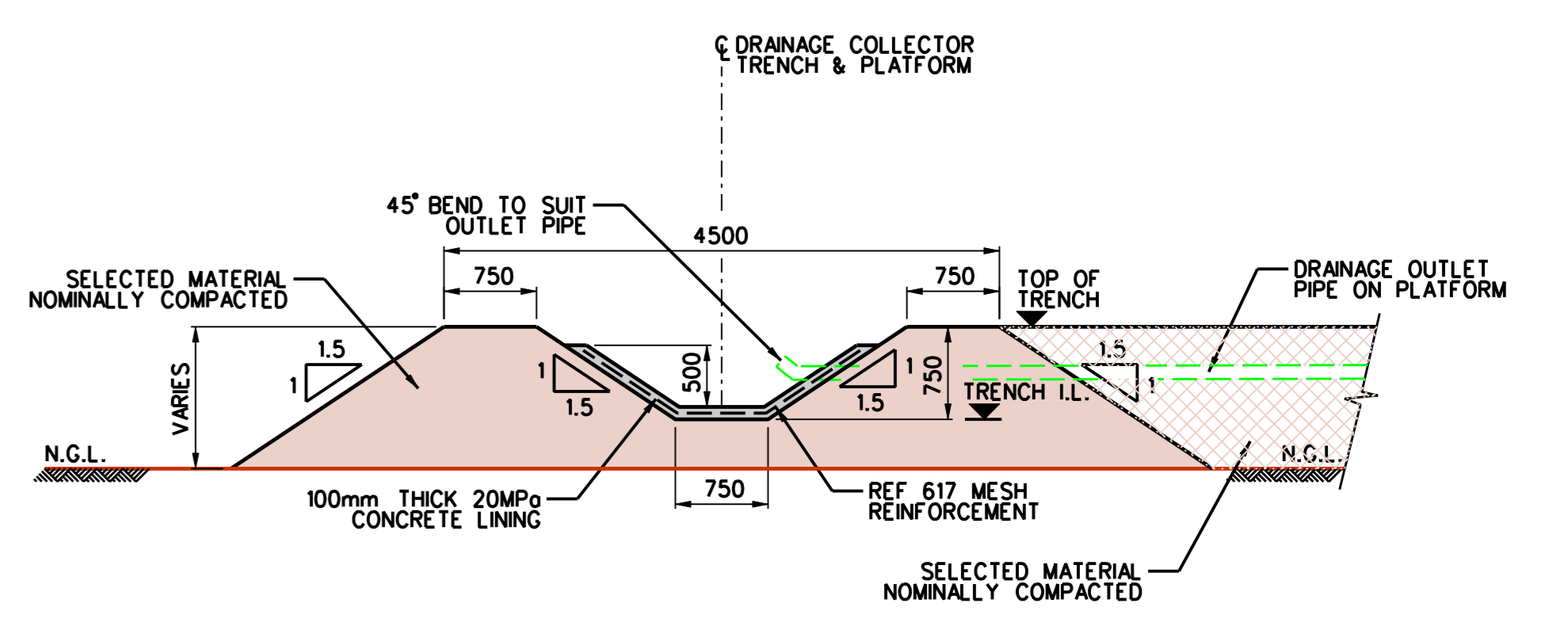
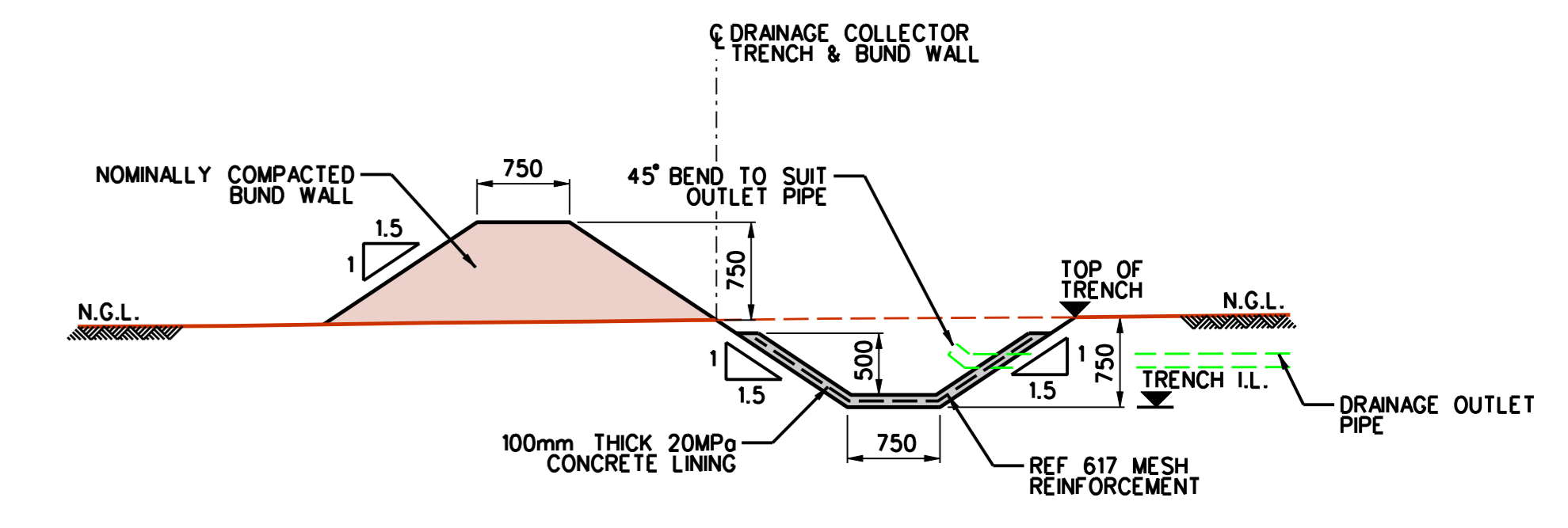
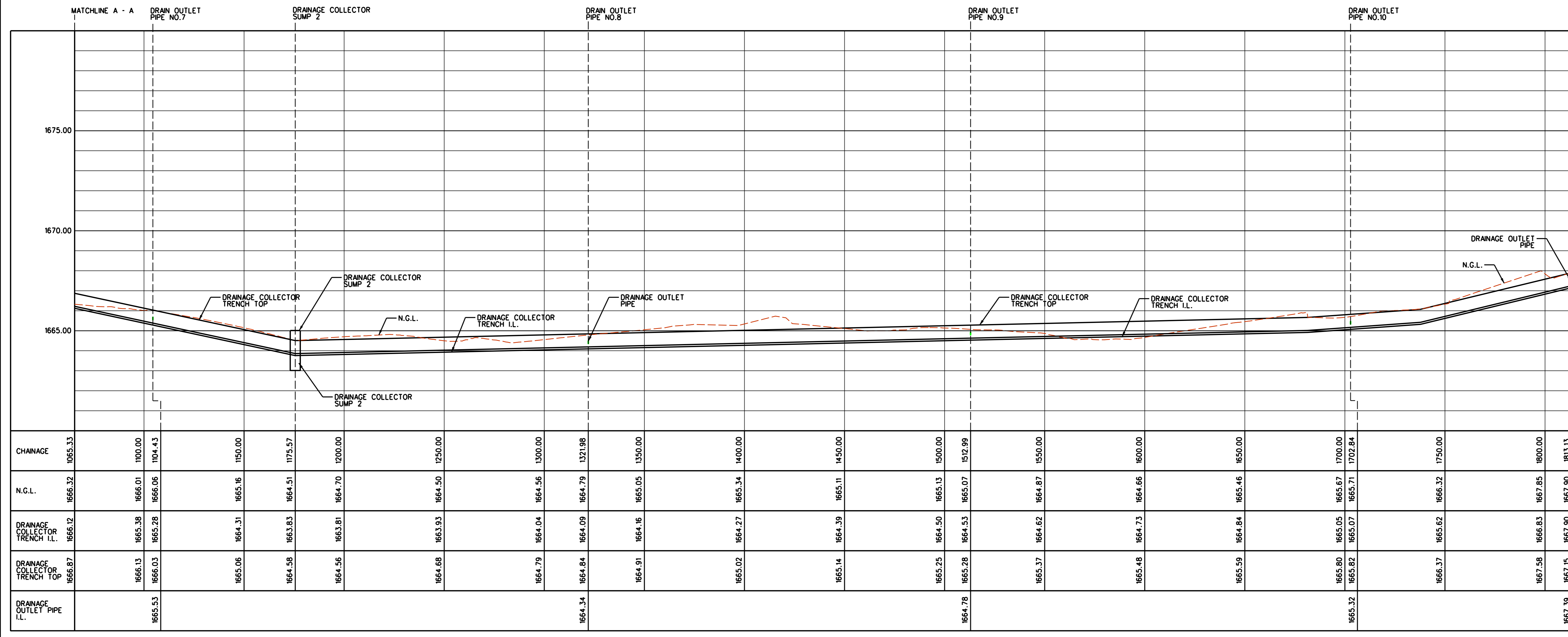
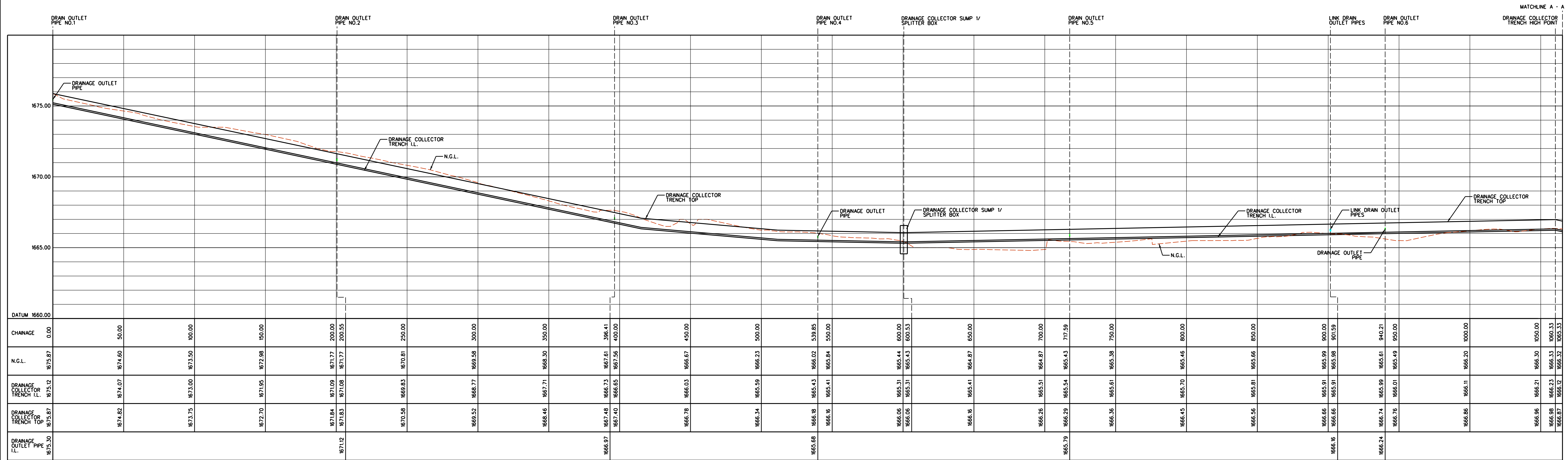
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REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
1	NS/SA	07-05-2009	DRAWING UPDATED	001	GENERAL ARRANGEMENT		
2	NS/SA	13-05-2009	SLURRY POND 2 WALL ALTERED	004	DRAINAGE DETAILS		
3	NS/SA	22-07-2009	DUMP ALTERED TO SUIT LOADING BIN	011	DRAINAGE COLLECTOR TRENCH LONG SECTION & DETAILS		

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CLIENT BADGER MINING & CONSULTING (PTY) LTD	BY N.S.	DATE MAR.09
TITLE MOOPLAATS COAL DISCARD DUMP DRAINAGE PIPE DETAILS	DRAWN N.S.	MAR.09
CHECKED A0-150	SCALE	REVISION 3
DRAWING No. T994-010		



LONGITUDINAL SECTION - DRAINAGE COLLECTOR TRENCH

HOR. SCALE 1:1000
VERT. SCALE 1:100

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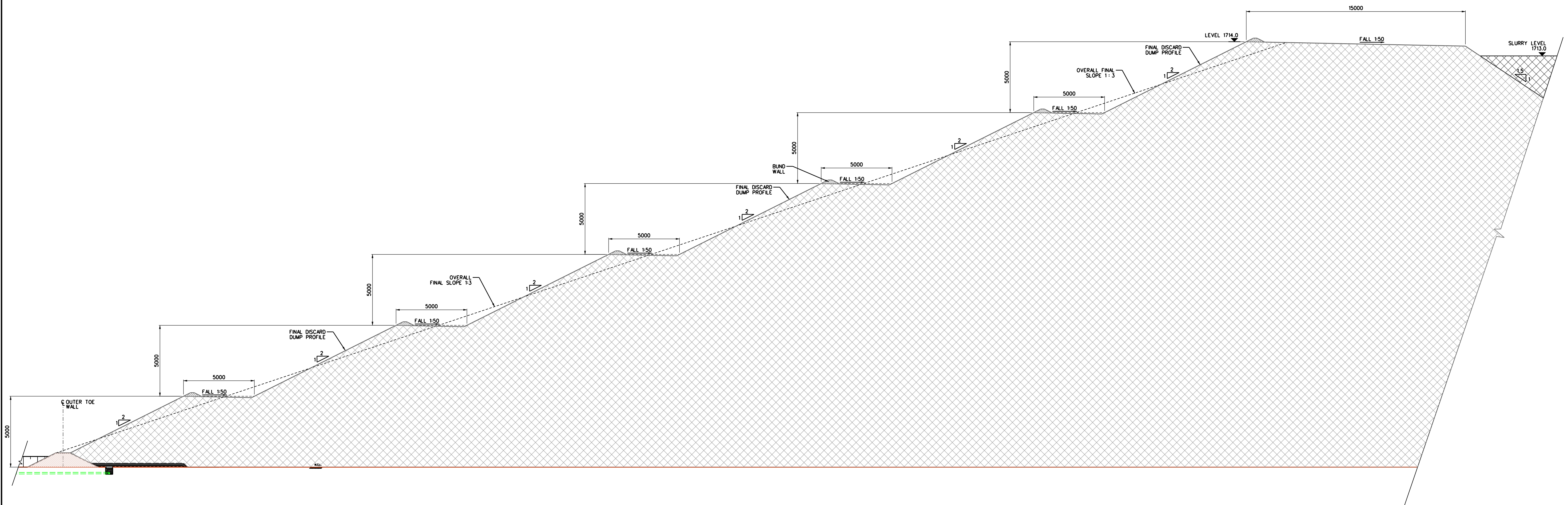
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				003	EARTHWORKS SECTIONS & DETAILS		
				004 SHT 1	DRAINAGE DETAILS		
				004 SHT 2	DRAINAGE COLLECTOR SUMP DETAILS		
				008	PENSTOCK OUTFALL PIPELINE DETAILS		

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CLIENT		BY		DATE	
BADGER MINING & CONSULTING (PTY) LTD		N.S.		MAR.09	
TITLE		DRAWN		CHECKED	
MOOIPLAATS COAL DISCARD DUMP DRAINAGE COLLECTOR TRENCH LONG SECTION & DETAILS		N.S.		MAR.09	
SCALE		DRAWING No.		REVISION	
A0-AS SHOWN		T994-011		1	



SECTION - FINAL DISCARD DUMP PROFILE
SCALE 1:100

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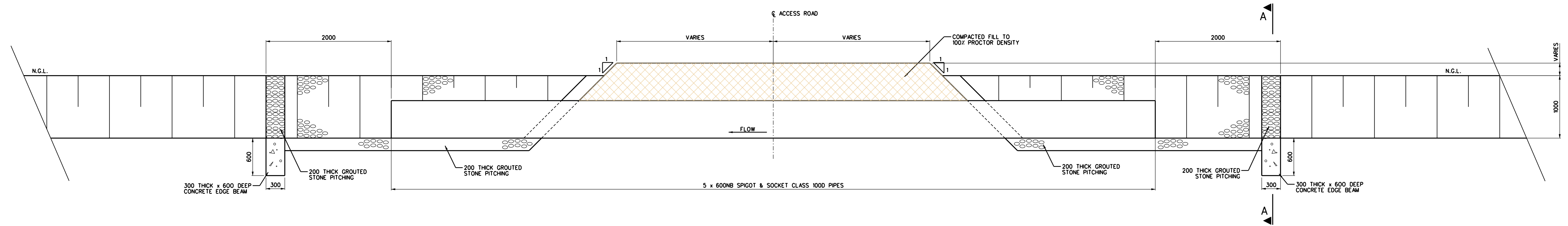
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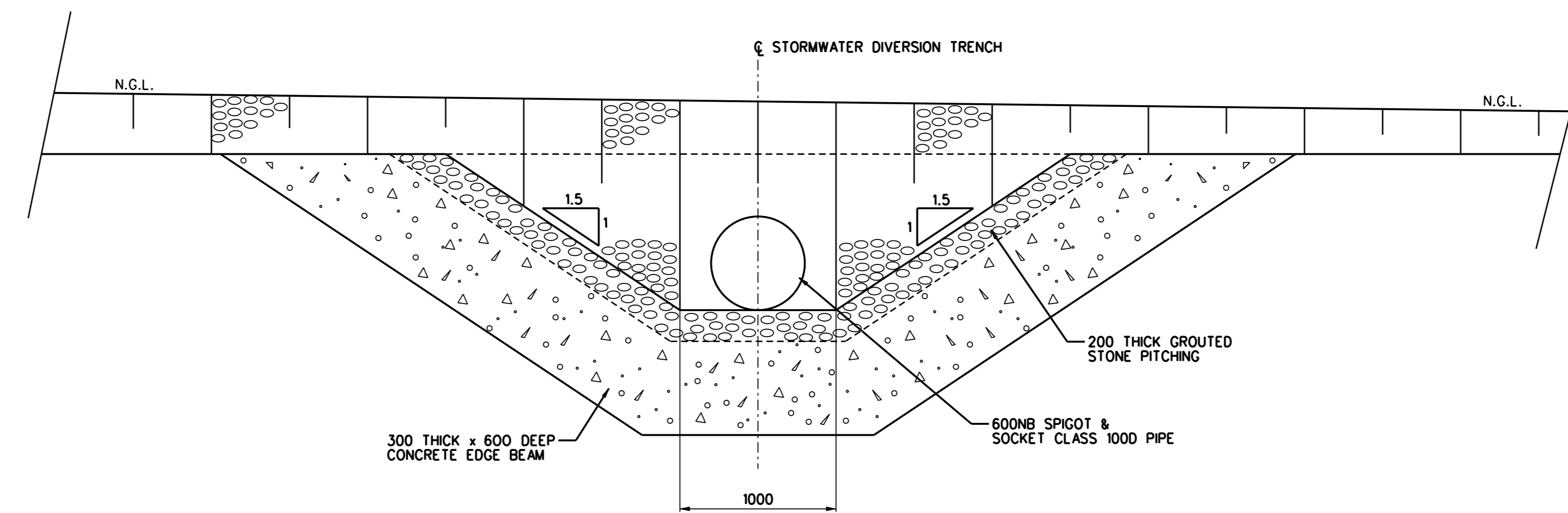
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									DRAWN	S.A.	APR.09
									CHECKED		
									SCALE	A0-1:50	
									DRAWING No.	T994-013	REVISION
											1

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TITLE
MOOPLAATS COAL DISCARD DUMP
FINAL PROFILE



SECTION - CULVERT
SCALE 1:25



SECTION A - A
SCALE 1:25

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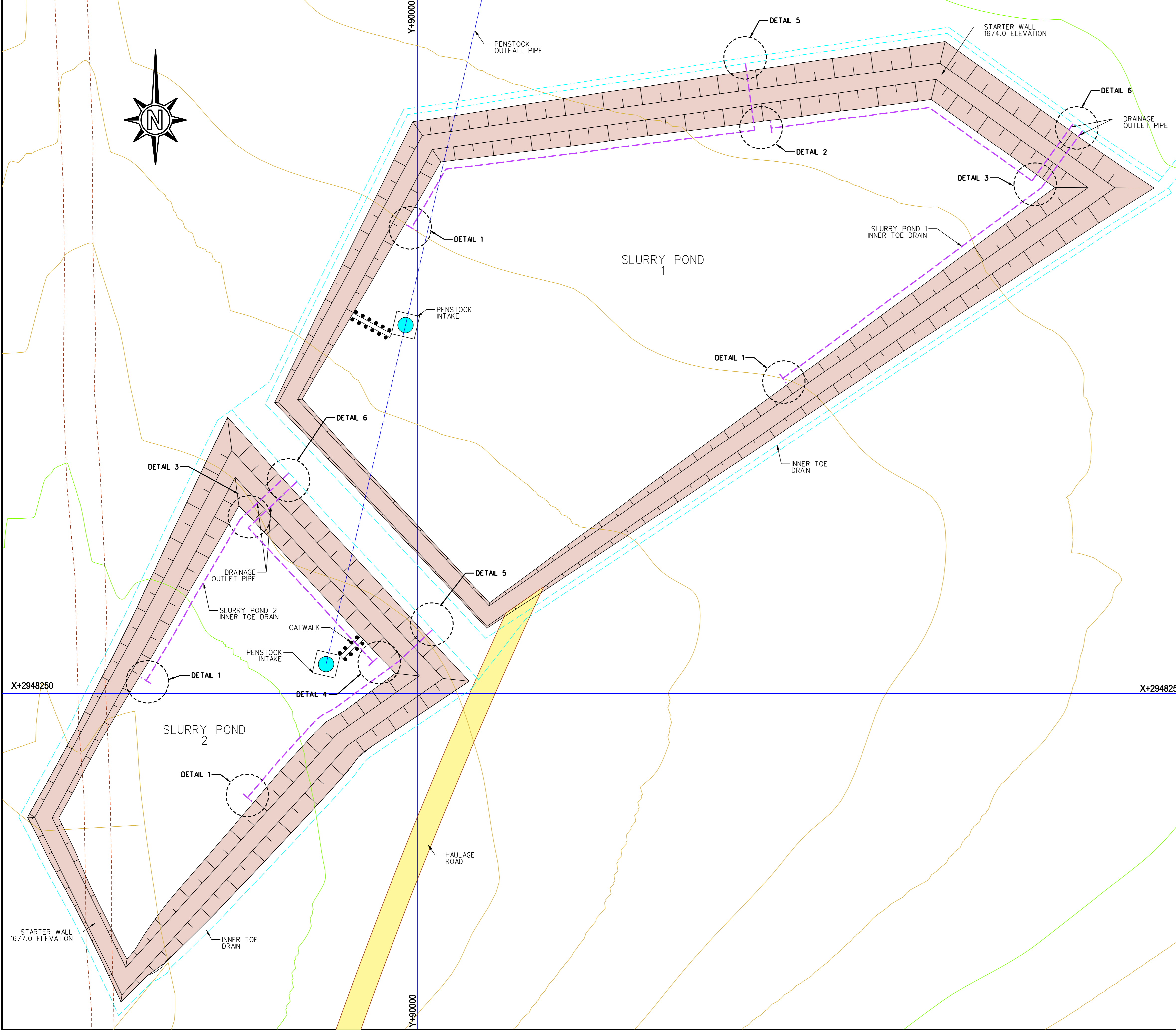
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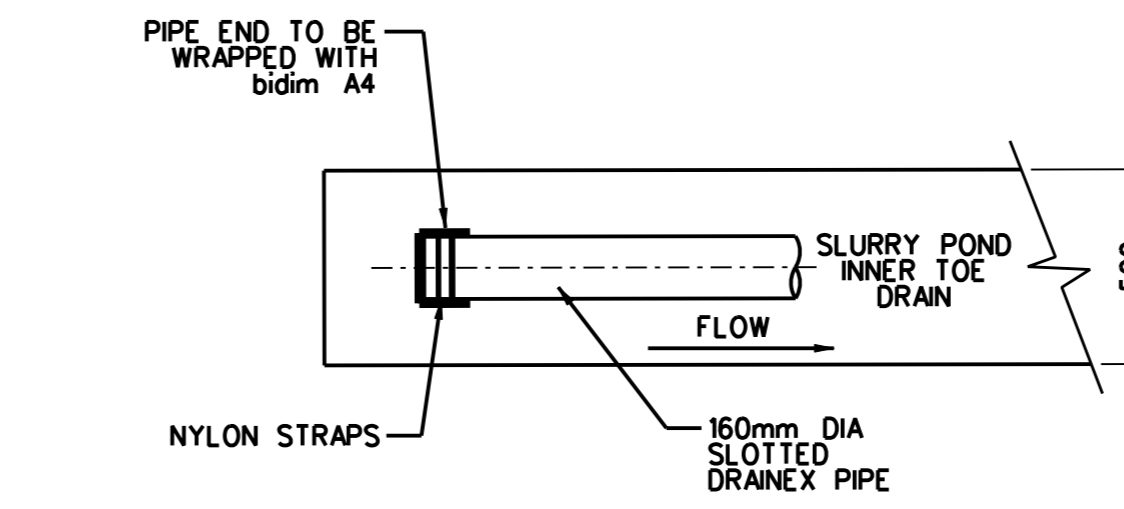
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1	NS/SA	11-05-2009	DRAWING UPDATED	001	GENERAL ARRANGEMENT		

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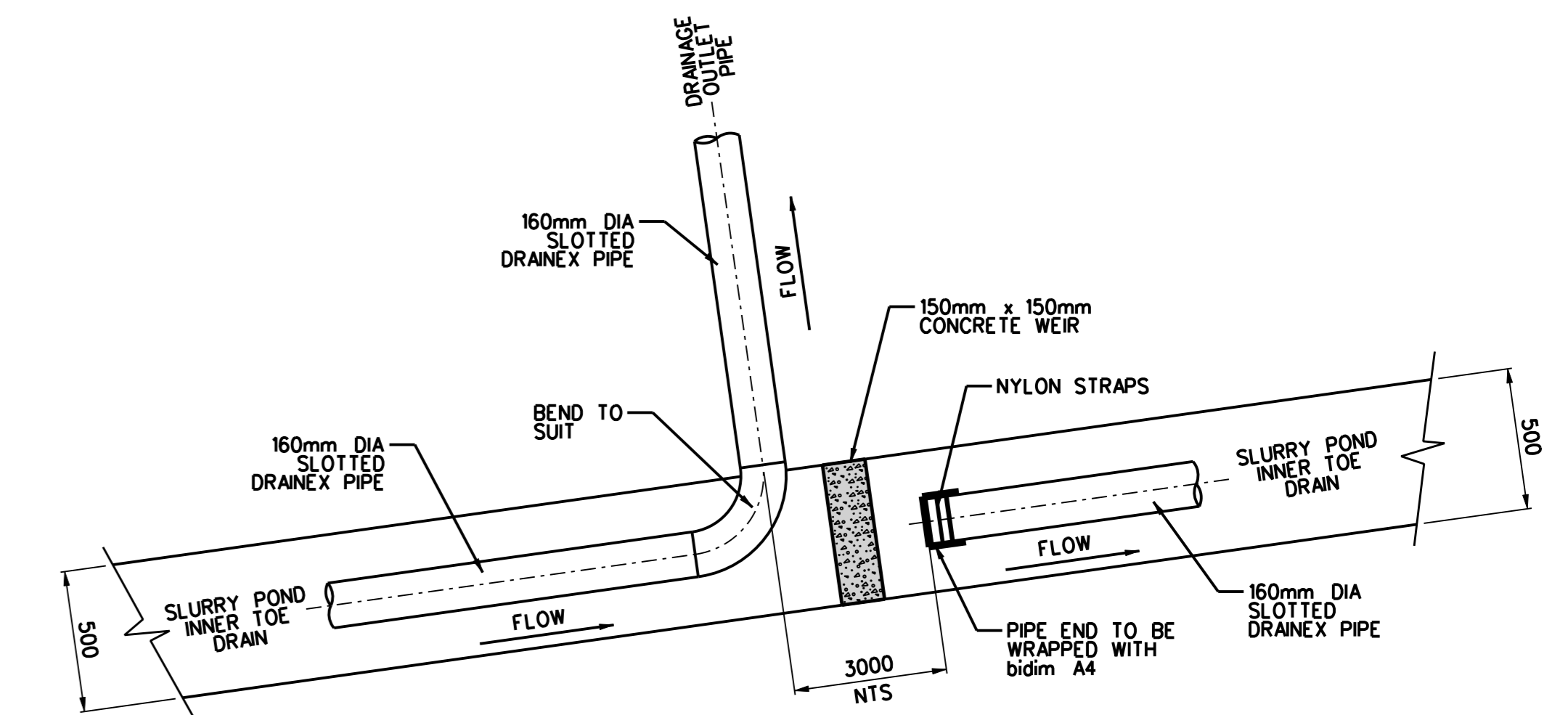
CLIENT		BY	DATE
BADGER MINING & CONSULTING (PTY) LTD		N.S.	APR.09
TITLE		S.A.	APR.09
MOOPLAATS COAL DISCARD DUMP PIPE CULVERT SECTIONS AND DETAILS			
CHECKED	SCALE AS SHOWN		
DRAWING No.	REVISION		
T994-014	1		



