Spinnaker Bay Limited

Foundation Completion Report - Stage 3

June 2007

Contents

1. Introduction

1.1 Scope

GHD were commissioned by Spinnaker Bay Limited to provide professional geotechnical engineering services for the construction monitoring, testing and certification of earthworks operations at Spinnaker Bay Subdivision, Beachlands.

This Foundation Completion Report provides details of construction activities, compliance testing undertaken and approvals granted by GHD during the construction of Stage 3 for the above development. The report also expresses an opinion as to the suitability of the lots within the subdivision for their intended use.

1.2 Project Outline

Spinnaker Bay subdivision is approximately 60 Ha in extent, comprising approximately 350 residential lots. This report covers Stage 3 of the subdivision and includes 55 Lots with a total area of approximately 12.3 Ha. Stage 3 comprise of residential Lots 295 - 349, access lots 406 to 411, road reserve lot 515, and reserve lots 1000, 504 and 505 516 over the western side end of the site. The area covered by the report is shown in Drawing Nos. 6164-01 and 6164-02 included in Appendix A.

1.3 GHD Involvement

GHD's involvement was:

- Approval of stripped and undercut subgrade areas prior to fill placement.
- Appropriate monitoring of bulk fill placement and testing in accordance with the specification.
- Submission of a Foundation Completion Report for areas modified by earthworks.

2. Summary of Ground Investigation

A geotechnical investigation report was prepared by Harrison Grierson Consultants Ltd in 2001 entitled "Outlook Park, Kelly's Cove Subdivision, Geotechnical Investigation."

The investigation found the southern end of the subdivision to be underlain by weathered Waitemata Group soils. The northern end of the subdivision was found to comprise variable alluvial sediments of the Tauranga Group above the Waitemata Group soils and rocks.

The geotechnical investigation included field investigations (visual appraisal, machine drilled and hand auger boreholes as well as test pit investigations) and also standard laboratory testing (moisture content, compaction, shrink/swell, and Plasticity Index Tests[1]).

The key conclusions and recommendations of that geotechnical report relating to Stage 3 are:

a. *"Occasional layers of organic and pumiceous soils can be anticipated at the site providing weaker and /or compressible layers within the foundation soils and may require undercut to provide a suitable foundation."*

b. *"Groundwater springs may also be encountered on site, especially adjacent to gullies."*

c. *"Cut and fill slopes should not exceed 14° without specific design."*

d. *"Building line limitations on Lot No. 44 adjacent to Pond 1 should be reviewed on completion of the works."*

e. *"Shallow building foundation footings should be founded a minimum of 450 mm below the final ground level prepared at the time of building construction."*

f. *"An allowable bearing capacity of 100 kPa for shallow building foundations is considered to be available."*

g. *"Building foundations should be designed for a soil classification of S (slightly expansive) as defined in AS 2870."*

h. *"Topsoil, and surface organic soils should be removed prior to placement of any fill. Organic soils should not be used as fill."*

i. *"Underfill drainage should be provided in gullies and all significant groundwater seepage encountered should be connected to the underfill drainage system."*

[1] Outlook Park, Kelly's Cove Subdivision, Geotechnical Investigation, Harrison Grierson Consultants Ltd 2001

j. *"Stormwater runoff from roofs, buildings and paved areas should be reticulated to avoid increasing flows to the underfill drainage."*

k. *Road Subgrade testing should be carried out to confirm the design CBR of 7 in fill and 5 in cut*

In accordance with the above report GHD was engaged to carry out specific investigation of the building limitation line proposed by Harrison Greirson Consultants Ltd (refer to item "D" above). The results of the investigation were presented in a report entitled "Report for Spinnaker Bay Subdivision, Stage 3 Building Line Limitation" dated November 2005.

Investigation comprised 12 hand auger boreholes and 6 Scala penetrometer tests. Detailed modelling of the slope stability using the proposed fill layout was carried out.

The report found that providing standard construction techniques were carried out during fill compaction, adequate factors of safety against slope failure were obtained for lots 321, 323, 324, 327, 332, 338 and 341.

It was recommended that the building limitation line proposed within the above Harrison Grierson Report be removed from these lots. Adequate factors of safety were not obtained for lots 328 and 331 and consequently it was recommended that the building limitation line remain on these lots.

3. Earthworks Operations

Bulk earthworks were carried out during the 2006/2007 earthworks season and the earthworks were completed for Stage 3 of the Spinnaker Bay Subdivision.

The main contractor was Masters Civil Contractors Ltd who undertook the bulk earthworks. Civil Lab Limited were engaged to undertake regular earthworks testing.

Earthworks equipment supplied by Masters Civil Contractors Ltd generally comprised 3 dozers and scoops, 2 scrapers, 2 excavators, 1 compactor and 1 tractor and disc set-up.

Cut and fill that was completed within Stage 3 followed the following sequence of operations:

- Topsoil striped to stockpile.
- Gullies mucked out.
- GHD carried out inspection of gullies to confirm suitability for filling.
- GHD instructed requirement of underfill drains as necessary.
- Cut to Fill operation commenced.
- Regular earthworks quality control testing undertaken in liaison with GHD and Masters Civil Engineering.
- Final fill areas inspected.
- Topsoil respread and grass sown.

During construction minor amounts of organic and unsuitable materials were excavated from the gullies prior to placing and compacting fill.

Underfill drains were placed in the invert of gullies prior to fill placement. These comprised perforated drainage coils contained within graded drainage material. The location of the underfill drains is shown on the Drawing 6164-01 and 6164-02. Final earthworks contours and cut and fill thicknesses are shown on drawing 6164-03 and 6164-06. These drawings are presented as Appendix A.

4. Earthworks Specification and Control

4.1 Earthworks

Fill quality control testing was undertaken by Civil Lab (an IANZ registered laboratory) in accordance with the earthworks specification.

The quality control testing criteria specified in the contract for the bulk fill placement were:

- Minimum average Undrained Shear Strength (over ten tests): 140 kPa
- Minimum single Undrained Shear Strength value: 110 kPa
- Maximum average Air Voids (over ten tests): 10%
- Maximum single Air Void value: 12%

The extent of certified bulk fill is shown on Drawing Nos. 6164-05 and 6164-06 (Appendix A). A summary of the test results is included as Appendix B. Test locations are shown on testing location plans included with the full test results in Appendix C.

Any fill found to have fallen below the specified criteria was rejected and reworked / re-compacted and then retested to ensure compliance with the specification. Details of the retesting carried out are included within the test results in Appendix B and C.

Testing was also carried out along the road subgrade using Benkelman beam pavement deflection and Scala penetrometer testing. Test results are included in Appendix C. A plan showing chainages referred to in the test results is included with the test results. The quality control testing criteria used for the road subgrade was a minimum equivalent CBR of 5 on natural soil and fill and a Benkelman beam deflection of less than 1.5 mm. Any subgrade found to have an equivalent CBR below the test criteria was undercut and additional subbase material was placed and compacted.

4.2 Soil Expansiveness

Expansive soils are defined in NZS 3604:1999 as those soils having a Liquid Limit greater than 50% and a linear shrinkage greater than 15%. Testing has been carried out to confirm the expansiveness class of the soil. Linear shrinkage, Plasticity Index and Shrink Swell index tests were carried out on samples from four locations (Lots 306, 316, 326, 346). Testing was carried out to AS 1289:7.1.1. The test results attached in Appendix C indicate that the soils should be classified as Class S (slightly expansive) as defined by AS 2870:1996.

4.3 Trench Backfilling

Trench backfill of stormwater and sewer lines are not included for the certification within this report. Trenches have been backfilled in accordance with standard industry practice. Backfill should not be considered as structural or certified fill.

4.4 Topsoil Depths

GHD has measured final topsoil depths. The results are included in Appendix C.

5. Building Line Limitations

A 10 m wide Building Limitation Line has been placed on the western boundary of lots 331 and 328 as recommended in previous reports and where the finished surface contours are steeper than 1V:4H.

Any building or earthworks to be carried out on these lots should be carried out only following specific investigation and design by a Chartered Professional Engineer (geotechnical) familiar with the contents of this report.

While a building limitation line has not been placed on Lots 321, 323, 324, 327, 332, 338 and 340, particular attention is drawn to the presence of buried pipelines located inside the western lot boundary. Trench backfill has not been certified and any foundations within a horizontal distance of 5 m of the pipelines should be constructed a minimum of 0.5 m below the zone of influence of the pipeline (as defined by a theoretical 45 degree line rising from the base of the pipe trench). These foundations will require specific investigation and design by a Chartered Professional Engineer (Geotechnical) familiar with the contents of this report.

6. Statement of Professional Opinion as to the Suitability of Land for Building Development

I Richard Kaser of GHD Limited, P.O. Box 76 477, Manukau City, hereby confirm that:

1) I am a Chartered Professional Engineer experienced in the field of geotechnical engineering. The GHD geotechnical group was retained by the developer as Geotechnical Engineer for the earthworks development of Stage 3, of Spinnaker Bay subdivision. Stage 3 comprises Lots 295 - 349, 406 to 411, 504, 505, 515, 516 and 1000 as shown on Drawings 6164-01 and 6164-02. These drawings are presented as Appendix A of this report.

2) The extent of the ground investigation for this project is outlined within the Harrison Grierson Consultants Ltd report entitled "Outlook Park, Kelly's Cove Subdivision, Geotechnical Investigation" dated 2001.

