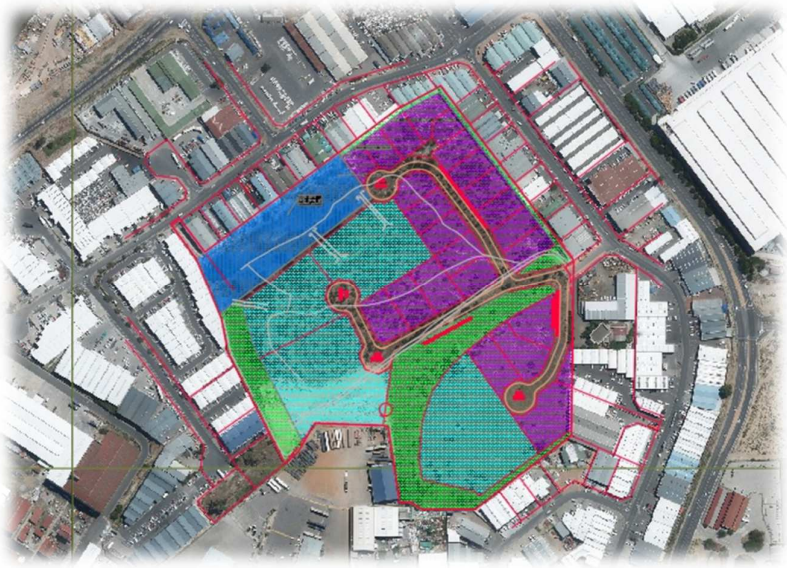
ELEMENT
Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING

EVERITE INDUSTRIAL DEVELOPMENT, ERF 18354, BRACKENFELL:

CIVIL SERVICES METHOD STATEMENT: REV 00



OUR REF NO. 200284

DECEMBER 2020

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DOCUMENT CONTROL SHEET

Compiled By:	 ……... Elroy Walters PrEng	9 December 2020 …….. Date
Reviewed By:	…… Brent Vivier PrEng	9 December 2020 …….. Date

Revision	Description	Date Issued	Revision By:
00	First Issue	9 December 2020	EW

DISTRIBUTION LIST

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CONTENTS

1 EARTHWORKS

1.1 In-Situ Conditions

The in-situ terrain must be compacted before any fill and/or capping layers are placed. The terrain must be compacted to 95% MOD AASHTO.

1.2 Capping

The capping layerworks depend on the total fill required to achieve the final earthworks levels, as well as the location of the capping (i.e. roads, building platforms, etc.). The capping layers have been specified by *Jones and Wagener Engineering and Environmental Consultants.*

1.2.1 In Green areas

In the green areas surrounding the industrial development, the existing vegetation will be cleared and the capping layerworks will be constructed directly on to the compacted insitu material. The typical layerworks for these areas is shown in Figures 1.2.1a.

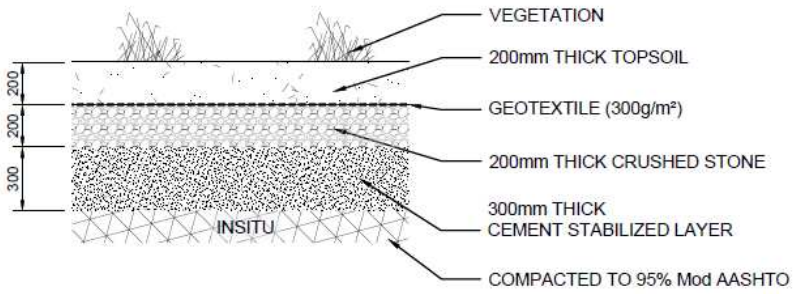


Figure 1.2.1a: Capping layerworks in green areas

Additionally, due to the mole activity that has been witnessed on site, a rodent barrier will be installed along the entire perimeter of the site. This will entail the excavation of one meter deep trench that will be lined with a HDPE geomembrane and backfilled with a cement stabilised material. The geomembrane will continue across the top of the trench and be place 100mm up against the property boundary. The typical cross section of the rodent barrier is shown in Figures 1.2.1b.

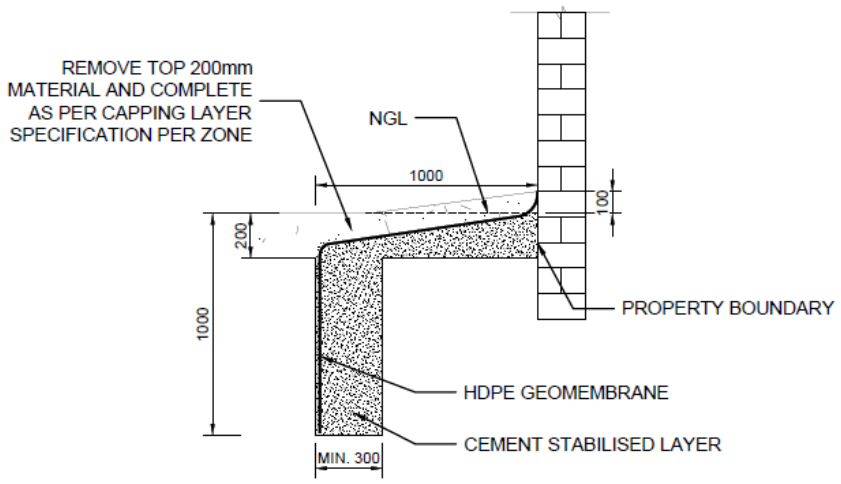


Figure 1.2.1b: Typical detail of perimeter rodent barrier

1.2.2 In Roads

The roads can be classified into two categories, based on the proposed layerworks, namely main access roads (asphalt finish) and internal parking areas (brick paved finish). Typical road sections are shown in Figures 1.2.1c and 1.2.1d.

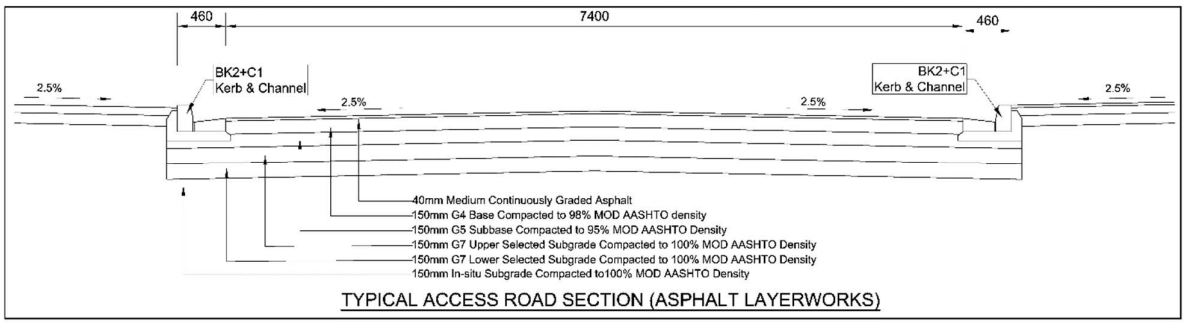


Figure 1.2.1c: Road Layerworks (Asphalt)

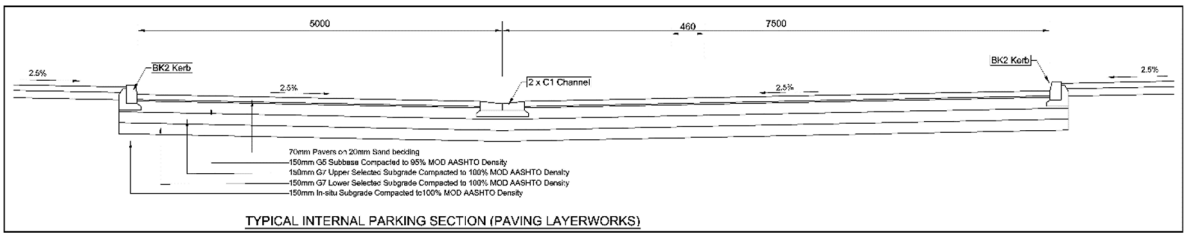


Figure 1.2.1d: Road Layerworks (Brick Paving)

The road layerworks are as follows:

- Asphalt Finish (640mm total thickness):
    - 40mm Premix
    - 150mm G4
    - 150mm G5
    - 150mm Upper Selected
    - 150mm Lower Selected
- Brick Paving (540mm total thickness):
    - 70mm Paver on 20mm Sand bedding
    - 150mm G5
    - 150mm Upper Selected
    - 150mm Lower Selected

Under the asphalt roads, the capping will be replaced by the road layerworks. Where the total fill required to achieve final level is less than the proposed road layerworks thickness, excavation will be required into the in-situ material. This is illustrated in Figure 1.2.1e (also refer to **Annexure A**), where the final level is approximately 70mm below the existing level. This scenario is limited to a 135m² area.

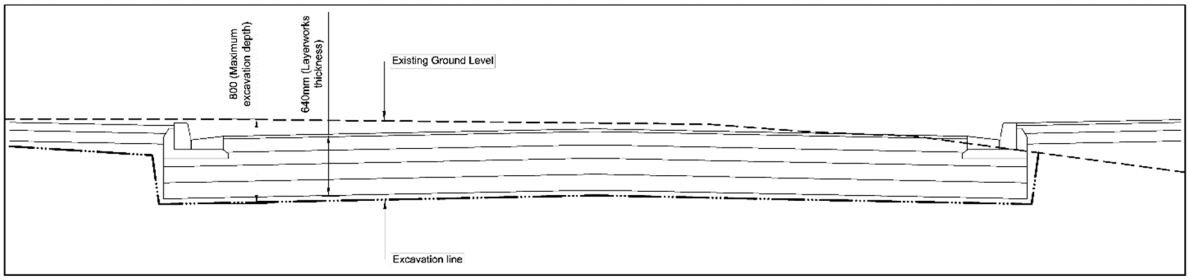


Figure 1.2.1e: Excavation for road layerworks at depth

Where the brick paving final earthworks levels are close to the existing ground and excavation is required, the 200mm thick crushed stone layer of the capping layerworks will be placed underneath the bricking paving layerworks are constructed.

1.2.3 On Building Platforms

The building platform areas can be categorized into three scenarios, namely:

a) Final level at, or just below the existing level (maximum excavation).

b) Final level between 0mm and 700mm above existing level (intermediate excavation).

c) Final level more than 700mm above existing level (no excavation).

