Validation Report: Lots 8-9-10 Preliminary Earthworks

Red Hill Waste Management Facility

Prepared for Eastern Metropolitan Regional Council

18 February 2021

Project Number: TW19110

Assets | Engineering | Environment | Noise | Spatial | Waste

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Name	Position	File Reference
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Signature	[redacted]	

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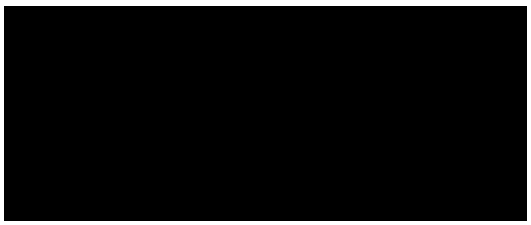
Validation

Talis has provided third party review of the monitoring services conducted by the Superintendent during the preliminary earthworks in Lots 8, 9, and 10 at Red Hill Waste Management Facility at the request of the Eastern Metropolitan Regional Council. The laboratory test results and installation observations by the Superintendent indicate that the works were constructed in accordance with the Technical Specification, with approved amendments and any departures monitored, recorded and documented by the Superintendent.

For and on behalf of

Talis Consultants Pty Ltd



Senior Waste Consultant/Engineer

MIEAust

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1 Introduction

1.1 General

Talis Consultants Pty Ltd (Talis) was appointed by the Eastern Metropolitan Regional Council (the EMRC) to provide engineering design and technical support for the preliminary earthworks (the Works) in Lots 8, 9, and 10 at the Red Hill Waste Management Facility (the Site). Following the Works, Talis was then commissioned to undertake a review of the Construction Quality Assurance (CQA) documentation and prepare a Validation Report.

1.2 Location

The Site is located approximately 16km southwest of Perth Airport at 1094 Toodyay Road, Red Hill, WA 6056. Lots 8, 9 and 10 cover a total area of 36.9ha and located west of the main Site waste management activities. These lots do not currently contain any permanent infrastructure. A former kaolinite clay quarry was operational across all three lots until the land was acquired by EMRC in December 2012. While these lots have yet to be incorporated into the prescribed Site Boundary, the EMRC is looking to expand operations into these areas in the near future, including the development and operation of a liquid waste processing facility, a food organics and garden organics (FOGO) processing facility and an anaerobic digestion facility.

The preliminary earthworks in Lots 8, 9 and 10 will provide a working platform for the development of the waste management activities proposed in this area.

1.3 Scope of Work

The engineering requirements for the Works are detailed in the Red Hill Lot 8-9-10 Preliminary Earthworks Technical Specification, Talis, January 2020 (the Specification).

The extent of works for the preliminary earthworks can be detailed as follows:

- Clearing of unsuitable materials from previously ponded areas;
- Exposing, removal and crushing of Laterite Cap Rock for use in the works;
- General earthworks to form construction pad;
- Ferricrete Erosion Protection Sheeting to Cut Slopes;
- Ferricrete Sub-base placement to construction pad; and
- Temporary Surface Water Management Controls and Safety Edge Bunding.

This report summarises the monitoring activities for the Works undertaken by the Contractor and managed by the Superintendent and presents the results of laboratory tests carried out on the general earthworks and ferricrete.

1.4 Project Team and Contract Programme

Raubex Construction Pty Ltd (Raubex) were contracted by the EMRC to undertake the Works designed by Talis. Raubex provided daily supervision and project management for the Works, with Castle Equipment subcontracted to complete the general earthworks.

The Independent NATA Laboratory used for soils testing during the Works was Kanga & Associates, Naval Base, WA.

Surveying for all Works was undertaken by Survey Dynamics on behalf of Raubex.

Talis was the Designer and provided ongoing technical advice as required. Contract management and Superintendent services were undertaken by the EMRC (as the Principal).

The Works commenced in April 2020 and were completed in January 2021. There was a stand-down period for the Works agreed to by Raubex and the EMRC from mid-June 2020 to late-August 2020 due to unsuitable weather conditions.