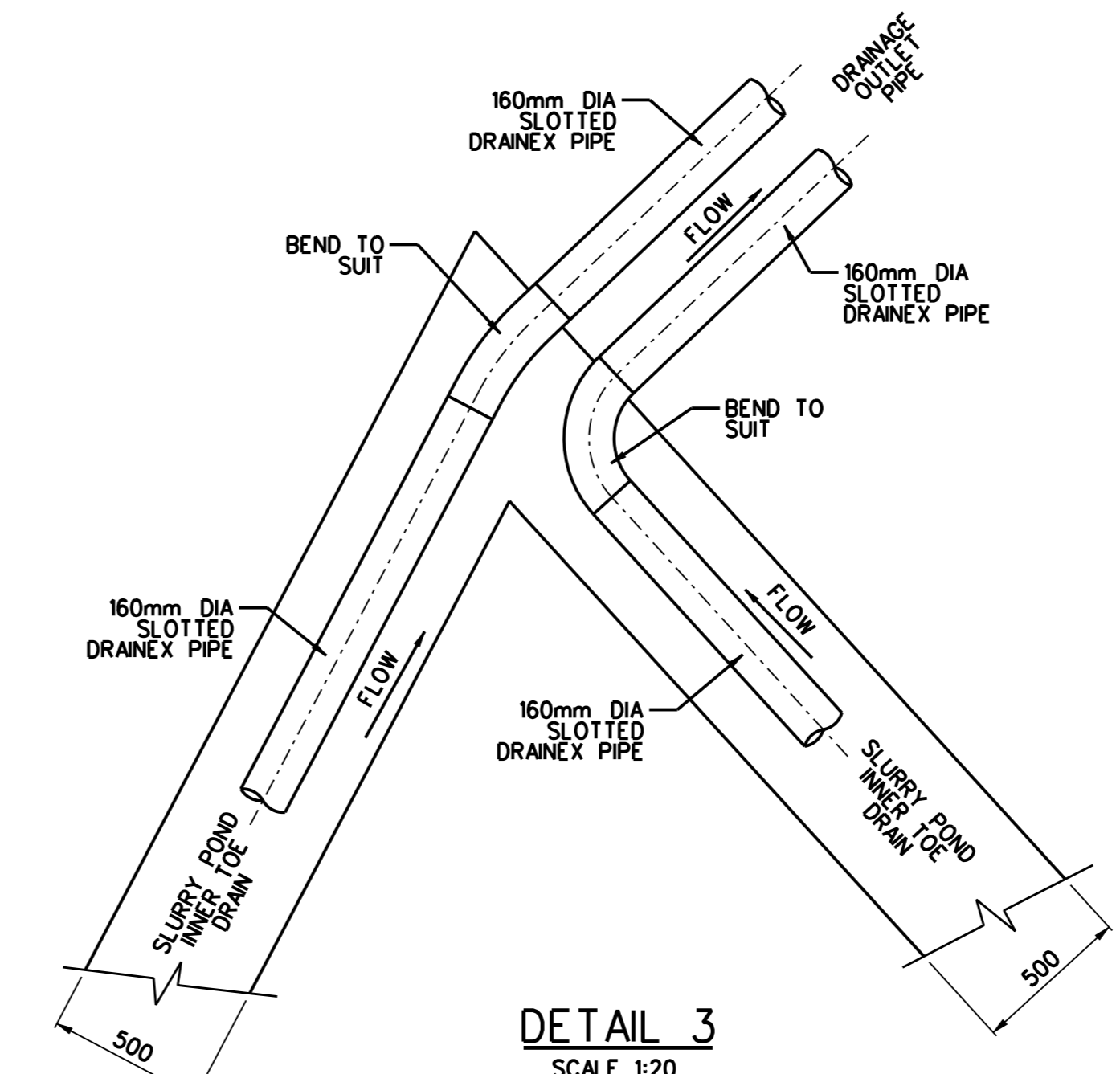
PLAN
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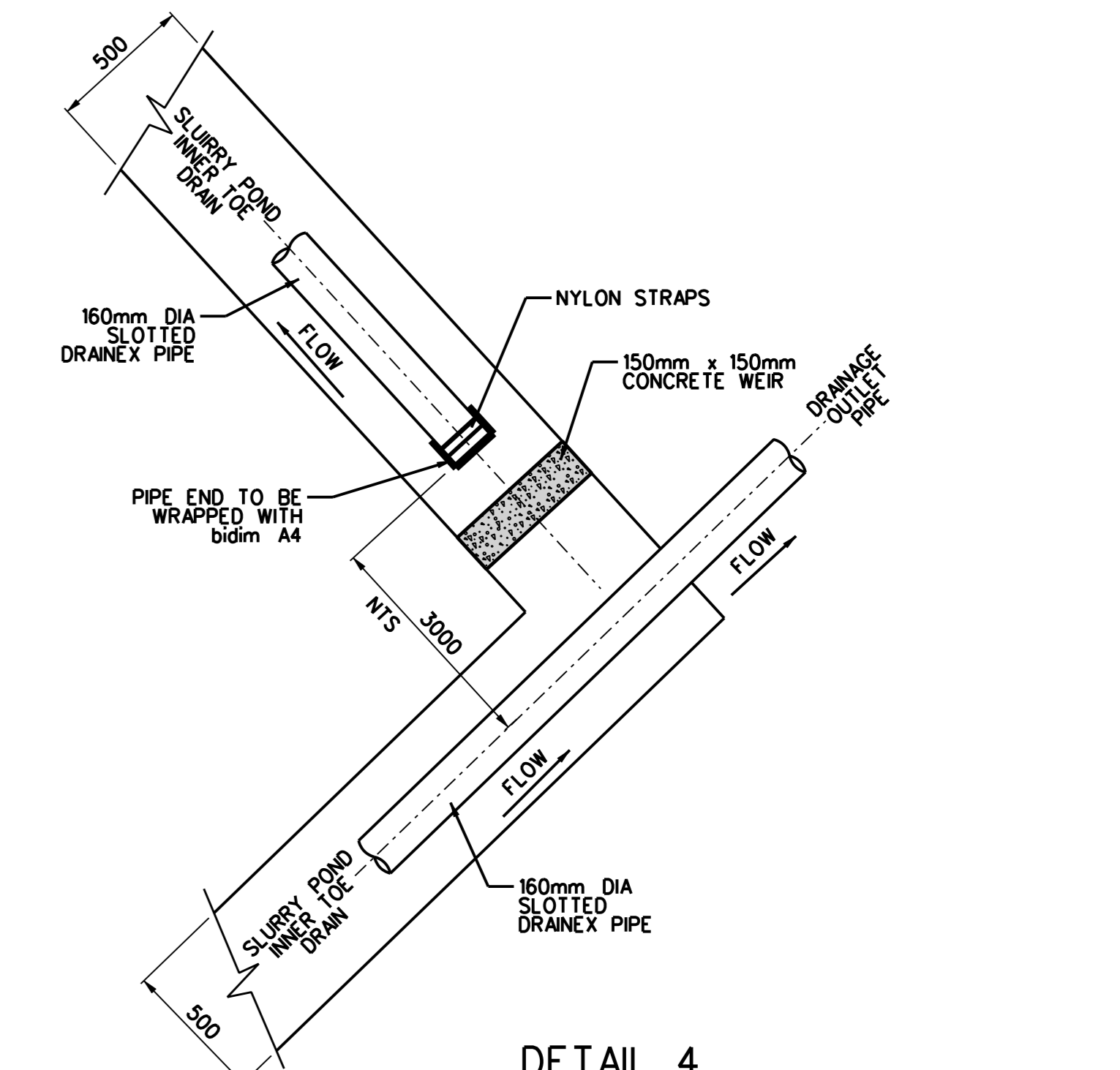
DETAIL 1
SCALE 1:20



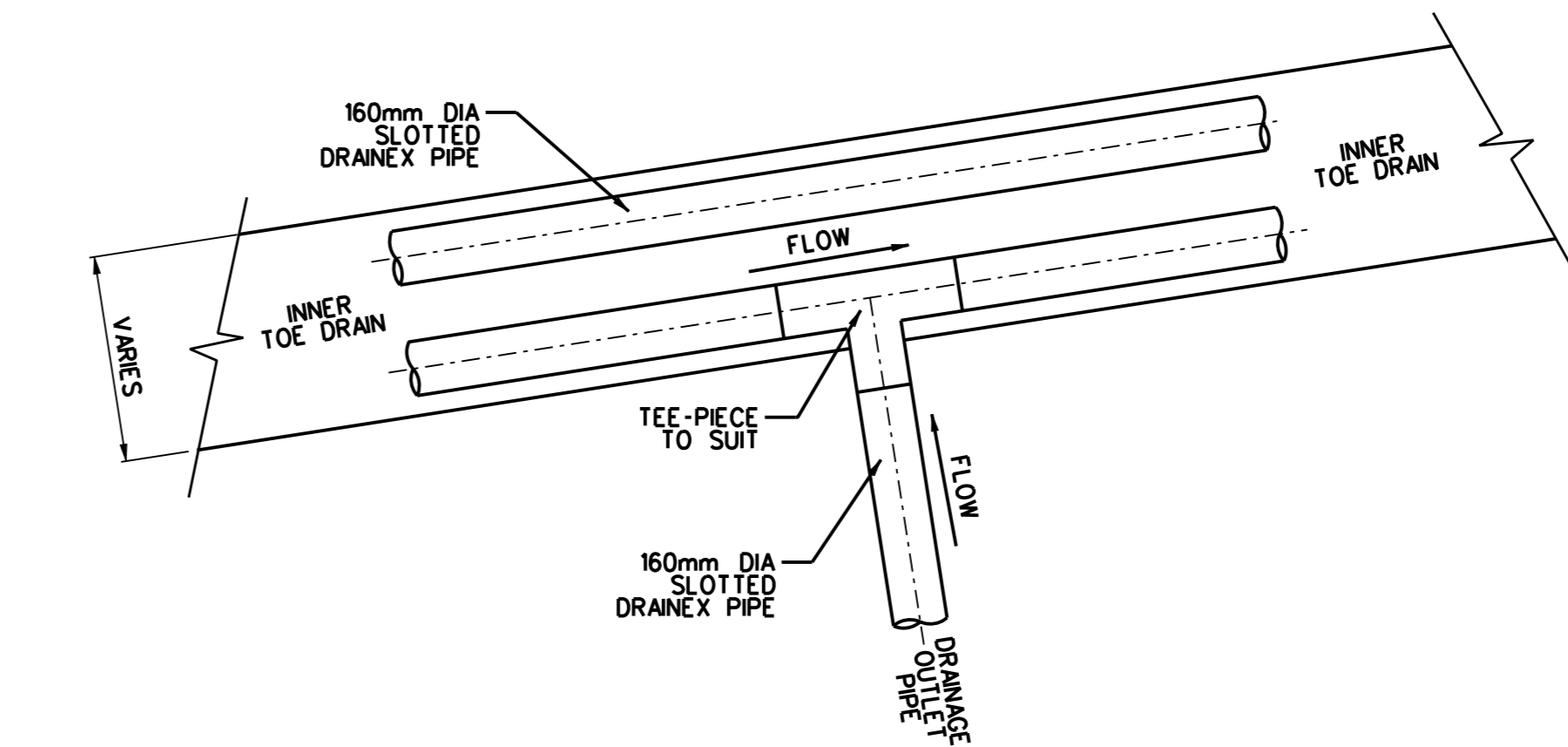
DETAIL 2
SCALE 1:20



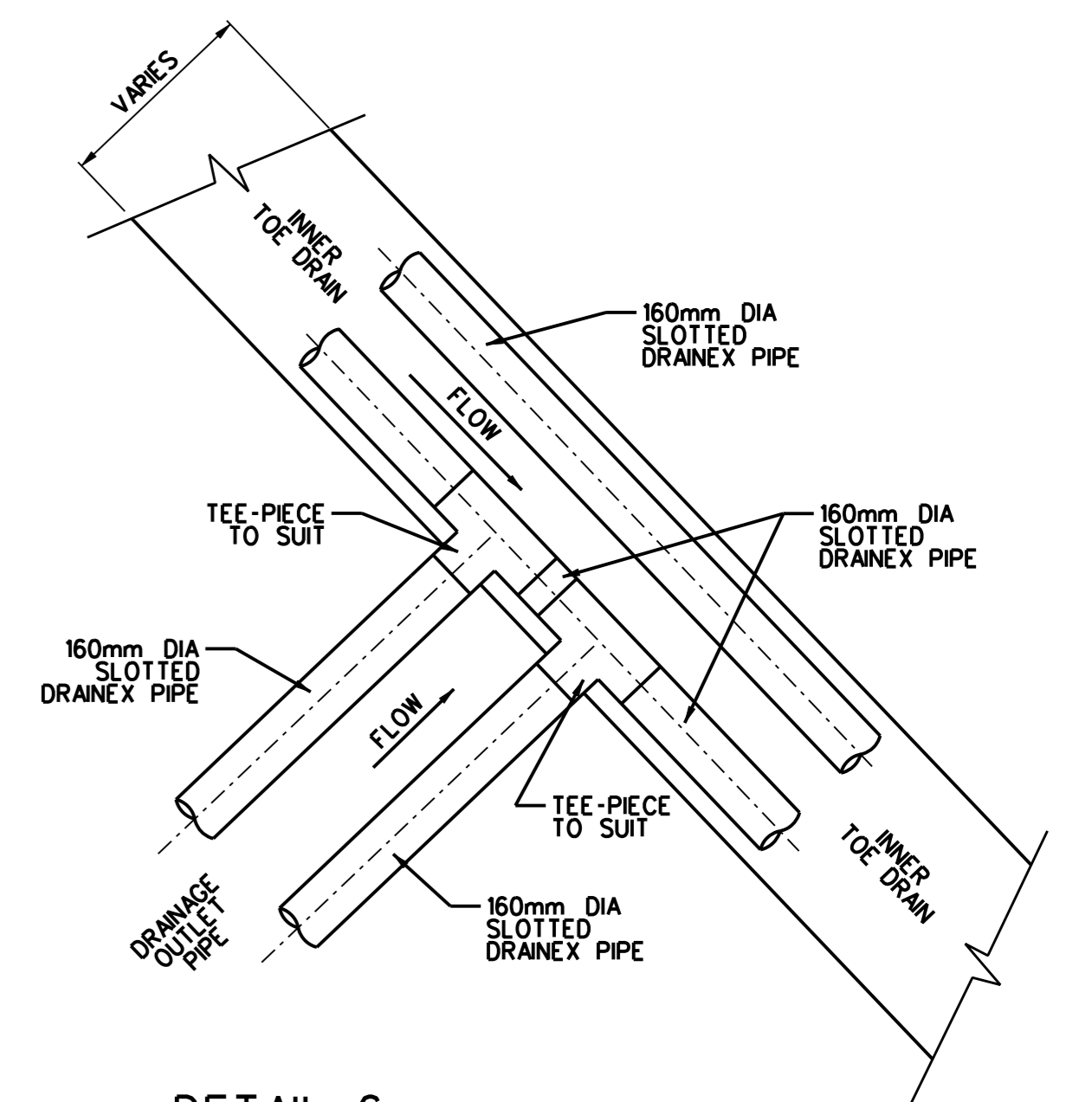
DETAIL 3
SCALE 1:20



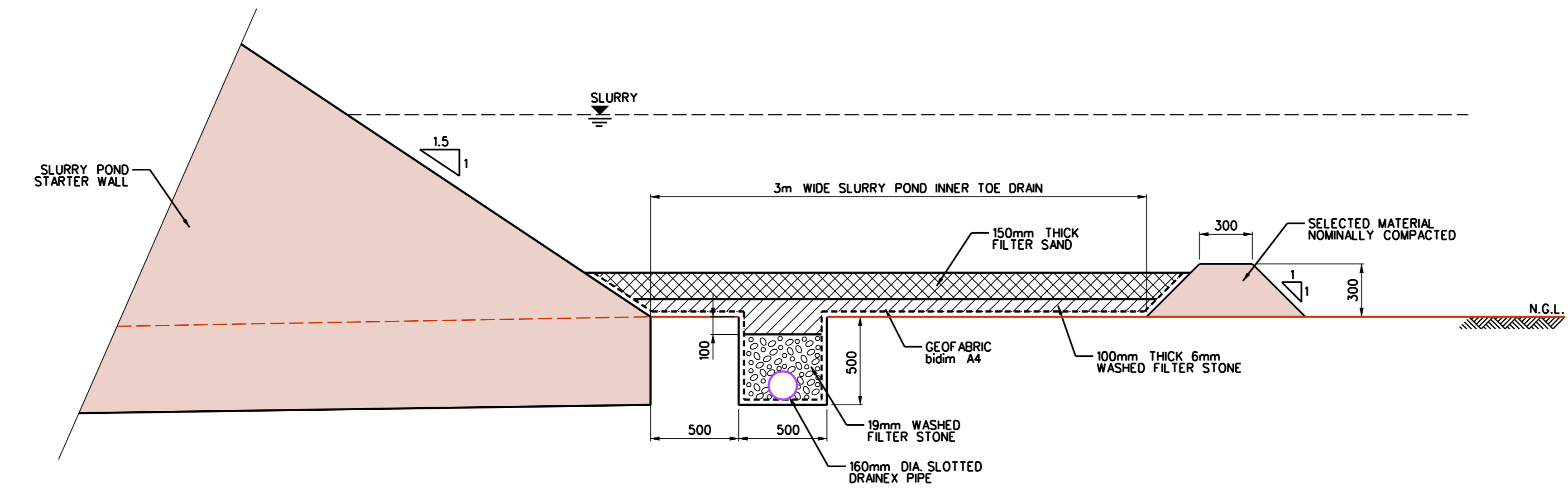
DETAIL 4
SCALE 1:20



DETAIL 5
SCALE 1:20



DETAIL 6
SCALE 1:20



TYPICAL SECTION - SLURRY POND
INNER TOE DRAIN
SCALE 1:20

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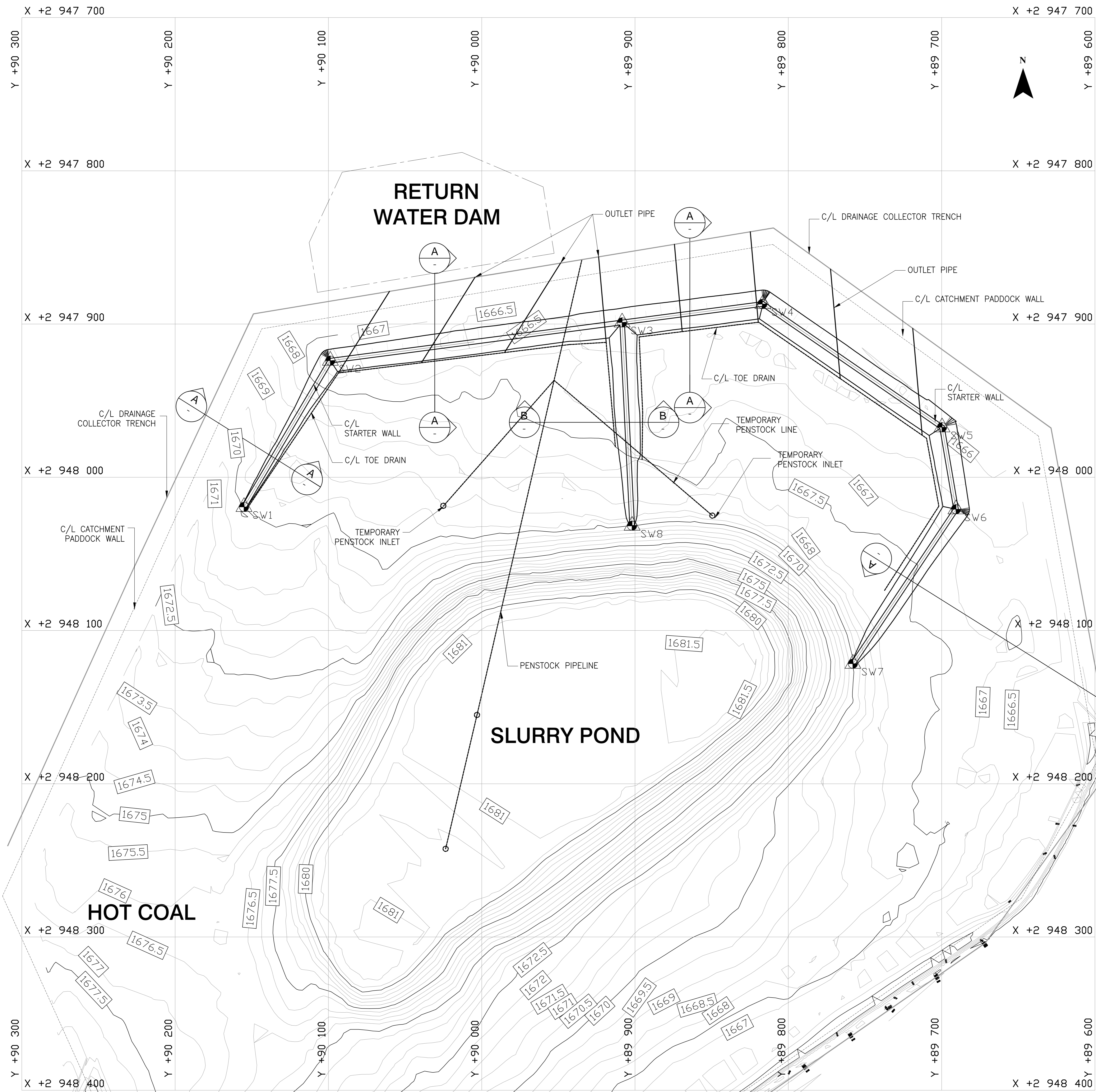
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REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
1	NS/SA	11-05-2009	DRAWING UPDATED	001	GENERAL ARRANGEMENT		
2	NS/SA	13-05-2009	SLURRY POND 2 WALL ALTERED	004	DRAINAGE DETAILS		

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CLIENT BADGER MINING & CONSULTING (PTY) LTD	DESIGNED	BY N.S.	DATE MAY.09
TITLE MOOPLAATS COAL DISCARD DUMP SLURRY PONDS DRAINAGE PIPE DETAILS	DRAWN	S.A.	MAY.09
	CHECKED		
	SCALE	A0:1:20	
	DRAWING No.	T994-015	REVISION 2



COORDINATE LIST		
SETTING OUT COORDINATES		
POINT	Y COORD	X COORD
CONST:		
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SW2	90098.739	2947923.879
SW3	89908.409	2947898.928
SW4	89816.586	2947886.890
SW5	89699.742	2947967.354
SW6	89690.623	2948020.861
SW7	89757.868	2948121.645
SW8	89901.898	2948031.589

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A	MCOO	MOKT	28/07/2011	ISSUED FOR COMMENTS AND APPROVAL

REFERENCE DRAWINGS	
430918/002	TYPICAL SECTIONS AND DETAILS

NOTES

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srk consulting

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265 Oxford Road, Boksburg
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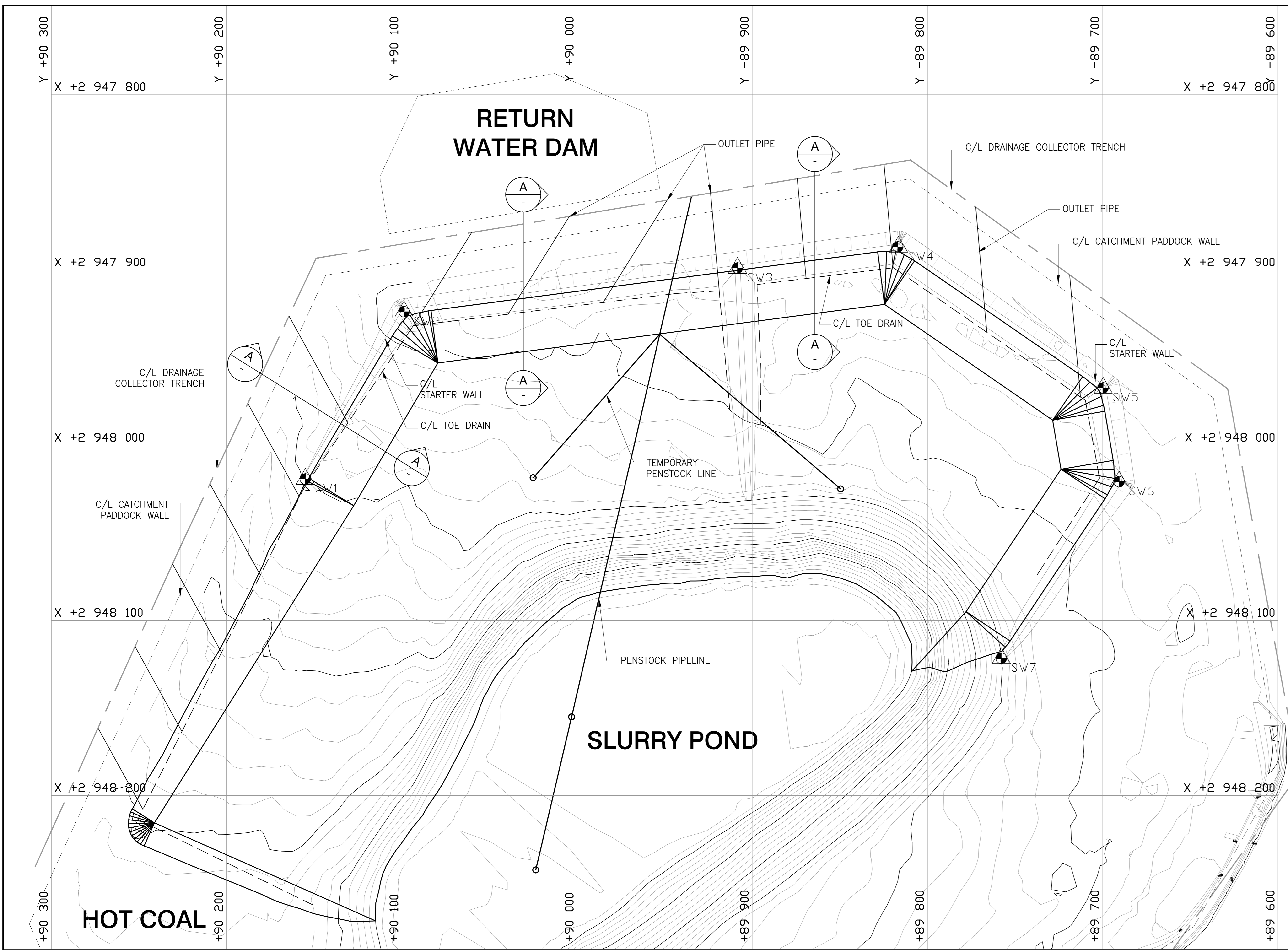
PO Box 50291
Fouriesburg
2116 South Africa

e-Mail: pharisaiburg@srk.co.za
Tel: +27 (0) 11 441 1111
Fax: +27 (0) 11 480 9086

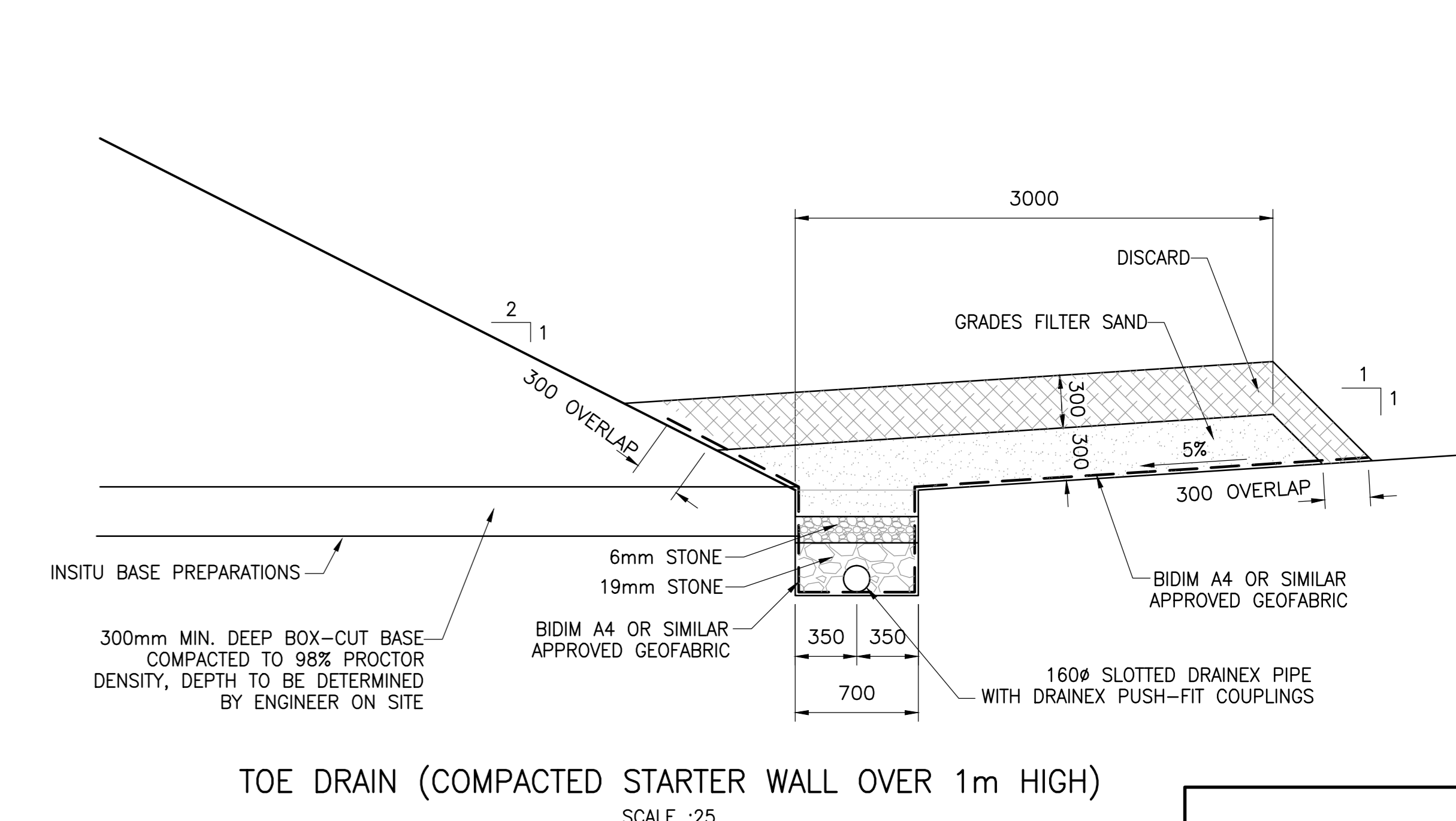
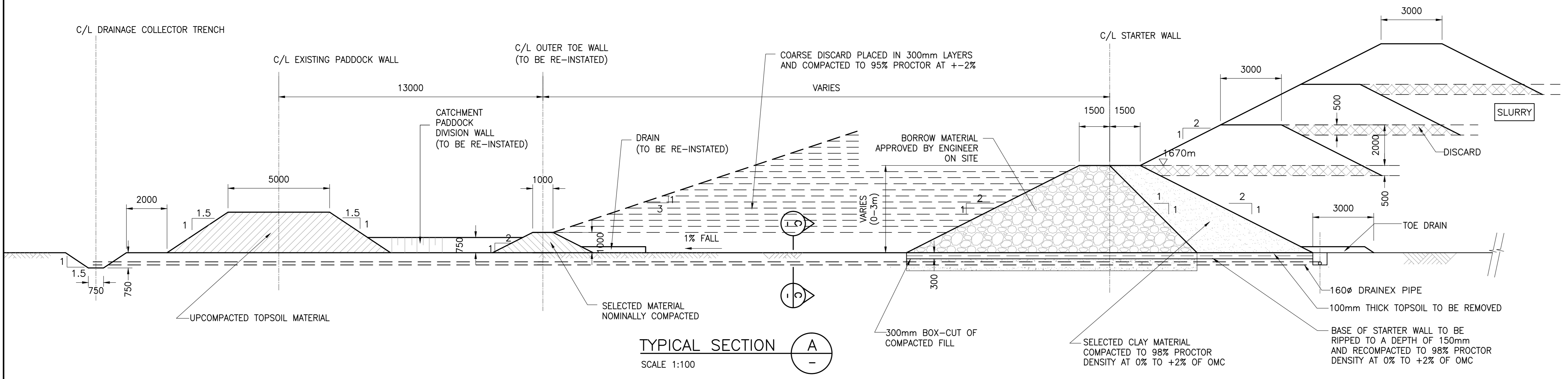
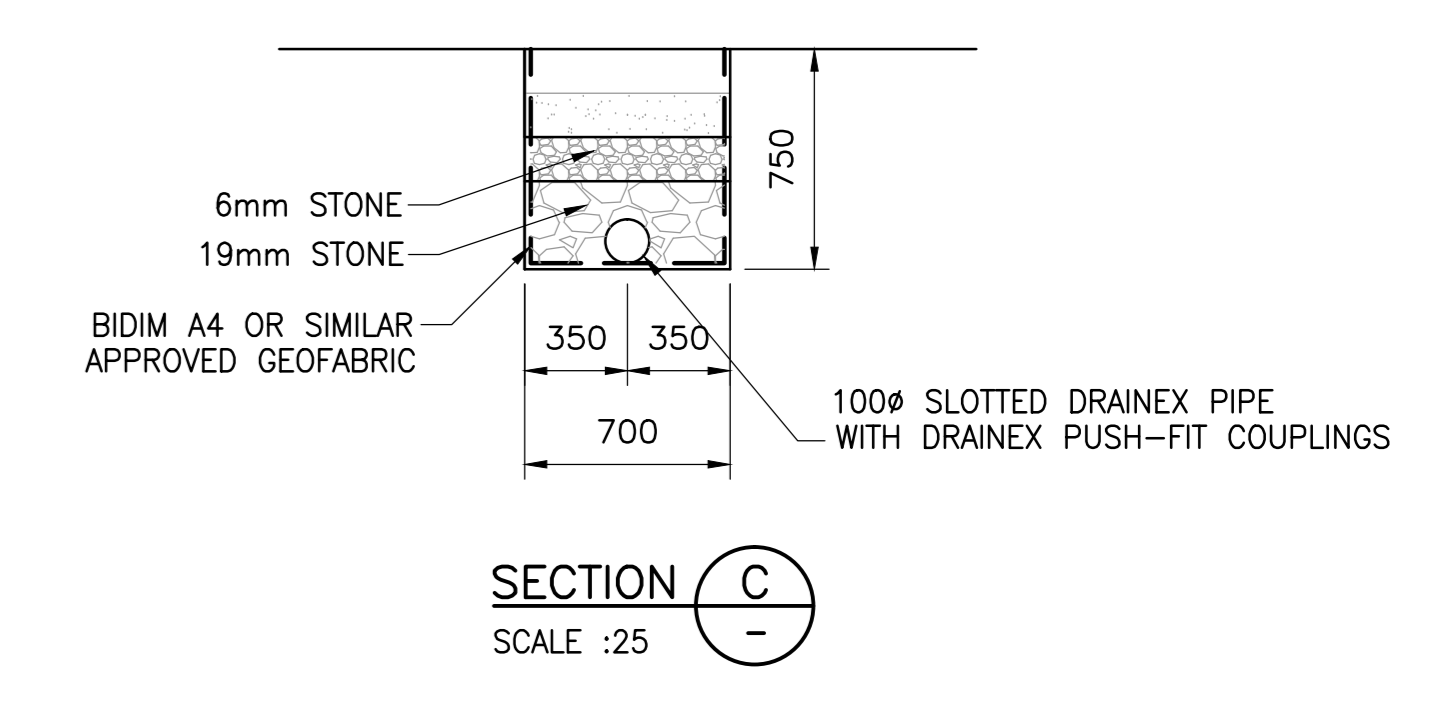
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CONSULTING ENGINEERS