   GHD have also carried out a geotechnical investigation and assessment report entitled "Report for Spinnaker Bay Subdivision, Stage 3 Building Line Limitation" dated November 2005.

3) In my professional opinion, not to be construed as a guarantee, I consider that:

   a) The earthworks shown on the attached Drawings No 6164-05 and 6164-06 have been placed in accordance with the Manukau City Council Engineering Quality Standards where appropriate.

   b) The completed works give due regard to land slope and foundation stability considerations. Lots 331 and 328 contain areas with ground slopes greater than 1V:4H. Any construction or earthworks to be carried out on these lots will require specific investigation and design by a Chartered Professional Engineer (Geotechnical) familiar with the contents of this report.

   c) The areas of natural cut ground or engineered filled ground as shown on the attached Drawings are suitable for the erection thereon of structures design and built in accordance with the Building Act 1991 and related documents, provided that:

      i) Any construction or earthworks carried out on Lots 331 and 328 should be subject to specific investigation and design. Such investigation and design should be carried out by a Chartered Professional Engineer (Geotechnical) familiar with the contents of this report, prior to building consent application.

      ii) Shallow building foundations are to be founded a minimum of 450 mm depth below final ground level, or 300 mm below the base of topsoil, whichever depth is greater. Foundation design should be carried out using an Allowable bearing capacity of 100 kPa.

      iii) Raft foundations may be designed for Class S site conditions in accordance with AS2870 1996.

iv) All foundations within the zone of influence of buried service drains should be embedded a minimum depth of 0.5 m below the zone of influence of the pipeline (as defined by a theoretical 45 degree line rising from the base of the pipe trench). These foundations will require specific investigation and design by a Chartered Professional Engineer (geotechnical) familiar with the contents of this report.

v) Any cut or fill earthworks greater than 600 mm depth / height is required to undergo specific engineering investigation and design. Such design should be carried out by a Chartered Professional Engineer (Geotechnical) familiar with the contents of this report.

vi) Cut or fill batters should either be formed at gradients less than 1V:4H or otherwise supported by suitably designed retaining walls.

d) The recommendations and conclusion given in this suitability statement do not preclude the need for inspections of site conditions and design of foundations as would be conducted under normal circumstances.

The professional opinion is furnished to the Territorial Authority and the current owner / developers 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 to any specific conditions pertaining to their particular land interest.

GHD Limited

Richard Kaser

Chartered Engineer

Registration Number: 253864

Appendix A

Drawings

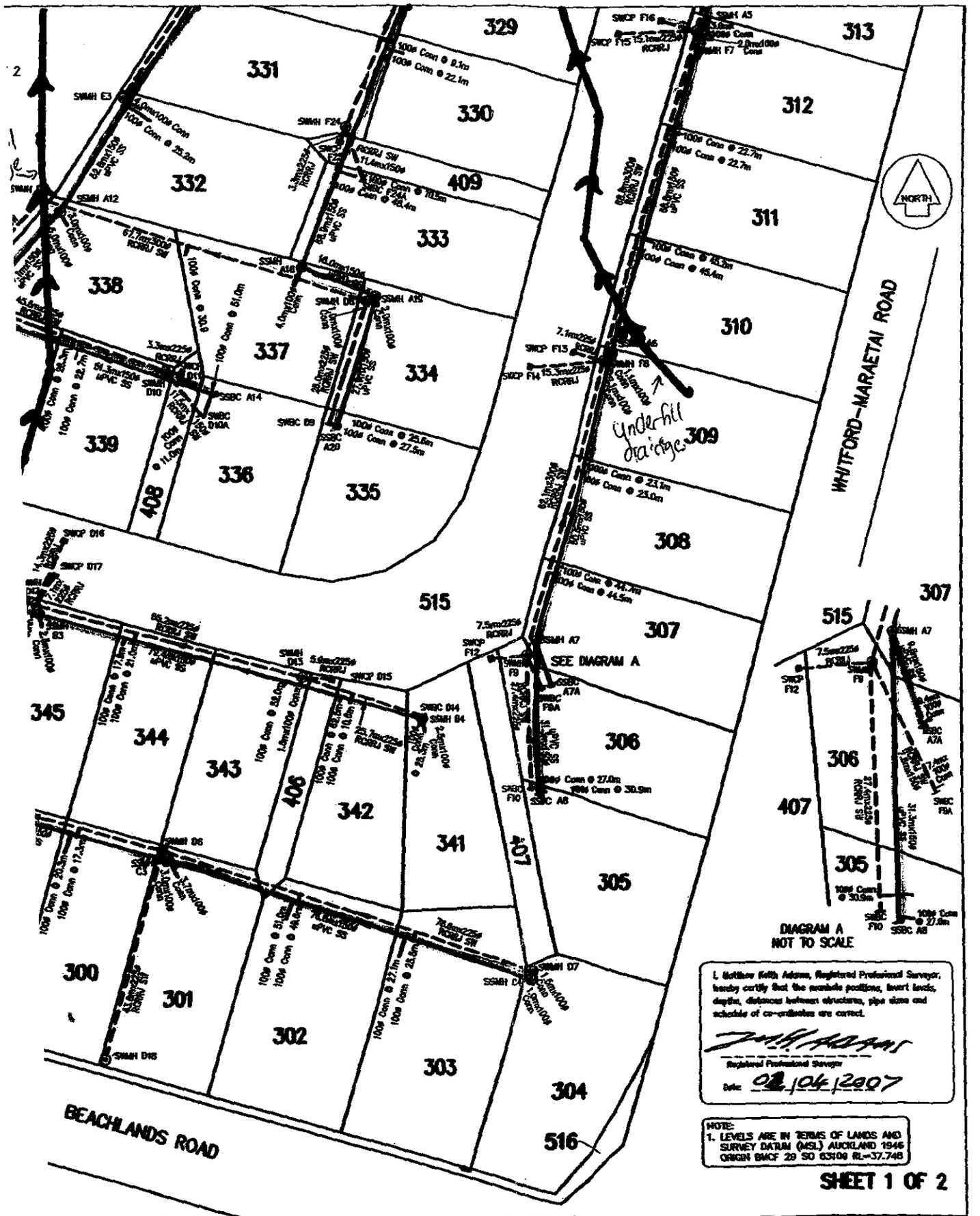

DIAGRAM A
NOT TO SCALE

I, Matthew Keith Adams, Registered Professional Surveyor, hereby certify that the available positions, invert levels, depths, distances between structures, pipe sizes and schedule of co-ordinates are correct.

Registered Professional Surveyor

Date: 02/04/2007

NOTE:
1. LEVELS ARE IN TERMS OF LANDS AND SURVEY DATUM (MSL) AUCKLAND 1946 ORIGIN BMCF 29 SO 63109 RL=37.748

SHEET 1 OF 2

...GE AS-BUILT
...Y STAGE 3B
...8) BEACHLANDS

AMENDMENT SCHEDULE		
A	Some pipe sizes and MH dia altered	02/04

CLIENT: GHD

AUTOCAD: L:/DWG/6164-STAGE 3B AS-BUILT		SCALE:	1:500 (A1)
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SURVEYOR: MA	DRAWN: CR	6164—01	A
DESIGNED: MA	CHECKED: MA		

DIMENSIONS TAKE PRECEDENCE OVER SCALING. IF IN DOUBT ASK.

[redacted]

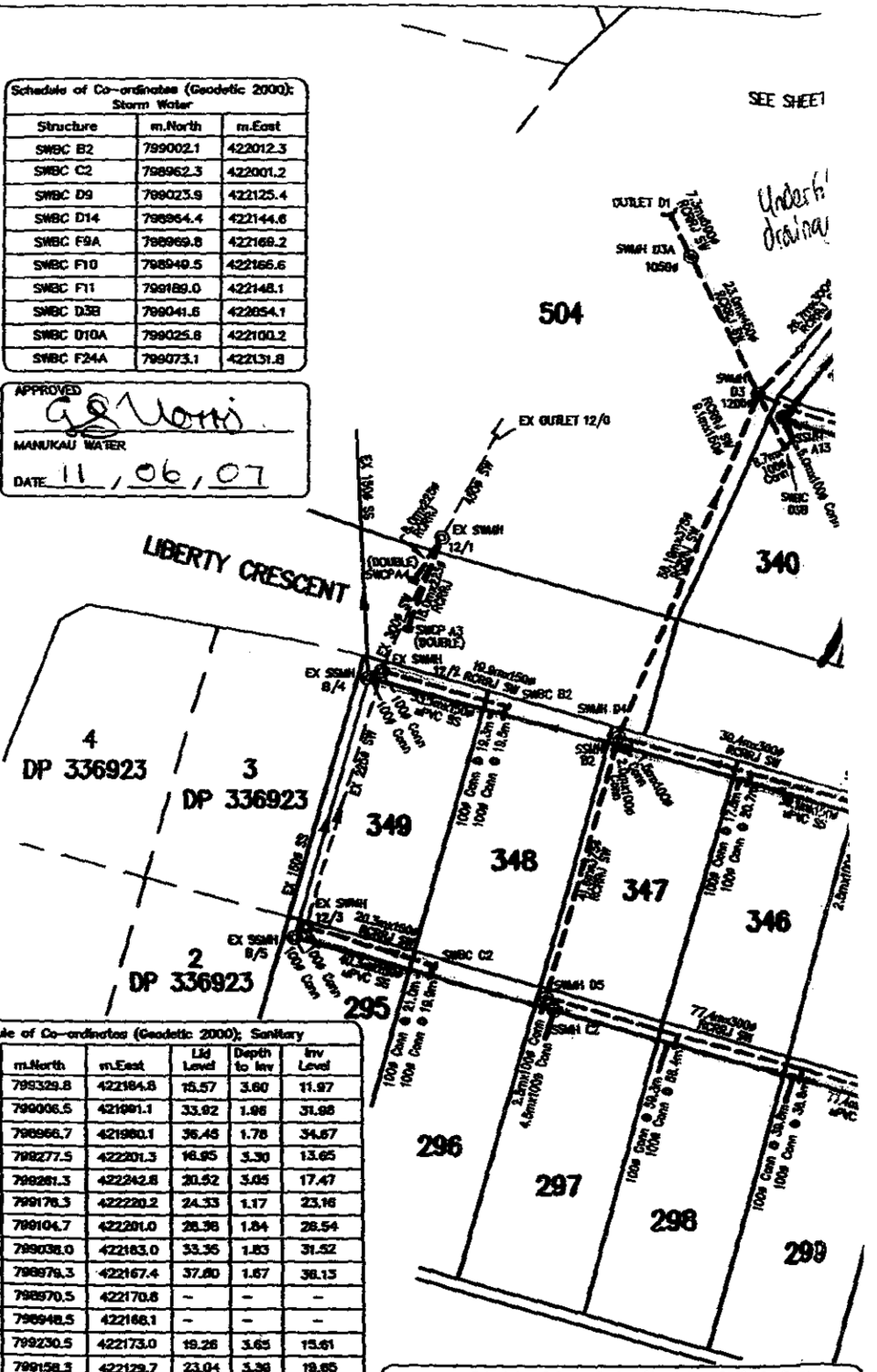
Schedule of Co-ordinates (Geodetic 2000): Storm Water