Each scenario will entail varying degrees of excavation into the existing ground, from 700mm excavation, to no excavation into the existing ground (refer to **Annexure B**). Excavation of 700mm into the existing ground will require capping with no additional fill (scenario a above) while the scenario with no excavation will not require capping layerworks and only bulk earthworks (scenario c above). These bulk earthworks will comprise of competent material constructed in 200mm thick layer and compacted to 95% MOD AASHTO. The area where maximum excavation is required for building platforms is limited to 25m². Hence, Figure 1.2.1f is applicable for scenarios a and b described above.

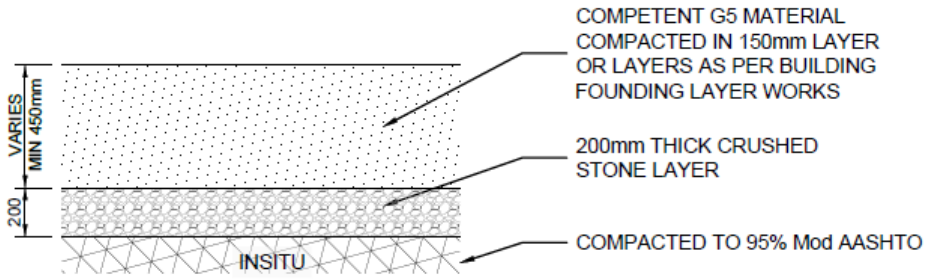


Figure 1.2.1f: Excavation for road layerworks at depth

2 UNDERGROUND SERVICES

Services have been designed to generally be at a maximum depth of 1m (refer to **Annexures C1** and **C2**, and therefore to be within the earthworks and/or capping layers. There are instances where this is not possible.

Services are located either in roads, parking areas or traverses across areas where no bulk earthworks occur. The areas where services cross outside of the roads or proposed bulk earthworks, the services will be deeper than the proposed capping layers and excavation into the existing ground will be required.

The three scenarios for services can be summarized as follows:

a) Deeper than proposed capping layer, in areas of no bulk earthworks/roadworks.

b) Within the existing ground under roads/parking.

c) Within the bulk earthworks fill, under roads/parking.

The above scenarios are illustrated in **Annexure C3**.

3 POND

The existing pond needs to be extended in length and widened (refer to **Annexure C2**). The pond will include a drainage layer of 500mm thick, consisting of clean drainage sand. Armorflex grass blocks will line the bottom and side slopes of the pond.

The drainage layer will contain a series of 110mmØ subsoil drains. Refer to **Annexure D** and Figure 3 below.

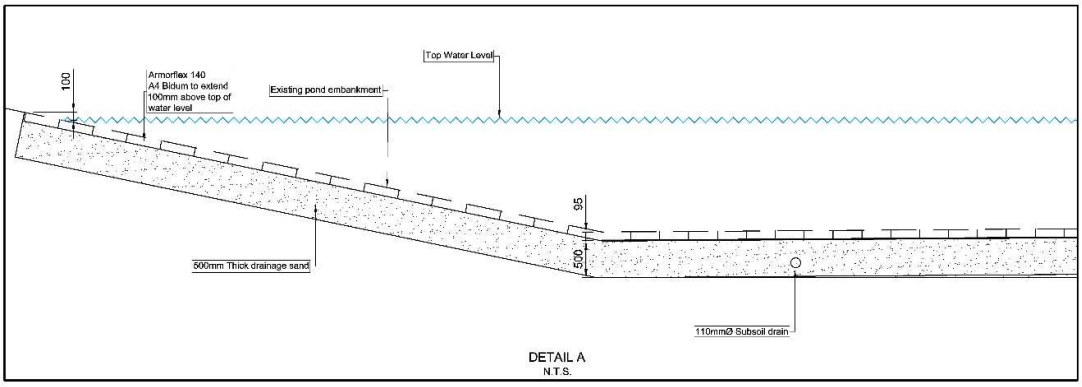
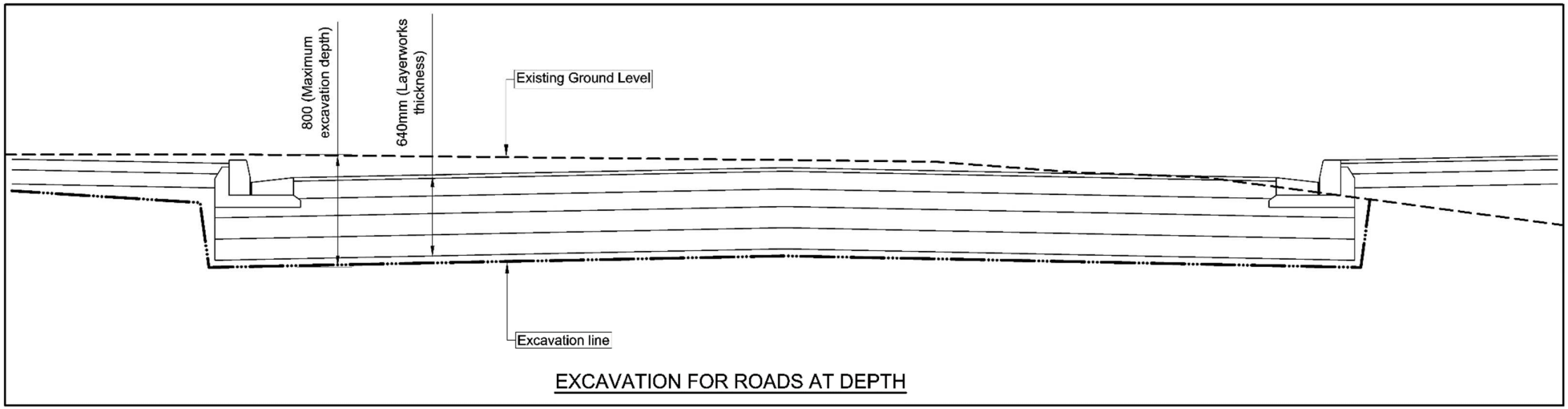


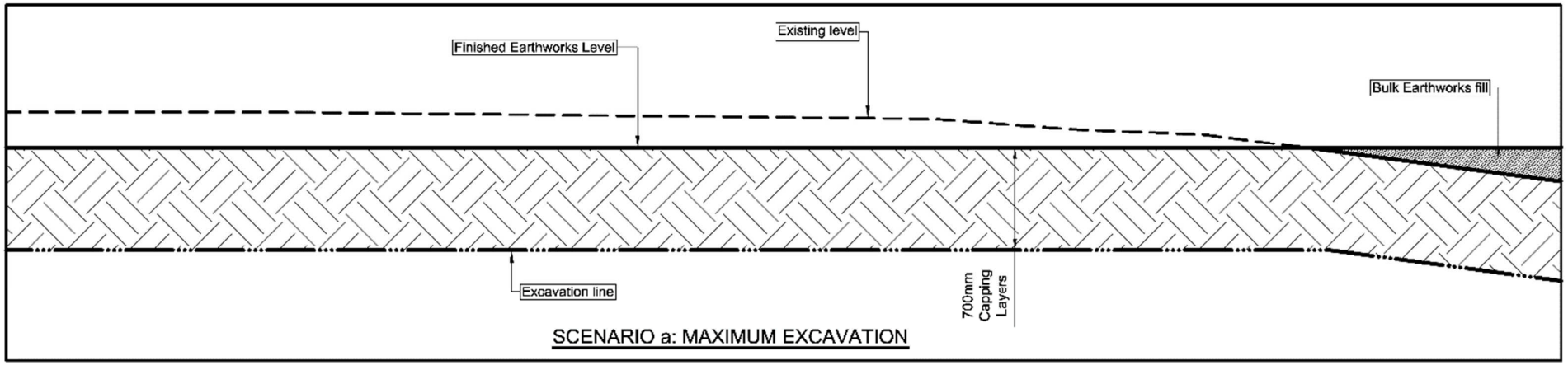
Figure 3: Pond details

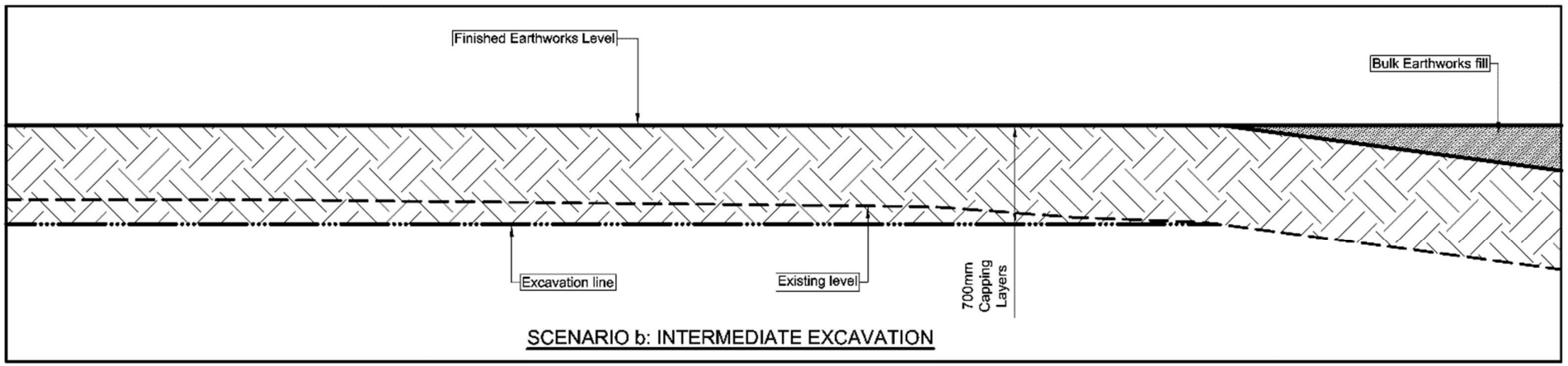
ANNEXURE A: EXCAVATION FOR ROADS AT DEPTH



EXCAVATION FOR ROADS AT DEPTH

ANNEXURE B: BUILDING EARTHWORKS SCENARIOS





ANNEXURE C: PRELIMINARY SEWER & WATER AND STORM WATER LAYOUT & TRENCHING

<u>ANNEXURE C1:</u> PRELIMINARY SEWER AND WATER LAYOUT (FULL SCALE ENCLOSED)