1.5 Hold Points

During the Works there were nine (9) Hold Points requiring sign-off by the Superintendent. A summary of these hold points is listed in Table 1-1 and the associated Hold Point documentation can be found in APPENDIX D.

Table 1-1: Hold Point Requirements

Hold Point Form Number	Item	Description Location in Technical Specification
HP-001	Approval of Traffic Management Plan	Section 2.14
HP-002	Approval of Formation Surface	Section 4.5.8
HP-003	Approval of Construction Pad Fill Field Trial	Section 4.7.2.1
HP-004	Approval of Construction Pad Structural Fill Testing	Section 4.7.3
HP-005	Approval of Construction Pad Structural Fill Formation Surface Survey Level	Section 4.7.5
HP-006	Approval of Construction Pad Ferricrete Sub-base Testing	Section 4.8.3
HP-007	Approval of Construction Pad Ferricrete Sub-base Surface Survey Level (Installed Thickness)	Section 4.8.4
HP-008	Approval of Ferricrete Erosion Sheeting	Section 4.8.1
HP-009	Approval of Temporary Surface Water Grips	Section 4.9

2 CQA Procedures and Observations

2.1 General

The general earthworks were overseen by the EMRC's Superintendent.

The Superintendent performed the following CQA procedures:

- General Excavation
  - Observation of excavation of selected material and placement of general and structural fill to formation level falls and geometry;
  - Review of all in-situ compliance testing;
- Ferricrete
  - Observation of placement and compaction of the ferricrete; and
  - Review of all in-situ compliance testing.

2.2 Earthworks

2.2.1 Clearing

Following quarry operations, there was minimal native vegetation across Lots 8, 9 and 10. Any remaining vegetation was cleared by EMRC in 2019.

The Contractor was responsible for the removal of any remaining topsoil from all surfaces to be excavated to a depth as specified in the Technical Specification. Topsoil material was stockpiled on site and before being redistributed where required at the completion of construction works at the direction of the Superintendent.

2.2.2 Characterisation of Material

In January 2020, Talis was engaged by the EMRC to undertake an initial geotechnical characterisation of the Lot 8, 9 and 10 soils cut/fill material for the construction of a hardstand for the proposed future waste management activities.

Based on the subsurface profiles encountered, in-situ testing and laboratory results, and in accordance with AS2870-2011, the investigation area in its current condition would be classified as "**Class M**, moderately reactive clay or silt sites, which may experience moderate ground movement from moisture changes".

The Technical Specification outlines that it is the Contractor's responsibility to ensure material used as engineering fill is suitable. Unsuitable material as defined in AS 3798, may include:

- Organic soils, such as many topsoils, severely root-affected subsoils and peat;
- Materials contaminated through past Site usage which may contain toxic substances or soluble compounds harmful to water supply or agriculture;
- Materials containing substances that can be dissolved or leached out in the presence of moisture (e.g. gypsum), or which undergo volume change or loss of strength when disturbed and exposed to moisture (e.g. some shales and sandstones), unless these matters are specifically addressed in the design;
- Silts, or materials that have the deleterious engineering properties of silt;
- Other materials with properties that are unsuitable for the forming of structural fill; and

- Fill that contains wood, metal, plastic, boulders or other deleterious material, in sufficient proportions to affect the required performance of the fill.

Samples were recovered for the characterisation testing shown in Table 2-1, with a required testing rate of 1 sample per 20,000m^3 as per the Technical Specification and the initial proposed fill value of 199,196m^3.

Table 2-1: Characterisation Testing

Property	Test Method	Testing Frequency	Number of Tests Required	Number of Tests Taken
Particle Size Distribution	AS 1289 3.6.1 and 3.6.3	1 sample per 20,000m^3	11	11
Plasticity Index/Atterberg Limits	AS 1289 3.1.2, 3.2.1, 3.3.1 & 3.4.1	1 sample per 20,000m^3	11	11
Modified Compaction Test (Moisture Density Relationship)	AS 1289 5.2.1	1 sample per 20,000m^3	11	11
CBR (soaked for 4 days) at 96% MDD 100% OMC	AS 1289 6.1.1	1 sample per 20,000m^3	11	11
Coefficient of Permeability (water)	AS 1289 6.7.2	1 sample	1	1
Coefficient of Permeability (50,000ppm NaCl)	AS 1289 6.7.2	1 sample	1	1

The certificates and results of the NATA laboratory testing can be seen in APPENDIX A.

