

**ABN: 51 612 825 313**

10 Dowsett Street

South Geelong, Vic, 3220

(P) +61 3 5282 1566



# **LEVEL 1 INSPECTION & TESTING CORIDALE ESTATE STAGE 3 LARA**

Prepared for Creo Consultants Pty Ltd

**Report Reference: GSSW979.1 AA**

**Date: 17 August 2020**

**ABN: 51 612 825 313**

10 Dowsett Street

South Geelong, Vic, 3220

(P) +61 3 5282 1566



## PROJECT DETAILS

Project Reference	GSSW979.1	Rev	AA
Project Title	Coridale Estate Stage 3		
Project Location	Lara	State	VIC
Date	17 August 2020		

## CLIENT DETAILS

Prepared For (Client)	Creo Consultants Pty Ltd
Client Address	Level 7/176 Wellington Parade, East Melbourne VIC 3002

## DISTRIBUTION

Original Held By	Ground Science South West Pty Ltd
One (1) Electronic Copy	Creo Consultants Pty Ltd

This document presents the results of the Level 1 Inspection and Testing performed by Ground Science South West for the aforementioned project, as the nominated project Geotechnical Inspection & Testing Authority (GITA). This report is detailed for the sole use of the intended recipient(s). Should you have any questions related to this report please do not hesitate to contact the undersigned.

### AUTHOR:

**Michael Knez**  
**Graduate Geotechnical Engineer**

# Table of Contents

---

- 1. INTRODUCTION ..... 1
- 2. PROJECT UNDERSTANDING ..... 1
- 3. SCOPE OF WORK ..... 1
  - 3.1 AREAS OF WORK..... 1
  - 3.2 PLACEMENT METHODOLOGY ..... 1
- 4. INSPECTION AND TESTING ..... 2
  - 4.1 SUBGRADE PREPARATION..... 2
  - 4.2 CONSTRUCTION MATERIALS ..... 2
  - 4.3 FILL CONSTRUCTION ..... 2
  - 4.4 RESULTS OF COMPACTION CONTROL TESTING..... 3
  - 4.5 FINAL SURFACE LEVELS ..... 3
- 5. COMPLIANCE ..... 3
- 6. UNDERSTANDING LEVEL 1 INSPECTION & TESTING ..... 4
- 7. LIMITATIONS..... 5
- 8. REFERENCES ..... 6

**FIGURES**

FIGURE 1      CORIDALE – STAGE 3 LAYOUT PLAN [NO.180014.3 R200 REV 0]

**APPENDICES**

- APPENDIX A      PROJECT SUMMARY REPORT
- APPENDIX B      FIELD DENSITY TEST REPORT SHEETS & TEST LOCATIONS
- APPENDIX C      SITE PHOTOGRAPHS

## 1. INTRODUCTION

This report presents the results of the inspection activities, compaction control and laboratory testing services performed by Ground Science South West Pty Ltd for the Coridale Estate Stage 3 project, located within the Lara, Victoria (the site).

## 2. PROJECT UNDERSTANDING

It is understood that the project involves the construction of a fill platform to the proposed residential lots of the Coridale Estate Stage 3. Ground Science South West was engaged to provide Level 1 Inspection and Testing services for the construction of these areas of the Coridale Estate Stage 3 project. Authorisation to proceed was provided by Creo Consultants Pty Ltd (the 'Client'). Creo Consultants prepared the civil drawings for the project.

Level 1 Inspection & Testing, as defined in AS3798 (2007) 'Guidelines on Earthworks for Commercial and Residential Developments' provides for full time inspection of the construction of controlled fill and compaction testing in accordance with AS1289 'Methods of Testing Soils for Engineering Purposes' and AS1726 (2017) 'Geotechnical Site Investigations'. Ground Science South West performed the role of the project Geotechnical Inspection & Testing Authority (GITA) with all Level 1 Inspection and Testing services described in this report undertaken by an experienced GITA site representative.

## 3. SCOPE OF WORK

### 3.1 AREAS OF WORK

Ground Science South West provided Level 1 Inspection and Testing services for the construction of residential lots between and adjacent to Brisbane Street and Lubec Street inside of Coridale Estate Stage 3. The areas requiring Level 1 Inspection & Testing are shown on the supplied construction drawing, on Figure 1, prepared by Creo Consultants (Coridale – Stage 3 Layout Plan [No.180014.3 R200 Rev 0]).

This report details the Level 1 earthworks process performed on site which commenced on 4<sup>th</sup> of August, 2020 and was completed on 15<sup>th</sup> of August, 2020.

### 3.2 PLACEMENT METHODOLOGY

A technical specification for the backfill operations was not provided. The placement of controlled fill on the above-mentioned areas was carried out in accordance with Level 1 fill procedures as detailed in AS3798 (2007) 'Guidelines on Earthworks for Commercial and Residential Developments'. The following fill placement guideline was adopted for the works:

- All existing loose surficial fill, topsoil, soft material, vegetation and materials containing significant organic matter were removed to expose the natural soil subgrade;
- Suitable fill material, sourced by the contractor and approved by Ground Science South West, was placed in loose horizontal layers not exceeding 250mm in thickness;
- The controlled fill material was compacted to achieve a target Dry Density Ratio of at least 95% Standard Compaction (AS 1289: 5.1.1, 5.4.1 or 5.7.1), based on our understanding that future building loads would be similar to residential type structures (i.e. non-commercial structural loading);
- The fill was moisture conditioned to within 90% – 110% of the standard optimum moisture content;
- The fill material was sorted and mixed to eliminate particles greater than 20% by volume, particles coarser than 37.5mm and no particle over 200mm in any dimension;
- The frequency of field density testing adopted for the project was in line with the requirements for large scale developments (Type 1), as detailed in AS3798 (2007), which nominates a frequency of not less than:



- 1 test per layer or 200mm per 2500m<sup>2</sup>;
- 1 test per 500m<sup>3</sup> distributed reasonably evenly throughout the full depth and area; or
- 3 tests per site visit; whichever requires the most tests.

#### **4. INSPECTION AND TESTING**

##### **4.1 SUBGRADE PREPARATION**

It is understood that the on-site contractor, Winslow Constructors, removed all organics, topsoil and compressible (soft) soils between the 28<sup>th</sup> of July and the 1<sup>st</sup> of August, 2020. Inspection of the prepared subgrade surface was carried throughout the project by the representative geotechnician from Ground Science South West prior to the placement of fill material.

The above stripped subgrade was visually assessed using tactile methods described in AS1726 (2017) and approved by the GITA representative throughout the project. The prepared subgrade was observed to be naturally occurring residual 'Newer Volcanic' deposits comprising of CLAY, with gravel, brown, medium to high plasticity, gravel fine to medium. A proof roll was conducted on the prepared subgrade with the use of a fully loaded 40 tonne water truck which indicated no deflection and/or rutting. At the time of the inspection, the prepared subgrade was observed to be generally suitable for subsequent works to proceed.

##### **4.2 CONSTRUCTION MATERIALS**

The fill material used in this project was nominated by Winslow Constructors, the on-site contractor. It is understood that all the fill materials used for the project was sourced onsite from a nearby hill cutting. The material was carted to site in dump trucks and stockpiled adjacent to the fill zones. Ground Science South West performed an assessment of the fill source to identify the following material characteristics:

- Material suitability as an engineering property;
- Cohesiveness;
- Free of building debris and vegetative matter;
- Free of oversize rock particles.

Visual assessments on the above-mentioned properties were conducted on-site and the fill material used was considered acceptable for use on this project. The nominated fill products were visually assessed to comprise of CLAY, with gravel, brown, medium to high plasticity, gravel fine to medium grained. Ground Science South West did not perform any chemical or environmental tests on the stockpiled fill material.

The fill source was assessed to range from dry to close of the optimum moisture content. Portions of the fill material that were found to be dry were moisture conditioned using a water cart prior to compaction, no portions of the fill material were found to be wet of the optimum moisture content. All fill materials were generally considered suitable for use as engineered fill.

##### **4.3 FILL CONSTRUCTION**

The contractor had the following plant available on site during the construction period for use in the fill placement;

- Scraper
- Grader
- Moxy
- Water Cart;
- Padfoot Compactor;

During fill placement, the weather conditions were fine, overcast and rainy with temperatures typically ranging from 5 to 20 degrees Celsius. Minor showers were observed on the 14<sup>th</sup> of August with no saturation noted to occur within fill or subgrade soils.

The filling process was generally consistent throughout the project and involved the approved fill stockpiled adjacent to the fill placement zones. The material was spread using scraper or grader into thin loose layers. Moisture conditioning of the fill soils was performed with the use of an on-site water cart to achieve a moisture condition close to OMC to assist with compaction of fill materials. Each layer was compacted using a padfoot roller applying a minimum of 6-8 passes, per layer observed. The thin layers of fill were compacted to form a composite layer, measuring 200mm thick, prior to undertaking the field density testing. This process was adopted for the fill placement works.

The depth of fill comprised of up to 2 layers of fill placed and compacted within the deepest sections of the site. Throughout the filling process and/or at the completion of the day's production, compaction testing was performed to assess the achieved density ratio of each layer. Figure 1 provide a guide to the fill placement and is limited to the areas described in this report. It is considered that a 100mm to 150mm thick layer of topsoil would be spread at the completion of all works, which does not form part of the Level 1 process. Any fill placed as part of newly constructed drainage, sewer works or similar does not form part of this Level 1 report.

#### **4.4 RESULTS OF COMPACTION CONTROL TESTING**

Level 1 Inspection and Testing was undertaken by experienced technicians from Ground Science South West who attended the site for the duration of the construction phase and nominated the location of the in-situ density tests. Testing comprised a total of 30 in-situ density tests using a nuclear moisture-density gauge in accordance with Australian Standard (AS1289 5.8.1) together with 30 "Rapid HILF" Compaction tests (AS1289 5.7.1).

A summary of the field density tests performed for the project, including failed tests and re-tests, is presented in Appendix A. Field density and compaction control testing report sheets are presented in Appendix B. It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. No test areas failed to meet the required target density ratio or failed to meet the required moisture content.

#### **4.5 FINAL SURFACE LEVELS**

Observations were made by a Ground Science South West staff member that filling had been complete up to the nominated finished levels designated on Figure 1 as per confirmation provided from the contractor's site foreman. We understand that the observed final levels are the constructed finished surface levels of the controlled fill. The overall fill depths and volumes are estimated using onsite visual tactile methods and may not be a true representation of fill depths given that conditions on site may change over time. True fill depths should be obtained from the contractor's survey data.

### **5. COMPLIANCE**

Ground Science South West Staff have undertaken Level 1 Inspection and Testing services of the construction of the controlled fill in the areas designated on Figure 1. Ground Science South West field staff have also observed that the prepared subgrade provided an adequate base for the subsequent placement of controlled fill.

Based on observations made by Ground Science South West staff and the results of density tests, we consider that the controlled fill placed has been constructed in accordance with the guidelines provided by the technical specification provided in AS3798 (2007).

It should be noted that the final fill layers may be subjected to adverse weather conditions resulting in either surface softening or drying and cracking over time; regardless of the compactive efforts and moisture conditioning applied during the works. The integrity of the top 200mm to 300mm of the fill will deteriorate with time and should be taken

into account by the foundation engineer prior to the construction of dwellings or buildings. The levels nominated in this report are a guide to amounts of fill placed and do not necessarily reflect an accurate survey of the fill levels.

## 6. UNDERSTANDING LEVEL 1 INSPECTION & TESTING

The purpose of performing Level 1 Inspection and Testing is to ensure compliance of the fill with the specification. The engagement of a Geotechnical Inspection Testing Authority (GITA) allows the contractor to perform their role in the construction of the filling operation while the GITA monitors the quality control process of the fill placement. The visual observations of thorough processes and work practices by the contractor allows the GITA to approve the subsequent placement of fill without having to wait for the completion of testing and the extended time it takes to get a test result back. The GITA will however, carry out random spot checks of the filling operations throughout the day's production as confirmation that the placement procedures and the fill moisture content is appropriate. At the end of a day's production the GITA will sign off the completed works as satisfactory. Any failed tests will result in that particular area of operation requiring rectification in the following mornings activities. This may be as simple as extra rolling with compaction plant if moisture conditioning is suitable. Sometimes these areas may be retested if the GITA feels it is necessary.

While AS3798 (2007) is a guideline on the minimum requirements of filling on commercial and residential developments, some projects require a more detailed project specification to deal with site specific issues. While moisture conditioning of fill sources aids in the ease with which compaction is achieved, it is not necessarily a physical characteristic that determines if the placed fill is acceptable. In some situations, the moisture requirement is an extremely important function of the final constructed product. In these situations, a specific project specification should apply to the project as detailed by the designing geotechnical engineer. These are typical of clay liners for wetlands, dams, landfill liners and caps and an array of other engineering situations. Creating a consolidated platform of which is similar to equivalent surrounding natural conditions is the primary aim of level one processes, preventing the occurrence of differential ground movements to footing structures.

