

coffey

geotechnics
SPECIALISTS MANAGING THE EARTH

**GEOTECHNICAL COMPLETION REPORT
ON BEACHWOOD ESTATES STAGE 2C
AT BEACHWOOD DRIVE, HATFIELDS
BEACH**

Cabra Developments Limited

GENZSILV13847AA-AP
2 April 2013

2 April 2013

Cabra Developments Limited
PO Box 197
Orewa

Attention: Mr L. Barker

Dear Lloyd,

**RE: Geotechnical Completion Report for Beachwood Estates Stage 2C at Beachwood Drive,
Hatfields Beach**

This report presents all supporting geotechnical data and our Suitability Statement in relation to land development works undertaken at the above location.

It has been prepared in accordance with instructions received from Woods Limited and forms part of the documentation required by Auckland Council to achieve certification under Section 224(c) of the Resource Management Act.

If you have any queries or you require any further clarification on any aspects of this report, please do not hesitate to contact the undersigned.

For and on behalf of Coffey Geotechnics (NZ) Ltd



Richard Knowles

Principal Geotechnical Engineer, CPEng

Distribution: Original held by Coffey Geotechnics (NZ) Ltd
3 hard copies and electronic copy to Woods Limited
1 hard copy to Cabra Developments Limited

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1 INTRODUCTION AND DESCRIPTION OF SUBDIVISION

This Geotechnical Completion Report has been prepared for Cabra Developments Limited as part of the documentation required to be submitted to Auckland Council following residential subdivisional development.

It contains our Suitability Statement, relevant test data and the Woods Limited as-built plan set relating to Stage 2C of the Beachwood Estate Residential Subdivision as follows:

TABLE 1: WOODS LIMITED AS-BUILT PLANS

| Title | Reference No. | Date |
|--|--------------------|------------|
| Final Contour As-Built Plan | 60354-2C-EW-100-AB | March 2013 |
| Cut / Fill Contours As-Built Plan – Original to Final Surface | 60354-2C-EW-110-AB | March 2013 |
| Cut / Fill Contours As-Built Plan – Undercut to Final Surface | 60354-2C-EW-111-AB | March 2013 |
| As-Built Retaining Wall Plan | 60354-2C-EW-120-AB | March 2013 |
| As-Built Retaining Wall Restriction Zone Plan | 60354-2C-EW-130-AB | March 2013 |
| As-Built Batter Restriction Zone Plan | 60354-2C-EW-140-AB | March 2013 |
| Roading and Street Tree As- Built Plan | 60354-2C-RD-200-AB | March 2013 |
| Typical Road Details As-Built Plan | 60354-2C-RD-220-AB | March 2013 |
| Overall As-Built Stormwater Plan | 60354-2C-DR-380-AB | March 2013 |
| As-Built Stormwater Details Plan | 60354-2C-DR-381-AB | March 2013 |
| As-Built Stormwater Details Plan | 60354-2C-DR-382-AB | March 2013 |
| Overall As-Built Wastewater Plan | 60354-2C-DR-400-AB | March 2013 |
| As-Built Wastewater Details Plan | 60354-2C-DR-401-AB | March 2013 |
| As-Built Wastewater Details Plan | 60354-2C-DR-402-AB | March 2013 |
| Watermain As-Built Plan | 60354-2C-WS-600-AB | March 2013 |

This report covers the construction period early December 2011 to March 2013. It is intended to be used for certification purposes for lots on DP 204356 as follows:

- 15 residential lots numbered 33 to 38 and 43 to 51,
- A portion of 1 new road numbered as lot 403 and named Seaview Crescent;

This stage of the subdivision is located off Beachwood Drive, Hatfields Beach and as can be seen on the as-built plans, a total of 14 of the residential lots have been partly or totally affected by filling undertaken within this construction period to a maximum depth of approximately 5.5 metres.

2 RELATED REPORTS

A Geotechnical Investigation Report on the subject land was prepared by this Consultancy, reference 12407, dated 14 July 2006.

Following the 2007/ 2008 earthworks, a Geotechnical Completion Report was prepared, referenced GENZOREW12407, dated 3 October 2008.

Additional design work was then undertaken for the stage 2 area in 2011 and a preliminary report was submitted for Resource Consent application (referenced GENZSILV13847 and dated 8 August 2011) that presented additional investigation and design information. A Design Report was then prepared for Beachwood Stage 2, referenced GENZSILV13847, dated 16 January 2012.

The conclusions and recommendations of the above reports have been reviewed during the preparation of this document.

3 EARTHWORKS OPERATIONS

3.1 Plant

The items of construction plant used on site during the operations are as follows:

Hick Bros Civil Construction Limited

- 1 x D7 & Scoop
- 1 x D6 with blade and towed roller
- 1 x 4WD Sheep's Foot Compactor
- 1 x Watercart
- 1 x Motorscraper
- 1 x Tractor with Rear Disks
- 1 x 20T Excavator
- 1 x 5T Excavator
- 1 x Bobcat
- 1 x 5T Loader
- 1 x 5T Dump Truck

ICB Construction Limited

- 1 x 7.5T Excavator
- 1 x 10T Excavator

1 x Backhoe Loader
1 x 20T Excavator

Matakana Drainage Limited

1 x 20T Excavator
1 x 12T Excavator
1 x 5T Bobcat

Mulchit Limited

1 x Front End Loader
1 x Mulching Spreader Truck

Hiway Stabilizers Limited

1 x Lime Spreader
1 x Lime Hoe

3.2 Construction Programme

Earthworks were previously undertaken on this land in 2007 and 2008 in conjunction with the stage 1 works to the east that included engineered fills up to approximately 3 metres deep within this area.

However, earthworks construction for this stage was largely undertaken during the 2011/ 2012 earthworks season in conjunction with works across a wider area of the site. There was no requirement for new subsoil drainage beneath this portion of the development and filling operations were undertaken principally through the latter portions of that season.

Following the winter 2012 shut-down and concentration of works on other stage areas, works resumed here in mid September 2012 with stripping and site preparation works to prepare for retaining wall construction within lots 33 to 52.

Retaining wall construction along lot boundaries began in late September, with walls being constructed by subcontractor ICB Construction Limited. Coffey staff carried out observation and testing of aspects of wall construction on a near- daily basis. Wall construction within this stage of the development continued to late November 2012.

Drainage works within this stage of the development began in early October 2012, constructed by subcontractor Matakana Drainage Limited. Stormwater and sanitary sewer lines were excavated into the existing filling and natural ground within the Seaview Road reserve area and outer boundaries of lots 43 to 51.

Meanwhile earthworks were undertaken in this stage of the development with cuts and fills in lots 43 to 51 and the knoll to the northwest of the development boundary to form level platforms. Level platforms within lots 33 to 41 were completed in the previous earthworks stage (Stage 2AC).

Civil works including combined services trenches, and curb, channel and road construction were carried out between mid September 2012 and March 2013.

4 QUALITY ASSURANCE AND CONTROLS

4.1 Inspections

During the earthworks engineering inspections were undertaken on a regular basis to assess compliance with NZS 4431 and our project specific recommendations and specifications. Project specific inspections were required on this stage of the development for excavation, ground/ foundation preparation and construction of timber cantilever retaining walls including drainage placement.

4.2 Quality Control Criteria

Due to the widely varying soil types being used as filling, the compaction control criteria of minimum allowable shear strength and maximum allowable air voids were mainly used for quality assurance purposes.

Specification details were as follows:

TABLE 2: COMPACTION CONTROL CRITERIA

| <u>Minimum Shear Strength and Maximum Air Voids Method</u> | |
|--|--|
| (a) | <u>Air Voids Percentage</u> |
| | (As defined in NZS 4402) |
| | Average value less than 10% |
| | Maximum single value 12% |
| (b) | <u>Undrained Shear Strength</u> |
| | (Measured by hand held shear vane - calibrated using NZGS 2001 method) |
| | Average value not less than 140 kPa |
| | Minimum single value 110 kPa |
| <u>Note:</u> | The average value shall be determined over any ten consecutive tests |

4.3 Quality Assurance Testing

Regular in situ density, strength and water content tests were carried out on all areas of the filling at or in excess of the frequency recommended by NZS 4431.

Penetration resistance tests were undertaken at representative locations following preparation of the road subgrades and the results were subsequently forwarded to Woods Limited for pavement design purposes. Areas demonstrating low equivalent CBR values were generally reworked and stabilised using lime and cement stabilisation.

5 PROJECT EVALUATION

5.1 Bearing Capacity and Settlement of Building Foundations

Following the completion of earthworks operations, we returned to the site on 13 February 2012 and drilled a series of hand auger boreholes at appropriate natural ground locations in order to determine representative finished ground conditions and hence evaluate likely foundation options for future

building development. The resulting bearing capacity recommendations are presented in the appended Suitability Statement.

At current subgrade levels lots 33 to 38 and 43 to 51 have a geotechnical ultimate bearing capacity of 300 kPa within the influence of conventional shallow residential building foundation loads. At these bearing pressures differential settlements due to building loads should be within code limits.

Where a geotechnical ultimate bearing capacity greater than 300 kPa is required, further specific site investigation and design of foundations should be carried out prior to building consent application.

It should be noted that NZS 3604 only allows a maximum backfill depth of 600mm over the building platform of a dwelling unless an Engineering design solution is proposed, on account of the risk of induced consolidation of the subsoils caused by the weight of the backfill.

5.2 Expansive Soils

Two sets of Expansive soil tests were carried out on samples selected from around the site and within the zone of likely influence of shallow building foundations.

These limit tests were carried out in accordance with NZS 4402, "Methods of Testing Soils for Civil Engineering Purposes" test section 2 and were primarily intended to assess the Expansive Classes of the site materials as defined in AS 2870, "Residential Slabs and Footings – Construction".

All test results are IANZ (International Accreditation New Zealand) endorsed and full details are appended.

The AS 2870 Site Class for this stage of the subdivision is S (slight). Specific design alternatives for this Site Class are presented in the Suitability Statement.

5.3 Lot Gradients

Stability conditions at this site have been enhanced by the construction of retaining walls and subsoil drainage (installed as part of the previous Stage 2AC). The appended Batter Restriction Zone Plan shows areas having gradients steeper than 1 in 4 or being adjacent to land having such gradients. The extent of these areas has been determined by site gradients and our final walkover inspection, but there may be localised areas having such gradients that have not been shown on the plans.

Details of resulting building and earthworks restrictions within the vicinity of these areas are presented in the Suitability Statement.

5.4 Fill Induced Settlement

As a result of our pre-fill inspections, quality control testing and the time elapsed since the placement of the majority of the filling, we are of the opinion that induced differential settlements beneath or within the certified filling due to its imposed weight should be insignificant with respect to conventional NZS 3604 residential building development that incorporates specific foundation and associated structural design on account of the expansive soils site Class.

5.5 Vegetation Cover

Wherever practical on sloping land beyond building platform areas all existing bush and grass cover should be maintained. Any vegetation cleared beyond the immediate area of building platforms for temporary construction purposes should be replaced as soon as possible.

The contribution of appropriate vegetation cover to overall site stability and erosion control, particularly on steep batters, should not be underestimated.

5.6 Stormwater Controls

It is important on all sloping lots that due care is paid to the design and construction of appropriate stormwater disposal systems. These systems should serve to collect all runoff from roofs, decks and paved areas, together with discharges from retaining wall drains and other subsoil drains and should connect directly into the public stormwater drainage network.

Uncontrolled stormwater discharges onto the ground surface or into soakage pits can cause erosion, scour and/or instability on sloping land and should not be permitted under any circumstances where stability could be compromised.

5.7 Service Trenches

As is normal on all subdivisions, building developments involving foundations within a 45 degree zone of influence from pipe inverts will require Engineering input.

Areas within lots 43 to 51 are known to have service trenches within the lots as shown on the appended Stormwater As-Built Plan. The resulting restrictions are set in the Suitability Statement below.

5.8 Land Drainage

The appended Cut / Fill Contours – Undercut Surface to Final Earthworks Surface Plan shows the positions of perforated underfill drains were placed in mucked out gully inverts prior to filling to tap groundwater seepages. The plans include the drains placed in 2007/ 2008.

These drains were intended to intercept localised groundwater seepages and springs during earthworks and were installed as a precautionary measure, not as remedial works for any existing instability and they need no specific maintenance. These drains are constructed well beneath the likely depth or influence of shallow foundations constructed in accordance with NZS 3604.

5.9 Road Subgrades

Penetration resistance tests were undertaken on the road subgrades on 26 June 2012 and 12 July 2012 during the previous Stage 2AC works and on 16 January 2013 within this stage. The results were subsequently forwarded to Woods Limited for pavement design purposes. All road subgrade areas were subsequently stabilised to achieve appropriate standards and to allow for a reduction in sub-base metal depths.

5.10 Retaining Walls

Some areas of the site have been stabilised by the construction of boundary retaining walls in the locations shown on the Retaining Wall Plan. These walls reach a maximum height of approximately 1.9

metres. Cantilever pole walls constructed during this development were designed by Ian Hutchinson Consultants Limited. Coffey inspected the ground conditions exposed in the pile holes and the structural and drainage elements of these walls during construction.

Details of resulting building and earthworks restrictions the vicinity of these walls are presented in the Suitability Statement.

Producer Statement – Construction Review documents for these walls are attached.

5.11 Topsoil

Topsoil depths in likely building platform areas were checked by the drilling of a borehole in the approximate centre of most of the residential lots. Our findings, which are indicative only and subject to variation at other locations, show that likely topsoil depths are between 50mm and 250mm. Site specific findings are presented in the Suitability Statement Summary.

5.12 Contractor's Work

We have relied on the Contractor's work practices and assume that the works have been carried out in accordance with:

- (i) The approved Contract drawings and design details,
- (ii) The approved Contract specifications,
- (iii) Authorised Variations to (i) and (ii) during the execution of the works,
- (iv) The conditions of Resource, Earthworks and Building Consents where applicable,
- (v) The relevant Coffey Geotechnics reports, recommendations and site instructions,

and that all as-built information and other details provided to the Client and/or Coffey Geotechnics are accurate and correct in all respects.