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DESIGNED	MOCKT	DATE	CHECKED
DRAWN	MCOO	28/07/2011	MCOO
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CLIENT		DWG NO.		REV.	
MOOIPLAATS COLLIERY		430918/001		A	



COORDINATE LIST		
SETTING OUT COORDINATES		
POINT	Y COORD	X COORD
CONST:		
SW1	90154.859	2948019.010
SW2	90098.739	2947923.879
SW3	89908.409	2947898.928
SW4	89816.586	2947886.890
SW5	89699.742	2947967.354
SW6	89690.623	2948020.861
SW7	89757.868	2948121.645



DO NOT SCALE

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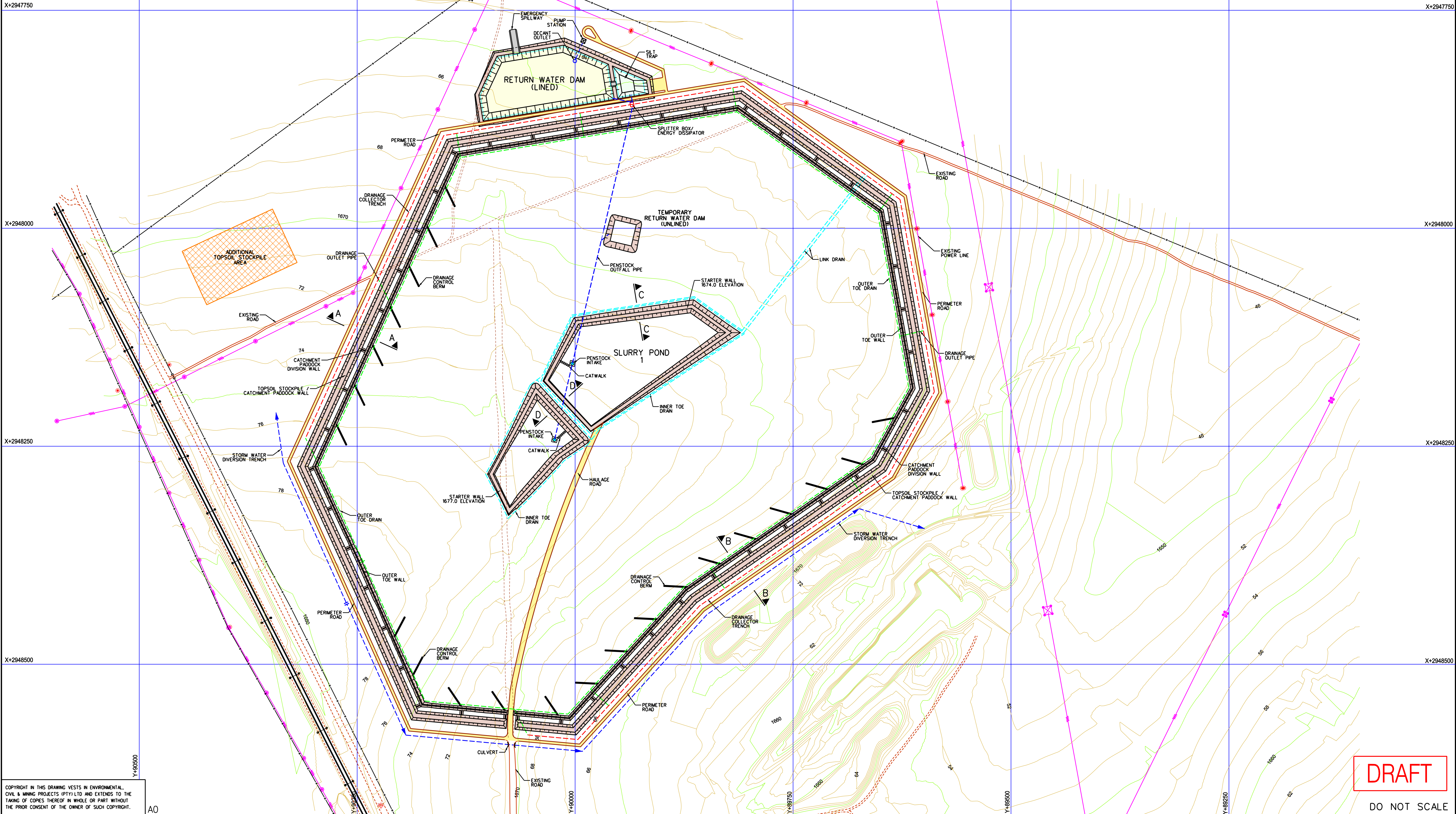
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Fouriesburg
2116 South Africa

www.srk.co.za

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		28/07/2011	
CLIENT			
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MCCO			
DATE			
28/07/2011			
SCALE			
1:1000			
DWG NO.			
430918/103			
REV.			
A			

TITLE
MOOIPLAATS COLIERY
CONTINUATION REPORT
GENERAL ARRANGEMENT
SHOWING DAM DEVELOPMENT



DRAFT

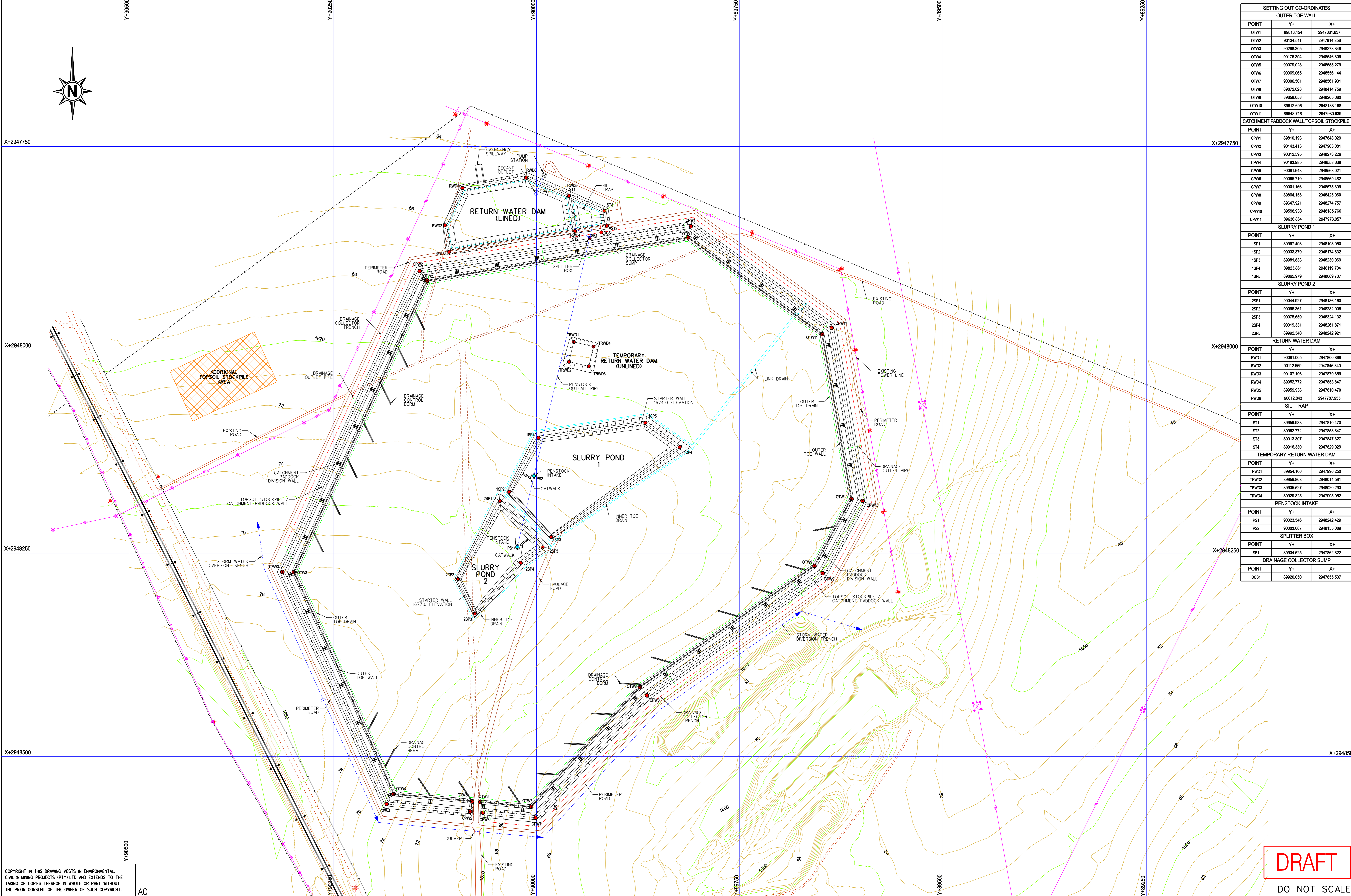
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REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
B	NS	01-04-09	DUMP FOOTPRINT ADJUSTED TO SUIT POWER LINES	002	SETTING OUT CO-ORDINATES	008	PENSTOCK OUTFALL PIPELINE DETAILS
				003	EARTHWORKS SECTIONS & DETAILS	009	CATWALK DETAILS
				004	DRAINAGE DETAILS	010	DRAINAGE PIPE DETAILS
				005	RETURN WATER DAM & SILT TRAP LAYOUT		
				006	RETURN WATER DAM & SILT TRAP DETAILS		
				007	RETURN WATER DAM SPILLWAY & TEMPORARY RETURN WATER DAM DETAILS		

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CLIENT BADGER MINING & CONSULTING (PTY) LTD		BY	DATE
TITLE MOOIPLAATS COAL DISCARD DUMP GENERAL ARRANGEMENT		N.S.	MAR.09
DESIGNED	DRAWN	S.A.	MAR.09
CHECKED			
SCALE 1:1500	DRAWING No.	REVISION	
	T994-001	B	



SETTING OUT CO-ORDINATES		
OUTER TOE WALL		
POINT	Y+	X+
OTW1	89813.454	2947861.837
OTW2	90134.511	2947914.856
OTW3	90298.305	2948273.348
OTW4	90175.394	2948546.309
OTW5	90079.028	2948555.279
OTW6	90069.065	2948556.144
OTW7	90006.501	2948561.931
OTW8	89872.628	2948414.759
OTW9	89658.058	2948265.880
OTW10	89612.606	2948183.168
OTW11	89648.718	2947980.639
CATCHMENT PADDOCK WALL/TOPSOIL STOCKPILE		
POINT	Y+	X+
CPW1	89810.193	2947848.029
CPW2	90143.413	2947903.081
CPW3	90312.595	2948273.228
CPW4	90183.985	2948558.638
CPW5	90081.643	2948568.021
CPW6	90065.710	2948569.482
CPW7	90001.186	2948575.399
CPW8	89864.153	2948425.060
CPW9	89647.921	2948274.757
CPW10	89598.938	2948185.766
CPW11	89636.864	2947973.057
SLURRY POND 1		
POINT	Y+	X+
1SP1	89997.493	2948108.050
1SP2	90033.379	2948174.632
1SP3	89981.833	2948230.069
1SP4	89823.861	2948119.704
1SP5	89865.979	2948089.707
SLURRY POND 2		
POINT	Y+	X+
2SP1	90044.927	2948186.180
2SP2	90096.361	2948282.005
2SP3	90075.659	2948324.132
2SP4	90019.331	2948261.871
2SP5	89992.340	2948242.921
RETURN WATER DAM		
POINT	Y+	X+
RWD1	90091.005	2947800.869
RWD2	90112.569	2947848.840
RWD3	90107.196	2947878.359
RWD4	89952.772	2947853.847
RWD5	89959.936	2947810.470
RWD6	90012.843	2947787.955
SILT TRAP		
POINT	Y+	X+
ST1	89959.938	2947810.470
ST2	89952.772	2947853.847
ST3	89913.307	2947847.327
ST4	89916.330	2947829.029
TEMPORARY RETURN WATER DAM		
POINT	Y+	X+
TRWD1	89954.166	2947990.250
TRWD2	89959.888	2948014.591
TRWD3	89935.527	2948020.283
TRWD4	89929.825	2947995.962
PENSTOCK INTAKE		
POINT	Y+	X+
PS1	90023.546	2948242.429
PS2	90003.087	2948155.089
SPLITTER BOX		
POINT	Y+	X+
SBI	89934.625	2947862.822
DRAINAGE COLLECTOR SUMP		
POINT	Y+	X+
DCS1	89920.050	2947855.537

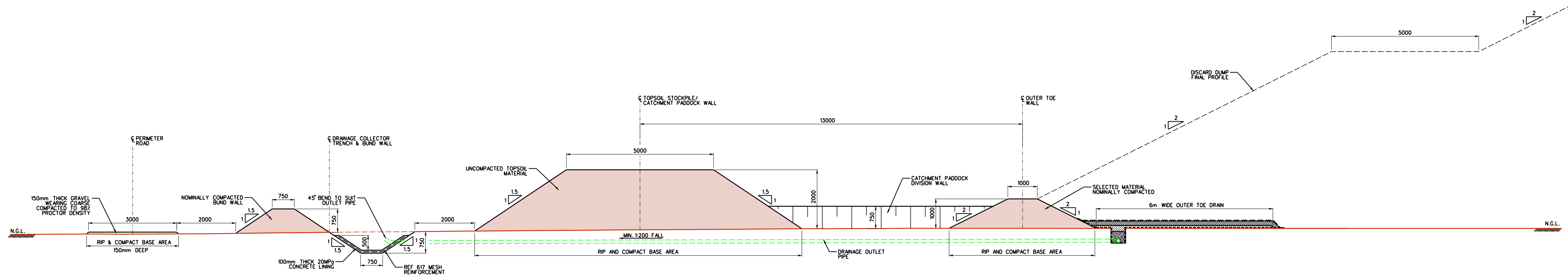
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REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
B	NS	02-04-09	DUMP FOOTPRINT ADJUSTED TO SUIT POWER LINES	001	GENERAL ARRANGEMENT		

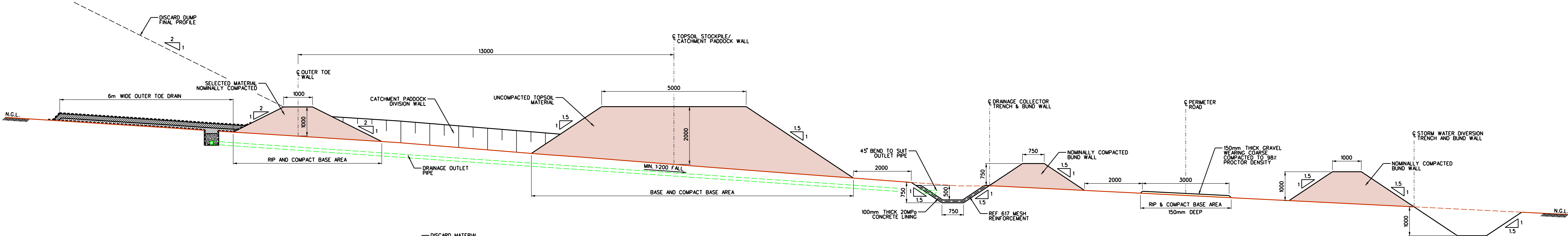
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CLIENT BADGER MINING & CONSULTING (PTY) LTD	BY N.S.	DATE MAR.09
TITLE MOOPLAATS COAL DISCARD DUMP SETTING OUT CO-ORDINATES	DRAWN S.A.	MAR.09
SCALE 1:1500	CHECKED	REVISION B
DRAWING No. T994-002		

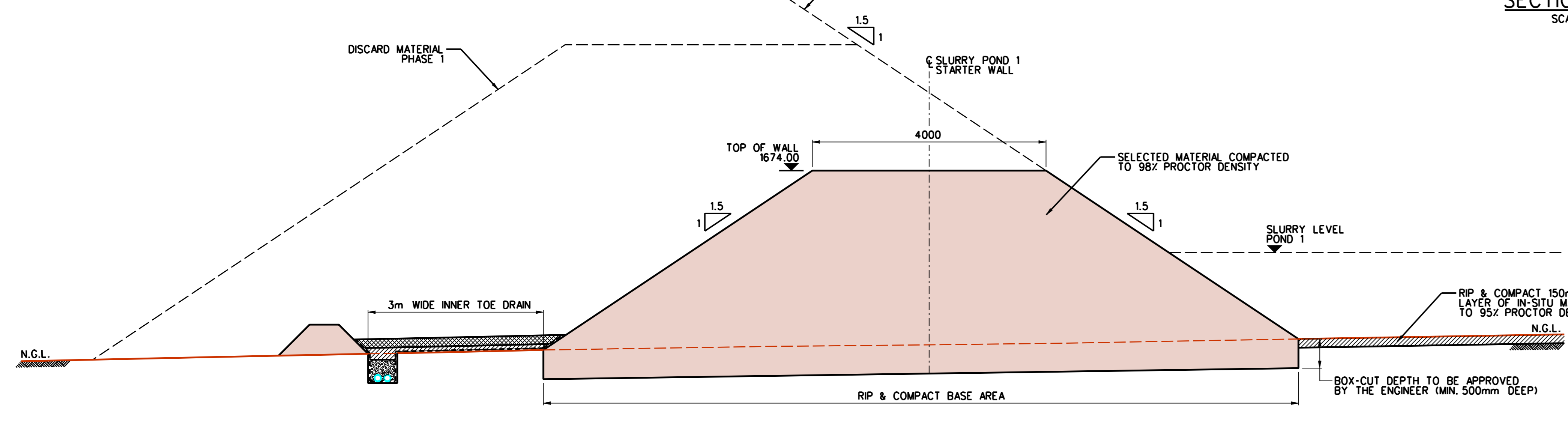
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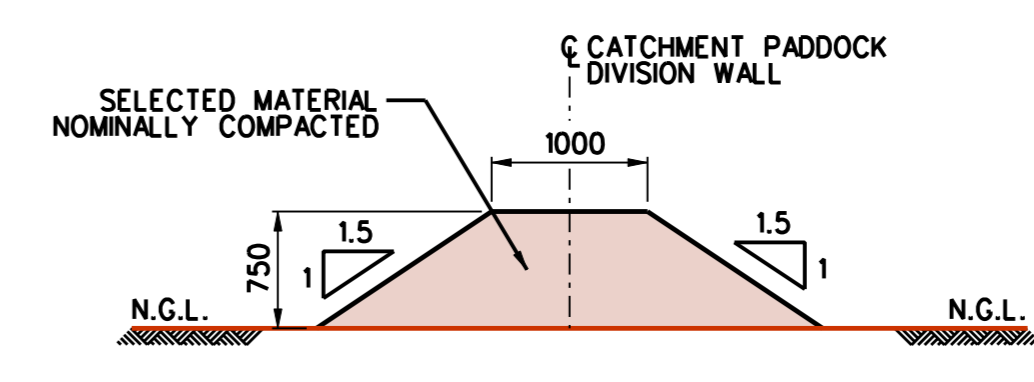
SECTION A - A
SCALE 1:50



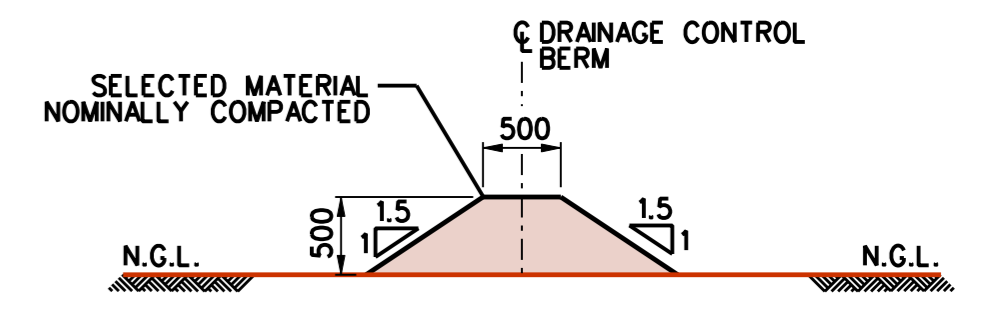
SECTION B - B
SCALE 1:50



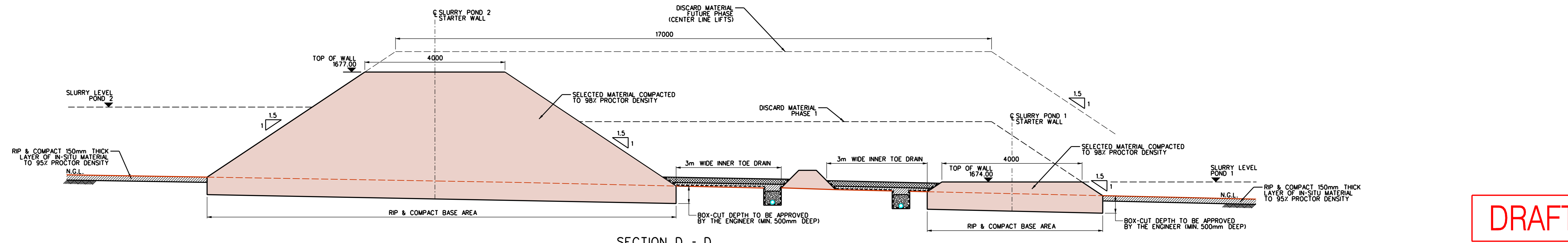
SECTION C - C
SLURRY POND 1 STARTER WALL
SCALE 1:50



TYPICAL SECTION - CATCHMENT Paddock DIVISION WALL
SCALE 1:50



TYPICAL SECTION - DRAINAGE CONTROL BERM
SCALE 1:50



SECTION D - D
SCALE 1:50

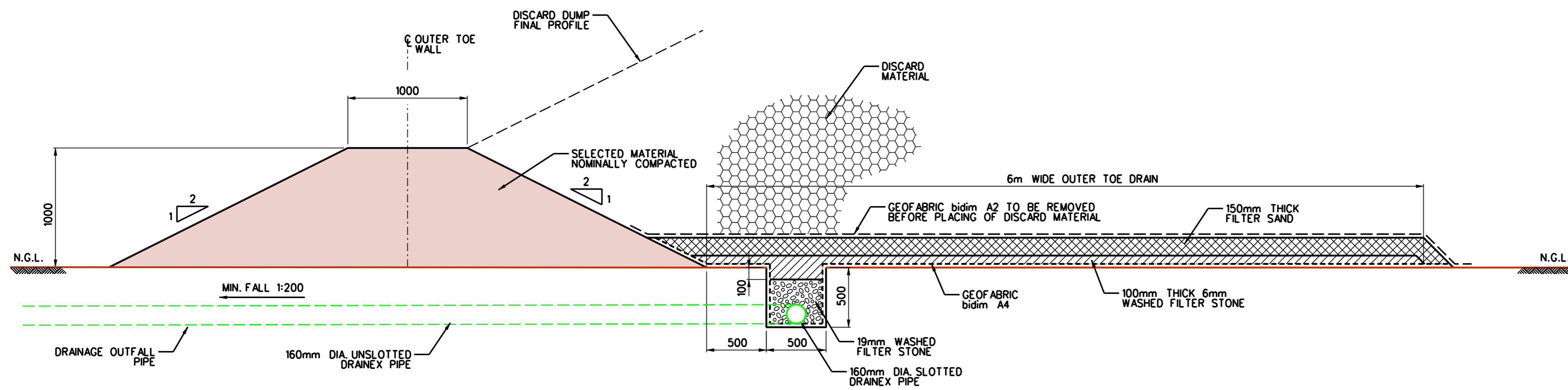
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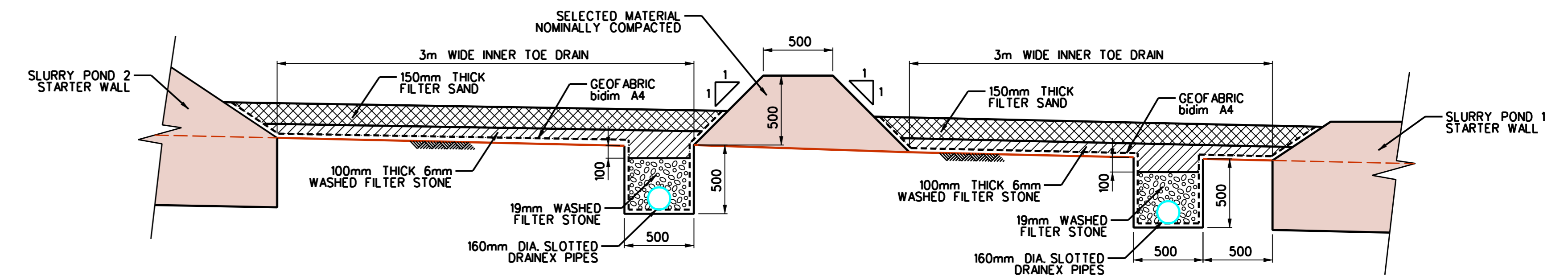
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B	NS	02-04-09	DETAILS ADDED	001	GENERAL ARRANGEMENT		
				004	DRAINAGE DETAILS		

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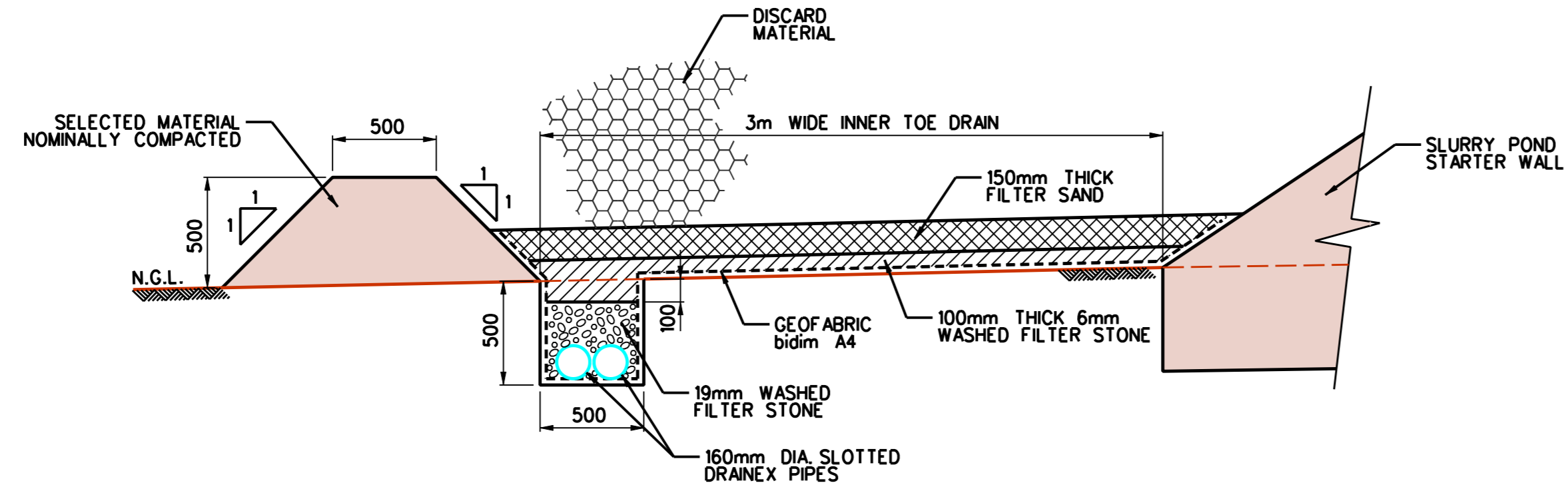
CLIENT	BADGER MINING & CONSULTING (PTY) LTD	BY	N.S.	DATE	MAR.09
TITLE	MOOIPLAATS COAL DISCARD DUMP EARTHWORKS SECTIONS & DETAILS	DRAWN	N.S.	REVISION	B
SCALE	A0-1:50	CHECKED			
DRAWING No.	T994-003				