LEGEND	
SYMBOL	DESCRIPTION
	PROPOSED 160mmØ CLASS 34 uPVC SEWER MAIN
	PROPOSED 110mmØ CLASS 34 uPVC HOUSE CONNECTION & END CAP
	PROPOSED SEWER MANHOLE
	PROPOSED 110mmØ CLASS 12 uPVC WATER MAIN
	PROPOSED FIRE HYDRANT
	PROPOSED VALVE
WM	PROPOSED 80mm BULK WATER METER
	EXISTING SEWER PIPE
	EXISTING SEWER MANHOLE
	EXISTING STORM WATER PIPE
	EXISTING STORM WATER MANHOLE
	EXISTING STORM WATER KERB INLET
	EXISTING WATER PIPE
	EXISTING FIRE HYDRANT
	EXISTING VALVE
	EXISTING ELECTRICAL DUCT
	EXISTING TELECOMMUNICATIONS DUCT
	EXISTING TELECOMMUNICATIONS JUNCTION BOX

Rev	Date	Description	Ref
B	15-NOV-2021	ISSUE FOR APPROVAL	Fell
A	21-SEP-2021	ISSUE FOR APPROVAL	Fell

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Client/Employer: HANOCRON GROUP (PTY) LTD

Project: EVERITE INDUSTRIAL DEVELOPMENT, ERF 18354, BRACKENFELL

Plan Description: PRELIMINARY SEWER AND WATER LAYOUT

	Name	Signature
Designed	EW	
Drawn	EW	
Checked	WB	
Approved	BV	

Scale: 1:500 (OR AS SHOWN) — ORIGINAL SIZE A0

Contract No.: 2002841

Drawing No.: 2002841/C/130 — Revision: B

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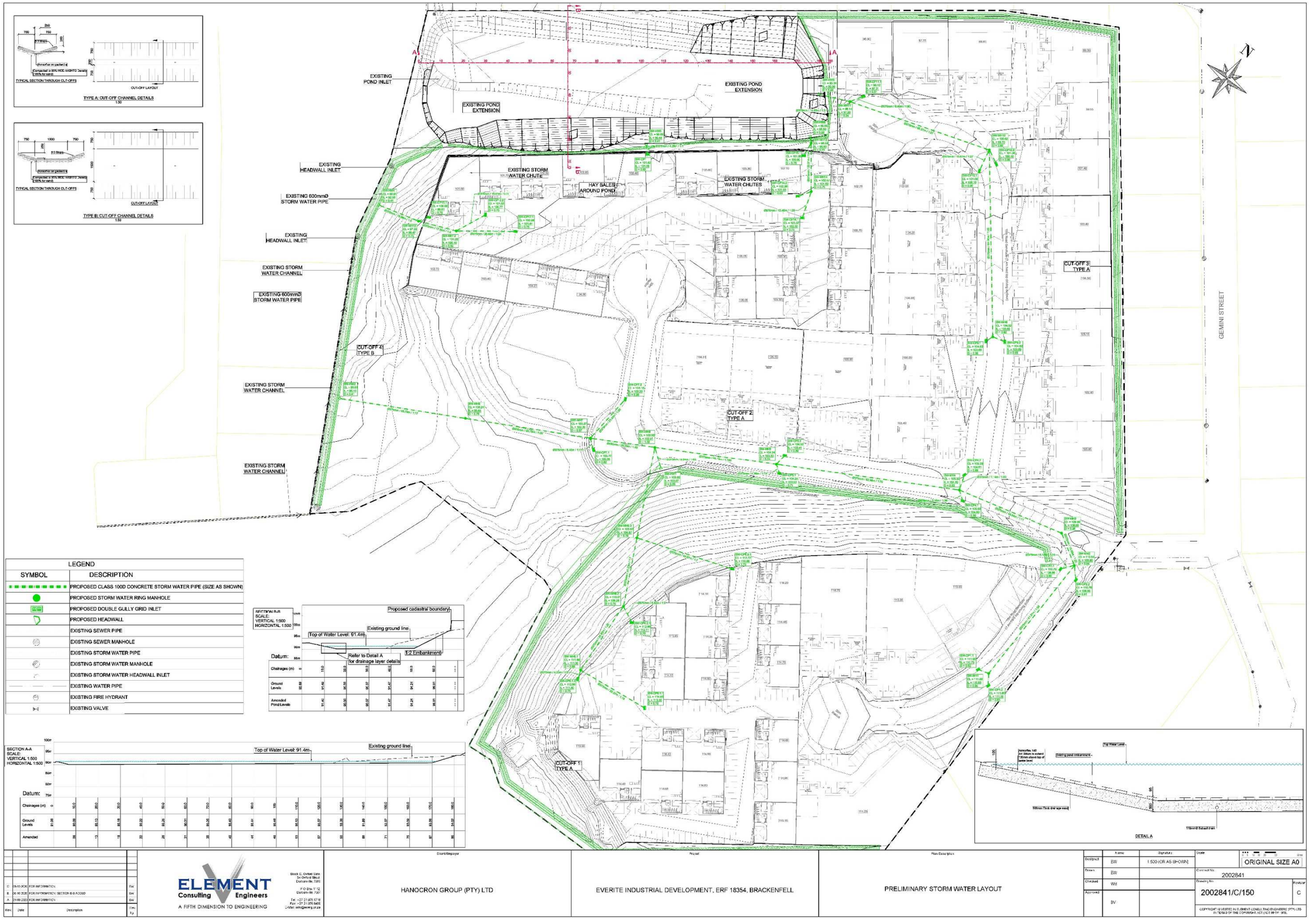
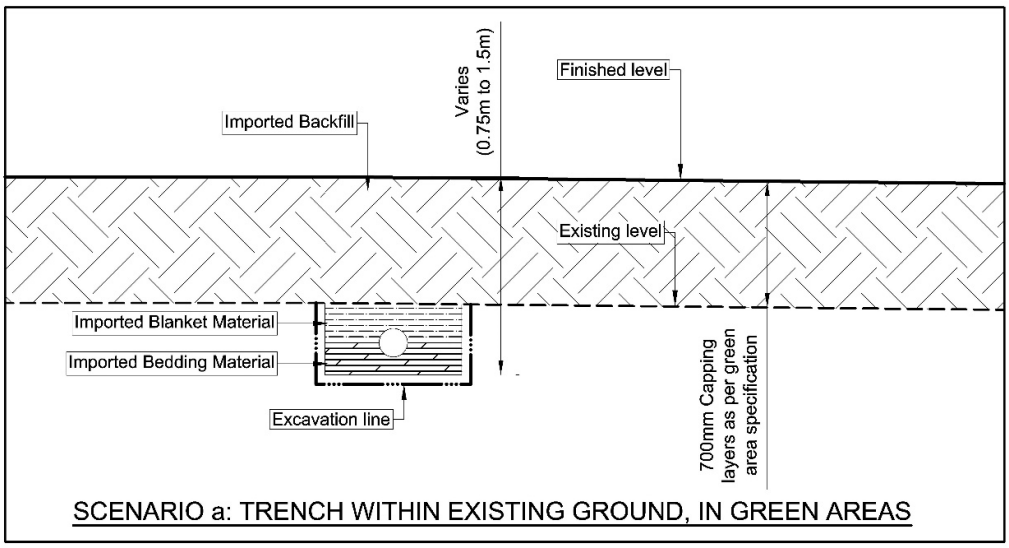
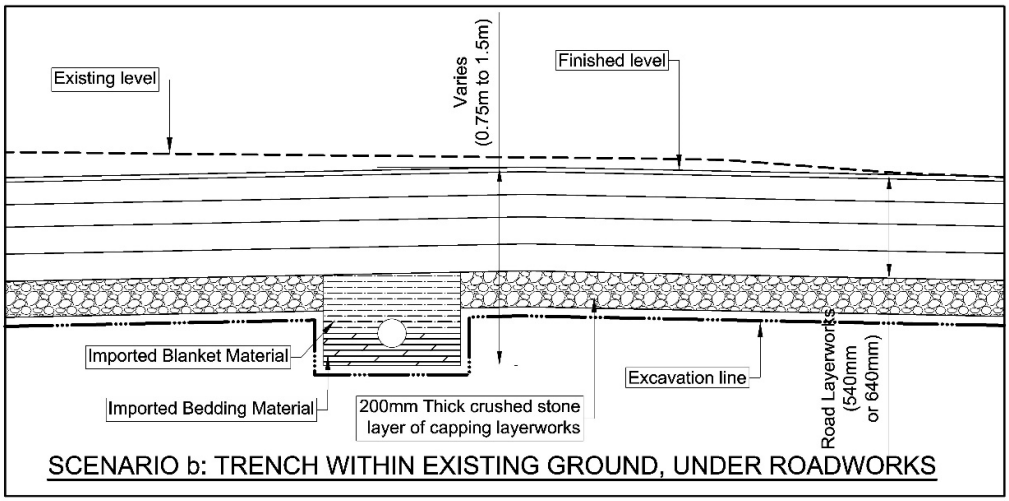
ANNEXURE C2: PRELIMINARY STORM WATER LAYOUT (FULL SCALE ENCLOSED)



