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Phone (08) 9204 3511

**St Leonards Estate Pty Ltd**
**C/- Progress Developments Pty Ltd**
**5/47 Cedric Street**
**STIRLING WA 6021**

Project 46748.41
17 December 2021
R.002.Rev0
BD

Attention: Mr Chris Lewis

Email: clewis@progressdevelopments.com.au

**Post Construction Geotechnical Report**
**Proposed Residential Subdivision**
**St Leonards Estate Stage 1Y, Dayton, WA**

## 1. Introduction

This report presents the results of a post construction geotechnical investigation undertaken by Douglas Partners Pty Ltd (DP) across Stage 1Y of the St Leonards Estate residential development in Dayton, WA. This work was commissioned by Mr Chris Lewis on behalf of St Leonards Estate Pty Ltd on 29 June 2021.

The purpose of this investigation was to assess the suitability of the ground for the proposed residential subdivision and to provide a site classification in accordance with AS 2870-2011.

## 2. Results of Field Work

A site inspection was conducted on 9 December 2021 following completion of the earthworks across the Stage 1Y area.

During the site inspection, a survey walk-over was conducted across the subdivision and Perth sand penetrometer (PSP) tests were undertaken at selected locations across the lots to assess the density of the sand. The PSP tests were carried out in accordance with AS 1289.6.3.3. In addition to the PSP testing, five boreholes were drilled across Lots 533, 537, 544, 548 and 556 to assess the ground conditions.

Results of the PSP testing generally indicate penetration resistance blow counts equal to or greater than 8 blows per 300 mm penetration, with no blow counts less than 7 blows, to depths of testing of up to 1.05 m below surface level across the lots. The results of the PSP tests are attached.

The results of the boreholes generally indicate that sand filling exists beneath the lots to a minimum depth of 1.8 m below surface levels.

## 3. Engineering Recommendations and Comments

The inspection and testing indicate that, at completion of the earthworks, suitable density of the fill that has been placed across the lots and behind retaining walls has been achieved.

Based on the information contained within this report, Douglas Partners considers that the ground across St Leonards Estate Stage 1Y forms a suitable foundation material for the proposed residential development. It is considered that each of the lots within Stage 1Y can be classified as 'Class A' in accordance with AS 2870-2011.

Please contact either of the undersigned for clarification of the above as necessary.

Yours faithfully
**Douglas Partners Pty Ltd**

**Brendan Divilly**
Associate

Reviewed by

**Dan Reaveley**
Senior Associate

Attachments: About this Inspection Report
Stage Plan
PSP Results

# About this Inspection Report



## Introduction

These notes are provided to amplify DP's inspection report in regard to the limitations of carrying out inspection work. Not all notes are necessarily relevant to this report.

### Standards

This inspection report has been prepared by qualified personnel to current engineering standards of interpretation and analysis.

### Copyright and Limits of Use

This inspection report is the property of DP and is provided for the exclusive use of the client for the specific project and purpose as described in the report. It should not be used by a third party for any purpose other than to confirm that the construction works addressed in the report have been inspected as described. Use of the inspection report is limited in accordance with the Conditions of Engagement for the commission.

DP does not undertake to guarantee the works of the contractors or relieve them of their responsibility to produce a completed product conforming to the design.

### Reports

This inspection report may include advice or opinion that is based on engineering and/or geological interpretation, information provided by the client or the client's agent, and information gained from:

- an investigation report for the project (if available to DP);
- inspection of the work, exposed ground conditions, excavation spoil and performance of excavating equipment while DP was on site;
- investigation and testing that was carried out during the site inspection;
- anecdotal information provided by authoritative site personnel; and
- DP's experience and knowledge of local geology.

Such information may be limited by the frequency of any inspection or testing that was able to be practically carried out, including possible site or cost constraints imposed by the client/ contractor(s). For these reasons, the reliability of this inspection report is limited by the scope of information on which it relies.

Every care is taken with the inspection report as it relates to interpretation of subsurface conditions and any recommendations or suggestions for construction or design. However, DP cannot anticipate or assume responsibility for:

- unexpected variations in subsurface conditions that are not evident from the inspection; and
- the actions of contractors responding to commercial pressures.