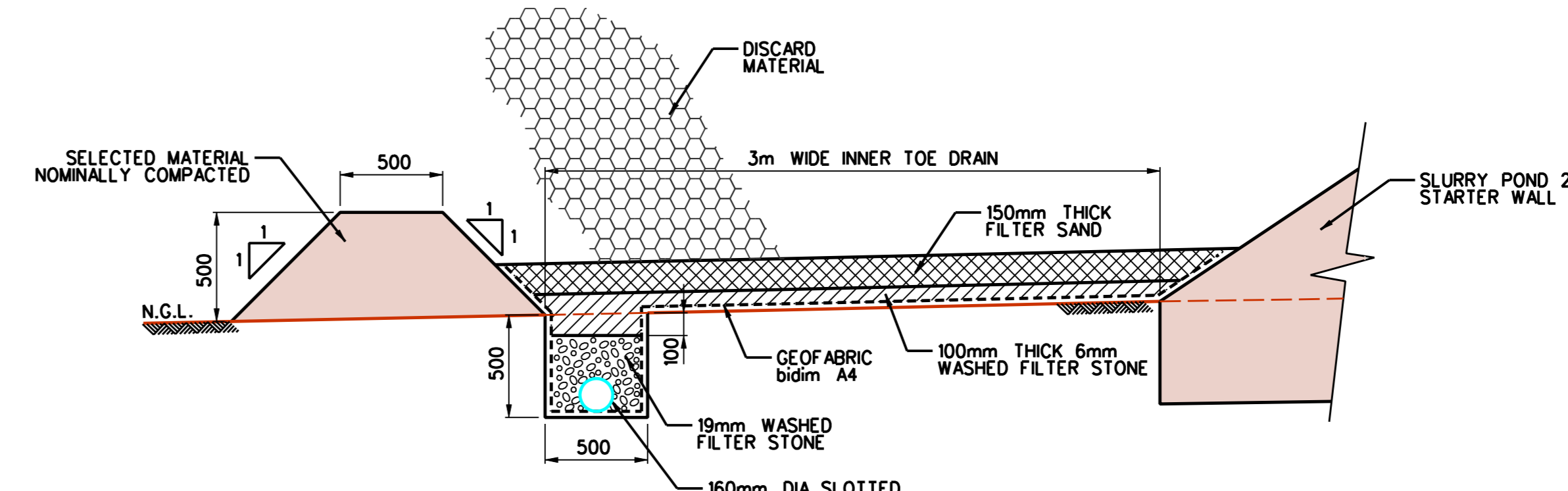
SECTION - OUTER TOE DRAIN
SCALE 1:25



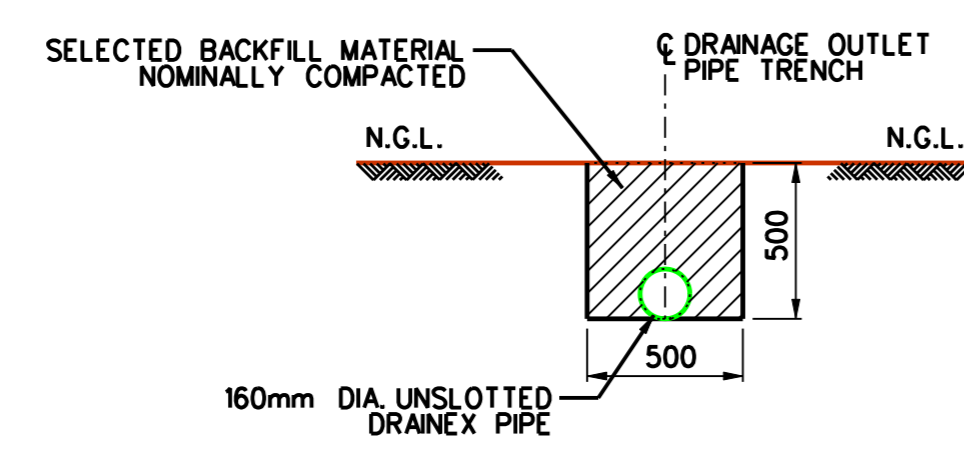
SECTION - INNER TOE DRAINS BETWEEN
SLURRY POND 1 & 2
SCALE 1:25



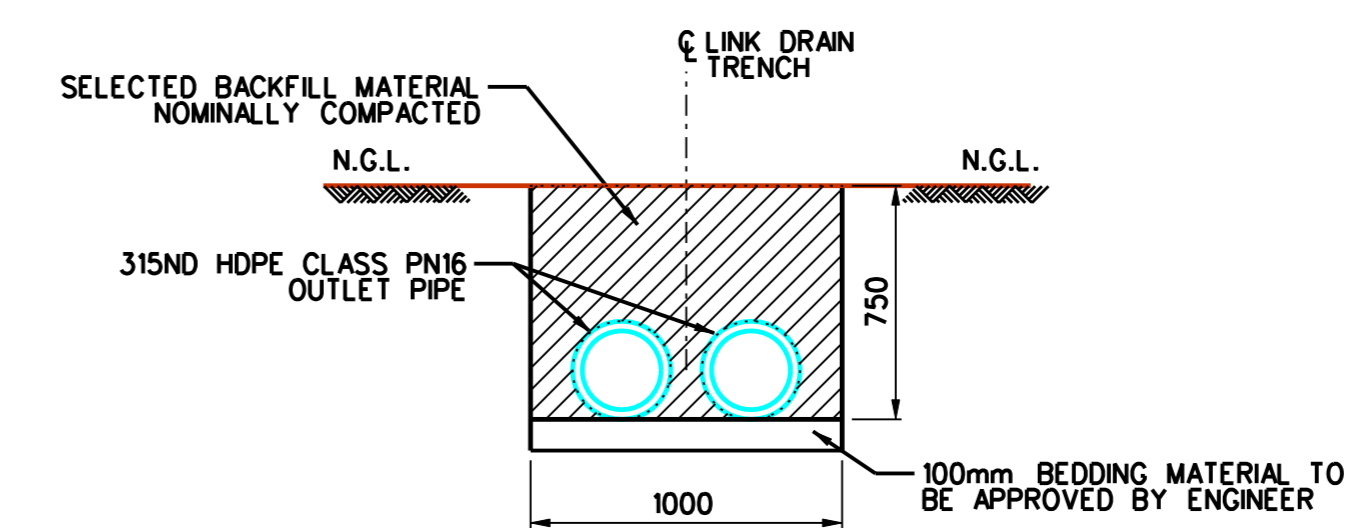
SECTION - INNER TOE DRAIN ALONG
SLURRY POND 1 PERIMETER
SCALE 1:25



SECTION - INNER TOE DRAIN ALONG
SLURRY POND 2 PERIMETER
SCALE 1:25



SECTION - DRAINAGE OUTLET PIPE
SCALE 1:25



SECTION - LINK DRAIN
SCALE 1:25

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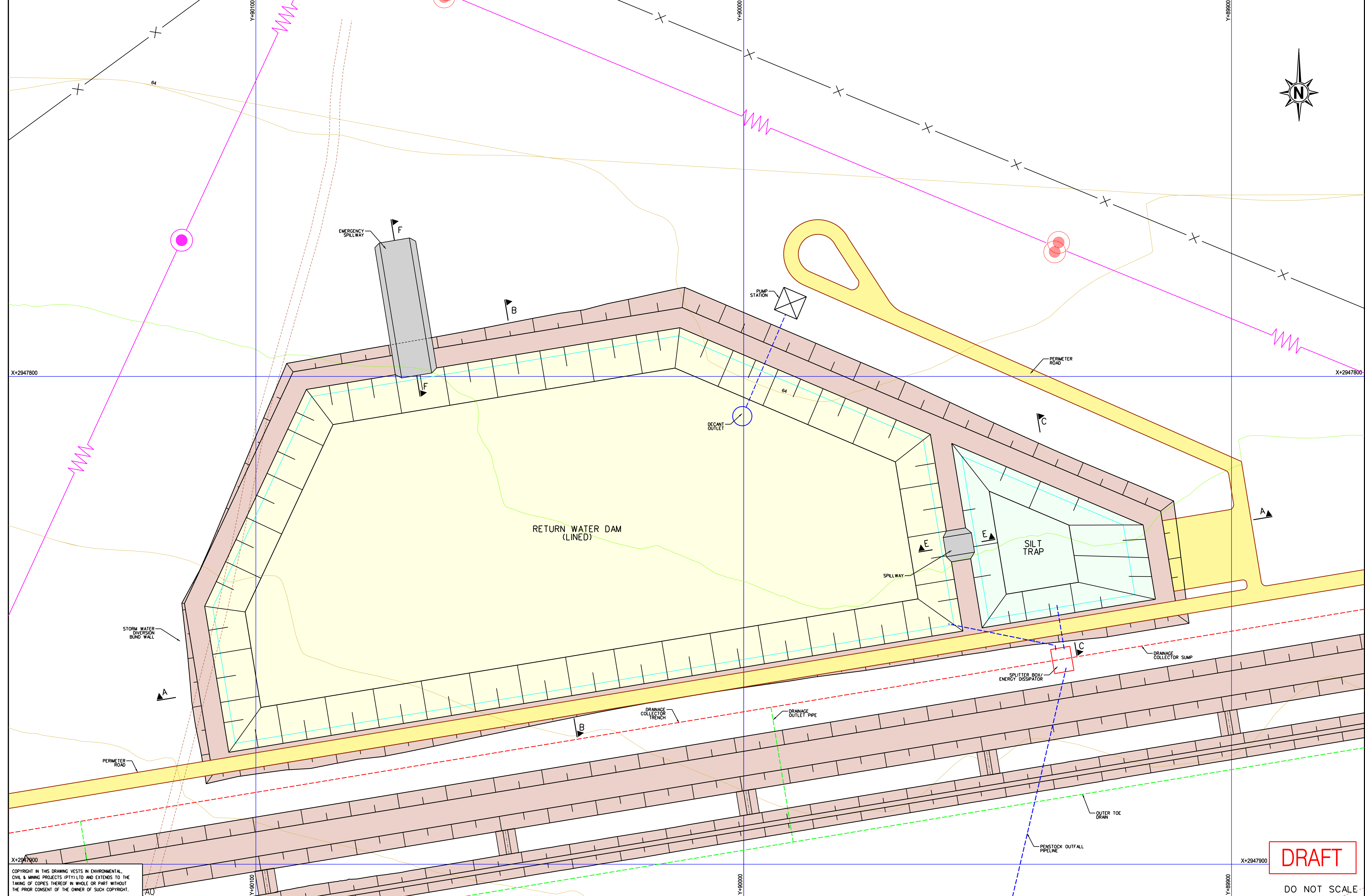
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REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
-	-	-	-	001	GENERAL ARRANGEMENT		
				003	EARTHWORKS & DETAILS		
				010	DRAINAGE PIPE DETAILS		

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CLIENT	BADGER MINING & CONSULTING (PTY) LTD	DESIGNED	N.S.	DATE	APR.09
TITLE	MOOPLAATS COAL DISCARD DUMP DRAINAGE DETAILS	DRAWN	N.S.	DATE	APR.09
CHECKED		SCALE	A0:1:25	REVISION	
DRAWING No.	T994-004				A

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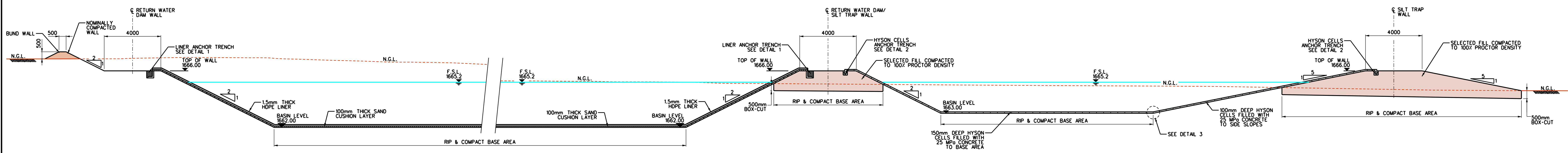
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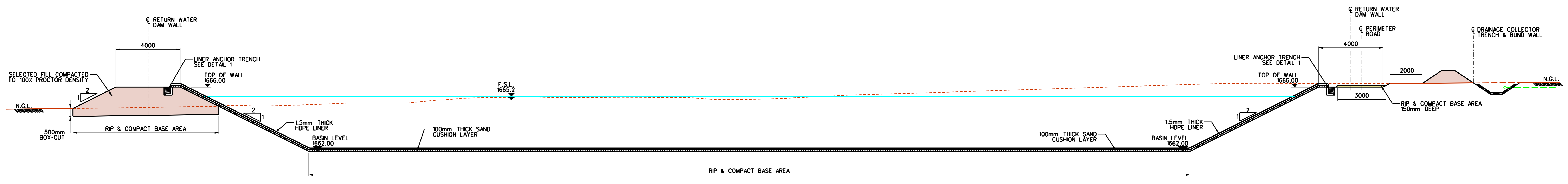
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				006	RETURN WATER DAM & SILT TRAP DETAILS		
				007	RETURN WATER DAM SPILLWAY & TEMPORARY RETURN WATER DAM DETAILS		

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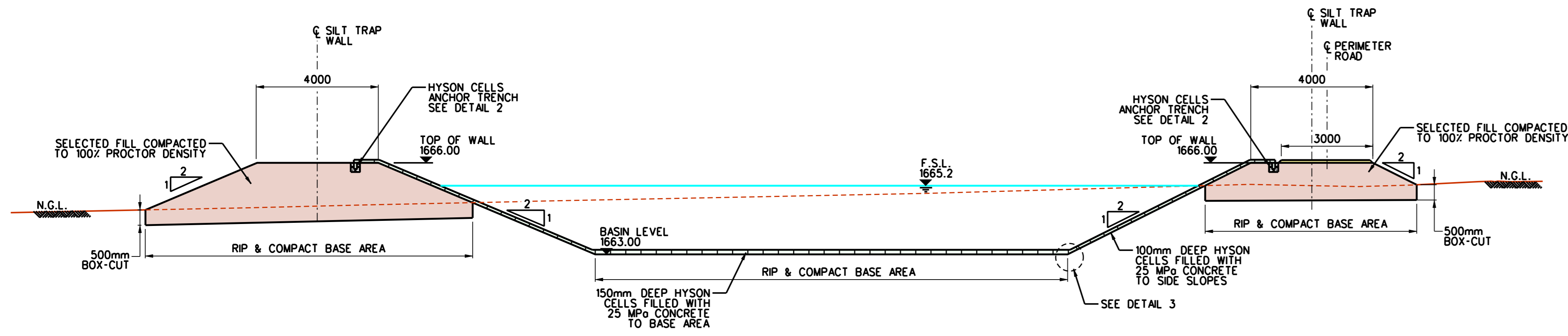
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TITLE	MOOPLAATS COAL DISCARD DUMP RETURN WATER DAM AND SILT TRAP LAYOUT	DRAWN	S.A.	REVISION	
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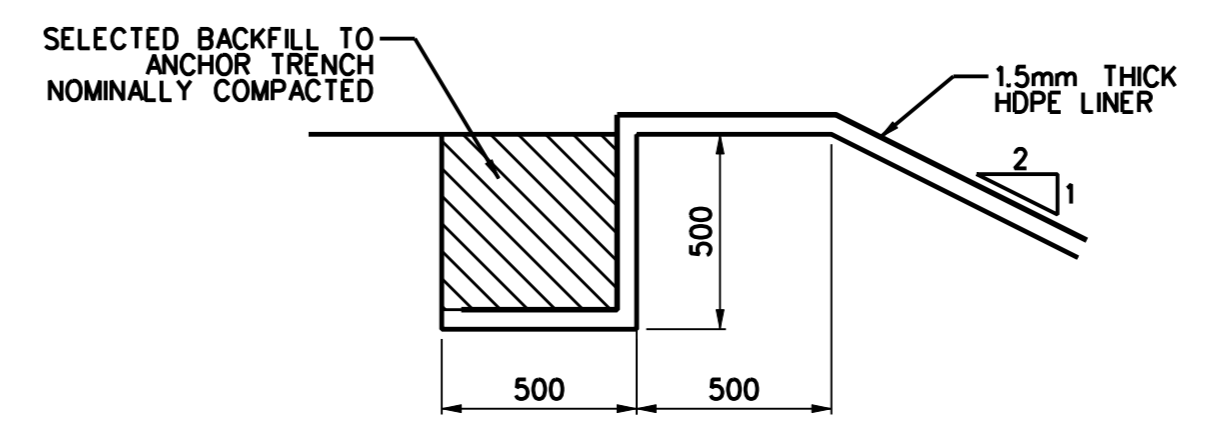
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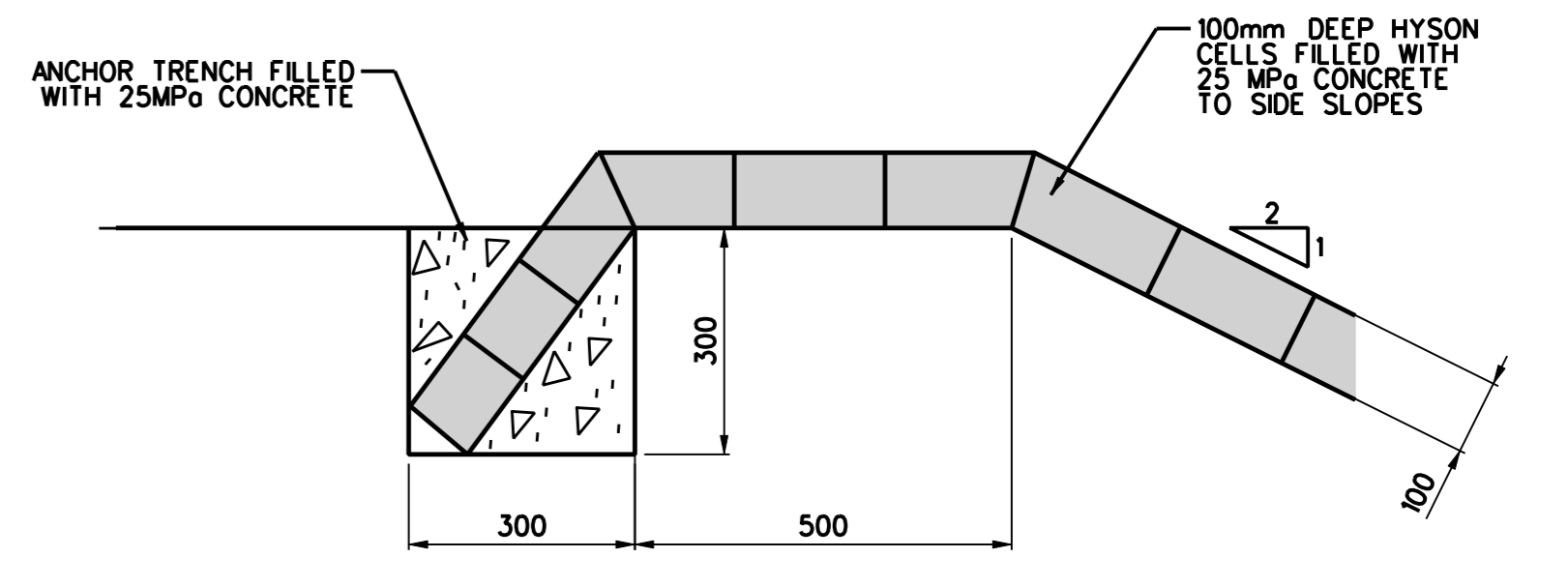
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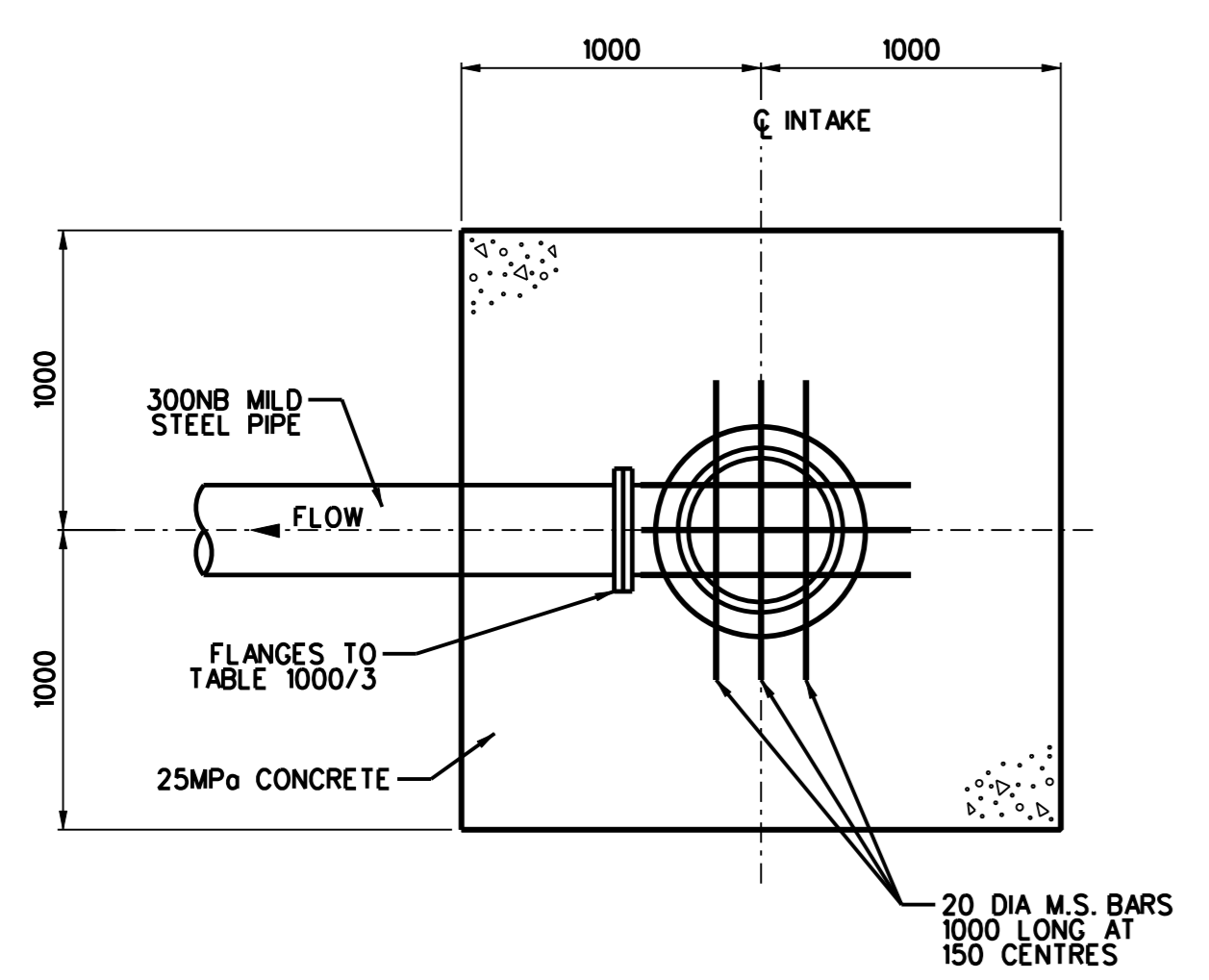
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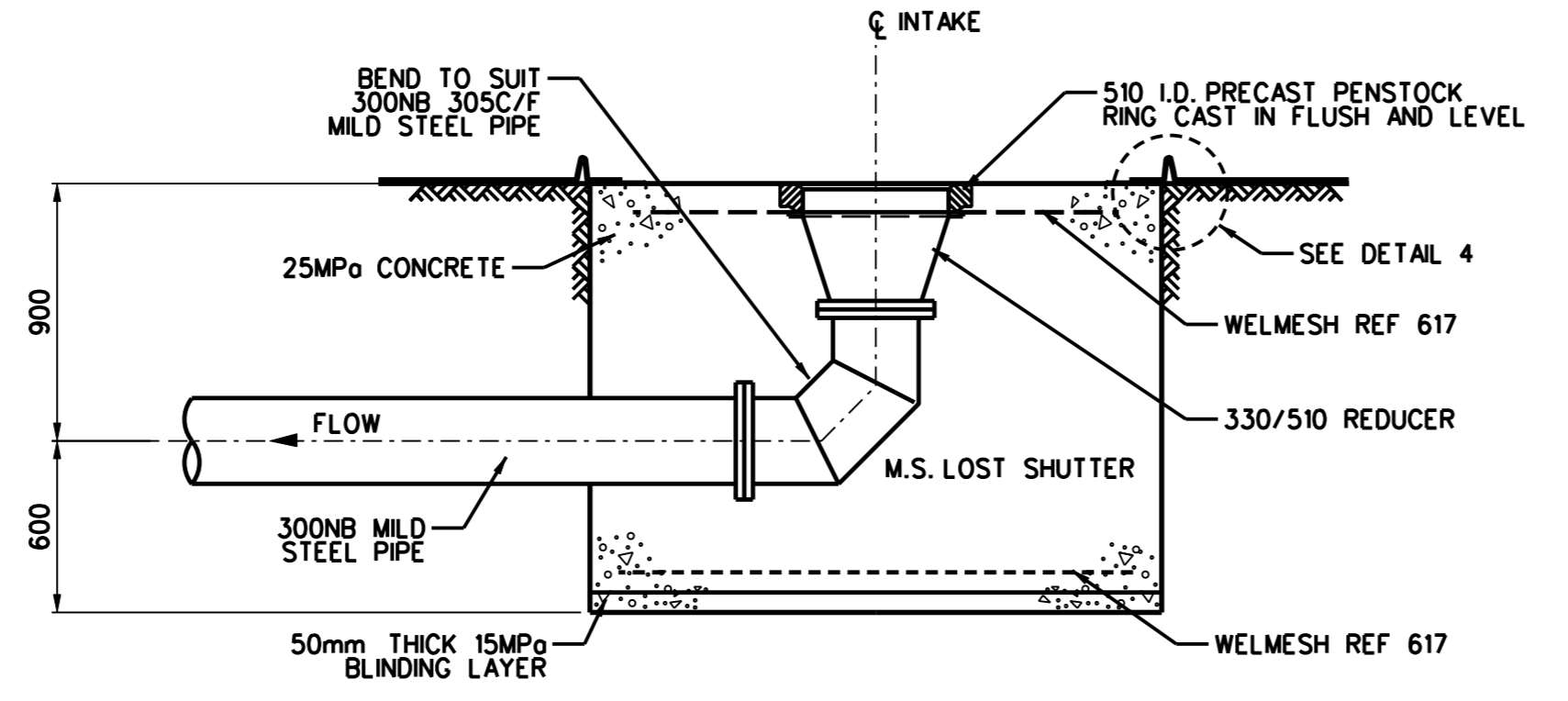
DETAIL 1
SCALE 1:20



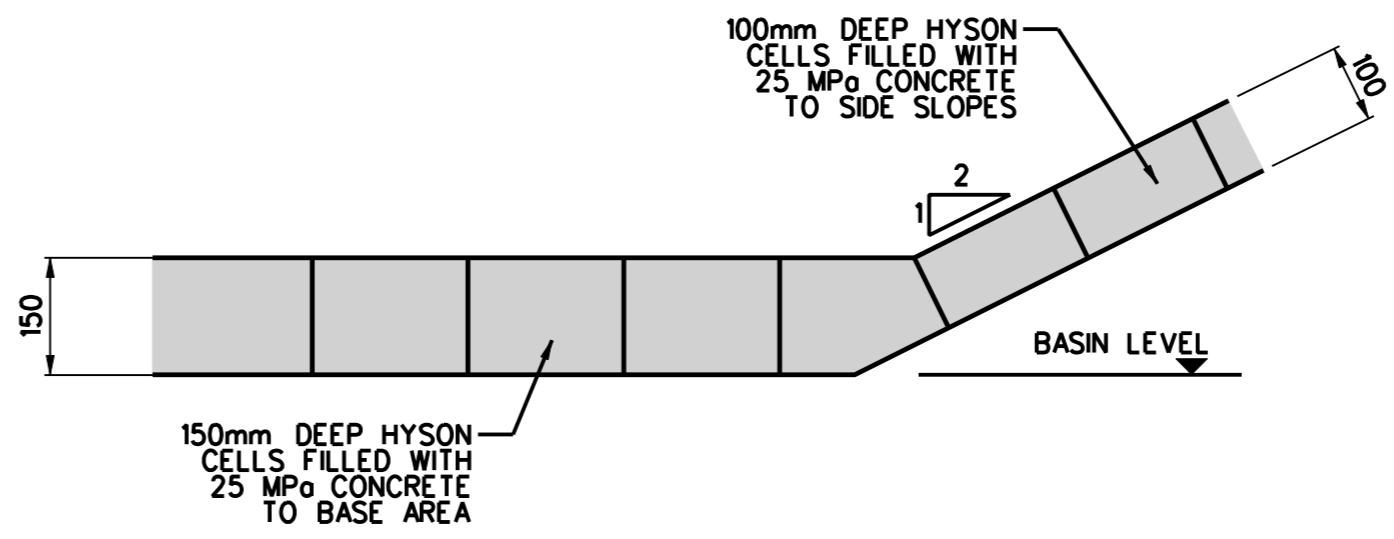
DETAIL 2
SCALE 1:10



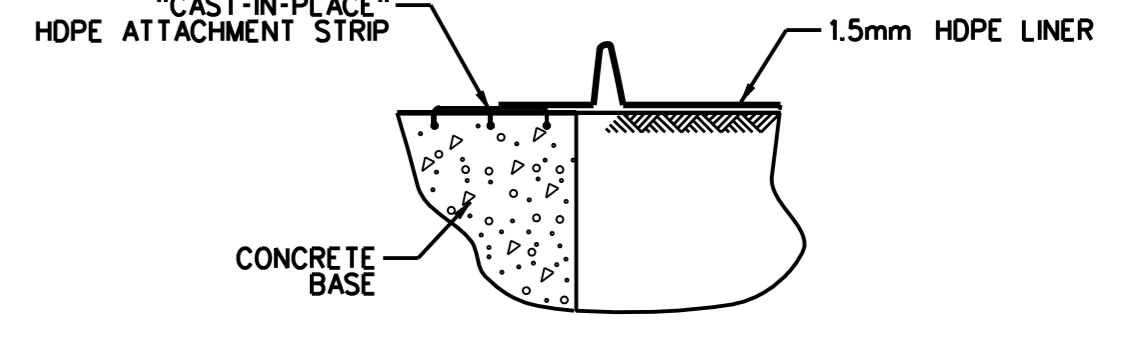
PLAN
RETURN WATER DAM DECANT OUTLET STRUCTURE
SCALE 1:25



SECTION
RETURN WATER DAM DECANT OUTLET STRUCTURE
SCALE 1:25



DETAIL 3
SCALE 1:10



DETAIL 4
N.T.S.

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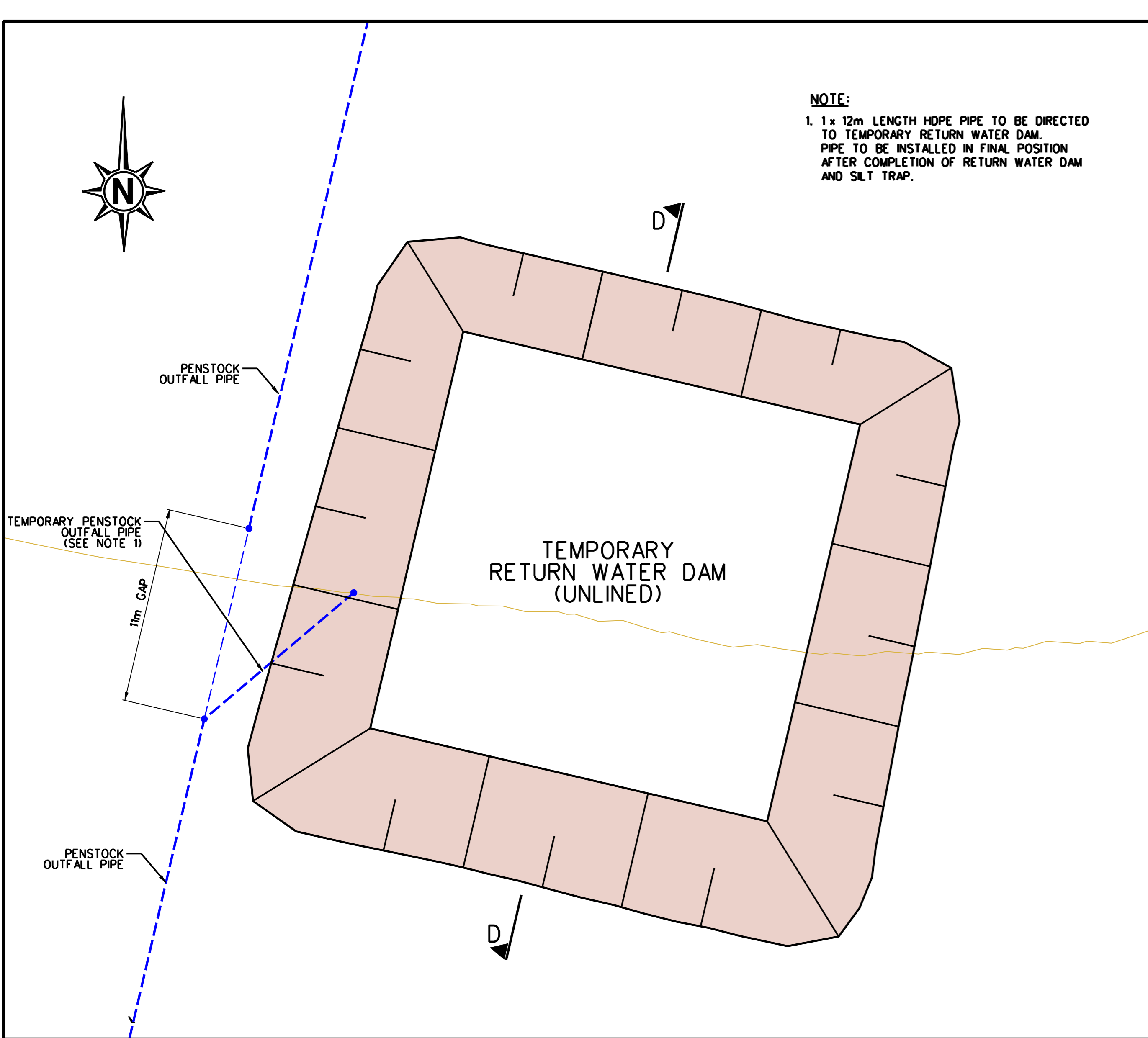
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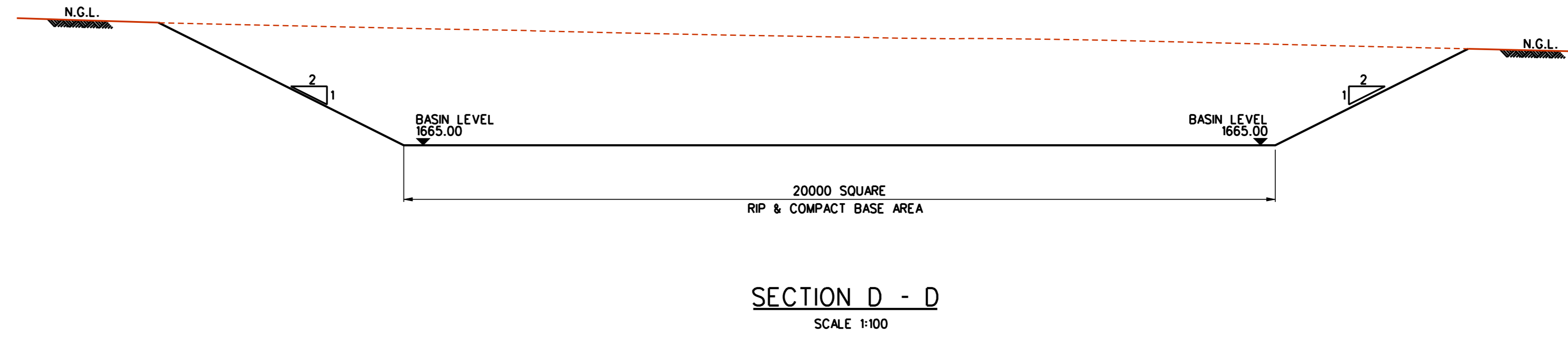
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				001	GENERAL ARRANGEMENT		
				005	RETURN WATER DAM & SILT TRAP LAYOUT		
				007	RETURN WATER DAM SPILLWAY & TEMPORARY RETURN WATER DAM DETAILS		