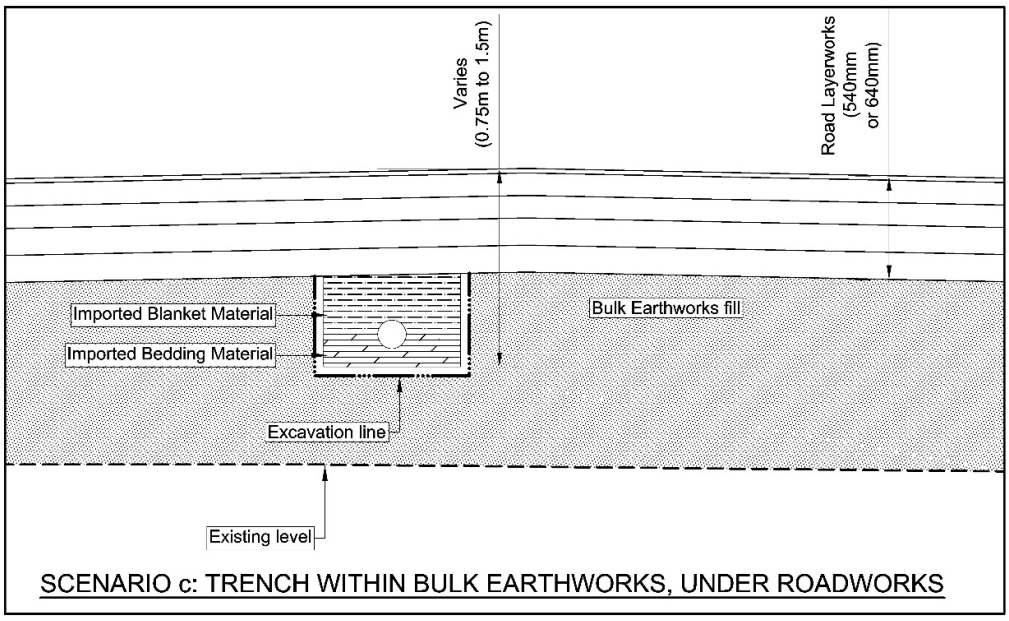
ANNEXURE C3: SERVICES TRENCHING SCENARIOS



SCENARIO a: TRENCH WITHIN EXISTING GROUND, IN GREEN AREAS

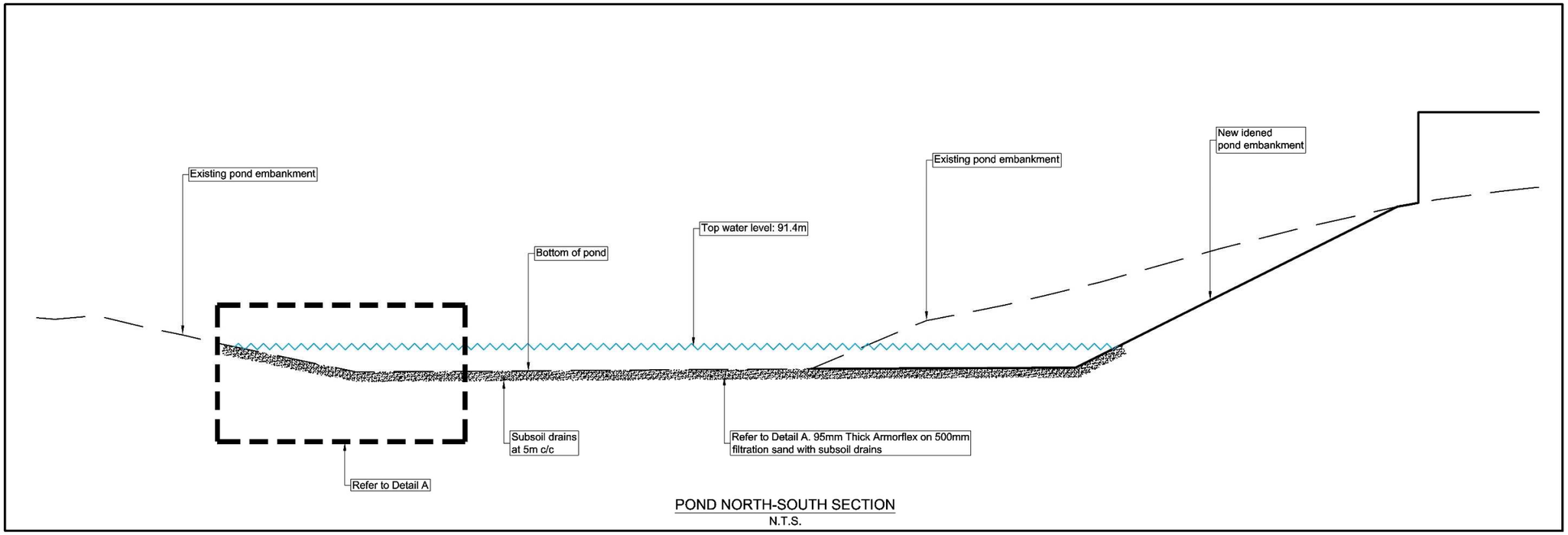


SCENARIO b: TRENCH WITHIN EXISTING GROUND, UNDER ROADWORKS



SCENARIO c: TRENCH WITHIN BULK EARTHWORKS, UNDER ROADWORKS

ANNEXURE D: POND DETAILS



POND NORTH-SOUTH SECTION
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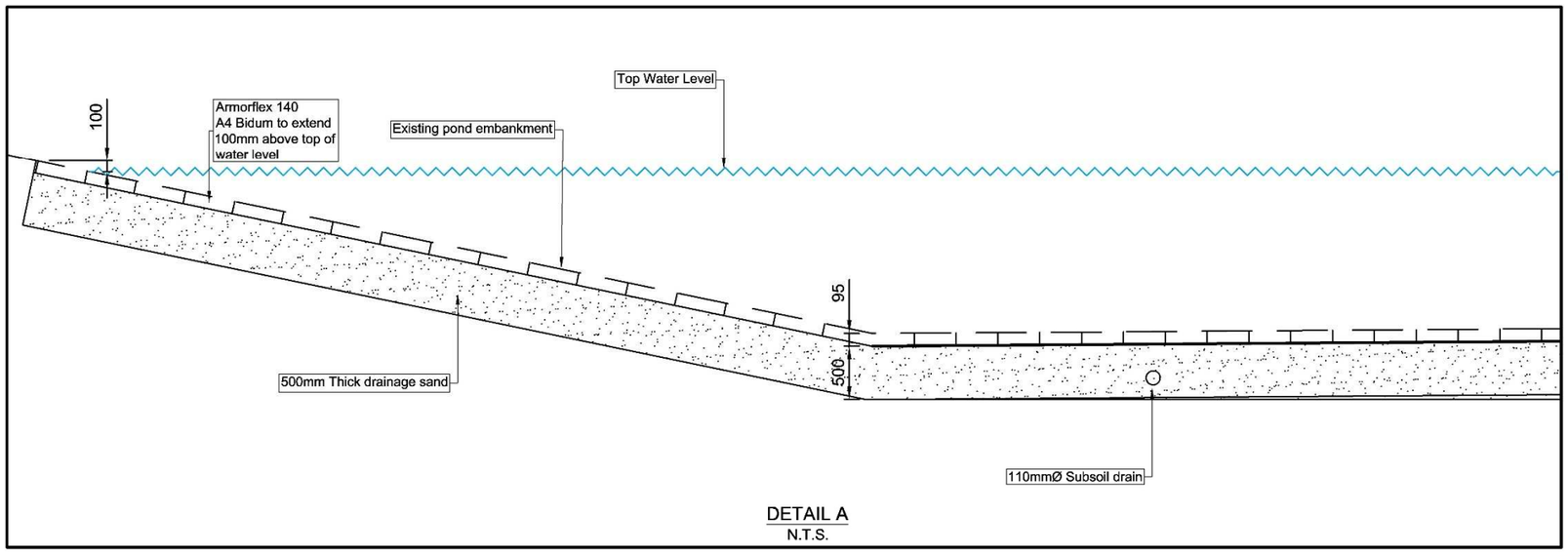

DETAIL A
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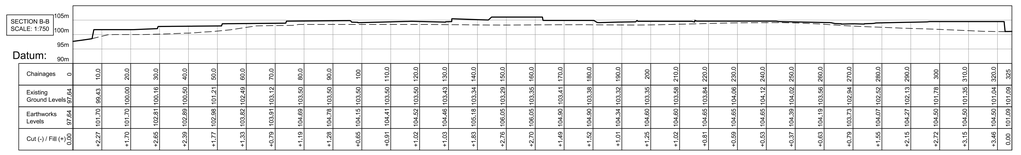