Level 1 Inspection & Testing requires full time inspection and testing of the fill placement undertaken on a site. Ground Science South West (project GITA), are notified daily (or at the completion of each day's work) by the project foreman where subsequent days of fill placement under Level 1 is to occur. On projects that rely upon the importation of a fill source, there can be delays in the receipt of sufficient materials to warrant fill placement works which may result in periods of time where a GITA representative is not required on site. It is the contractor's responsibility to notify the GITA when works proceed and their attendance on site is required again. A GITA relies upon the integrity of the contractor to advise when site attendance is required and makes all reasonable visual attempts to assess if the works are the same as the previous days attendance.

**For & on behalf of**  
**Ground Science South West Pty Ltd**



**Michael Knez**  
**Graduate Geotechnical Engineer**

## 7. LIMITATIONS

This type of investigation (as per our commission) is not designed or capable of locating all soil conditions, (which can vary even over short distances). The advice given in this report is based on the assumption that the test results are representative of the overall soil conditions. However, it should be noted that actual conditions in some parts of the Site might differ from those found. If further sampling reveals soil conditions significantly different from those shown in our findings, Ground Science South West must be consulted. Maintenance and upkeep of finished fill placement must be regularly monitored as exposure to extended weather periods/other elements may cause surface drying which may lead to cracking. Conversely, excessive exposure to moisture may cause heaving/softening in the soils.

It is recognised that the passage of time affects the information and assessment provided in this document. Ground Science South West's assessment is based on information that existed at the time of the preparation of this document. It is understood that the services provided allowed Ground Science South West to form no more than an opinion of the actual site conditions observed during sampling and observations of the site visit and cannot be used to assess the effects of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.

The scope and the period of Ground Science South West services are described in the proposal and are subject to restrictions and limitations. Ground Science South West did not perform a complete assessment of all possible conditions or circumstances that may exist at the Site. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Ground Science South West in regards to it.

Where data has been supplied by the client or a third party, it is assumed that the information is correct unless otherwise stated. No responsibility is accepted by Ground Science South West for incomplete or inaccurate data supplied by others.

Any drawings or figures presented in this report should be considered only as pictorial evidence of our work. Therefore, unless otherwise stated, any dimensions should not be used for accurate calculations or dimensioning.

This document is COPYRIGHT- all rights reserved. No part of this document may be reproduced or copied in any form or by means without written permission by Ground Science South West Pty Ltd. All other property in this submission shall not pass until all fees for preparation have been settled. This submission is for the use only of the party to whom it is addressed and for no other purpose. No responsibility is accepted to any third party who may use or rely on the whole or any part of the content of this submission. No responsibility will be taken for this report if it is altered in any way, or not reproduced in full. This document remains the property of Ground Science South West Pty Ltd until all fees and monies have been paid in full.

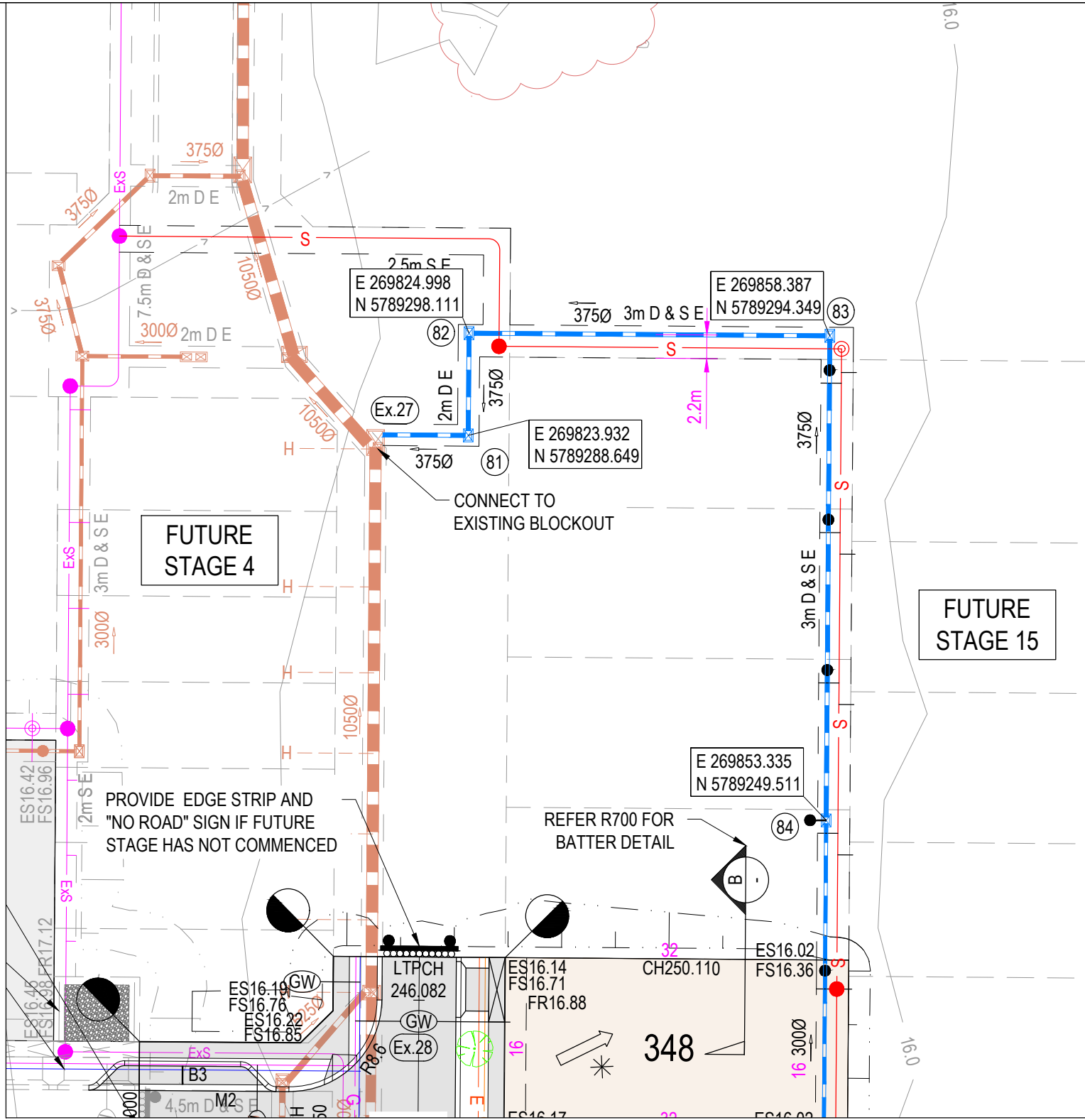
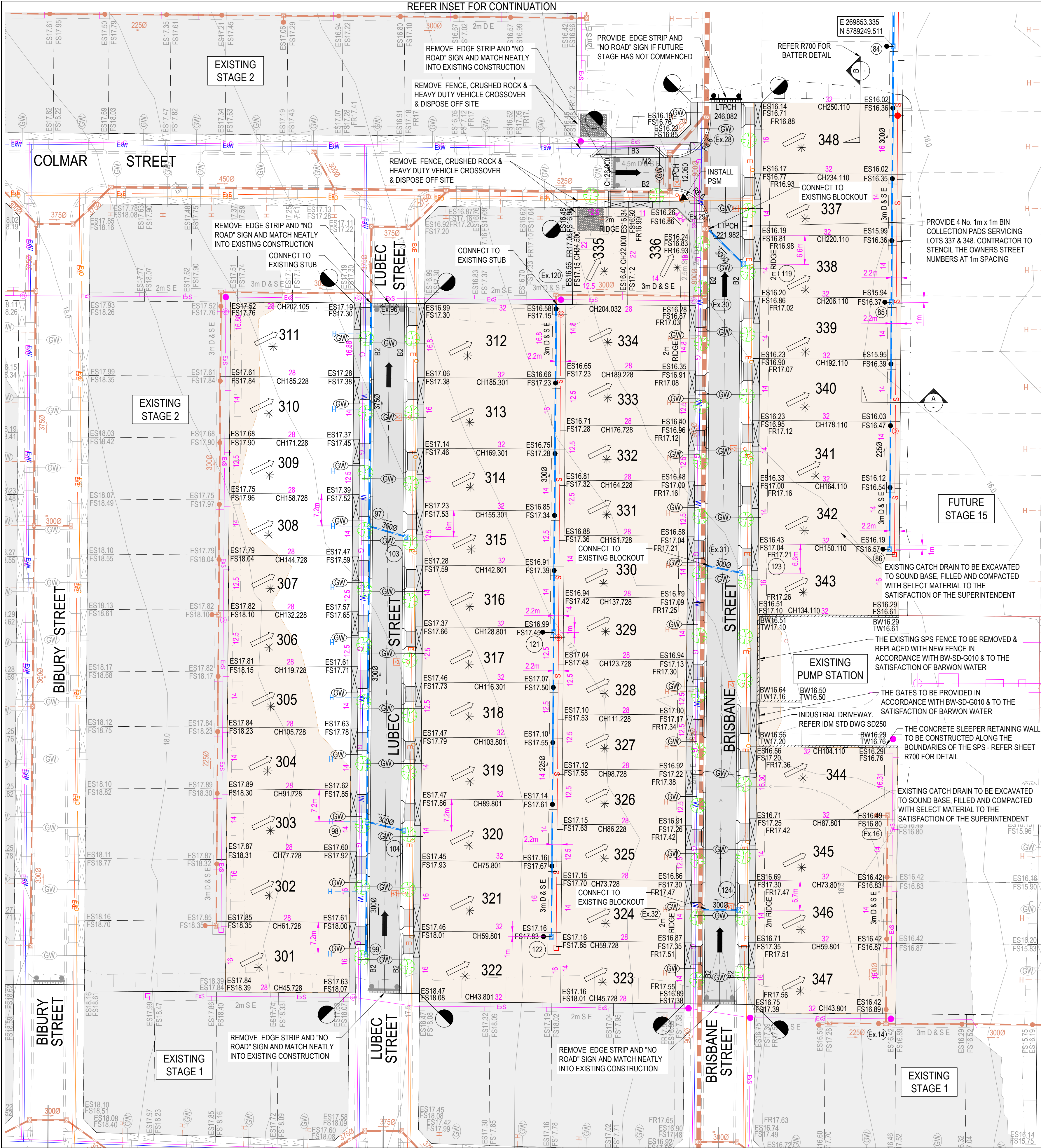
## 8. REFERENCES

- AS3798 (2007) Guidelines on Earthworks for Residential and Commercial Developments.
- AS1289 Methods of Testing Soils for Engineering Purposes.
- AS1726 (2017): Geotechnical Site Investigations

**FIGURE 1**

Coridale – Stage 3 Layout Plan [No.180014.3 R200 Rev 0]





- NOTES:**
1. ALL VEHICLE AND PRAM CROSSING LAYBACKS, TO BE MINIMUM OF 1.0m FROM PITS.
  2. ALL PRAM CROSSINGS TO BE A MINIMUM 2.0m FROM VEHICLE CROSSINGS.
  3. ALL PRAM CROSSINGS TO BE DDA COMPLIANT.
  4. VEHICLE EXCLUSION MEASURES BETWEEN ROAD RESERVE AND RESERVE TO FORM PART OF LANDSCAPE WORKS.
  5. THE USE OF DIRECTIONAL AND HAZARD TACTILE PAVERS MUST ACCORD WITH SECTION 2.2.3.1 OF AS/NZS 1428.4:2002.
  6. SEWER MAINTENANCE HOLE CONVERTER SLAB OR CONE, TO BE ROTATED TO ENSURE COVER POSITION IS CENTRALLY LOCATED WITHIN FOOTPATH.
  7. CHAINAGES FOR SETOUT OF PROPERTY INLET POINTS, SERVING FUTURE LOTS, ARE MEASURED FROM THE DOWNSTREAM PIT.
  8. CONTRACTOR TO LOCATE ALL EXISTING ASSETS PRIOR TO COMMENCEMENT OF WORKS. ANY DAMAGE TO EXISTING ASSETS TO BE RECTIFIED AT CONTRACTORS EXPENSE.
  9. CONTRACTOR TO VERIFY DEPTH OF EXISTING SERVICES, PRIOR TO COMMENCEMENT OF CONSTRUCTION.

- LEGEND**
- INDICATIVE TREE PLANTING LOCATION.
  - STREET TREE DESIGN TO LANDSCAPE DESIGN.
  - INDICATIVE PUBLIC LIGHTING LOCATION.
  - PUBLIC LIGHTING DESIGN SUBJECT TO ELECTRICAL DESIGN.

