



Construction Quality Assurance Plan

Red Hill Waste Management Facility – GO Hardstand,
Leachate Pond & Road Network Construction



Prepared for Eastern Metropolitan Regional Council

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1 Introduction

The purpose of the Construction Quality Assurance Plan (CQA) Plan is to detail the testing methods and quality assurance procedures to construct a new Garden Organics (GO) Hardstand and corresponding leachate pond at Red Hill Waste Management Facility (the Works), including:

- Construction of a 6m wide access road and tie-in to the Site's existing internal network;
- Placement and compaction of additional Ferricrete base material to design levels at varying thicknesses (material supplied by Principal);
- General earthwork excavation to formation levels for the leachate pond;
- Supply & installation of the geosynthetic lining system for the leachate pond:
 - 2mm High Density Polyethylene (HDPE) Double Textured Geomembrane;
- Construction of a leachate management system comprising:
 - Open channel drains; and
 - Pipework.
- Construction of a surface water management system comprising:
 - Open channel drains;
 - Culverts; and
 - Grouted/mortared rock pitching outlet to existing surface water detention basin.
- Supply & installation of 1.8m high chain-link fence around the perimeter of the leachate pond with a 4m wide gate.

This plan shall be read in conjunction with the Technical Specification (the Specification) and the Drawings for the Works. Further detailed and specific construction procedures and requirements are outlined in the Specification and Drawings. This document does not replace the Specification or Drawings.

2 Definitions

For the purposes of the CQA Plan guidelines, the following terms are defined below:

'Construction Quality Assurance' (CQA) – A planned system of activities that provide assurance that materials or construction activities are undertaken and installed as specified in the design.

'Construction Quality Control' (CQC) - The process of measuring and controlling the characteristics of the item/product in order to meet the manufacturers or project specifications.

'The Principal' shall be as defined in the Conditions of Contract and for this Project will be the Eastern Metropolitan Regional Council.

'The Contractor' shall mean the future company contracted by the Principal to execute the Works and complete the project; and

'The Superintendent' shall be as defined in the Conditions of Contract and for this Project will be the Eastern Metropolitan Regional Council's appointed representative.

2.1 Material Definitions

'Subgrade': In-situ soils with suitable geophysical characteristics to form a firm and unyielding surface for engineering purposes.

'Engineered Attenuation Layer': Clay that when compacted has a coefficient of permeability of no greater than 1×10^{-8} m/sec for the GO Hardstand Extension & Leachate Pond.

'Ferricrete': Crushed laterite rock material commonly found in the underlying surface at Red Hill Waste Management Facility.

'Geomembrane': A geomembrane is very low permeability synthetic membrane liner or barrier used with any geotechnical engineering related material so as to control fluid (or gas) migration in a human-made project, structure, or system.

'Separation Geotextile': Any permeable textile woven or non-woven, used with foundation, soil, rock, earth, or any geotechnical engineering related material as an integral part of a human-made project, structure, or system.

'Minimum Average Roll Value' (MARV): The minimum average value of a particular physical property of a material, for 95 percent of all of the material in the lot.

'Overlap': Where two adjacent geosynthetic panels contact, the distance measuring perpendicular from the overlying edge of one panel to the underlying edge of the other.

3 Roles of Participants

The participants and/or parties that have been identified as key personnel in the delivery of this Project include, but are not necessarily limited to Principal and Superintendent; Design Engineer; CQA Consultant; Contractor; Resin Supplier; Geosynthetics Manufacturer; Geosynthetics Installer; and Soils Testing Laboratory. The roles and responsibilities of the participants and/or parties are detailed in the following sections.

3.1 Superintendent

During the construction, the Superintendent acting on behalf of the Principal will serve as a single point of contact for the Design Engineer, Contractor and CQA Consultant during construction.

3.2 Design Engineer

The design engineering services for the earthworks and landfill cell construction works may be provided by Talis. The Design Engineer reviews and approves any proposed changes in design during construction.