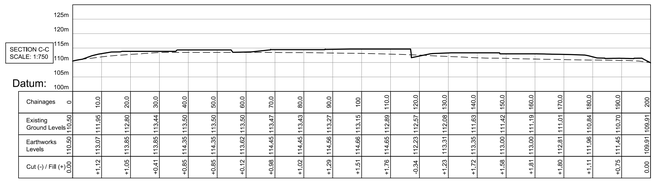

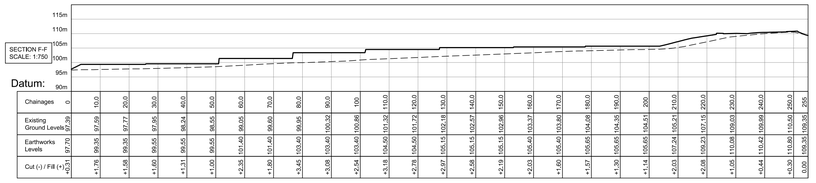

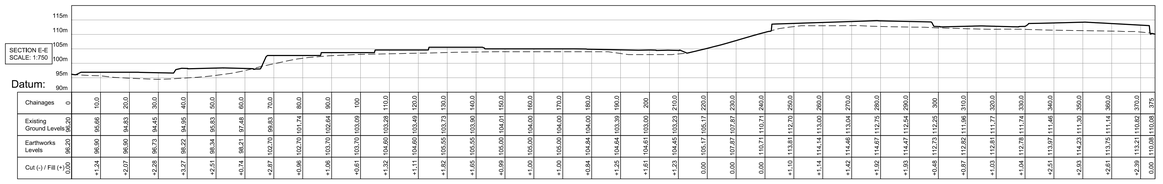

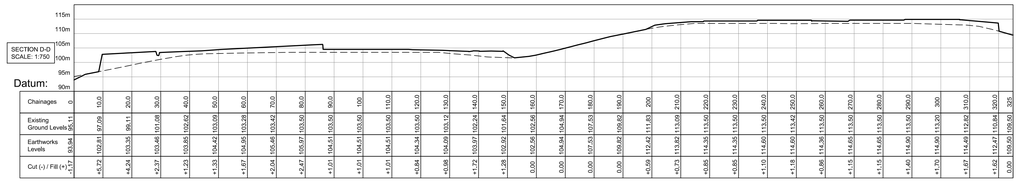

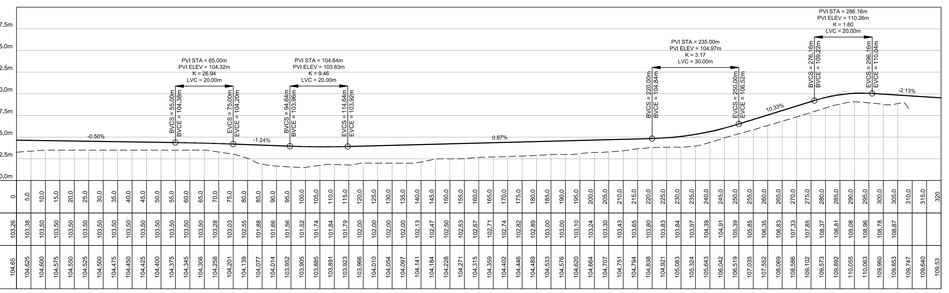

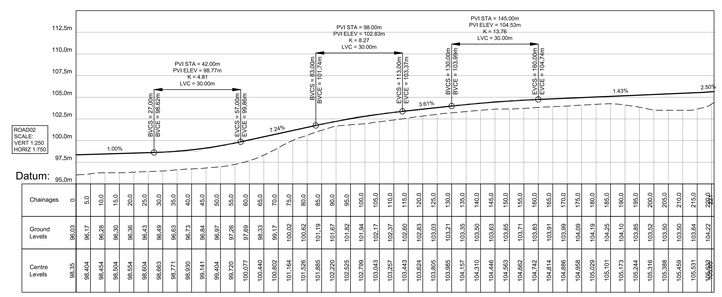

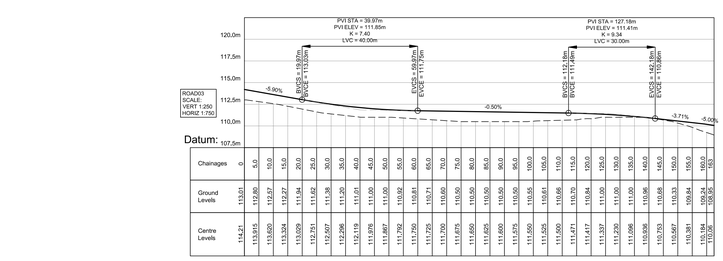

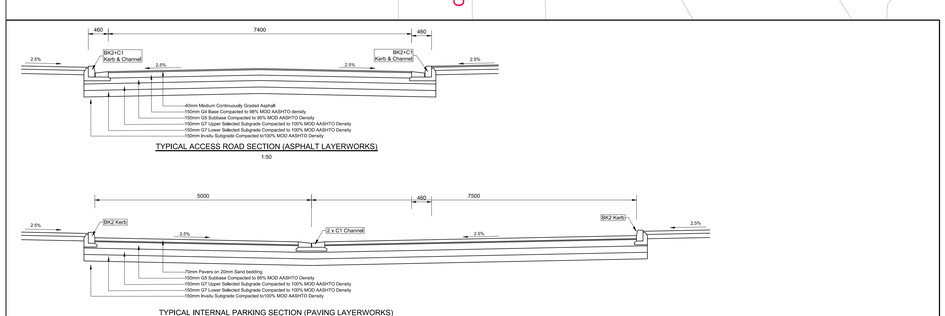

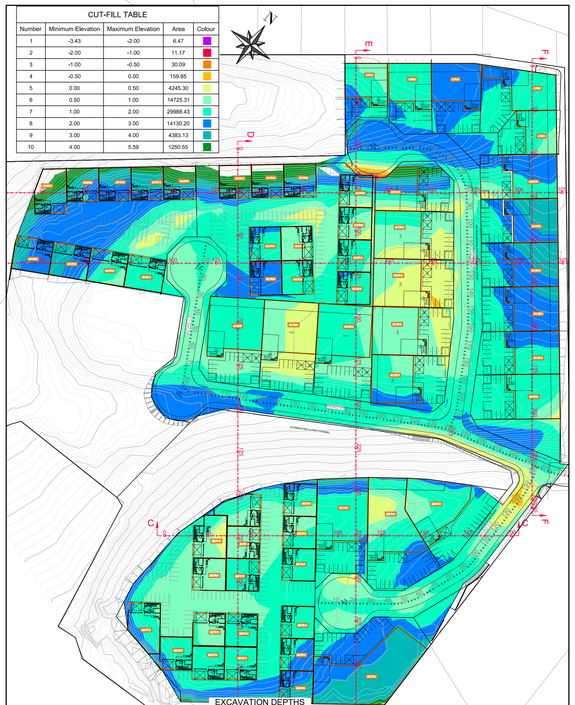

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5	0.00	0.50	4245.30	
6	0.50	1.00	14725.31	
7	1.00	2.00	29988.43	
8	2.00	3.00	14130.20	
9	3.00	4.00	4383.13	
10	4.00	5.59	1250.55	

NOTES: EARTHWORKS

1. LEVELS SHOWN ARE FINAL TOP OF LAYERWORKS LEVELS.
2. REMAINDER OF AREA TO BE CAPPED AS PER SPECIFIED LAYERWORKS.
3. ALL CONSTRUCTION TO BE AS PER SANS 1200 STANDARDS WITH VARIATIONS AS PER PROJECT SPECIFICATIONS.
4. EARTHWORKS METHOD:

4.1. CLEAR SITE OF VEGETATION AND RUBBLE.
4.2. INITIAL COMPACTION OF CLEARED AREAS TO95% MOD AASHTO DENSITY.
4.3. INSTALL CAPPING LAYERS (BY OTHERS).
4.4. INSTALL ASPHALT AND PAVING LAYERWORKS IN RESPECTIVE AREAS TO TOP OF FINAL LAYERWORKS LEVELS.
4.5. TIE IN SLOPES TO BE TO A MAXIMUM OF 1 IN 3.
4.6. UNSUITABLE MATERIAL TO BE SPOILED OFF SITE TO A SITE PROCURED BY THE CONTRACTOR.

5. CONTRACTOR TO VERIFY LEVELS AND REPORT ANY DISCREPANCIES TO THE ENGINEER.

Rev.	Date	Description	Rev. by
A	20-10-2020	FOR DISCUSSION	EW
B	23-10-2020	FOR DISCUSSION	EW
C	20-11-2020	FOR DISCUSSION	EW
D	03-12-2020	FOR DISCUSSION	EW

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Client/Employer

HANOCRON GROUP (PTY) LTD

Project

EVERITE INDUSTRIAL DEVELOPMENT, ERF 18354, BRACKENFELL

Plan Description

BULK EARTHWORKS LAYOUT

	Name	Signature
Designed	EW	
Drawn	EW	
Checked	WB	
Approved	BV	

Scale: 1:750 (OR AS SHOWN) — ORIGINAL SIZE A0

Contract No. 200284

Drawing No. 200284/C/001 — Revision D

P:\Documents\2020\200284\ - Everite Brand Site - Civil Eng Set\02 - Drawings\04 - Working Drawings\200284 - C - 001 - BULK EARTHWORKS - REV D_2020.12.03.dwg

LEGEND

SYMBOL	DESCRIPTION
	PROPOSED 160mmØ CLASS 34 uPVC SEWER MAIN
	PROPOSED 110mmØ CLASS 34 uPVC HOUSE CONNECTION & END CAP
	PROPOSED SEWER MANHOLE
	PROPOSED 110mmØ CLASS 12 uPVC WATER MAIN
	PROPOSED FIRE HYDRANT
	PROPOSED VALVE
WM	PROPOSED 80mm BULK WATER METER
	EXISTING SEWER PIPE
	EXISTING SEWER MANHOLE
	EXISTING STORM WATER PIPE
	EXISTING STORM WATER MANHOLE
	EXISTING STORM WATER KERB INLET
	EXISTING WATER PIPE
	EXISTING FIRE HYDRANT
	EXISTING VALVE
	EXISTING ELECTRICAL DUCT
	EXISTING TELECOMMUNICATIONS DUCT
	EXISTING TELECOMMUNICATIONS JUNCTION BOX

Rev.	Date	Description	Rev. by
B	03-12-2020	FOR INFORMATION	EW
A	21-08-2020	FOR INFORMATION	EW

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E-Mail: info@eceng.co.za

Client/Employer: HANOCRON GROUP (PTY) LTD

Project: EVERITE INDUSTRIAL DEVELOPMENT, ERF 18354, BRACKENFELL

Plan Description: PRELIMINARY SEWER AND WATER LAYOUT

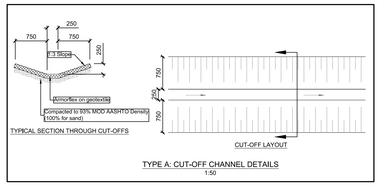
	Name	Signature
Designed	EW	1:500 (OR AS SHOWN)
Drawn	EW	
Checked	WB	
Approved	BV	

Scale: 0 5 10 15 20 30 50mm — ORIGINAL SIZE A0

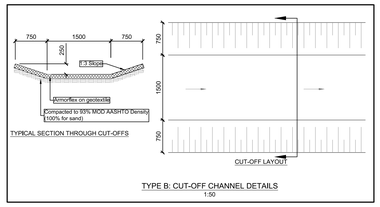
Contract No. 2002841

Drawing No. 2002841/C/130

Revision B



TYPE A: CUT-OFF CHANNEL DETAILS
1:50



TYPE B: CUT-OFF CHANNEL DETAILS
1:50

EXISTING POND INLET

EXISTING POND EXTENSION

EXISTING HEADWALL INLET

EXISTING 600mmØ STORM WATER PIPE

EXISTING HEADWALL INLET

EXISTING STORM WATER CHANNEL

EXISTING 600mmØ STORM WATER PIPE

CUT-OFF 4: TYPE B

EXISTING STORM WATER CHANNEL

EXISTING STORM WATER CHANNEL

EXISTING STORM WATER CHUTE

EXISTING STORM WATER CHUTES

SALES AROUND POND

CUT-OFF 3: TYPE A

CUT-OFF 2: TYPE A

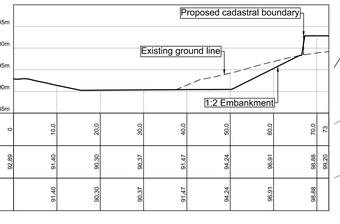
CUT-OFF 1: TYPE A

GEMINI STREET

STORMWATER CUTOFF CHANNEL

LEGEND	
SYMBOL	DESCRIPTION
	PROPOSED CLASS 100D CONCRETE STORM WATER PIPE (SIZE AS SHOWN)
	PROPOSED STORM WATER RING MANHOLE
	PROPOSED DOUBLE GULLY GRID INLET
	PROPOSED HEADWALL
	EXISTING SEWER PIPE
	EXISTING SEWER MANHOLE
	EXISTING STORM WATER PIPE
	EXISTING STORM WATER MANHOLE
	EXISTING STORM WATER HEADWALL INLET
	EXISTING WATER PIPE
	EXISTING FIRE HYDRANT
	EXISTING VALVE