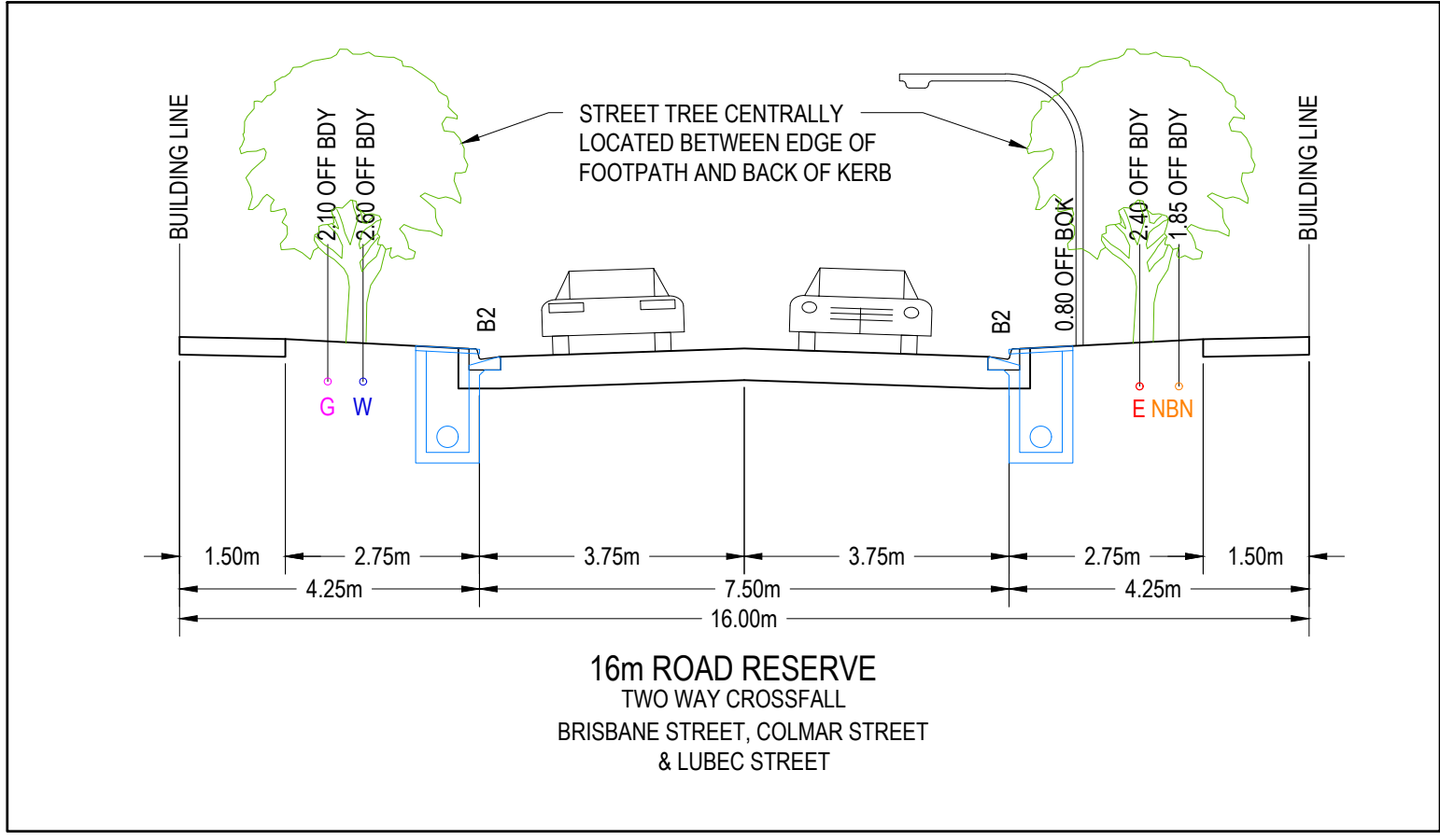
**WARNING**

**BEWARE OF UNDERGROUND & OVERHEAD SERVICES**

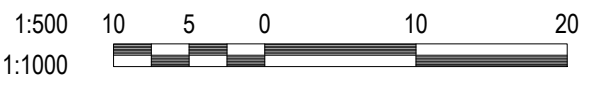
The locations of underground & overhead services are approximate only & their exact position should be proven on site. No guarantee is given that all existing services are shown. Locate all underground services before commencement of works

**DIAL 1100 BEFORE YOU DIG**

[www.1100.com.au](http://www.1100.com.au)



ROAD NAME	SERVICES OFFSET SCHEDULE									
	GAS		RECYCLED WATER		WATER		OPTIC FIBRE		ELECTRICITY	
	SIDE	OFFSET (m)	SIDE	OFFSET (m)	SIDE	OFFSET (m)	SIDE	OFFSET (m)	SIDE	OFFSET (m)
LUBEC STREET	WEST	2.10	-	-	WEST	2.60	EAST	1.85	EAST	2.40
BRISBANE STREET	WEST	2.10	-	-	WEST	2.60	EAST	1.85	EAST	2.40
COLMAR STREET	NORTH	2.10	-	-	NORTH	2.60	SOUTH	1.85	SOUTH	2.40



REVISION	DATE	ISSUE DESCRIPTION	DRAWN	CHECKED	APPROVED
0	01/05/20	ISSUED FOR CONSTRUCTION	K.MCKELVIE	M.TROUNCE	T.PALIOS
C	07/04/20	COUNCIL COMMENTS DATED 06/04/20	K.MCKELVIE	M.TROUNCE	T.PALIOS
B	31/03/20	ISSUED FOR TENDER	K.MCKELVIE	M.TROUNCE	T.PALIOS
A	28.01.20	ISSUED FOR APPROVAL	K.MCKELVIE	M.TROUNCE	T.PALIOS



**CORIDALE - STAGE 3 LAYOUT PLAN**

**ISSUED FOR CONSTRUCTION**

SCALE AT A1	DRAWN	DESIGNED
1:500 @ A1	K.MCKELVIE	K.MCKELVIE
PROJECT ENGINEER	PROJECT MANAGER	DATE FIRST ISSUE
M.TROUNCE	T.PALIOS	JANUARY 2020
PROJECT No.	DRAWING No.	REVISION
180014.3	R200	0



## **APPENDIX A**

### Project Summary Report



# Project Summary Report



**Ground Science South West**

Geotechnical & Environmental Consultants

**Report Date:** 17/08/2020  
**Client:** CREO CONSULTANTS PTY LTD  
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002  
**Project Number:** GSSW979  
**Project Name:** CORIDALE ESTATE STAGE 3  
**Project Location:** LARA  
**Specification:** 95% Standard Compaction & +/- 2% Moisture Variation as per AS 3798-2007

Ground Science South West Pty Ltd  
 10 Dowsett Street South Geelong Vic 3220  
 Phone: (03) 5282 1566  
 Email: chrism@groundscience.com.au

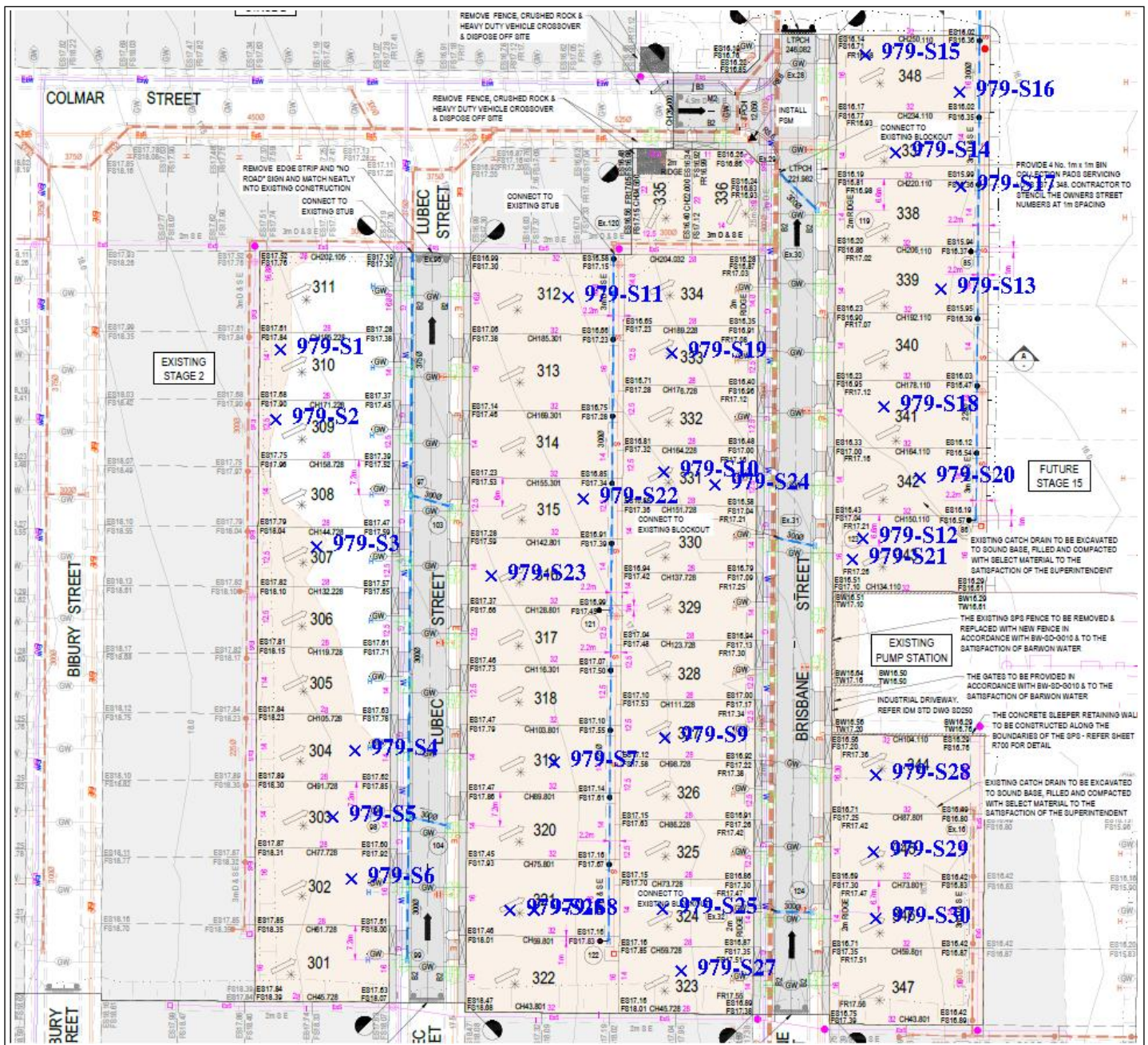
Lot #	Sample #	Date Sampled	Location	Easting	Northing	Layer	Relative Compaction (%)	Moisture Variation (%)	Moisture Content (%)	Field Wet Density (t/m3)
Lots 306 - 311	979-S1	04/08/2020	Lots 301- 311 Lot 310	55H 0269718	5789172	1	98.5	2.0	19.9	1.89
Lots 306 - 311	979-S2	04/08/2020	Lots 301- 311 Lot 309	55H 0269713	5789163	1	99.0	1.5	21.0	1.91
Lots 306 - 311	979-S3	04/08/2020	Lots 301- 311 Lot 307	55H 0269700	5789143	1	102.0	1.0	21.7	1.95
Lots 301 - 305	979-S4	05/08/2020	Lots 301 - 305 Lot 304	55H 0269705	5789104	1	105.5	0.0	24.0	2.07
Lots 301 - 305	979-S5	05/08/2020	Lots 301 - 305 Lot 303	55H 0269702	5789089	1	105.0	-0.5	22.5	2.15
Lots 301 - 305	979-S6	05/08/2020	Lots 301 - 305 Lot 302	55H 0269700	5789073	1	102.5	-1.0	24.5	1.98
Lots 319 - 347	979-S7	06/08/2020	Lot 321	55H 0269743	5789077	1	98.5	-1.0	25.1	1.95
Lots 319 - 347	979-S8	06/08/2020	Lot 319	55H 0269746	5789102	1	102.0	0.0	17.9	2.06
Lots 319 - 347	979-S9	06/08/2020	Lot 327	55H 0269775	5789097	1	98.5	1.0	19.7	1.93
Lots 312 - 343	979-S10	07/08/2020	Lot 331	55H 0269797	5789152	1	103.5	0.5	22.1	2.08
Lots 312 - 343	979-S11	07/08/2020	Lot 312	55H 0269750	5789188	1	104.0	2.0	21.6	2.06
Lots 312 - 343	979-S12	07/08/2020	Lot 343	55H 0269841	5789132	1	100.5	2.0	21.0	1.99
Lots 337 - 348	979-S13	10/08/2020	Lot 339	55H 0269823	5789195	1	95.0	-2.0	25.2	1.91
Lots 337 - 348	979-S14	10/08/2020	Lot 337	55H 0269823	5789211	1	95.5	-2.0	25.1	1.91
Lots 337 - 348	979-S15	10/08/2020	Lot 348	55H0269824	5789232	1	102.5	-2.0	24.9	2.03
Lots 338 - 348	979-S16	11/08/2020	Lot 348	55H 0269832	5789228	2	105.5	2.0	17.9	2.09
Lots 338 - 348	979-S17	11/08/2020	Lot 338	55H 0269839	5789206	2	105.5	1.5	19.0	2.08
Lots 338 - 348	979-S18	11/08/2020	Lot 341	55H 0269826	5789170	2	103.5	2.0	18.0	2.05
Lots 333 - 343	979-S19	12/08/2020	Lot 333	55H 0269792	5789190	2	103.0	1.0	19.0	2.06
Lots 333 - 343	979-S20	12/08/2020	Lot 342	55H 0269818	5789144	2	104.0	0.0	21.8	2.12
Lots 333 - 343	979-S21	12/08/2020	Lot 343	55H 0269814	5789127	2	104.0	2.0	20.8	2.06
Lots 315 - 331	979-S22	13/08/2020	Lot 315	55H 0269759	5789168	2	105.5	2.0	22.2	2.05
Lots 315 - 331	979-S23	13/08/2020	Lot 316	55H 0269757	5789156	2	102.0	1.0	21.5	2.04
Lots 315 - 331	979-S24	13/08/2020	Lot 331	55H 0269776	5789160	2	102.5	0.5	20.5	2.07
Lots 321 - 324	979-S25	14/08/2020	Lot 324	55H 0269765	5789064	2	97.5	0.0	23.1	1.91
Lots 321 - 324	979-S26	14/08/2020	Lot 321	55H 0269753	5789066	2	101.5	-1.0	23.1	1.96
Lots 321 - 324	979-S27	14/08/2020	Lot 323	55H 0269777	5789058	2	100.5	1.5	24.2	1.92
Lots 344 - 346	979-S28	15/08/2020	Lot 344	55H 0269016	5789088	1	101.0	1.5	20.3	2.04
Lots 344 - 346	979-S29	15/08/2020	Lot 345	55H 0269825	5789069	1	101.0	2.0	20.7	1.98
Lots 344 - 346	979-S30	15/08/2020	Lot 346	55H 0269817	5789052	1	102.5	2.0	21.0	2.02