Should these issues occur, then additional advice should be sought from DP and, if required, amendments made.

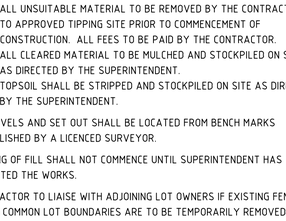
This inspection report must be read in conjunction with any attached information. This inspection report should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions from review by others of this inspection report or test data, which are not otherwise supported by an expressed statement, interpretation, outcome or conclusion stated in this inspection report.

## NOTES

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE CONTRACT DRAWINGS AND SPECIFICATION.
2. EXISTING FEATURES AND LEVELS AS SUPPLIED BY MNG SURVEYS.
   - 2.1. ALL FINISHED LEVELS ARE IN METRES TO AHD.
   - 2.2. HORIZONTAL DATUM IS PCG94.
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.
4. CONTRACTOR TO LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS ON SITE.
5. PRIOR TO CUTTING OR FILLING, THE SITE AREAS SHALL BE CLEARED AND TOPSOIL REMOVED.
   - 5.1. EXTENT OF CLEARING TO BE LIMITED TO THE BOUNDARY UNLESS AGREED WITH THE SUPERINTENDENT.
   - 5.2. VEGETATION WHERE NOTED FOR PROTECTION SHALL BE FENCED PRIOR TO CLEARING SURROUNDING AREA. THE CONTRACTOR TO PROTECT THE "VEGETATION PROTECTION AREAS" FROM ANY DAMAGE.
   - 5.3. ALL UNSUITABLE MATERIAL TO BE REMOVED BY THE CONTRACTOR TO APPROVED TIPPING SITE PRIOR TO COMMENCEMENT OF CONSTRUCTION. ALL FEES TO BE PAID BY THE CONTRACTOR.
   - 5.4. ALL CLEARED MATERIAL TO BE MULCHED AND STOCKPILED ON SITE AS DIRECTED BY THE SUPERINTENDENT.
   - 5.5. TOPSOIL SHALL BE STRIPPED AND STOCKPILED ON SITE AS DIRECTED BY THE SUPERINTENDENT.
6. ALL LEVELS AND SET OUT SHALL BE LOCATED FROM BENCH MARKS ESTABLISHED BY A LICENCED SURVEYOR.
7. PLACING OF FILL SHALL NOT COMMENCE UNTIL SUPERINTENDENT HAS INSPECTED THE WORKS.
8. CONTRACTOR TO LIAISE WITH ADJOINING LOT OWNERS IF EXISTING FENCING ALONG COMMON LOT BOUNDARIES ARE TO BE TEMPORARILY REMOVED. ANY SUCH WORKS ARE TO BE REINSTATED BY THE CONTRACTOR.
9. ALL LEVELS SHOWN ARE FINISHED LEVELS AFTER FINAL WORKS. LOT LEVELS ARE FINISHED SAND LEVELS. VERGE AND P.O.S. SURFACES SHALL BE 50mm BELOW FINISHED LEVELS FOR TOPSOILING. ROADS SHALL BE BOXED AS PER THE TYPICAL ROAD SECTIONS AND DETAILS SHOWN ON THE STANDARD DRAWINGS.
10. CONTRACTOR TO ARRANGE FOR PRINCIPAL'S GEOTECHNICAL ENGINEER TO PROVIDE INDEPENDENT CERTIFICATION THAT EARTHWORKS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE DRAWINGS AND THE SPECIFICATION.
11. THE CONTRACTOR SHALL PROVIDE THE SUPERINTENDENT AN AS-CONSTRUCTED SURVEY OF FINISHED DEVELOPMENT LEVELS WITHIN THE EXTENT OF WORKS BOUNDARY. THE LEVELS SHOULD ACCURATELY DEFINE BATTERS AND CHANGE OF GRADE. THE AS-CONSTRUCTED SURVEY SHALL BE SUPPLIED IN ELECTRONIC FORMAT (CAD AND PDF FILES).