Structure	m.North	m.East	Lid Level	Depth to Inv	Inv Level
SWMH D2	799069.3	422068.1	30.95	1.36	29.59
SWMH D3	799049.7	422049.8	32.41	3.51	28.90
SWMH D3A	799073.4	422040.0	28.12	3.62	24.50
SWMH D4	798997.6	422029.0	34.78	1.40	33.38
SWMH D5	798957.7	422017.7	38.13	1.63	36.50
SWMH D6	798957.0	422092.2	42.77	1.70	41.07
SWMH D7	798912.5	422166.9	47.81	1.63	46.18
SWMH D8	799048.9	422132.6	32.96	1.24	31.72
SWMH D10	799034.6	422092.9	34.25	1.12	33.13
SWMH D12	798967.1	422067.0	36.63	1.65	34.98
SWMH D13	798972.3	422120.1	37.99	1.74	36.25
SWMH D18	798884.8	422080.5	43.79	1.25	42.54
SWMH E2	799134.1	422112.8	23.54	4.92	18.62
SWMH E3	799089.6	422084.3	27.82	3.48	24.33
SWMH F2	799225.5	422168.5	19.73	3.95	15.78
SWMH F2A	799229.3	422162.3	17.75	4.49	13.26
SWMH F3	799247.6	422181.2	18.02	1.93	16.09
SWMH F4	799260.0	422207.6	18.52	2.05	16.47
SWMH F5	799280.2	422241.2	20.30	3.15	17.15
SWMH F6	799174.5	422218.2	24.38	1.53	22.85
SWMH F7	799103.3	422199.5	28.37	1.58	26.79
SWMH F8	799036.9	422181.7	33.42	1.65	31.77
SWMH F9	798976.8	422165.7	37.60	1.99	35.61
SWMH F21	799218.2	422169.9	21.21	1.43	19.78
SWMH F22	799187.4	422174.5	22.96	1.98	20.98
SWMH F23	799130.2	422147.1	26.78	1.55	25.23
SWMH F24	799083.9	422128.4	29.96	1.45	28.51
SWMH G2	799325.6	422131.0	17.17	3.82	13.35
SWMH G3	799332.8	422185.4	16.16	2.40	13.76
(SWMH 12/1	799027.9	422002.3	33.53	5.30	28.23
(SWMH 12/2	799007.5	421993.1	33.74	2.63	31.11
(SWMH 12/3	798966.4	421981.8	36.45	2.45	34.00
OUTLET 12/0	799043.3	422010.3	–	–	27.93
OUTLET D1	799076.8	422036.6	–	–	24.30
OUTLET E1	799142.7	422100.4	–	–	18.18
OUTLET F1	799233.2	422155.7	–	–	12.94
OUTLET G1	799310.5	422133.2	–	–	13.14

Schedule of Co-ordinates (Geodetic 2000): Storm Water

Structure	m.North	m.East
SWBC B2	799002.1	422012.3
SWBC C2	798962.3	422001.2
SWBC D9	799023.9	422125.4
SWBC D14	798964.4	422144.6
SWBC F9A	798969.8	422168.2
SWBC F10	798949.5	422166.6
SWBC F11	799189.0	422148.1
SWBC D3B	799041.6	422054.1
SWBC D10A	799025.8	422100.2
SWBC F24A	799073.1	422131.8

APPROVED
MANUKAU WATER
DATE 11/06/07



Schedule of Co-ordinates (Geodetic 2000): Sanitary

Structure	m.North	m.East	Lid Level	Depth to Inv	Inv Level
EX SSMH A1	799329.8	422184.8	15.57	3.60	11.97
EX SSMH B/4	799006.5	421991.1	33.92	1.98	31.98
EX SSMH B/5	798966.7	421980.1	36.45	1.78	34.67
SSMH A2	799277.5	422201.3	16.95	3.30	13.65
SSMH A3	799281.3	422242.8	20.92	3.05	17.47
SSMH A4	799178.3	422220.2	24.33	1.17	23.16
SSMH A5	799104.7	422201.0	28.38	1.84	26.54
SSMH A6	799038.0	422183.0	33.35	1.83	31.52
SSMH A7	798979.3	422167.4	37.80	1.67	36.13
SSBC A7A	798970.5	422170.8	–	–	–
SSBC A8	798948.5	422168.1	–	–	–
SSMH A9	799230.5	422173.0	19.28	3.65	15.61
SSMH A10	799158.3	422129.7	23.04	3.38	19.65
SSMH A11	799111.3	422089.6	24.30	2.72	21.58
SSMH A12	799066.7	422071.8	31.02	1.73	29.29
SSMH A13	798046.4	422053.9	32.77	2.97	29.80
SSBC A14	799029.8	422102.5	–	–	–
SSMH A15	799219.1	422182.1	21.17	1.83	19.34
SSMH A16	799177.0	422171.0	23.51	1.56	21.95
SSMH A17	799120.1	422144.2	27.34	3.04	24.30
SSMH A18	799055.7	422119.8	32.36	2.20	30.16
SSMH A19	799049.8	422134.6	32.89	1.73	31.16

Schedule of Co-ordinates (Geodetic 2000): Sanitary

Structure	m.North	m.East	Lid Level	Depth to Inv	Inv Level
SSBC A20	799023.1	422126.9	–	–	–
SSMH B2	798996.1	422030.1	34.85	1.92	32.93
SSMH B3	798985.2	422067.7	36.73	1.79	34.94
SSMH B4	798983.8	422144.2	39.11	1.92	37.19
SSMH C2	798955.8	422018.9	38.33	2.49	35.84
SSMH C3	798934.9	422093.5	42.99	2.16	40.83
SSMH C4	798910.8	422156.3	47.85	3.41	44.44