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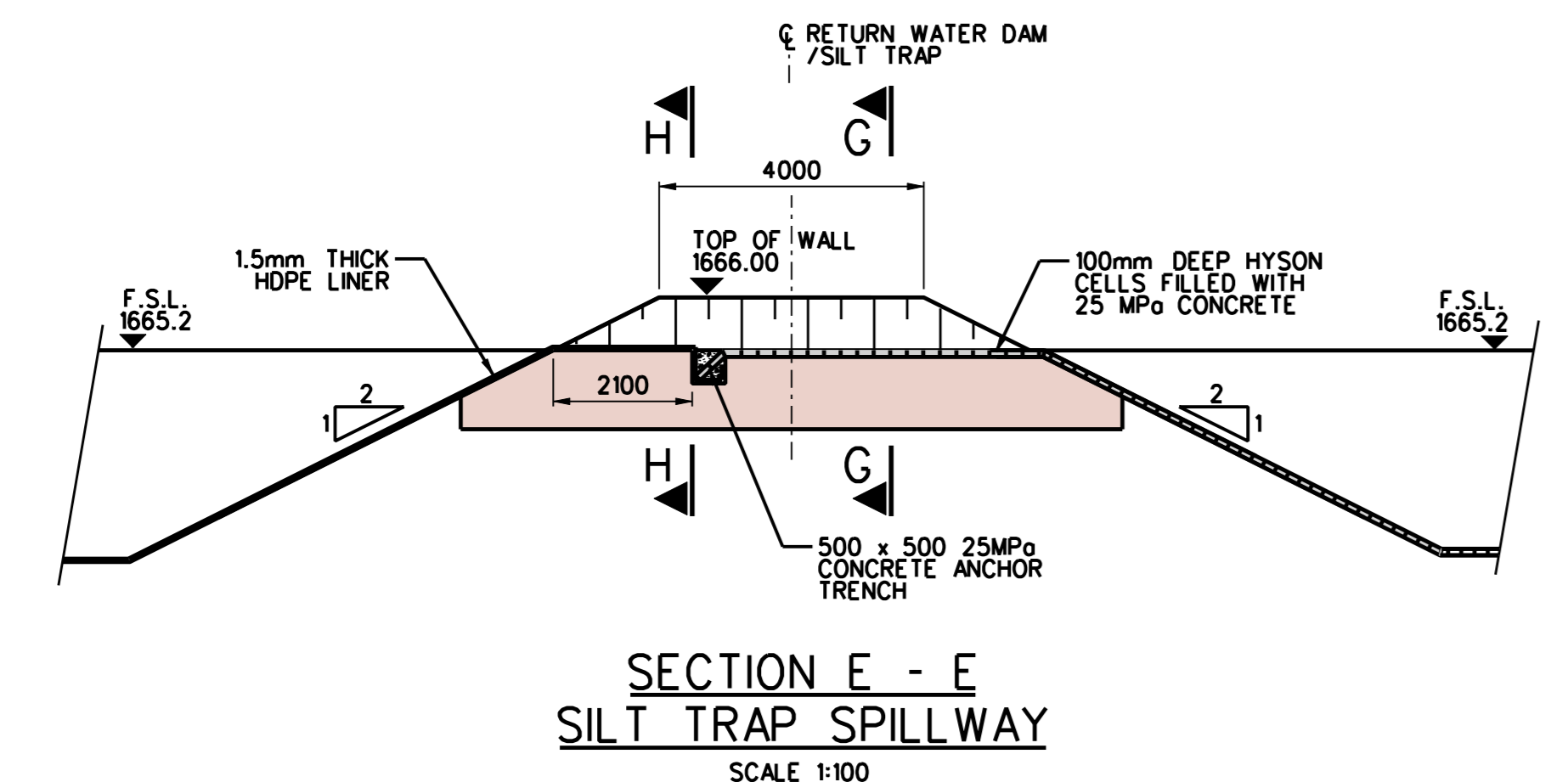
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TITLE MOOPLAATS COAL DISCARD DUMP RETURN WATER DAM AND SILT TRAP DETAILS	DRAWN S.A.	APR.09
	CHECKED	
	SCALE AS SHOWN	
DRAWING No. T994-006	REVISION A	



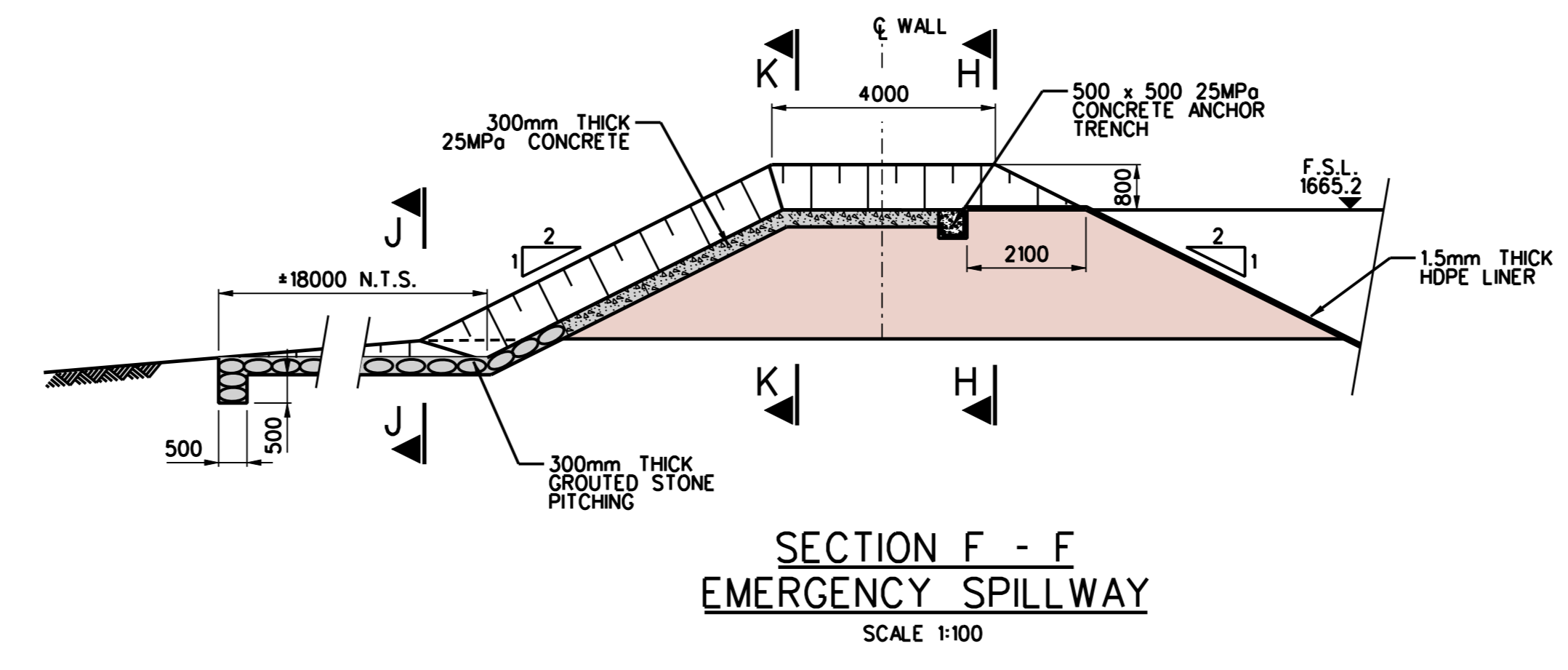
PLAN
TEMPORARY RETURN WATER DAM (UNLINED)
SCALE 1:200



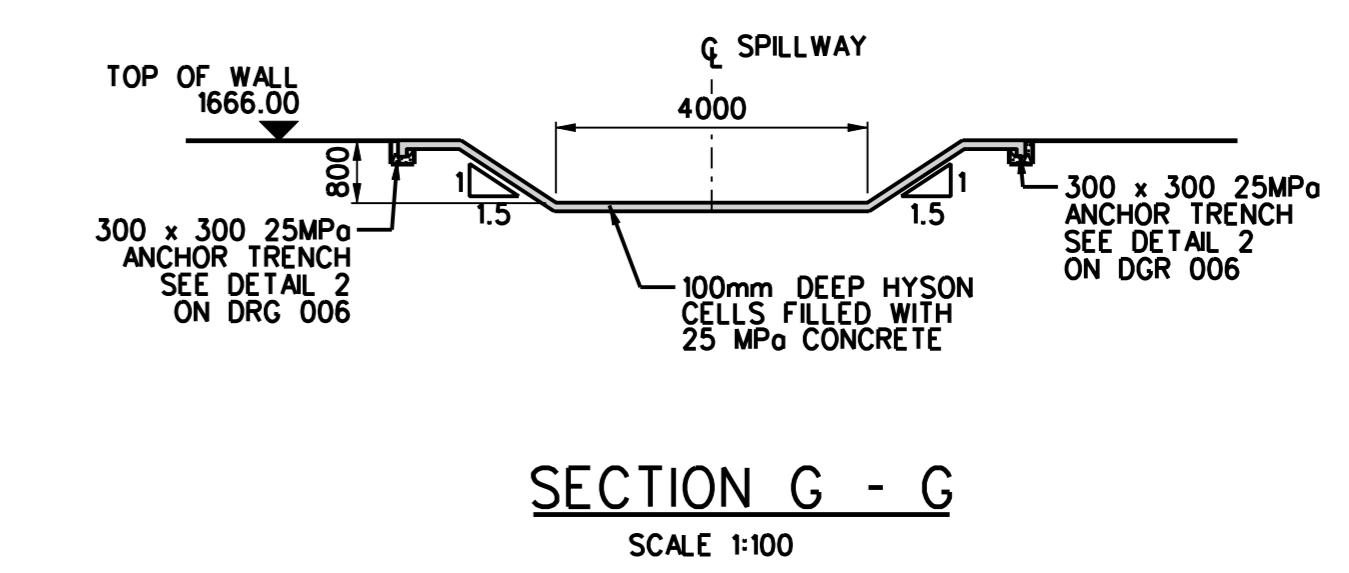
SECTION D - D
SCALE 1:100



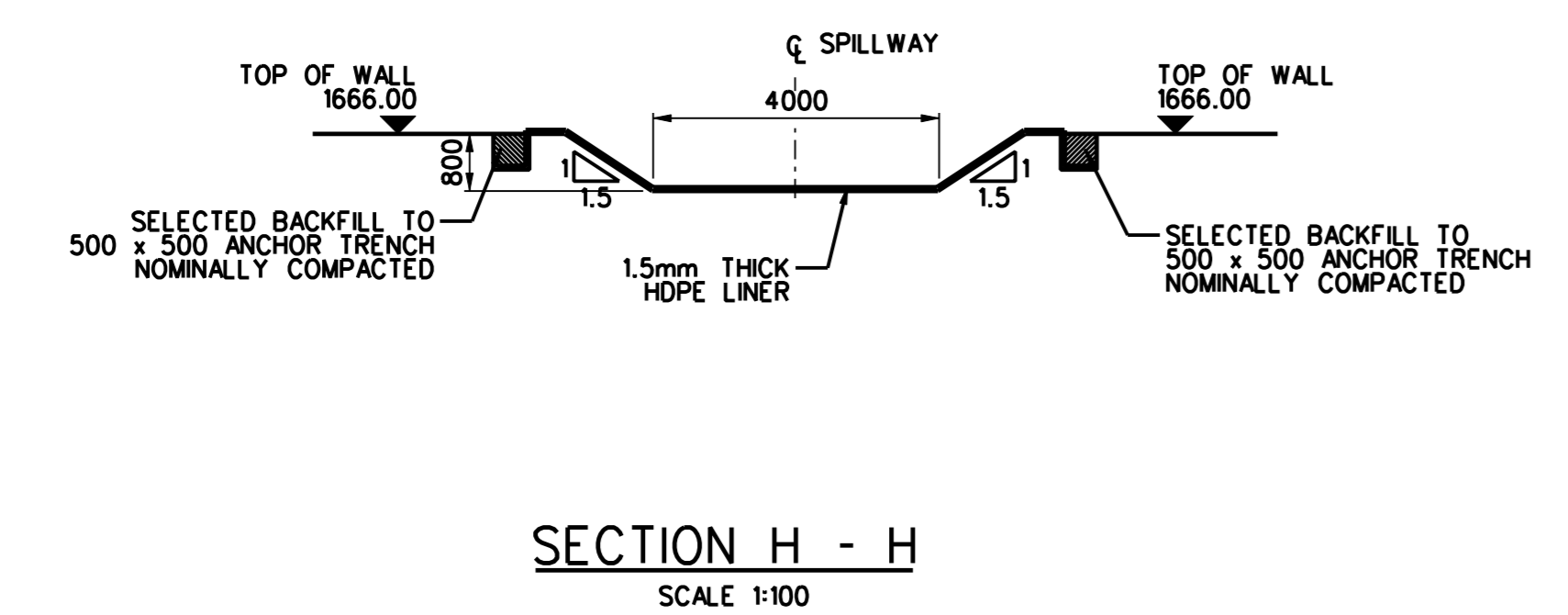
SECTION E - E
SILT TRAP SPILLWAY
SCALE 1:100



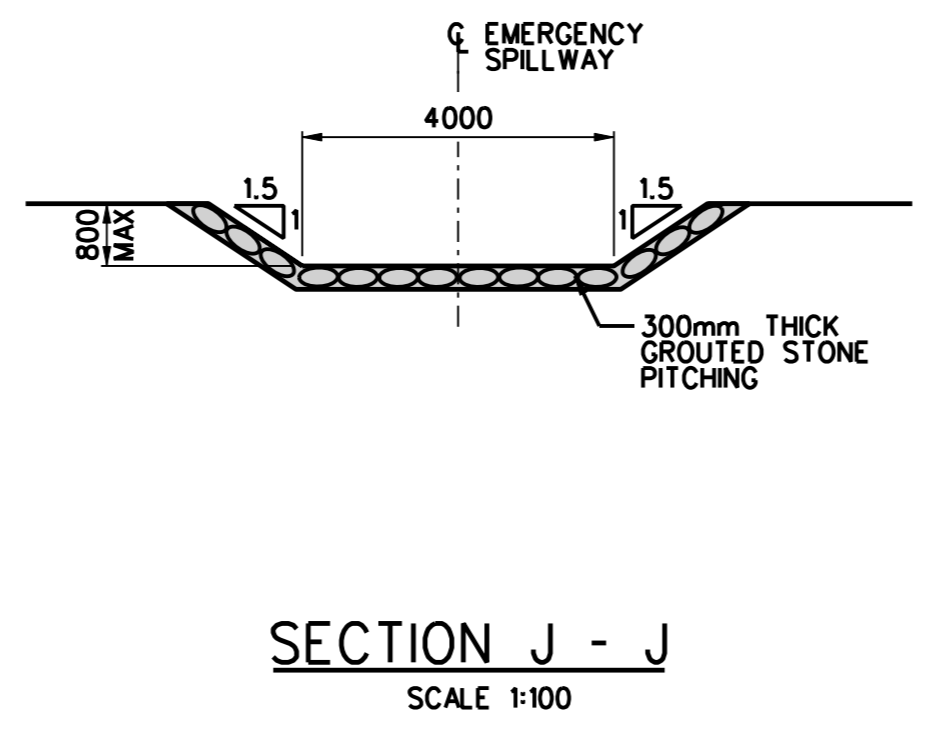
SECTION F - F
EMERGENCY SPILLWAY
SCALE 1:100



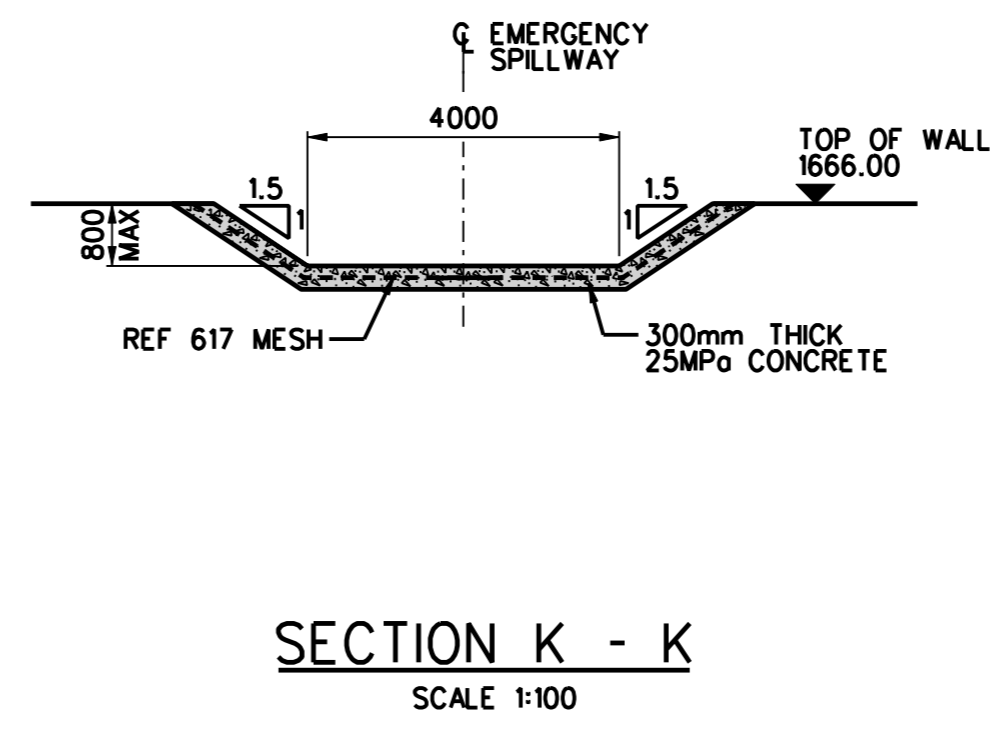
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SCALE 1:100



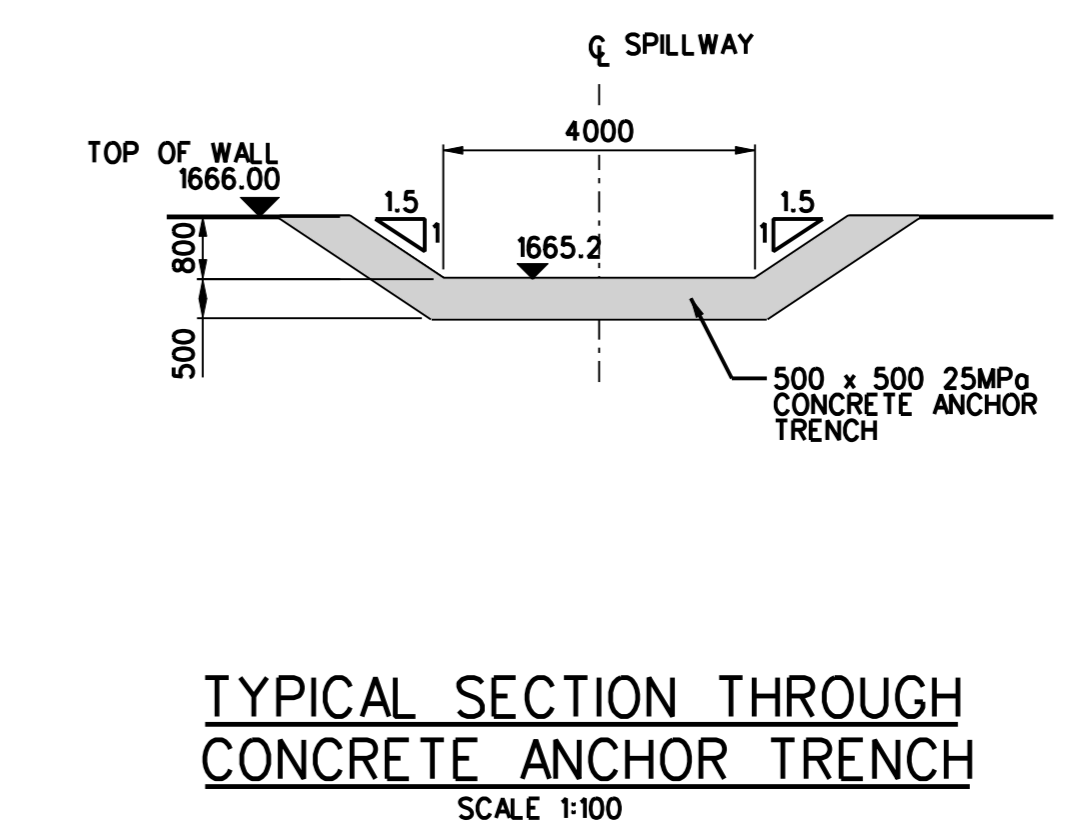
SECTION H - H
SCALE 1:100



SECTION J - J
SCALE 1:100



SECTION K - K
SCALE 1:100



TYPICAL SECTION THROUGH
CONCRETE ANCHOR TRENCH
SCALE 1:100

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REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS	CLIENT	DESIGNED	BY	DATE
				001	GENERAL ARRANGEMENT			BADGER MINING & CONSULTING (PTY) LTD		N.S.	APR.09
				005	RETURN WATER DAM & SILT TRAP LAYOUT				DRAWN	S.A.	APR.09
				006	RETURN WATER DAM & SILT TRAP DETAILS				CHECKED		
									SCALE	AS SHOWN	
									DRAWING No.	T994-007	REVISION
											A

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CLIENT
BADGER MINING & CONSULTING (PTY) LTD

TITLE
MOOPLAATS COAL DISCARD DUMP
RETURN WATER DAM SPILLWAY
AND TEMPORARY RETURN WATER DAM
DETAILS

DESIGNED
BY
DATE

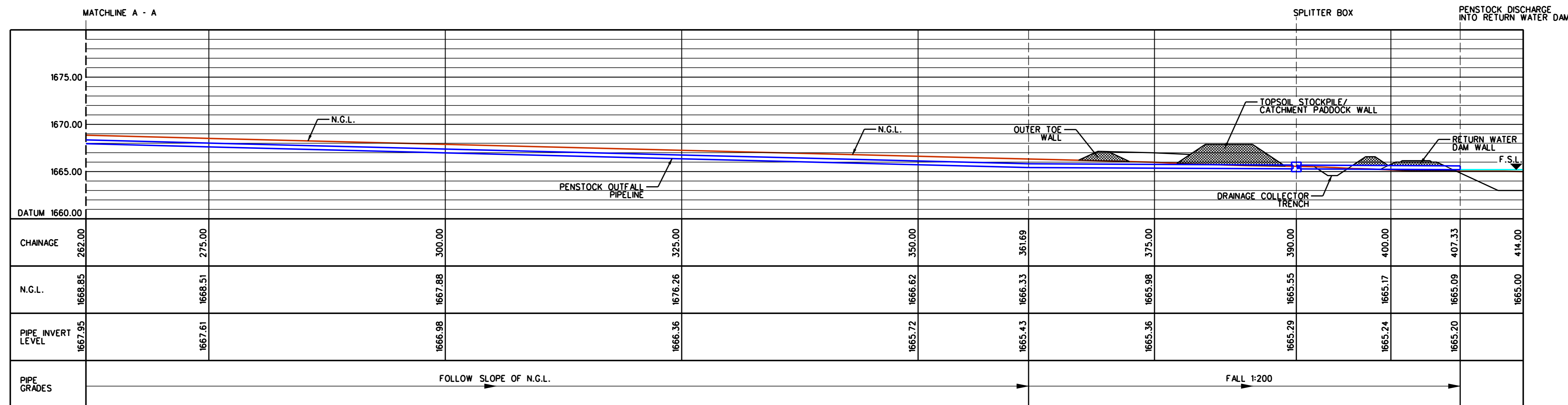
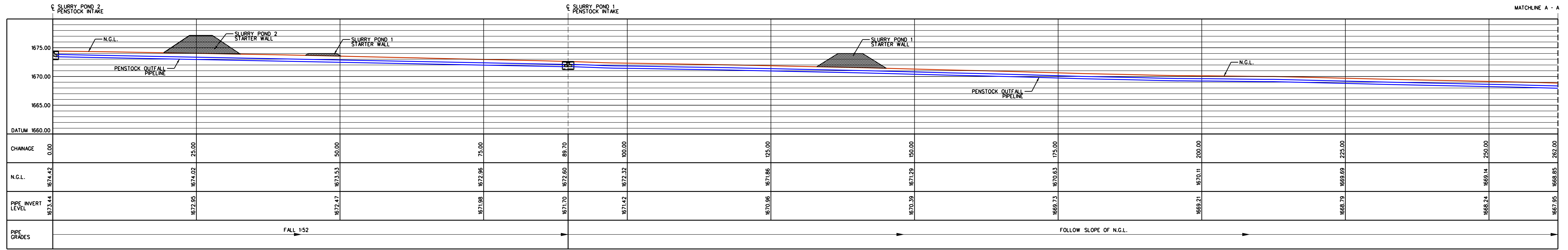
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S.A.
APR.09

CHECKED

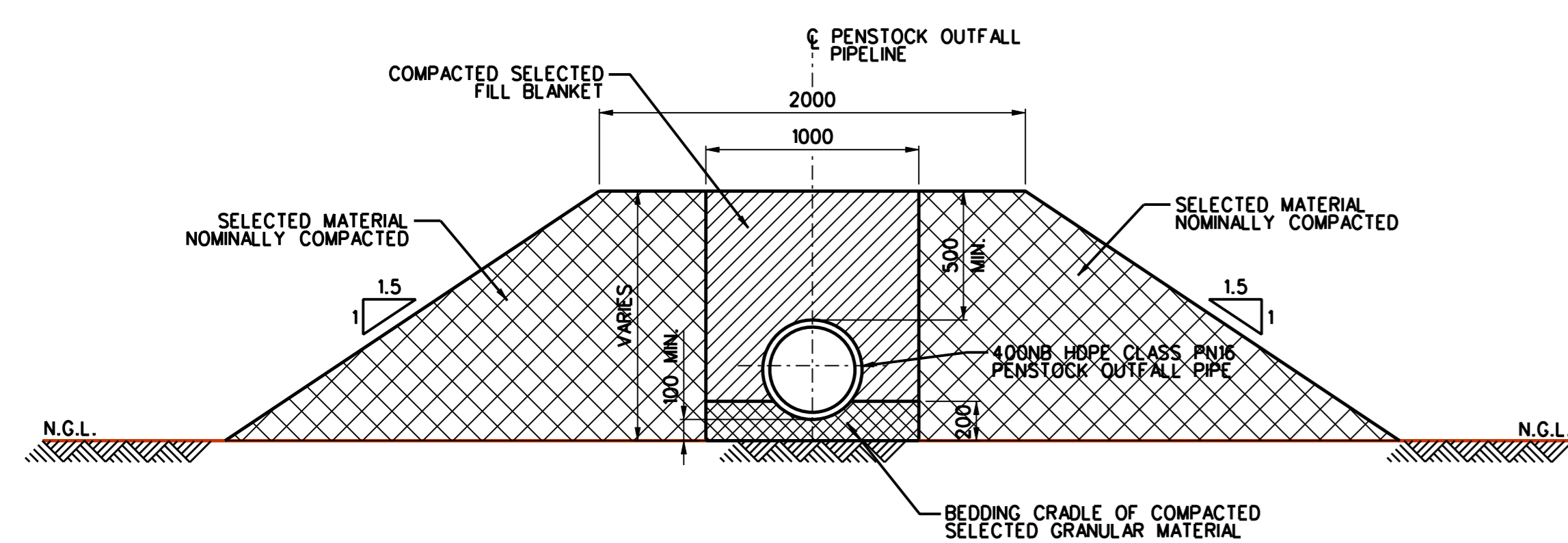
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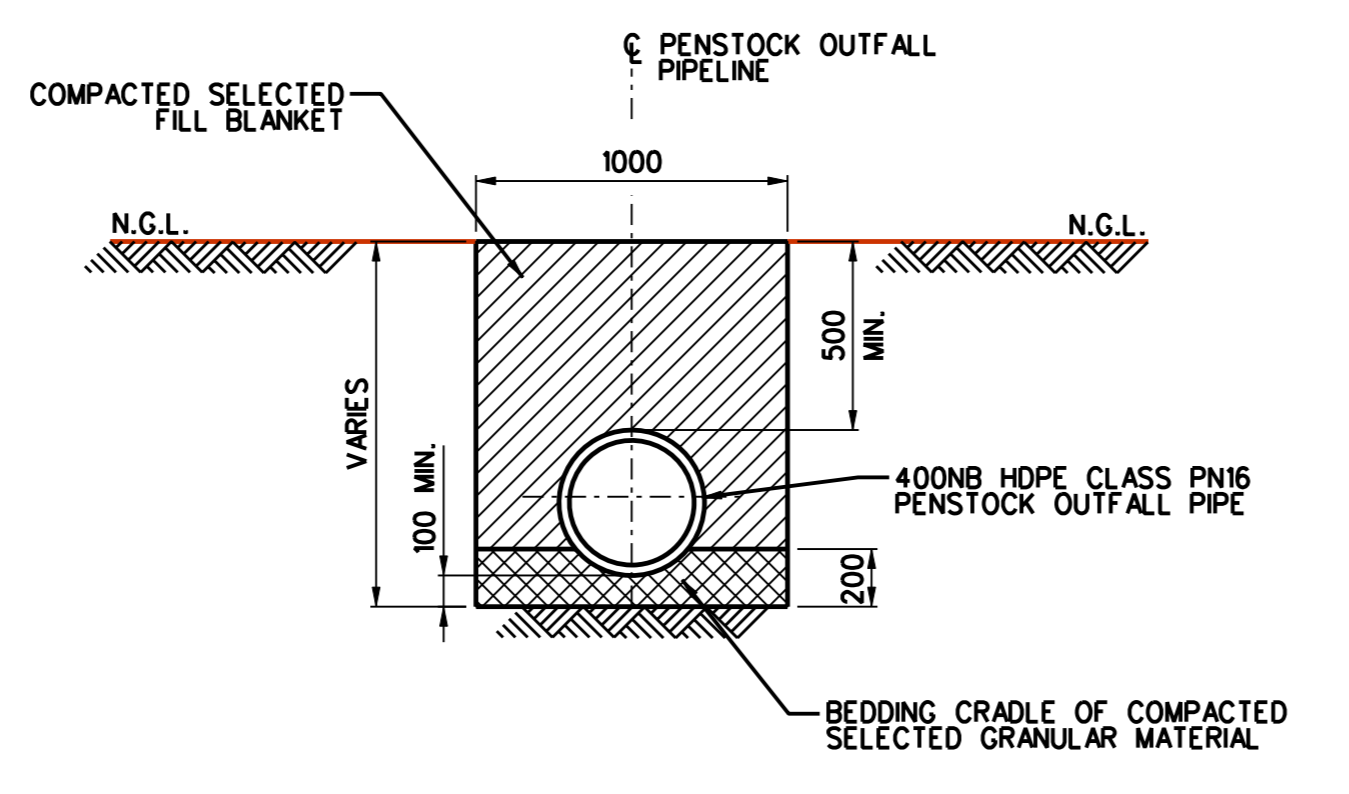
REVISION
A