## RETAINING WALL NOTES

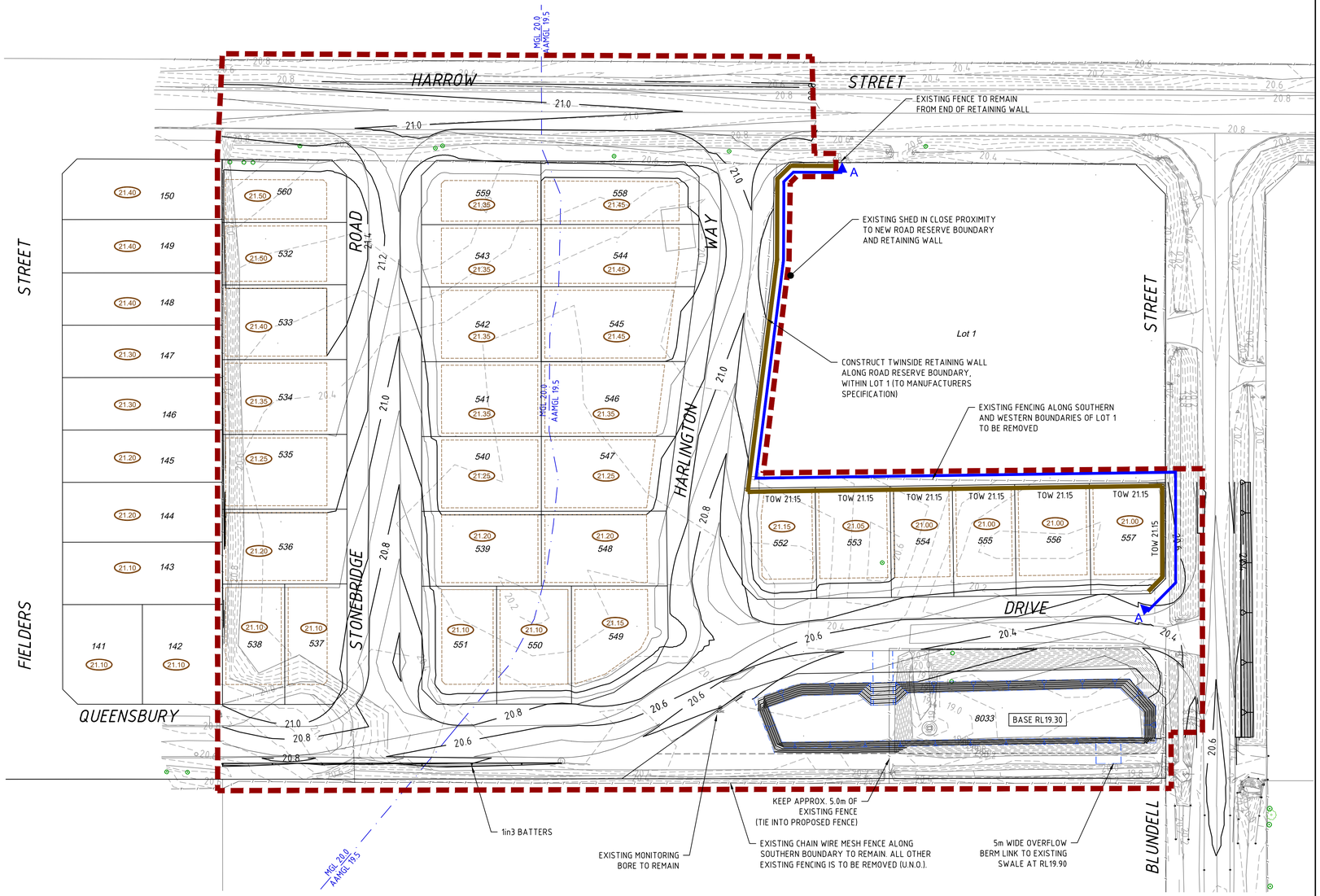
1. REFER DRAWING TABEC-STD-W01 FOR RETAINING WALL CONSTRUCTION DETAILS. REPLACE TOP COURSE WITH 165x350x1000 BLOCKS WHEN INDICATED AS '1/2C TOP BLOCK' ON PLANS. ENSURE M4 POINTING MORTAR IS USED.
2. ALL RETAINING WALLS TO BE LIMESTONE BLOCK TYPE WITH FOOTINGS SUITABLE FOR SAND AREAS (CLASS 'A') U.N.O.
3. WALL COURSING TO BE ESTABLISHED FROM TOP OF WALL LEVELS SHOWN ON DRAWINGS.
4. CONTRACTOR SHALL PROVIDE SUPERINTENDENT AN AS-CONSTRUCTED SURVEY OF RETAINING WALLS WITHIN THE EXTENT OF WORKS BOUNDARY. THE LEVELS AND LOCATION SHOULD BE ACCURATELY DEFINED. THE AS-CONSTRUCTED SURVEY SHALL BE SUPPLIED IN DIGITAL FORMAT (CAD AND PDF FILES).
5. CONTRACTOR TO CONFIRM LEVEL OF EXISTING STUB WALLS PRIOR TO COMMENCEMENT OF CONSTRUCTION OF ANY RETAINING WALLS.
6. REFER TO POWER DRAWINGS FOR DEEPENED FOOTING LOCATIONS.




