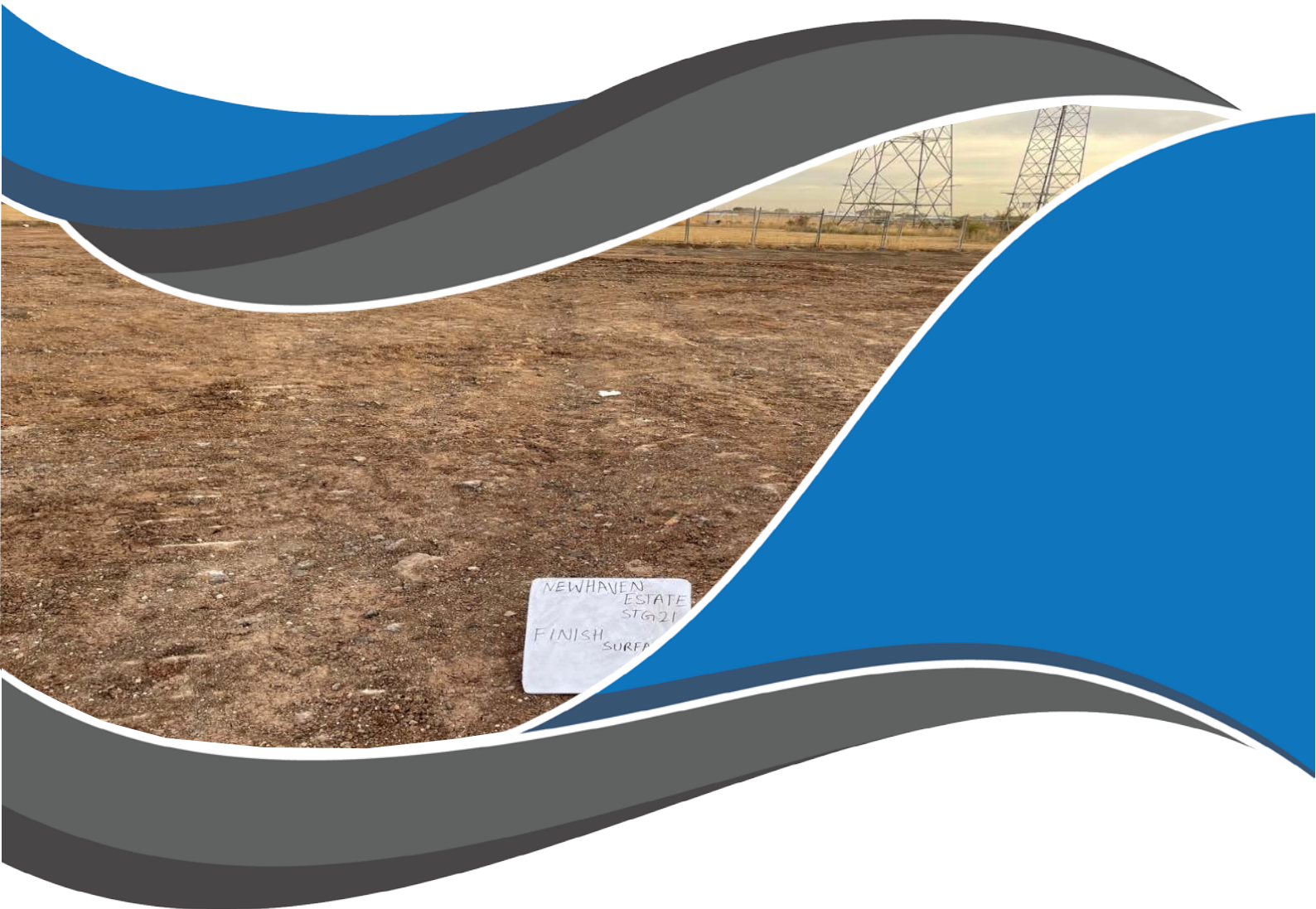


# Newhaven Estate - Stage 21, Tarneit (Level 1)

## Level 1 Inspection & Testing Report

Reference: 1120 0390-1



### Prepared for:

BMD Urban

July 2023



**A&Y ASSOCIATES**  
GEOTECHNICAL ENGINEERING CONSULTANTS

# Document Control Record

Prepared by:

**A&Y Associates Pty Ltd**

ABN 92 614 244 665

5/16 Network Drive

Truganina, VIC 3029

T: (03) 8754 8325

E: info@ayassociates.com.au

W: www.ayassociates.com.au

## Document control

Report title	Level 1 Inspection & Testing				
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Client	BMD Urban				
Contact name	Aaron Gosden				
Contact number	0438 824 305				
Contact e-mail	Aaron.Gosden@bmd.com.au				
Revision	Date	Descriptions/Status	Author	Reviewer	Approver
0	31/07/2023	First Issue	Y Balkis	A Tan	A Tan

## Approver



Alvin Tan

(BE Civil and Infrastructure), MIEAust

Senior Geotechnical Engineer

E: alvin@ayassociates.com.au | M: 0449 288 338



ENGINEERS  
AUSTRALIA  
Professional Engineer  
MEMBER

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## **Disclaimer**

The findings and conclusions contained in this report are made based on site conditions that existed at the time this work was conducted. The conclusions present in this report are relevant to the conditions of the site and the state of legislation currently enacted as at the date of this report.

Findings and conclusions are made assuming that the soil, groundwater, geological and chemical conditions detailed within this report are accurate and remain applicable to the site at the time of writing. No other warranties are made or intended.

A&Y Associates (A&Y) Pty Ltd has used a degree of skill and care ordinarily exercised by reputable members of our profession practicing in the same or similar locality.

A&Y does not make any representation or warranty that the conclusions in this report will be applicable in the future as there may be changes in the condition of the site, applicable legislation or other factors that would affect the conclusions contained in this report.

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## **Applicability**

This report has been prepared for the benefit for our client with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

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## 1 Introduction

This report presents the results of the Level 1 Inspection and Testing for the construction of the fill platforms located in Newhaven Estate - Stage 21, Tarneit.

## 2 Project Summary

It is understood that BMD Urban require the fill platforms within Stage 21 to be constructed under Level 1 Inspection and Testing undertaken by a Geotechnical Inspection and Testing Authority (GITA).

Level 1 Inspection and Testing, as defined in AS3798-2007 "Guidelines on Earthworks for Commercial and Residential Development," provides for full time inspection of the construction of controlled fill and field and laboratory testing in accordance with AS1289 "Methods of Testing Soils for Engineering Purposes".

The Level 1 inspection was undertaken by a Geotechnician from A&Y Associates over a period of **10 working days** from the **17<sup>th</sup> January 2023 to 13<sup>th</sup> July 2023**.

This report is applicable for fill placed by BMD Urban for the following lots located in Newhaven Estate - Stage 21 of Tarneit, as shown in Appendix A – Site Plan.

- Lot 2101 – 2111
- Lot 2114 – 2119
- Lot 2123 – 2147
- Lot 2149 – 2155

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### 3 Project Specifications

The supervision and inspections were performed based on AS3798 and the specifications provided in the drawing (ref: Newhaven Estate Stage 21, Drawing No. 306194CR100 – RevA by PEET Pty Ltd, Dated 23/12/2021) for the construction works in Newhaven Estate - Stage 21 of Tarneit. A short summary of the requirements outline in AS3798 is provided below:

- All filling in excess of 200mm depth within the building envelope of allotments shall be undertaken to specifications satisfying the requirements of AS3798.
- Material to be used for fill construction shall satisfy the requirements of AS3798-2007 “Guidelines on Earthworks for Commercial and Residential Developments”. Material used shall be free of:
  - Organic soils, such as topsoils, severely root affected subsoil and peat;
  - Contaminated soils;
  - Materials which undergo volume change or loss of strength when disturbed and exposed to moisture;
  - Silts, or materials that have deleterious engineering properties of silt;
  - Fill that contains wood, metal, plastic, boulders, or other deleterious material, in sufficient proportions to affect the required performance of fill;
  - The maximum particle size of any rocks or other lump, within the layer, has not exceeded two-thirds (2/3) of the compacted layer thickness.
- Compaction to achieve a dry density ratio of at least 98% Standard.

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## 4 Subgrade Assessment

The subgrade was assessed by A&Y Associates following the removal of topsoil and before any fill was placed. The subgrade assessment was undertaken on the **17<sup>th</sup> of January 2023** as mentioned in report **1120 0390-1 (SSI1)**.

The exposed subgrade material comprised of silty clay. No wet or soft patches were found during the inspection. No evidence of deleterious material was found during the inspection.

## 5 Earthworks

The earthworks for this project included stripping of topsoil, removing of tree roots, proof rolling the subgrade and placement and compaction of fill to construct engineered platforms.

Based on design plans and site inspection, it appears that the fill thickness placed is approximately 200mm to 600mm. The fill layers or thickness nominated in this report are provided as a guide on the amounts of fill placed and do not necessarily reflect an accurate survey of the fill levels.

## 6 Fill Material

The fill material used for the platform consisted of site derived material. The material was predominantly comprising of Silty Clay with gravel.

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## 7 Testing

Field density testing was undertaken on the compacted fill at a frequency of a minimum of 3 tests per lot (AS3798 Table 8.1).

Tests were performed using a Nuclear Density Gauge for field density determination as per AS 1289.5.8.1. Testing was completed at a minimum rate of 3 field density tests per day's production based on the minimum requirements of AS 3798-2007 and taken from each layer of fill placed.

A total of 30 field density tests were performed during the earthworks. All of the test results met the specified compaction requirement of 98% Standard Compaction.

The locations of the 30 field density tests are shown in Appendix B – Test Locations. A summary of the test results obtained from the field density testing is presented in Appendix C – Test Results Summary. The laboratory test reports of the field density tests are presented in Appendix D – NATA Test Results.

## 8 Finished Surface Levels

It should be noted that even though the final fill layer meets the specification requirements, over time, the material may be subject to adverse weather conditions resulting in either surface softening or drying and cracking. The top 150mm – 200mm of the fill will deteriorate with time and should be considered by the foundation engineer.

## 9 Exclusion

A&Y Associates was not involved in monitoring and testing the following works and as such are not included in the Level 1 report.

- Any trenches excavated and backfilled on site for the installation of underground services such as sewers, electrical conduits, water mains etc.
- Footpaths in front of the lots that may be excavated and filled after the Level 1 supervision conducted by A&Y Associates.
- Uncontrolled fill and topsoil that may have been placed as part of the landscaping of the site following the completion of the engineered fill construction.