6 STATEMENT OF PROFESSIONAL OPINION AS TO THE SUITABILITY OF LAND FOR BUILDING DEVELOPMENT

I, R.J. Knowles, of Coffey Geotechnics (NZ) Limited, Auckland, hereby confirm that:

1. I am a Chartered Professional Engineer experienced in the field of geotechnical engineering as defined in section 1.2.3 of NZS 4404 and was retained by the Owner/Developer as the Geotechnical Engineer on Stage 2C of the Beachwood Estate residential subdivision.
2. The extent of preliminary investigations carried out to date are described in Geotechnical Investigation Report number 12407, dated 14 July 2006. Previous earthworks operations within the stage area conducted between 2007 and 2008 were described in Geotechnical Completion Report GENZOREW12407, dated 3 October 2008. The conclusions and recommendations of those documents have been re-evaluated in the preparation of this report. The results of all tests carried out are also appended.
3. In my professional opinion, not to be construed as a guarantee, I consider that:

- (a) The earth fills shown on the appended cut/ fill contours as-built plans have been placed in compliance with NZS 4431, the Legacy Rodney District Council District Plans and related documents.
- (b) The completed earthworks give due regard to land slope and foundation stability considerations within the residential lots, but as shown on the appended Batter Restriction Zone Plan, areas on lots 33 to 38 and 47 to 51 have gradients steeper than 1 in 4 or are adjacent to land having such gradients and accordingly, batter set-backs incorporating **specific design zones** and/ or **leading edge pile zones** have been applied.

No building construction and no earthworks should take place within the designated **specific design zone areas** or elsewhere if similar gradients exist unless endorsed by design of all foundations and retaining walls and by construction inspections undertaken by a Chartered Professional Engineer experienced in geomechanics, as such operations may, in certain circumstances, have detrimental effects on overall site stability.

Building development within the designated **leading edge pile zones** within lots 33 to 38 will need to be piled to account for a 1 metre deep soil creep zone / lateral load. Accordingly the piles should be designed in shear and bending to resist an 'at-rest' lateral soil load equivalent to 3 pile diameters applied to a depth of 1 metre. The minimum pile depth within this zone should be 2 metres. The following design parameters may be assumed:

$\phi' = 30$ degrees

$S_u = 100$ kPa

Geotechnical ultimate end bearing capacity beyond 1.8m depth = 450 kPa

Ultimate side adhesion beyond 1m depth = 25 kPa. Ignore side adhesion in the top 1m.

The structural designer should attend to the details of pile type, spacing, diameter and load capacity and must also ensure that the design allows for any differential movement that may occur between the piled and un-piled portions of any building.

- (c) A geotechnical ultimate bearing capacity of 300 kPa may be assumed for shallow foundation design on lots 33 to 38 and 43 to 51.

Where a geotechnical bearing capacity greater than 300 kPa is required, (ie outside the limits of NZS 3604, such as when piling is undertaken), further specific site investigation and design of foundations should be carried out prior to building consent application.

- (d) The backfilling and compaction of the stormwater and sanitary sewer trenches on this subdivision has where possible been carried out to appropriate standards having regard for the prevailing ground conditions and associated compaction induced pipe loadings.

Nevertheless, no building development should take place within the 45 degree zone of influence of drain inverts unless endorsed by a Chartered Professional Engineer experienced in geomechanics to ensure that lateral stability and differential settlement

issues are addressed and that building loads are transferred beyond the influence of the pipe and beyond the extent of the trench backfill.

This requirement is most likely to impact on areas adjacent to the stormwater lines that lie inside the front boundaries of lots 43 to 51.

- (e) No building construction, including the construction of additional retaining walls and no earthworks should take place should take place within the designated retaining wall setback areas adjacent to the retaining walls on lots 33 to 38 and 43 to 51 as shown on the appended Retaining Wall Restriction Zone Plan unless endorsed by specific designs and by construction inspections undertaken by a Chartered Professional Engineer experienced in geomechanics to ensure that no additional loads are applied to the walls. Specific site investigation should not be required.
- (f) The assessed AS 2870 expansive site Class for all lots is S (slight).
- (g) Subject to the geotechnical limitations, restrictions, recommendations and expansive soil assessments associated with 3(b), 3(c), 3(d), 3(e) and 3(f) above:
 - (i) The filled and undisturbed original ground within residential lot boundaries is generally suitable for residential buildings constructed in accordance with NZS 3604 (that incorporates specific foundation and associated structural design on account of the expansive soils site class) and related documents.
 - (ii) Non-specific shallow foundation design may be carried out in accordance with AS 2870 (Class S) or alternatively, a specific foundation and structural design may be undertaken by a Chartered Professional Engineer who should allow for expansive soil effects in the design. In this latter case, the minimum foundation depth below cleared ground level following topsoil removal and benching of building platform areas is 450mm for NZS 3604 type shallow strip and pad foundations.

- 4. Road subgrades and lot accessway subgrades have been formed having due regard for slope stability and settlement, although CBR values do vary between natural and filled ground as is to be expected.

The appended table summarises the status of each residential lot covered by this Suitability Statement.

The professional opinion contained within this report is furnished to the Auckland Council, Cabra Developments Limited and their professional advisors for their purposes alone on the express condition that it will not be relied upon by any other person. Prospective purchasers should still satisfy themselves as to any specific conditions pertaining to their particular land interest.

For and on behalf of Coffey Geotechnics (NZ) Limited



Richard Knowles

Principal Geotechnical Engineer, CPEng

Prepared By:



Greg Snook

Engineering Geologist

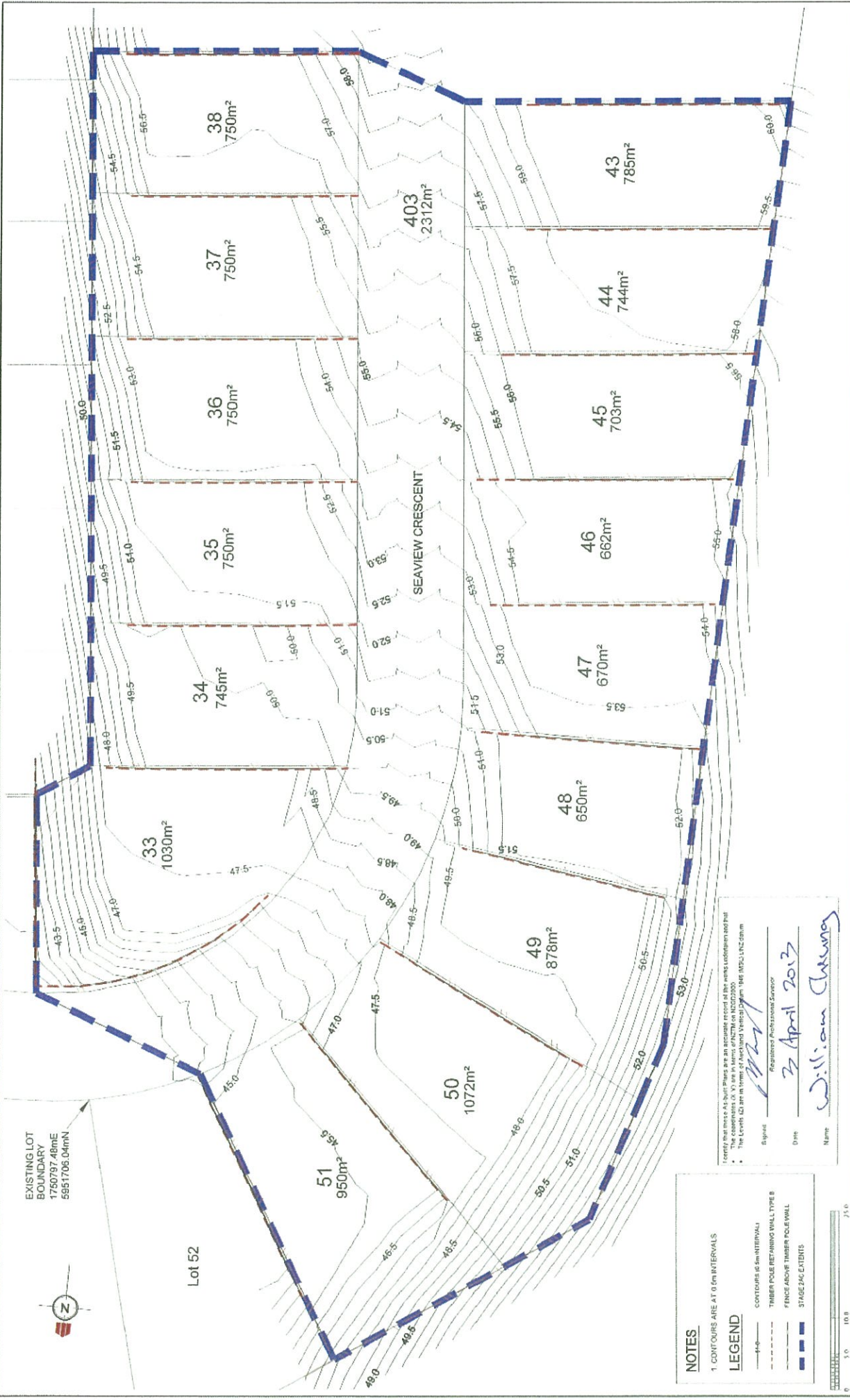
TABLE 3: SUITABILITY STATEMENT SUMMARY (refer to Project Evaluation and Suitability Statement for details)

| Lot No. | Comments | Topsoil Depth (mm) | Ultimate Bearing (kPa) | AS2870 :1996 Class |
|---------|---|--------------------|------------------------|--------------------|
| 33 | Batter specific design zone restrictions Retaining wall set-back area restrictions Leading edge piling zone restriction Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 50 | 300 | S |
| 34 | Batter specific design zone restrictions Retaining wall set-back area restrictions Leading edge piling zone restriction Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 50 | 300 | S |
| 35 | Batter specific design zone restrictions Retaining wall set-back area restrictions Leading edge piling zone restriction Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 50 | 300 | S |
| 36 | Batter specific design zone restrictions Retaining wall set-back area restrictions Leading edge piling zone restriction Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 50 | 300 | S |
| 37 | Batter specific design zone restrictions Retaining wall set-back area restrictions Leading edge piling zone restriction Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 150 | 300 | S |
| 38 | Batter specific design zone restrictions Retaining wall set-back area restrictions Leading edge piling zone restriction Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 50 | 300 | S |

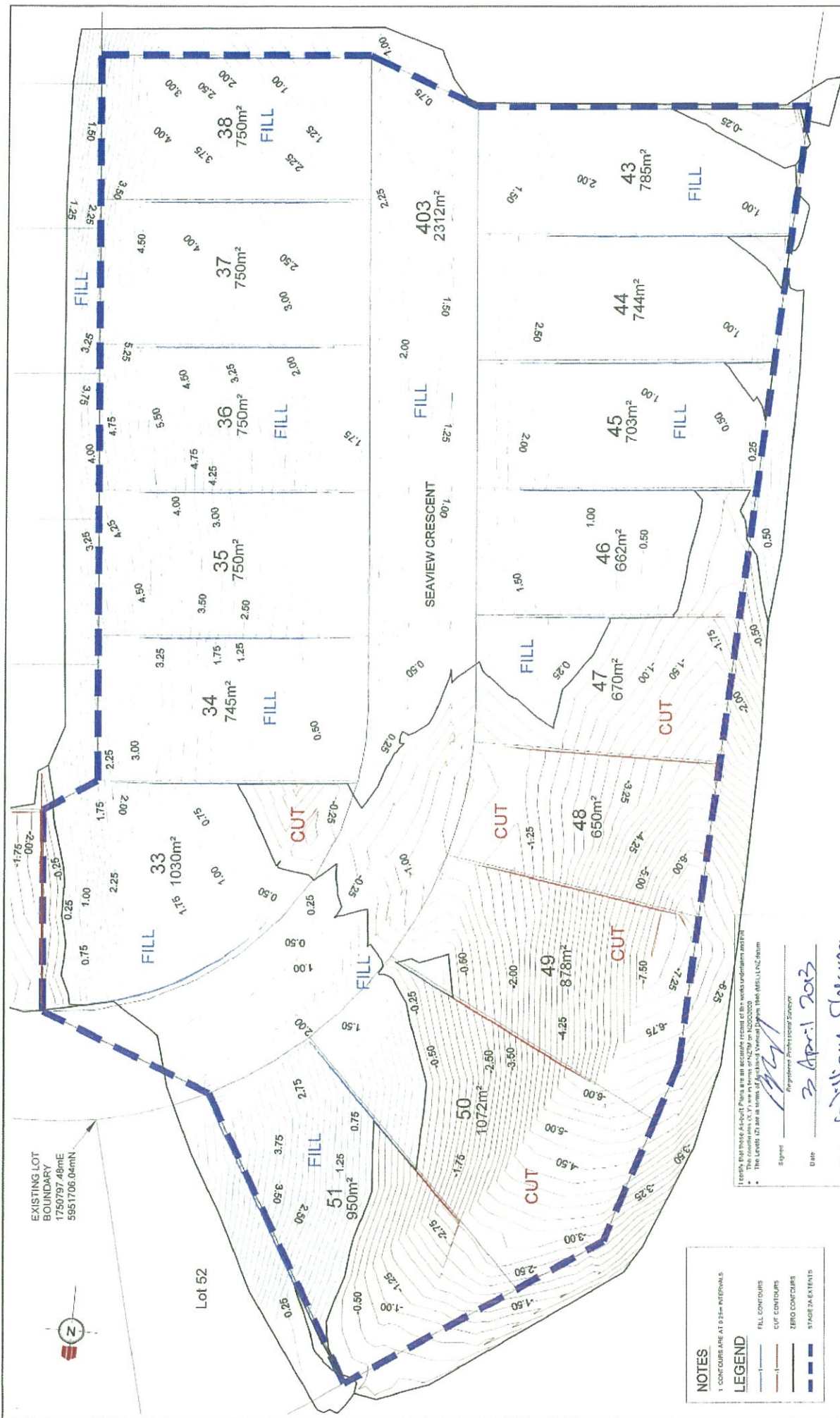
| Lot No. | Comments | Topsoil Depth (mm) | Ultimate Bearing (kPa) | AS2870 :1996 Class |
|---------|--|--------------------|------------------------|--------------------|
| 43 | Retaining wall set-back area restrictions Stormwater Line within lot; no building development with 45 degree zone of influence of drain invert unless endorsed by CP Eng. Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 200 | 300 | S |
| 44 | Retaining wall set-back area restrictions Stormwater Line within lot; no building development with 45 degree zone of influence of drain invert unless endorsed by CP Eng. Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 200 | 300 | S |
| 45 | Retaining wall set-back area restrictions Stormwater Line within lot; no building development with 45 degree zone of influence of drain invert unless endorsed by CP Eng. Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 200 | 300 | S |
| 46 | Retaining wall set-back area restrictions Stormwater Line within lot; no building development with 45 degree zone of influence of drain invert unless endorsed by CP Eng. Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 150 | 300 | S |
| 47 | Batter specific design zone restrictions Retaining wall set-back area restrictions Stormwater Line within lot; no building development with 45 degree zone of influence of drain invert unless endorsed by CP Eng. Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 250 | 300 | S |
| 48 | Batter specific design zone restrictions Retaining wall set-back area restrictions Stormwater Line within lot; no building development with 45 degree zone of influence of drain invert unless endorsed by CP Eng. Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 100 | 300 | S |