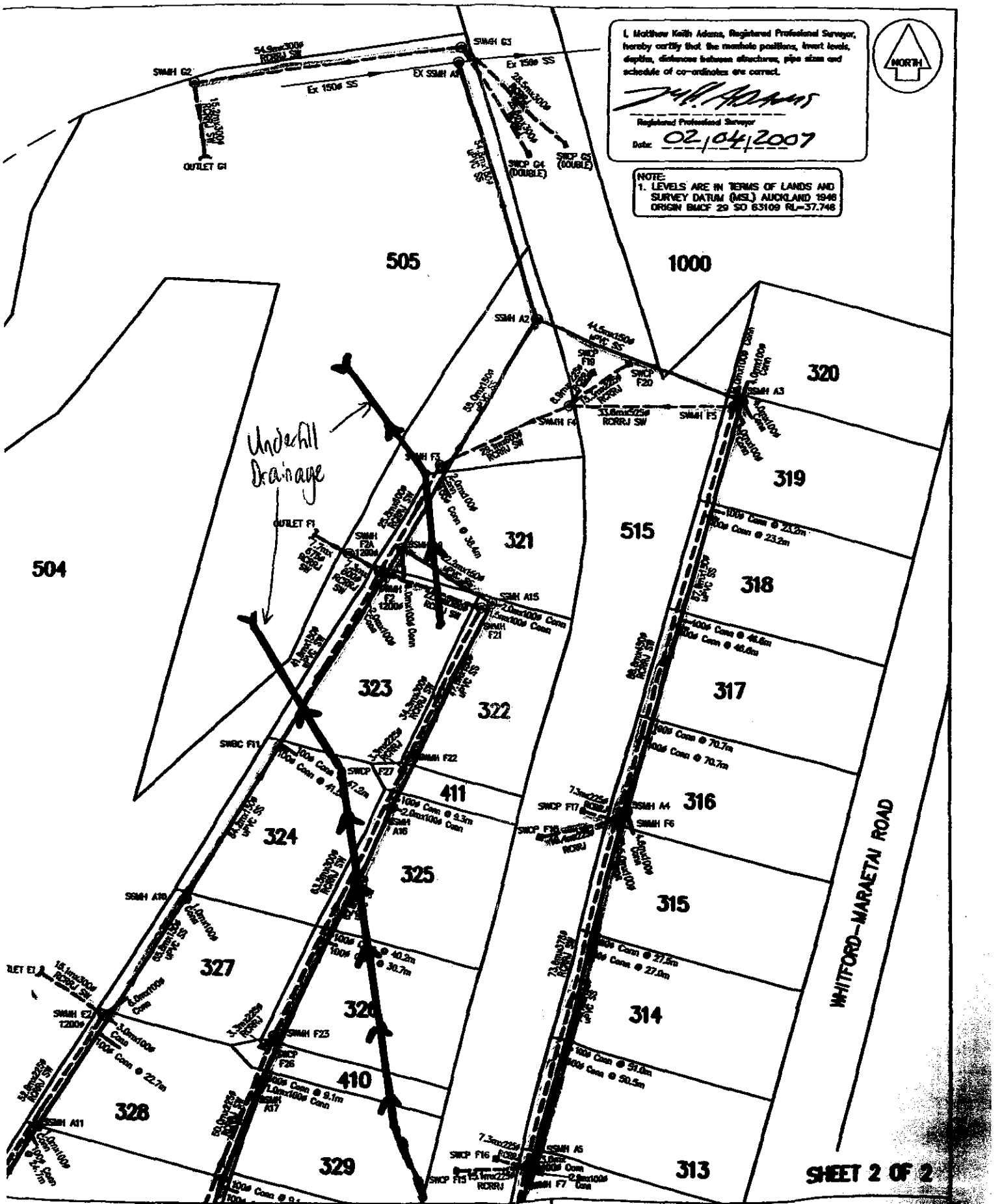
Schedule of Co-ordinates (Geodetic 2000): Cess Pit

Structure	m.North	m.East	Grate Level
CP C4	799311.4	422199.4	15.36
CP G5	799313.5	422206.4	15.40
CP F12	798976.1	422156.3	37.83
CP F13	799036.6	422174.7	33.08
CP F14	799035.5	422166.4	33.54
CP F15	799102.7	422184.4	28.34
CP F16	799105.2	422192.4	28.12
CP F17	799176.3	422211.2	24.22
CP F18	799170.6	422202.3	24.55
CP F19	799267.0	422213.1	17.95
CP F20	799268.8	422220.1	17.94
CP F25	799080.8	422127.2	30.12
CP F26	799127.9	422144.8	28.83
CP F27	799184.5	422173.1	22.96
CP A3	799013.9	421997.0	33.59
CP A4	799021.2	421998.0	33.50
CP D11	799034.1	422096.2	34.28
CP D15	798972.0	422206.4	37.85
CP D16	799000.2	422072.6	36.33
CP D17	798993.1	422070.8	36.37

CHURCHILL TIMMS LTD
Land Development Consultants
P.O. Box 84 246 Tel : 273-4182
Botany Downs Fax: 273-4309
Manukau 2142
Email: admin@ctltd.co.nz

PROJECT:

TITLE: PUBLIC DRAIN
SPINNAKER B
(LOT 2 DP 37319



AINAGE AS-BUILT
R BAY STAGE 3B
73198) BEACHLANDS

TED. DIMENSIONS TAKE PRECEDENCE OVER SCALING. IF IN DOUBT ASK.

AMENDMENT SCHEDULE		
A	Some pipe sizes and MH dia altered	02/04

CLIENT: CHD

AUTOCAD: L:/DWG/6164-STAGE 3B AS-BUILT		SCALE:	1:500 (A1)
CIVILCAD: 6164 ASBUILT	DATE: FEB 2007	SURVEYED:	1:1000 (A3)
SURVEYOR: MA	DRAWN: CR	6164-02	A
DESIGNED: MA	CHECKED: MA		

1001

Schedule of Co-ordinates (Geodetic 2000): Storm Water

Structure	m.North	m.East	Lid Level	Depth to Inv	Inv Level
SWMH D2	799069.3	422068.1	30.95	1.36	29.59
SWMH D3	799049.7	422049.8	32.41	3.51	28.90
SWMH D3A	799073.4	422040.0	28.12	3.62	24.50
SWMH D4	798997.6	422029.0	34.78	1.40	33.38
SWMH D5	798957.7	422017.7	38.13	1.63	36.50
SWMH D6	798937.0	422092.2	42.77	1.70	41.07
SWMH D7	798912.5	422166.9	47.81	1.63	46.18
SWMH D8	798948.9	422132.6	32.96	1.24	31.72
SWMH D10	799034.6	422092.9	34.25	1.12	33.13
SWMH D12	798987.1	422067.0	36.63	1.65	34.98
SWMH D13	798972.3	422120.1	37.99	1.74	36.25
SWMH D18	798894.8	422080.5	43.78	1.25	42.54
SWMH E2	799134.1	422112.8	23.54	4.92	18.62
SWMH E3	799089.6	422084.3	27.82	3.49	24.33
SWMH F2	799225.5	422168.5	19.73	3.95	15.78
SWMH F2A	799229.3	422162.3	17.75	4.49	13.26
SWMH F3	799247.6	422181.2	18.02	1.93	16.09
SWMH F4	799260.0	422207.6	18.52	2.05	16.47
SWMH F5	799260.2	422241.2	20.30	3.15	17.15
SWMH F6	799174.5	422218.2	24.38	1.53	22.85
SWMH F7	799103.3	422199.5	28.37	1.58	26.79
SWMH F8	799036.9	422181.7	33.42	1.65	31.77
SWMH F9	798976.8	422165.7	37.60	1.99	35.61
SWMH F21	799218.2	422189.9	21.21	1.43	19.78
SWMH F22	799187.4	422174.5	22.96	1.98	20.98
SWMH F23	799130.2	422147.1	26.78	1.55	25.23
SWMH F24	799083.9	422128.4	29.96	1.45	28.51
SWMH G2	799325.6	422131.0	17.17	3.82	13.35
SWMH G3	799332.8	422185.4	16.16	2.40	13.76
EX SWMH 12/1	799027.9	422002.3	33.53	5.30	28.23
EX SWMH 12/2	799007.5	421993.1	33.74	2.63	31.11
EX SWMH 12/3	798968.4	421981.8	36.45	2.45	34.00
EX OUTLET 12/0	799043.3	422010.3	–	–	27.93
OUTLET D1	798976.8	422036.6	–	–	24.30
OUTLET E1	799142.7	422100.4	–	–	18.18
OUTLET F1	799233.2	422156.7	–	–	12.94
OUTLET G1	799310.5	422133.2	–	–	13.14

Schedule of Co-ordinates (Geodetic 2000); Sanitary

Structure	m.North	m.East	Lid Level	Depth to Inv	Inv Level
EX SSMH A1	799329.8	422184.8	15.57	3.60	11.97
EX SSMH B/4	799006.5	421991.1	33.92	1.96	31.96
EX SSMH B/5	798965.7	421980.1	36.45	1.78	34.67
SSMH A2	799277.5	422201.3	16.85	3.30	13.65
SSMH A3	799261.3	422242.8	20.52	3.05	17.47
SSMH A4	799176.3	422220.2	24.35	1.17	23.16
SSMH A5	799104.7	422201.0	28.38	1.84	26.54
SSMH A6	799038.0	422183.0	33.35	1.83	31.52
SSMH A7	798979.3	422167.4	37.80	1.67	36.13
SSBC A7A	798970.5	422170.8	–	–	–
SSBC A8	798948.5	422168.1	–	–	–
SSMH A9	799230.5	422173.0	19.26	3.65	15.61
SSMH A10	799158.3	422129.7	23.04	3.39	19.65
SSMH A11	799111.3	422099.6	24.30	2.72	21.58
SSMH A12	799066.7	422071.8	31.02	1.73	29.29
SSMH A13	799046.4	422053.9	32.77	2.97	29.80
SSBC A14	799029.8	422102.5	–	–	–
SSMH A15	799219.1	422192.1	21.17	1.83	19.34
SSMH A16	799177.0	422171.0	23.51	1.56	21.95
SSMH A17	799120.1	422144.2	27.34	3.04	24.30
SSMH A18	799065.7	422119.8	32.36	2.20	30.16
SSMH A19	799049.6	422134.6	32.89	1.73	31.16
SSBC A20	799023.1	422126.9	–	–	–
SSMH B2	798996.1	422030.1	34.85	1.92	32.93
SSMH B3	798985.2	422067.7	38.73	1.79	34.94
SSMH B4	798963.8	422144.2	39.11	1.92	37.19
SSMH C2	798955.8	422018.9	38.33	2.49	35.84
SSMH C3	798934.9	422083.5	42.99	2.16	40.83
SSMH C4	798910.8	422166.3	47.85	3.41	44.44