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## 10 Conclusion

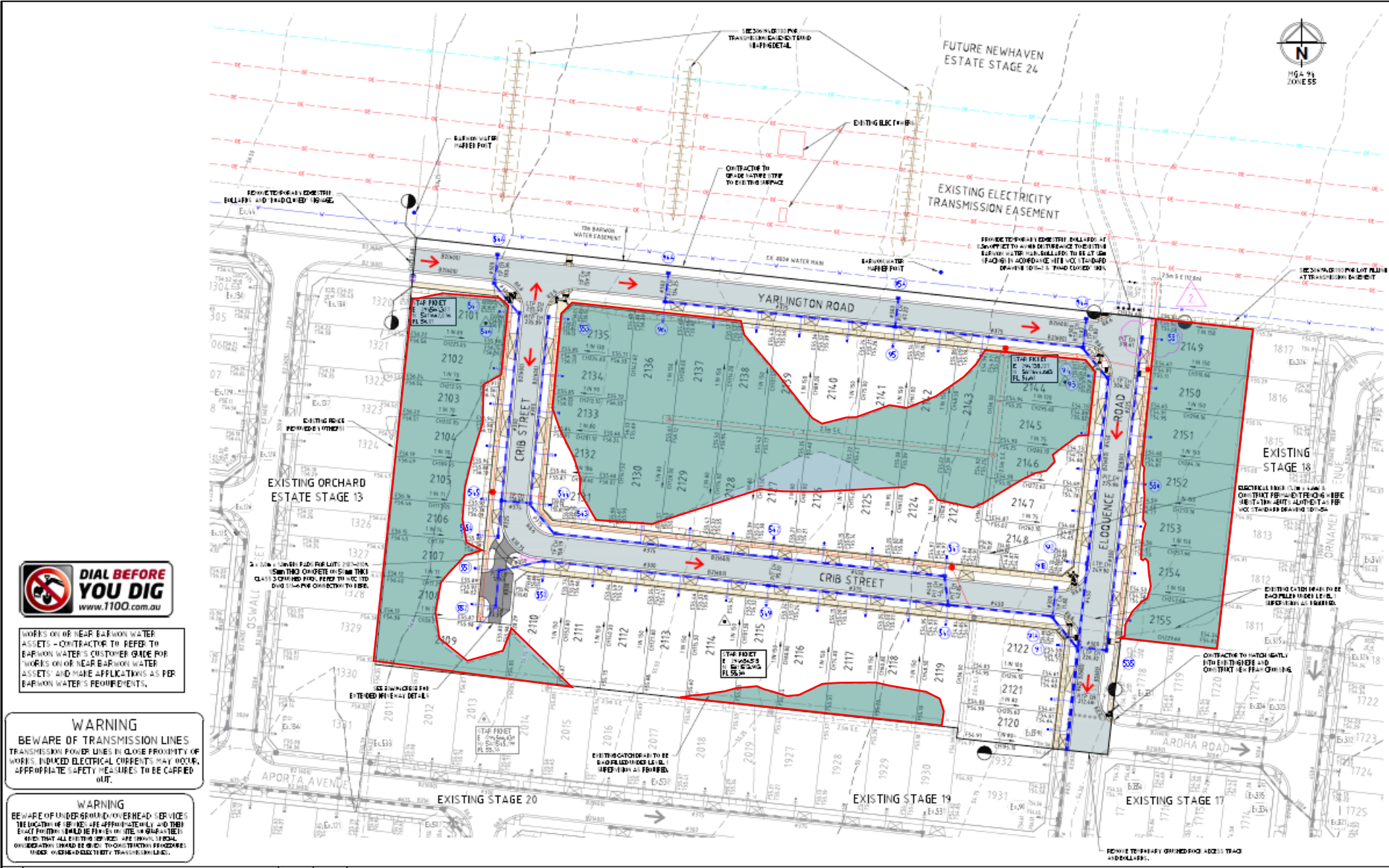
On the completion of the earthworks and after analysing the materials used, it has been concluded that the filling procedure conducted by BMD Urban appears to be consistent with the requirements of AS 3798 in regards to the placement of fill materials on a project under Level 1 Supervision and in accordance with the project specification as provided to A&Y Associates.

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# **Appendix A - Site Plan**



Area Inspected and Tested



WORKS ON OR NEAR BARBORN WATER ASSETS - CONTRACTOR TO REFER TO BARBORN WATER'S CUSTOMER GUIDE FOR WORKS ON OR NEAR BARBORN WATER ASSETS AND MAKE APPLICATIONS AS PER BARBORN WATER'S REQUIREMENTS.

**WARNING**  
BEWARE OF TRANSMISSION LINES  
TRANSMISSION POWER LINES IN CLOSE PROXIMITY OF WORKS. HUNGRY ELECTRICAL COEFFICIENTS MAY VARY. APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT.

**WARNING**  
BE AWARE OF UNDERGROUND/OVERHEAD SERVICES  
THE LOCATION OF SERVICES ARE APPROXIMATELY AS SHOWN ON THIS PLAN. CONTRACTOR TO VERIFY THE LOCATION OF ALL SERVICES BY USE OF APPROPRIATE SURVEYING PROCEDURES PRIOR TO CONSTRUCTION.

<b>PROJECT:</b> Newhaven Estate Stage 21 (Level 1)	<b>CLIENT:</b> BMD Urban
<b>LOCATION:</b> Tarnet	<b>PROJECT No.:</b> 1120 0390-1

**SITE PLAN SKETCH—NOT TO SCALE**

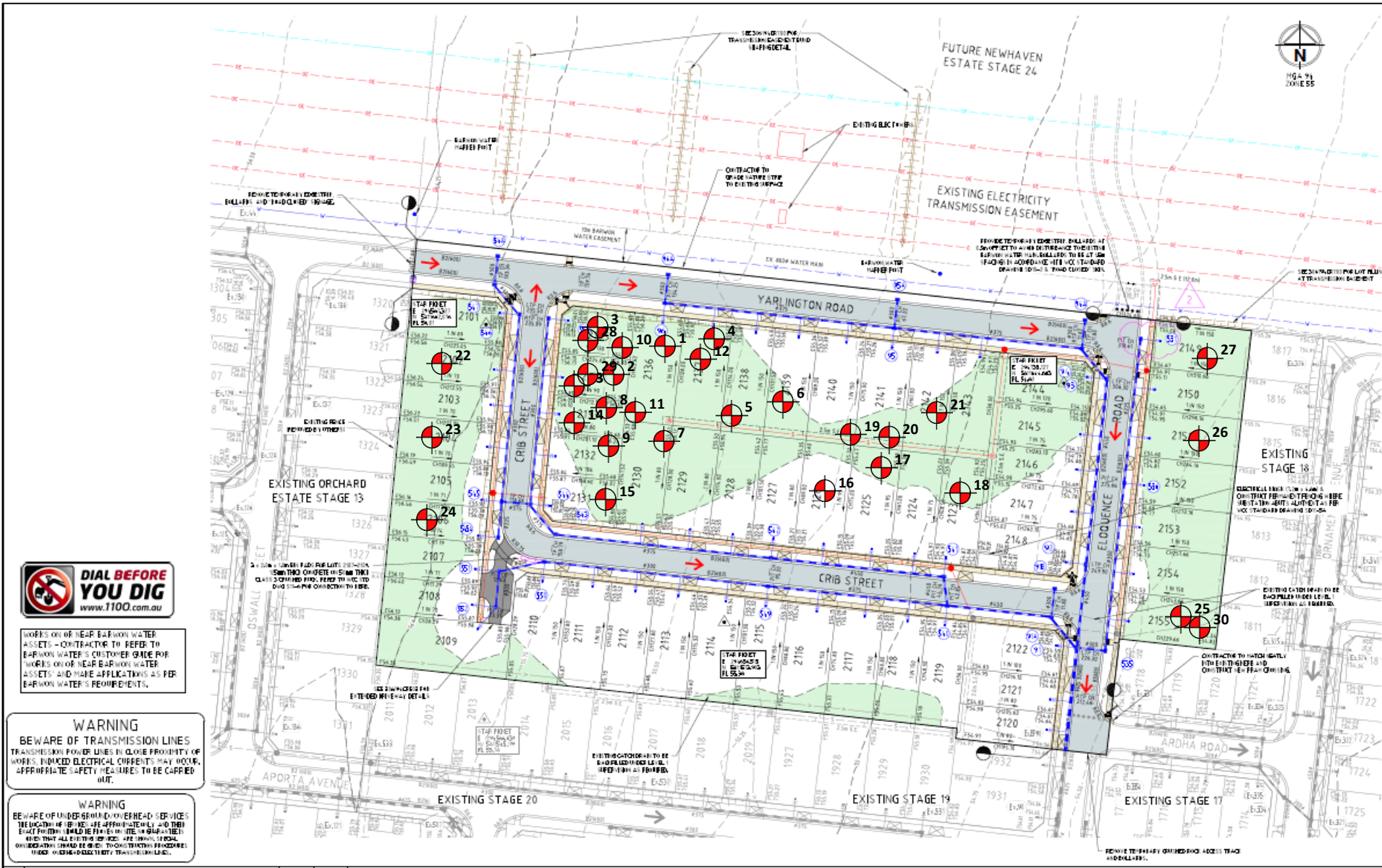


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## **Appendix B – Test Locations**



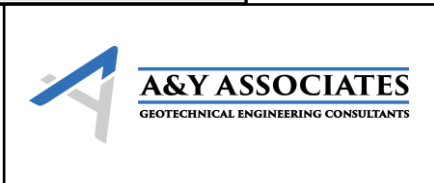
Indicative Test Location



<b>PROJECT:</b> Newhaven Estate Stage 21 (Level 1)
<b>LOCATION:</b> Tarnet

<b>CLIENT:</b> BMD Urban
<b>PROJECT No:</b> 1120 0390-1


**SITE PLAN SKETCH—NOT TO SCALE**



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# **Appendix C – Test Results Summary**