| Lot No. | Comments | Topsoil Depth (mm) | Ultimate Bearing (kPa) | AS2870 :1996 Class |
|---------|--|--------------------|------------------------|--------------------|
| 49 | Batter specific design zone restrictions Retaining wall set-back area restrictions Stormwater Line within lot; no building development with 45 degree zone of influence of drain invert unless endorsed by CP Eng. Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 50 | 300 | S |
| 50 | Batter specific design zone restrictions Retaining wall set-back area restrictions Stormwater Line within lot; no building development with 45 degree zone of influence of drain invert unless endorsed by CP Eng. Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 50 | 300 | S |
| 51 | Batter specific design zone restrictions Retaining wall set-back area restrictions Stormwater Line within lot; no building development with 45 degree zone of influence of drain invert unless endorsed by CP Eng. Elsewhere, AS 2870 foundation design or specific CP Eng design with minimum footing depth 450mm for NZS3604 type strip or pad foundations. | 250 | 300 | S |

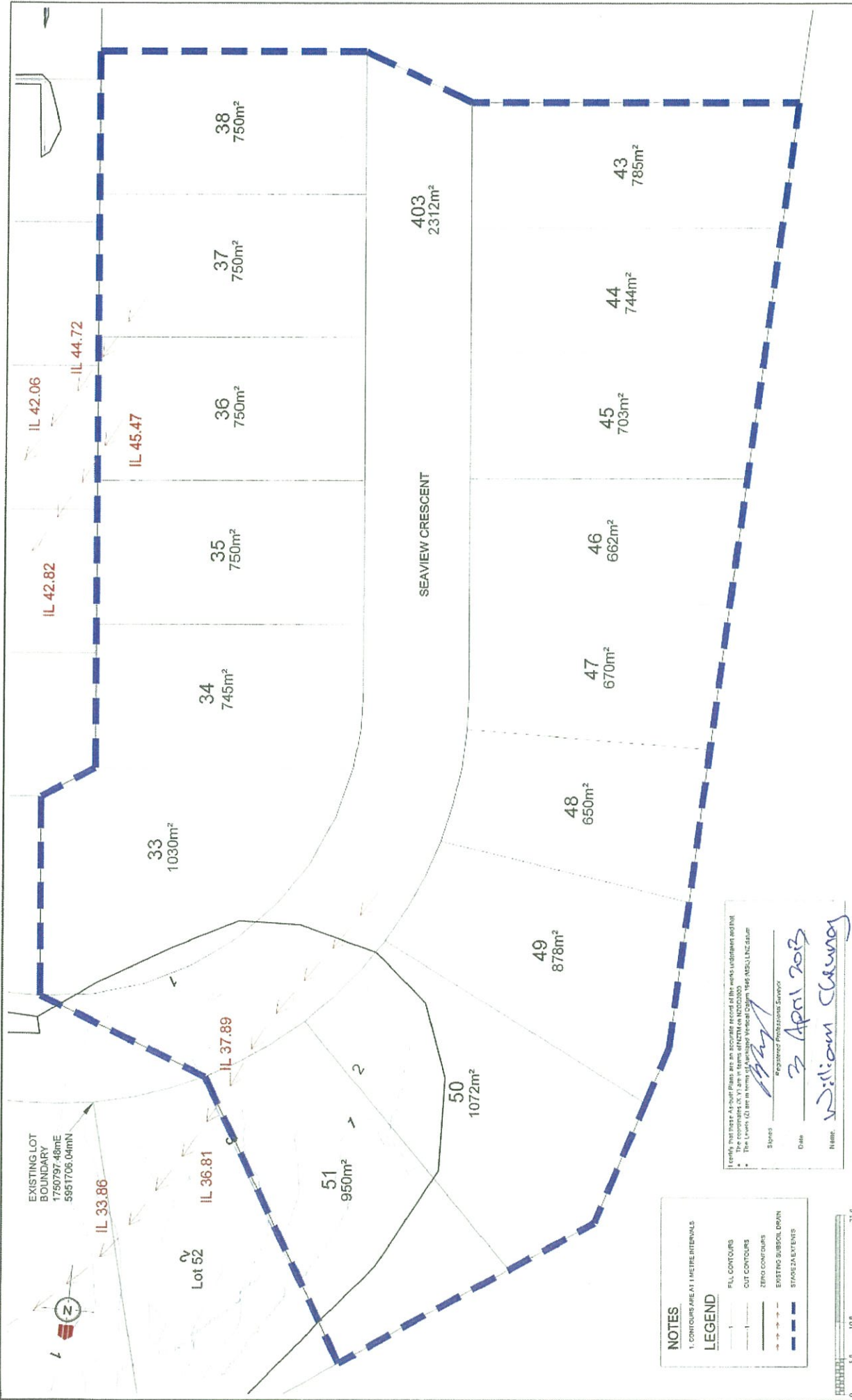
Figures



| | | | | | |
|--|--|---|--|--|--|
| BEACHWOOD SUBDIVISION - STAGE 2C FINAL CONTOURS ASBUILT PLAN RMA SLIC-57858 & RDC 21082 AUCKLAND COUNCIL | | WOODS Engineers, Surveyors, Planners | | LEIGHED MW PREPARED: [Signature] APPROVED: [Signature] JOB NUMBER: 60354-2C DRAWN: CD SCALE: 1:500 @ A3 TITLED: MAR 2013 EWC NO: 60354-2C-EW-100-AB REV: A | |
| CABRA CABRA DEVELOPMENTS LIMITED | | NOTES 1. CONTOURS ARE AT 0.5m INTERVALS LEGEND --- CONTOURS @ 5m INTERVALS --- TIMBER POLE RETAINING WALL TYPE B --- FENCE ABOVE TIMBER POLE WALL --- STAGE 2C EXTENTS | | | |
| EXISTING LOT BOUNDARY 1760797.48mE 5951706.04mN | | 1. Contours are shown at 0.5m intervals and are not to be used as a substitute for a full topographic survey. 2. The Levels (L2) are in terms of Mean Sea Level (MSL) NZ datum. Signed: [Signature] Registered Professional Surveyor Date: 2 April 2013 Name: William Cheung | | | |
| REVISION DETAILS A. ISSUED FOR L2&C | | CL/RTT NAME: [Blank] DATE: 26/03/13 CD: 26/03/13 | | | |



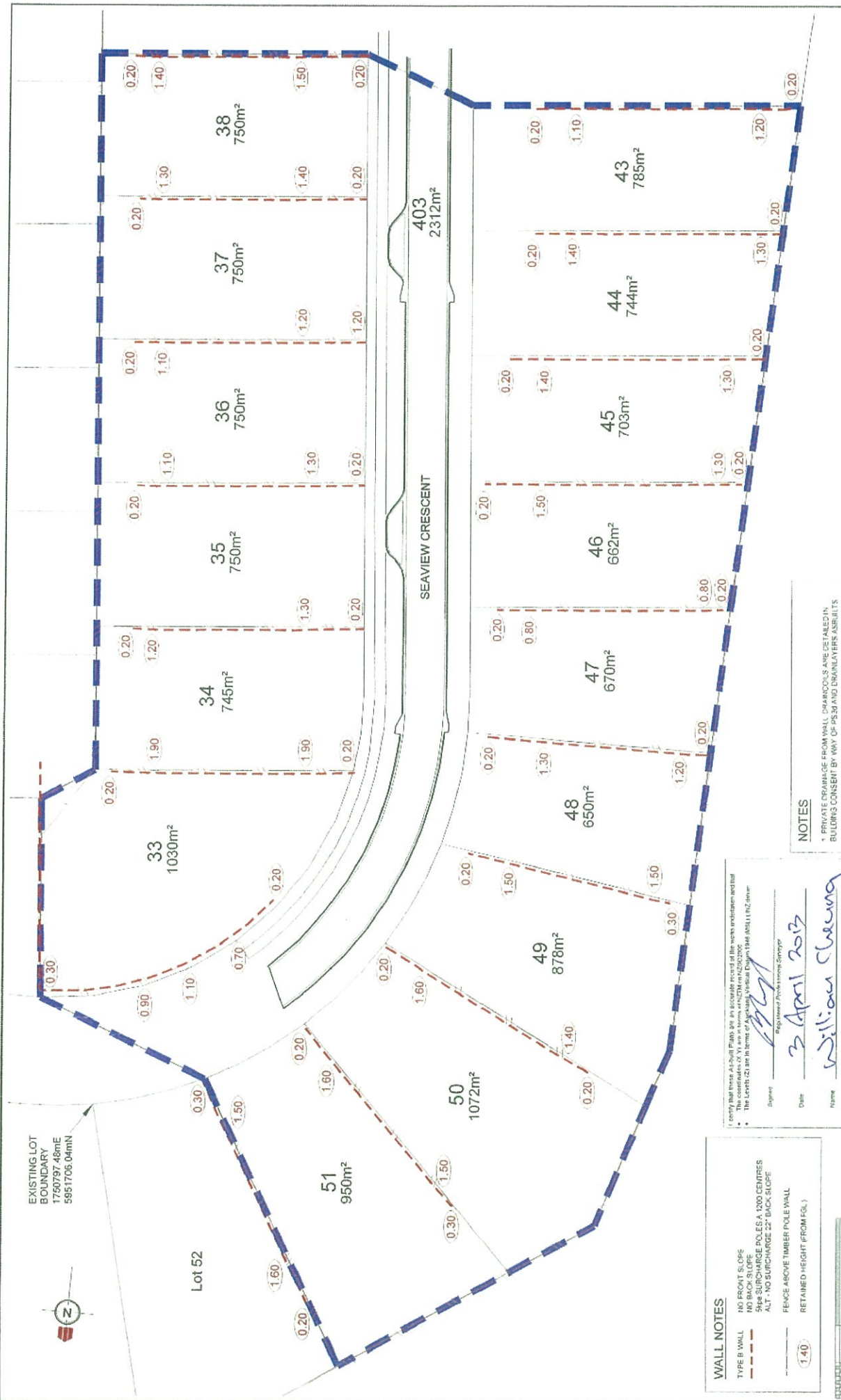
| <p>EXISTING LOT BOUNDARY 1750797.48mE 5951705.04mN</p> | | <p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>NAME</th> <th>REASON</th> </tr> <tr> <td>A</td> <td>2003.13</td> <td>CD</td> <td>ISSUED FOR 224c</td> </tr> </table> | | NO. | DATE | NAME | REASON | A | 2003.13 | CD | ISSUED FOR 224c | | | | | | | | |
|--|----------------------------|---|-----------------|-------------|--------------------|--------|----------------------------|----------|---------|-------|-----------------|------------|----------|---------|--|---------|----------|-----|---|
| NO. | DATE | NAME | REASON | | | | | | | | | | | | | | | | |
| A | 2003.13 | CD | ISSUED FOR 224c | | | | | | | | | | | | | | | | |
| <p>Lot 52</p> | | <p>NOTES</p> <p>1. CONTOURS ARE AT 0.25M INTERVALS</p> | | | | | | | | | | | | | | | | | |
| <p>SEASIDE CREST</p> | | <p>LEGEND</p> <ul style="list-style-type: none"> FILL CONTOURS CUT CONTOURS ZERO CONTOURS STAGE 2A EXTENTS | | | | | | | | | | | | | | | | | |
| <p>SEASIDE CREST</p> | | <p>Scale: 1:500</p> | | | | | | | | | | | | | | | | | |
| <p>SEASIDE CREST</p> | | <p>Signature: <i>William Chikney</i> Date: 3 April 2003 Name: William Chikney Title: Registered Professional Surveyor</p> | | | | | | | | | | | | | | | | | |
| <p>SEASIDE CREST</p> | | <p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>NAME</th> <th>REASON</th> </tr> <tr> <td>A</td> <td>2003.13</td> <td>CD</td> <td>ISSUED FOR 224c</td> </tr> </table> | | NO. | DATE | NAME | REASON | A | 2003.13 | CD | ISSUED FOR 224c | | | | | | | | |
| NO. | DATE | NAME | REASON | | | | | | | | | | | | | | | | |
| A | 2003.13 | CD | ISSUED FOR 224c | | | | | | | | | | | | | | | | |
| <p>SEASIDE CREST</p> | | <p>PROJECT INFORMATION</p> <table border="1"> <tr> <td>PROJECT NO.</td> <td>60354-2C-EW-110-AB</td> </tr> <tr> <td>CLIENT</td> <td>CABRA DEVELOPMENTS LIMITED</td> </tr> <tr> <td>DATE</td> <td>21.0</td> </tr> </table> | | PROJECT NO. | 60354-2C-EW-110-AB | CLIENT | CABRA DEVELOPMENTS LIMITED | DATE | 21.0 | | | | | | | | | | |
| PROJECT NO. | 60354-2C-EW-110-AB | | | | | | | | | | | | | | | | | | |
| CLIENT | CABRA DEVELOPMENTS LIMITED | | | | | | | | | | | | | | | | | | |
| DATE | 21.0 | | | | | | | | | | | | | | | | | | |
| <p>SEASIDE CREST</p> | | <p>PROJECT TITLE</p> <p>BEACHWOOD SUBDIVISION - STAGE 2C CUT / FILL CONTOURS ASBUILT PLAN ORIGINAL SURFACE TO ASBUILT SURFACE RMA SLC-57858 & RDC 21 082 AUCKLAND COUNCIL</p> | | | | | | | | | | | | | | | | | |
| <p>SEASIDE CREST</p> | | <p>LOGO</p> | | | | | | | | | | | | | | | | | |
| <p>SEASIDE CREST</p> | | <p>ASBUILT</p> <table border="1"> <tr> <td>CHECKED</td> <td>NOV</td> <td>DATE</td> <td>1.500 @ A3</td> </tr> <tr> <td>APPROVED</td> <td>CD</td> <td>SCALE</td> <td></td> </tr> <tr> <td>FOR NUMBER</td> <td>60354-2C</td> <td>PROJECT</td> <td></td> </tr> <tr> <td>PROJECT</td> <td>MAR 2013</td> <td>REV</td> <td>A</td> </tr> </table> | | CHECKED | NOV | DATE | 1.500 @ A3 | APPROVED | CD | SCALE | | FOR NUMBER | 60354-2C | PROJECT | | PROJECT | MAR 2013 | REV | A |
| CHECKED | NOV | DATE | 1.500 @ A3 | | | | | | | | | | | | | | | | |
| APPROVED | CD | SCALE | | | | | | | | | | | | | | | | | |
| FOR NUMBER | 60354-2C | PROJECT | | | | | | | | | | | | | | | | | |
| PROJECT | MAR 2013 | REV | A | | | | | | | | | | | | | | | | |