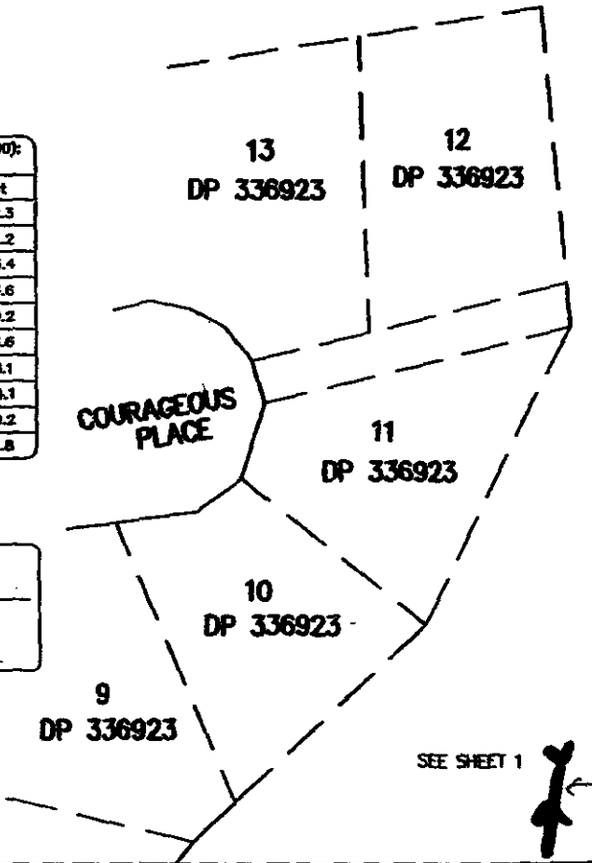
Schedule of Co-ordinates (Geodetic 2000); Ceas Pit

Structure	m.North	m.East	Grate Level
CP G4	799311.4	422199.4	15.36
CP G5	799313.5	422206.4	15.40
CP F12	798978.1	422158.3	37.83
CP F13	799038.6	422174.7	33.08
CP F14	799035.5	422168.4	33.54
CP F15	799102.7	422184.4	28.34
CP F16	799105.2	422182.4	28.12
CP F17	799176.3	422211.2	24.22
CP F18	799170.6	422202.3	24.55
CP F19	799267.0	422213.1	17.95
CP F20	799268.8	422220.1	17.94
CP F25	799080.8	422127.2	30.12
CP F26	799127.9	422144.8	26.63
CP FZ7	799184.5	422173.1	22.98
CP A3	799013.9	421997.0	33.58
CP A4	799021.2	421998.0	33.50
CP D11	799034.1	422096.2	34.28
CP D15	798972.0	422206.4	37.85
CP D16	799000.2	422072.6	36.33
CP D17	798993.1	422070.8	36.37

Schedule of Co-ordinates (Geodetic 2000): Storm Water

Structure	m.North	m.East
SWBC B2	799002.1	422012.3
SWBC C2	798962.3	422001.2
SWBC D9	799023.9	422125.4
SWBC D14	798964.4	422144.6
SWBC F9A	798969.8	422169.2
SWBC F10	798949.5	422166.6
SWBC F11	799189.0	422148.1
SWBC D3B	799041.6	422054.1
SWBC D10A	799025.6	422100.2
SWBC F24A	799073.1	422131.8

APPROVED
MANUKAU WATER
DATE 11,06,07



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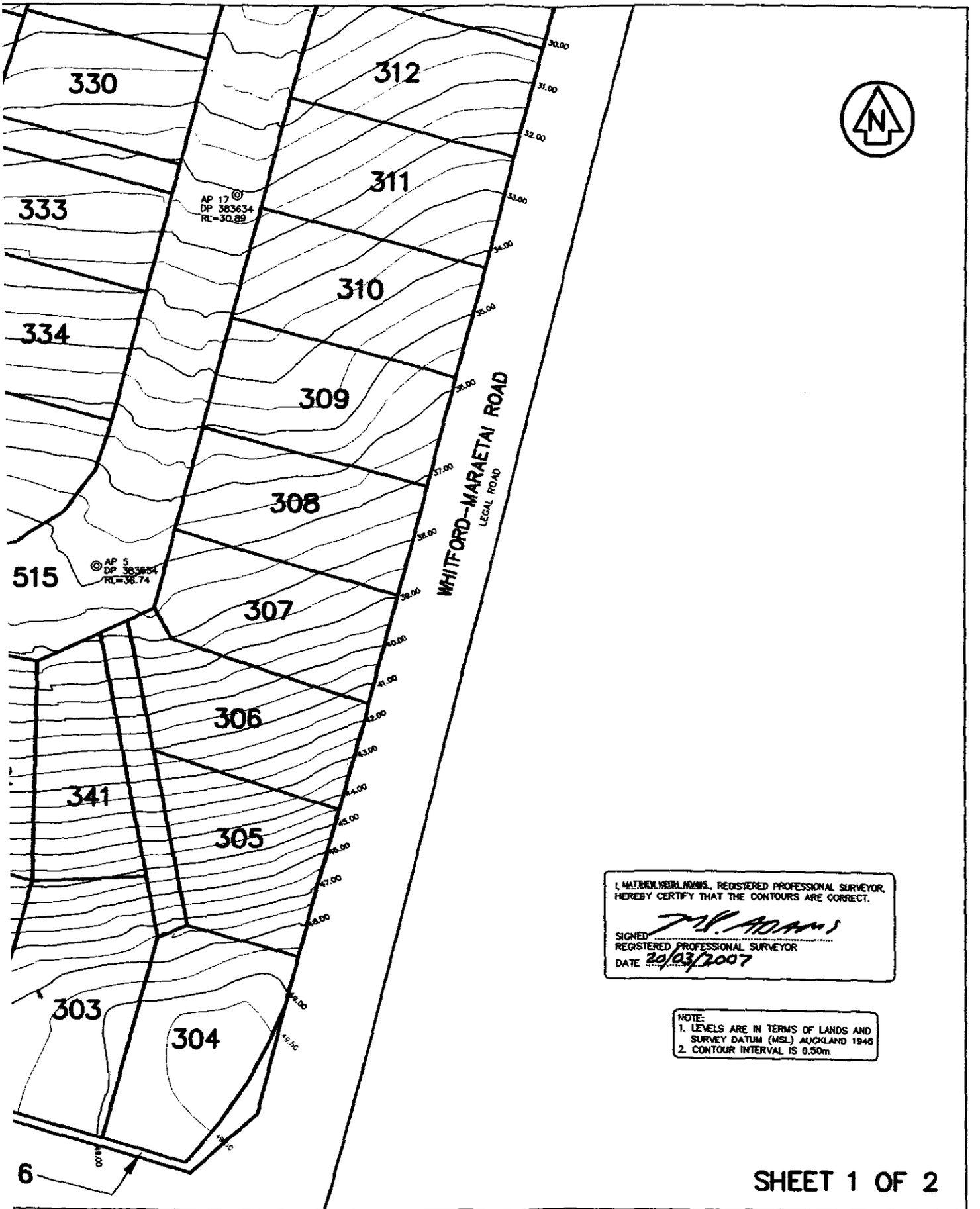
Botany Downs Fax: 273-4309
Manukau 2142
Email: admin@ctltd.co.nz

PROJECT:

TITLE: PUBLIC SPINN (LOT 2 D



I, MATTHEW KEITH ADAMS, REGISTERED PROFESSIONAL SURVEYOR, HEREBY CERTIFY THAT THE CONTOURS ARE CORRECT.