2.2.3 Trial Compaction

Prior to placement and compaction of general and structural fill, a field trial, witnessed by the Superintendent, was undertaken to verify the Contractor's compaction methodology could meet the moisture and density requirements.

Fill was excavated from the stockpile, hauled to the work area, and placed in two 200mm lifts using a scraper prior to compaction with a 19-tonne vibratory padfoot roller.

The NDM Gauge was calibrated with 1 sand replacement test and 4 core cutter tests. Four compaction trials were undertaken with 6, 8, 9, and 10 return passes with the roller. Four in-situ NDM tests were undertaken on each trial pad, and four corresponding disturbed samples were recovered for laboratory testing. The specified compaction and moisture contents were achieved, and this method was approved by the Superintendent through Hold Point #3 (Field Trial) which has been provided in APPENDIX D. The trial pits were backfilled and all trial pads compacted using the same method prior to incorporation into the permanent works.

The results from the NATA certified laboratory and Contractor's method statement are enclosed in APPENDIX B.

2.2.4 Proof-Rolling

To assess the suitability of the base of the excavation as a suitable platform, prior to placement of general or structural fill, proof rolling was undertaken using a 19-tonne vibratory pad-foot roller.

An area in Lot 3 showed signs of deformation/heave and this was brought to the attention of the Superintendent by the Contractor. It was agreed that the soft spot should be removed, and the area repaired to provide a foundation suitable and in-line with the requirements of the Technical Specification. No other areas showed signs of deformation or heave and each Lot was approved for general and structural filling by the Superintendent. Acceptance of the formation surfaces was recorded on the Hold Point Release Forms HP-002 for each Lot, which are presented in APPENDIX D.

2.2.5 General and Structural Fill

2.2.5.1 *Moisture Conditioning*

Site-won material was moisture conditioned to ±2% of its optimum moisture content (OMC) in cut areas and again during placement. Clay clods greater than 300mm were broken down and the material was thoroughly mixed, and moisture conditioned by the addition of water.

2.2.5.2 *Placement and Compaction*

Material was excavated from areas of cut using scrapers and placed in 100mm lifts to form a 300mm lift. A minimum of 2 passes was made with an 18-tonne pad foot roller after each 100mm lift. At the completion of each 300mm lift, a minimum of 6 passes on high vibration with the 18-tonne pad foot roller was carried out before testing was undertaken.

During the construction works the in-situ density and moisture content of the compacted materials were tested by the NATA laboratory using the Nuclear Density Meter (NDM) method in accordance with AS1289.5.8.1 and AS1289.5.2.1. This is discussed further in Section 2.2.5.3.

General and Structural Fill was placed and compacted, to the required geometry and falls. Acceptance of the fill placement was recorded on the ITP Forms for each lift in each Lot and results are presented in APPENDIX D.

The top of General Fill (formation) levels were approved by the Superintendent through the Hold Point Release Form HP-005, which is enclosed in APPENDIX D. As-constructed drawings are available in APPENDIX C.

2.2.5.3 *Conformance Testing*

Approximately 221,217m^3 of General and Structural Fill was ultimately placed during the Works.

For quality control purposes, the Works were divided into 10 Lots for the construction of the hardstand as per Diagram 2-1.