| | | |
|--|--|--|
| | | DESIGN: MW CHECKED: [Signature] APPROVED: [Signature] DRAWN: [Signature] SURVEYED: [Signature] DATE: MAR 2013 SCALE: 1:500 @ A3 DWG. NO: 60354-2C-EW-111-AB REV: A |
| BEACHWOOD SUBDIVISION - STAGE 2C CUT / FILL CONTOURS ASBUILT PLAN UNDERCUT SURFACE TO ASBUILT SURFACE RMA SLIC-57858 & RDC 21082 AUCKLAND COUNCIL | | |
| | | CLIENT: [Blank] NAME: [Blank] DATE: 28.03.13 ISSUED FOR: 224: [Blank] |

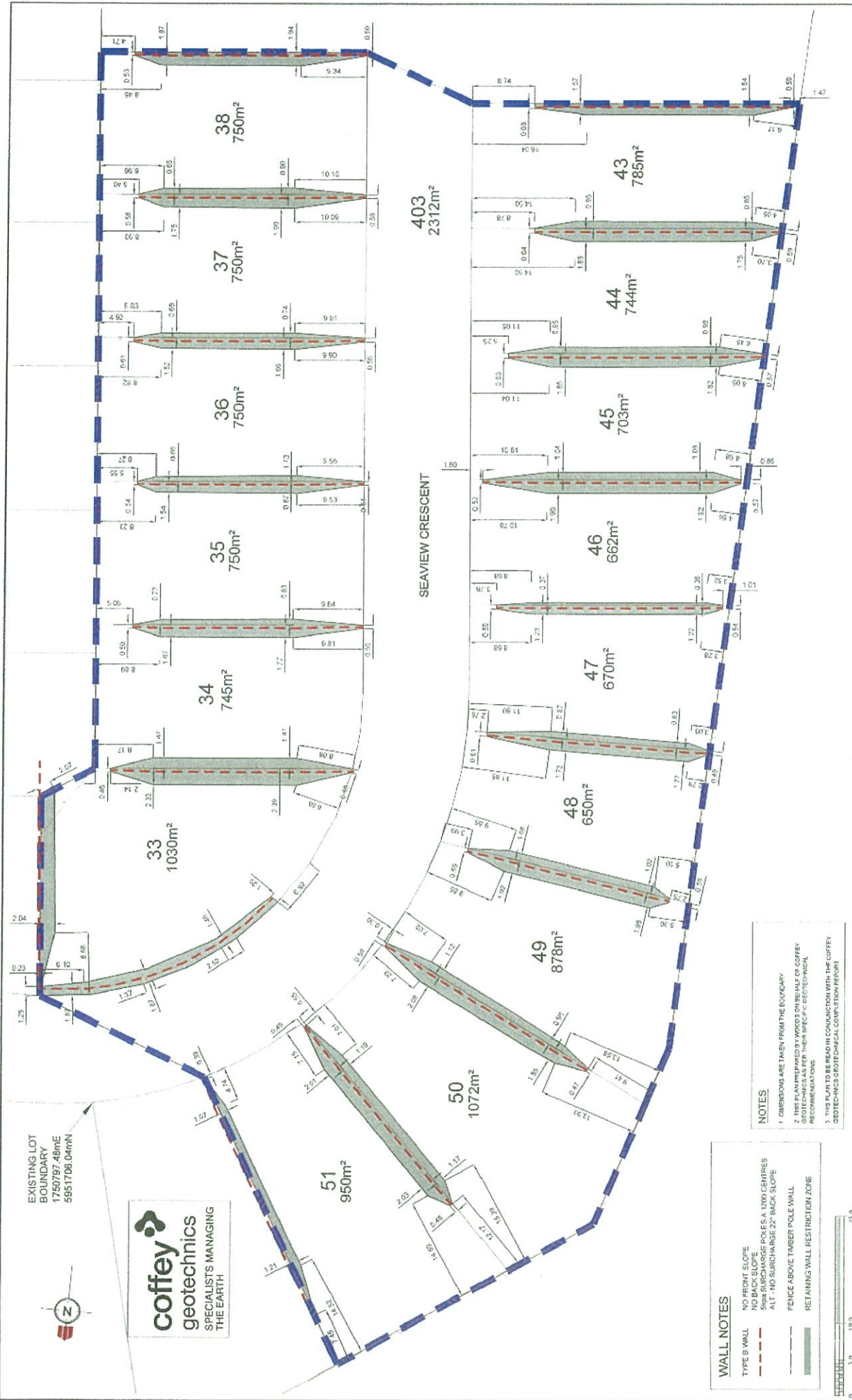
- NOTES**
 1. CONTOURS ARE AT 1 METRE INTERVALS
- LEGEND**
- FILL CONTOURS
 - - - CUT CONTOURS
 - ZERO CONTOURS
 - - - EXISTING SUBSOIL DRAIN
 - STAGE BOUNDARY

I hereby declare that the above is a true and correct copy of the original plan and that the information contained therein is true and correct to the best of my knowledge and belief.
 The information contained herein is for the use of the Council only and is not to be used for any other purpose.
 The Levels (IL) are in terms of Mean Sea Level Datum 1946 (MSL) LNZ datum.
 Signed: [Signature]
 Date: 3 April 2013
 Name: William Clancy
 Registration Professional Surveyor



| | | | |
|---|--|--|--|
| WALL NOTES NO FRONT SLOPE NO BACK SLOPE SHEET SURCHARGE POLES A 1200 CENTRES ALT - NO SURCHARGE 22° BACK SLOPE FENCE ABOVE TIMBER POLE WALL RETAINED HEIGHT (FROM FGL) | | PROVISION DETAILS NAME: CD DATE: 2009113 A ISSUED FOR 224c | |
| NOTES 1 PRIVATE DRAINAGE FROM WALL DRAINCOCKS ARE DETAILED IN BUILDING CONSENT BY WAY OF PS 50 AND DRAINLAYERS ASBUILT | | REVISIONS NO. 1 DATE: 2009113 BY: CD REASON: | |
| CLIENT CABRA DEVELOPMENTS LIMITED | | ASBUILT DRAWN: CO CHECKED: MF APPROVED: WF JOB NUMBER: 60354-2C ROAD: MAB 2013 SCALE: 1:500 @ A3 DWG. NO: 60354-2C-EW-120-AB REV: A | |
| BEACHWOOD SUBDIVISION - STAGE 2C ASBUILT RETAINING WALL PLAN RMA SL-57858 & RDC 21082 AUCKLAND COUNCIL | | | |
| CABRA DEVELOPMENTS LIMITED | | | |
| WOODS Engineers Surveyors Planners | | | |

I certify that these As-built Plans, etc. are a true and correct record of the works undertaken and that the coordinates of all points shown are NZTM or NZM2000.
 The Levels (z) are in terms of Applicable Vertical Datum 1984 (MSL) (NZ datum).
 Signature: *William Cheung*
 Date: 3 April 2013
 Name: William Cheung



EXISTING LOT
BOUNDARY
1750797.48mE
5951706.04mN

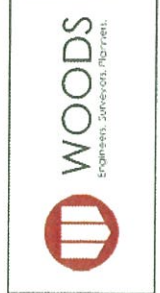


WALL NOTES

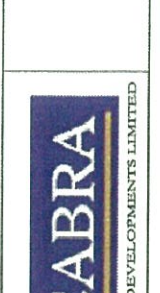
- TYPE B WALL
- NO FRONT SLOPE
- NO BACK SLOPE
- NO POLES A 1000 CENTRES
- NO SURCHARGE 22° BACK SLOPE
- FENCE ABOVE TIMBER POLE WALL
- RETAINING WALL RESTRICTION ZONE

- NOTES**
1. DIMENSIONS ARE TAKEN FROM THE BOUNDARY
 2. THIS PLAN PREPARED BY TIMOTHY COFFEY GEOTECHNICALS FOR THEIR SPECIFIC GEOTECHNICAL RECOMMENDATIONS
 3. THIS PLAN TO BE READ IN CONJUNCTION WITH THE COFFEY GEOTECHNICALS GEOTECHNICAL CONSULTATION REPORT

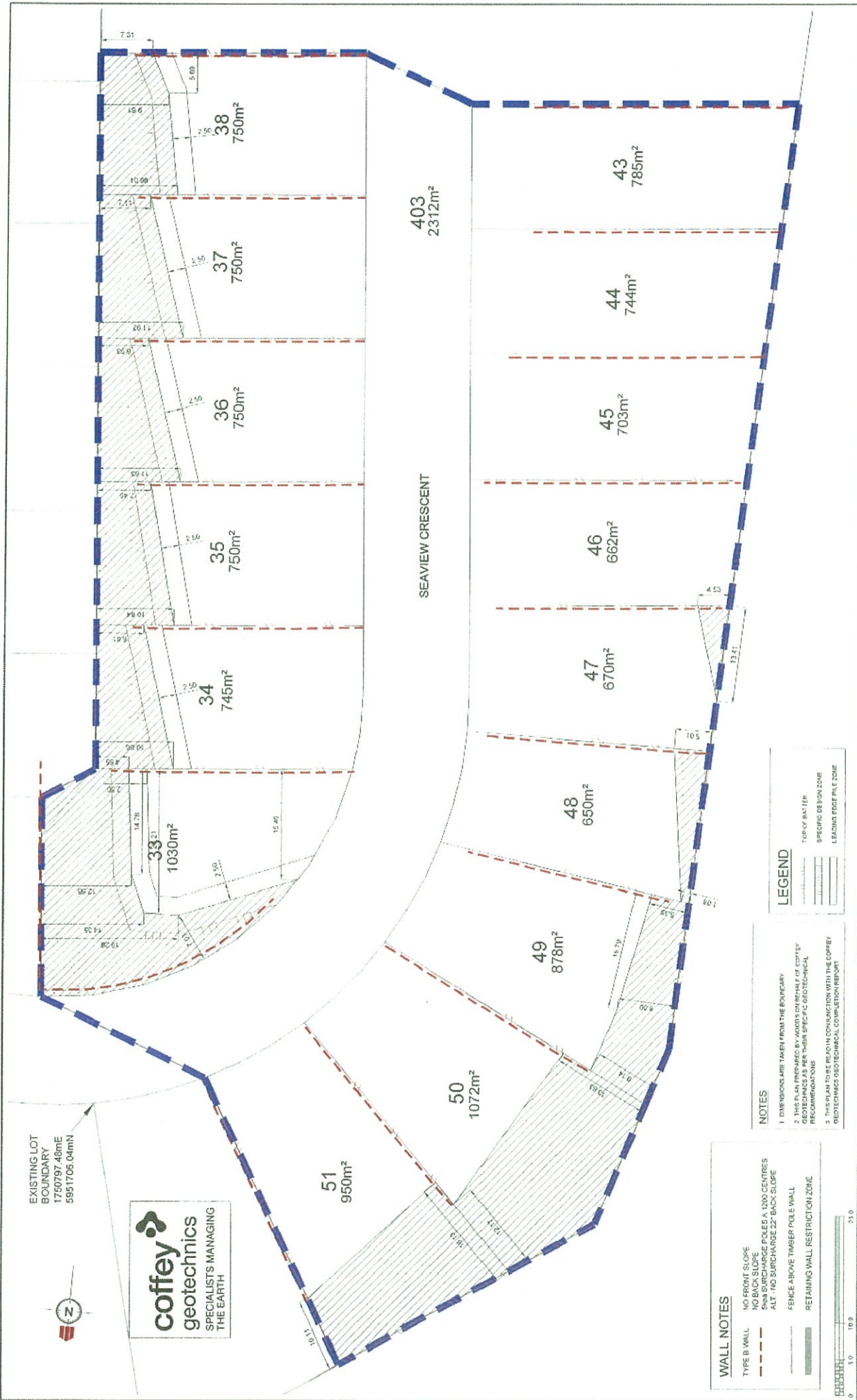
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| DESIGNED | NYK | CHECKED | NYK |
| DRAWN | CD | APPROVED | NYK |
| DATE | 15/03/13 | SCALE | 1:500 @ A3 |
| PROJECT | 60354-2C-EW-130-AB | ISSUED | MAR 2013 |