Project No		1120 0390-1			Client	BMD Urban				
Project Name		Newhaven Estate - Stage 21 (Level 1)			Specification			Density Ratio $\geq$ 98% of Peak Wet Density		
Location		Tarneit								
Test No	Retest of Test	Date	Location	Layer	Oversize	Density Ratio	Moisture Ratio	Moisture Variation	Pass / Fail	Retest
#	#		Lot #	#	%	%	%	%		Pass / Fail
1	-	17/01/2023	-	1	14.5	98.5	95.5	-1.0	Pass	-
2	-	17/01/2023	-	1	14.7	99.0	95.5	-1.0	Pass	-
3	-	17/01/2023	-	1	15.6	98.0	106.0	1.0	Pass	-
4	-	18/01/2023	-	1	18.5	98.5	95.0	-1.0	Pass	-
5	-	18/01/2023	-	1	18.1	98.0	96.0	-1.0	Pass	-
6	-	18/01/2023	-	1	19.1	98.5	104.5	1.0	Pass	-
7	-	19/01/2023	-	1	18.4	99.0	107.5	1.0	Pass	-
8	-	19/01/2023	-	1	16.3	98.0	95.5	-1.0	Pass	-
9	-	19/01/2023	-	1	18.3	98.0	105.5	1.0	Pass	-
10	-	20/01/2023	-	2	17.7	98.5	96.0	-1.0	Pass	-
11	-	20/01/2023	-	2	16.7	99.5	106.5	1.0	Pass	-
12	-	20/01/2023	-	2	17.0	98.5	94.5	-1.0	Pass	-
13	-	21/01/2023	-	2	18.3	98.0	107.0	1.0	Pass	-
14	-	21/01/2023	-	2	12.6	98.5	95.0	-1.0	Pass	-
15	-	21/01/2023	-	2	15.2	98.0	93.5	-1.0	Pass	-
16	-	23/01/2023	-	1	15.2	98.5	104.5	1.0	Pass	-
17	-	23/01/2023	-	1	17.1	98.5	94.5	-1.0	Pass	-
18	-	23/01/2023	-	1	18.2	98.5	94.5	-1.0	Pass	-
19	-	24/01/2023	-	1	14.7	98.5	94.5	-1.0	Pass	-
20	-	24/01/2023	-	1	16.8	98.0	95.0	-1.0	Pass	-
21	-	24/01/2023	-	1	19.7	99.0	107.0	1.0	Pass	-
22	-	11/07/2023	-	FSL	0.0	98.5	97.0	-0.5	Pass	-
23	-	11/07/2023	-	FSL	0.0	98.5	98.0	-0.5	Pass	-
24	-	11/07/2023	-	FSL	0.0	98.5	98.0	-0.5	Pass	-

25	-	12/07/2023	-	1	0.0	98.5	98.0	-0.5	Pass	-
26	-	12/07/2023	-	FSL	0.0	98.5	97.5	-0.5	Pass	-
27	-	12/07/2023	-	FSL	0.0	98.5	96.5	-0.5	Pass	-
28	-	13/07/2023	-	FSL	0.0	98.5	98.0	-0.5	Pass	-
29	-	13/07/2023	-	FSL	0.0	98.5	97.5	-0.5	Pass	-
30	-	13/07/2023	-	FSL	0.0	98.5	98.5	-0.5	Pass	-
** Negative (-) value indicates that the field moisture content is drier than the optimum moisture content (OMC)										
** Positive (+) value indicates that the field moisture content is wetter than the optimum moisture content (OMC)										



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# **Appendix D – NATA Test Results**

# Field Density Test Results AS1289.5.7.1

<b>Client:</b>	BMD Urban	<b>Job No:</b>	BMD2597
<b>Project:</b>	Newhaven Estate - Stage 21 (Level 1)	<b>Report:</b>	1
<b>Location:</b>	Tarneit		

Sample No	1	2	3			
Date Tested	17/01/2023	17/01/2023	17/01/2023			
Time Tested	AM	AM	AM			

Test Location	Refer to Plan	Refer to Plan	Refer to Plan			
Level/Layer	1	1	1			
Layer Thickness	mm 200	mm 200	mm 200			
Test Depth	mm 175	mm 175	mm 175			
Field Wet Density	t/m <sup>3</sup> 1.96	t/m <sup>3</sup> 2.01	t/m <sup>3</sup> 1.97			
Field Moisture Content	% 22.4	% 21.0	% 22.8			
Material:	Site Derived Clay Fill	Site Derived Clay Fill	Site Derived Clay Fill			

Oversize Material	WET, %	14.5	14.7	15.6		
Sieve Size	mm	37.5	37.5	37.5		
Peak Converted Wet Density	t/m <sup>3</sup>	1.99	2.03	1.98		
Optimum Moisture Content	%	23.5	22	21.5		



  

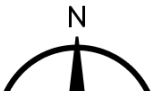
<b>Moisture Ratio</b>	%	95.5	95.5	106		
<b>Moisture Variation from OMC</b>	%	-1.0 Drier	-1.0 Drier	1.0 Wetter		
<b>Density Ratio</b>	%	98.5	99.0	98.0		

<b>Specification:</b>	98% STD	<b>Test Selection:</b>	N/A
<b>Notes:</b>	Ref : 1120 0390-1 (SI01)		
<b>Test Method</b>	AS1289 5.8.1, 5.7.1, 2.1.1, 1.1	<b>Sampling Method:</b>	AS 1289 1.2.1 6.4(b)

 <p><b>NATA</b> WORLD RECOGNISED ACCREDITATION</p>	<p>NATA Accredited Laboratory No. 20172 Accreditation for compliance with ISO/IEC 17025 - Testing</p>	<p>Approved Signatory:</p>  <p>David Burns Date: 1/02/2023</p>
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Test Location



WORKS ON OR NEAR BARHORN WATER ASSETS - CONTRACTOR TO REFER TO BARHORN WATER'S CUSTOMER GUIDE FOR WORKS ON OR NEAR BARHORN WATER ASSETS AND MAKE APPLICATIONS AS PER BARHORN WATER'S REQUIREMENTS.

**WARNING**  
BEWARE OF TRANSMISSION LINES  
TRANSMISSION POWER LINES IN CLOSE PROXIMITY OF WORKS. HUNGRY ELECTRICAL COEFFICIENTS MAY VARY. APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT.

**WARNING**  
BE AWARE OF UNDERGROUND/OVERHEAD SERVICES  
THE LOCATION OF SERVICES ARE APPROXIMATELY AS SHOWN ON THIS PLAN. EXACT POSITION SHOULD BE CHECKED ON SITE. CONTRACTOR TO VERIFY ALL SERVICES BY VISUAL INSPECTION. ALL APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT TO CONSTRUCTIVE PROCEDURES TAKEN TO MAINTAIN ELECTRICAL TRANSMISSION LINES.

<b>PROJECT:</b> Newhaven Estate Stage 21	<b>CLIENT:</b> BMD URBAN	<b>DATE:</b> 17 /01/2023
<b>LOCATION:</b> Tarnet	<b>PROJECT No:</b> 1120 0390-1 (SI01)	<b>SITE PLAN SKETCH—NOT TO SCALE</b>



## Field Density Test Results AS1289.5.7.1

<b>Client:</b>	BMD Urban	<b>Job No:</b>	BMD2597
<b>Project:</b>	Newhaven Estate - Stage 21 (Level 1)	<b>Report:</b>	2
<b>Location:</b>	Tarneit		

Sample No	4	5	6			
Date Tested	18/01/2023	18/01/2023	18/01/2023			
Time Tested	AM	AM	AM			

Test Location	Refer to Plan	Refer to Plan	Refer to Plan			
Level/Layer	1	1	1			
Layer Thickness	mm 200	mm 200	mm 200			
Test Depth	mm 175	mm 175	mm 175			
Field Wet Density	t/m <sup>3</sup> 1.94	t/m <sup>3</sup> 1.96	t/m <sup>3</sup> 1.93			
Field Moisture Content	% 22.8	% 21.1	% 23.0			
Material:	Site Derived Clay Fill	Site Derived Clay Fill	Site Derived Clay Fill			

Oversize Material	WET, %	18.5	18.1	19.1		
Sieve Size	mm	37.5	37.5	37.5		
Peak Converted Wet Density	t/m <sup>3</sup>	1.96	2.01	1.95		
Optimum Moisture Content	%	24	22	22		



  

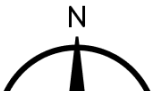
<b>Moisture Ratio</b>	%	95	96	104.5		
<b>Moisture Variation from OMC</b>	%	-1.0 Drier	-1.0 Drier	1.0 Wetter		
<b>Density Ratio</b>	%	98.5	98.0	98.5		

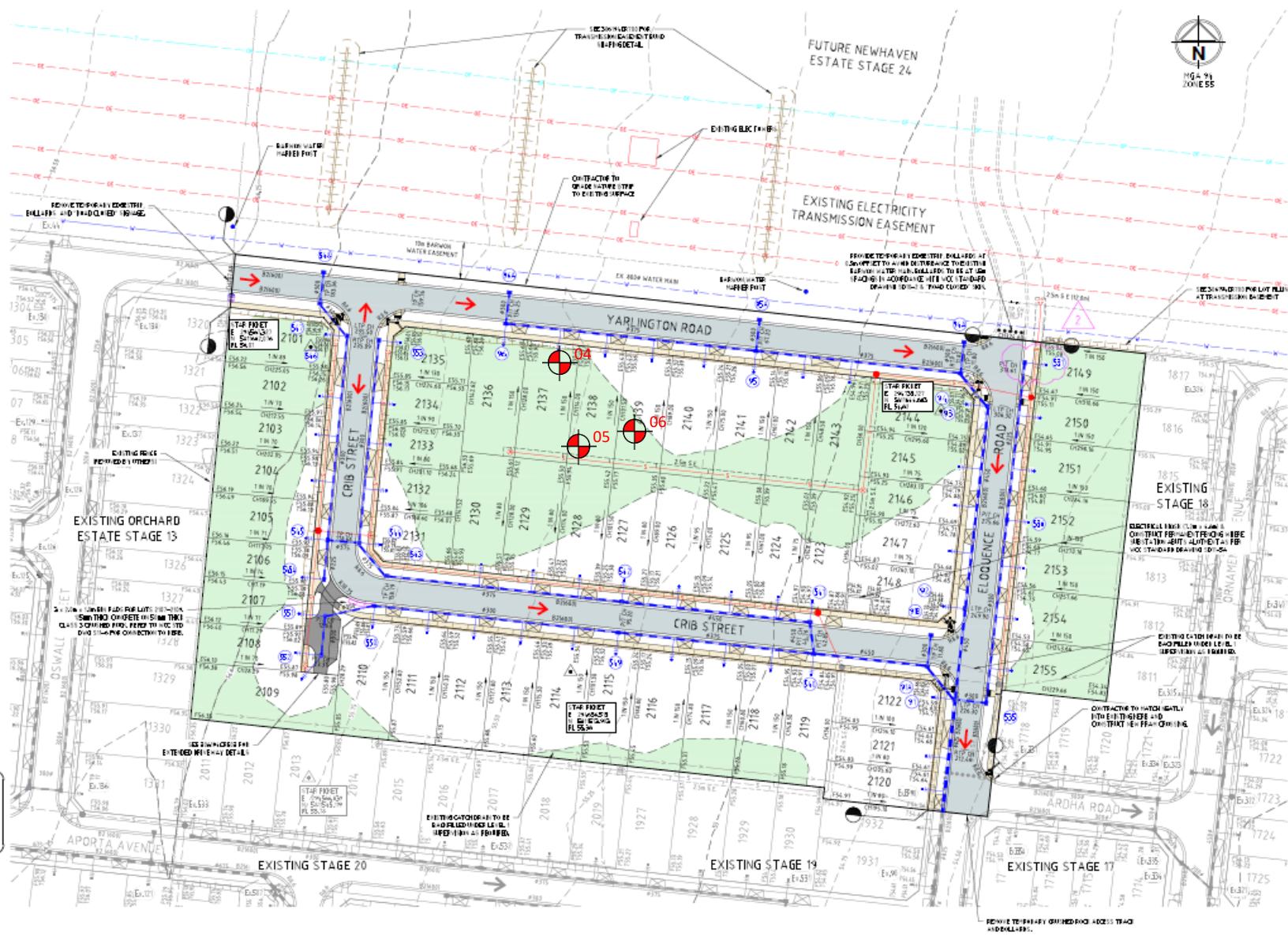
<b>Specification:</b>	98% STD	<b>Test Selection:</b>	N/A
<b>Notes:</b>	Ref : 1120 0390-1 (SI02)		
<b>Test Method</b>	AS1289 5.8.1, 5.7.1, 2.1.1, 1.1	<b>Sampling Method:</b>	AS 1289 1.2.1 6.4(b)