# Sample Locations Plan



**Ground Science South West**

Geotechnical & Environmental Consultants



## **APPENDIX B**

Field Density Test Report Sheets & Test Locations

# Material Test Report



**Ground Science South West**

Geotechnical & Environmental Consultants

**Report Number:** GSSW979-1  
**Issue Number:** 1  
**Date Issued:** 06/08/2020  
**Client:** CREO CONSULTANTS PTY LTD  
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002  
**Project Number:** GSSW979  
**Project Name:** CORIDALE ESTATE STAGE 3  
**Project Location:** LARA  
**Contractor:** WINSLOW CONSTRUCTION  
**Work Request:** 7510  
**Date Sampled:** 04/08/2020 10:00  
**Dates Tested:** 04/08/2020 - 05/08/2020  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% Standard Compaction & +/- 2% Moisture Variation as per AS 3798-2007  
**Lot Number:** Lots 306 - 311  
**Material:** CLAY, with gravel, brown, medium to high plasticity.  
**Material Source:** Onsite Stockpile

Ground Science South West Pty Ltd  
 10 Dowsett Street South Geelong Vic 3220  
 Phone: (03) 5282 1566  
 Email: tomas@groundscience.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tomas Wheadon  
 Field & Laboratory Technician  
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	979-S1	979-S2	979-S3
Date Tested	04/08/2020	04/08/2020	04/08/2020
Time Tested	11:41	12:57	13:11
Test Request #/Location	Lots 301- 311 Lot 310	Lots 301- 311 Lot 309	Lots 301- 311 Lot 307
Easting	55H 0269718	55H 0269713	55H 0269700
Northing	5789172	5789163	5789143
Layer / Reduced Level	1	1	1
Thickness of Layer (mm)	200	200	200
Soil Description	CLAY, with gravel, brown, medium to high plasticity.	CLAY, with gravel, brown, medium to high plasticity.	CLAY, with gravel, brown, medium to high plasticity.
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	1	3	2
Field Wet Density (FWD) t/m <sup>3</sup>	1.89	1.91	1.95
Field Moisture Content %	19.9	21.0	21.7
Field Dry Density (FDD) t/m <sup>3</sup>	1.58	1.58	1.60
Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	1.92	1.93	1.91
Moisture Variation (Wv) %	**	**	**
Adjusted Moisture Variation %	2.0	1.5	1.0
Hilf Density Ratio (%)	98.5	99.0	102.0
Compaction Method	Standard	Standard	Standard

## Moisture Variation Note:

Positive values = test is dry of OMC  
 Negative values = test is wet of OMC

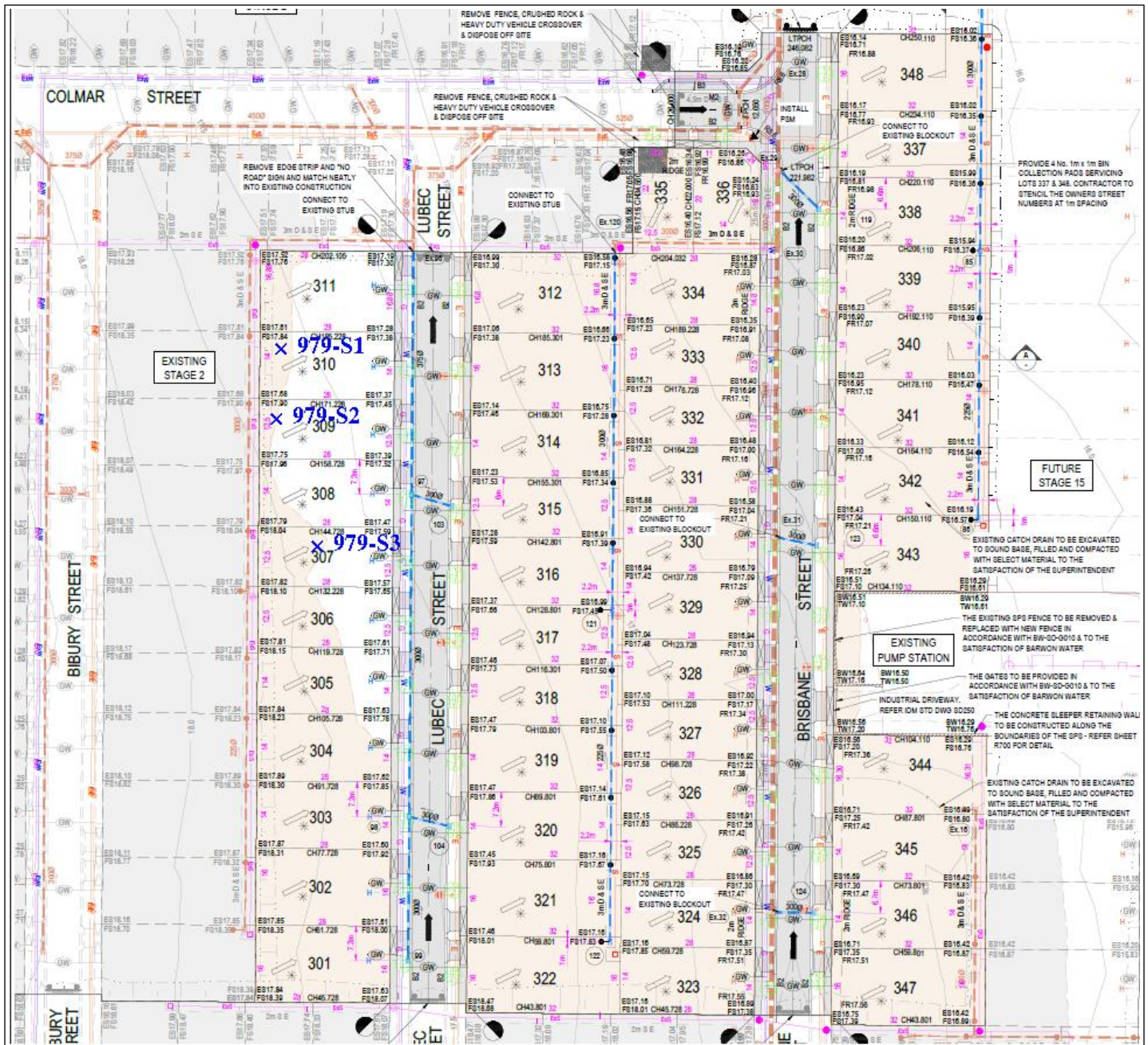


# Sample Locations Plan



**Ground Science South West**

Geotechnical & Environmental Consultants



# Material Test Report

**Report Number:** GSSW979-2  
**Issue Number:** 1  
**Date Issued:** 06/08/2020  
**Client:** CREO CONSULTANTS PTY LTD  
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002  
**Project Number:** GSSW979  
**Project Name:** CORIDALE ESTATE STAGE 3  
**Project Location:** LARA  
**Contractor:** WINSLOW CONSTRUCTION  
**Work Request:** 7516  
**Date Sampled:** 05/08/2020  
**Dates Tested:** 05/08/2020 - 06/08/2020  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% Standard Compaction & +/- 2% Moisture Variation as per AS 3798-2007  
**Lot Number:** Lots 301 - 305  
**Material:** CLAY, with gravel, brown, medium to high plasticity.  
**Material Source:** Onsite Stockpile



**Ground Science South West**

Geotechnical & Environmental Consultants

Ground Science South West Pty Ltd  
10 Dowsett Street South Geelong Vic 3220

Phone: (03) 5282 1566

Email: tomas@groundscience.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

*Tomas Wheadon*

Approved Signatory: Tomas Wheadon

Field & Laboratory Technician

NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	979-S4	979-S5	979-S6
Date Tested	05/08/2020	05/08/2020	05/08/2020
Time Tested	14:11	14:23	14:30
Test Request #/Location	Lots 301 - 305 Lot 304	Lots 301 - 305 Lot 303	Lots 301 - 305 Lot 302
Easting	55H 0269705	55H 0269702	55H 0269700
Northing	5789104	5789089	5789073
Layer / Reduced Level	1	1	1
Thickness of Layer (mm)	200	200	200
Soil Description	CLAY, with gravel, brown, medium to high plasticity.	CLAY, with gravel, brown, medium to high plasticity.	CLAY, with gravel, brown, medium to high plasticity.
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	3	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	2.07	2.15	1.98
Field Moisture Content %	24.0	22.5	24.5
Field Dry Density (FDD) t/m <sup>3</sup>	1.67	1.76	1.59
Peak Converted Wet Density t/m <sup>3</sup>	**	2.05	1.93
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	1.96	**	**
Moisture Variation (Wv) %	**	-0.5	-1.0
Adjusted Moisture Variation %	0.0	**	**
Hilf Density Ratio (%)	105.5	105.0	102.5
Compaction Method	Standard	Standard	Standard

## Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

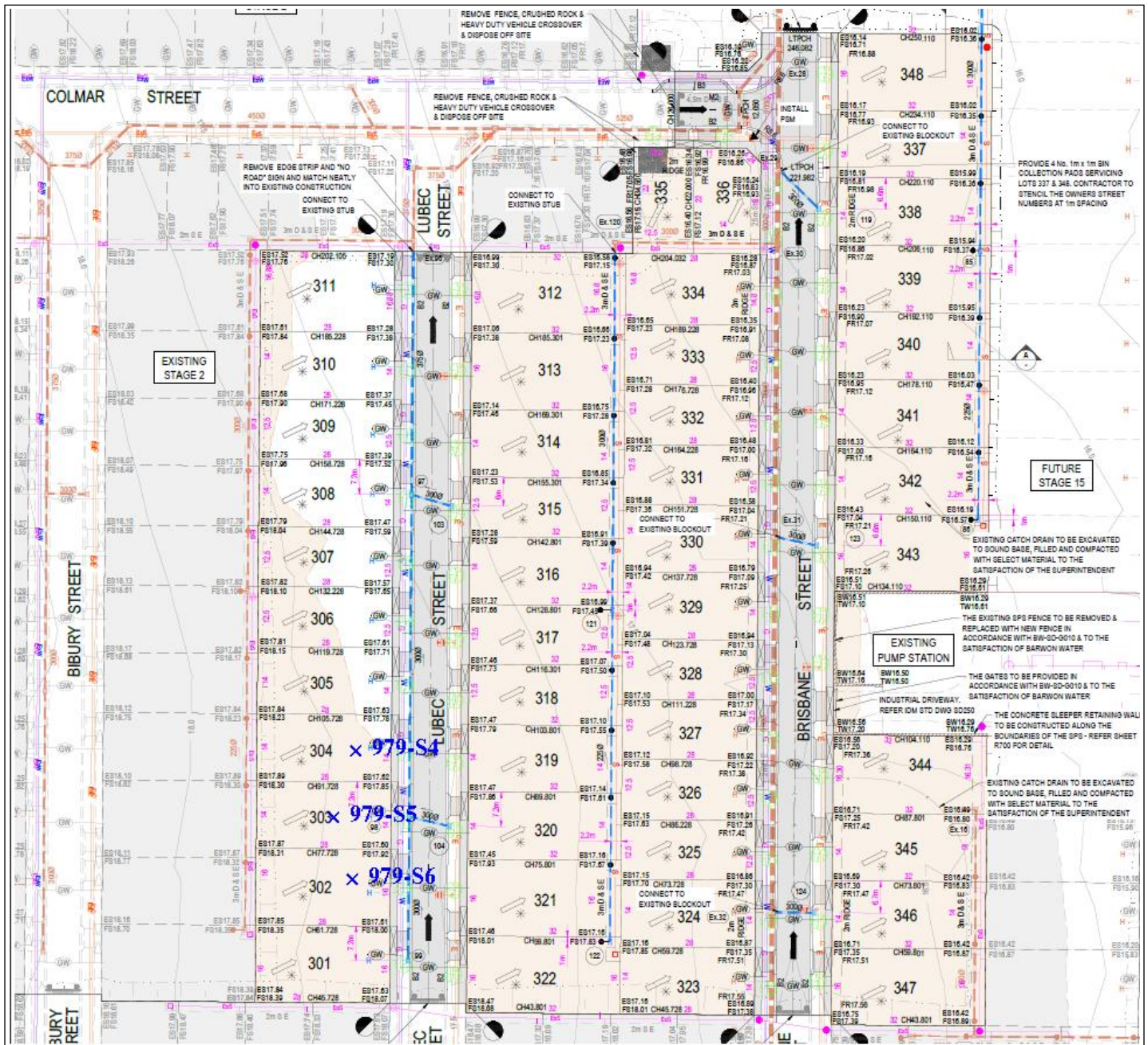


# Sample Locations Plan



**Ground Science South West**

Geotechnical & Environmental Consultants



# Material Test Report



**Ground Science South West**

Geotechnical & Environmental Consultants

**Report Number:** GSSW979-3  
**Issue Number:** 1  
**Date Issued:** 07/08/2020  
**Client:** CREO CONSULTANTS PTY LTD  
Level 7/176 Wellington Parade, East Melbourne Victoria 3002  
**Project Number:** GSSW979  
**Project Name:** CORIDALE ESTATE STAGE 3  
**Project Location:** LARA  
**Contractor:** WINSLOW CONSTRUCTION  
**Work Request:** 7524  
**Date Sampled:** 06/08/2020 7:30  
**Dates Tested:** 06/08/2020 - 07/08/2020  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% Standard Compaction & +/- 2% Moisture Variation as per AS 3798-2007  
**Lot Number:** Lots 323 - 347  
**Material:** CLAY, with gravel, brown, medium to high plasticity.  
**Material Source:** Onsite

Ground Science South West Pty Ltd  
10 Dowsett Street South Geelong Vic 3220  
Phone: (03) 5282 1566  
Email: chrism@groundscience.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Chris Mamalis  
Laboratory Manager  
NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	979-S7	979-S8	979-S9
Date Tested	06/08/2020	06/08/2020	06/08/2020
Time Tested	11:39	13:43	14:00
Test Request #/Location	Lot 321	Lot 319	Lot 327
Easting	55H 0269743	55H 0269746	55H 0269775
Northing	5789077	5789102	5789097
Layer / Reduced Level	1	1	1
Thickness of Layer (mm)	200	200	200
Soil Description	**	**	**
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	2	2	2
Field Wet Density (FWD) t/m <sup>3</sup>	1.95	2.06	1.93
Field Moisture Content %	25.1	17.9	19.7
Field Dry Density (FDD) t/m <sup>3</sup>	1.56	1.75	1.61
Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	1.98	2.02	1.96
Moisture Variation (Wv) %	**	**	**
Adjusted Moisture Variation %	-1.0	0.0	1.0
Hilf Density Ratio (%)	98.5	102.0	98.5
Compaction Method	Standard	Standard	Standard

## Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

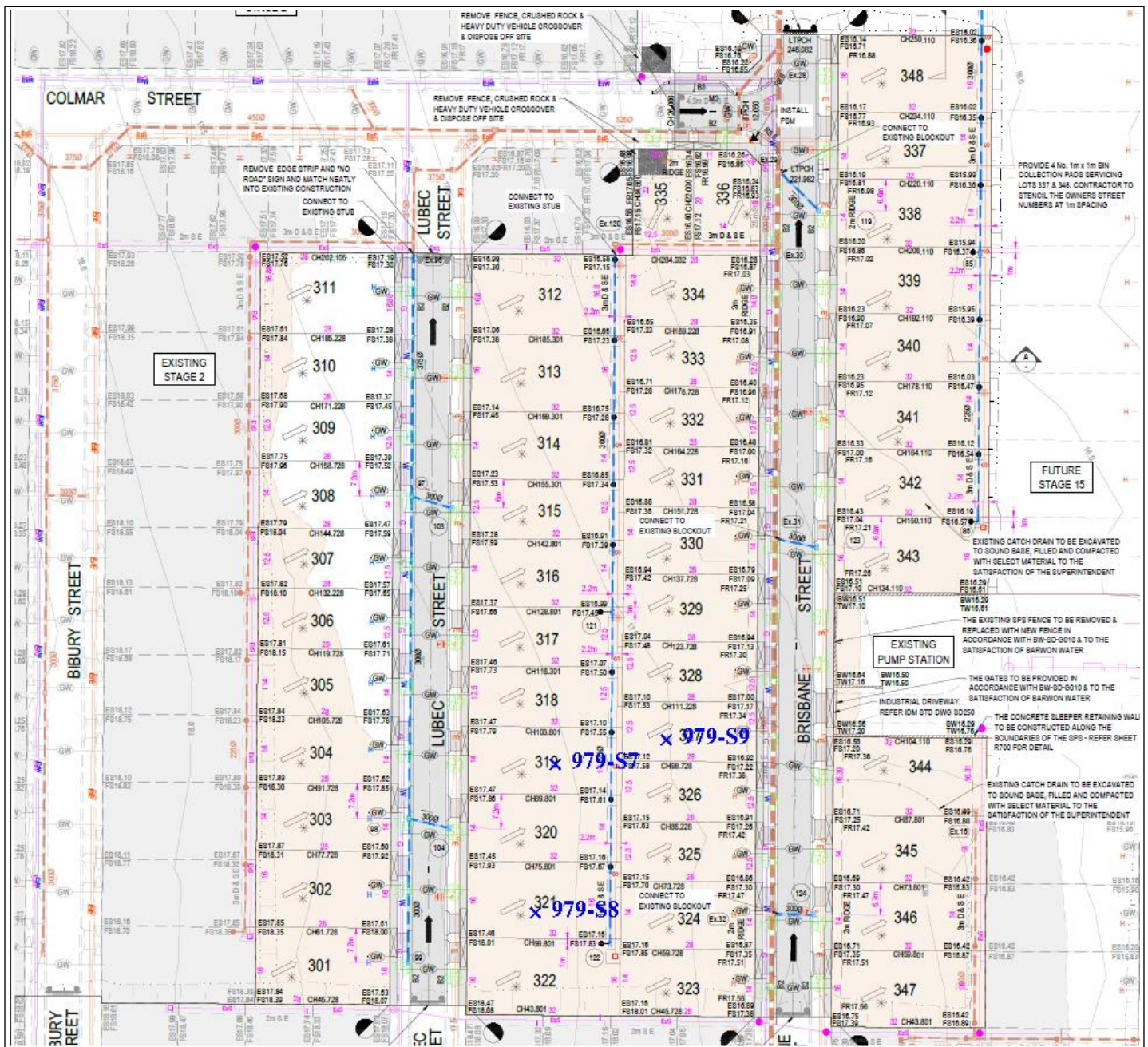


# Sample Locations Plan



**Ground Science South West**

Geotechnical & Environmental Consultants



# Material Test Report



**Ground Science South West**

Geotechnical & Environmental Consultants

**Report Number:** GSSW979-4  
**Issue Number:** 1  
**Date Issued:** 10/08/2020  
**Client:** CREO CONSULTANTS PTY LTD  
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002  
**Project Number:** GSSW979  
**Project Name:** CORIDALE ESTATE STAGE 3  
**Project Location:** LARA  
**Contractor:** WINSLOW CONSTRUCTION  
**Work Request:** 7531  
**Date Sampled:** 07/08/2020 7:30  
**Dates Tested:** 07/08/2020 - 10/08/2020  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% Standard Compaction & +/- 2% Moisture Variation as per AS 3798-2007  
**Lot Number:** Lots 312 - 343  
**Material:** CLAY, with gravel, brown medium to high plasticity  
**Material Source:** Onsite

Ground Science South West Pty Ltd  
 10 Dowsett Street South Geelong Vic 3220  
 Phone: (03) 5282 1566  
 Email: tomas@groundscience.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tomas Wheadon  
 Field & Laboratory Technician  
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	979-S10	979-S11	979-S12
Date Tested	07/08/2020	07/08/2020	07/08/2020
Time Tested	11:13	12:30	13:46
Test Request #/Location	Lot 331	Lot 312	Lot 343
Easting	55H 0269797	55H 0269750	55H 0269841
Northing	5789152	5789188	5789132
Layer / Reduced Level	1	1	1
Thickness of Layer (mm)	200	200	200
Soil Description	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	7	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	2.08	2.06	1.99
Field Moisture Content %	22.1	21.6	21.0
Field Dry Density (FDD) t/m <sup>3</sup>	1.70	1.70	1.65
Peak Converted Wet Density t/m <sup>3</sup>	**	1.98	1.98
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	2.00	**	**
Moisture Variation (Wv) %	**	2.0	2.0
Adjusted Moisture Variation %	0.5	**	**
Hilf Density Ratio (%)	103.5	104.0	100.5
Compaction Method	Standard	Standard	Standard