BEACHWOOD SUBDIVISION - STAGE 2C
 ASBUILT RETAINING WALL RESTRICTION ZONE PLAN
 RMA SLC-57858 & RDC 21082
 AUCKLAND COUNCIL



| | |
|------------|----------------------------|
| PROJECT | 60354-2C-EW-130-AB |
| ISSUED FOR | 224 |
| DATE | 15/03/13 |
| CLIENT | CABRA DEVELOPMENTS LIMITED |



EXISTING LOT
BOUNDARY
1750797.48mE
5951706.04mN



WALL NOTES
 TYPE B WALL
 NO FRONT SLOPE
 NO BACK SLOPE
 500mm SURFACE POLES AT 1500 CENTRES
 150mm SURFACE POLES AT 1500 CENTRES
 FENCE ABOVE TIMBER POLE WALL
 RETAINING WALL RESTRICTION ZONE

NOTES
 1 DIMENSIONS ARE TAKEN FROM THE BOUNDARY
 2 THIS PLAN PREPARED BY WOODS BAGOT IN ACCORDANCE WITH THE GEOTECHNICALS PERFORMED BY WOODS BAGOT
 3 THIS PLAN TO BE READ IN CONJUNCTION WITH THE COFFEY GEOTECHNICALS GEOTECHNICAL CONSULTATION REPORT

LEGEND
 TOP OF BATTER
 SPECIFIC DESIGN ZONE
 LEADING EDGE PILE ZONE

| PROVISIONAL DETAILS | DATE | CLIENT |
|---------------------|-----------------|--------|
| A | 20/03/13 | |
| A | ISSUED FOR 224c | |



BEACHWOOD SUBDIVISION - STAGE 2C
 ASBUILT BATTER RESTRICTION ZONE PLAN
 RMA SLC-57858 & RDC 21082
 AUCKLAND COUNCIL

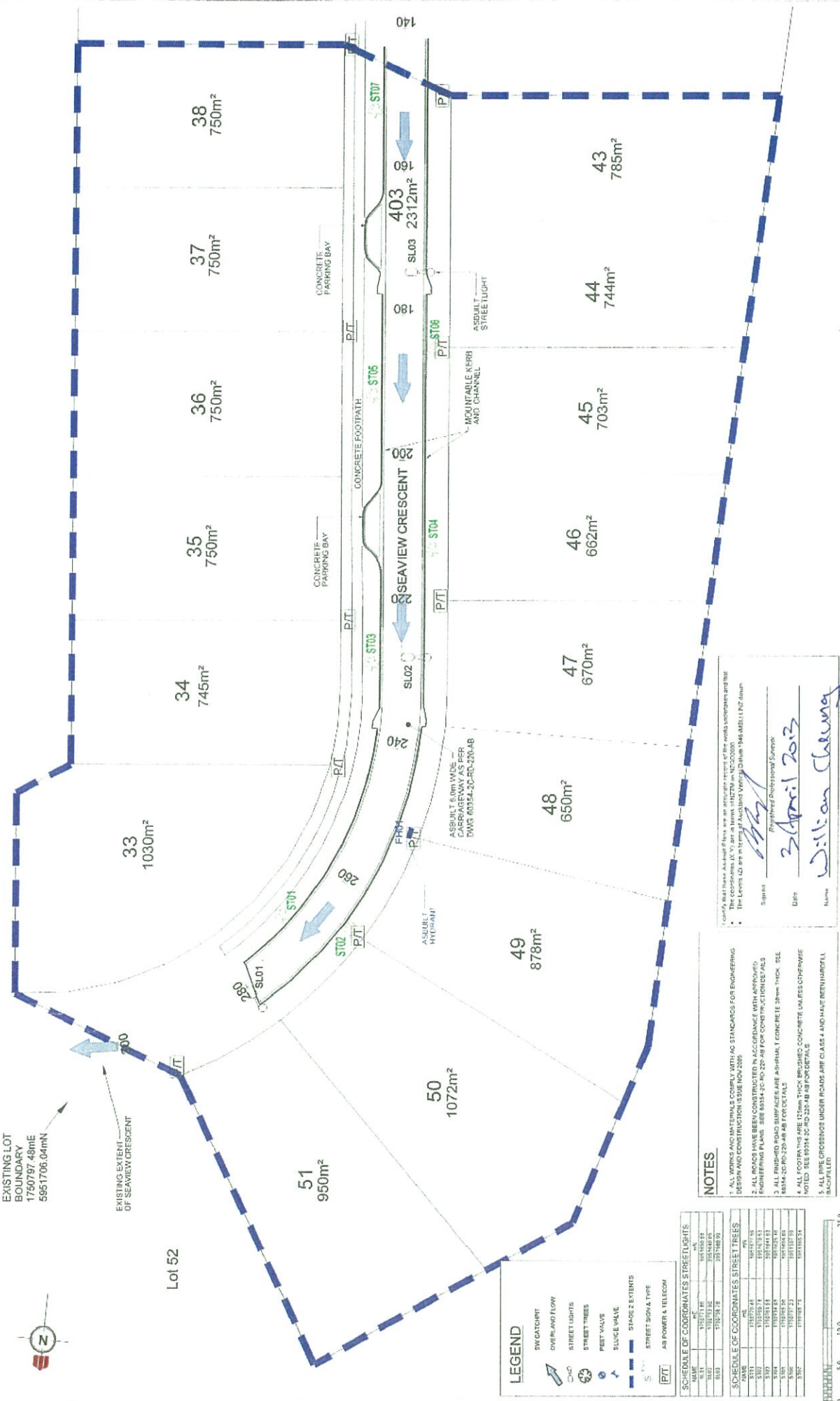


| DESIGNED | DRAWN | CHECKED | APPROVED | DATE |
|----------|-------|---------|----------|------|
| | | | | |

SCALE: 1:500 @ A3
 DATE: MAR 2013
 DWG NO: 60354-2C-EW-140-AB
 REV: A

EXISTING LOT BOUNDARY
1750797 48mE
5951706.04mN

EXISTING EXTENT OF SEAVIEW CRESCENT



Lot 52

33 1030m²

34 745m²

35 750m²

36 750m²

37 750m²

38 750m²

39 750m²

40 750m²

41 750m²

42 750m²

43 785m²

44 744m²

45 703m²

46 662m²

47 670m²

48 650m²

49 878m²

50 1072m²

51 950m²

403 2312m²

140

LEGEND

SW DITCH
OVERLAND FLOW
STREET LIGHTS
STREET TREES
PIEST VALVE
SLUDGE VALVE
STAGE 2 EXTENTS
STREET SIGN TYPE
AS POWER & TELECOM

SCHEDULE OF COORDINATES STREET LIGHTS

| LOT | TYPE | HEIGHT | SPACING |
|-----|------|--------|---------|
| 33 | ST01 | 3.0m | 10m |
| 34 | ST02 | 3.0m | 10m |
| 35 | ST03 | 3.0m | 10m |
| 36 | ST04 | 3.0m | 10m |
| 37 | ST05 | 3.0m | 10m |
| 38 | ST06 | 3.0m | 10m |
| 39 | ST07 | 3.0m | 10m |

SCHEDULE OF COORDINATES STREET TREES

| LOT | TYPE | HEIGHT | SPACING |
|-----|------|--------|---------|
| 33 | ST01 | 3.0m | 10m |
| 34 | ST02 | 3.0m | 10m |
| 35 | ST03 | 3.0m | 10m |
| 36 | ST04 | 3.0m | 10m |
| 37 | ST05 | 3.0m | 10m |
| 38 | ST06 | 3.0m | 10m |
| 39 | ST07 | 3.0m | 10m |

NOTES

1. ALL WORKS AND MATERIALS COMPLY WITH AG STANDARDS FOR ENGINEERING DESIGN AND CONSTRUCTION (ISSUE NOV 2005)
2. ALL ROADS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH APPROVED CONSTRUCTION PLANS. SEE 60354-2C-RD-200-AB FOR CONSTRUCTION DETAILS
3. ALL FINISHED ROAD SURFACES ARE ASPHALT, CONCRETE, OR TRUCK TIRE MARKING SURFACES AS SHOWN ON CONSTRUCTION PLANS
4. ALL FOOTWAYS ARE 1.20m THICK BUSHED CONCRETE UNLESS OTHERWISE NOTED. SEE 60354-2C-RD-200-AB FOR DETAILS
5. ALL PIPE CROSSINGS UNDER ROADS ARE CLASS 4 AND HAVE BENTHURFELL BUSHFELL

I certify that I have a full and complete knowledge of the works undertaken and that the conditions of this contract are fully understood and agreed to by all parties.

The Licensee is not responsible for the accuracy of the information provided in this plan.

Signature: *William Claugy*
Date: 2 April 2013
Name: William Claugy

| | |
|-------------|--------------------|
| DESIGNED BY | ASBUILT |
| DRAWN BY | CD |
| SURVEYED BY | MC |
| PER NUMBER | SCALE |
| ISSUED | 1:500 @ A3 |
| DWS NO | 60354-2C-RD-200-AB |
| REV | A |



BEACHWOOD SUBDIVISION - STAGE 2C
ROADING AND STREET TREE AS-BUILT PLAN
RMA SLC-57858 & RDC 211082
AUCKLAND COUNCIL



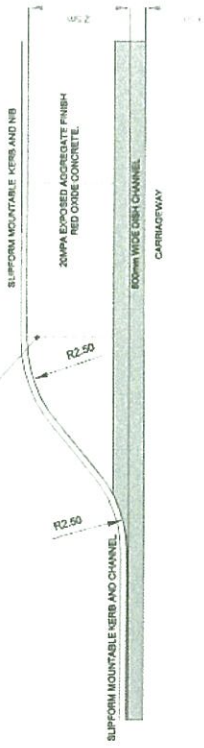
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| ISSUED FOR | DATE | CLIENT |
| 2246 | 20/03/13 | |
| NAME | DATE | |
| CD | 20/03/13 | |

NOTE

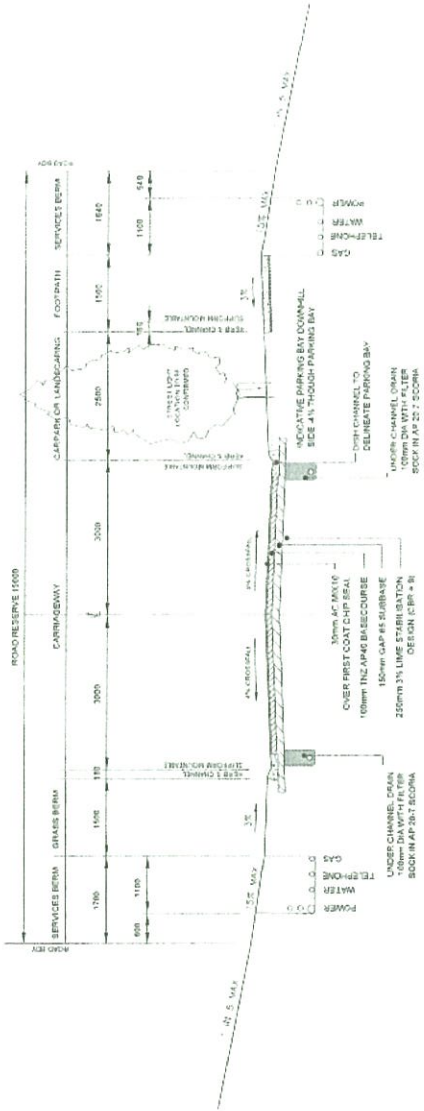
1. ALL WORKS AND MATERIALS COMPLY WITH ALL REQUIREMENTS FOR FINISHED HIGHWAY AND CONSTRUCTION TABLE NOV 2007 APPROVED ENGINEERING PLANS
2. ALL ROADS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH APPROVED ENGINEERING PLANS
3. ALL FINISHED ROAD SURFACES ARE ASPHALT CONCRETE 30mm THICK. EXCEPT FOR DRIVEWAYS AND DRIVEWAYS ARE ASPHALT CONCRETE 30mm THICK. MATERIAL SPECIFICATIONS ARE AS FOLLOWS: ASPHALT CONCRETE 30mm THICK: 150mm CARBON FIBRE FIBRE REINFORCED CONCRETE (RCC) WITH 15% FIBRE (RCC) WITH 15% FIBRE
4. ALL CONCRETE WORKS SHALL BE TO THE FOLLOWING STANDARDS:
 - Slump: 120mm (max)
 - Air Content: 4.0% (min)
 - Density: 2400 kg/m³ (min)
 - W/C Ratio: 0.45 (max)
5. ALL DEF-DEFERRED WORKS SHALL BE FINISHED IN ACCORDANCE WITH THE FOLLOWING STANDARDS:
 - Slump: 120mm (max)
 - Air Content: 4.0% (min)
 - Density: 2400 kg/m³ (min)
 - W/C Ratio: 0.45 (max)
6. ALL DEF-DEFERRED WORKS SHALL BE FINISHED IN ACCORDANCE WITH THE FOLLOWING STANDARDS:
 - Slump: 120mm (max)
 - Air Content: 4.0% (min)
 - Density: 2400 kg/m³ (min)
 - W/C Ratio: 0.45 (max)

I hereby certify that the above information is an accurate record of the work performed in the construction of the above project in accordance with the conditions of the contract and the relevant standards.