 <b>NATA</b> <small>WORLD RECOGNISED ACCREDITATION</small>	<b>NATA Accredited Laboratory No. 20172</b> Accreditation for compliance with ISO/IEC 17025 - Testing	<b>Approved Signatory:</b>  David Burns <b>Date:</b> 1/02/2023
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Test Location



WORKS ON OR NEAR BARHON WATER ASSETS - CONTRACTOR TO REFER TO BARHON WATER'S CUSTOMER GUIDE FOR WORKS ON OR NEAR BARHON WATER ASSETS AND MAKE APPLICATIONS AS PER BARHON WATER'S REQUIREMENTS.

**WARNING**  
BEWARE OF TRANSMISSION LINES  
TRANSMISSION POWER LINES IN CLOSE PROXIMITY OF WORKS. HUNGRY ELECTRICAL CURRENTS MAY WORK APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT.

**WARNING**  
BE AWARE OF UNDERGROUND/OVERHEAD SERVICES  
THE LOCATION OF SERVICES ARE APPROXIMATELY AS SHOWN ON THIS PLAN. CONTRACTOR TO VERIFY THE LOCATION OF ALL SERVICES BY VISUAL INSPECTION AND/OR SURVEY. APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT TO CONSTRUCTIVE PROCEDURES TAKEN TO MAINTAIN ELECTRICAL SAFETY.

**PROJECT:**  
Newhaven Estate Stage 21

**CLIENT:**  
BMD Urban

**DATE:**  
18/01/2023

**LOCATION:**  
Tarnet

**PROJECT No:**  
1120 0390-1 (SI02)

**SITE PLAN SKETCH—NOT TO SCALE**



# Field Density Test Results AS1289.5.7.1

<b>Client:</b>	BMD Urban	<b>Job No:</b>	BMD2597
<b>Project:</b>	Newhaven Estate - Stage 21 (Level 1)	<b>Report:</b>	3
<b>Location:</b>	Tarneit		

Sample No	7	8	9			
Date Tested	19/01/2023	19/01/2023	19/01/2023			
Time Tested	AM	AM	AM			

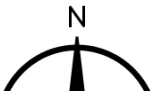
Test Location	Refer to Plan	Refer to Plan	Refer to Plan			
Level/Layer	1	1	1			
Layer Thickness	mm 200	mm 200	mm 200			
Test Depth	mm 175	mm 175	mm 175			
Field Wet Density	t/m <sup>3</sup> 1.99	t/m <sup>3</sup> 1.92	t/m <sup>3</sup> 1.97			
Field Moisture Content	% 20.4	% 22.9	% 21.1			
Material:	Site Derived Clay Fill	Site Derived Clay Fill	Site Derived Clay Fill			

Oversize Material	WET, % 18.4	16.3	18.3			
Sieve Size	mm 37.5	mm 37.5	mm 37.5			
Peak Converted Wet Density	t/m <sup>3</sup> 2.00	t/m <sup>3</sup> 1.94	t/m <sup>3</sup> 1.99			
Optimum Moisture Content	% 19	% 24	% 20			

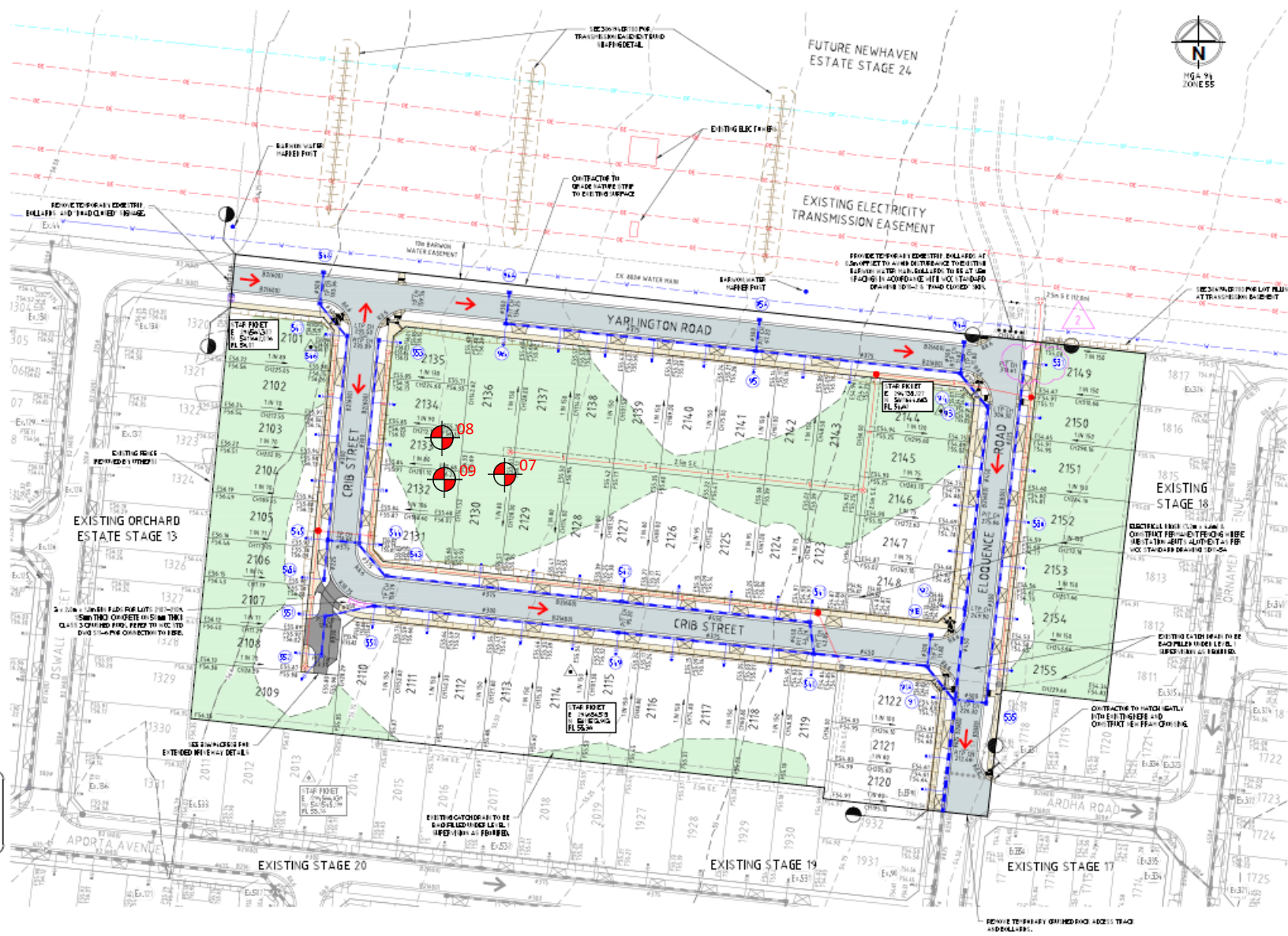
<b>Moisture Ratio</b>	107.5	95.5	105.5			
<b>Moisture Variation from OMC</b>	1.0 Wetter	-1.0 Drier	1.0 Wetter			
<b>Density Ratio</b>	99.0	98.0	98.0			

<b>Specification:</b>	98% STD	<b>Test Selection:</b>	N/A
<b>Notes:</b>	Ref : 1120 0390-1 (SI03)		
<b>Test Method</b>	AS1289 5.8.1, 5.7.1, 2.1.1, 1.1	<b>Sampling Method:</b>	AS 1289 1.2.1 6.4(b)

 <p style="font-size: small;">WORLD RECOGNISED ACCREDITATION</p>	<p style="font-size: small;">NATA Accredited Laboratory No. 20172 Accreditation for compliance with ISO/IEC 17025 - Testing</p>	<p style="font-size: small;">Approved Signatory:</p>  <p style="font-size: small;">Date: 1/02/2023</p> <p style="font-size: small;">David Burns</p>
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Test Location



WORKS ON OR NEAR BARROW WATER ASSETS - CONTRACTOR TO REFER TO BARROW WATER'S CUSTOMER GUIDE FOR WORKS ON OR NEAR BARROW WATER ASSETS AND MAKE APPLICATIONS AS PER BARROW WATER'S REQUIREMENTS.

**WARNING**  
BEWARE OF TRANSMISSION LINES  
TRANSMISSION POWER LINES IN CLOSE PROXIMITY OF WORKS. HUNGRY ELECTRICAL COEFFICIENTS MAY VARY. APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT.

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THE LOCATION OF SERVICES ARE APPROXIMATELY AS SHOWN ON THIS PLAN. THERE MAY BE OTHER SERVICES IN THE AREA. ALL SERVICES TO BE IDENTIFIED BY THE CONTRACTOR PRIOR TO COMMENCING WORKS. UNDERGROUND SERVICES TO BE IDENTIFIED BY THE CONTRACTOR PRIOR TO COMMENCING WORKS.