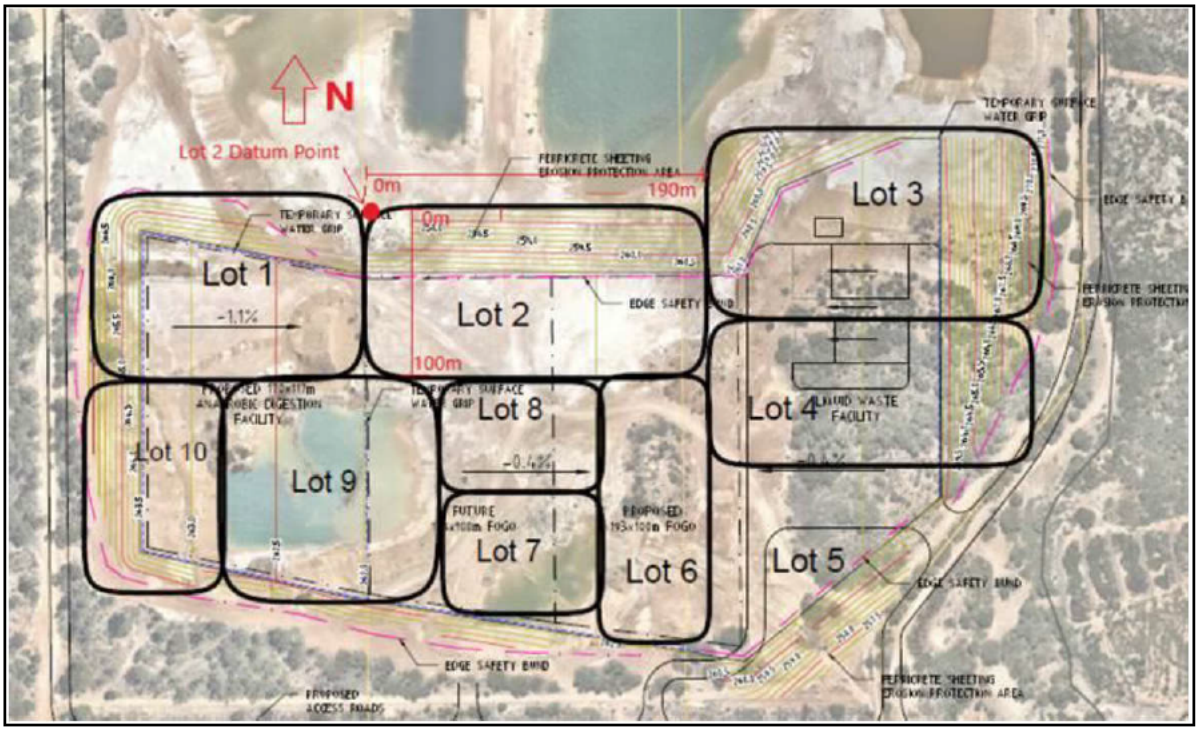

Diagram 2-1: Lot Map for Structural Fill Hardstand

The minimum testing frequencies for the General and Structural Fill, as required by the Technical Specification are shown in Table 2-2, along with the number of conforming and non-conforming results.

Table 2-2: Summary of General and Structural Fill Conformance Testing

Test	Required Value	Number of Tests			
		Required	Undertaken	Conforming	Non-conforming
Dry Density Ratio (Compaction)	≥95%	462	462*	462	0
OMC Moisture Variation	±2%	462	464*	462	2**
Grading Analysis	Not Stated	11	11†	N/A	N/A
Plasticity Index/Atterberg Limits	Not Stated	11	11†	N/A	N/A
MMDD Compaction	Not Stated	11	11†	N/A	N/A
CBR at 96% MDD 100% OMC	Not Stated	11	11†	N/A	N/A
Permeability (water)	Not Stated	1	1†	N/A	N/A
Permeability (50,000ppm NaCl)	Not Stated	1	1†	N/A	N/A

NOTES: * Required by AS 3798-2007, Guidelines of Earthworks for Commercial and Residential Development
** Two results were found to be non-conforming, and therefore two additional samples were taken that subsequently met the requirements of the Technical Specification.
† Testing undertaken during characterisation testing.

The minimum frequency of all NDM testing was met for the General and Structural Fill. The results of the conformance testing are included in APPENDIX B. Two tests were outside the acceptable moisture

content range for the General and Structural Fill, being more than 2% dry of OMC (Sample No. NB51380 and NB51381). This is discussed further in Section 3.3.1.

The in-situ and laboratory test results show that the works method utilised for both conditioning and compaction of the General and Structural Fill achieved the minimum dry density ratio / compaction level of 95%. The conformance testing for the General and Structural Fill was approved by the Superintendent through the relevant ITPs provided in APPENDIX D.