## Moisture Variation Note:

Positive values = test is dry of OMC  
 Negative values = test is wet of OMC

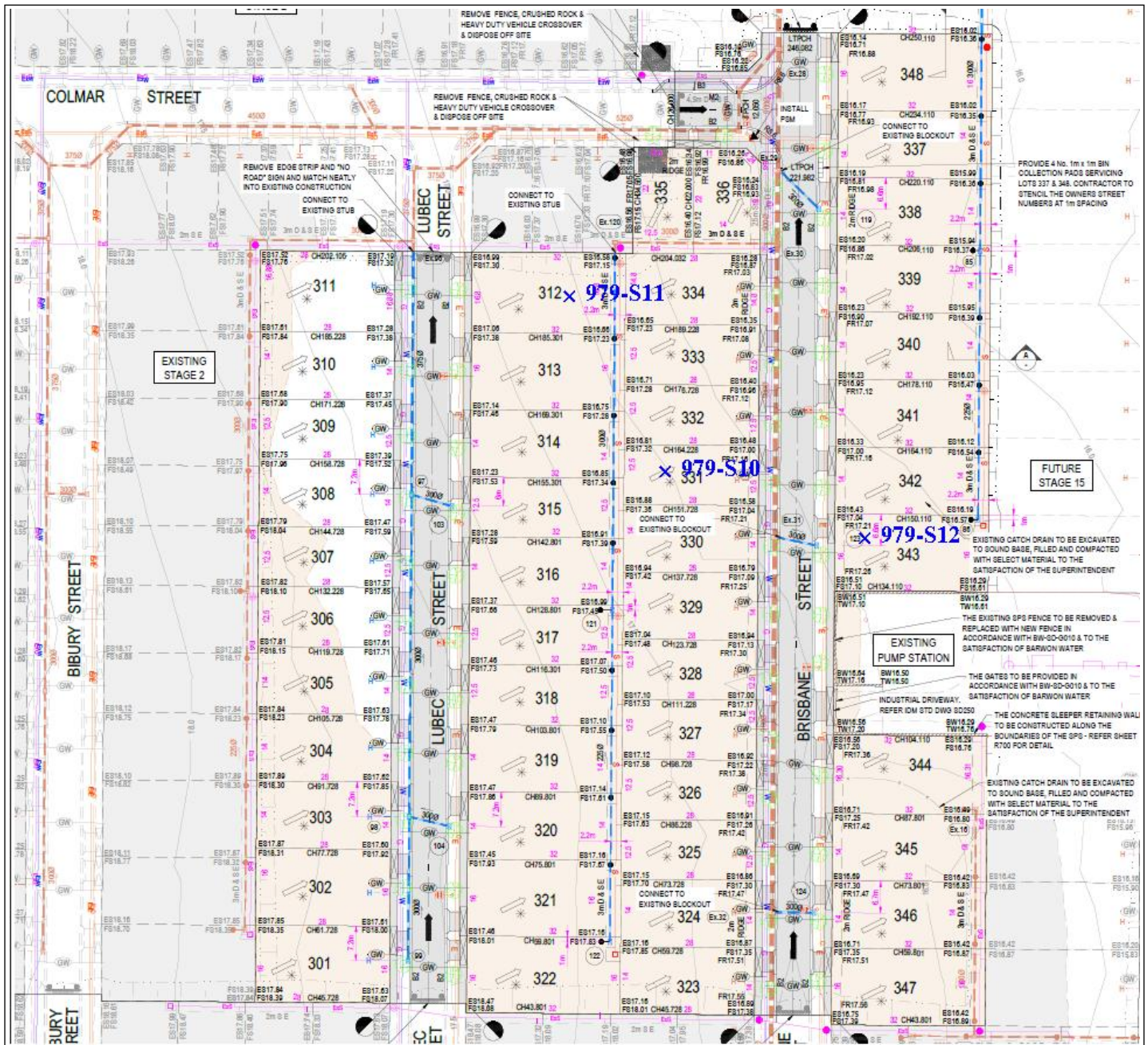


# Sample Locations Plan



**Ground Science South West**

Geotechnical & Environmental Consultants



# Material Test Report



**Ground Science South West**

Geotechnical & Environmental Consultants

**Report Number:** GSSW979-5  
**Issue Number:** 1  
**Date Issued:** 11/08/2020  
**Client:** CREO CONSULTANTS PTY LTD  
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002  
**Project Number:** GSSW979  
**Project Name:** CORIDALE ESTATE STAGE 3  
**Project Location:** LARA  
**Contractor:** WINSLOW CONSTRUCTION  
**Work Request:** 7538  
**Date Sampled:** 10/08/2020 7:30  
**Dates Tested:** 10/08/2020 - 11/08/2020  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% Standard Compaction & +/- 2% Moisture Variation as per AS 3798-2007  
**Lot Number:** Lots 339-348  
**Material:** CLAY, with gravel, brown medium to high plasticity  
**Material Source:** Onsite

Ground Science South West Pty Ltd  
 10 Dowsett Street South Geelong Vic 3220  
 Phone: (03) 5282 1566  
 Email: tomas@groundscience.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

*Tomas Wheadon*

Approved Signatory: Tomas Wheadon  
 Field & Laboratory Technician  
 NATA Accredited Laboratory Number: 20109

## Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	979-S13	979-S14	979-S15
Date Tested	10/08/2020	10/08/2020	10/08/2020
Time Tested	13:21	13:46	14:36
Test Request #/Location	Lot 339	Lot 337	Lot 348
Easting	55H 0269823	55H 0269823	55H0269824
Northing	5789195	5789211	5789232
Layer / Reduced Level	1	1	1
Thickness of Layer (mm)	200	200	200
Soil Description	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	1.91	1.91	2.03
Field Moisture Content %	25.2	25.1	24.9
Field Dry Density (FDD) t/m <sup>3</sup>	1.52	1.53	1.62
Peak Converted Wet Density t/m <sup>3</sup>	2.01	2.00	1.97
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Moisture Variation (Wv) %	-2.0	-2.0	-2.0
Adjusted Moisture Variation %	**	**	**
Hill Density Ratio (%)	95.0	95.5	102.5
Compaction Method	Standard	Standard	Standard

### Moisture Variation Note:

Positive values = test is dry of OMC  
 Negative values = test is wet of OMC

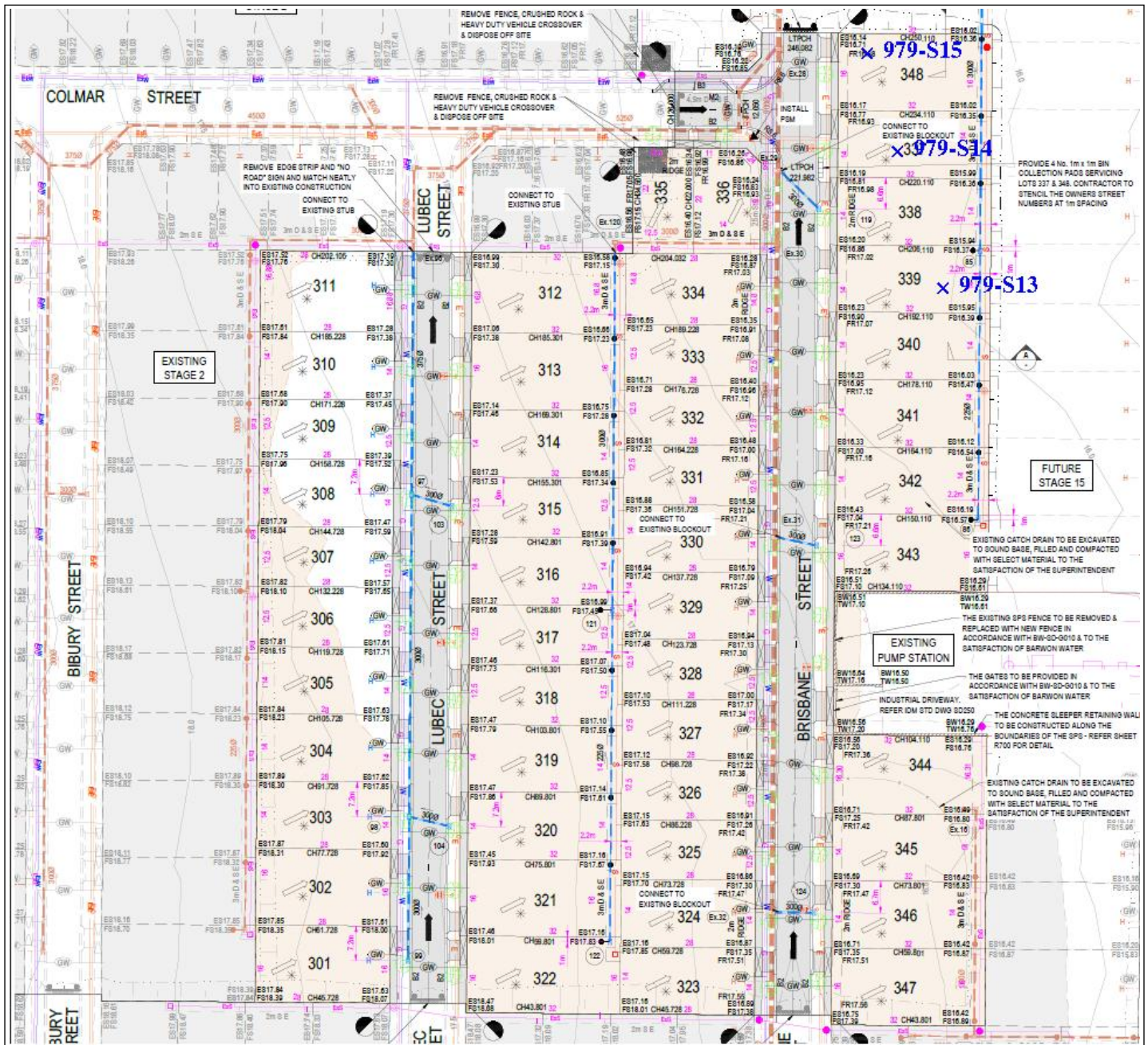


# Sample Locations Plan



**Ground Science South West**

Geotechnical & Environmental Consultants



# Material Test Report



**Ground Science South West**

Geotechnical & Environmental Consultants

**Report Number:** GSSW979-6  
**Issue Number:** 1  
**Date Issued:** 12/08/2020  
**Client:** CREO CONSULTANTS PTY LTD  
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002  
**Project Number:** GSSW979  
**Project Name:** CORIDALE ESTATE STAGE 3  
**Project Location:** LARA  
**Contractor:** WINSLOW CONSTRUCTION  
**Work Request:** 7543  
**Date Sampled:** 11/08/2020 7:30  
**Dates Tested:** 11/08/2020 - 12/08/2020  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% Standard Compaction & +/- 2% Moisture Variation as per AS 3798-2007  
**Lot Number:** Lots 341 - 348  
**Material:** CLAY, with gravel, brown medium to high plasticity  
**Material Source:** Onsite

Ground Science South West Pty Ltd  
 10 Dowsett Street South Geelong Vic 3220  
 Phone: (03) 5282 1566  
 Email: tomas@groundscience.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

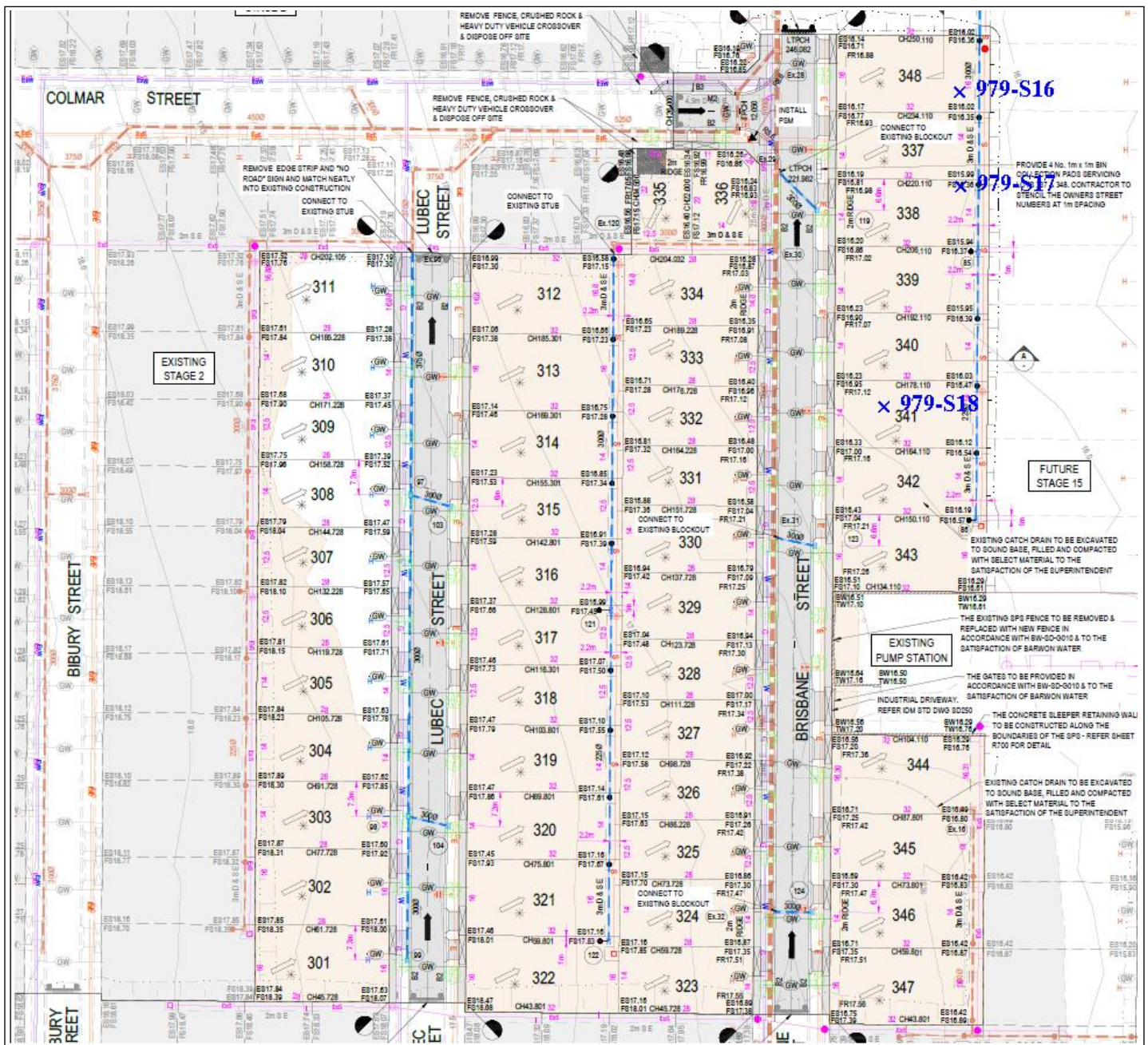
Approved Signatory: Tomas Wheadon  
 Field & Laboratory Technician  
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	979-S16	979-S17	979-S18
Date Tested	11/08/2020	11/08/2020	11/08/2020
Time Tested	12:36	13:02	14:57
Test Request #/Location	Lot 348	Lot 338	Lot 341
Easting	55H 0269832	55H 0269839	55H 0269826
Northing	5789228	5789206	5789170
Layer / Reduced Level	2	2	2
Thickness of Layer (mm)	200	200	200
Soil Description	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	1	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	2.09	2.08	2.05
Field Moisture Content %	17.9	19.0	18.0
Field Dry Density (FDD) t/m <sup>3</sup>	1.77	1.75	1.74
Peak Converted Wet Density t/m <sup>3</sup>	**	1.97	1.98
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	1.98	**	**
Moisture Variation (Wv) %	**	1.5	2.0
Adjusted Moisture Variation %	2.0	**	**
Hill Density Ratio (%)	105.5	105.5	103.5
Compaction Method	Standard	Standard	Standard