SECTION B-B
SCALE:
VERTICAL 1:500
HORIZONTAL 1:500



Chainages (m)	0	10.0	20.0	30.0	40.0	50.0	60.0	70.0
Ground Levels	97.66	91.40	90.30	90.37	91.47	94.24	96.91	98.88
Amended Pond Levels		91.40	90.30	90.37	91.47	94.24	96.91	98.88

SECTION A-A
SCALE:
VERTICAL 1:500
HORIZONTAL 1:500

Chainages (m)	0	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	100	110.0	120.0	130.0	140.0	150.0	160.0	170.0	180.0	185
Ground Levels	91.66	90.09	90.13	90.18	90.22	90.26	90.31	90.35	90.40	90.44	90.48	90.53	90.57	93.38	91.89	92.57	93.99	93.56	94.02	94.28
Amended Pond Levels		90.09	90.13	90.18	90.22	90.26	90.31	90.35	90.40	90.44	90.48	90.53	90.57	90.60	90.66	90.71	90.75	90.97	93.86	

Rev.	Date	Description	Rev. by
C	03-12-2020	FOR INFORMATION	EW
B	05-10-2020	FOR INFORMATION: SECTION B-B ADDED	EW
A	21-08-2020	FOR INFORMATION	EW

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Client/Employer: HANOCRON GROUP (PTY) LTD

Project: EVERITE INDUSTRIAL DEVELOPMENT, ERF 18354, BRACKENFELL

Plan Description: PRELIMINARY STORM WATER LAYOUT

	Name	Signature
Designed	EW	1:500 (OR AS SHOWN)
Drawn	EW	
Checked	WB	
Approved	BV	

Scale: 0 5 10 15 20 25 50mm
ORIGINAL SIZE A0

Contract No. 2002841

Drawing No. 2002841/C/150

Revision C

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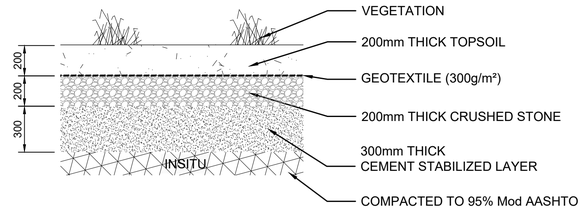
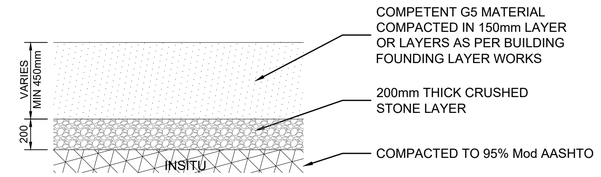
LEGEND	
SYMBOL	DESCRIPTION
	PERIMETER RODENT BARRIER
	ZONE 1
	ZONE 2
	ZONE 3
	ZONE 4

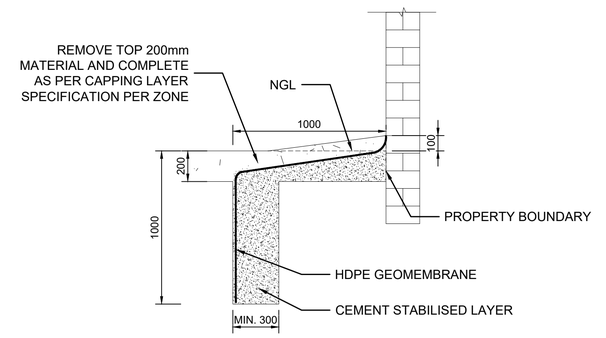
GENERAL LAYOUT AND CAPPING DETAILS
SCALE 1:2000



ZONE 1 DETAILS
1 : 20



ZONE 2 DETAILS
1 : 20



TYPICAL DETAIL OF PERIMETER RODENT BARRIER
1 : 20

NOTES:

ZONE 3: BULK FILL AND LAYERWORKS AS PER BUILDING FOUNDING LAYER WORKS (BY OTHERS)
ZONE 4: DRAINAGE LAYER AND EROSION PROTECTION (BY OTHERS)

FOR APPROVAL

Reference Drawings		Rev.	Revision	Name	Date	Approved
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	A	ISSUED FOR APPROVAL	SM	04.12.2020	JM

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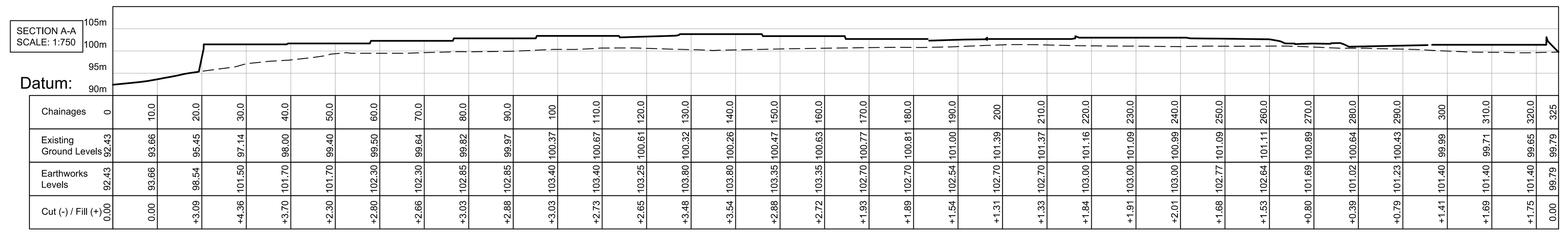
59 Bevan Road P.O. Box 1434 Rivonia 2128, South Africa
Tel. +27 (0)11 519 0200, www.jaws.co.za Email: post@jaws.co.za

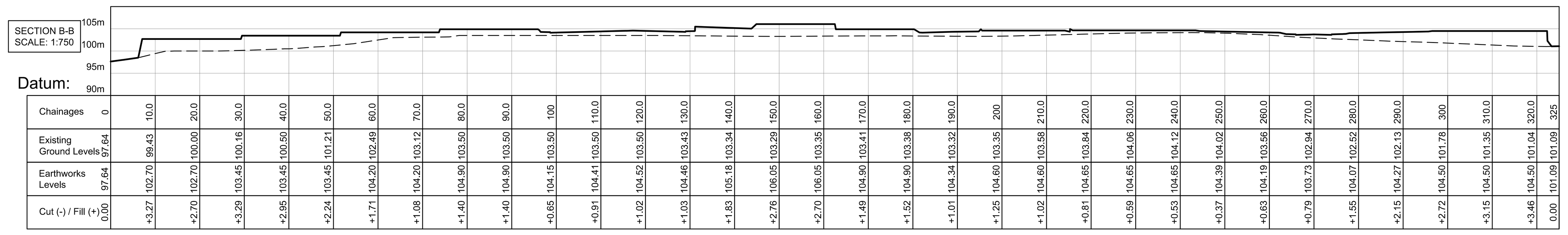
Drawn	S MANANA	04.12.2020
Designed	S LOUW	04.12.2020
Checked	S LOUW	04.12.2020
Pr. Eng. Approval	J MSIZA	
Signature		

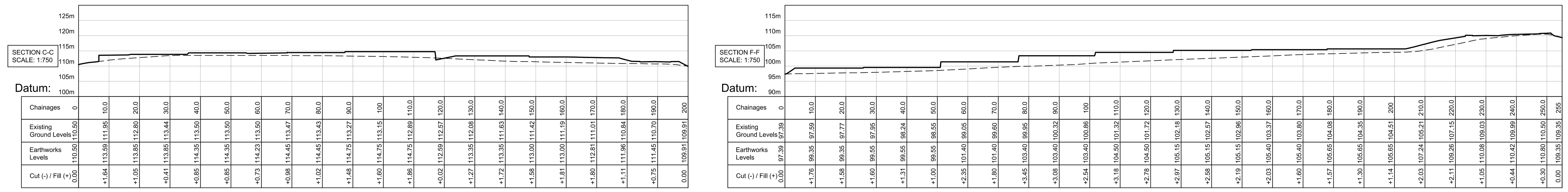
Client: **HANOCRON GROUP (PTY) LTD**
Project: **EVERITE INDUSTRIAL DEVELOPMENT REHABILITATION PROJECT**