<b>PROJECT:</b> Newhaven Estate Stage 21	<b>CLIENT:</b> BMD Urban	<b>DATE:</b> 19/01/2023
<b>LOCATION:</b> Tarnet	<b>PROJECT No:</b> 1120 0390-1 (SI03)	<b>SITE PLAN SKETCH—NOT TO SCALE</b>



# Field Density Test Results AS1289.5.7.1

<b>Client:</b>	BMD Urban	<b>Job No:</b>	BMD2597
<b>Project:</b>	Newhaven Estate - Stage 21 (Level 1)	<b>Report:</b>	4
<b>Location:</b>	Tarneit		

Sample No	10	11	12			
Date Tested	20/01/2023	20/01/2023	20/01/2023			
Time Tested	AM	AM	AM			

Test Location	Refer to Plan	Refer to Plan	Refer to Plan			
Level/Layer	2	2	2			
Layer Thickness	mm 200	mm 200	mm 200			
Test Depth	mm 175	mm 175	mm 175			
Field Wet Density	t/m <sup>3</sup> 1.96	t/m <sup>3</sup> 1.92	t/m <sup>3</sup> 2.00			
Field Moisture Content	% 21.6	% 22.9	% 20.8			
Material:	Site Derived Clay Fill	Site Derived Clay Fill	Site Derived Clay Fill			

Oversize Material	WET, % 17.7	16.7	17.0			
Sieve Size	mm 37.5	mm 37.5	mm 37.5			
Peak Converted Wet Density	t/m <sup>3</sup> 1.98	t/m <sup>3</sup> 1.90	t/m <sup>3</sup> 2.01			
Optimum Moisture Content	% 22.5	% 21.5	% 22			

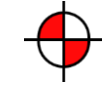
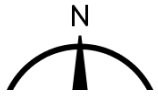
  

<b>Moisture Ratio</b>	%	96	106.5	94.5		
<b>Moisture Variation from OMC</b>	%	-1.0 Drier	1.0 Wetter	-1.0 Drier		
<b>Density Ratio</b>	%	98.5	99.5	98.5		

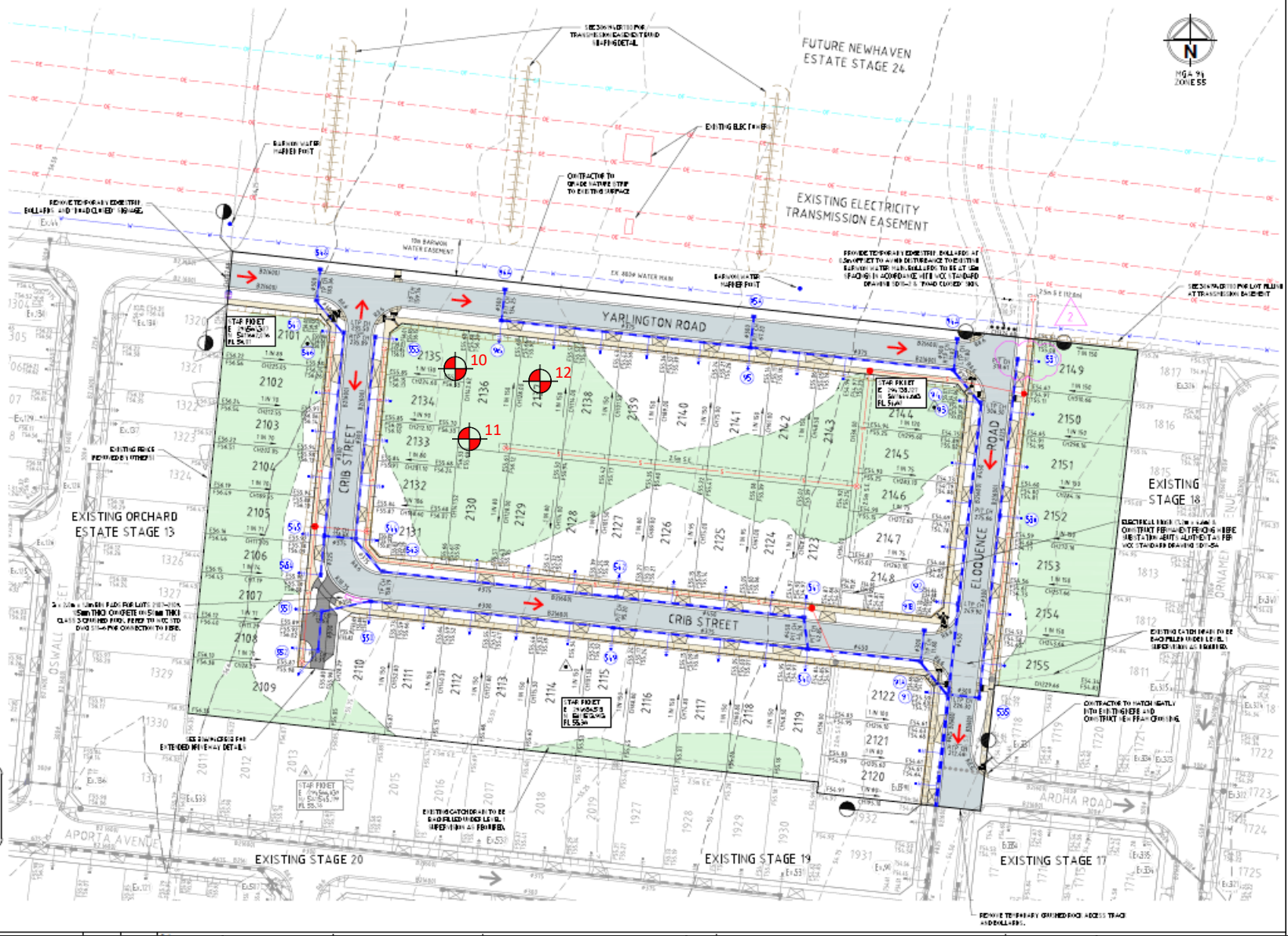
<b>Specification:</b>	98% STD	<b>Test Selection:</b>	N/A
<b>Notes:</b>	Ref : 1120 0390-1 (SI04)		
<b>Test Method</b>	AS1289 5.8.1, 5.7.1, 2.1.1, 1.1	<b>Sampling Method:</b>	AS 1289 1.2.1 6.4(b)

 <b>NATA</b> <small>WORLD RECOGNISED ACCREDITATION</small>	<b>NATA Accredited Laboratory No. 20172</b> Accreditation for compliance with ISO/IEC 17025 - Testing	<b>Approved Signatory:</b>  David Burns	<b>Date:</b> 1/02/2023
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Test Location



WORKS ON OR NEAR BARNON WATER ASSETS - CONTRACTOR TO REFER TO BARNON WATER'S CUSTOMER GUIDE FOR WORKS ON OR NEAR BARNON WATER ASSETS AND MAKE APPLICATIONS AS PER BARNON WATER'S REQUIREMENTS.

**WARNING**  
BEWARE OF TRANSMISSION LINES  
TRANSMISSION POWER LINES IN CLOSE PROXIMITY OF WORKS. HUNGRY ELECTRICAL CURRENTS MAY WORK APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT.

**WARNING**  
BE AWARE OF UNDERGROUND/OVERHEAD SERVICES  
THE LOCATION OF SERVICES ARE APPROXIMATELY AS SHOWN ON THIS PLAN. THERE MAY BE OTHER SERVICES IN THE AREA. ALL SERVICES TO BE LOCATED PRIOR TO CONSTRUCTION. PROCEDURES MUST BE FOLLOWED TO LOCATE ALL SERVICES.

**PROJECT:**  
Newhaven Estate Stage 21

**CLIENT:**  
BMD Urban

**DATE:**  
20/01/2023

**LOCATION:**  
Tarnet

**PROJECT No:**  
1120 0390-1 (SI04)

**SITE PLAN SKETCH—NOT TO SCALE**



## Field Density Test Results AS1289.5.7.1

<b>Client:</b>	BMD Urban	<b>Job No:</b>	BMD2597
<b>Project:</b>	Newhaven Estate - Stage 21 (Level 1)	<b>Report:</b>	5
<b>Location:</b>	Tarneit		

Sample No	13	14	15			
Date Tested	21/01/2023	21/01/2023	21/01/2023			
Time Tested	PM	PM	PM			

Test Location	Refer to Plan	Refer to Plan	Refer to Plan			
Level/Layer	2	2	2			
Layer Thickness	mm 200	mm 200	mm 200			
Test Depth	mm 175	mm 175	mm 175			
Field Wet Density	t/m <sup>3</sup> 1.95	t/m <sup>3</sup> 1.98	t/m <sup>3</sup> 1.99			
Field Moisture Content	% 21.9	% 21.4	% 21.5			
Material:	Site Derived Clay Fill	Site Derived Clay Fill	Site Derived Clay Fill			

Oversize Material	WET, % 18.3	12.6	15.2			
Sieve Size	mm 37.5	mm 37.5	mm 37.5			
Peak Converted Wet Density	t/m <sup>3</sup> 1.94	t/m <sup>3</sup> 1.98	t/m <sup>3</sup> 1.99			
Optimum Moisture Content	% 20.5	% 22.5	% 23			



  

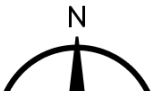
<b>Moisture Ratio</b>	%	107	95	93.5		
<b>Moisture Variation from OMC</b>	%	1.0 Wetter	-1.0 Drier	-1.0 Drier		
<b>Density Ratio</b>	%	98.0	98.5	98.0		