TYPICAL 'CJ' LOCATION DETAIL
SCALE 1:50

## LEGEND

- EXTENT OF EARTHWORKS
- EXISTING SURFACE CONTOUR
- 10.5 — PROPOSED SURFACE CONTOUR (0.2m)
- 20.00 — PROPOSED LOT PAD LEVEL
- PROPOSED RETAINING WALLS
- FUTURE RETAINING WALLS
- EXISTING RETAINING WALLS
- 18.00 TOW 18.00 — TOP OF RETAINING WALL LEVEL
- CJ — CONTROL JOINT (DIAGRAMATIC ONLY)
- UNIFORM INFILL FENCING
- SPECIAL RETAINING WALL TREATMENT BUILDING ADJACENT TO TOP OF RETAINING WALL
- A A — REFER TO RETAINING WALL PROFILE SHEETS




Standard Retaining Wall Drawings: TABEC-STD-W01 Rev 7

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNLESS IT HAS BEEN CERTIFIED BY A PRACTISING STRUCTURAL ENGINEER.

STRUCTURAL ENGINEER — COMPANY: Terpkos Engineering Pty Ltd — DATE

WAPC No. 160391

SCALE 1:500 (0, 10, 20, 30)

A1

DIAL BEFORE YOU DIG www.1100.com.au

| No. | DATE | DRAWN | APPROVED | AMENDMENT |
|---|---|---|---|---|
| B | 09.06.21 | RDE | JZ | ISSUED FOR APPROVAL. |
| A | 20.05.21 | RDE | JZ | ISSUED FOR COMMENTS & PRICING. |

This plan shall not to be used for construction unless issued as rev 0 and signed as approved.



CLIENT: PROGRESS DEVELOPMENTS — St Leonards

| DESIGNED | CHECKED | APPROVED |
|---|---|---|
| RDE | JZ | B.FARRELL |
| DRAWN | CHECKED | DATE |
| RDE | JZ | 09.06.21 |

TABEC Civil Engineering Consultants
TABEC PTY LTD ACN 090 796 204
14 Wickham Street, East Perth WA 6004
t 08 9425 5900 e info@tabec.com.au www.tabec.com.au

PROJECT: ST LEONARDS ESTATE, DAYTON - STAGE 1Y

TITLE: BULK EARTHWORKS AND RETAINING WALL PLAN

DRAWING NUMBER: 2223-1Y-100

ISSUE: B

T:\Projects\2223\Design\CAD\Drawings\Stage 1Y\2223-1Y-100.dwg 09/06/21 10:04:19 revons

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# Results of Dynamic Penetrometer Tests

| | | | |
|---|---|---|---|
| **Client** | St Leonards Estate Pty Ltd | **Project No.** | 46748.41 |
| **Project** | Proposed Residential Subdivision | **Date** | 9/12/2021 |
| **Location** | St Leonards Estate Stage 1Y, Dayton, WA | **Page No.** | 1 of 2 |