## Moisture Variation Note:

Positive values = test is dry of OMC  
 Negative values = test is wet of OMC





# Material Test Report



**Ground Science South West**

Geotechnical & Environmental Consultants

**Report Number:** GSSW979-7  
**Issue Number:** 1  
**Date Issued:** 13/08/2020  
**Client:** CREO CONSULTANTS PTY LTD  
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002  
**Project Number:** GSSW979  
**Project Name:** CORIDALE ESTATE STAGE 3  
**Project Location:** LARA  
**Contractor:** WINSLOW CONSTRUCTION  
**Work Request:** 7547  
**Date Sampled:** 12/08/2020 7:30  
**Dates Tested:** 12/08/2020 - 12/08/2020  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% Standard Compaction & +/- 2% Moisture Variation as per AS 3798-2007  
**Lot Number:** Lots 340 - 333  
**Material:** CLAY, with gravel, brown medium to high plasticity  
**Material Source:** Onsite

Ground Science South West Pty Ltd  
 10 Dowsett Street South Geelong Vic 3220  
 Phone: (03) 5282 1566  
 Email: tomas@groundscience.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

*Tomas Wheadon*

Approved Signatory: Tomas Wheadon  
 Field & Laboratory Technician  
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	979-S19	979-S20	979-S21
Date Tested	12/08/2020	12/08/2020	12/08/2020
Time Tested	13:28	14:16	14:41
Test Request #/Location	Lot 333	Lot 342	Lot 343
Easting	55H 0269792	55H 0269818	55H 0269814
Northing	5789190	5789144	5789127
Layer / Reduced Level	2	2	2
Thickness of Layer (mm)	200	200	200
Soil Description	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	7	5
Field Wet Density (FWD) t/m <sup>3</sup>	2.06	2.12	2.06
Field Moisture Content %	19.0	21.8	20.8
Field Dry Density (FDD) t/m <sup>3</sup>	1.73	1.74	1.71
Peak Converted Wet Density t/m <sup>3</sup>	2.00	**	**
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	**	2.04	1.98
Moisture Variation (Wv) %	1.0	**	**
Adjusted Moisture Variation %	**	0.0	2.0
Hilf Density Ratio (%)	<b>103.0</b>	<b>104.0</b>	<b>104.0</b>
Compaction Method	<b>Standard</b>	<b>Standard</b>	<b>Standard</b>

## Moisture Variation Note:

Positive values = test is dry of OMC  
 Negative values = test is wet of OMC

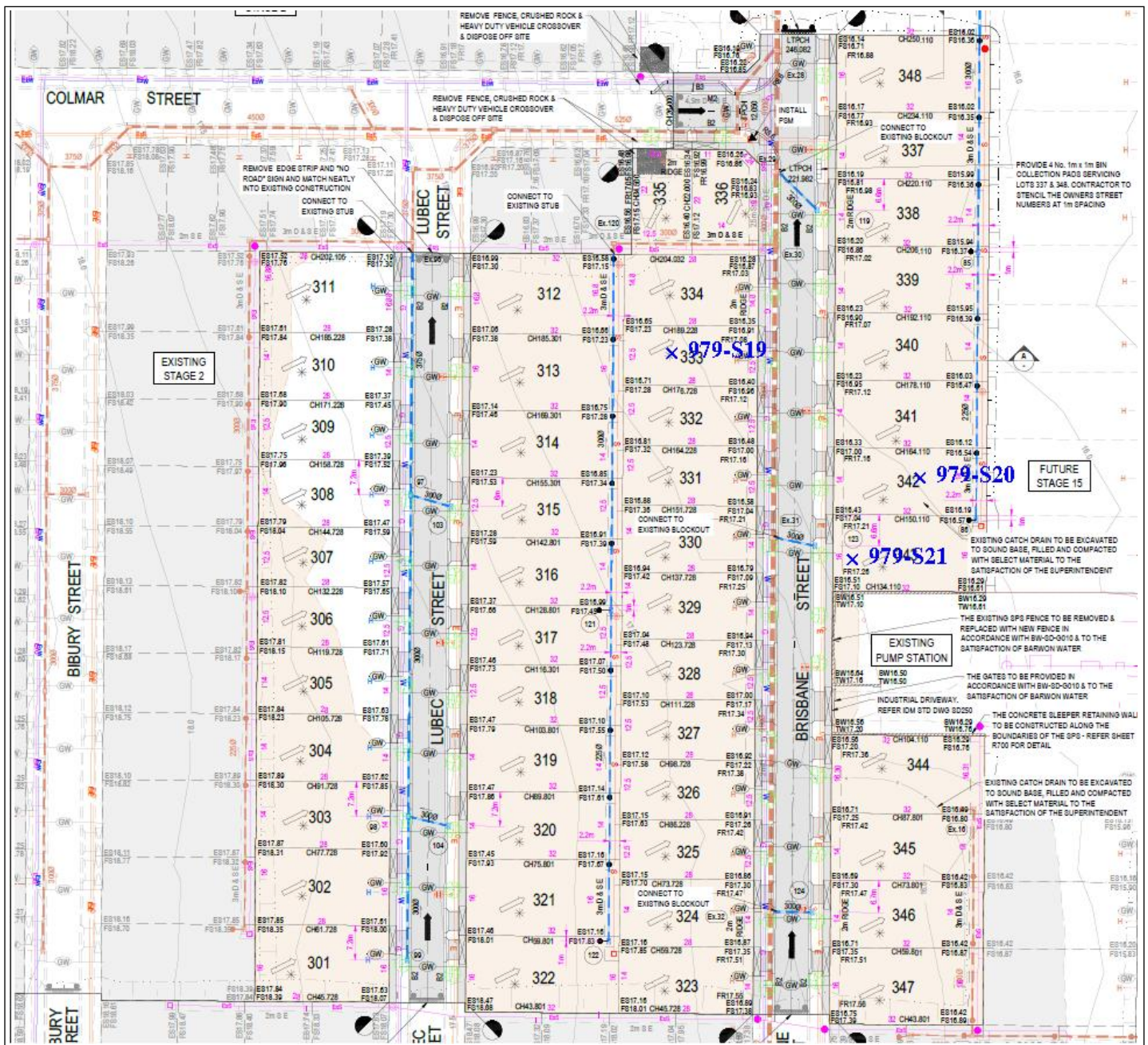


# Sample Locations Plan



**Ground Science South West**

Geotechnical & Environmental Consultants



# Material Test Report



**Ground Science South West**

Geotechnical & Environmental Consultants

**Report Number:** GSSW979-8  
**Issue Number:** 1  
**Date Issued:** 14/08/2020  
**Client:** CREO CONSULTANTS PTY LTD  
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002  
**Project Number:** GSSW979  
**Project Name:** CORIDALE ESTATE STAGE 3  
**Project Location:** LARA  
**Contractor:** WINSLOW CONSTRUCTION  
**Work Request:** 7554  
**Date Sampled:** 13/08/2020 7:30  
**Dates Tested:** 13/08/2020 - 14/08/2020  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% Standard Compaction & +/- 2% Moisture Variation as per AS 3798-2007  
**Lot Number:** Lots 315-331  
**Material:** CLAY, with gravel, brown medium to high plasticity  
**Material Source:** Onsite

Ground Science South West Pty Ltd  
 10 Dowsett Street South Geelong Vic 3220  
 Phone: (03) 5282 1566  
 Email: tomas@groundscience.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tomas Wheadon  
 Field & Laboratory Technician  
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	979-S22	979-S23	979-S24
Date Tested	13/08/2020	13/08/2020	13/08/2020
Time Tested	13:25	13:50	14:00
Test Request #/Location	Lot 315	Lot 316	Lot 331
Easting	55H 0269759	55H 0269757	55H 0269776
Northing	5789168	5789156	5789160
Layer / Reduced Level	2	2	2
Thickness of Layer (mm)	200	200	200
Soil Description	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	2	2	2
Field Wet Density (FWD) t/m <sup>3</sup>	2.05	2.04	2.07
Field Moisture Content %	22.2	21.5	20.5
Field Dry Density (FDD) t/m <sup>3</sup>	1.67	1.68	1.72
Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	1.94	2.00	2.02
Moisture Variation (Wv) %	**	**	**
Adjusted Moisture Variation %	2.0	1.0	0.5
Hilf Density Ratio (%)	105.5	102.0	102.5
Compaction Method	Standard	Standard	Standard

## Moisture Variation Note:

Positive values = test is dry of OMC  
 Negative values = test is wet of OMC

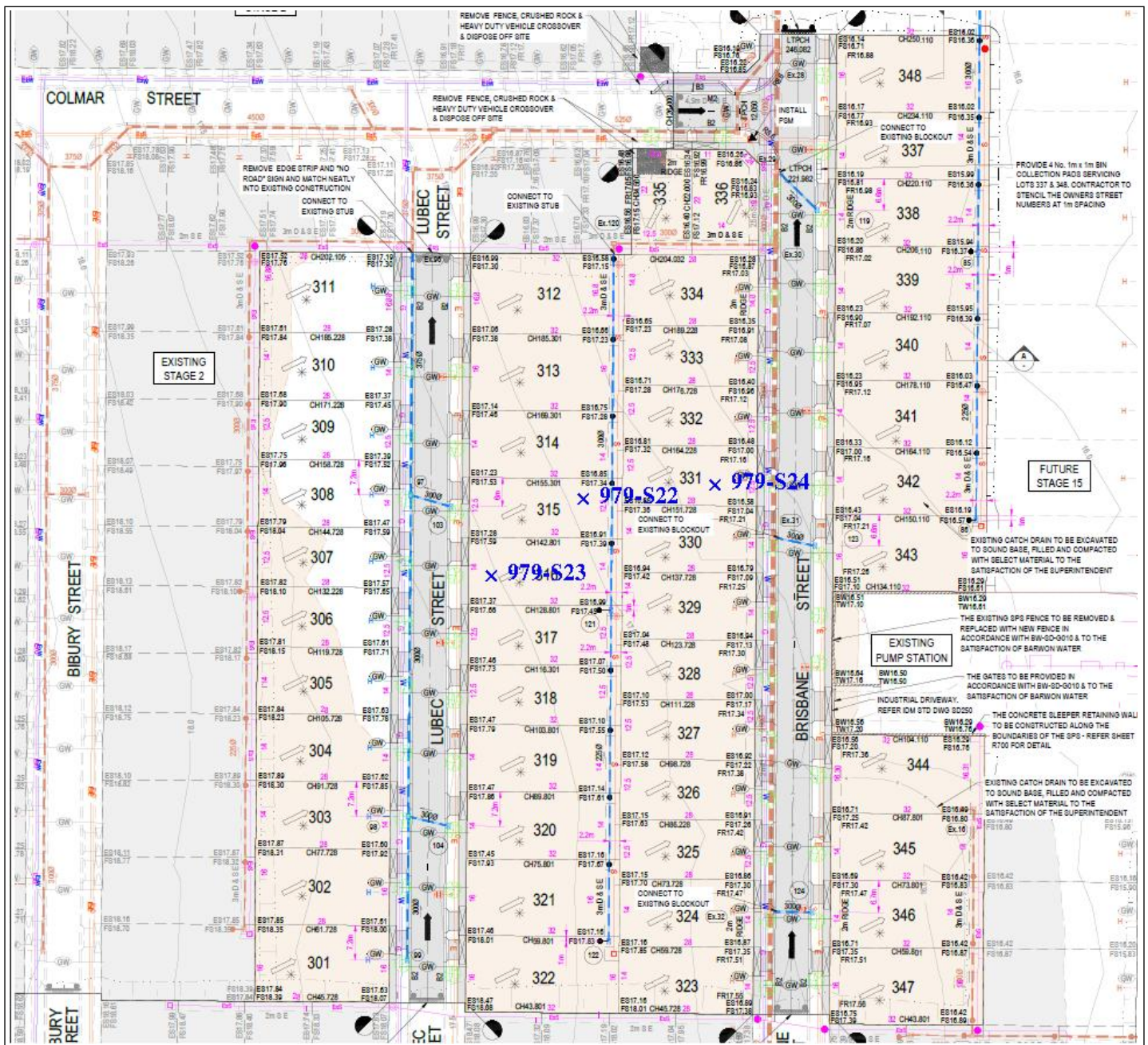


# Sample Locations Plan



**Ground Science South West**

Geotechnical & Environmental Consultants



# Material Test Report



**Ground Science South West**

Geotechnical & Environmental Consultants

**Report Number:** GSSW979-9  
**Issue Number:** 1  
**Date Issued:** 17/08/2020  
**Client:** CREO CONSULTANTS PTY LTD  
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002  
**Project Number:** GSSW979  
**Project Name:** CORIDALE ESTATE STAGE 3  
**Project Location:** LARA  
**Contractor:** WINSLOW CONSTRUCTION  
**Work Request:** 7562  
**Date Sampled:** 14/08/2020 7:30  
**Dates Tested:** 14/08/2020 - 17/08/2020  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% Standard Compaction & +/- 2% Moisture Variation as per AS 3798-2007  
**Lot Number:** Lots 321 - 347  
**Material:** CLAY, with gravel, brown medium to high plasticity  
**Material Source:** Onsite