Core Cutter Calibration

The core cutter was used to verify the results of the nuclear gauge readings. The Technical Specification required that the core cutter tests be conducted at a rate of 1 reading per 10 nuclear gauge readings. The core cutter results from the independent NATA Laboratory can be found in APPENDIX D, whilst the corresponding nuclear gauge readings are presented in APPENDIX B. A direct correlation is shown in Table 2-3 below.

Table 2-3: Core Cutter Calibration Results

Details				Core Cutter Results			Nuclear Density Gauge Results		
Date	Sample ID	Lot No.	Lift No.	Wet Density (t/m³)	Dry Density (t/m³)	Moisture Content (%)	Wet Density (t/m³)	Dry Density (t/m³)	Moisture Content (%)
16/05/20	NB49199A	7	5	2.01	1.75	15.11	2.01	1.74	15.20
16/05/20	NB49216E	2	7	2.19	1.94	13.28	2.18	1.93	13.10
18/05/20	NB49393C	2	10	2.02	1.76	14.53	2.00	1.74	14.90
20/05/20	NB49371C	7	10	2.08	1.82	14.46	2.07	1.81	14.10
20/05/20	NB49375D	2	8	1.96	1.73	13.68	1.97	1.74	13.40
20/05/20	NB49380I	2	9	2.07	1.82	13.76	2.07	1.82	14.00
20/05/20	NB49380K	2	9	2.06	1.73	19.11	2.05	1.72	18.90
22/05/20	NB49416A	7	11	2.12	1.80	17.32	2.12	1.80	18.00
22/05/20	NB49424B	7	13	2.02	1.71	18.05	2.03	1.73	17.60
22/05/20	NB49428A	2	11	2.04	1.74	17.15	2.05	1.74	17.50
25/05/20	NB49463B	7	14	2.06	1.76	17.36	2.08	1.78	17.00
25/05/20	NB49471C	7	16	2.08	1.82	14.21	2.01	1.82	14.40
25/05/20	NB49475B	2	12	2.01	1.71	17.08	2.00	1.70	17.80
25/05/20	NB49552A	7	18	2.02	1.71	18.15	2.01	1.71	17.60
25/05/20	NB49556C	7	19	2.13	1.83	16.35	2.13	1.82	17.00
25/05/20	NB49560J	2	13	2.10	1.82	15.45	2.10	1.82	15.20
21/09/20	NB50709D	9	3	2.13	1.87	13.91	2.12	1.87	13.40
21/09/20	NB50722G	9	4	2.01	1.73	16.36	2.02	1.73	16.90
21/09/20	NB50739C	5	1	2.02	1.72	17.65	2.03	1.71	18.20
24/09/20	NB50777J	9	5	2.15	1.87	14.71	2.14	1.86	15.30
24/09/20	NB50790C	9	6	2.09	1.81	15.37	2.07	1.81	14.90
24/09/20	NB50807B	3	5	2.00	1.64	21.74	2.01	1.64	22.50
24/09/20	NB50815A	5	3	1.98	1.67	18.17	1.97	1.67	17.50
30/09/20	NB50851F	9	7	2.16	1.90	13.65	2.17	1.91	14.00
30/09/20	NB50864H	9	8	2.12	1.84	15.19	2.12	1.83	15.40
30/09/20	NB50881A	8	2	2.10	1.81	16.39	2.10	1.81	16.10
6/10/20	NB50915E	9	9	2.17	1.93	12.45	2.17	1.92	12.90
6/10/20	NB50924B	9	10	1.94	1.67	16.30	1.95	1.66	17.00