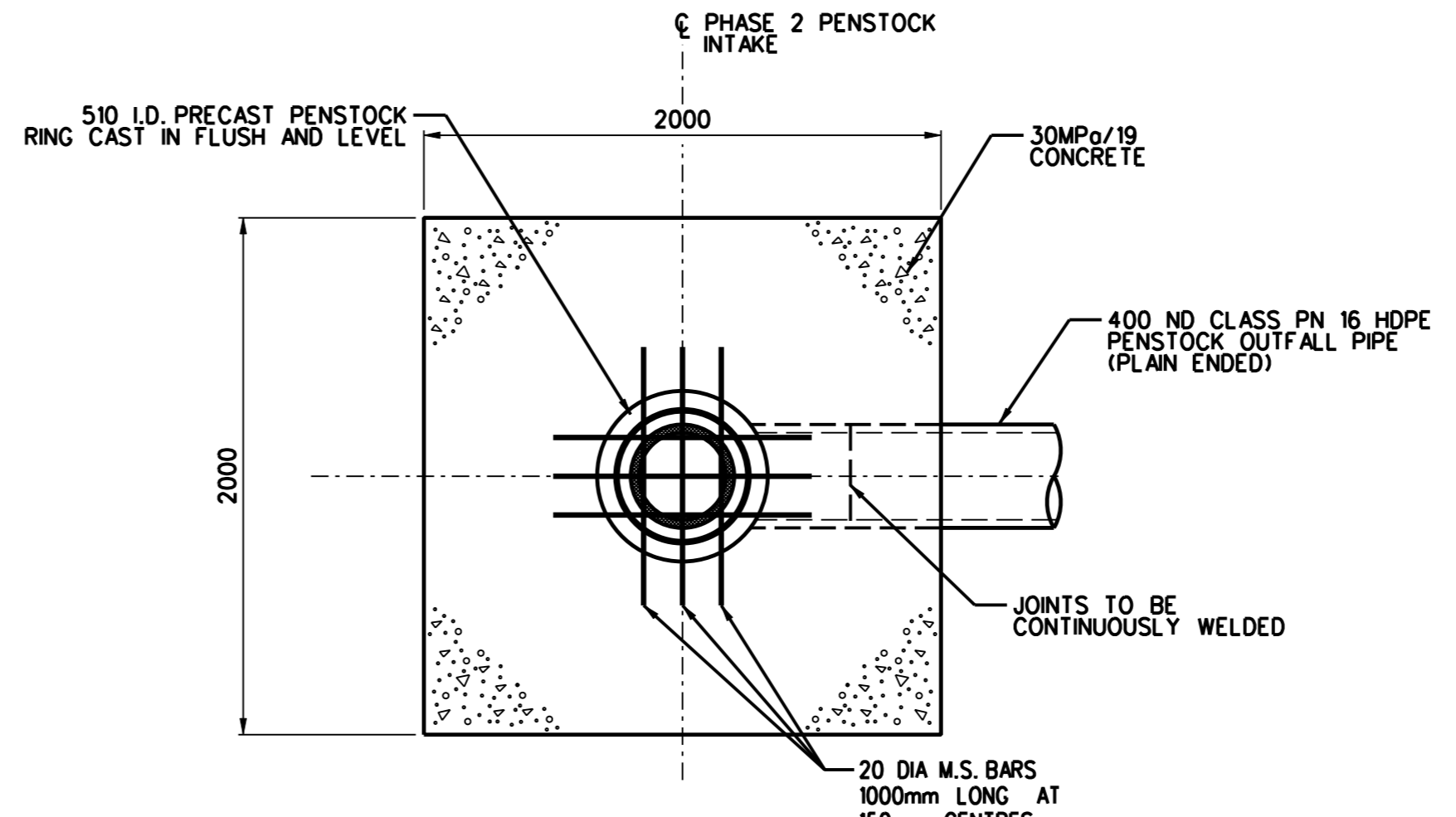
LONGITUDINAL SECTION - PENSTOCK OUTFALL PIPELINE
SCALE 1:250



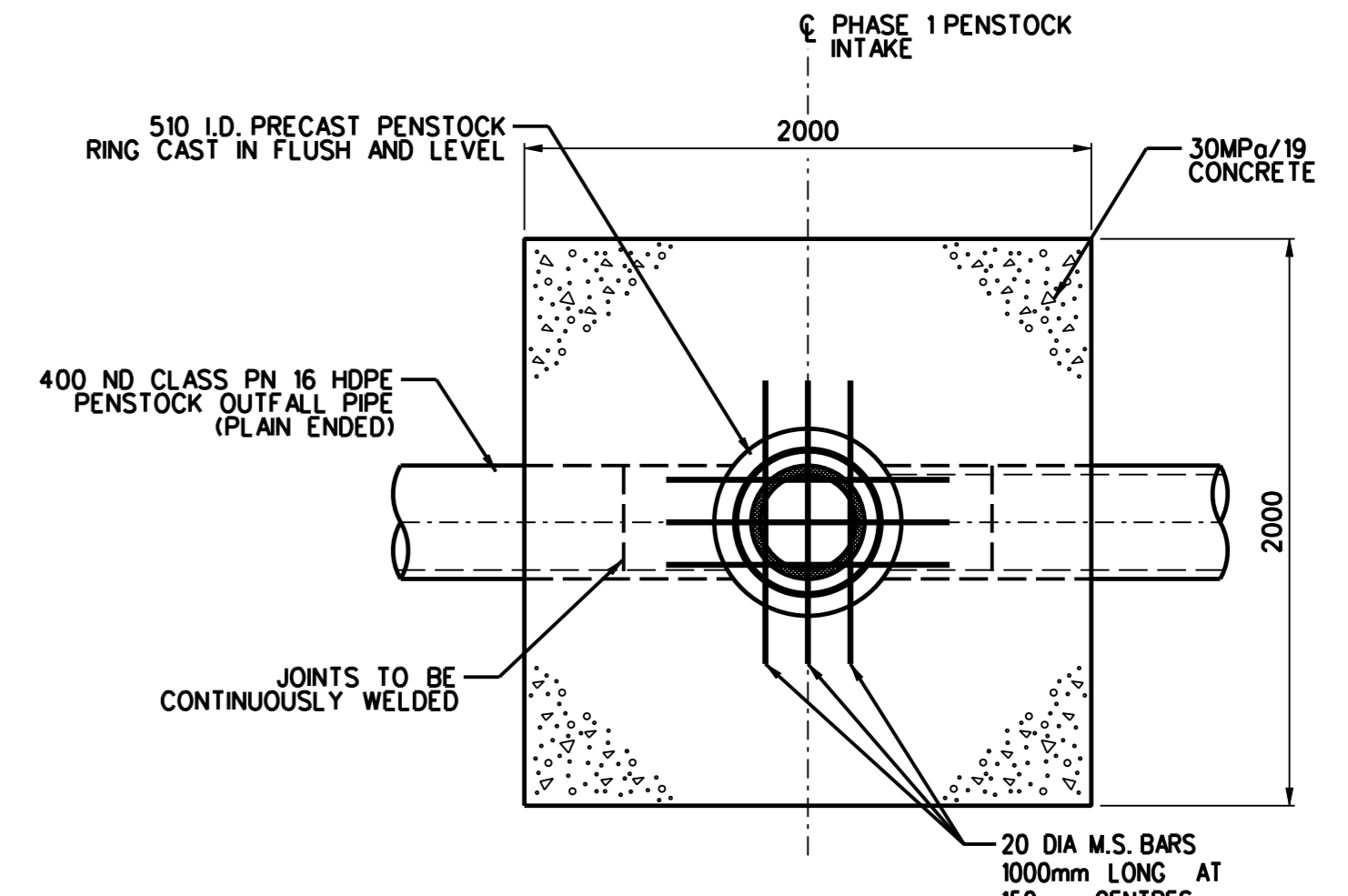
TYPICAL SECTION - PENSTOCK OUTFALL PIPELINE ABOVE N.G.L. (CLASS C BEDDING)
SCALE 1:25



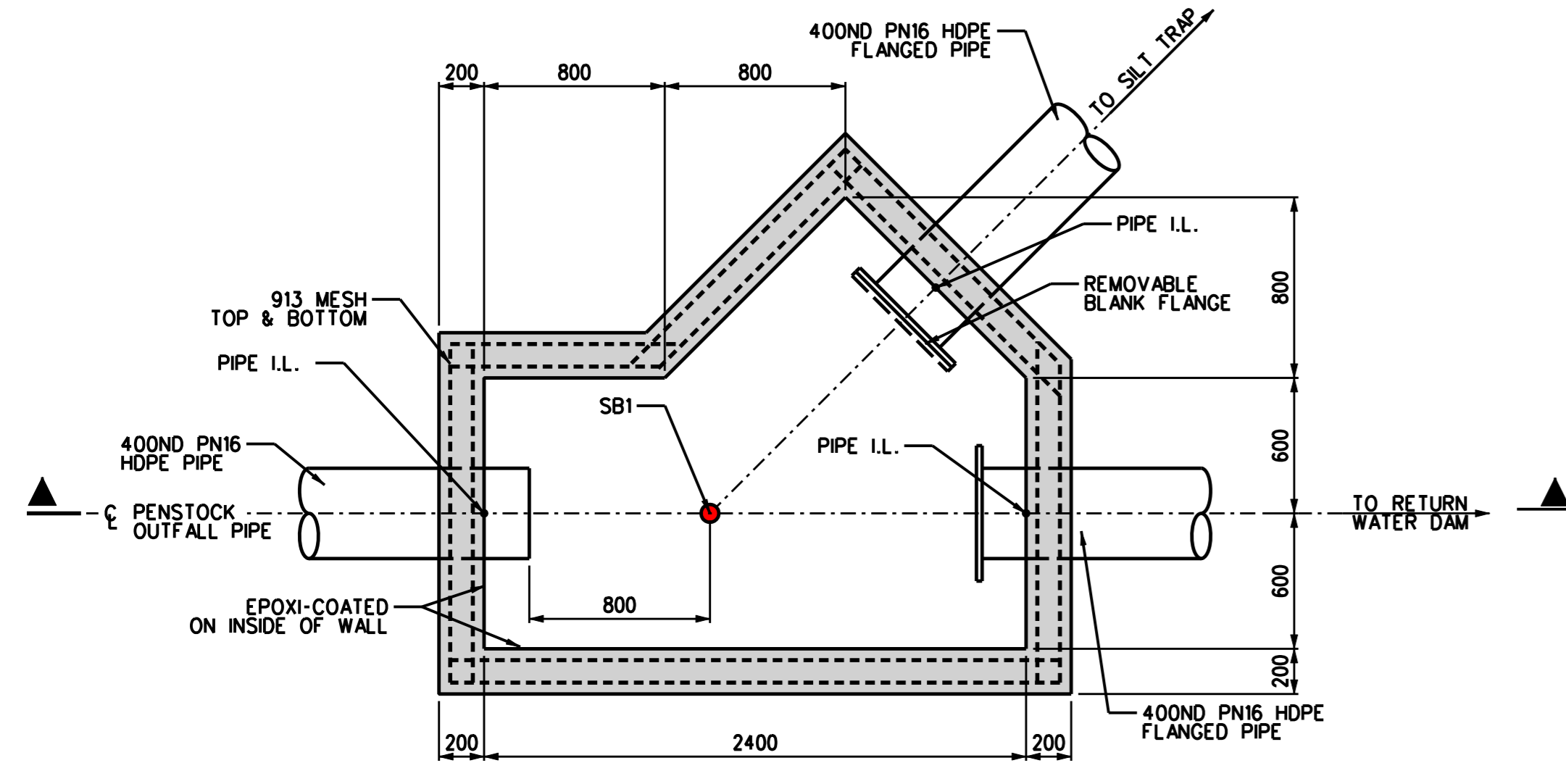
TYPICAL SECTION - PENSTOCK OUTFALL PIPELINE BELOW N.G.L. (CLASS C BEDDING)
SCALE 1:25



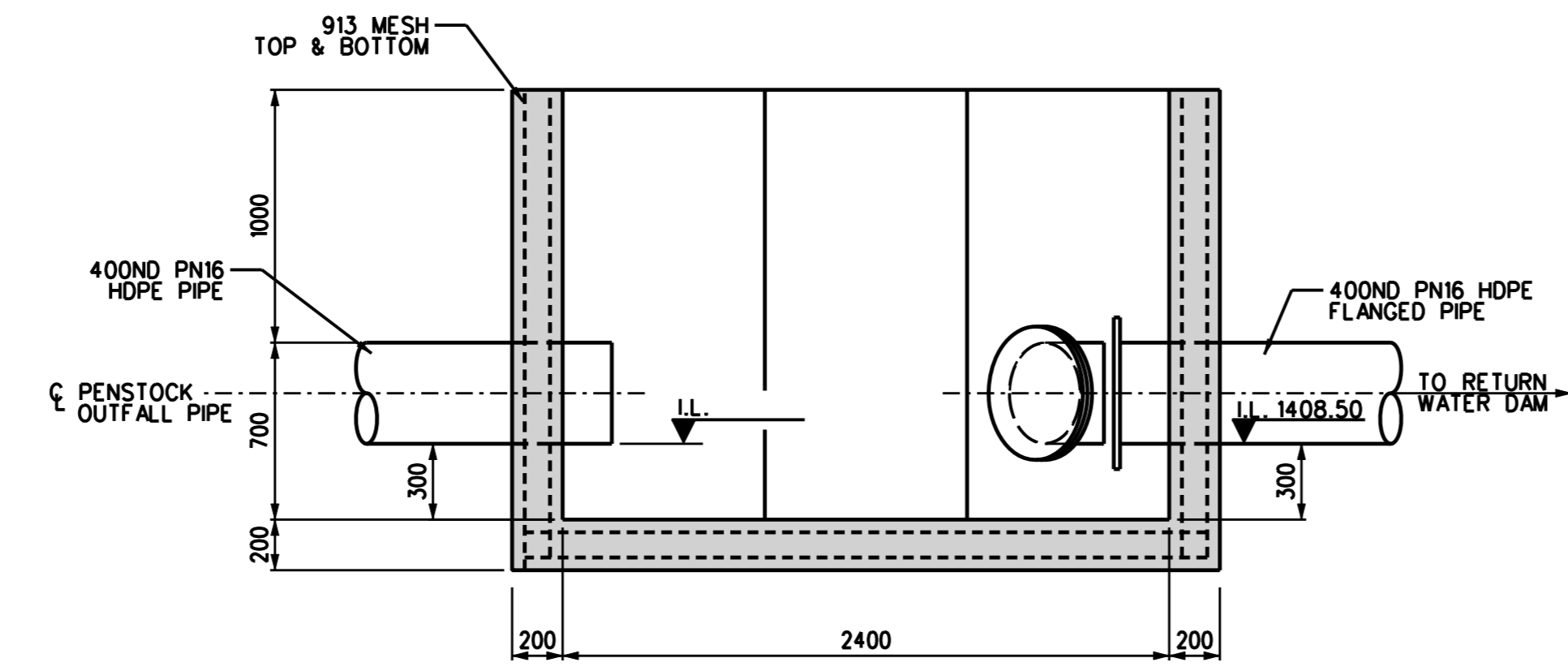
PLAN - SLURRY POND 2 PENSTOCK INTAKE
SCALE 1:25



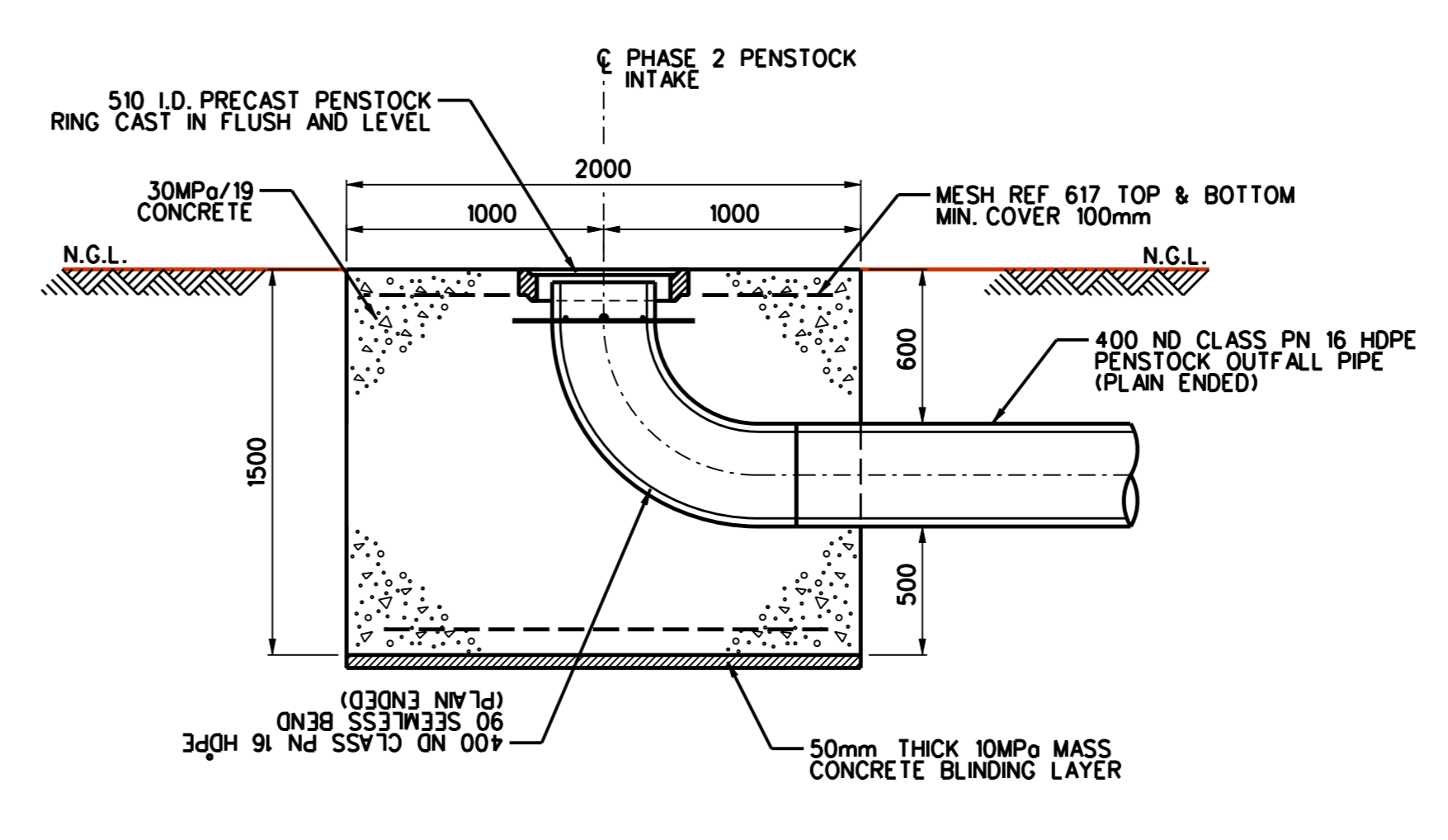
PLAN - SLURRY POND 1 PENSTOCK INTAKE
SCALE 1:25



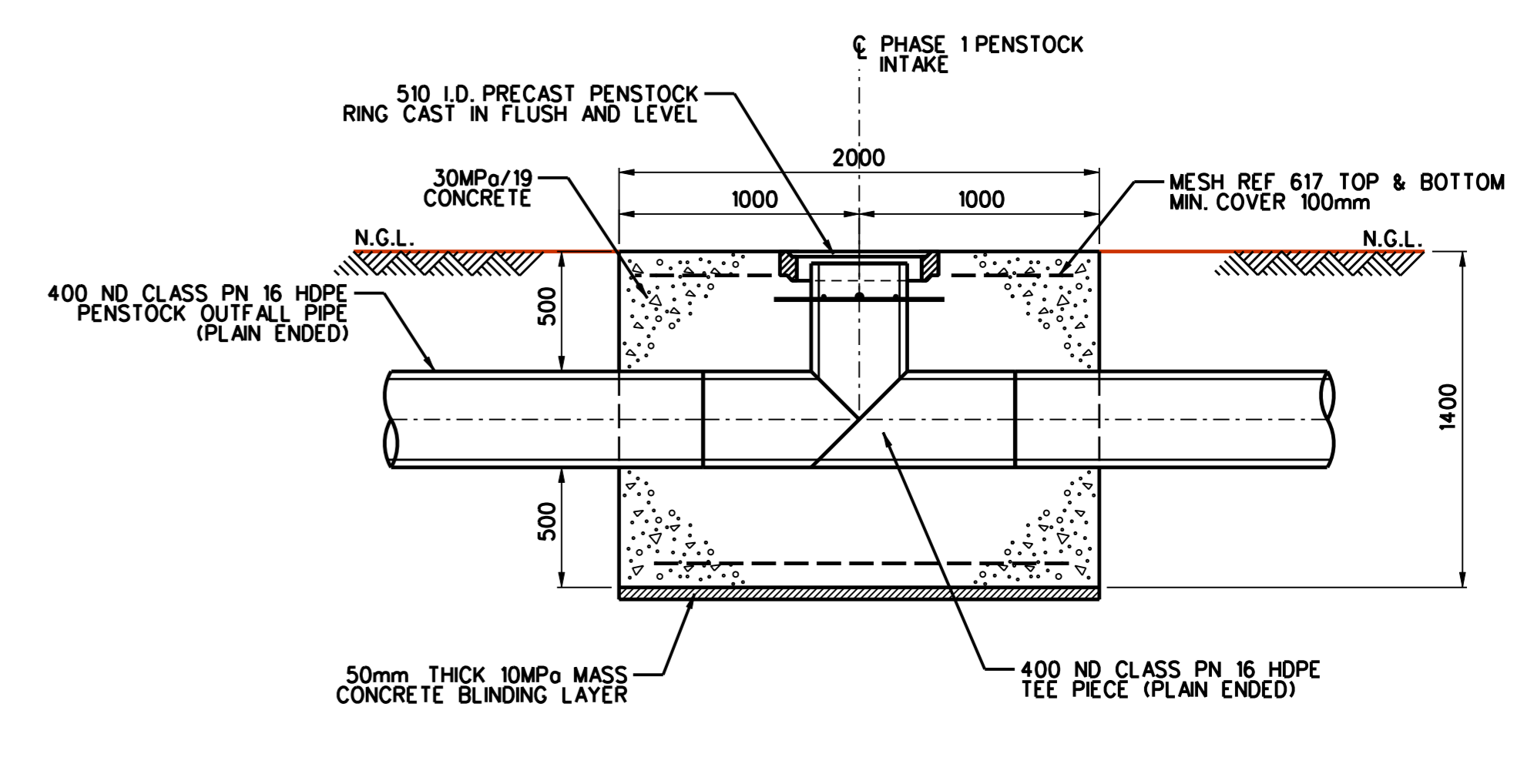
PLAN OF SPLITTER BOX
SCALE 1:25



SECTION - SPLITTER BOX
SCALE 1:25



SECTION - SLURRY POND 2 PENSTOCK INTAKE
SCALE 1:25



SECTION - SLURRY POND 1 PENSTOCK INTAKE
SCALE 1:25

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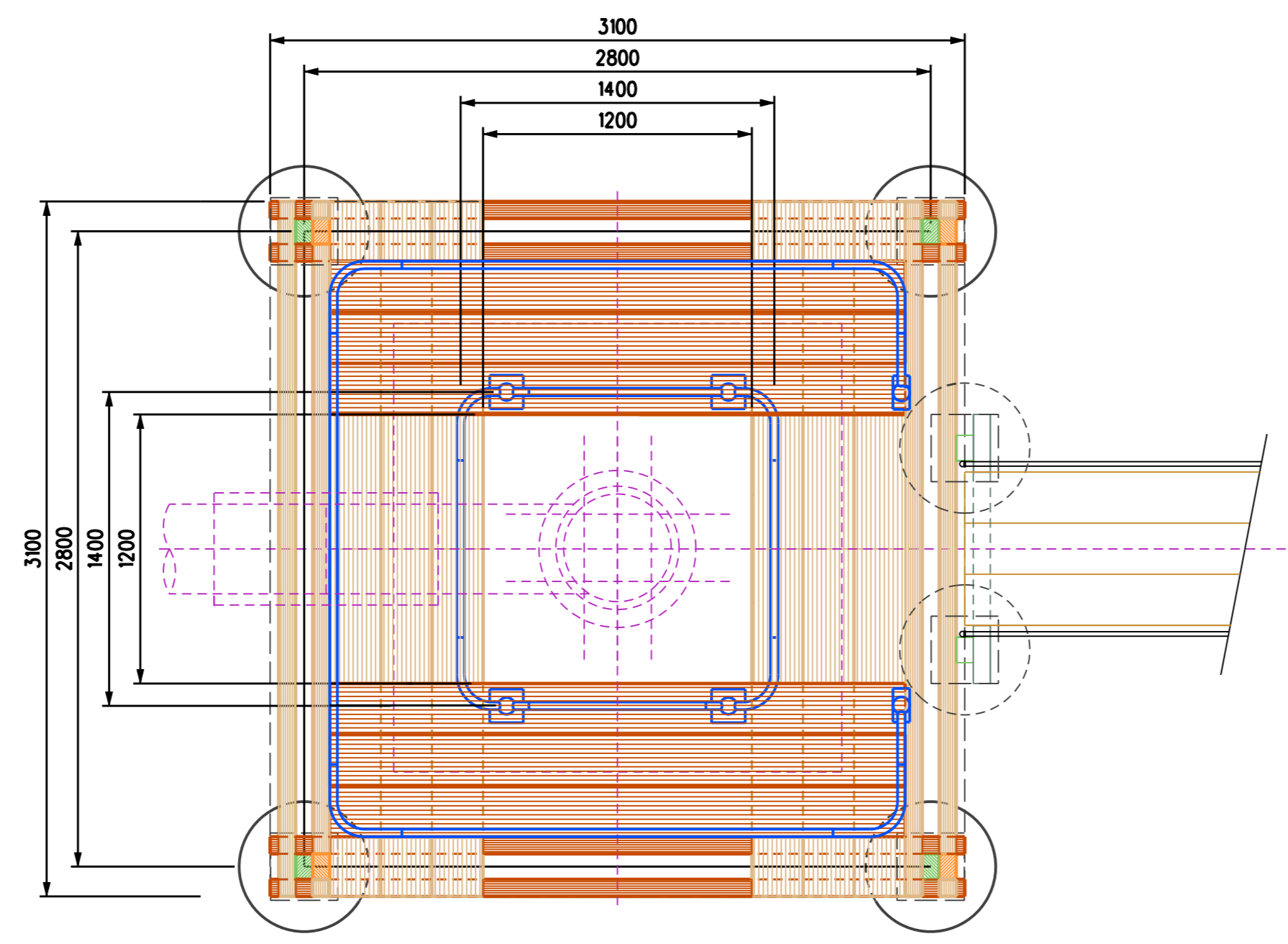
REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
				001	GENERAL ARRANGEMENT		



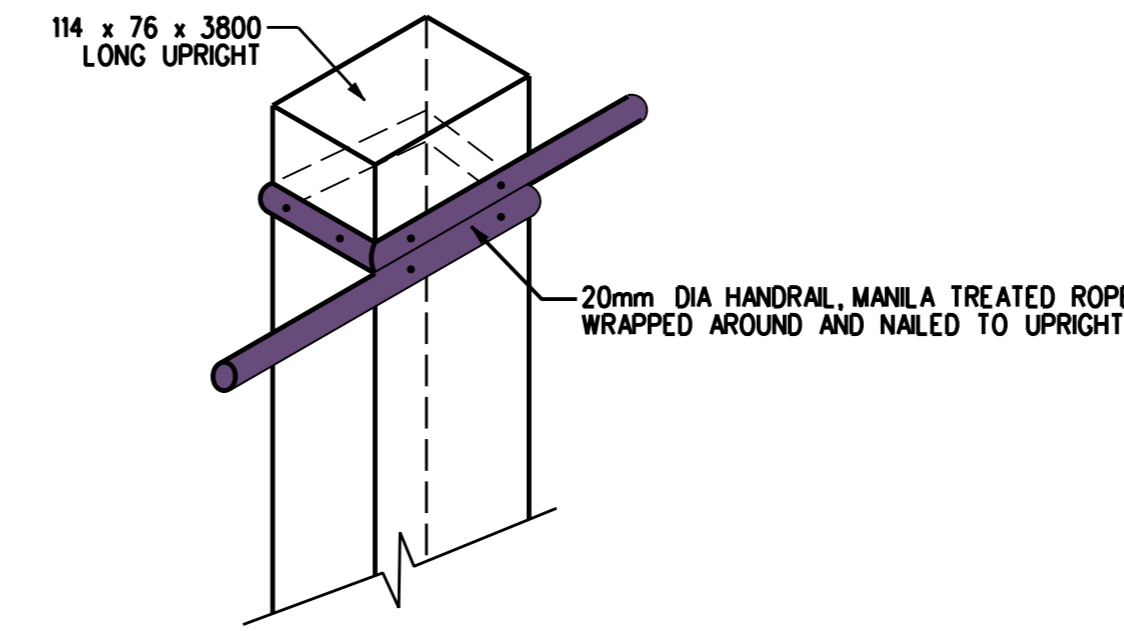
CLIENT	BADGER MINING & CONSULTING (PTY) LTD	DESIGNED	N.S.	DATE	MAR.09
TITLE	MOOIPLAATS COAL DISCARD DUMP PENSTOCK OUTFALL PIPELINE DETAILS	DRAWN	N.S.		
		CHECKED			
		SCALE	AS SHOWN		
		DRAWING No.	T994-008	REVISION	B

DRAFT

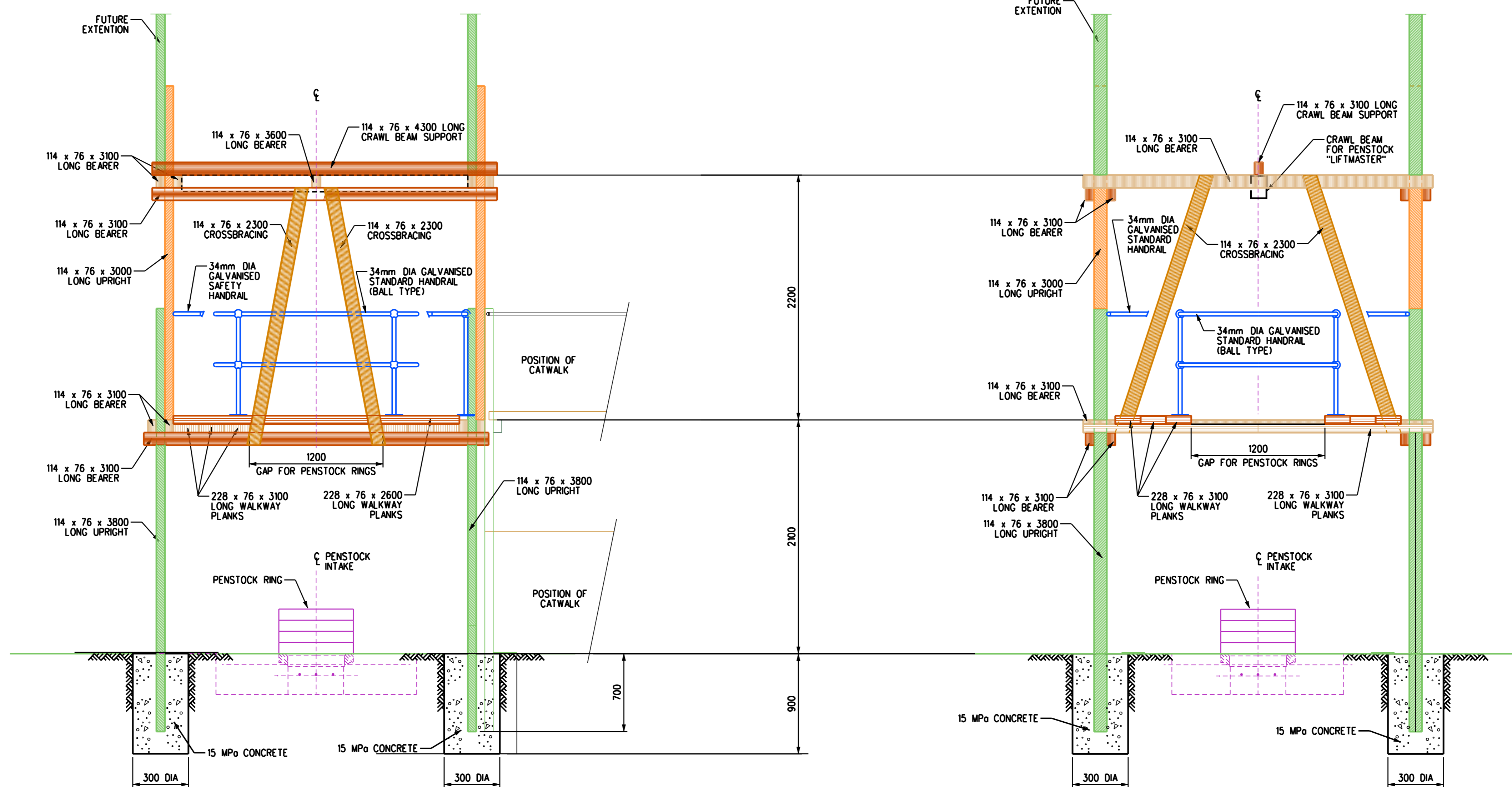
DO NOT SCALE



PLAN - PLATFORM
AT SINGLE PENSTOCK INTAKE
SCALE 1:25

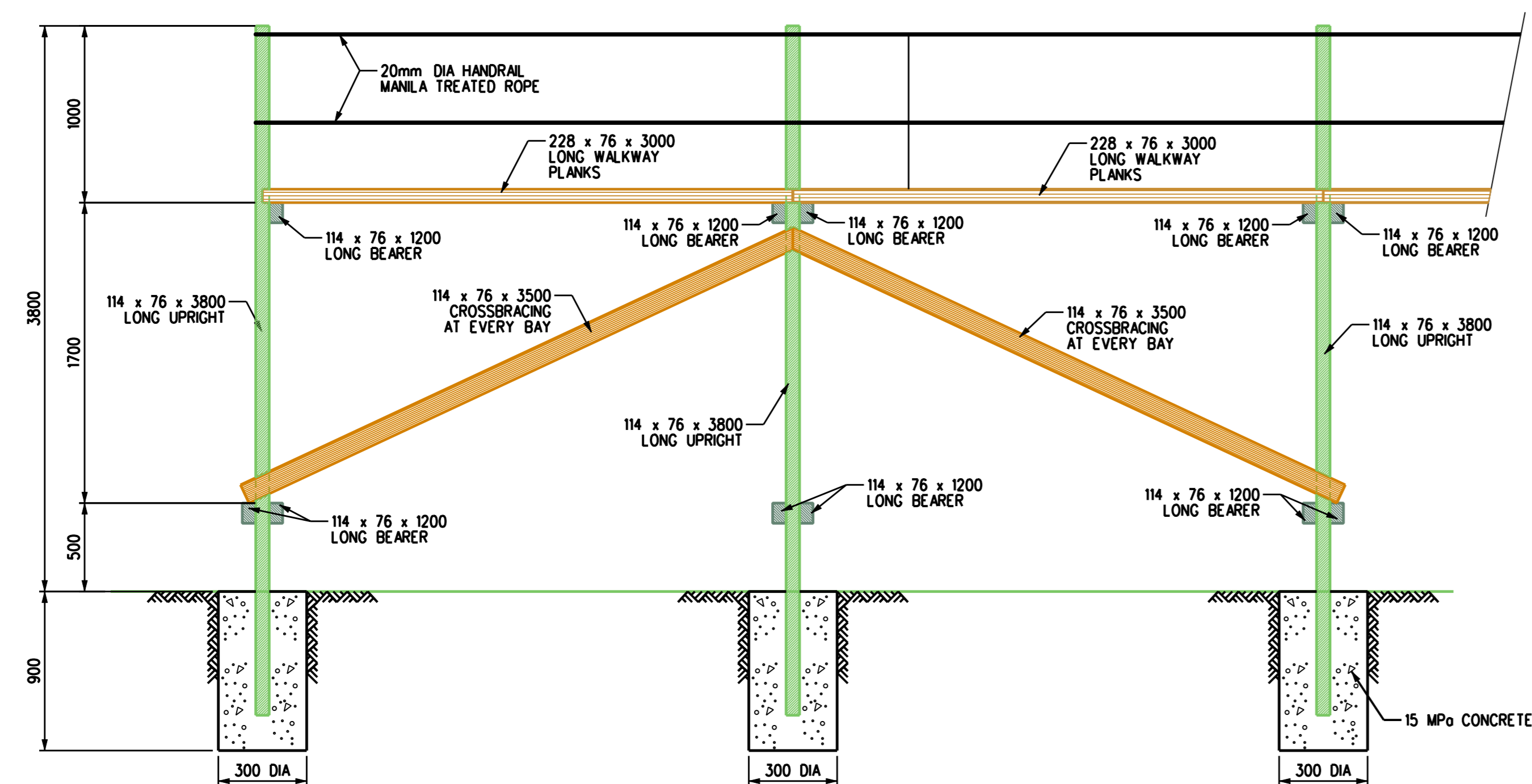


DETAIL 1
SHOWING ROPE HANDRAIL AT UPRIGHT
N.T.S.