SIGNED M.K. ADAMS

REGISTERED PROFESSIONAL SURVEYOR

DATE 20/03/2007

NOTE:
1. LEVELS ARE IN TERMS OF LANDS AND SURVEY DATUM (MSL) AUCKLAND 1946
2. CONTOUR INTERVAL IS 0.50m

SHEET 1 OF 2

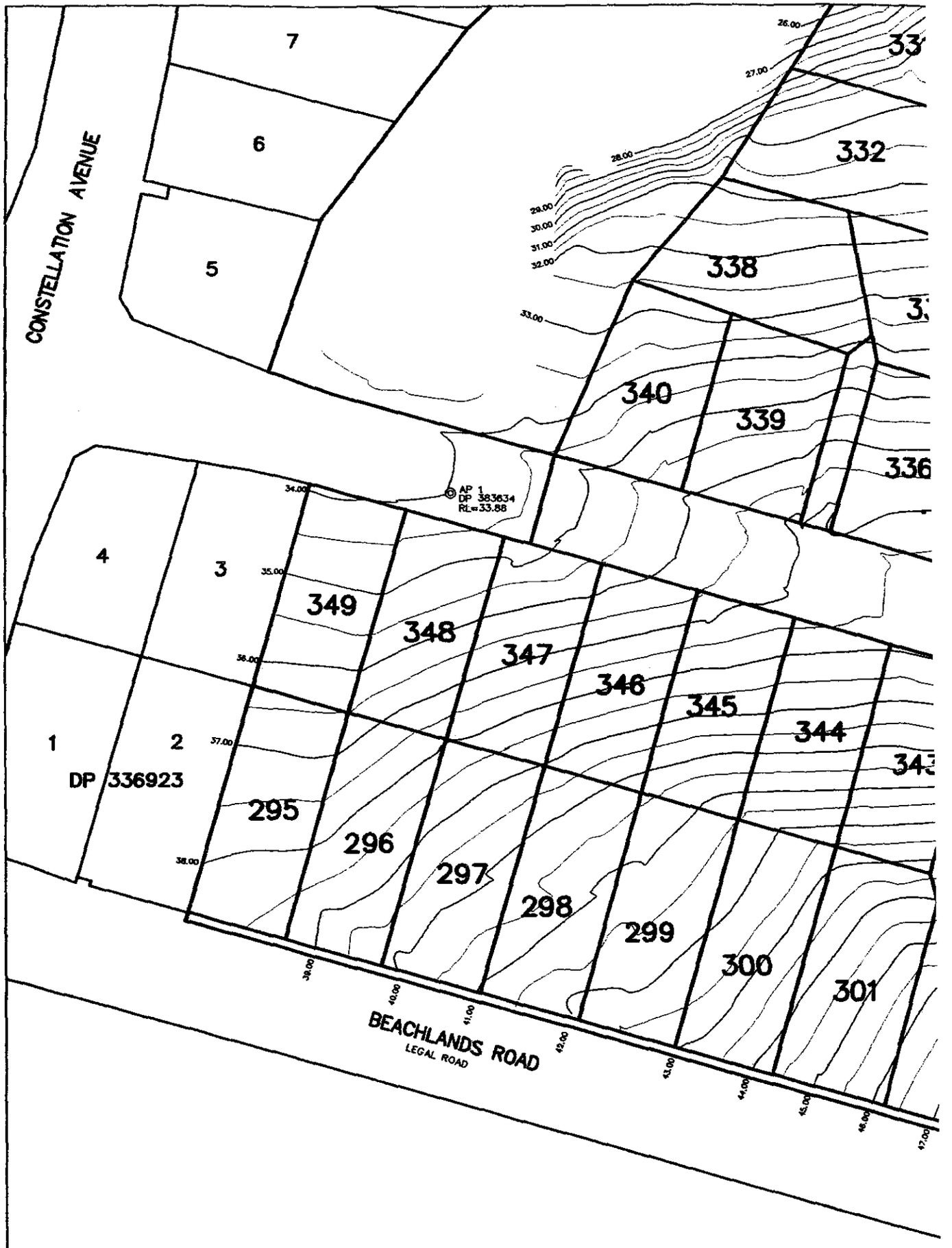
CONTOURS FOR
BAY: STAGE 3B
ACHLANDS

AMENDMENT SCHEDULE

CLIENT: GHD

AUTOCAD: L: /DWG/6164		SCALE:	1:500 (A1)
CIVILCAD: L: /CCAD6/6164	DATE: FEBRUARY 2007	REDUCED:	1:1000 (A3)
SURVEYOR: SF	DRAWN: SF	6164-03	
DESIGNED:	CHECKED:		

NTED. DIMENSIONS TAKE PRECEDENCE OVER SCALING. IF IN DOUBT ASK.



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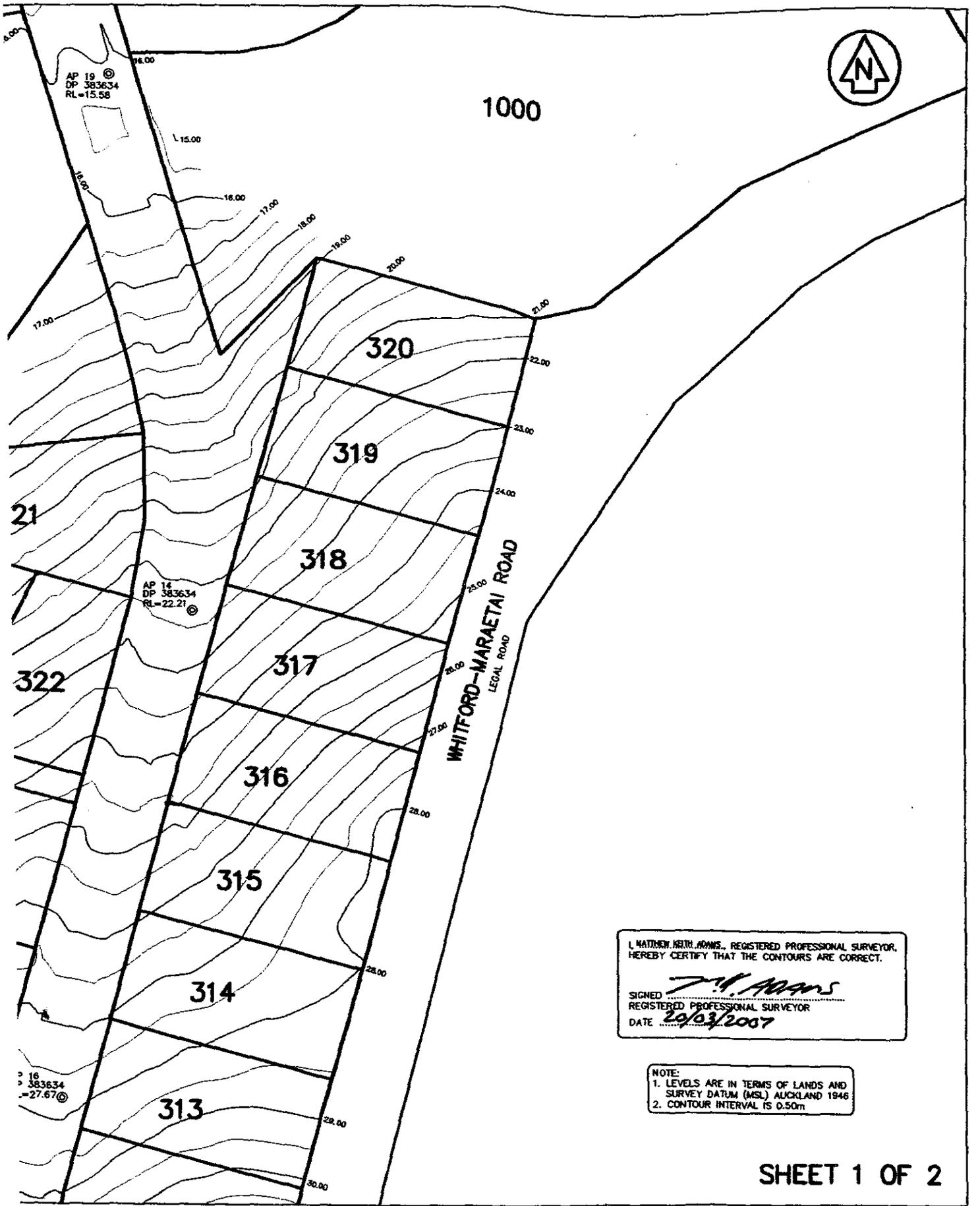
PROJECT:

OUTLOOK PARK

TITLE:



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DATE 20/03/2007

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SHEET 1 OF 2

CONTOURS FOR
BAY: STAGE 3B
ACHLANDS

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AMENDMENT SCHEDULE			

CLIENT: GHD			
AUTOCAD: L: /DWG/6164		SCALE:	1:500 (A1)
CIVILCAD: L: /CCAD6/6164	DATE: FEBRUARY 2007	REDUCED:	(A3)
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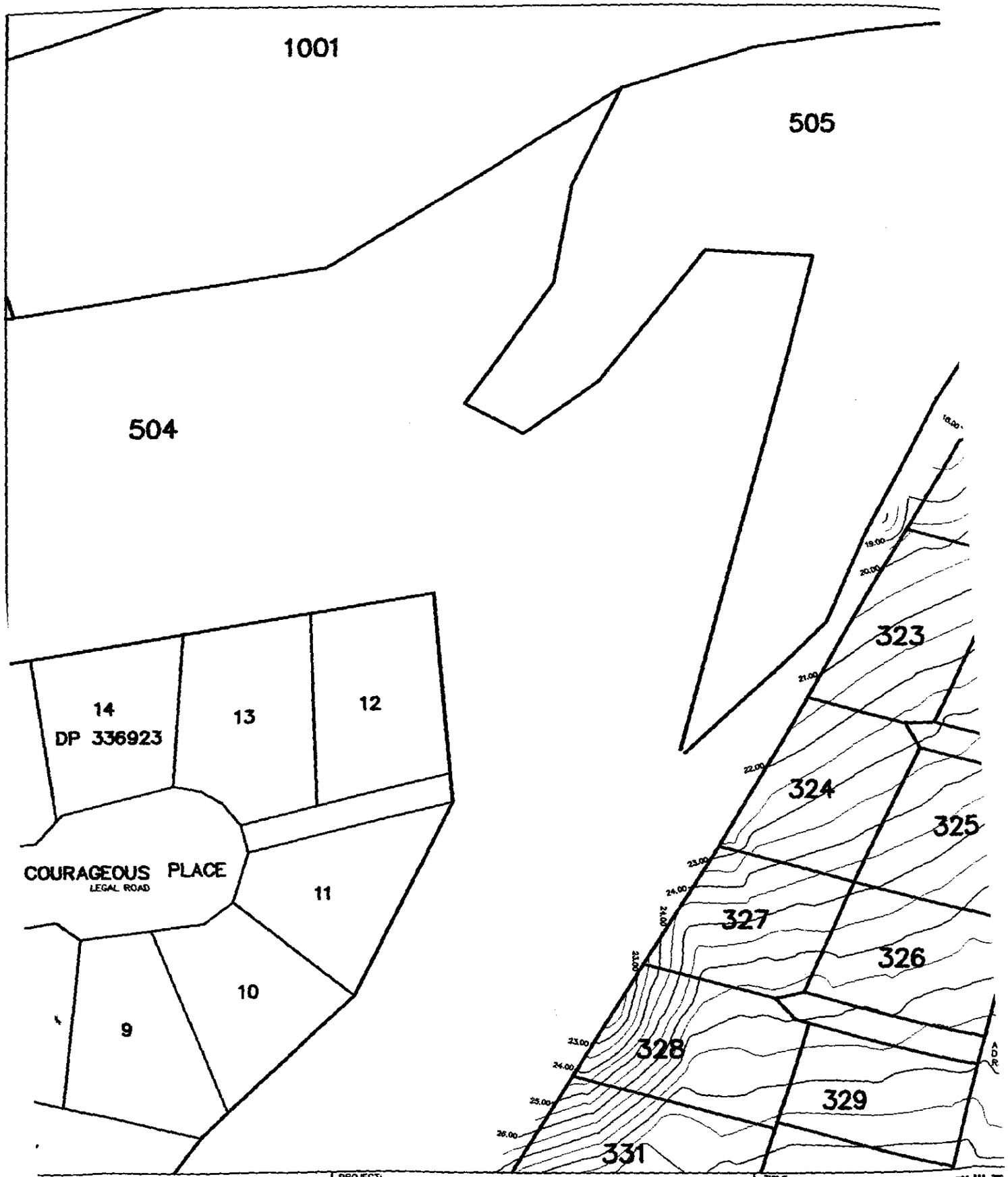
DESIGNED:	CHECKED:		