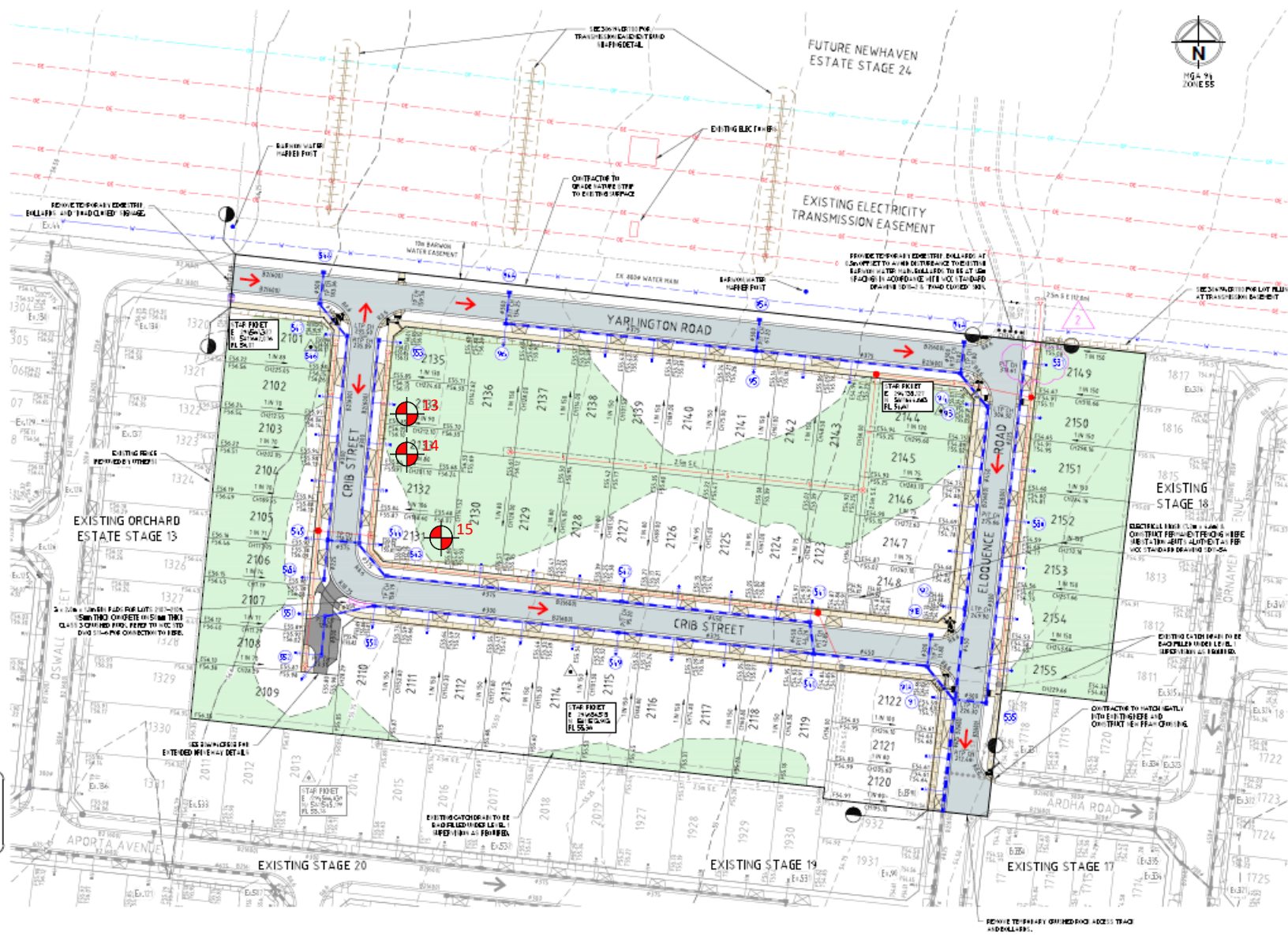
<b>Specification:</b>	98% STD	<b>Test Selection:</b>	N/A
<b>Notes:</b>	Ref : 1120 0390-1 (SI05)		
<b>Test Method</b>	AS1289 5.8.1, 5.7.1, 2.1.1, 1.1	<b>Sampling Method:</b>	AS 1289 1.2.1 6.4(b)

 <b>NATA</b> <small>WORLD RECOGNISED ACCREDITATION</small>	<b>NATA Accredited Laboratory No. 20172</b> Accreditation for compliance with ISO/IEC 17025 - Testing	<b>Approved Signatory:</b>  David Burns <b>Date:</b> 1/02/2023
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Test Location



WORKS ON OR NEAR BARHORN WATER ASSETS - CONTRACTOR TO REFER TO BARHORN WATER'S CUSTOMER GUIDE FOR WORKS ON OR NEAR BARHORN WATER ASSETS AND MAKE APPLICATIONS AS PER BARHORN WATER'S REQUIREMENTS.

**WARNING**  
BEWARE OF TRANSMISSION LINES  
TRANSMISSION POWER LINES IN CLOSE PROXIMITY OF WORKS. HUNGRY ELECTRICAL COEFFICIENTS MAY VARY. APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT.

**WARNING**  
BE AWARE OF UNDERGROUND/OVERHEAD SERVICES  
THE LOCATION OF SERVICES ARE APPROXIMATELY AS SHOWN ON THIS PLAN. EXACT POSITION SHOULD BE CHECKED ON SITE. CONTRACTOR TO VERIFY ALL SERVICES BY VISUAL AND/OR SURVEY. APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT TO AVOID DAMAGE TO SERVICES AND TO ENSURE SAFETY OF ALL PERSONNEL.

<b>PROJECT:</b> Newhaven Estate Stage 21	<b>CLIENT:</b> BMD Urban	<b>DATE:</b> 21/01/2023
<b>LOCATION:</b> Tarnet	<b>PROJECT No:</b> 1120 0390-1 (S105)	<b>SITE PLAN SKETCH—NOT TO SCALE</b>



## Field Density Test Results AS1289.5.7.1

<b>Client:</b>	BMD Urban	<b>Job No:</b>	BMD2597
<b>Project:</b>	Newhaven Estate - Stage 21 (Level 1)	<b>Report:</b>	6
<b>Location:</b>	Tarneit		

Sample No	16	17	18			
Date Tested	23/01/2023	23/01/2023	23/01/2023			
Time Tested	AM	AM	AM			

Test Location	Refer to Plan	Refer to Plan	Refer to Plan			
Level/Layer	1	1	1			
Layer Thickness	mm 200	mm 200	mm 200			
Test Depth	mm 175	mm 175	mm 175			
Field Wet Density	t/m <sup>3</sup> 1.95	t/m <sup>3</sup> 1.98	t/m <sup>3</sup> 1.92			
Field Moisture Content	% 22.5	% 21.3	% 23.1			
Material:	Site Derived Clay Fill	Site Derived Clay Fill	Site Derived Clay Fill			

Oversize Material	WET, % 15.2	17.1	18.2			
Sieve Size	mm 37.5	mm 37.5	mm 37.5			
Peak Converted Wet Density	t/m <sup>3</sup> 1.97	t/m <sup>3</sup> 2.00	t/m <sup>3</sup> 1.94			
Optimum Moisture Content	% 21.5	% 22.5	% 24.5			



  

<b>Moisture Ratio</b>	%	104.5	94.5	94.5		
<b>Moisture Variation from OMC</b>	%	1.0 Wetter	-1.0 Drier	-1.0 Drier		
<b>Density Ratio</b>	%	98.5	98.5	98.5		

<b>Specification:</b>	98% STD	<b>Test Selection:</b>	N/A
<b>Notes:</b>	Ref : 1120 0390-1 (SI06)		
<b>Test Method</b>	AS1289 5.8.1, 5.7.1, 2.1.1, 1.1	<b>Sampling Method:</b>	AS 1289 1.2.1 6.4(b)

 <b>NATA</b> <small>WORLD RECOGNISED ACCREDITATION</small>	<b>NATA Accredited Laboratory No. 20172</b> Accreditation for compliance with ISO/IEC 17025 - Testing	<b>Approved Signatory:</b>  David Burns Date: 1/02/2023
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# Field Density Test Results AS1289.5.7.1

<b>Client:</b>	BMD Urban	<b>Job No:</b>	BMD2597
<b>Project:</b>	Newhaven Estate - Stage 21 (Level 1)	<b>Report:</b>	7
<b>Location:</b>	Tarneit		



Sample No	19	20	21			
Date Tested	24/01/2023	24/01/2023	24/01/2023			
Time Tested	AM	AM	AM			

Test Location	Refer to Plan	Refer to Plan	Refer to Plan			
Level/Layer	1	1	1			
Layer Thickness	mm 200	mm 200	mm 200			
Test Depth	mm 175	mm 175	mm 175			
Field Wet Density	t/m <sup>3</sup> 1.98	t/m <sup>3</sup> 1.93	t/m <sup>3</sup> 1.96			
Field Moisture Content	% 20.3	% 22.8	% 21.4			
Material:	Site Derived Clay Fill	Site Derived Clay Fill	Site Derived Clay Fill			

Oversize Material	WET, % 14.7	16.8	19.7			
Sieve Size	mm 37.5	mm 37.5	mm 37.5			
Peak Converted Wet Density	t/m <sup>3</sup> 2.00	t/m <sup>3</sup> 1.95	t/m <sup>3</sup> 1.97			
Optimum Moisture Content	% 21.5	% 24	% 20			

<b>Moisture Ratio</b>	94.5	95	107			
<b>Moisture Variation from OMC</b>	% -1.0 Drier	% -1.0 Drier	% 1.0 Wetter			
<b>Density Ratio</b>	% 98.5	% 98.0	% 99.0			

<b>Specification:</b>	98% STD	<b>Test Selection:</b>	N/A
<b>Notes:</b>	Ref : 1120 0390-1 (SI07)		
<b>Test Method</b>	AS1289 5.8.1, 5.7.1, 2.1.1, 1.1	<b>Sampling Method:</b>	AS 1289 1.2.1 6.4(b)



 <p><b>NATA</b> WORLD RECOGNISED ACCREDITATION</p>	<p>NATA Accredited Laboratory No. 20172 Accreditation for compliance with ISO/IEC 17025 - Testing</p>	<p>Approved Signatory: </p> <p>David Burns Date: 1/02/2023</p>
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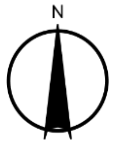
## Field Density Test Results AS1289.5.7.1

<b>Client:</b>	BMD Urban	<b>Job No:</b>	BMD2597
<b>Project:</b>	Newhaven Estate - Stage 21 (Level 1)	<b>Report:</b>	8
<b>Location:</b>	Tarneit		
Sample No	22	23	24
Date Tested	11/07/2023	11/07/2023	11/07/2023
Time Tested	PM	PM	PM
Test Location	Refer to Plan	Refer to Plan	Refer to Plan
Level/Layer	FSL	FSL	FSL
Layer Thickness	mm 200	mm 200	mm 200
Test Depth	mm 175	mm 175	mm 175
Field Wet Density	t/m <sup>3</sup> 1.93	t/m <sup>3</sup> 1.89	t/m <sup>3</sup> 1.96
Field Moisture Content	% 24.2	% 25.5	% 23.0
Material:	Site Derived Clay Fill	Site Derived Clay Fill	Site Derived Clay Fill
Oversize Material	WET, % 0.0	WET, % 0.0	WET, % 0.0
Sieve Size	mm 19	mm 19	mm 19
Peak Converted Wet Density	t/m <sup>3</sup> 1.96	t/m <sup>3</sup> 1.93	t/m <sup>3</sup> 1.99
Optimum Moisture Content	% 25	% 26	% 23.5
<b>Moisture Ratio</b>	% 97	% 98	% 98
<b>Moisture Variation from OMC</b>	% -0.5 Drier	% -0.5 Drier	% -0.5 Drier
<b>Density Ratio</b>	% 98.5	% 98.5	% 98.5