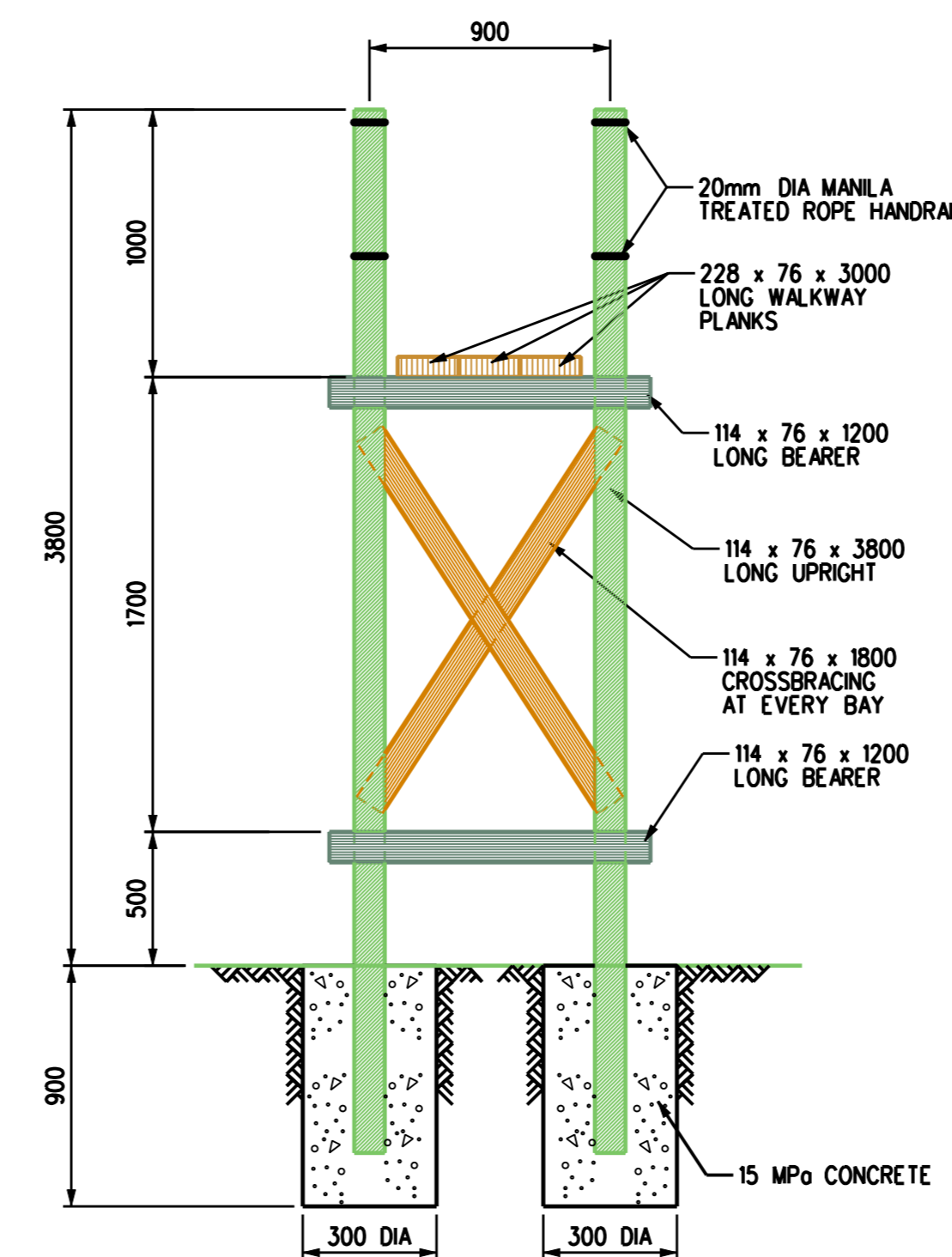


TYPICAL ELEVATION THROUGH PLATFORM
AT SINGLE PENSTOCK INTAKE
SCALE 1:25

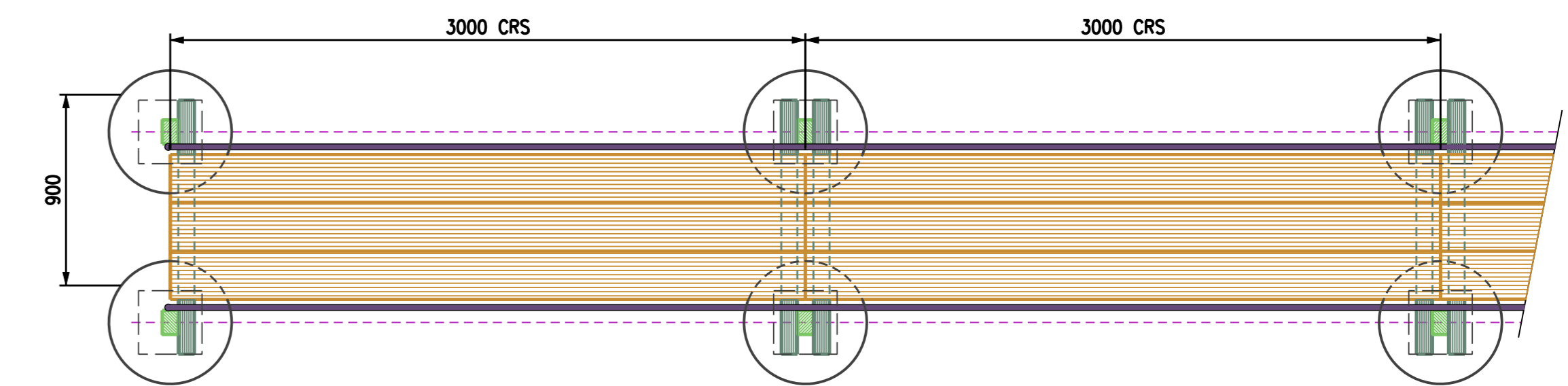
SECTION THROUGH PLATFORM
AT SINGLE PENSTOCK INTAKE
SCALE 1:25



SIDE ELEVATION - CATWALK
SCALE 1:25



TYPICAL SECTION THROUGH CATWALK
SCALE 1:25



PLAN - CATWALK
SCALE 1:25

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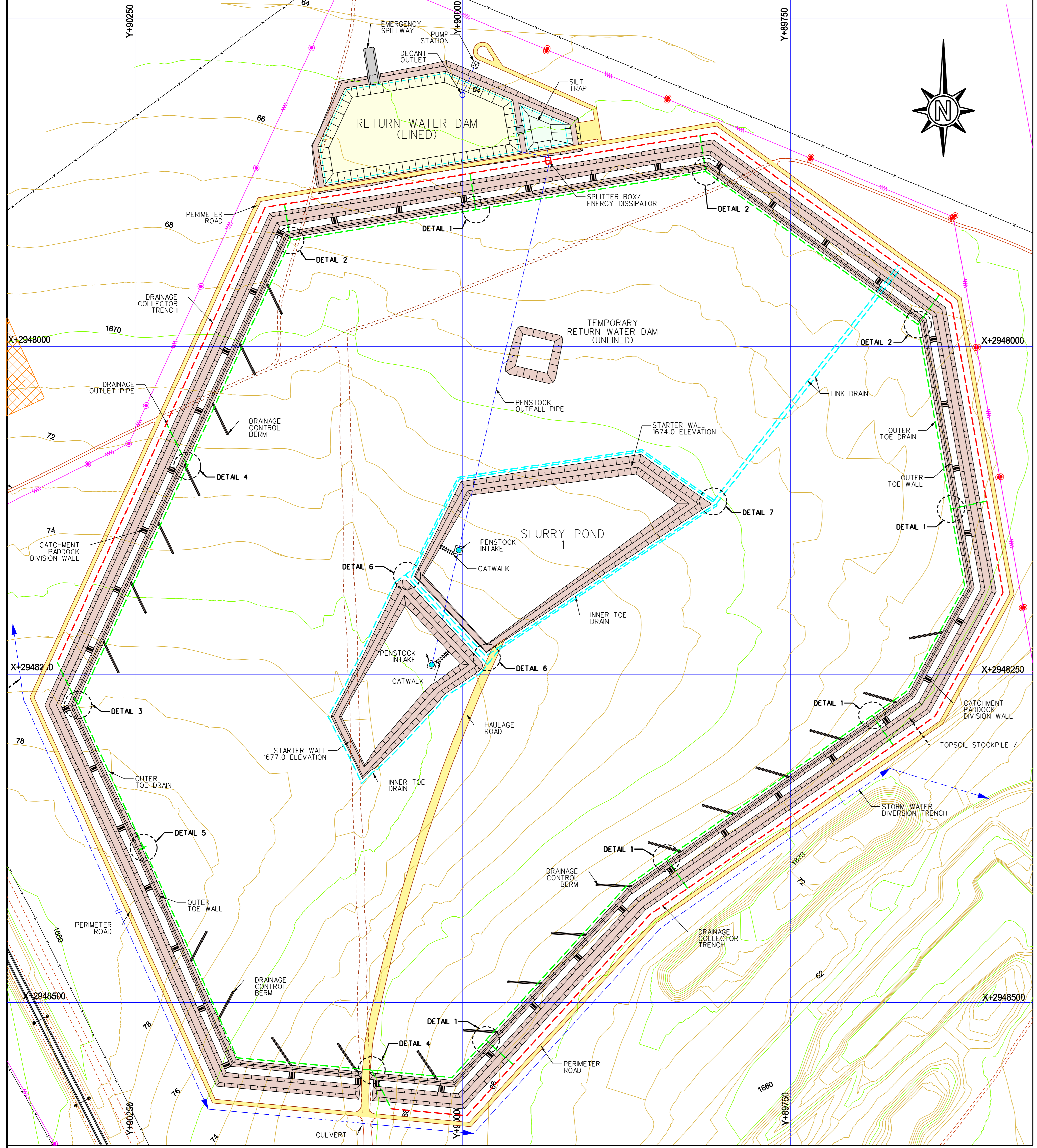
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REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
				001	GENERAL ARRANGEMENT		

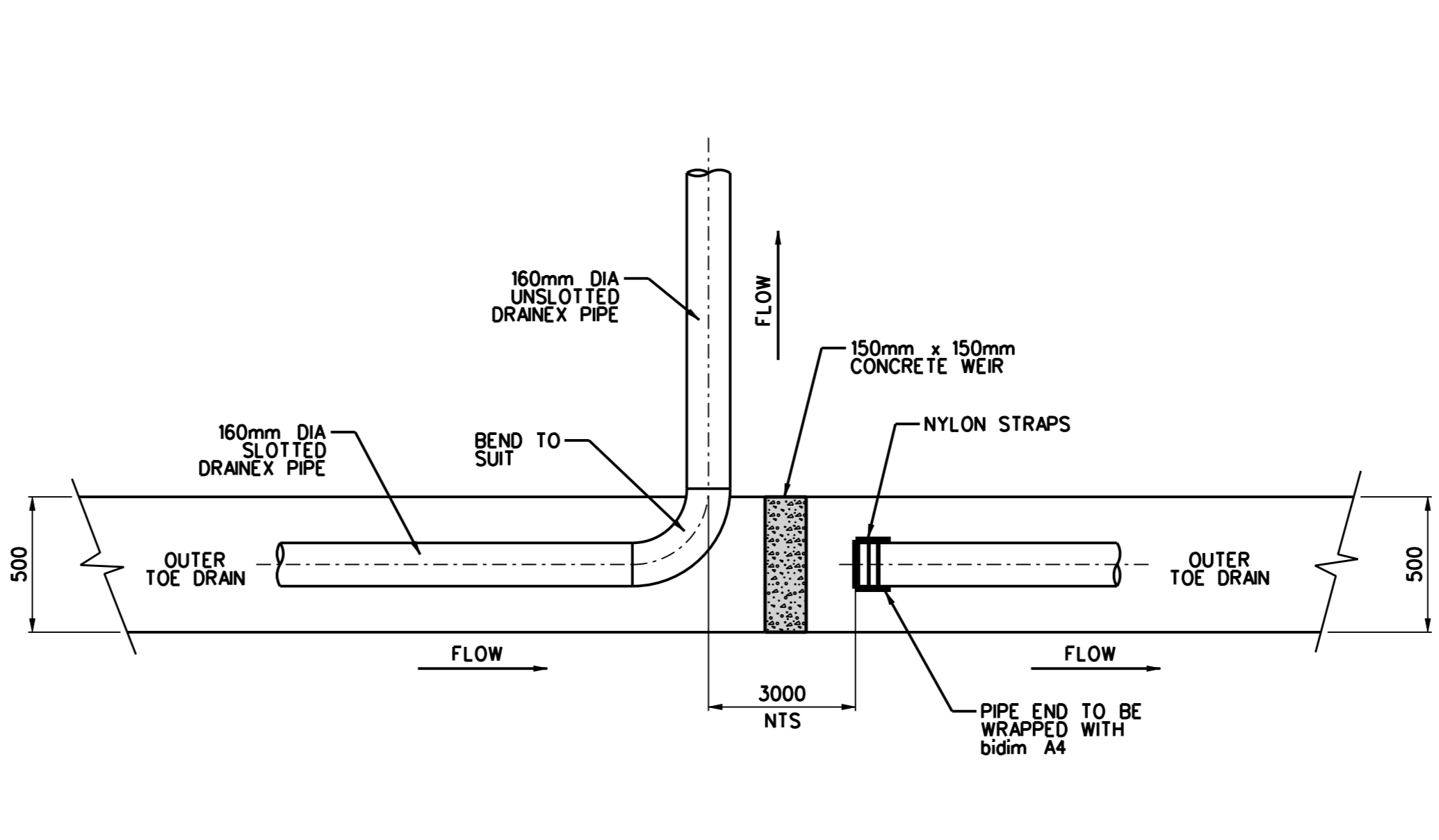
ECMP
Environmental, Civil & Mining Projects (Pty) Ltd
Box 783697 Sandton 2146
Tel. (011) 705 1111
Fax. (011) 705 1908

CLIENT		BY	DATE
BADGER MINING & CONSULTING (PTY) LTD		N.S.	MAR.09
TITLE		S.A.	MAR.09
MOOPLAATS COAL DISCARD DUMP CATWALK DETAILS			
DESIGNED	CHECKED	SCALE	AS SHOWN
DRAWN	DRAWING No.	T994-009	REVISION A

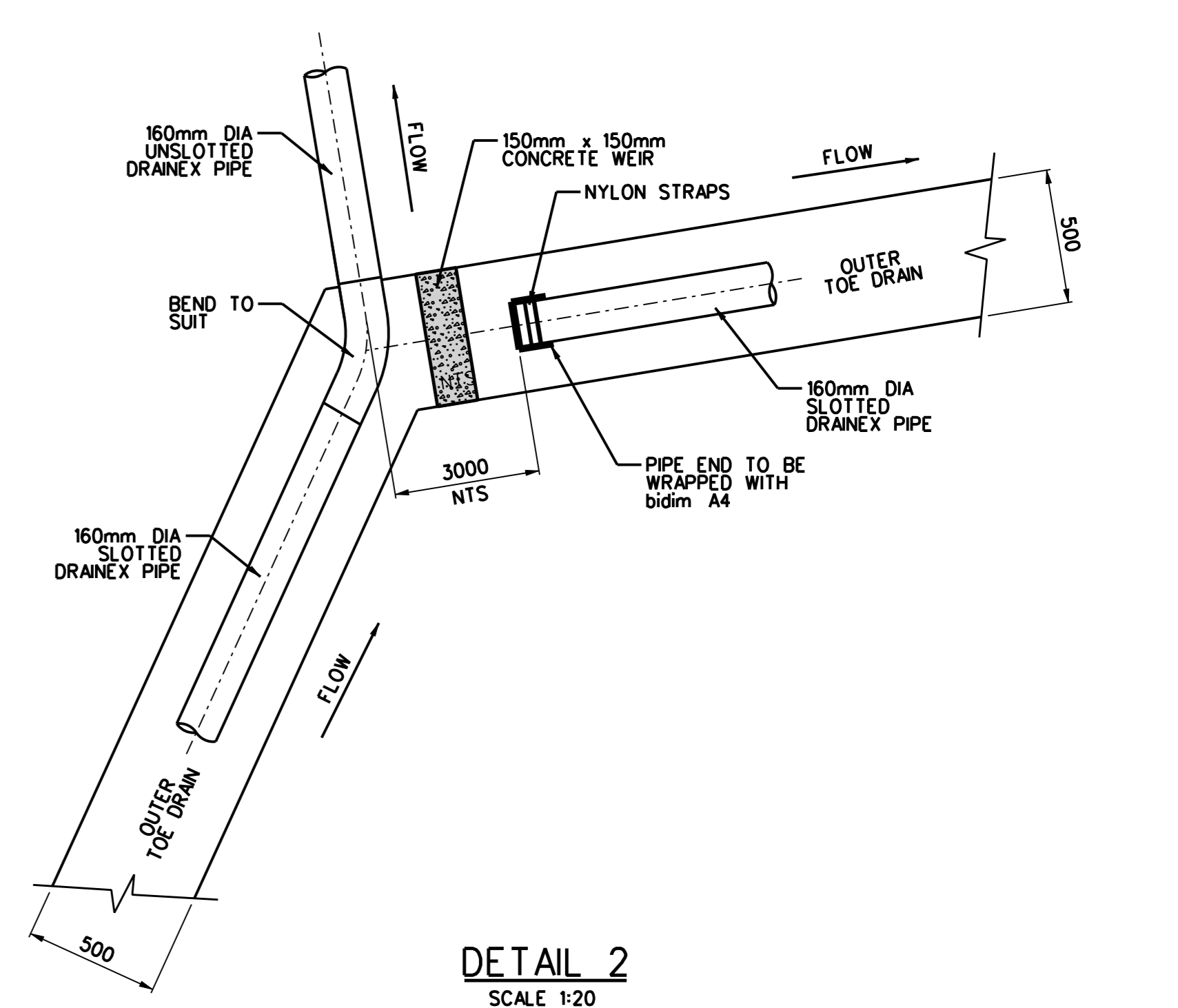
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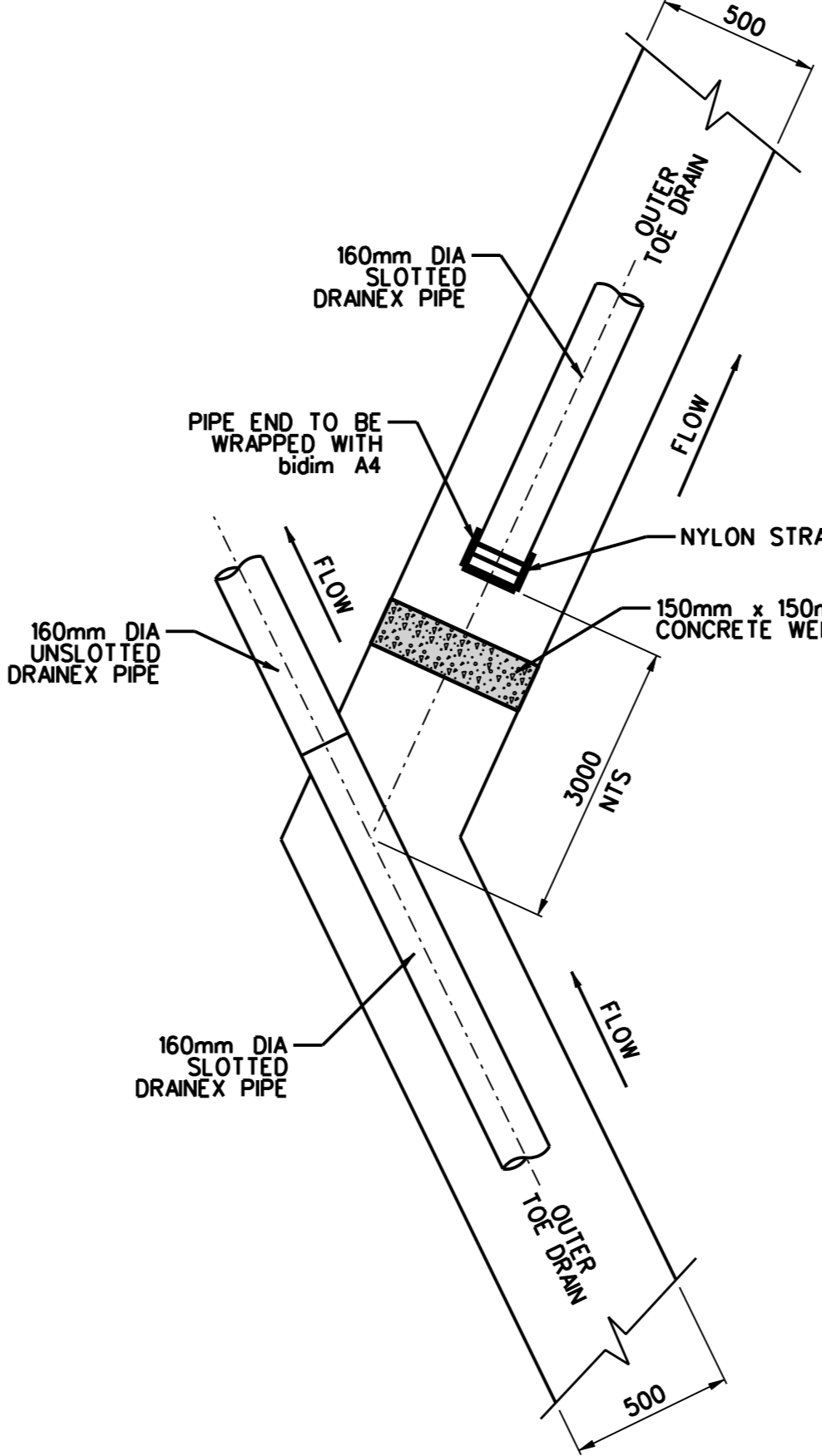
PLAN
SCALE 1:1500