6/10/20	NB50945A	5	5	2.06	1.82	12.76	2.07	1.83	12.80
6/10/20	NB50949G	2	14	1.96	1.69	15.81	1.95	1.68	16.60
13/10/20	NB51028D	9	11	2.05	1.79	14.82	2.06	1.78	15.40
13/10/20	NB51050A	8	6	2.13	1.86	14.84	2.13	1.86	14.90
19/10/20	NB51130E	9	13	2.18	2.02	8.19	2.17	2.01	8.10
19/10/20	NB51139B	9	14	2.03	1.77	14.46	2.04	1.78	14.70
19/10/20	NB51148A	8	7	2.00	1.77	12.68	2.00	1.76	13.70
3/12/20	NB51511B	9	17	2.04	1.83	11.61	2.05	1.84	11.40
3/12/20	NB51511E	9	17	2.08	1.87	11.42	2.09	1.86	12
3/12/20	NB51517A	9	18	2.12	1.92	10.05	2.13	1.92	11.1
3/12/20	NB51517C	9	18	2.03	1.83	11.05	2.02	1.82	11.3
3/12/20	NB51526	8	8	2.02	1.75	15.66	2.03	1.76	15
8/12/20	NB51589D	9	19	2.09	1.87	11.69	2.08	1.86	11.9
8/12/20	NB51602H	9	20	2.06	1.79	14.91	2.06	1.78	15.5
9/12/20	NB51621B	9	21	2.02	1.81	11.53	2.02	1.81	12.1
9/12/20	NB51634F	8	9	1.99	1.75	13.35	1.98	1.76	12.5

2.2.6 Ferricrete

2.2.6.1 *Ferricrete Sheeting*

A minimum 200mm thick ferricrete sheeting layer was placed on the finished cut surfaces within the designated areas as per the Drawings. The 200mm thickness was measured parallel to the line of the slope. On completion of the placement of the sheeting, it was ripped along the contour line of the slope to slow run-off, increase infiltration and minimise the erosion runnels/gullying until vegetation can be established. This sheeting was observed and approved by the Superintendent through Hold Point release Form HP-008 which is enclosed in APPENDIX D.

2.2.6.2 *Ferricrete Sub-base*

The required 300mm of ferricrete sub-base was placed in three 100mm thick lifts. This was a variation from the Technical Specification which is further discussed in Section 3.2.4.

The ferricrete sub-base was placed and compacted to the required grades and levels, and in layers not more than 150mm and not less than 100mm. The sub-base was compacted to optimum moisture content for that material > 95% MMDD as per the requirements of the Technical Specification. Acceptance of the ferricrete sub-base placement was recorded on the ITP forms for each lift in each Lot and results are presented in APPENDIX D.

The top of ferricrete sub-base (installed thickness) levels were approved by the Superintendent through the Hold Point Release Form HP-007, which is enclosed in APPENDIX D. As-constructed drawings are available in APPENDIX C.

2.2.6.3 *Conformance Testing*

Approximately 45,110m^3 of ferricrete sub-base was ultimately placed during the Works. For quality control purposes, the Works were divided into 4 Lots for the placement of the ferricrete as per Diagram 2-2.