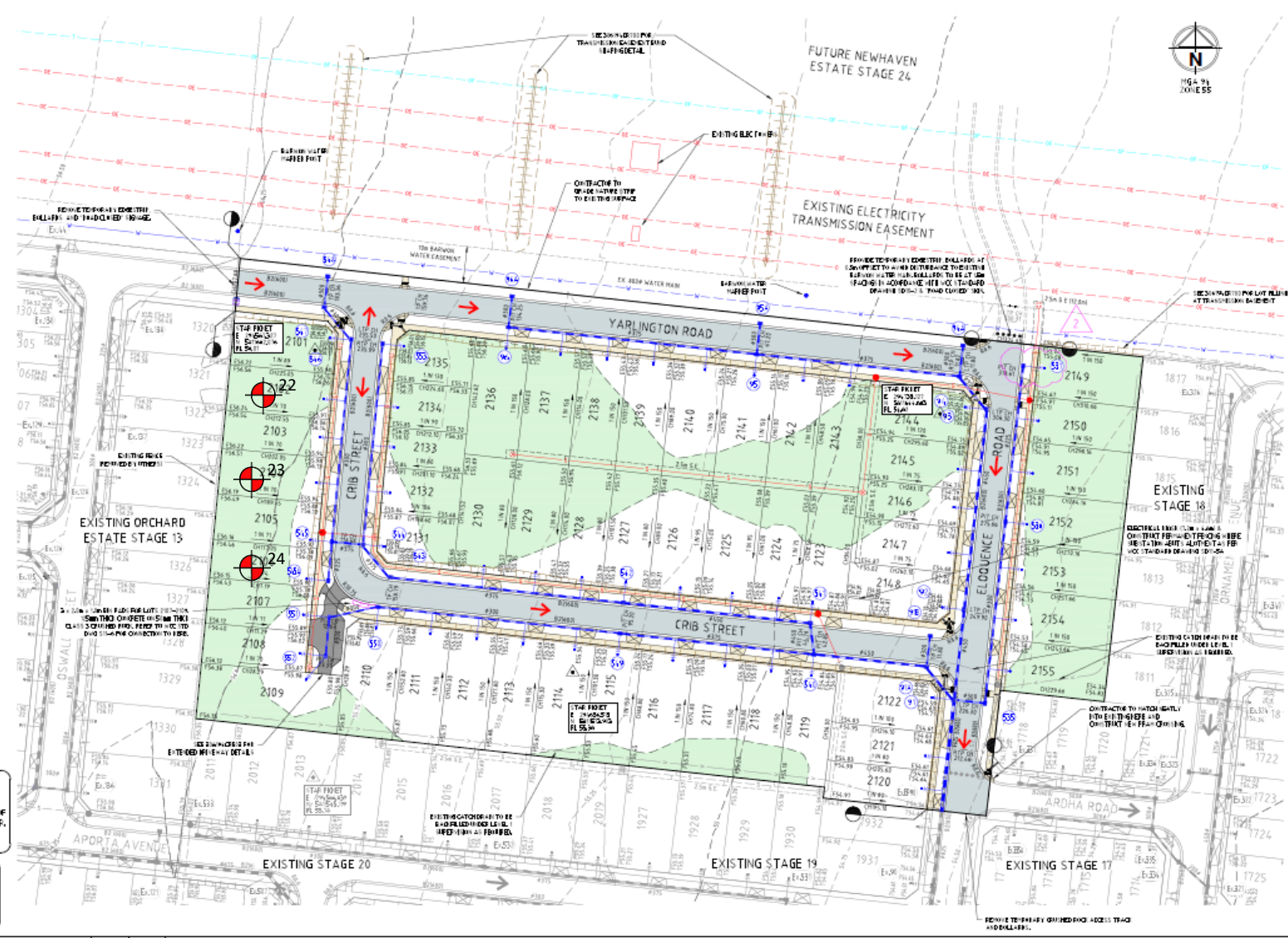
<b>Specification:</b>	98% STD	<b>Test Selection:</b>	N/A
<b>Notes:</b>	Ref : 1120 0390-1 (SI08)		
<b>Test Method</b>	AS1289 5.8.1, 5.7.1, 2.1.1, 1.1	<b>Sampling Method:</b>	AS 1289 1.2.1 6.4(b)

 <small>WORLD RECOGNISED ACCREDITATION</small>	<p>NATA Accredited Laboratory No. 20172</p> <p>Accreditation for compliance with ISO/IEC 17025 - Testing</p>	<p>Approved Signatory:</p> 	
		<p>David Burns</p>	
		<p>Date: 25/07/2023</p>	





Test Location



WORKS ON OR NEAR BARHON WATER ASSETS - CONTRACTOR TO REFER TO BARHON WATER'S CUSTOMER GUIDE FOR WORKS ON OR NEAR BARHON WATER ASSETS AND MAKE APPLICATIONS AS PER BARHON WATER'S REQUIREMENTS.

**WARNING**  
BEWARE OF TRANSMISSION LINES  
TRANSMISSION POWER LINES IN CLOSE PROXIMITY OF WORKS. INDICATED ELECTRICAL CURRENTS MAY OCCUR. APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT.

**WARNING**  
BEWARE OF UNDERGROUND UTILITY SERVICES  
THE LOCATION OF SERVICES ARE APPROXIMATELY 0.75M FROM PROPERTY BOUNDARIES. CONTRACTOR TO VERIFY ALL SERVICES PRIOR TO CONSTRUCTION. APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT.

**PROJECT:**  
Newhaven Estate - Stage 21

**CLIENT:**  
BMD Urban

**DATE:**  
11/07/2023

**LOCATION:**  
Tarneit

**PROJECT No:**  
1120 0390-1 (SI08)

**SITE PLAN SKETCH—NOT TO SCALE**



# Field Density Test Results

## AS1289.5.7.1

<b>Client:</b>	BMD Urban	<b>Job No:</b>	BMD2597
<b>Project:</b>	Newhaven Estate - Stage 21 (Level 1)	<b>Report:</b>	9
<b>Location:</b>	Tarneit		

Sample No	25	26	27			
Date Tested	12/07/2023	12/07/2023	12/07/2023			
Time Tested	PM	PM	PM			

Test Location	Refer to Plan	Refer to Plan	Refer to Plan			
Level/Layer	1	FSL	FSL			
Layer Thickness	mm 200	200	200			
Test Depth	mm 175	175	175			
Field Wet Density	t/m <sup>3</sup> 2.00	1.97	1.96			
Field Moisture Content	% 22.1	23.4	22.6			
Material:	Site Derived Clay Fill	Site Derived Clay Fill	Site Derived Clay Fill			

Oversize Material	WET, %	0.0	0.0	0.0		
Sieve Size	mm	19	19	19		
Peak Converted Wet Density	t/m <sup>3</sup>	2.03	2.00	1.99		
Optimum Moisture Content	%	22.5	24	23.5		

<b>Moisture Ratio</b>	%	98	97.5	96.5		
<b>Moisture Variation from OMC</b>	%	-0.5	-0.5	-0.5		
<b>Density Ratio</b>	%	98.5	98.5	98.5		

<b>Specification:</b>	98% STD	<b>Test Selection:</b>	N/A
<b>Notes:</b>	Ref : 1120 0390-1 (SI09)		
<b>Test Method</b>	AS1289 5.8.1, 5.7.1, 2.1.1, 1.1	<b>Sampling Method:</b>	AS 1289 1.2.1 6.4(b)



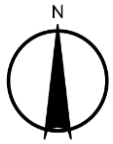
NATA Accredited Laboratory No. 20172  
Accreditation for compliance with ISO/IEC 17025 - Testing

Approved Signatory:

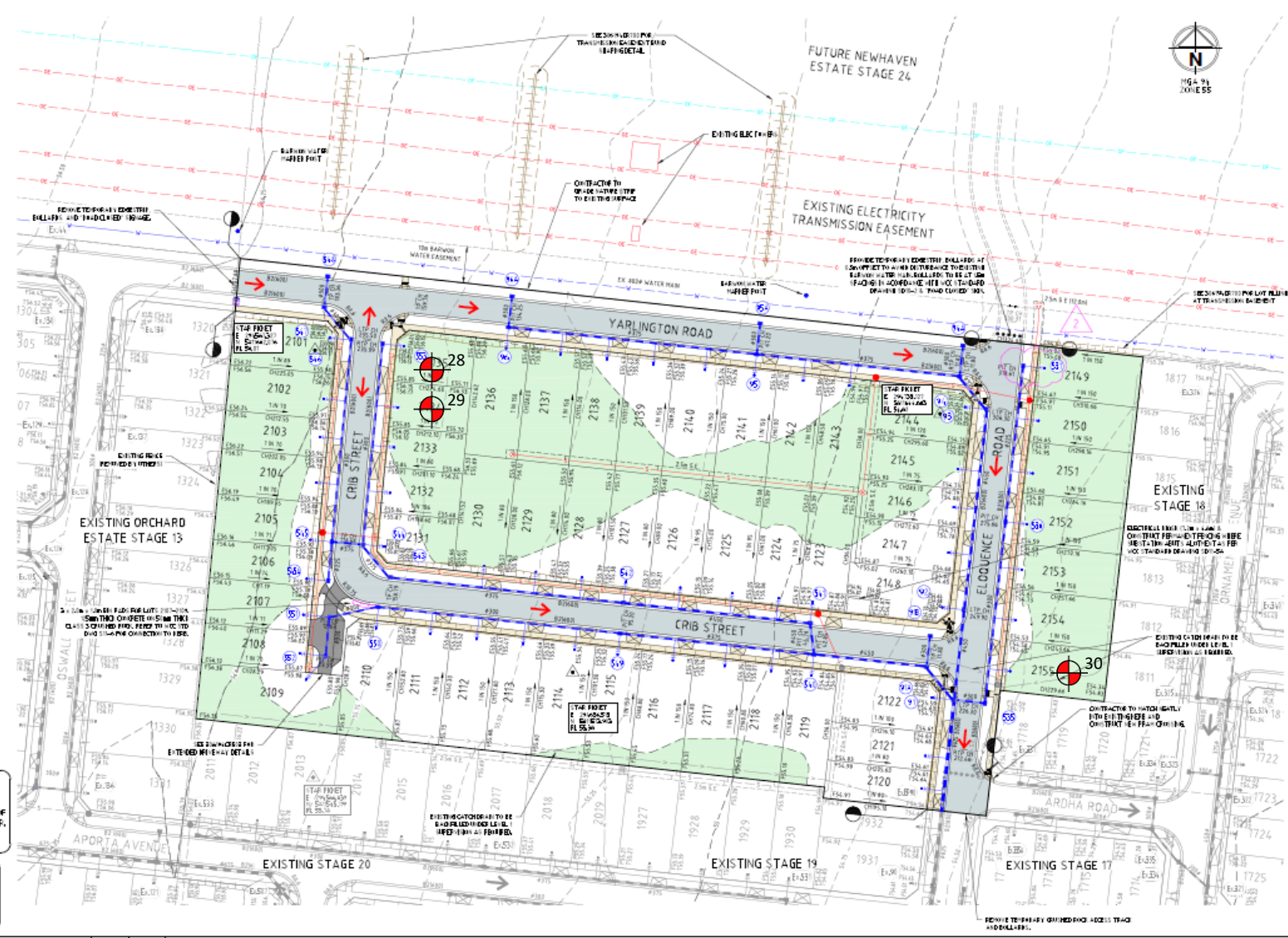


David Burns

Date: 25/07/2023



Test Location



WORKS ON OR NEAR BARBON WATER ASSETS - CONTRACTOR TO REFER TO BARBON WATER'S CUSTOMER GUIDE FOR WORKS ON OR NEAR BARBON WATER ASSETS AND MAKE APPLICATIONS AS PER BARBON WATER'S REQUIREMENTS.

**WARNING**  
BEWARE OF TRANSMISSION LINES  
TRANSMISSION POWER LINES IN CLOSE PROXIMITY OF WORKS. INDICATED ELECTRICAL CURRENTS MAY OCCUR. APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT.

**WARNING**  
BEWARE OF UNDERGROUND UTILITY SERVICES  
THE LOCATION OF SERVICES ARE APPROXIMATELY 0.75M DEPTH FROM SURFACE. CONTRACTOR TO VERIFY SERVICE LOCATIONS PRIOR TO ANY WORK. CONTRACTOR TO BE RESPONSIBLE FOR ANY DAMAGE TO SERVICES. CONTRACTOR TO BE RESPONSIBLE FOR ANY DAMAGE TO SERVICES.

**PROJECT:**  
Newhaven Estate - Stage 21

**CLIENT:**  
BMD Urban

**DATE:**  
13/07/2023

**LOCATION:**  
Tarneit

**PROJECT No:**  
1120 0390-1 (S110)

**SITE PLAN SKETCH—NOT TO SCALE**



## Field Density Test Results AS1289.5.7.1

<b>Client:</b>	BMD Urban	<b>Job No:</b>	BMD2597
<b>Project:</b>	Newhaven Estate - Stage 21 (Level 1)	<b>Report:</b>	10
<b>Location:</b>	Tarneit		

Sample No	28	29	30			
Date Tested	13/07/2023	13/07/2023	13/07/2023			
Time Tested	PM	PM	PM			

Test Location	Refer to Plan	Refer to Plan	Refer to Plan			
Level/Layer	FSL	FSL	FSL			
Layer Thickness	mm 200	mm 200	mm 200			
Test Depth	mm 175	mm 175	mm 175			
Field Wet Density	t/m <sup>3</sup> 1.93	t/m <sup>3</sup> 1.96	t/m <sup>3</sup> 1.95			
Field Moisture Content	% 24.0	% 22.9	% 24.6			
Material:	Site Derived Clay Fill	Site Derived Clay Fill	Site Derived Clay Fill			

Oversize Material	WET, %	0.0	0.0	0.0		
Sieve Size	mm	19	19	19		
Peak Converted Wet Density	t/m <sup>3</sup>	1.96	1.99	1.98		
Optimum Moisture Content	%	24.5	23.5	25		

<b>Moisture Ratio</b>	%	98	97.5	98.5		
<b>Moisture Variation from OMC</b>	%	-0.5	-0.5	-0.5		
<b>Density Ratio</b>	%	98.5	98.5	98.5		

<b>Specification:</b>	98% STD	<b>Test Selection:</b>	N/A
<b>Notes:</b>	Ref : 1120 0390-1 (SI10)		
<b>Test Method</b>	AS1289 5.8.1, 5.7.1, 2.1.1, 1.1	<b>Sampling Method:</b>	AS 1289 1.2.1 6.4(b)



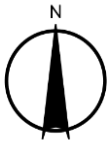
NATA Accredited Laboratory No. 20172  
Accreditation for compliance with ISO/IEC 17025 - Testing

Approved Signatory:

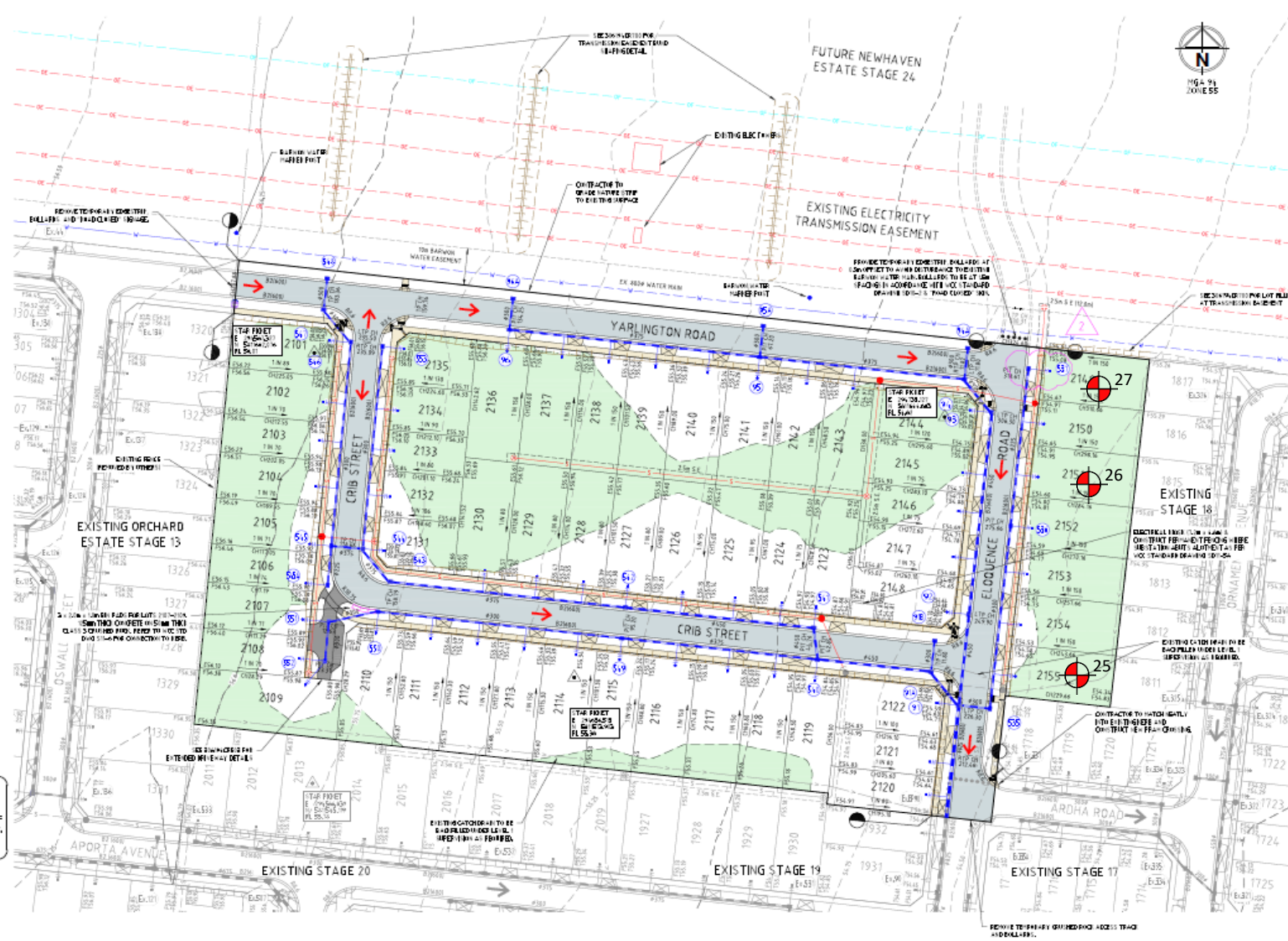


David Burns

Date: 25/07/2023



Test Location



WORKS ON OR NEAR BARBON WATER ASSETS - CONTRACTOR TO REFER TO BARBON WATER'S CUSTOMER GUIDE FOR WORKS ON OR NEAR BARBON WATER ASSETS AND MAKE APPLICATIONS AS PER BARBON WATER'S REQUIREMENTS.

**WARNING**  
BEWARE OF TRANSMISSION LINES  
TRANSMISSION POWER LINES IN CLOSE PROXIMITY OF WORKS, INDICATED ELECTRICAL CURRENTS MAY OCCUR, APPROPRIATE SAFETY MEASURES TO BE CARRIED OUT.

**WARNING**  
BEWARE OF UNDERGROUND UTILITY SERVICES  
THE LOCATION OF SERVICES ARE APPROXIMATELY 1:0 TO 1:5M DEPTH. SERVICES SHOULD BE IDENTIFIED BY THE CONTRACTOR PRIOR TO ANY WORK. ALL ELECTRICAL SERVICES ARE UNARMED. OVERHEAD LINES SHOULD BE IDENTIFIED PRIOR TO ANY WORK. UNDERGROUND SERVICES SHOULD BE IDENTIFIED PRIOR TO ANY WORK.

<b>PROJECT:</b> Newhaven Estate - Stage 21	<b>CLIENT:</b> BMD Urban	<b>DATE:</b> 12/07/2023
<b>LOCATION:</b> Tarneit	<b>PROJECT No:</b> 1120 0390-1 (SI09)	<b>SITE PLAN SKETCH—NOT TO SCALE</b>