Ground Science South West Pty Ltd  
 10 Dowsett Street South Geelong Vic 3220  
 Phone: (03) 5282 1566  
 Email: tomas@groundscience.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

*Tomas Wheadon*

Approved Signatory: Tomas Wheadon  
 Field & Laboratory Technician  
 NATA Accredited Laboratory Number: 20109

## Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	979-S25	979-S26	979-S27
Date Tested	14/08/2020	14/08/2020	14/08/2020
Time Tested	13:44	14:04	14:26
Test Request #/Location	Lot 324	Lot 321	Lot 323
Easting	55H 0269765	55H 0269753	55H 0269777
Northing	5789064	5789066	5789058
Layer / Reduced Level	2	2	2
Thickness of Layer (mm)	200	200	200
Soil Description	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Field Wet Density (FWD) t/m <sup>3</sup>	1.91	1.96	1.92
Field Moisture Content %	23.1	23.1	24.2
Field Dry Density (FDD) t/m <sup>3</sup>	1.55	1.60	1.54
Peak Converted Wet Density t/m <sup>3</sup>	1.96	1.93	1.91
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	**	**	**
Moisture Variation (Wv) %	0.0	-1.0	1.5
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	97.5	101.5	100.5
Compaction Method	Standard	Standard	Standard

### Moisture Variation Note:

Positive values = test is dry of OMC  
 Negative values = test is wet of OMC

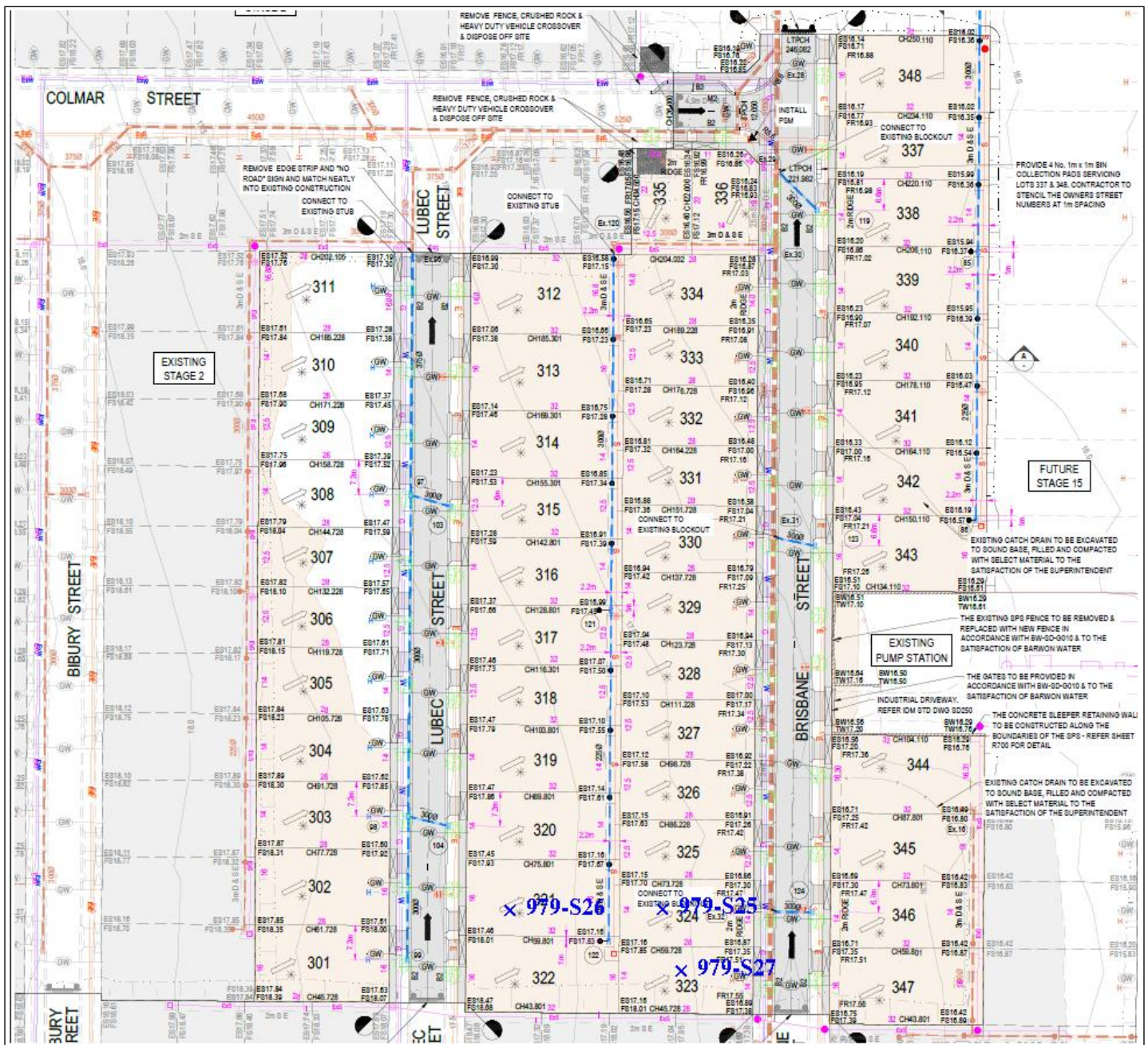


# Sample Locations Plan



**Ground Science South West**

Geotechnical & Environmental Consultants



# Material Test Report



**Ground Science South West**

Geotechnical & Environmental Consultants

**Report Number:** GSSW979-10  
**Issue Number:** 1  
**Date Issued:** 17/08/2020  
**Client:** CREO CONSULTANTS PTY LTD  
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002  
**Project Number:** GSSW979  
**Project Name:** CORIDALE ESTATE STAGE 3  
**Project Location:** LARA  
**Contractor:** WINSLOW CONSTRUCTION  
**Work Request:** 7565  
**Date Sampled:** 15/08/2020 8:00  
**Dates Tested:** 15/08/2020 - 17/08/2020  
**Sampling Method:** AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted  
**Specification:** 95% Standard Compaction & +/- 2% Moisture Variation as per AS 3798-2007  
**Lot Number:** Lots 344 - 302  
**Material:** CLAY, with gravel, brown medium to high plasticity  
**Material Source:** Onsite

Ground Science South West Pty Ltd  
 10 Dowsett Street South Geelong Vic 3220  
 Phone: (03) 5282 1566  
 Email: tomas@groundscience.com.au



Accredited for compliance with ISO/IEC 17025 - Testing

*Tomas Wheadon*

Approved Signatory: Tomas Wheadon  
 Field & Laboratory Technician  
 NATA Accredited Laboratory Number: 20109

## Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	979-S28	979-S29	979-S30
Date Tested	15/08/2020	15/08/2020	15/08/2020
Time Tested	10:26	11:03	11:26
Test Request #/Location	Lot 344	Lot 345	Lot 346
Chainage (m)	55H 0269016	55H 0269825	55H 0269817
Location Offset (m)	5789088	5789069	5789052
Layer / Reduced Level	1	1	1
Thickness of Layer (mm)	200	200	200
Soil Description	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity	CLAY, with gravel, brown medium to high plasticity
Test Depth (mm)	175	175	175
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	3	0
Field Wet Density (FWD) t/m <sup>3</sup>	2.04	1.98	2.02
Field Moisture Content %	20.3	20.7	21.0
Field Dry Density (FDD) t/m <sup>3</sup>	1.69	1.64	1.67
Peak Converted Wet Density t/m <sup>3</sup>	2.02	**	1.97
Adjusted Peak Converted Wet Density t/m <sup>3</sup>	**	1.96	**
Moisture Variation (Wv) %	1.5	**	2.0
Adjusted Moisture Variation %	**	2.0	**
Hill Density Ratio (%)	101.0	101.0	102.5
Compaction Method	Standard	Standard	Standard

### Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

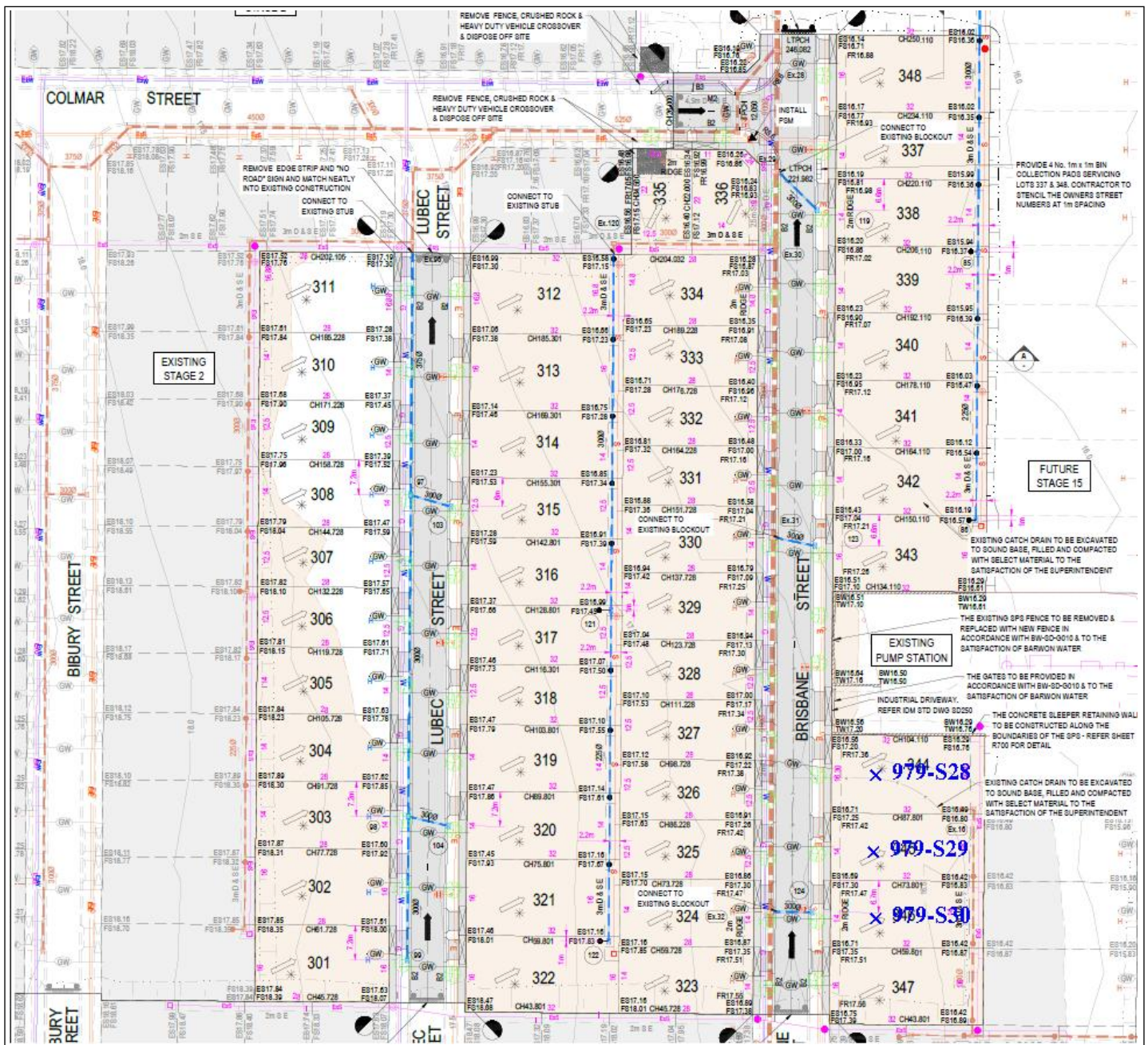


# Sample Locations Plan



**Ground Science South West**

Geotechnical & Environmental Consultants



## **APPENDIX C**

### Site Photographs



