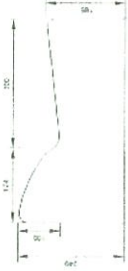
Signed: [Signature]
 Date: 7 April 2013
 Name: William Claug



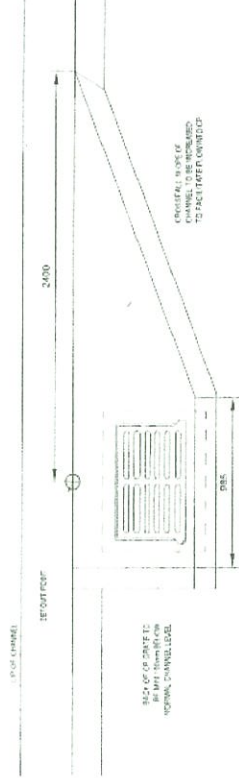
TYPICAL PARKING BAY PLAN



TYPICAL CROSS SECTION - SEAVIEW CRESCENT



ROLLED KERB & CHANNEL DETAIL
SCALE 1:12.5 @ A3



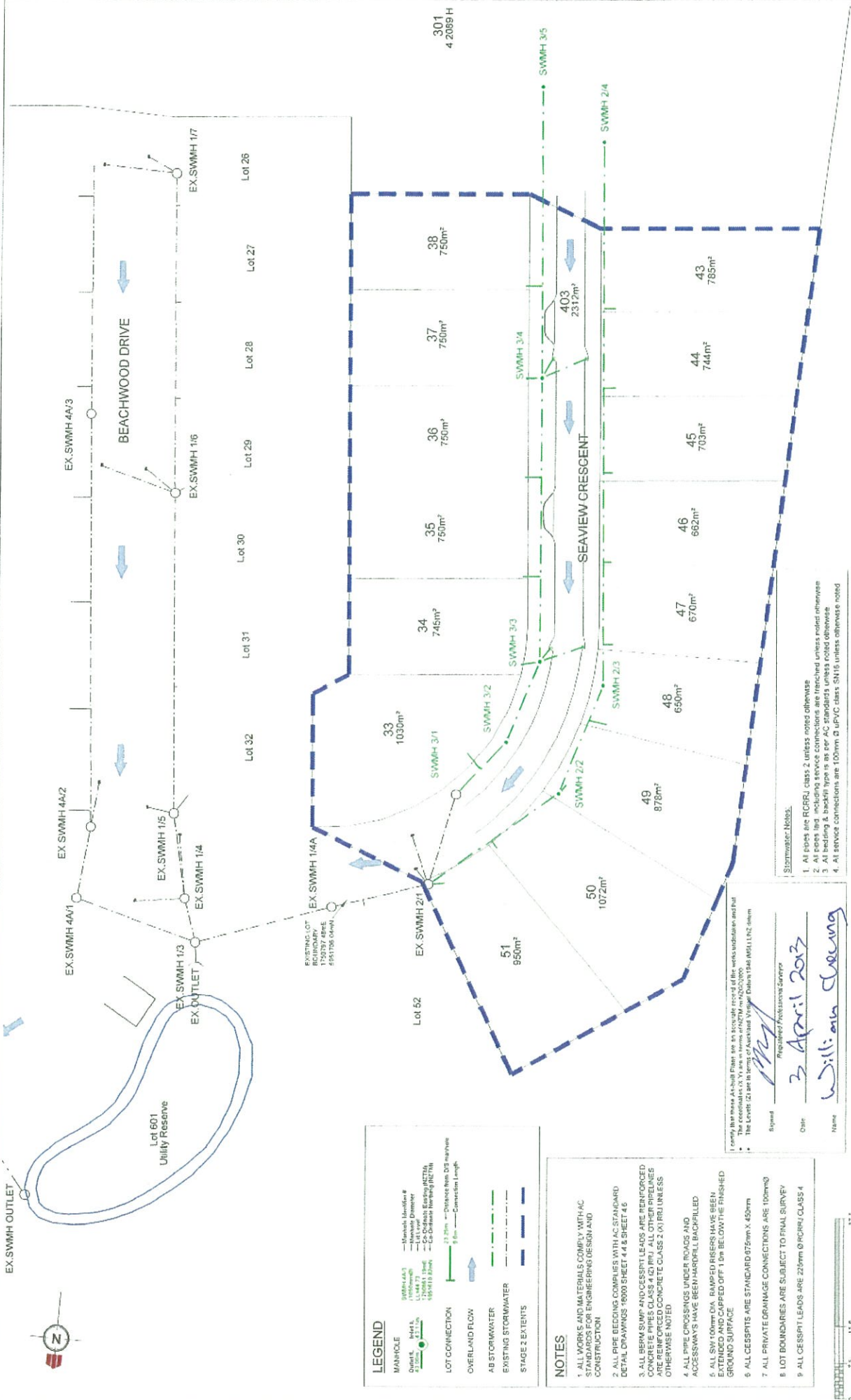
RECESSED CATCHPIT DETAIL
SCALE 1:33.3 @ A3



BEACHWOOD SUBDIVISION - STAGE 2C
TYPICAL ROAD DETAILS ASBUILT PLAN
RMA SLC 57858 & RDC 21082
AUCKLAND COUNCIL

| | | | |
|---|----------------|-----------------------|-------------------|
| CLIENT: AUCKLAND COUNCIL | DATE: 20.03.13 | NAME: CD | SCALE: 1:100 @ A3 |
| PROJECT: BEACHWOOD SUBDIVISION - STAGE 2C | DATE: 03/14 | DRAWN: CD | SCALE: 1:100 @ A3 |
| PROJECT NUMBER: 60354-2C-RD-220-AB | DATE: 03/14 | APPROVED: [Signature] | SCALE: 1:100 @ A3 |
| DWG NO: 60354-2C-RD-220-AB | DATE: 03/14 | CHECKED: [Signature] | SCALE: 1:100 @ A3 |
| REV: A | DATE: 03/14 | DESIGNED: [Signature] | SCALE: 1:100 @ A3 |





LEGEND

| | |
|--|---------------------|
| | MANHOLE |
| | PIT |
| | PIPE |
| | OVERLAND FLOW |
| | EXISTING STORMWATER |
| | STAGE 2 EXTENTS |

- NOTES**
1. ALL WORKS AND MATERIALS COMPLY WITH AC STANDARDS FOR ENGINEERING DESIGN AND CONSTRUCTION
 2. ALL PIPE BEDDING COMPLIES WITH AC STANDARD DETAIL DRAWINGS 19000 SHEET 4.4 & SHEET 4.5
 3. ALL BERM SWIMPS AND CESSPIT LEADS ARE REINFORCED CONCRETE CLASS 2 (X) RRI UNLESS OTHERWISE NOTED
 4. ALL PIPE CROSSINGS UNDER ROADS AND ACCESSWAYS HAVE BEEN HARDPITTED/BACKFILLED
 5. ALL SW 100mm DIA. RAMPED RISERS HAVE BEEN EXTENDED AND CAPPED OFF 1.0m BELOW THE FINISHED GROUND SURFACE
 6. ALL CESSPITS ARE STANDARD 675mm X 450mm
 7. ALL PRIVATE DRAINAGE CONNECTIONS ARE 100mm
 8. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY
 9. ALL CESSPIT LEADS ARE 225mm Ø PIPRI CLASS 4

- Stormwater Notes:**
1. All pipes are RCERU class 2 unless noted otherwise
 2. All pits and including service connections are finished unless noted otherwise
 3. All bedding & backfill type is per AC standards unless noted otherwise
 4. All service connections are 100mm Ø uPVC class SN16 unless otherwise noted

I certify that these As-built Plans are an accurate record of the works undertaken and that the Levels (if any) are in terms of Australian Vertical Datum (1984) (AVD) LLGL datum.

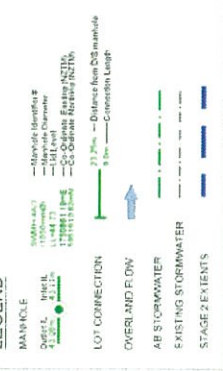
Signed: *William Cheung*
 Registered Professional Surveyor
 Date: 3 April 2023
 Name: William Cheung

| | | | | | | | |
|---------------------------------------|--|---|--|--|--|---|--|
| CABRA DEVELOPMENTS LIMITED | | BEACHWOOD SUBDIVISION - STAGE 2C OVERALL ASBUILT STORMWATER PLAN RMA SLC 57858 & RDC 21082 AUCKLAND COUNCIL | | WOODS Engineers Surveyors Planners | | DEMAND: DWG CHECKED: [Signature] APPROVED: [Signature] JOB NUMBER: 60354-2C SCALE: 1:750 @ A3 DATE: MAR 2023 DWG NO: 60354-2C-DR-380-AB REV: A | |
|---------------------------------------|--|---|--|--|--|---|--|

NOTES

1. ALL WORKS AND MATERIALS COMPLY WITH A.C. STANDARDS FOR ENGINEERING DESIGN AND CONSTRUCTION.
2. ALL PIPE BEDDING COMPLIES WITH A.C. STANDARD DETAIL DRAWINGS 16000 SHEET 4.4 & SHEET 4.6
3. ALL BERM, SUMP AND CESSPIT LEADS ARE REINFORCED CONCRETE CLASS 2/10 RCRRI. ALL OTHER PIPES ARE REINFORCED CONCRETE CLASS 2/10 RCRRI UNLESS OTHERWISE NOTED.
4. ALL PIPE CROSSINGS UNDER ROADS AND ACCESSWAYS HAVE BEEN HANDPILLED BROCPILLED.
5. ALL SW 100mm DIA. RAMPED RISERS HAVE BEEN EXTENDED AND CAPPED OFF 10m BELOW THE FINISHED GROUND SURFACE.
6. ALL CESSPITS ARE STANDARD 675mm x 450mm
7. ALL PRIVATE DRAINAGE CONNECTIONS ARE 100mm
8. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY
9. ALL CESSPIT LEADS ARE 225mm Ø RCRRI CLASS 4

LEGEND



Stormwater Notes

1. All pipes are RCRRI class 2, unless noted otherwise.
2. All pipes laid, including service connections are trenchless unless noted otherwise.
3. All bedding & backfill type is as per A.C. standards unless noted otherwise.
4. All service connections are 100mm Ø UPVC class S116 unless otherwise noted.

I certify that these As-Built Plans are an accurate record of the work undertaken and that:
 • The coordinates (X, Y) are in terms of NZTM on NZGD2000
 • The Levels (Z) are in terms of Australian Vertical Datum 1984 (MSL) UNZ datum

Signed: *William Colving*
 Registered Professional Surveyor
 Date: 3 April 2013
 Name: William Colving

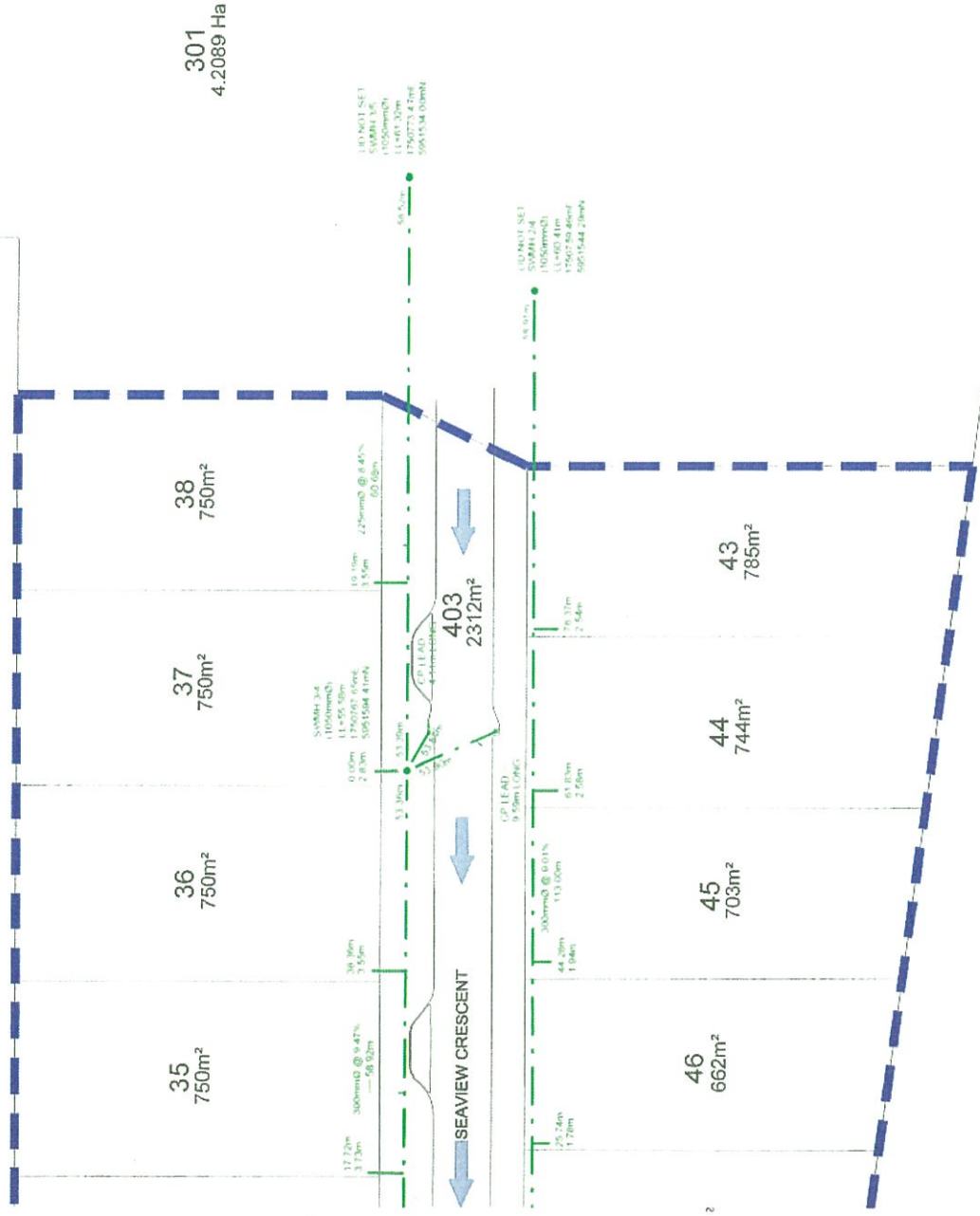
| | |
|--------------|---------------------|
| DESIGNED BY | ASBUILT |
| CHECKED BY | DATE |
| APPROVED BY | SURVEYED |
| DRAWN NUMBER | SCALE |
| ISSUED | DATE |
| DWG. NO. | 6035-4-2C-DR-382-AB |
| REV | A |

