DUNEDIN CITY COUNCIL

RECEIVED
22 AUG 2017
BY:

terramark.co.nz

Application Form for a Resource Consent

50 The Octagon, PO Box 5045, Moray Place
Dunedin 9058, New Zealand
Ph 477 4000
www.dunedin.govt.nz

PLEASE FILL IN ALL THE FIELDS

Application Details

I/We **Downie Stewart Foundation** (must be the FULL name(s) of an individual or an entity registered with the New Zealand Companies Office. Family Trust names and unofficial trading names are not acceptable: in those situations, use the trustee(s) and director(s) names instead) hereby apply for:

☑ Land Use Consent ☐ Subdivision Consent

Brief description of the proposed activity: **Community support activity (Moana House) on 401, 402 and 403 High Street including re-configuration of existing residential activities, erection of new building on 403 and Consent to disturb soil under the NES provisions**

Have you applied for a Building Consent? ☑ Yes, Building Consent Number ABA **PIM ONLY – PIM-2016-849** ☐ No

Site location/description

I am/We are the: (owner, occupier, lessee, prospective purchaser etc) of the site

Street Address of Site: **401, 402 and 403 High Street, DUNEDIN**

Legal Description: Lot 1 & 2 DP 4266, Lot 4 DP 2281, Pt Lot 3 DP 2281, Pt Lot 5 DP 1266 & Pt Sec 40 Block II Tn of DN

Certificate of Title: **OT368/120, OT276/233, OT14C/712**

Address for correspondence (this will be the first point of contact for all communications for this application)

Name: **C/- Terramark Limited (Maaike Duncan)** (applicant/agent (delete one))

Address: **PO Box 235, Dunedin** Postcode: **9054**

Phone (daytime): **03 477 4783** Email: **maaike@terramark.co.nz**

Address for invoices or refunds (if different from above)

Name: **As above**

Address:

Bank details for refunds

Bank Account Name

Account Number: Bank Branch / Account Number / Suffix

Ownership of the site

Who is the current owner of the site? **As above**

If the applicant is not the site owner, please provide the site owner's contact details:

Address: Postcode:

Phone (daytime): Email:

Monitoring of your Resource Consent

To assist with setting a date for monitoring, please estimate the date of completion of the work for which Resource Consent is required. Your Resource Consent may be monitored for compliance with any conditions at the completion of the work. (If you do not specify an estimated time for completion, your Resource Consent, if granted, may be monitored three years from the decision date).

_____(month and year)

Monitoring is an additional cost over and above consent processing. You may be charged at the time of the consent being issued or at the time monitoring occurs. Please refer to City Planning's Schedule of Fees for the current monitoring fee.

Detailed description of proposed activity

Please describe the proposed activity for the site, giving as much detail as possible. Where relevant, discuss the bulk and location of buildings, parking provision, traffic movements, manoeuvring, noise generation, signage, hours of operation, number of people on-site, number of visitors etc. Please provide proposed site plans and elevations.

See attached application for specific detail

Description of site and existing activity

Please describe the existing site, its size, location, orientation and slope. Describe the current usage and type of activity being carried out on the site. Where relevant, discuss the bulk and location of buildings, parking provision, traffic movements, manoeuvring, noise generation, signage, hours of operation, number of people on-site, number of visitors etc. Please also provide plans of the existing site and buildings. Photographs may help.

See attached application for specific detail

_____(Attach separate sheets if necessary)

District plan zoning

What is the District Plan zoning of the site? **Residential 1**

Are there any overlaying District Plan requirements that apply to the site e.g. in a Landscape Management Area, in a Townscape or Heritage Precinct, Scheduled Buildings on-site etc? If unsure, please check with City Planning staff.

Townscape Precinct – High Street

Breaches of district plan rules

Please detail the rules that will be breached by the proposed activity on the site (if any). Also detail the degree of those breaches. In most circumstances, the only rules you need to consider are the rules from the zone in which your proposal is located. However, you need to remember to consider not just the Zone rules but also the Special Provisions rules that apply to the activity. If unsure, please check with City Planning staff or the Council website.

See attached application for specific detail

Affected persons' approvals

I/We have obtained the written approval of the following people/organisations and they have signed the plans of the proposal:

Name: _____

Address: _____

Name: _____

Address: _____

Please note: You must submit the completed written approval form(s), and any plans signed by affected persons, with this application, unless it is a fully notified application in which case affected persons' approvals need not be provided with the application. If a written approval is required, but not obtained from an affected person, it is likely that the application will be fully notified or limited notified.