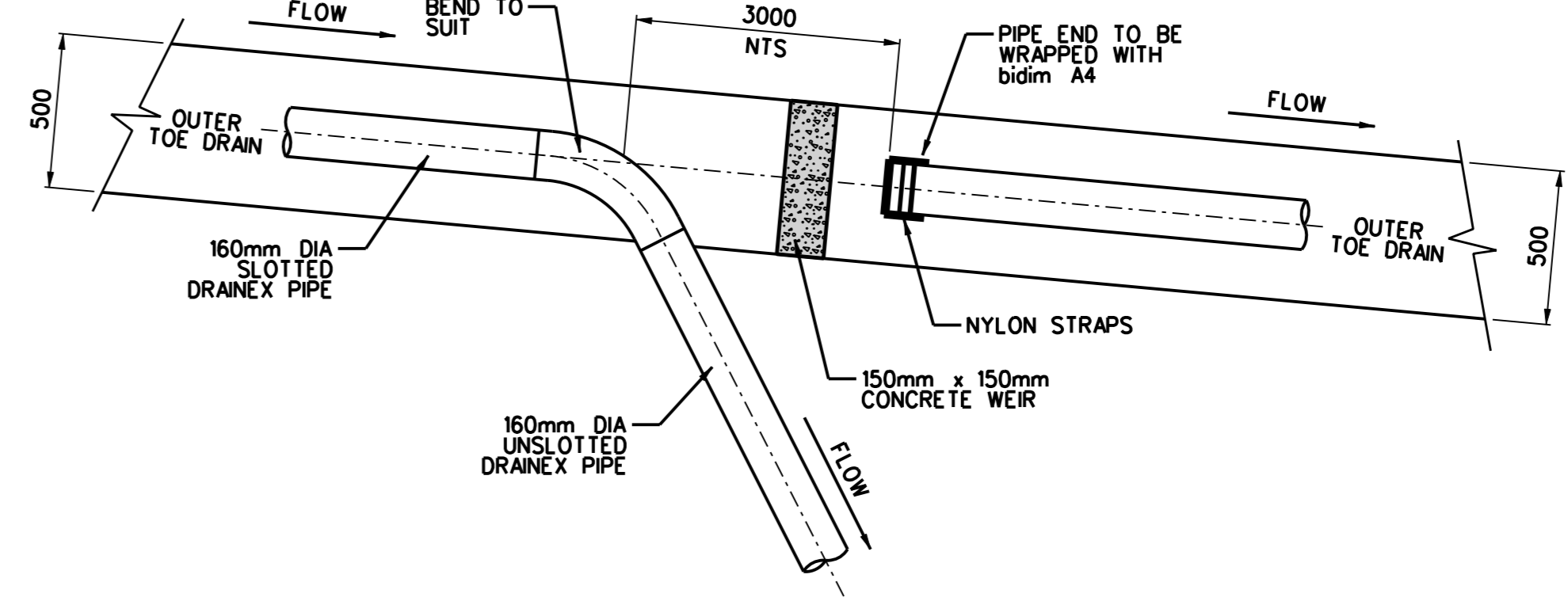
DETAIL 1
SCALE 1:20



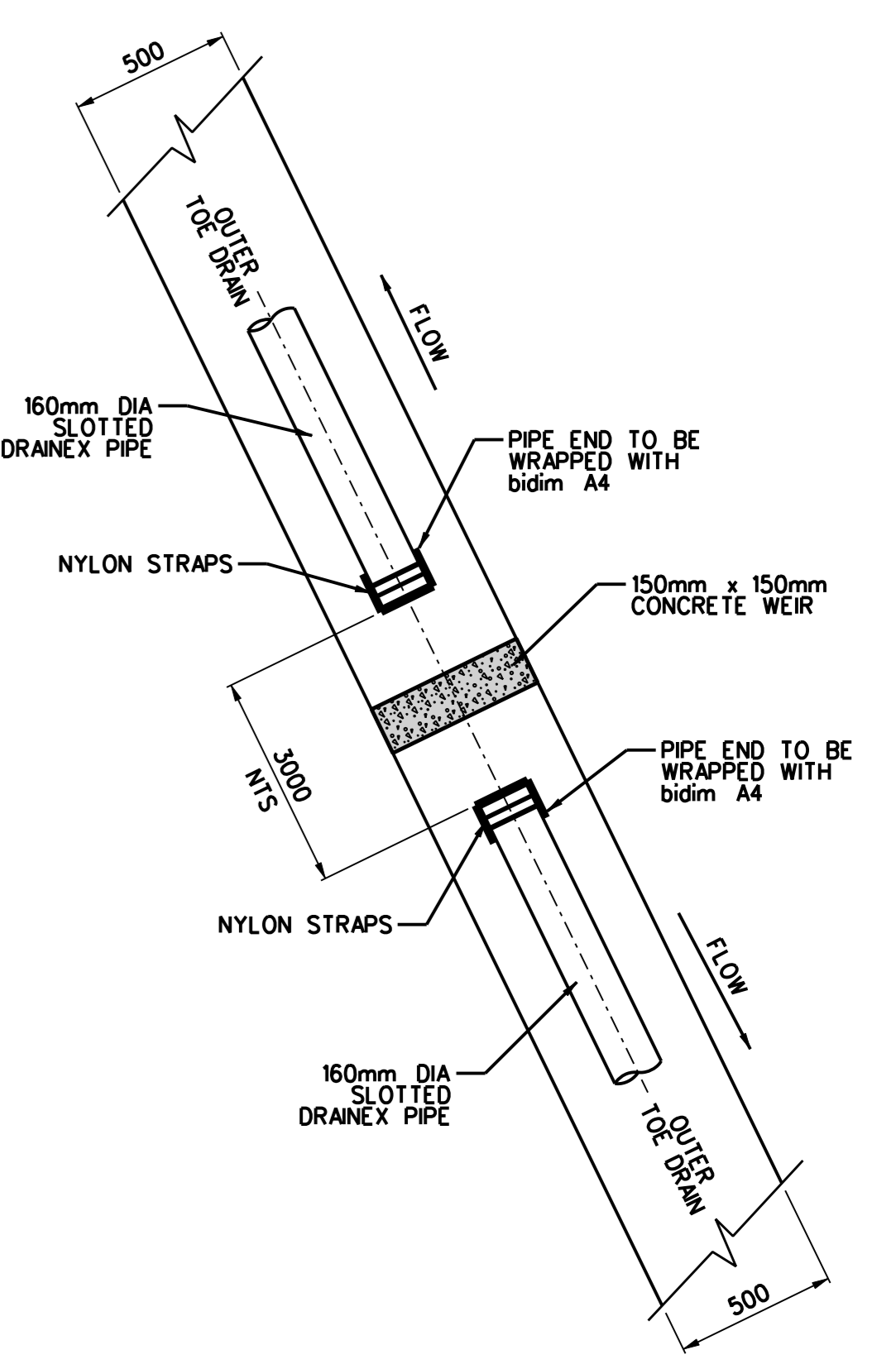
DETAIL 2
SCALE 1:20



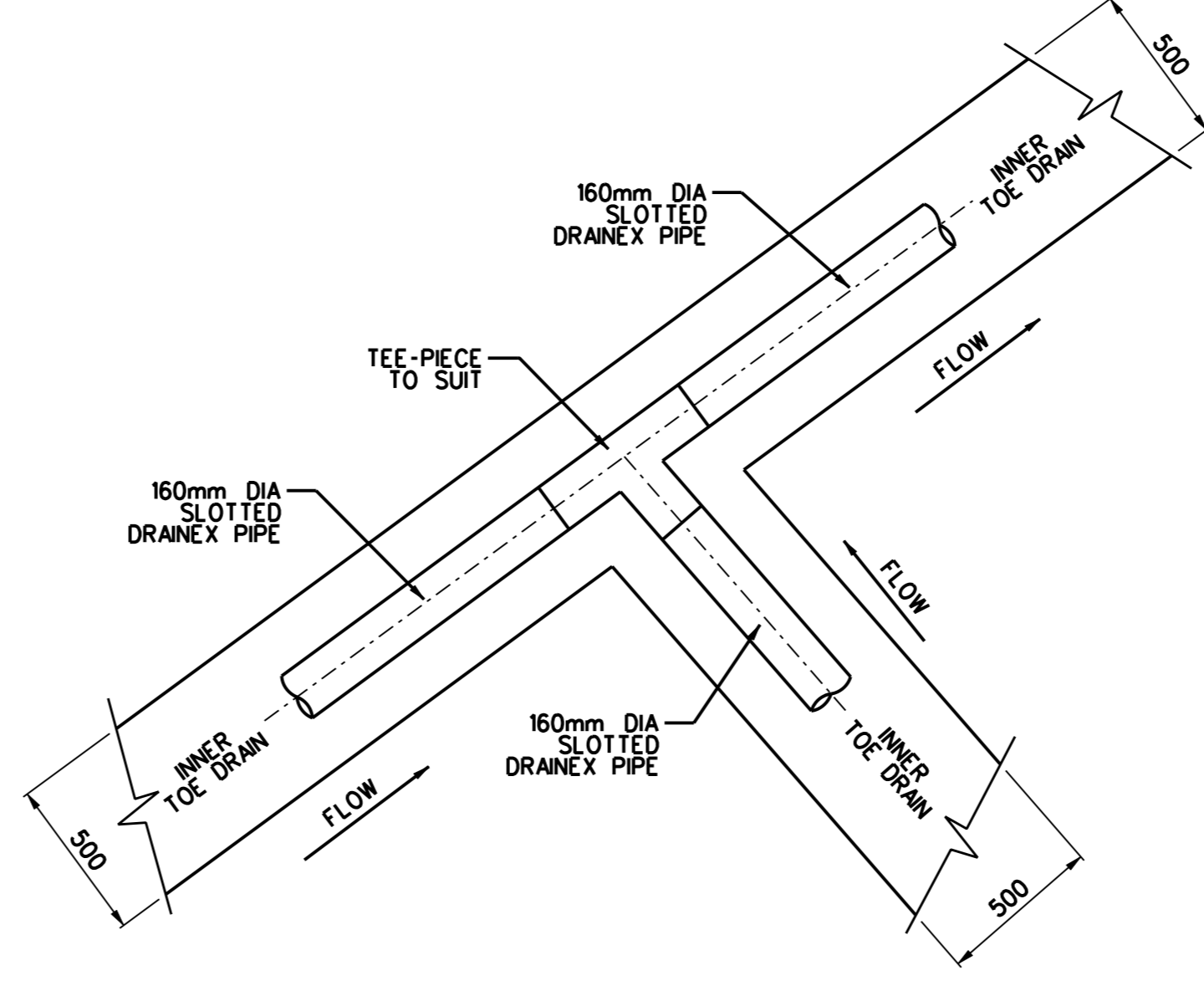
DETAIL 3
SCALE 1:20



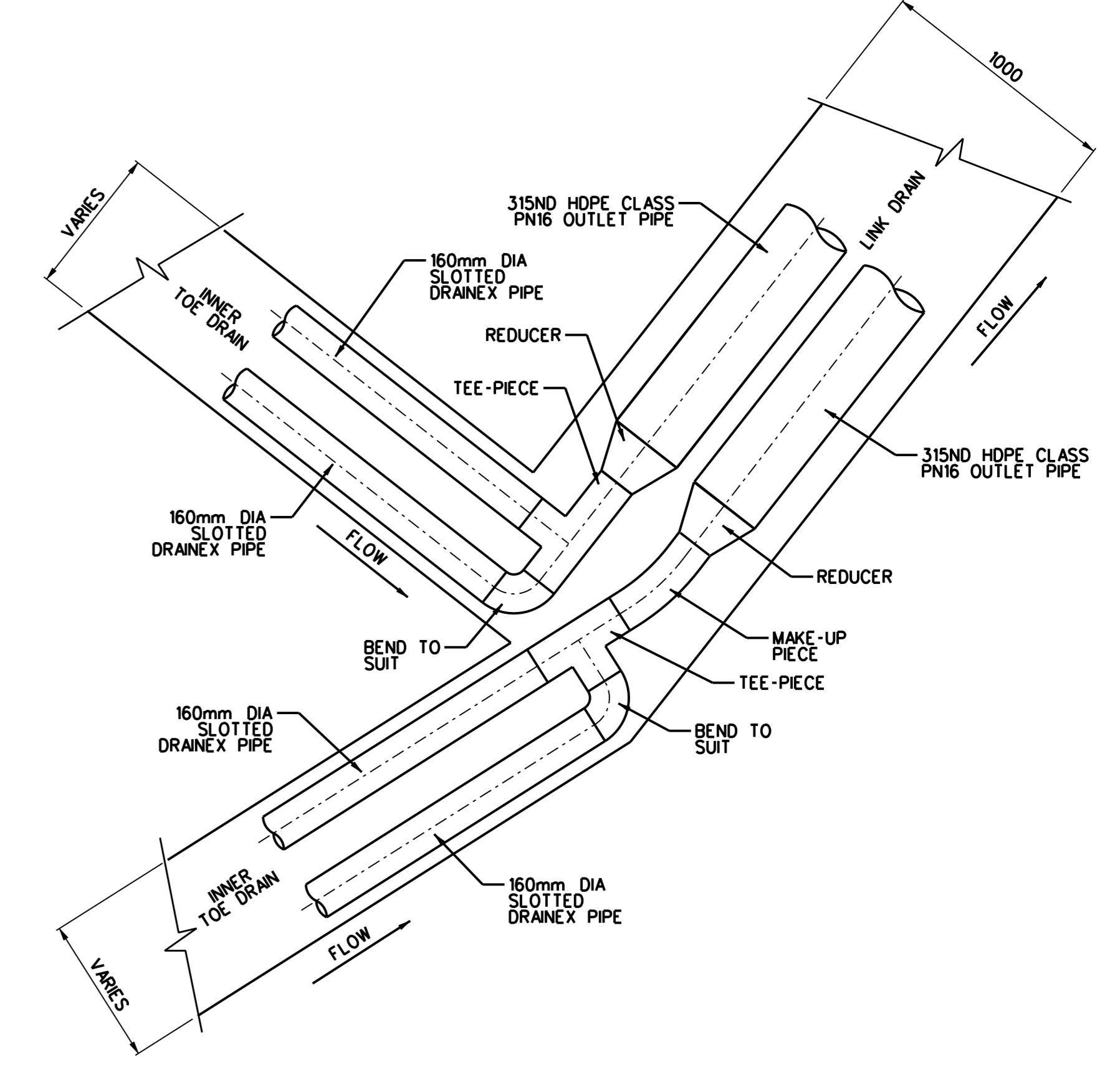
DETAIL 4
SCALE 1:20



DETAIL 5
SCALE 1:20



DETAIL 6
SCALE 1:20



DETAIL 7
SCALE 1:20

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REV	BY	DATE	DESCRIPTION	DRG.No.	REFERENCE DRAWINGS	DRG.No.	REFERENCE DRAWINGS
				001	GENERAL ARRANGEMENT		
				004	DRAINAGE DETAILS		

ECMP
Environmental, Civil & Mining Projects (Pty) Ltd
Box 783697 Sandton 2146
Tel. (011) 705 1111
Fax. (011) 705 1908

CLIENT BADGER MINING & CONSULTING (PTY) LTD	BY N.S.	DATE MAR.09
TITLE MOOPLAATS COAL DISCARD DUMP DRAINAGE PIPE DETAILS	DRAWN N.S.	
	CHECKED	
	SCALE A0-150	
	DRAWING No. T994-010	REVISION A

Mooiplaats Coal Discard Dump - Design Parameters

INPUT REQUIRED (Required for each Mine/Colliery contributing to the Coal Discard dump)

PHASE 1 (Discard dump 1)

Name of Mine	R.O.M.				Coal Production			Balance (Discard + Slurry) (tpm)	Discard deposition						Slurry deposition					
	Duration (Months)	Duration (Years)	R.O.M. (tpa)	R.O.M. (tpm)	Coal %	Coal (tpa)	Coal (tpm)		Discard (% of balance)	Discard (tpa)	Discard (tpm)	Discard dry density (t/m ³)	Discard volume (m ³ /mth)	Discard volume (m ³ /a)	Slurry (% of balance)	Slurry (tpa)	Slurry (tpm)	Slurry dry density (t/m ³)	Slurry volume (m ³ /mth)	Slurry volume (m ³ /a)
Mooiplaats Phase 1	18	1.50	1,533,600.00	127,800.00	78.25%	1,200,000.00	100,000.00	27,800.00	83.81%	279,600.00	23,300.00	1.60	14,562.50	174,750.00	16.19%	54,000.00	4,500.00	1.00	4,500.00	54,000.00
Total over phase duration	18			2,300,400.00			1,800,000.00				419,400.00		262,125.00			81,000.00		81,000.00		

PHASE 2 (Discard dump 1)

Name of Mine	R.O.M.				Coal Production			Balance (Discard + Slurry) (tpm)	Discard deposition						Slurry deposition					
	Duration (Months)	Duration (Years)	R.O.M. (tpa)	R.O.M. (tpm)	Coal %	Coal (tpa)	Coal (tpm)		Discard (% of balance)	Discard (tpa)	Discard (tpm)	Discard dry density (t/m ³)	Discard volume (m ³ /mth)	Discard volume (m ³ /a)	Slurry (% of balance)	Slurry (tpa)	Slurry (tpm)	Slurry dry density (t/m ³)	Slurry volume (m ³ /mth)	Slurry volume (m ³ /a)
Mooiplaats Phase 2	123	10.25	3,067,200.00	255,600.00	78.25%	2,400,000.00	200,000.00	55,600.00	83.81%	559,200.00	46,600.00	1.60	29,125.00	349,500.00	16.19%	108,000.00	9,000.00	1.00	9,000.00	108,000.00
Total over phase duration	123			31,438,800.00			24,600,000.02				5,731,799.98		3,582,374.99			1,107,000.00		1,107,000.00		
Total over life of project	141	11.75		33,739,200.00			26,400,000.02				6,151,199.98		3,844,499.99			1,188,000.00		1,188,000.00		

PHASE 3 (Discard dump 2)

Name of Mine	R.O.M.				Coal Production			Balance (Discard + Slurry) (tpm)	Discard deposition						Slurry deposition					
	Duration (Months)	Duration (Years)	R.O.M. (tpa)	R.O.M. (tpm)	Coal %	Coal (tpa)	Coal (tpm)		Discard (% of balance)	Discard (tpa)	Discard (tpm)	Discard dry density (t/m ³)	Discard volume (m ³ /mth)	Discard volume (m ³ /a)	Slurry (% of balance)	Slurry (tpa)	Slurry (tpm)	Slurry dry density (t/m ³)	Slurry volume (m ³ /mth)	Slurry volume (m ³ /a)
Mooiplaats Phase 3	108	9.00	1,680,000.00	140,000.00	71.43%	1,200,000.00	100,000.00	40,000.00	90.00%	432,000.00	36,000.00	1.60	22,500.00	270,000.00	10.00%	48,000.00	4,000.00	1.00	4,000.00	48,000.00
Total over phase duration	108			15,120,000.00			10,800,000.00				3,888,000.00		2,430,000.00			432,000.00		432,000.00		

48,859,200.00

37,200,000.01

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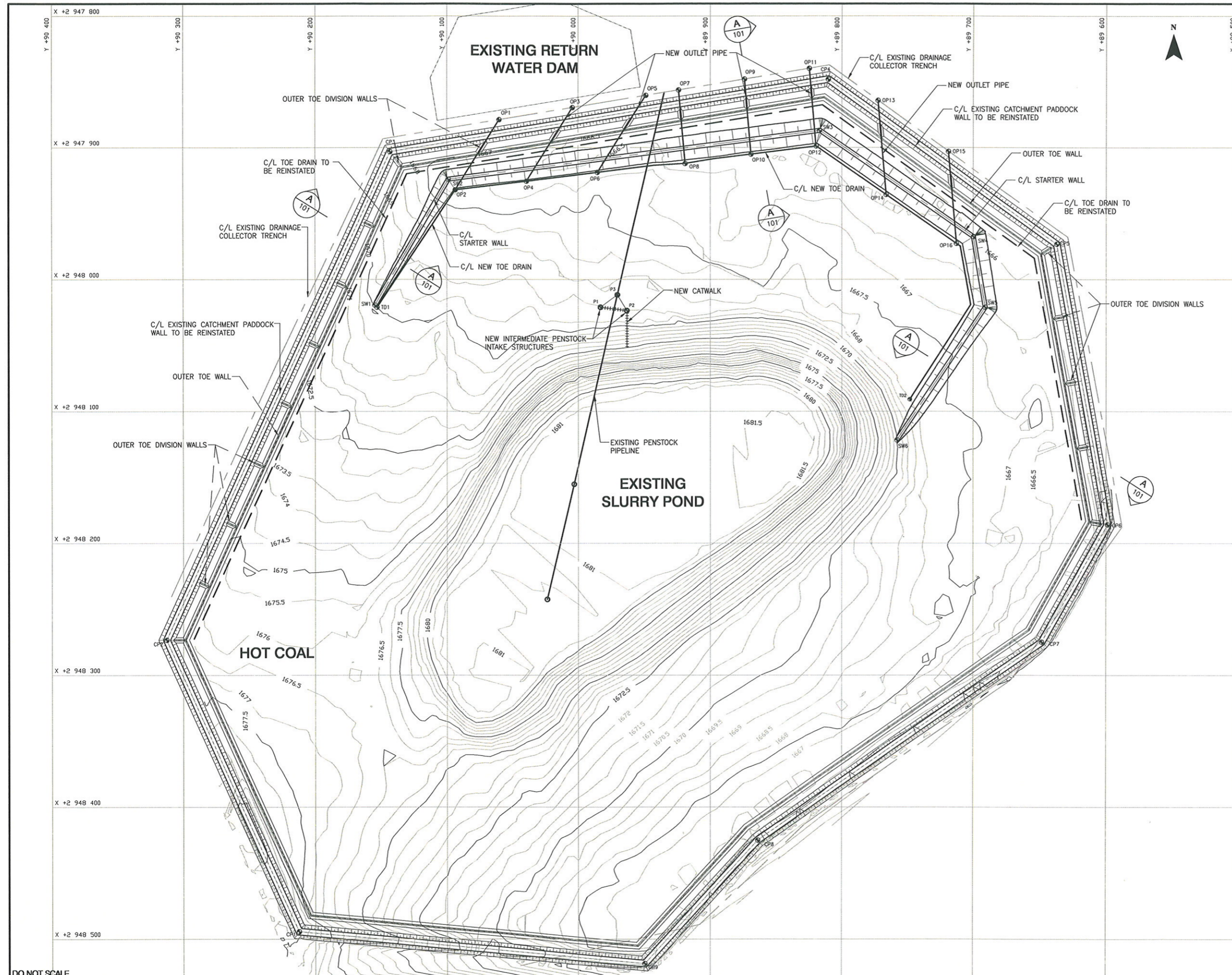
CAPACITY ANALYSIS									
Mooiplaats Coal Discard Dump 1: Coarse Discard									
DRY DENSITY:		1.60 t/m ³							
Deposition rate (tpm)	Vertical height (m)	Elevation (mamsl)	Volume (m ³)	Acc. volume (m ³)	Acc. tonnage (tonnes)	Time (months)	Acc. time (months)	Acc. time (years)	Rate of rise (m/y)
46,600	0	1666	0	0	0	0.0	0.0	0.00	0.00
46,600	48	1714	3,900,000	3,900,000	6,240,000	133.9	133.9	11.16	4.30

CAPACITY ANALYSIS									
Mooiplaats Coal Discard Dump 1: Slurry									
DRY DENSITY:		1.00 t/m ³							
Deposition rate (tpm)	Vertical height (m)	Elevation (mamsl)	Volume (m ³)	Acc. volume (m ³)	Acc. tonnage (tonnes)	Time (months)	Acc. time (months)	Acc. time (years)	Rate of rise (m/y)

SW	4,500	0	1670	0	0	0	0.0	0.00	0.00
	4,500	1	1671	117	117	117	0.0	0.00	459.72
	4,500	2	1672	3,596	3,714	3,714	0.8	0.07	15.02
	4,500	3	1673	9,522	13,236	13,236	2.1	0.25	5.67
	4,500	4	1674	13,673	26,909	26,909	3.0	0.50	3.95
1	4,500	5	1675	14,860	41,769	41,769	3.3	0.77	3.63
	4,500	6	1676	15,539	57,308	57,308	3.5	1.06	3.48
	4,500	7	1677	16,227	73,535	73,535	3.6	1.36	3.33
	4,500	8	1678	16,925	90,460	90,460	3.8	1.68	3.19
	9,000	9	1679	17,632	108,092	108,092	2.0	1.84	6.13
2	9,000	10	1680	18,348	126,441	126,441	2.0	2.01	5.89
	9,000	11	1681	19,074	145,515	145,515	2.1	2.18	5.66
	9,000	12	1682	19,809	165,323	165,323	2.2	2.37	5.45
	9,000	13	1683	20,553	185,876	185,876	2.3	2.56	5.25
	9,000	14	1684	21,306	207,182	207,182	2.4	2.76	5.07
3	9,000	15	1685	22,068	229,250	229,250	2.5	2.96	4.89
	9,000	16	1686	22,840	252,091	252,091	2.5	3.17	4.73
	9,000	17	1687	23,621	275,712	275,712	2.6	3.39	4.57
	9,000	18	1688	24,411	300,123	300,123	2.7	3.62	4.42
	9,000	19	1689	25,211	325,334	325,334	2.8	3.85	4.28
4	9,000	20	1690	26,020	351,354	351,354	2.9	4.09	4.15
	9,000	21	1691	26,838	378,191	378,191	3.0	4.34	4.02
	9,000	22	1692	27,665	405,856	405,856	3.1	4.60	3.90
	9,000	23	1693	28,501	434,357	434,357	3.2	4.86	3.79
	9,000	24	1694	29,347	463,704	463,704	3.3	5.13	3.68
5	9,000	25	1695	30,202	493,906	493,906	3.4	5.41	3.58
	9,000	26	1696	31,066	524,973	524,973	3.5	5.70	3.48
	9,000	27	1697	31,940	556,912	556,912	3.5	5.99	3.38
	9,000	28	1698	32,822	589,735	589,735	3.6	6.30	3.29
	9,000	29	1699	33,714	623,449	623,449	3.7	6.61	3.20
6	9,000	30	1700	34,616	658,065	658,065	3.8	6.93	3.12
	9,000	31	1701	35,526	693,591	693,591	3.9	7.26	3.04
	9,000	32	1702	36,446	730,036	730,036	4.0	7.60	2.96
	9,000	33	1703	37,375	767,411	767,411	4.2	7.94	2.89
	9,000	34	1704	38,313	805,724	805,724	4.3	8.30	2.82
7	9,000	35	1705	39,260	844,984	844,984	4.4	8.66	2.75
	9,000	36	1706	40,217	885,201	885,201	4.5	9.03	2.69
	9,000	37	1707	41,183	926,384	926,384	4.6	9.42	2.62
	9,000	38	1708	42,158	968,543	968,543	4.7	9.81	2.56
	9,000	39	1709	43,143	1,011,685	1,011,685	4.8	10.21	2.50
8	9,000	40	1710	44,136	1,055,822	1,055,822	4.9	10.61	2.45
	9,000	41	1711	45,139	1,100,961	1,100,961	5.0	11.03	2.39
	9,000	42	1712	46,151	1,147,112	1,147,112	5.1	11.46	2.34
	9,000	43	1713	47,173	1,194,285	1,194,285	5.2	11.90	2.29

CAPACITY ANALYSIS									
Mooiplaats Coal Discard Dump 2: Coarse Discard									
DRY DENSITY:		1.60		t/m ³					
Deposition rate (tpm)	Vertical height (m)	Elevation (mamsl)	Volume (m ³)	Acc. volume (m ³)	Acc. tonnage (tonnes)	Time (months)	Acc. time (months)	Acc. time (years)	Rate of rise (m/y)
36,000	0	1674	0	0	0	0.0	0.0	0.00	0.00
36,000	40	1714	2,627,903	2,627,903	4,204,645	116.8	116.8	9.73	4.11

CAPACITY ANALYSIS									
Mooiplaats Coal Discard Dump 2: Slurry									
DRY DENSITY:		1.00		t/m ³					
Deposition rate (tpm)	Vertical height (m)	Elevation (mamsl)	Volume (m ³)	Acc. volume (m ³)	Acc. tonnage (tonnes)	Time (months)	Acc. time (months)	Acc. time (years)	Rate of rise (m/y)
SW	4,000	0	1674	0	0	0.0	0.0	0.00	0.00
	4,000	1	1675	1,964	1,964	0.5	0.5	0.04	24.44
	4,000	2	1676	4,038	6,002	1.0	1.5	0.13	11.89
	4,000	3	1677	5,056	11,058	1.3	2.8	0.23	9.49
	4,000	4	1678	5,480	16,538	1.4	4.1	0.34	8.76
	4,000	5	1679	5,881	22,419	1.5	5.6	0.47	8.16
	4,000	6	1680	6,293	28,713	1.6	7.2	0.60	7.63
1	4,000	7	1681	6,716	35,429	1.7	8.9	0.74	7.15
	4,000	8	1682	7,149	42,578	1.8	10.6	0.89	6.71
	4,000	9	1683	7,593	50,171	1.9	12.5	1.05	6.32
	4,000	10	1684	8,047	58,218	2.0	14.6	1.21	5.96
	4,000	11	1685	8,512	66,730	2.1	16.7	1.39	5.64
2	4,000	12	1686	8,987	75,717	2.2	18.9	1.58	5.34
	4,000	13	1687	9,473	85,190	2.4	21.3	1.77	5.07
	4,000	14	1688	9,970	95,160	2.5	23.8	1.98	4.81
	4,000	15	1689	10,477	105,637	2.6	26.4	2.20	4.58
	4,000	16	1690	10,994	116,631	2.7	29.2	2.43	4.37
3	4,000	17	1691	11,523	128,154	2.9	32.0	2.67	4.17
	4,000	18	1692	12,061	140,215	3.0	35.1	2.92	3.98
	4,000	19	1693	12,611	152,825	3.2	38.2	3.18	3.81
	4,000	20	1694	13,171	165,996	3.3	41.5	3.46	3.64
	4,000	21	1695	13,741	179,737	3.4	44.9	3.74	3.49
4	4,000	22	1696	14,322	194,059	3.6	48.5	4.04	3.35
	4,000	23	1697	14,914	208,973	3.7	52.2	4.35	3.22
	4,000	24	1698	15,516	224,488	3.9	56.1	4.68	3.09
	4,000	25	1699	16,128	240,617	4.0	60.2	5.01	2.98
	4,000	26	1700	16,752	257,368	4.2	64.3	5.36	2.87
5	4,000	27	1701	17,386	274,754	4.3	68.7	5.72	2.76
	4,000	28	1702	18,030	292,784	4.5	73.2	6.10	2.66
	4,000	29	1703	18,685	311,469	4.7	77.9	6.49	2.57
	4,000	30	1704	19,350	330,819	4.8	82.7	6.89	2.48
	4,000	31	1705	20,027	350,846	5.0	87.7	7.31	2.40
6	4,000	32	1706	20,713	371,559	5.2	92.9	7.74	2.32
	4,000	33	1707	21,410	392,970	5.4	98.2	8.19	2.24
	4,000	34	1708	22,118	415,088	5.5	103.8	8.65	2.17
7	4,000	35	1709	22,837	437,924	5.7	109.5	9.12	2.10
	4,000	36	1710	23,566	461,490	5.9	115.4	9.61	2.04
	4,000	37	1711	24,305	485,795	6.1	121.4	10.12	1.97
	4,000	38	1712	25,055	510,850	6.3	127.7	10.64	1.92
	4,000	39	1713	25,816	536,666	6.5	134.2	11.18	1.86



COORDINATE LIST		
WGS 84 Lo31		
POINT	Y COORD	X COORD
CONST:		
STARTER WALL		
SW1	90154.859	2948019.010
SW2	90098.739	2947923.879
SW3	89816.586	2947886.890
SW4	89699.742	2947967.354
SW5	89690.623	2948020.861
SW6	89757.868	2948121.645
PENSTOCK INTAKES		
P1	89982.877	2948020.829
P2	89962.876	2948023.392
P3	89970.022	2948011.494
TOE DRAIN		
TD1	90153.407	2948020.957
TD2	89748.144	2948090.726
CATCHMENT PADDOCK WALL		
CP1	90212.407	2948494.436
CP2	90312.595	2948273.226
CP3	90143.413	2947903.081
CP4	89810.193	2947848.029
CP5	89636.854	2947973.057
CP6	89598.838	2948185.765
CP7	89647.921	2948274.757
CP8	89964.153	2948425.060
CP9	89949.437	2948518.639
OUTLET DRAIN PIPES		
OD1	90060.157	2947878.685
OD2	90093.498	2947931.933
OD3	90004.387	2947869.470
OD4	90038.930	2947925.658
OD5	89948.618	2947860.256
OD6	89985.151	2947918.603
OD7	89923.754	2947856.148
OD8	89918.826	2947911.963
OD9	89874.281	2947847.974
OD10	89869.252	2947904.943
OD11	89824.808	2947839.801
OD12	89819.376	2947898.785
OD13	89772.464	2947864.146
OD14	89766.157	2947935.588
OD15	89718.856	2947902.813
OD16	89712.699	2947972.558

DO NOT SCALE

REV	DR	CH	DATE	REVISIONS
A	MCOO	MCOO	28.07.2011	ISSUED FOR COMMENTS AND APPROVAL
B	GOSK	REVR	11.08.2011	ISSUED FOR CONSTRUCTION

REFERENCE DRAWINGS	
400916/01	TYPICAL SECTIONS AND DETAILS

NOTES

Datum: WGS 84
Projection: UTM
Central Meridian / Zone: 1831
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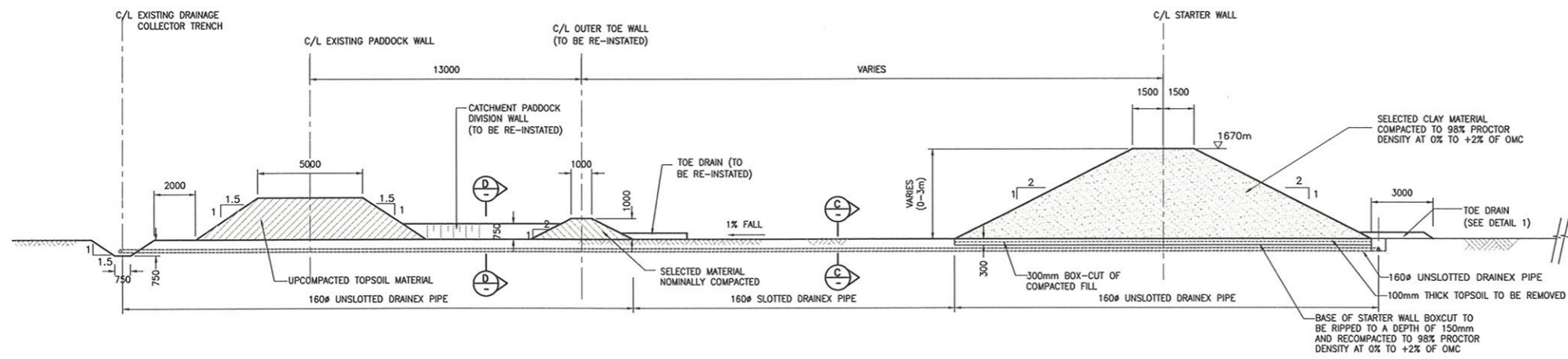
PO Box 50261
Northridge
2116 South Africa

Phone: +27 (0) 11 441 1111
Fax: +27 (0) 11 680 9398

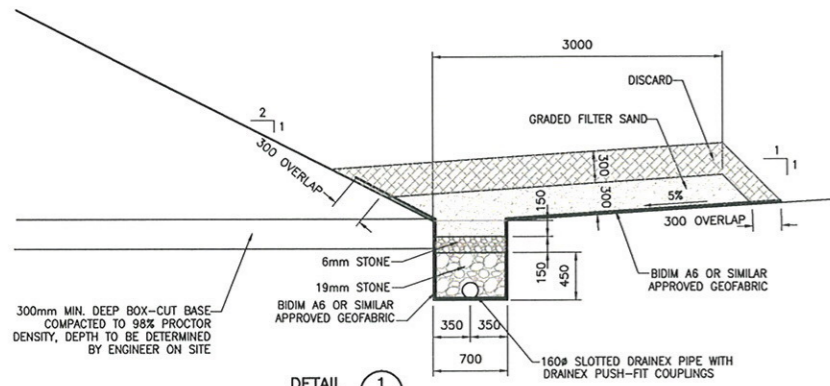
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CESA
Construction Engineering & Surveying Association of South Africa

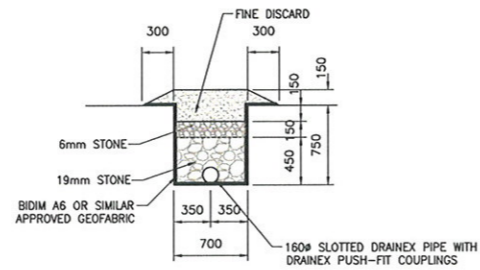
CLIENT: MOOIPLAATS COLLIERY		TITLE: MOOIPLAATS COLLIERY GENERAL ARRANGEMENT SHOWING LAYOUT AT STARTER WALL	
DATE: 28.07.2011	CHECKED: MCOO	DATE: 28.07.2011	REV: 0
SCALE: 1:1000	DRG No: 430918/100	FOR CONSTRUCTION	



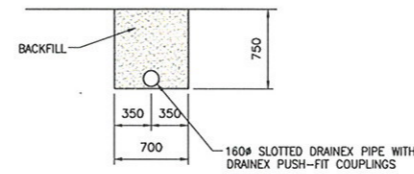
TYPICAL SECTION A
SCALE 1:100



TOE DRAIN (COMPACTED STARTER WALL OVER 1m HIGH)
SCALE :25



SECTION C
SCALE :25



SECTION D
SCALE :25

DO NOT SCALE

REV	DR	CH	DATE	REVISIONS
A	MOOD	MOOD	28.07.2011	ISSUED FOR COMMENTS AND APPROVAL
0	GOSK	RVCB	11.08.2011	ISSUED FOR CONSTRUCTION

REFERENCE DRAWINGS	
430918/100	GENERAL ARRANGEMENT SHOWING LAYOUT AT STARTER WALL

NOTES

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Projection:
Central Meridian / Zone:
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PROJECT INFORMATION			
DESIGNED	MOOD	DATE	CHECKED
MOOD	MOOD	28.07.2011	MOOD
DRAWN: MOOD			
SCALE: AS SHOWN			
CLIENT: MOOIPLAATS COLLIERY			

PROJECT INFORMATION			
DESIGNED	MOOD	DATE	CHECKED
MOOD	MOOD	28.07.2011	MOOD
DRAWN: MOOD			
SCALE: AS SHOWN			
CLIENT: MOOIPLAATS COLLIERY			
DRG NO:	430918/101	REV:	0

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