| Lot Number | 533 | 535 | 537 | 540 | 546 | 548 | 551 | 552 | 552 | 553 |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | C | C | C | C | C | C | R(W) | R(W) | R(W) | R(N) |
| Depth (m) | **Penetration Resistance** Blows/150 mm | | | | | | | | | |
| 0.00 – 0.15 | - | - | - | - | - | - | - | - | - | - |
| 0.15 – 0.30 | 4 | 4 | 7 | 19 | 5 | 13 | 3 | 3 | 4 | 3 |
| 0.30 – 0.45 | 6 | 8 | 14 | >20 | 13 | >20 | 4 | 4 | 5 | 5 |
| 0.45 – 0.60 | 10 | 13 | >20 | | >20 | | 10 | 4 | 9 | 12 |
| 0.60 – 0.75 | 13 | >20 | | | | | 13 | 17 | 7 | >20 |
| 0.75 – 0.90 | 17 | | | | | | 10 | >20 | 14 | |
| 0.90 – 1.05 | 15 | | | | | | >20 | | 5 | |

| Lot Number | 553 | 554 | 555 | 555 | 556 | 557 | 557 | 557 | 558 | 559 |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | C | R(N) | R(N) | C | R(N) | R(N) | C | R(E) | R(N) | R(N) |
| Depth (m) | **Penetration Resistance** Blows/150 mm | | | | | | | | | |
| 0.00 – 0.15 | - | - | - | - | - | - | - | - | - | - |
| 0.15 – 0.30 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 3 |
| 0.30 – 0.45 | 12 | 5 | 7 | 10 | 7 | 4 | 7 | 4 | 5 | 6 |
| 0.45 – 0.60 | 16 | 13 | 7 | 19 | 8 | 7 | 10 | 9 | 8 | 10 |
| 0.60 – 0.75 | >20 | 17 | 8 | >20 | 7 | 10 | 15 | 12 | 10 | 12 |
| 0.75 – 0.90 | | >20 | 12 | | 7 | 11 | >20 | 14 | 13 | 12 |
| 0.90 – 1.05 | | | 16 | | 10 | 9 | | 13 | 12 | 15 |

**Test Method** AS 1289.6.3.2, Cone Penetrometer ☐
AS 1289.6.3.3, Sand Penetrometer ☑

**Tested By** GG
**Checked By** BD

**Remarks** >20 indicates greater than 20 blows for 150 mm penetration.

C – central area of the lot.

R: Adjacent to the Retaining wall – top side. The test was completed between 1.0 m and 1.5 m behind the wall. (N): Northern wall of Lot, (E): Eastern wall of Lot, (S): Southern Wall of Lot, (W): Western wall of Lot.

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| **Project** | Proposed Residential Subdivision | **Date** | 9/12/2021 |
| **Location** | St Leonards Estate Stage 1Y, Dayton, WA | **Page No.** | 2 of 2 |

| Lot Number | 559 | 560 | 566 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | C | C | R(N) | | | | | | | |
| Depth (m) | **Penetration Resistance** Blows/150 mm | | | | | | | | | |
| 0.00 – 0.15 | - | - | - | - | - | - | - | - | - | - |
| 0.15 – 0.30 | 4 | 4 | 3 | | | | | | | |
| 0.30 – 0.45 | 7 | 8 | 5 | | | | | | | |
| 0.45 – 0.60 | 10 | 15 | 7 | | | | | | | |
| 0.60 – 0.75 | 15 | >20 | 15 | | | | | | | |
| 0.75 – 0.90 | 16 | | >20 | | | | | | | |
| 0.90 – 1.05 | 16 | | | | | | | | | |

| Lot Number | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Location | | | | | | | | | | |
| Depth (m) | **Penetration Resistance** Blows/150 mm | | | | | | | | | |
| 0.00 – 0.15 | - | - | - | - | - | - | - | - | - | - |
| 0.15 – 0.30 | | | | | | | | | | |
| 0.30 – 0.45 | | | | | | | | | | |
| 0.45 – 0.60 | | | | | | | | | | |
| 0.60 – 0.75 | | | | | | | | | | |
| 0.75 – 0.90 | | | | | | | | | | |
| 0.90 – 1.05 | | | | | | | | | | |

| | | | | |
|---|---|---|---|---|
| **Test Method** | AS 1289.6.3.2, Cone Penetrometer | ☐ | **Tested By** | GG |
| | AS 1289.6.3.3, Sand Penetrometer | ☑ | **Checked By** | BD |

**Remarks** >20 indicates greater than 20 blows for 150 mm penetration.

C – central area of the lot.

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