Assessment of Effects on Environment (AEE)

In this section you need to consider what effects your proposal will have on the environment. You should discuss all actual and potential effects on the environment arising from this proposal. The amount of detail provided must reflect the nature and scale of the development and its likely effect. i.e. small effect equals small assessment.

You can refer to the Council's relevant checklist and brochure on preparing this assessment. If needed there is the Ministry for the Environment's publication "A Guide to Preparing a Basic Assessment of Environmental Effects" available on www.mfe.govt.nz. Schedule 4 of the Resource Management Act 1991(RMA) provides some guidance as to what to include.

See attached application for specific detail

(Attach separate sheets if necessary)

The following additional Resource Consents from the Otago Regional Council are required and have/have not (delete one) been applied for:

☐ Water Permit ☐ Discharge Permit ☐ Coastal Permit ☐ Land Use Consent for certain uses of lake beds and rivers ☑ Not applicable

Declaration

I certify that, to the best of my knowledge and belief, the information given in this application is true and correct.

I accept that I have a legal obligation to comply with any conditions imposed on the Resource Consent should this application be approved.

Subject to my/our rights under section 357B and 358 of the RMA to object to any costs, I agree to pay all the fees and charges levied by the Dunedin City Council for processing this application, including a further account if the cost of processing the application exceeds the deposit paid.

Signature of ~~Applicant~~/Agent (delete one): MDunce Date: 22/8/17

Privacy – Local Government Official Information and Meetings Act 1987

You should be aware that this document becomes a public record once submitted. Under the above Act, anyone can request to see copies of applications lodged with the Council. The Council is obliged to make available the information requested unless there are grounds under the above Act that justify withholding it. While you may request that it be withheld, the Council will make a decision following consultation with you. If the Council decides to withhold an application, or part of it, that decision can be reviewed by the Office of the Ombudsmen.

Please advise if you consider it necessary to withhold your application, or parts of it, from any persons (including the media) to (tick those that apply):

☐ Avoid unreasonably prejudicing your commercial position

☐ Protect information you have supplied to Council in confidence

☐ Avoid serious offence to tikanga Maori or disclosing location of waahi tapu

What happens when further information is required?

If an application is not in the required form, or does not include adequate information, the Council may reject the application, pursuant to section 88 of the RMA. In addition (section 92 RMA) the Council can request further information from an applicant at any stage through the process where it may help to a better understanding of the nature of the activity, the effects it may have on the environment, or the ways in which adverse effects may be mitigated. The more complete the information provided with the application, the less costly and more quickly a decision will be reached.

Fees

Council recovers all actual and reasonable costs of processing your application. Most applications require a deposit and costs above this deposit will be recovered. A current fees schedule is available on www.dunedin.govt.nz or from Planning staff. Planning staff also have information on the actual cost of applications that have been processed. This can also be viewed on the Council website.

Further assistance

Please discuss your proposal with us if you require any further help with preparing your application. The Council does provide pre-application meetings without charge to assist in understanding the issues associated with your proposal and completing your application. This service is there to help you.

Please note that we are able to provide you with planning information but we cannot prepare the application for you. You may need to discuss your application with an independent planning consultant if you need further planning advice.

City Planning Staff can be contacted as follows:

In Writing: Dunedin City Council, PO Box 5045, Moray Place, Dunedin 9058

In Person: Customer Services Centre, Ground Floor, Civic Centre, 50 The Octagon

By Phone: (03) 477 4000, Fax: (03) 474 3451

By Email: planning@dcc.govt.nz

There is also information on our website at www.dunedin.govt.nz.

Information requirements (two copies required)

- [x] Completed and Signed Application Form
- [x] Description of Activity and Assessment of Effects
- [x] Site Plan, Floor Plan and Elevations (where relevant)
- [x] Certificate of Title (less than 3 months old) including any relevant restrictions (such as consent notices, covenants, encumbrances, building line restrictions)
- [ ] Written Approvals
- [ ] Forms and plans and any other relevant documentation signed and dated by Affected Persons
- [x] Application Fee (cash, cheque or EFTPOS only; no Credit Cards accepted)

In addition, subdivision applications also need the following information

- [ ] Number of existing lots.
- [ ] Number of proposed lots.
- [ ] Total area of subdivision.
- [ ] The position of all new boundaries.

In order to ensure your application is not rejected or delayed through requests for further information, please make sure you have included all of the necessary information. A full list of the information required for resource consent applications is in the Information Requirements Section of the District Plan.

OFFICE USE ONLY

Has the application been completed appropriately (including necessary information and adequate assessment of effects)?