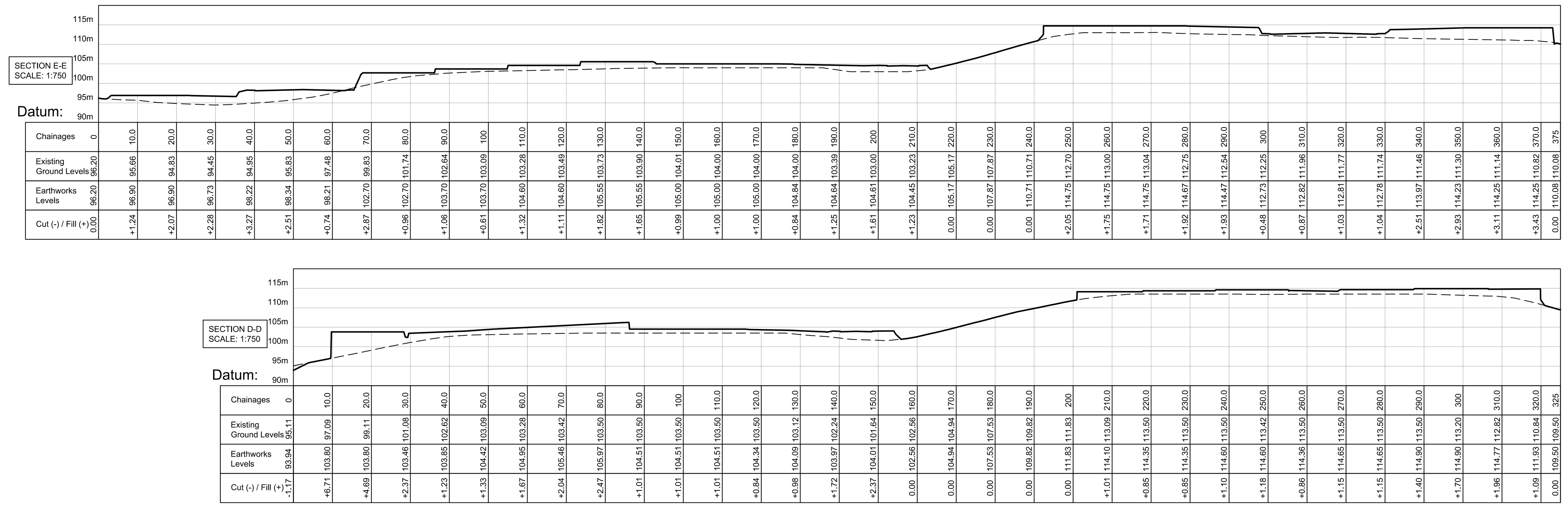
GENERAL LAYOUT AND CAPPING DETAILS

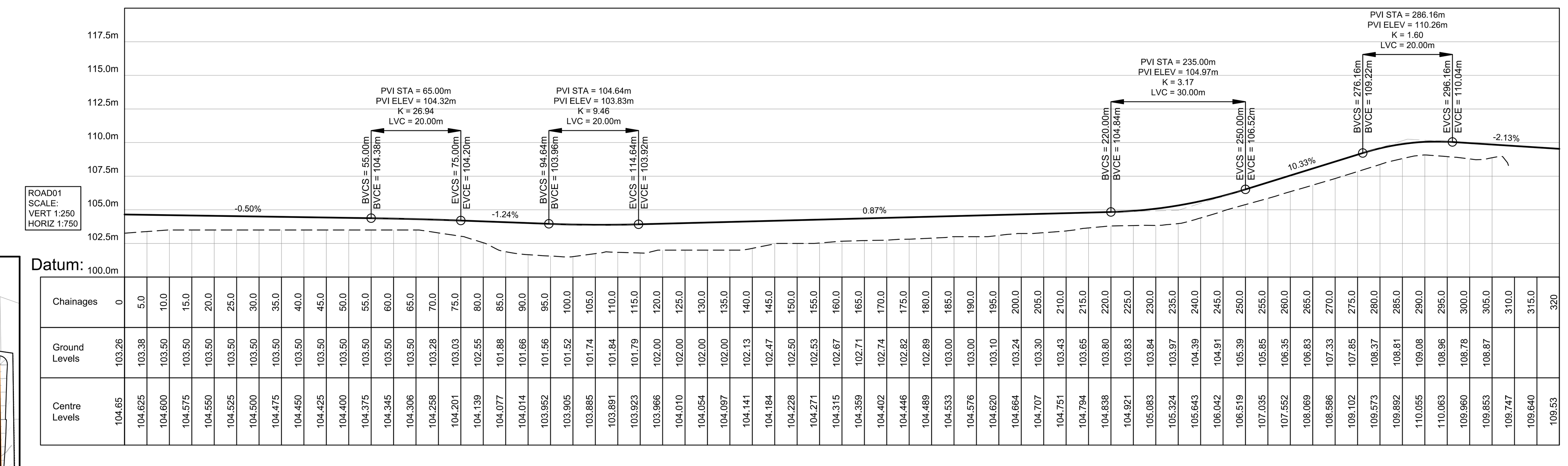
Scale: AS SHOWN | A1
Drawing No: **F720 - 01 - 001**
Revision: **A**