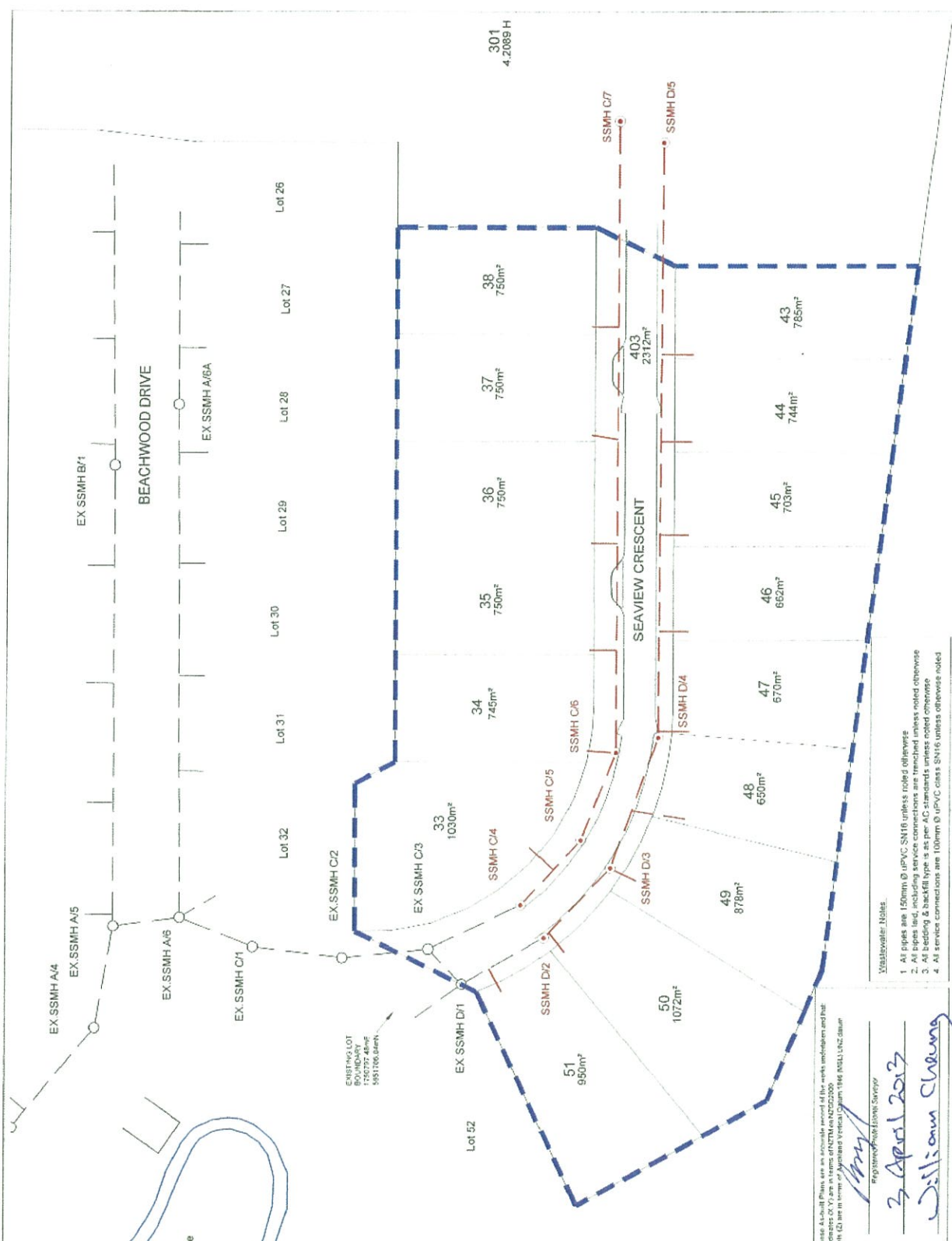


BEACHWOOD SUBDIVISION - STAGE 2C
 AS-BUILT STORMWATER DETAIL PLAN
 RMA SLC 57858 & RDC 21082
 AUCKLAND COUNCIL



| | | |
|------------------|--------|----------|
| REVISION DETAILS | NAME | DATE |
| A - 2244-PS&E | CD | 19/03/13 |
| | CLIENT | |





LEGEND

| MANHOLE | |
|-----------------|-----------------------|
| Symbol | Material Identifier # |
| 1. 1500mm dia | 1. 1500mm dia |
| 2. 1500mm dia | 2. 1500mm dia |
| 3. 1500mm dia | 3. 1500mm dia |
| 4. 1500mm dia | 4. 1500mm dia |
| 5. 1500mm dia | 5. 1500mm dia |
| 6. 1500mm dia | 6. 1500mm dia |
| 7. 1500mm dia | 7. 1500mm dia |
| 8. 1500mm dia | 8. 1500mm dia |
| 9. 1500mm dia | 9. 1500mm dia |
| 10. 1500mm dia | 10. 1500mm dia |
| 11. 1500mm dia | 11. 1500mm dia |
| 12. 1500mm dia | 12. 1500mm dia |
| 13. 1500mm dia | 13. 1500mm dia |
| 14. 1500mm dia | 14. 1500mm dia |
| 15. 1500mm dia | 15. 1500mm dia |
| 16. 1500mm dia | 16. 1500mm dia |
| 17. 1500mm dia | 17. 1500mm dia |
| 18. 1500mm dia | 18. 1500mm dia |
| 19. 1500mm dia | 19. 1500mm dia |
| 20. 1500mm dia | 20. 1500mm dia |
| 21. 1500mm dia | 21. 1500mm dia |
| 22. 1500mm dia | 22. 1500mm dia |
| 23. 1500mm dia | 23. 1500mm dia |
| 24. 1500mm dia | 24. 1500mm dia |
| 25. 1500mm dia | 25. 1500mm dia |
| 26. 1500mm dia | 26. 1500mm dia |
| 27. 1500mm dia | 27. 1500mm dia |
| 28. 1500mm dia | 28. 1500mm dia |
| 29. 1500mm dia | 29. 1500mm dia |
| 30. 1500mm dia | 30. 1500mm dia |
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| 65. 1500mm dia | 65. 1500mm dia |
| 66. 1500mm dia | 66. 1500mm dia |
| 67. 1500mm dia | 67. 1500mm dia |
| 68. 1500mm dia | 68. 1500mm dia |
| 69. 1500mm dia | 69. 1500mm dia |
| 70. 1500mm dia | 70. 1500mm dia |
| 71. 1500mm dia | 71. 1500mm dia |
| 72. 1500mm dia | 72. 1500mm dia |
| 73. 1500mm dia | 73. 1500mm dia |
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| 87. 1500mm dia | 87. 1500mm dia |
| 88. 1500mm dia | 88. 1500mm dia |
| 89. 1500mm dia | 89. 1500mm dia |
| 90. 1500mm dia | 90. 1500mm dia |
| 91. 1500mm dia | 91. 1500mm dia |
| 92. 1500mm dia | 92. 1500mm dia |
| 93. 1500mm dia | 93. 1500mm dia |
| 94. 1500mm dia | 94. 1500mm dia |
| 95. 1500mm dia | 95. 1500mm dia |
| 96. 1500mm dia | 96. 1500mm dia |
| 97. 1500mm dia | 97. 1500mm dia |
| 98. 1500mm dia | 98. 1500mm dia |
| 99. 1500mm dia | 99. 1500mm dia |
| 100. 1500mm dia | 100. 1500mm dia |

- NOTES**
1. ALL WORKS AND MATERIALS COMPLY WITH AC STANDARDS FOR ENGINEERING DESIGN AND CONSTRUCTION.
 2. ALL PIPE BEDDING COMBES WITH AC STANDARD DETAIL DRAWINGS 18000 SHEET 4.4.1 & SHEET 4.6
 3. ALL PIPE CROSSINGS UNDER ROADS AND ACCESSWAYS HAVE BEEN HATCHED/BAGGIFIED
 4. ALL 150mm DIA. RAMPED RISERS HAVE BEEN EXTENDED AND CAPPED OFF 1.0m BELOW THE FINISHED GROUND SURFACE
 5. ALL PRIVATE DRAINAGE CONNECTIONS ARE 100mmØ
 6. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY
 7. ALL WW PIPE TYPES ARE 150mmØ uPVC SNI18 UNLESS OTHERWISE NOTED

- Wastewater: Notes**
1. All pipes are 150mmØ uPVC SNI18 unless noted otherwise
 2. All pipe bedding is 100mmØ crushed rock unless noted otherwise
 3. All bedding & backfill type is as per AC standard unless noted otherwise
 4. All service connections are 100mmØ uPVC class SNI18 unless otherwise noted

I certify that these As-built Plans are an accurate record of the works undertaken and that:
 The coordinates (X,Y) are in terms of NZTM (EPSG:2193)
 The datum is the New Zealand Datum 1949 (NZLD 1949 datum)

Signature: *[Signature]*
 Date: 3 April 2013
 Name: Williamson Chuang

| | | | | |
|---------------------------------------|---|---------------------------------------|--|--|
| CABRA DEVELOPMENTS LIMITED | BEACHWOOD SUBDIVISION - STAGE 2C OVERALL ASBUILT WASTEWATER PLAN RMA SLC 57858 & RDC 21082 AUCKLAND COUNCIL | | WOODS Engineers Surveyors Planners | PROJECT NO: 60354-2C-DR-400-AB REV: A |
| | REVISION DETAILS NAME: DATE A 22.4.13 | CLIENT NAME: DATE C/D: 19.03.13 | | |

NOTES

1. ALL WORKS AND MATERIALS COMPLY WITH AC STANDARDS FOR ENGINEERING DESIGN AND CONSTRUCTION
2. ALL PIPE BEDDING COMPLIES WITH AC STANDARD DETAIL DRAWINGS 19000 SHEET 4.4 & SHEET 4.9.
3. ALL PIPE CROSSINGS UNLESS NOTED OTHERWISE HAVE BEEN HARBORL BAG FILLED
4. ALL 100mm DIA. RAMPED RISERS HAVE BEEN EXTENDED AND CAPPED OFF 1.0m BELOW THE FINISHED GROUND SURFACE
5. ALL PRIVATE DRAINAGE CONNECTIONS ARE 100mmØ
6. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY
7. ALL WAREPIE TYPES ARE 150mmØ UPVC UNLESS OTHERWISE NOTED

LEGEND



Wastewater Notes:

1. All pipes are 150mm Ø UPVC SNI10 unless noted otherwise
2. All pipes laid including service connections are trench unless noted otherwise
3. All bedding & backfill type is as per AC standards unless noted otherwise
4. All service connections are 100mm Ø UPVC class SNI10 unless otherwise noted

I, **William Clancy**, a Licensed Professional Engineer, certify that these As-built Plans are an accurate record of the work performed and that the construction of the works is in accordance with the standards of the Engineering Council of New Zealand (ECNZ) and the standards of the Engineering Council of New Zealand (ECNZ).
 Date: **22 April 2013**
 Name: **William Clancy**

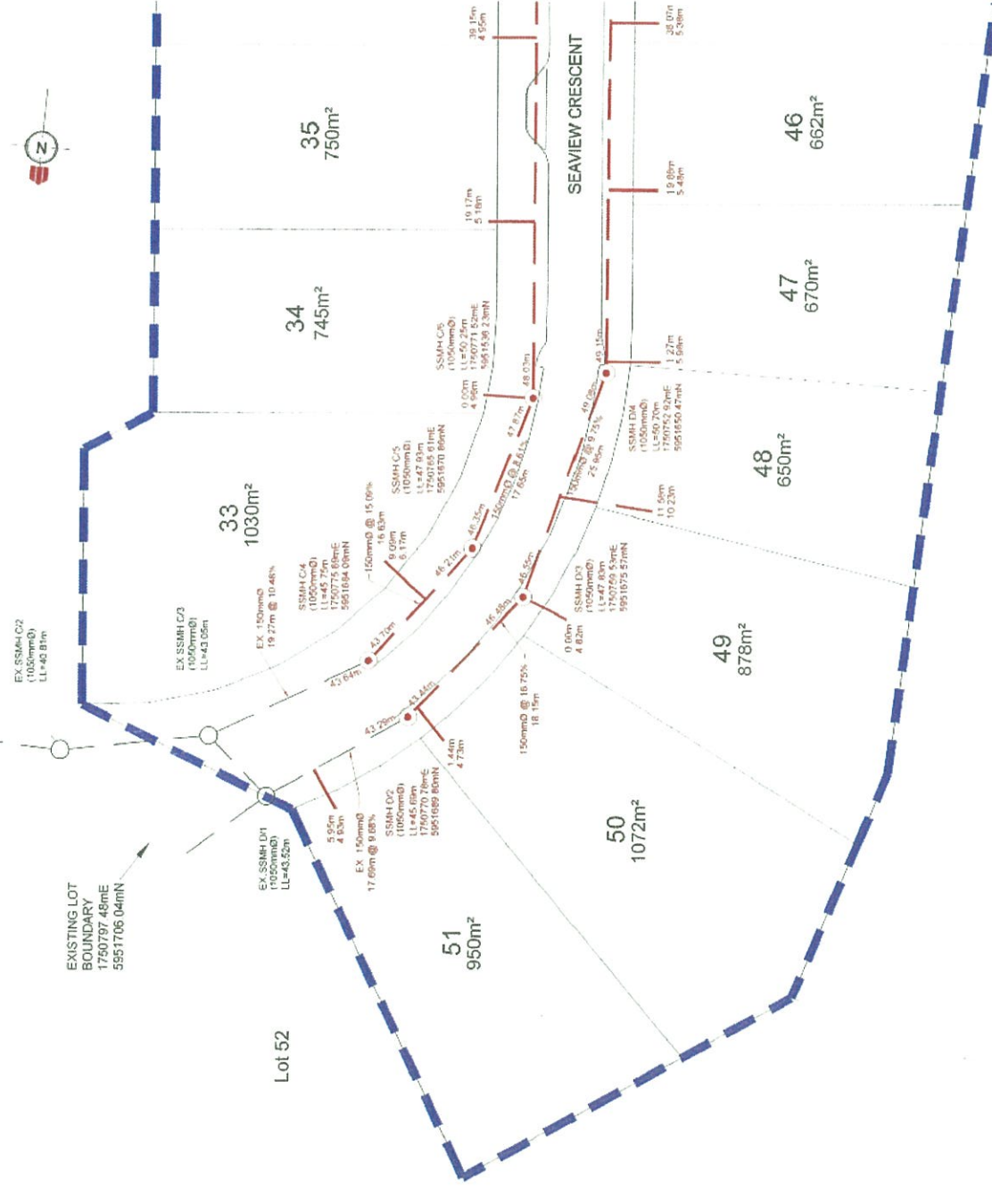
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|-------------|--------------------|--------|
| DESIGNED | NR | ASBLET |
| CHECKED | CD | CD |
| APPROVED | WJ | WJ |
| DRAWN | WJ | WJ |
| SCALE | 1:500 @ A3 | |
| DATE | MAR 2013 | |
| PROJECT NO. | 60354-2C-DR-401-AB | |