3.3 CQA Consultant

The CQA Consultant is an independent party not affiliated with the contractor, subcontractors, suppliers or manufacturers. The CQA Consultant may be the Design Engineer. The CQA Consultant has the overall responsibility for managing, coordinating and implementing the CQA activities and confirming that the Contractor's construction quality control activities are performed in accordance with the CQA Plan, construction drawings and technical specifications. Critical activities related to the construction, manufacture and installation of the earthwork, geosynthetics, civil improvements and other project components will be monitored and documented by the CQA Consultant. The CQA Consultant will be responsible for issuing a Final Certification Report containing CQA documentation sufficient to satisfy regulatory requirements and the requirements of this CQA Plan.

3.4 Contractor

The Contractor is responsible for the timely construction of the project, as delineated in the Drawings and Technical Specifications and in accordance with this CQA Plan. The Contractor is also responsible for the CQC. In particular, the Contractor shall ensure that:

- Only materials meeting the requirements set forth in the Technical Specifications and Drawings are used; and
- The materials are installed in full conformance with the Technical Specifications and Design Drawings.

3.5 Soil Testing Laboratory

In the performance of the CQA activities, the CQA Consultant may engage a Geotechnical Testing Laboratory, independent from the Contractor, subcontractors, or any material supplier or manufacturer. The testing laboratory will conduct tests on representative samples to evaluate their properties and compliance with the Technical Specifications.

3.6 Resin Supplier

The Resin Supplier produces and delivers the resin to the Geosynthetics Manufacturer. Qualifications of the Resin Supplier are specific to the manufacturer's requirements.

3.7 Geosynthetic Manufacturer

The Geosynthetic Manufacturer is responsible for the production of finished material from appropriate raw materials. The Geosynthetic Manufacturer reports to the Geosynthetics Installer.

3.8 Geosynthetic Installer

The Geosynthetics Installer is the Contractor or his subcontractor. The Geosynthetics Installer is responsible for field handling, storage, placement, seaming, loading or anchoring against wind uplift and other aspects of the geosynthetic material installation. The Geosynthetic Installer will be trained and qualified to install geosynthetic materials of the type specified for this Project.

3.9 Materials Testing Laboratory

In the performance of the CQA activities, the CQA Consultant may engage a Materials Testing Laboratory, independent from the Contractor, subcontractors, or any material supplier or manufacturer. The testing laboratory will conduct tests on representative samples to evaluate their properties and compliance with the Technical Specifications.

4 Description of Works

The works to be carried out under this Specification include, but are not limited to the following:

- Construction of a 6m wide access road and tie-in to the Site's existing internal network;
- Placement and compaction of additional Ferricrete base material to design levels at varying thicknesses (material supplied by Principal);
- General earthwork excavation to formation levels for the leachate pond;
- Supply & installation of the geosynthetic lining system for the leachate pond:
 - 2mm High Density Polyethylene (HDPE) Double Textured Geomembrane;
- Construction of a leachate management system comprising:
 - Open channel drains; and
 - Pipework.
- Construction of a surface water management system comprising:
 - Open channel drains;
 - Culverts; and
 - Grouted/mortared rock pitching outlet to existing surface water detention basin.
 - Supply & installation of 1.8m high chain-link fence around the perimeter of the leachate pond with a 4m wide gate.

5 Daily Reporting and Documentation

5.1 General

An effective CQA Plan recognises all construction activities that should be monitored and assigns responsibilities for the monitoring of each activity. This is most effectively accomplished and verified by the documentation of quality assurance activities. The CQA Consultant will document that all quality assurance requirements have been satisfied. The CQA Consultant will also maintain at the job site a complete file of Construction Drawings, Technical Specifications, CQA Plan, test procedures, daily logs and other pertinent documents.