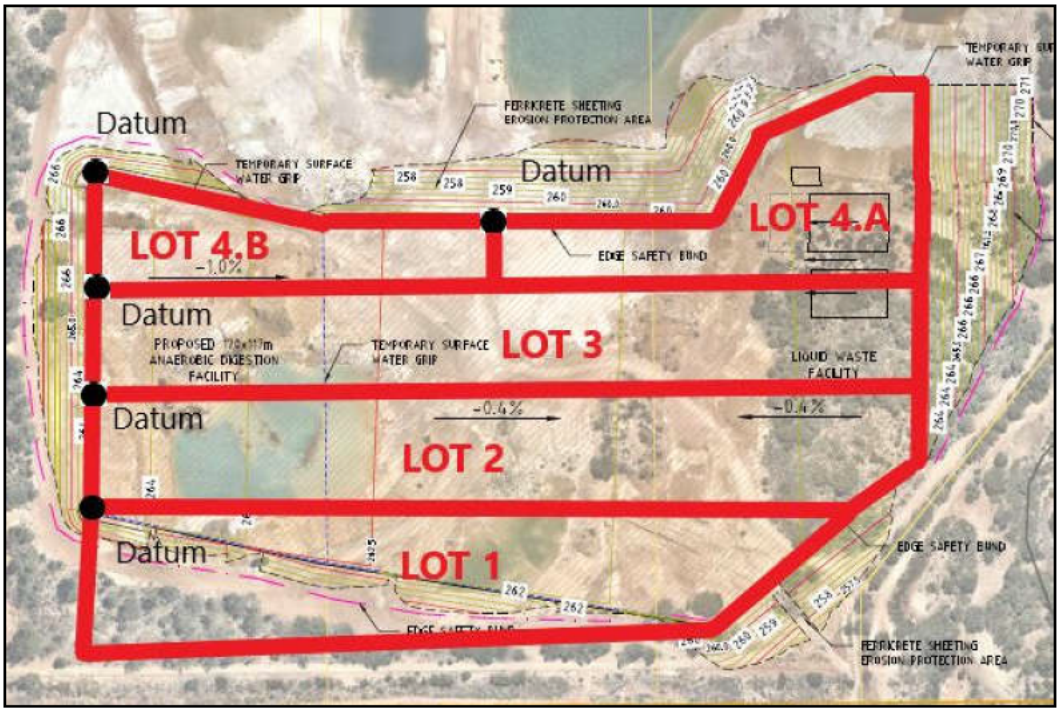

Diagram 2-2: Lot Map for Ferricrete Placement

The minimum testing frequencies for the ferricrete sub-base, as required by the Technical Specification are shown in Table 2-2, along with a summary of conforming and non-conforming results.

Table 2-4: Summary of Ferricrete Sub-base Conformance Testing

Test	Required Value	Number of Tests			
		Required	Undertaken	Conforming	Non-conforming
Dry Density Ratio (Compaction)	≥95%	40	40	40	0
OMC Moisture Variation	±2%	40	40	40	0
Linear Shrinkage	Not Stated	4	4	N/A	N/A
Atterberg Limits	Not Stated	4	4	N/A	N/A
MMDD Compaction	Not Stated	4	4	N/A	N/A
CBR at 96% MDD 100% OMC	Not Stated	4	4	N/A	N/A

The minimum frequency of all testing was met for the ferricrete sub-base. The results of the conformance testing are included in APPENDIX B.

The in-situ and laboratory test results show that the works method utilised for both conditioning and compaction of the ferricrete sub-base achieved the minimum dry density ratio / compaction level of 95%. The conformance testing for the ferricrete sub-base was approved by the Superintendent through Inspection Testing Plans provided in APPENDIX D.

2.3 Surface Water Management

The temporary surface water management grips were constructed around the perimeter of the finished surface levels of the ferricrete sub-base. They were constructed to a minimum 300mm in depth with 1:6 (V:H) slopes and were approved by the Superintendent through Hold Point Release Form HP-009, available in APPENDIX D.

3 Construction Issues, Mitigation and Design Variations

3.1 Technical Advice

Seven (7) Technical Queries were submitted during the Works, copies of which can be found in APPENDIX E in addition to being summarised in the following sub-sections.

3.1.1 Technical Query 1

Technical Query 1 was submitted on the 17th of April 2020 and related to confirming the compaction requirement and OMC requirement for the engineering fill material in the Specification. The response outlined the required elements from the Technical Specification, namely that engineered fill shall be compacted to a minimum 95% MMDD with moisture conditioned to ±2% OMC. The response also noted that this was the same requirement for the ferricrete sub-base layer.

3.1.2 Technical Query 2

Technical Query 2 was submitted on the 26th of May 2020 and related to the soft spots discovered during proof rolling, as described in Section 2.2.4. Raubex proposed in TQ2 to cut, fill and recompact the affected areas, requiring removal of approximately 2,400m^3 of soil. This request was accepted with comments by the Superintendent, who stipulated that the completion of this variation needed to be carried out in accordance with the Specification and be inspected by the Superintendent before any backfilling commenced.

3.1.3 Technical Query 3

Technical Query 3 was submitted on the 2nd of October 2020 and related to the provided design drawings did not adequately show the ferricrete extending up onto the batters. This request was accepted with comments by the Superintendent, who provided a digital drawing for the Contractor that showed the correct design.

3.1.4 Technical Query 4

Technical Query 4 was submitted on the 2nd of October 2020 and related to the format of the provided digital design as it contained mesh triangles that made interpretation difficult. The Superintendent provided an updated model with the format changes requested.