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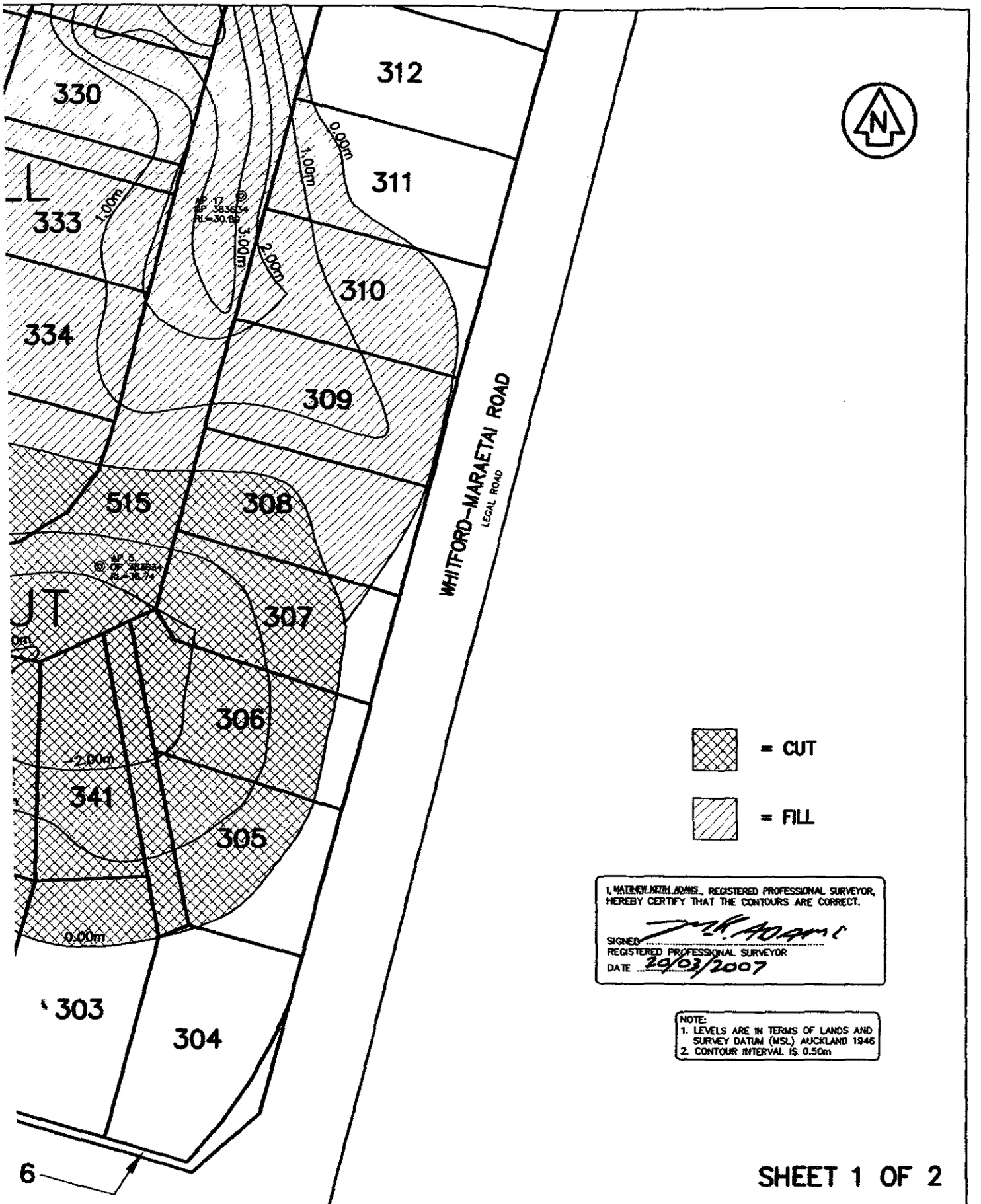
PROJECT:
OUTLOOK PARK

TITLE:
AS-BUILT
SPINNAKER
BEA



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SIGNED M.K. Adams

REGISTERED PROFESSIONAL SURVEYOR

DATE 20/03/2007

NOTE:
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2. CONTOUR INTERVAL IS 0.50m

SHEET 1 OF 2

LL CONTOURS FOR
BAY: STAGE 3B
ACHLANDS

AMENDMENT SCHEDULE

CLIENT: GHD

AUTOCAD: L:/DWG/6164		SCALE: 1:500 (A1)	
CIVILCAD: L:/CCAD6/6164	DATE: FEBRUARY 2007	REDUCED: 1:1000 (A3)	
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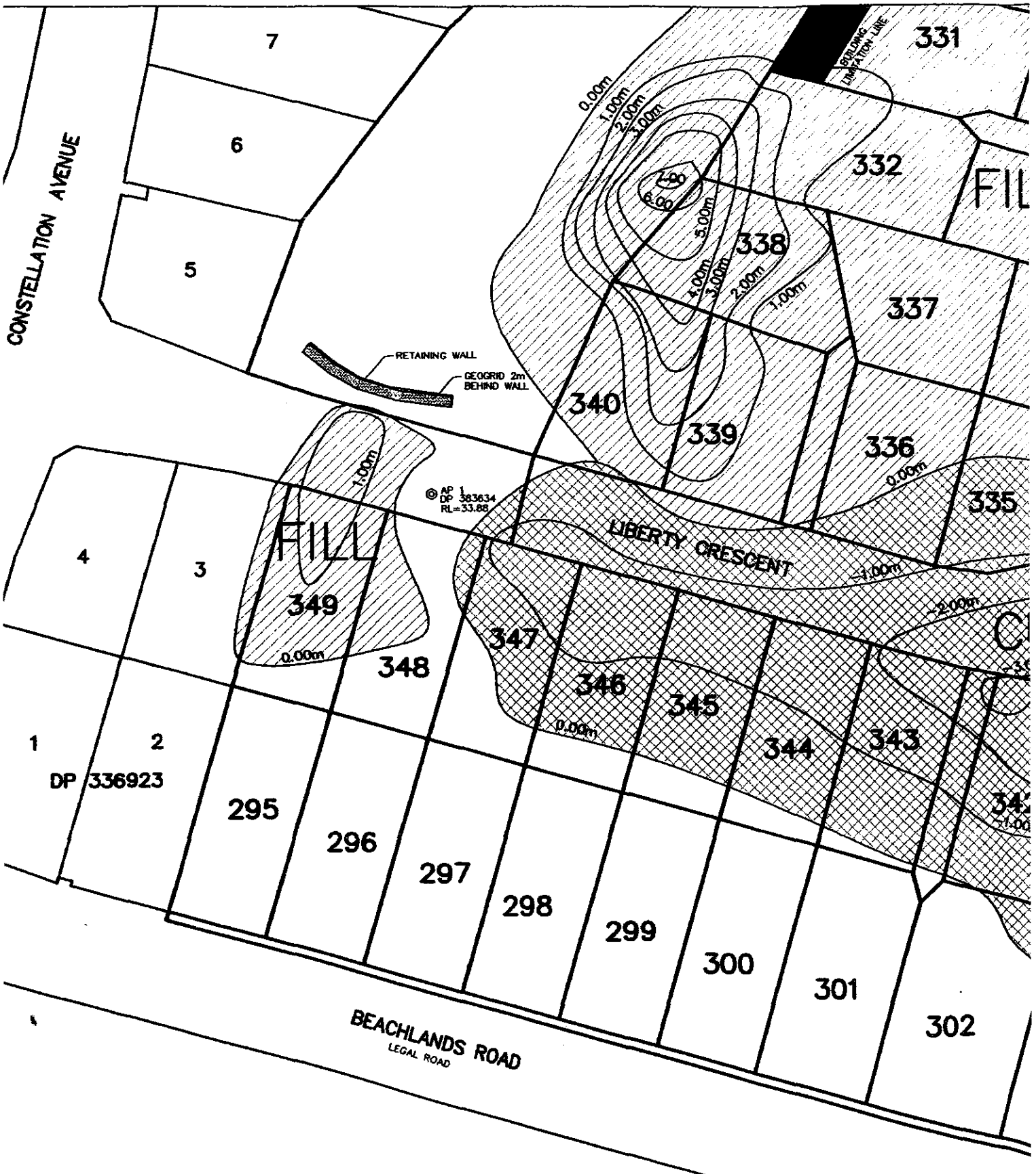
DESIGNED:	CHECKED:		

TED. DIMENSIONS TAKE PRECEDENCE OVER SCALING. IF IN DOUBT ASK.