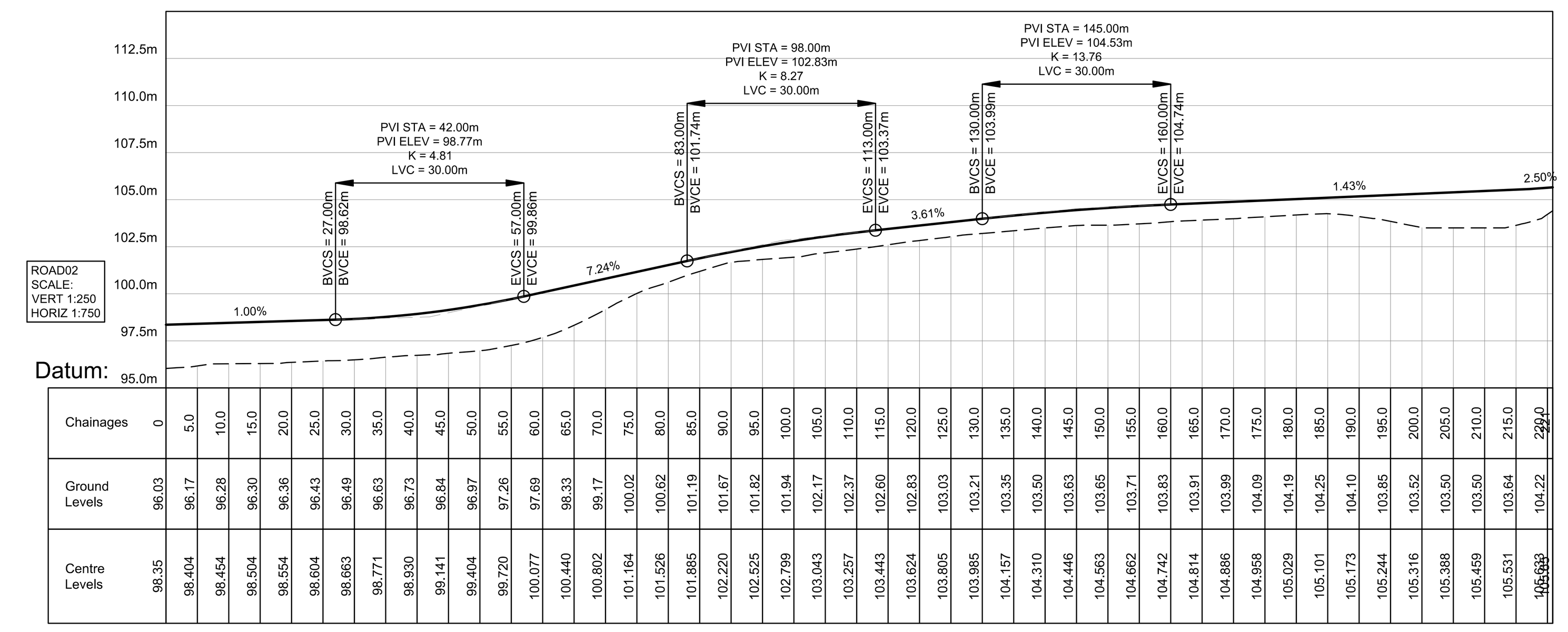


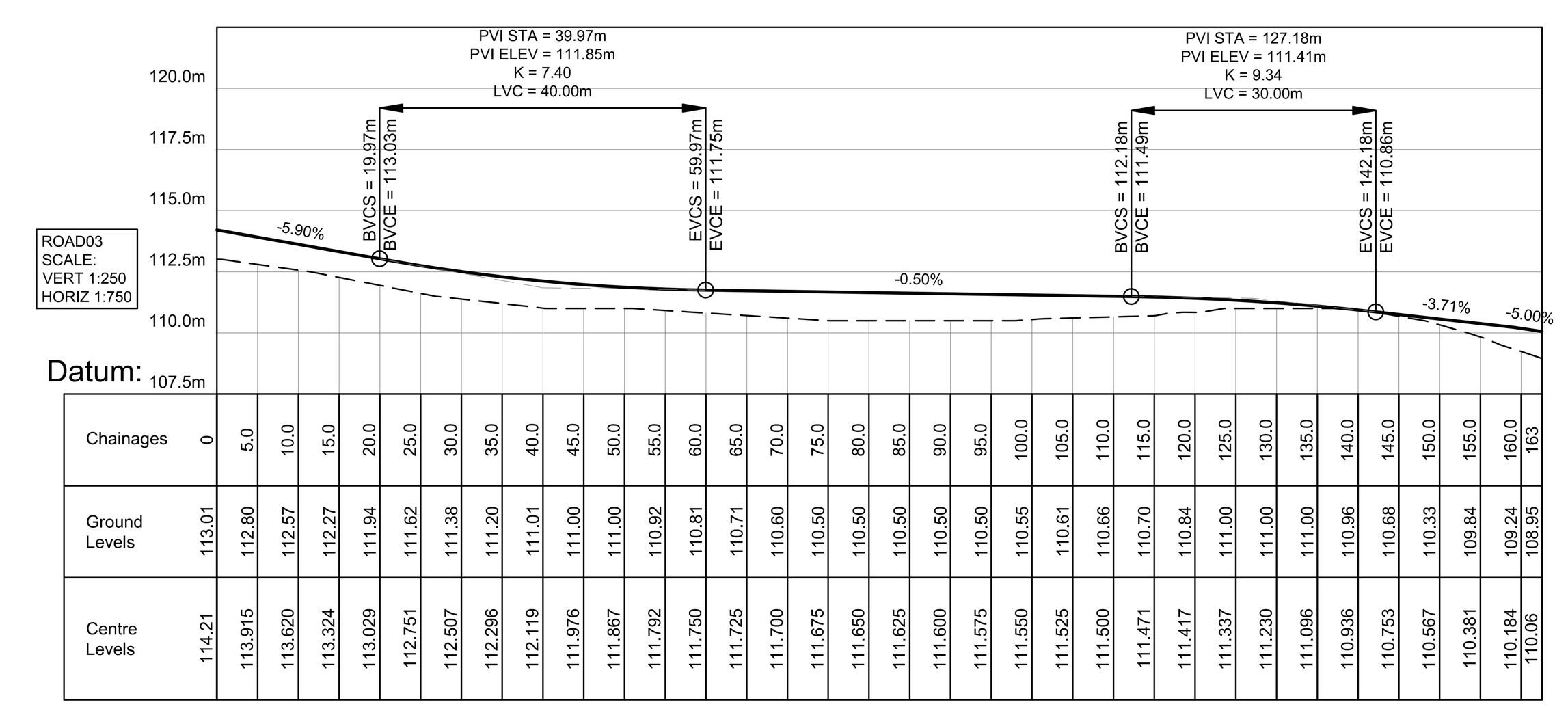




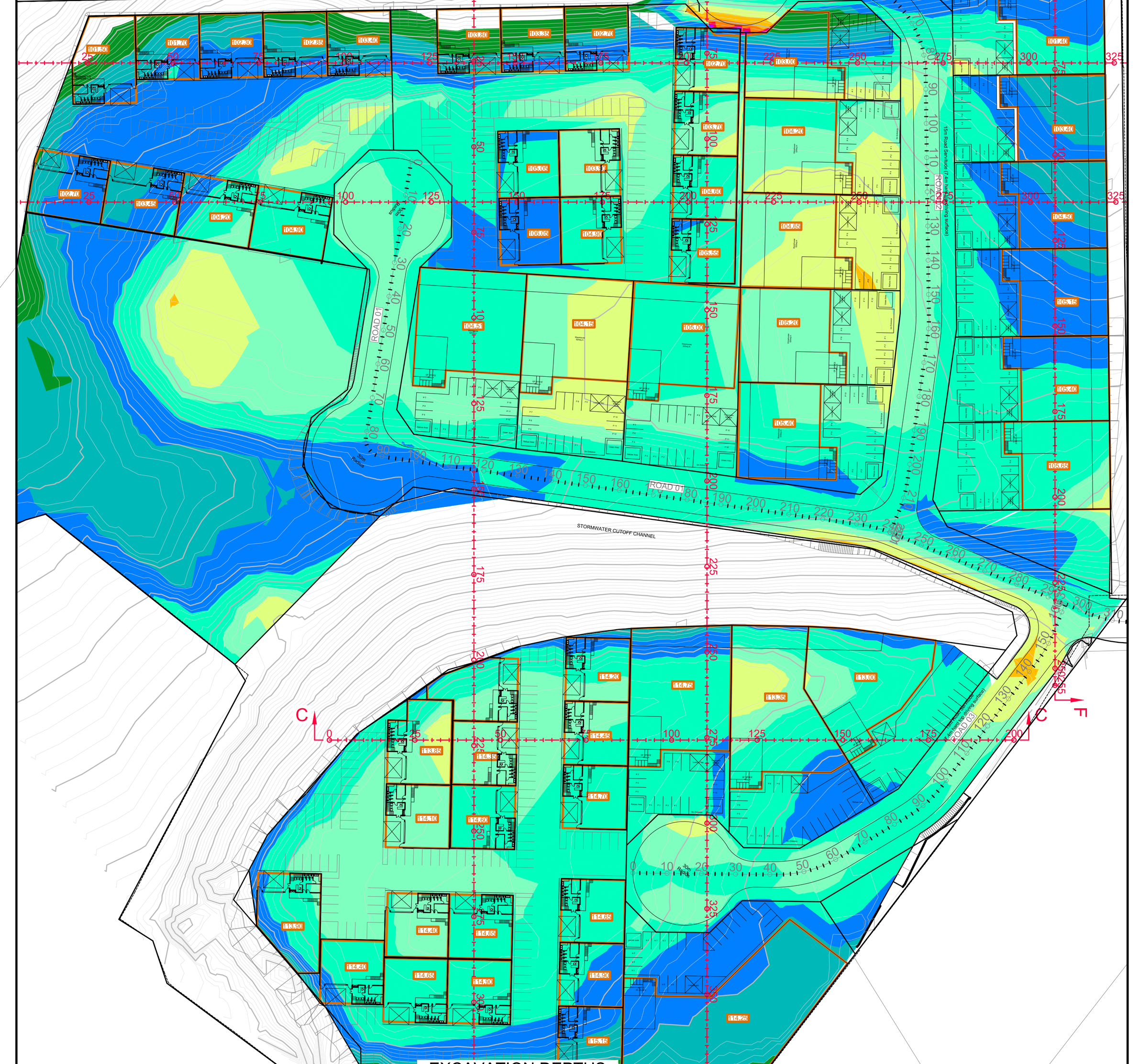




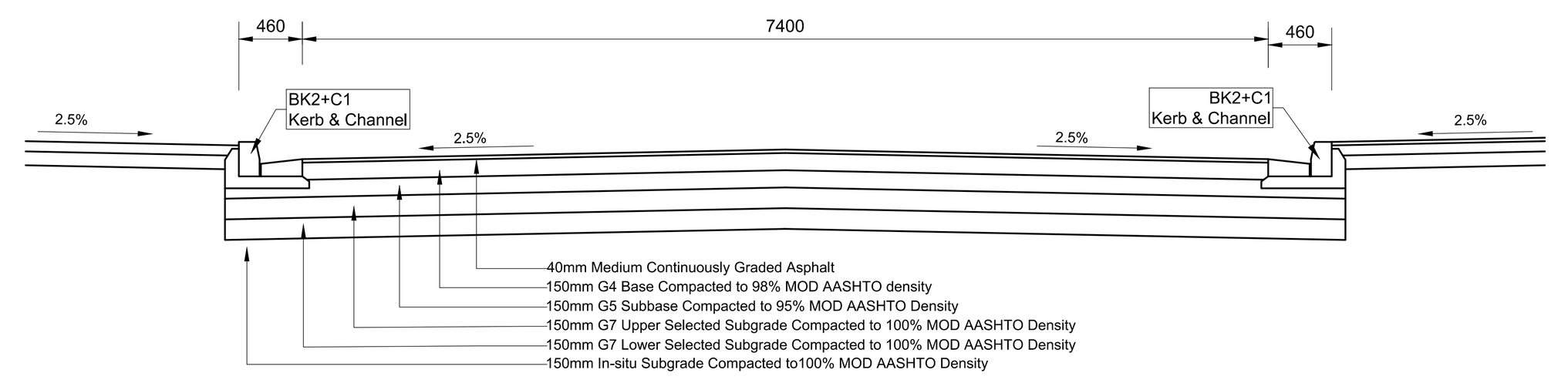




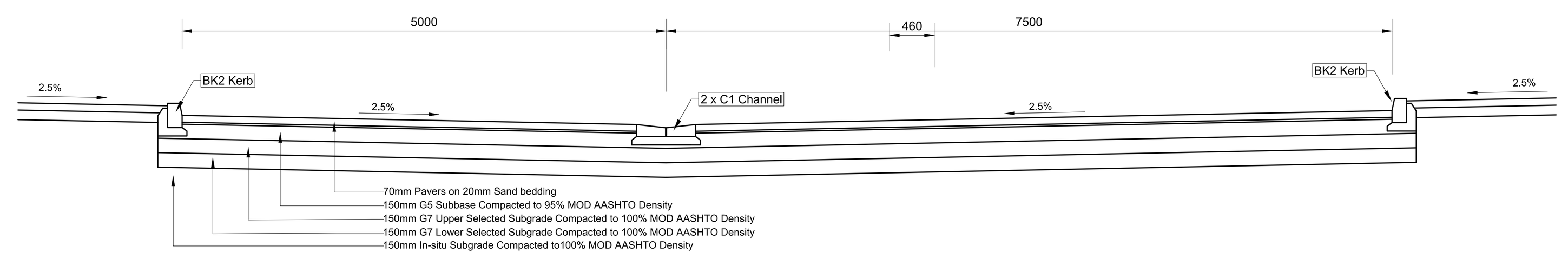
CUT-FILL TABLE				
Number	Minimum Elevation	Maximum Elevation	Area	Colour
1	-3.43	-2.00	6.47	
2	-2.00	-1.00	11.17	
3	-1.00	-0.50	30.09	
4	-0.50	0.00	159.85	
5	0.00	0.50	4245.30	
6	0.50	1.00	14725.31	
7	1.00	2.00	29988.43	
8	2.00	3.00	14130.20	
9	3.00	4.00	4383.13	
10	4.00	5.59	1250.55	



EXCAVATION DEPTHS
1:1250



TYPICAL ACCESS ROAD SECTION (ASPHALT LAYERWORKS)
1:50



TYPICAL INTERNAL PARKING SECTION (PAVING LAYERWORKS)
1:50

NOTES: EARTHWORKS

1. LEVELS SHOWN ARE FINAL TOP OF LAYERWORKS LEVELS.
2. REMAINDER OF AREA TO BE CAPPED AS PER SPECIFIED LAYERWORKS.
3. ALL CONSTRUCTION TO BE AS PER SANS 1200 STANDARDS WITH VARIATIONS AS PER PROJECT SPECIFICATIONS.
4. EARTHWORKS METHOD:
4.1. CLEAR SITE OF VEGETATION AND RUBBLE.
4.2. INITIAL COMPACTION OF CLEARED AREAS TO95% MOD AASHTO DENSITY.
4.3. INSTALL CAPPING LAYERS (BY OTHERS).
4.4. INSTALL ASPHALT AND PAVING LAYERWORKS IN RESPECTIVE AREAS TO TOP OF FINAL LAYERWORKS LEVELS.
4.5. TIE IN SLOPES TO BE TO A MAXIMUM OF 1 IN 3.
4.6. UNSUITABLE MATERIAL TO BE SPOILED OFF SITE TO A SITE PROCURED BY THE CONTRACTOR.
5. CONTRACTOR TO VERIFY LEVELS AND REPORT ANY DISCREPANCIES TO THE ENGINEER.

Rev.	Date	Description	Rev. by
A	20-10-2020	FOR DISCUSSION	EW
B	23-10-2020	FOR DISCUSSION	EW
C	20-11-2020	FOR DISCUSSION	EW
D	03-12-2020	FOR DISCUSSION	EW
E	22-04-2021	FOR INFORMATION	EW

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E-Mail: info@eceng.co.za

Client/Employer: HANOCRON GROUP (PTY) LTD

Project: EVERITE INDUSTRIAL DEVELOPMENT, ERF 18354, BRACKENFELL

Plan Description: BULK EARTHWORKS LAYOUT

	Name	Signature
Designed	EW	1:750 (OR AS SHOWN)
Drawn	EW	
Checked	WB	
Approved	BV	

Scale: 0 5 10 15 20 30 50mm — ORIGINAL SIZE A0

Contract No. 200284

Drawing No. 200284/C/001 — Revision E

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