5.2 Daily Record Keeping

Standard reporting procedures will include preparation of daily CQA documentation which, at a minimum, will consist of:

- Supervision of Level 2 sampling and testing performed by the geotechnical testing authority (GTA);
- Field notes, including memoranda of meetings and/or discussions with the Design Engineer or construction manager;
- CQA consulting logs and testing data sheets; and
- Construction problems and solution summary sheets.

This information will be reviewed by the CQA Consultant, signed and transmitted to the construction manager on a daily basis.

Monitoring logs and testing data sheets will be prepared daily. At a minimum, these logs and data sheets will include the following information:

- Date, project name, location and other identification;
- Data on weather conditions;
- A site plan showing work areas and locations selected for random CQA testing;
- Descriptions and locations of ongoing construction;
- Records or deliveries, condition, material roll numbers, descriptions and locations of materials stores;
- Equipment and personnel in each work area;
- Location where in-site CQA tests and samples were taken;
- A summary of test results;
- Calibration of test equipment;
- An identifying sheet number for cross referencing and document control;
- Decisions made regarding acceptance of units of work and/or corrective actions to be taken; and
- Signature of CQA Consultant representative.

5.3 Construction Issues

The Installer will be informed by the CQA Consultant about any significant recurring non-conformance with the Construction Drawings, Technical Specifications, or CQA Plan. The cause of the non-conformance will be determined and appropriate changes in procedures of Specifications may be

recommended. These changes will be submitted to the design engineer for approval. When changes are made, they will become part of the construction documents.

5.4 Photographic Records

Photographs will be taken by the CQA Consultant and documented in order to serve as a pictorial record of work progress, problems and mitigation activities. The basic file will contain colour prints and they will be identified with the date, time and location of the photograph.

5.5 Design and/or Specification Change

Design and/or specification changes may be required during construction. In such cases, the CQA Consultant will notify the Design Engineer and Construction Manager.

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6 CQA Validation Reporting

6.1 General Requirements

At the completion of the work, the CQA Consultant will submit to the Superintendent a signed final certification report. This report will document that:

- Work has been performed in compliance with the construction documents;
- Physical sampling and testing has been conducted at the appropriate frequencies specified in the CQA Plan; and
- The required CQA documentation has been completed.

As a minimum, this report will include:

- Geosynthetic manufacturers quality control documentation;
- A summary describing the CQA activities and indicating compliance with the Drawings and Technical Specifications;
- A summary of CQA testing, including failures, retest results, non-conformances and corrective measures;
- Geosynthetic panel layout drawings with test locations (where applicable);
 - Roll numbers deployed; and
 - Repairs.
- Records of sample and resample locations, the name of the individual conducting the tests, and the results of the tests;
- Daily inspection reports;
- Plant and labour;
- Records of site meetings;
- Progress photographs;
- Any other relevant information; and
- As built drawings (see below)

The as-built drawings must detail the following:

- Construction details including levels and slope angles for the following:
 - Finished surface level of hardstand;
 - Finished surface levels and formation of constructed access road including tie-in locations;
 - Invert level and top of leachate and stormwater swales;
 - Culvert pipe and headwall details;
 - Extent and levels of rock protection;
 - Subgrade levels for access road;
 - Finished surface levels of Leachate Pond including any inlets/ outlets; and
 - Surface water drains inlets, outlets, etc.
- Locations and identification marks of each geosynthetic panel including locations of penetrations and patch repairs.

The validation report must contain a statement by the CQA Consultant that the works have been carried out in accordance with the CQA Plan (and specifications attached to it) and that the validation report (including the drawings and appendices) represent a fair and accurate record of the works.

6.2 Works Approval Requirements

The CQA Validation Report must fulfill as requirements for the Critical Containment Infrastructure Report and Environmental Compliance Report as outlined in the relevant DWER Works Approval for the Works. An additional Time Limited Operations Compliance Report may be required at the discretion of the Principal. This report must fulfill the reporting requirements as outlined in the relevant DWER Works Approval. All available Works Approval Documentation will be provided by the Principal.

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