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PROJECT:
OUTLOOK PARK

TITLE:
CUT AND
SPINNAKE
B

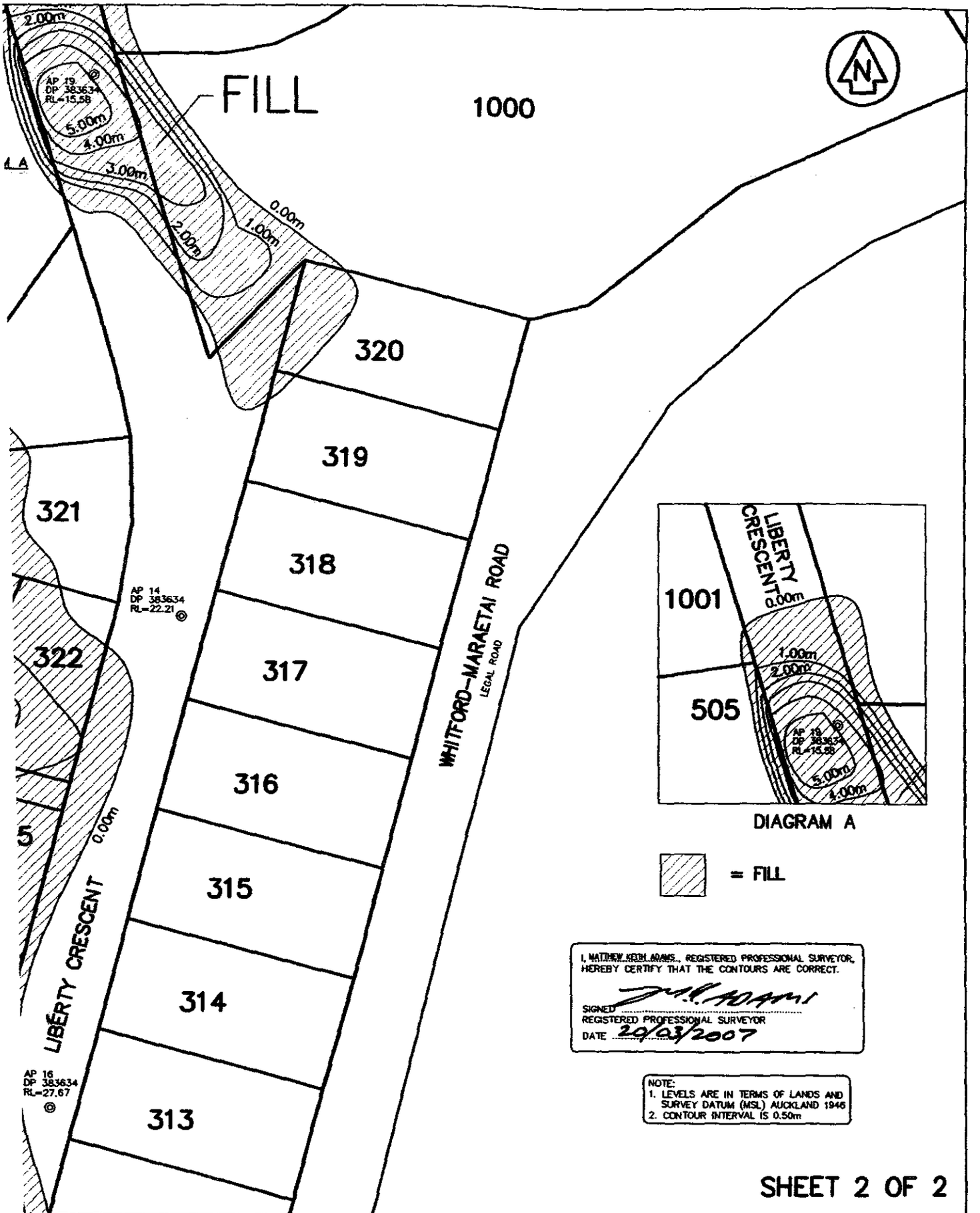

DIAGRAM A

= FILL

I, MATTHEW KEITH ADAMS., REGISTERED PROFESSIONAL SURVEYOR, HEREBY CERTIFY THAT THE CONTOURS ARE CORRECT.

SIGNED

REGISTERED PROFESSIONAL SURVEYOR

DATE 20/03/2007

NOTE:
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SHEET 2 OF 2

. CONTOURS FOR
BAY: STAGE 3B
HLANDS

D. DIMENSIONS TAKE PRECEDENCE OVER SCALING. IF IN DOUBT ASK.

AMENDMENT SCHEDULE			

CLIENT: GHD			
AUTOCAD: L: /DWG/6164		SCALE:	1:500 (A1)
CIVILCAD: L: /CCAD6/6164	DATE: FEBRUARY 2007	REDUCED:	1:1000 (A3)
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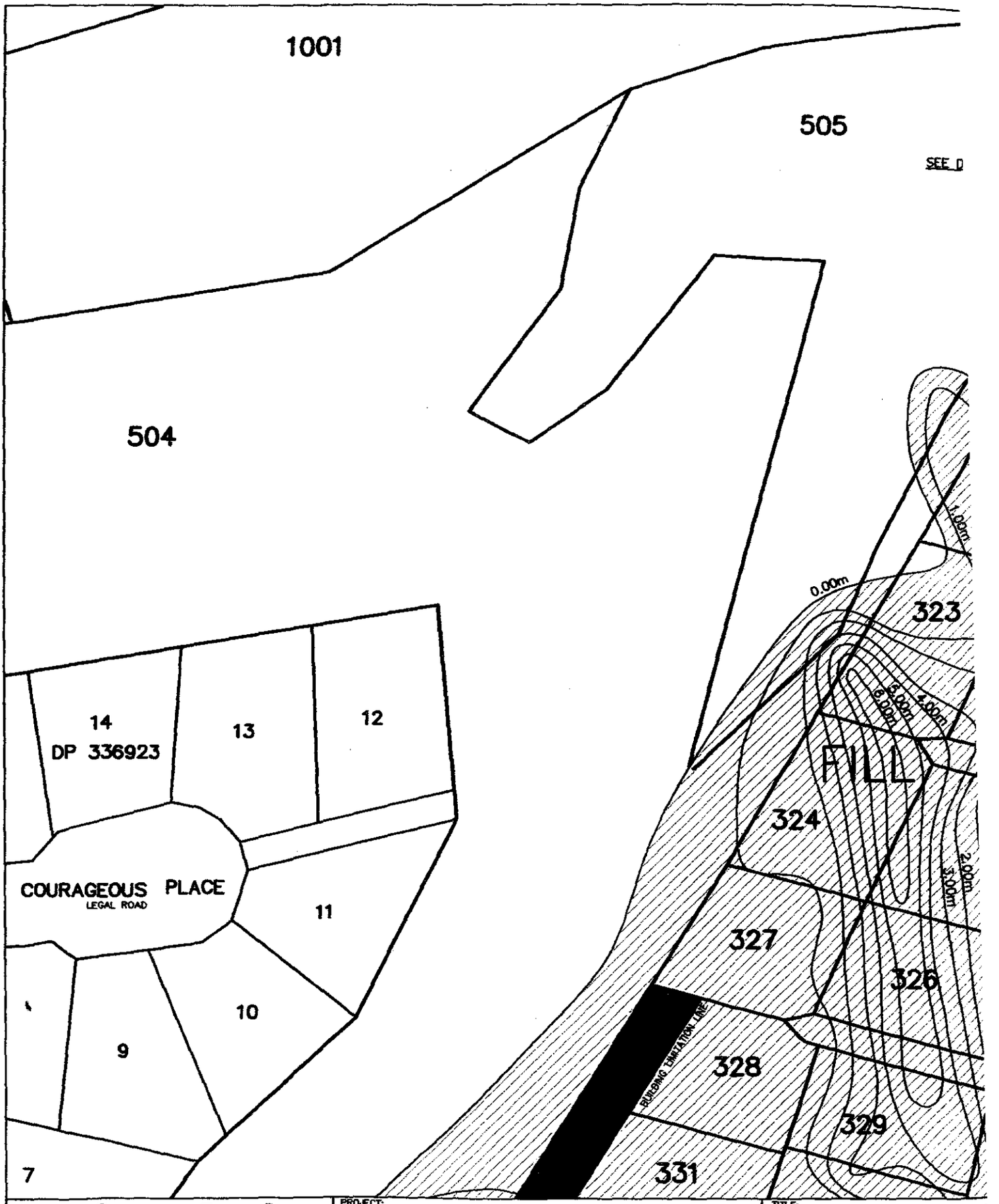
DESIGNED:	CHECKED:		



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PROJECT:

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TITLE:

CUT AND
SPINNA