BEACHWOOD SUBDIVISION - STAGE 2C
 ASBUILT WASTEWATER DETAIL PLAN
 RMA SLC 57858 & RDC 21082
 AUCKLAND COUNCIL

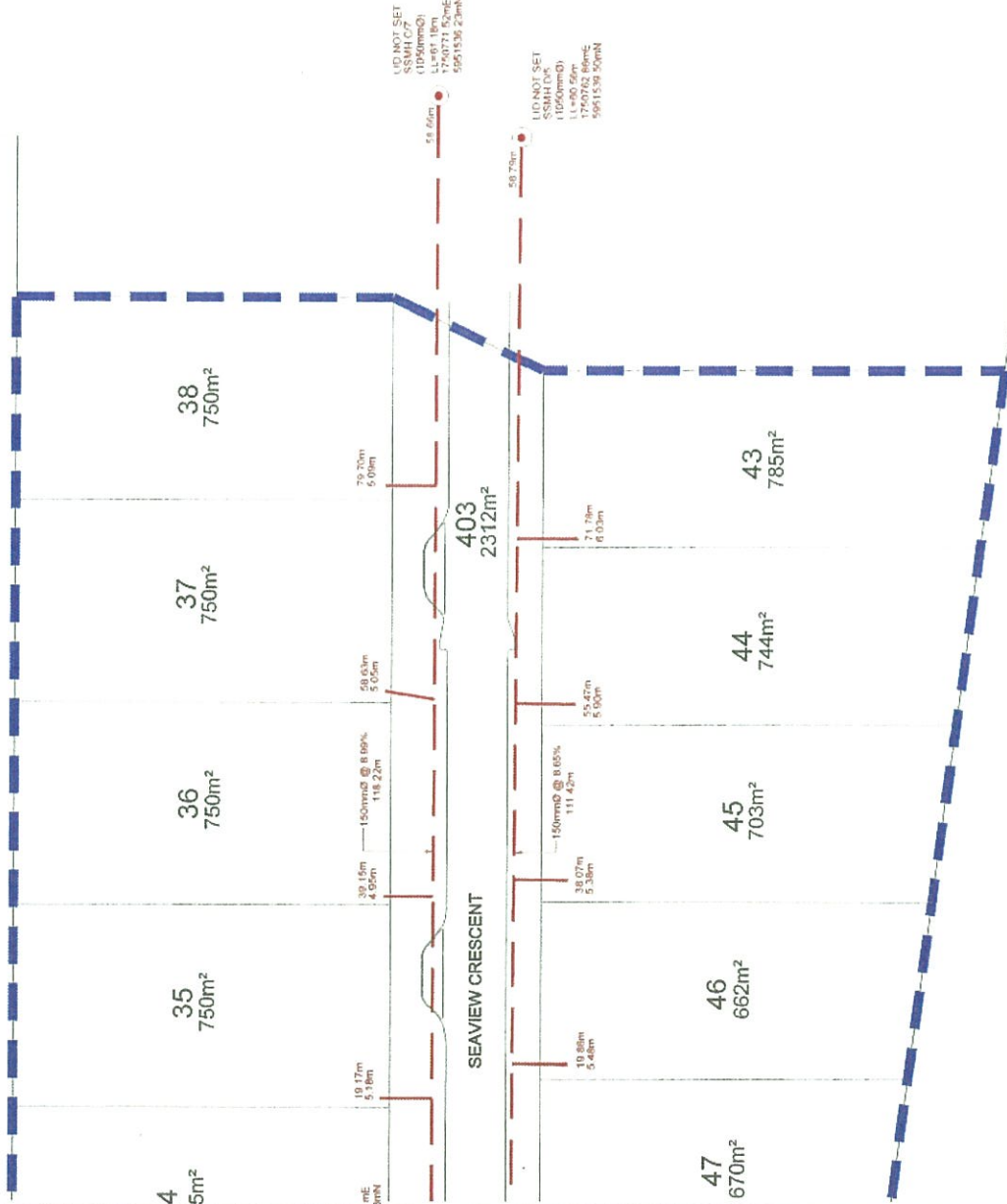


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| REVISION DETAILS | DATE |
| A. 2/24/6 650E | 19/03/13 |





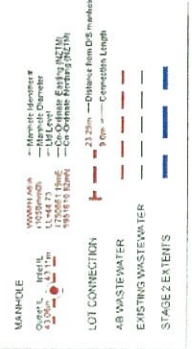
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NOTES

1. ALL WORKS AND MATERIALS COMPLY WITH AC STANDARDS FOR ENGINEERING DESIGN AND CONSTRUCTION
2. ALL PIPE BEDDINGS COMPLY WITH AC STANDARD DETAIL DRAWINGS 1000 SHEET 4.4 & SHEET 4.6
3. ALL PIPE CONNECTIONS UNDER ROADS AND ACCESSWAYS HAVE BEEN HANDFUL BACKFILLED
4. ALL 150mm DIA. RAMMED RISERS HAVE BEEN EXTENDED AND CAPPED OFF 1.0m BELOW THE FINISHED GROUND SURFACE
5. ALL PRIVATE DRAINAGE CONNECTIONS ARE 100mm
6. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY
7. ALL 150mm PIPE TYPES ARE 150mm Ø UPVC SN16 UNLESS OTHERWISE NOTED

LEGEND




Wastewater Notes:

1. All pipes are 150mm Ø UPVC SN16 unless noted otherwise.
2. All pipes (incl. including service connections) are trenchless unless noted otherwise.
3. All bedding & backfill type is as per AC standards unless noted otherwise.
4. All service connections are 100mm Ø UPVC class SN16 unless otherwise noted.

I certify that these AS-built Plans are an accurate record of the works undertaken and that the information is true and correct to the best of my knowledge and belief.

The Level: CD, in terms of Auckland Vertical Datum 1984 (MVD 1984) NZD datum

Signed: 
 Registered Professional Surveyor

DATE: 3 April 2013

Name: William Clancy

| PROVISION DETAILS | NAME | DATE |
|-------------------|------|----------|
| A 224- ISSUE | CD | 19/01/13 |

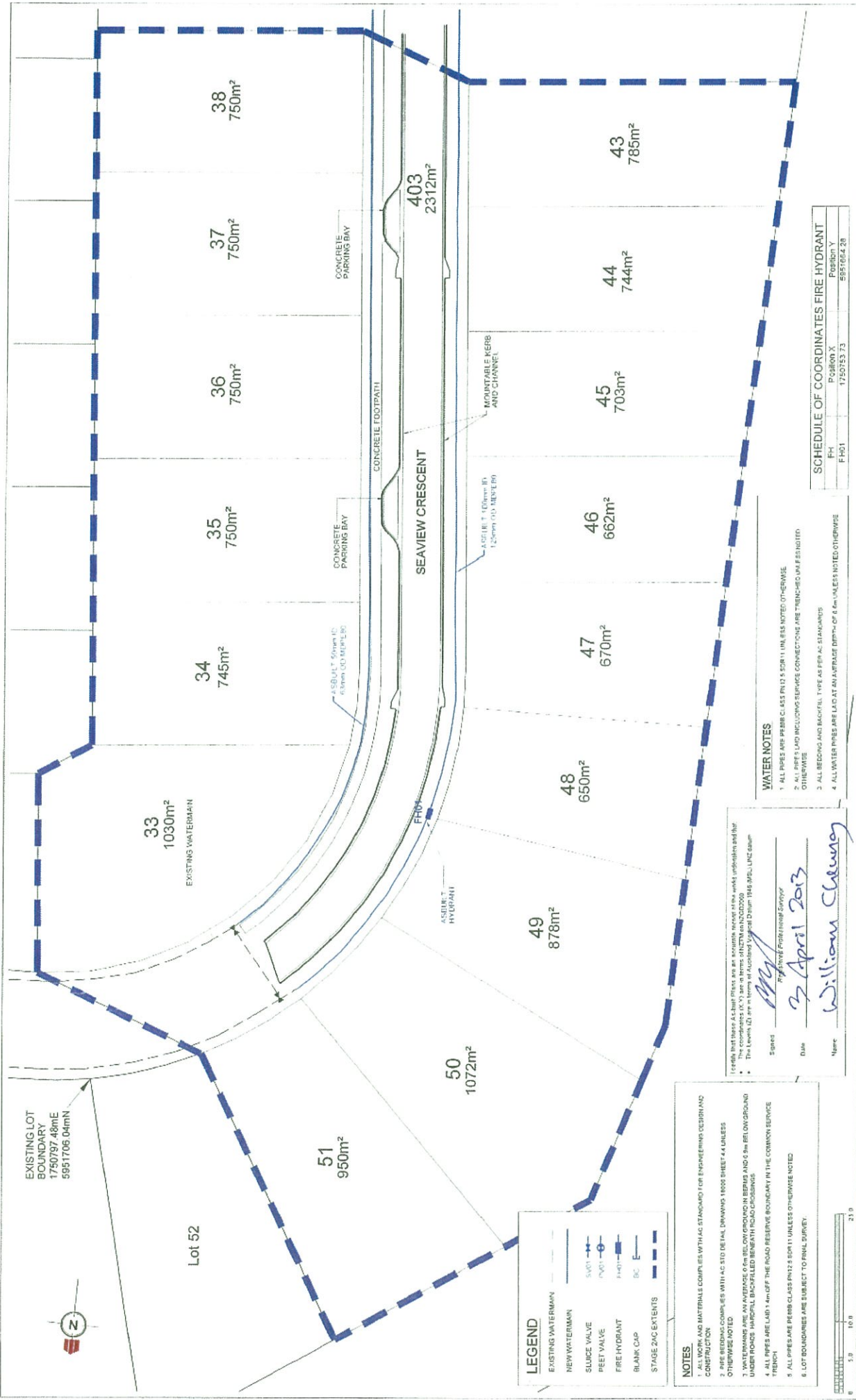
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BEACHWOOD SUBDIVISION - STAGE 2C
 ASBUILT WASTEWATER DETAIL PLAN
 RMA SLC 57858 & RDC 21082
 AUCKLAND COUNCIL



| | | | |
|------------|----------|-----------|--------------------|
| DESIGNED | NW | ASBUILT | CD |
| CHECKED | WF | DRAWN | CD |
| APPROVED | WF | SUBMITTED | WOODS |
| JOB NUMBER | 603542C | SCALE | 1:500 @ A3 |
| ISSUED | MAR 2013 | DWG. NO. | 60354-2C-DR-402-AB |
| | | | REV |
| | | | A |



| | | |
|-------------|--------------------|--------------|
| DESIGNED BY | WV | ASBULT |
| CHECKED BY | DM | CO |
| APPROVED BY | SV | WC |
| JOB NUMBER | 6035472C | SCALE |
| ISSUED | MAR 2013 | 1:500 (P.A3) |
| DWG NO | 60354-2C-WS-600-AB | REV |



BEACHWOOD SUBDIVISION - STAGE 2C
WATERMAIN AS-BUILT PLAN
 RMA SLC-57858 & RDC 21082
 AUCKLAND COUNCIL



| | | |
|-----------|----------|--------|
| REVISIONS | DATE | CLIENT |
| A | 20.03.13 | |
| B | 21.0 | |

| SCHEDULE OF COORDINATES FIRE HYDRANT | | |
|--------------------------------------|------------|------------|
| FH | POSITION X | POSITION Y |
| FH1 | 175053.73 | 5951664.28 |

- WATER NOTES**
1. ALL PIPES ARE PERFB CLASS PN12.5 SDR11 UNLESS NOTED OTHERWISE.
 2. ALL PIPE LAYOUT INCLUDING SERVICE CONNECTIONS ARE FINISHED UNLESS NOTED OTHERWISE.
 3. ALL BEDDING AND BACKFILL TYPE AS PER AC STANDARDS.
 4. ALL WATER PIPES ARE LAD AT AN AVERAGE DEPTH OF 6.4m UNLESS NOTED OTHERWISE.

I certify that these As-Built Plans are an accurate record of the works undertaken and that the information contained herein is true and correct to the best of my knowledge and belief.
 This is issued in accordance with the provisions of the Resource Management Act 1991.
 Signed: *William Clewley*
 Date: 3 April 2013
 Name: William Clewley
 Position: Professional Engineer

- NOTES**
1. ALL WORK AND MATERIALS COMPLY WITH AC STANDARDS FOR ENGINEERING DESIGN AND CONSTRUCTION.
 2. PIPE BEDDING COMPLETES WITH AC STD DETAIL DRAWINGS 16000 SHEET 4.4 UNLESS OTHERWISE NOTED.
 3. WATERMANS ARE AN AVERAGE 0.6m BELOW GROUND IN BERMS AND 0.9m BELOW GROUND UNDER ROADS. HANDSILL BACKFILLED BENEATH ROAD CROSSINGS.
 4. ALL PIPES ARE LAD 1.4m OFF THE ROAD RESERVE BOUNDARY IN THE COMMON SERVICE TRENCH.
 5. ALL PIPES ARE PERFB CLASS PN12.5 SDR11 UNLESS OTHERWISE NOTED.
 6. LOT BOUNDARIES ARE SUBJECT TO FINAL SURVEY.

LEGEND

| | |
|--------------------|-----|
| EXISTING WATERMAIN | --- |
| NEW WATERMAIN | --- |
| SLUCE VALVE | SV |
| PEET VALVE | PV |
| FIRE HYDRANT | FH |
| BLANK CAP | BC |
| STAGE 2C EXTENTS | --- |

Appendix 1

Producer Statements