3.1.5 Technical Query 5

Technical Query 6 was submitted on the 5th of October 2020 and contained information regarding a low point in the design where surface water could accumulate. The Contractor suggested increasing the slope in the area to facilitate drainage. The Designer updated the design files accordingly for use by the Contractor.

3.1.6 Technical Query 6

Technical Query 7 was submitted on the 7th of October 2020 and regarded the provision of a design drawing that may have been superseded. The Designer explained that the original model provided at

the start of Works was the correct file until it was updated as part of the TQ#5. Any other files provided to Raubex other than these two occasions are out of date files and should not be used.

3.1.7 Technical Query 7

Technical Query 7 was submitted on the 8th of October 2020 and related to the identification of soft spots within areas of the cut of Lots 1, 4 and 5. The Contractor proposed to remove the material and replace it with new approved material to meet the specification, an action accepted by the Superintendent.

3.2 Variations to Contract

3.2.1 Removal of Dolerite Intrusions

The EMRC proposed a variation for the Contractor to remove Dolerite Intrusions uncovered during excavations on the 16th of October 2020.

3.2.2 Extension of Hardstand

On the 3rd of October 2020, the EMRC proposed a design change to extend the hardstand to the southern fence boundary on Lot 8 in line with the Ministerial Statement 976 – Resource Recovery Facility Red Hill.

3.2.3 Removal and Replacement of Unsuitable Materials

On the 1st of October 2020, the EMRC requested the removal of the unsuitable material identified in Technical Query 7, the detail of which can be found in Section 3.1.7.

3.2.4 Reduction in Thickness of Ferricrete Hardstand

On the 21st of October 2020, the EMRC proposed to reduce the thickness of the ferricrete sub-base layer from 500mm to 300mm. It was intended that the 300mm layer be installed in three, 100mm lifts, with the final 300mm layer being treated as a single lift for testing purposes.

3.2.5 Increased Testing for Ferricrete Sub-base

On the 21st of October 2020, the EMRC proposed that additional testing be carried out on the ferricrete sub-base, conducting one MMDD test for every NDM test. This would result in an additional 93 MMDD tests being undertaken.

3.3 Construction Issues

3.3.1 Failed OMC Conformance Tests

Two (No. 2) of the 464 samples taken to quantify the OMC moisture variation for the optimisation were found to be outside the ±2% allowable threshold. These two samples (NB51380 and NB51381) were 2.5% dry of OMC, but they still met the >95% MMDD requirement. The two areas where the samples were taken from were reworked and resampled for retesting. The two new samples were within the required -2% to +2% OMC.

4 Summary

Talis has provided design and technical advice during the Lots 8-9-10 preliminary earthworks at the Red Hill Waste Management Facility.

The construction works were monitored by the Superintendent from April 2020 to mid-June 2020, and from late August to completion in January 2021, during each stage of the Works. The monitoring activities mainly comprised of observing and recording the following during the construction stages; formation of subgrade, placement of ferricrete layer. In addition, the Superintendent assessed the results of independent laboratory conformance testing for materials incorporated in the design. Talis also conducted a separate review of the conformance testing following the completion of the Works.

The results of laboratory test results and observations by the Superintendent indicate that preliminary earthworks at the Red Hill Waste Management Facility were carried out in accordance with the Specification, with approved amendments monitored and recorded.

APPENDIX A
Material Characterisation

A.1: General and Structural Fill

A.2: Ferricrete Sub-base

APPENDIX B
Earthworks

B.1: General and Structural Fill Trial Pad

B.2: General and Structural Fill Hardstand

B.3: Ferricrete Sub-base

B.4: Core Cutter Verification Results

APPENDIX C
As-Built Drawings

APPENDIX D
Contractor MDR

D.1: Hold Point Release Forms

D.2: Contractor ITP's

APPENDIX E
Technical Queries, Non-Conformance and Variations

E.1: Technical Queries

E.2: Variation Requests

APPENDIX F
Construction Photographs

Assets | Engineering | Environment | Noise | Spatial | Waste

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