☐ Yes ☐ No

Application: ☐ Received ☐ Rejected

Received by: ☐ Counter ☐ Post ☐ Courier ☐ Other: _____

Comments: _____

_____

_____

_____

(Include reasons for rejection and/or notes to handling officer)

Planning Officer: _____ Date: _____

22 August 2017

RECEIVED
22 AUG 2017
BY:

Dunedin City Council
PO Box 5045
DUNEDIN 9054

ATTENTION: The Senior Planner

Dear Sir/Madam

LANDUSE CONSENT APPLICATION
401, 402 AND 403 HIGH STREET, DUNEDIN

On behalf of Downie Stewart Foundation, we submit for consideration by your Council an application for land use consent for the Moana House activity at 401, 402 and 403 High Street, Dunedin and consent for a discretionary activity in terms of the National Environmental Standard for Assessing and Managing Contaminants in Soil (NES:Soil) on 403 High Street.

Please find enclosed the following documents:

1. Form 9
2. Processing Cheque for $1350.00
3. Resource Consent Application
4. Appendix 1: Warnock Architecture Plans (16 pages)
5. Appendix 2: Solar Studies
6. Appendix 3: Geosolve - Geotechnic
7. Appendix 4: Environmental Consultants Otago - HAIL
8. Appendix 5: Certificates of Title

For reference, the applicant's details are:

Downie Stewart Foundation
P O Box 619
Dunedin 9054

All resource consent associated correspondence is to be directed via the writer; the applicant's agents, and our contact details are as follows:

Terramark Limited	Attention:	Mrs Maaike Duncan
P O Box 235	Phone:	03 477 4783
Dunedin 9054	Email:	maaike@terramark.co.nz

If you have any further queries please do not hesitate to contact the undersigned.

Yours faithfully
Terramark Ltd

Maaike Duncan
Licensed Cadastral Surveyor

LANDUSE CONSENT APPLICATION
401, 402 AND 403 HIGH STREET, DUNEDIN

1.00 THE EXISTING ENVIRONMENT

1.01 The Sites

The properties are referenced in the DCC Webmap as 401, 402 and 403 High Street, Dunedin. 401 and 403 High Street are located on the southern side of High Street whilst 402 High Street is located directly opposite 401 and 403 on the northern side.

401 High Street (OT14C/712) is legally described as Lot 2 DP 4266 and comprises 551m² and is held in the name of Downie Stewart Foundation and Justice Purposes NZGZ 1992.

402 High Street (OT368/120) is legally described as Lot 4 DP 2281, Part Lot 3 DP 2281, Part Lot 5 DP 1266 and Part Section 40 Block II Town of Dunedin and comprises 509m² and is held in the name of Downie Stewart Foundation.

403 High Street (OT276/233) is legally described as Lot 1 DP 4266 and comprises 551m² and is held in the name of Downie Stewart Foundation.

1.02 Background

Downie Stewart Foundation is a charitable trust established to run the Moana House programme. Moana House is a residential therapeutic community catering for adult male offenders and has operated from the same site since 1987.

The Moana House programme consists of a long term residential programme which incorporates continuing care (counselling/therapy), and an outpatients after care programme with training and workshops offered throughout to improve their work and study skills. All programmes are funded by the Ministry of Health. Funding currently allows for 17 beds.

Moana House is funded to deliver the only Impaired Drivers Programme south of Christchurch to Community Probation clients and also provides training to health professionals. The Impaired drivers program consists of a group of 12 people meeting once a week for 8 weeks. Moana House is funded to run 2-3 per year.

Training to health professionals consists of day long workshops with speakers. This are currently run as required but not more than once a month.

1.03 Existing Setup and Consents

401 High Street contains the original Moana House and operates as a residential dwelling providing seven programme beds and one staff bed, and also accommodates the foundations administration and counselling personnel's office. An eighth bedroom and toilet is located in a detached sleep out located in the south west corner of the site whilst a meeting room is located in the outbuilding in the southeast corner of the site. A number of lean-to's are located along the western boundary and these are currently used as cover for firewood and storage of tools. A single garage located at street level is utilised for carving (wood and stone).

402 High Street was acquired by Downie Stewart Foundation in 1997. It operates under existing consent 2003-1193 which approved residential activity for the programme participants in the flat on the upper level (three beds). It also approved training and workshops to be run from the downstairs flat for

programme participants, to other community groups of social services and to community probation service clients. The consent also approved the provision of no onsite parks. The training was at that stage approved for up to three workshops being held each week for up to 15 people.

403 High Street was acquired in 2005 and contains a two storey dwelling which is used solely as a residential dwelling providing four programme beds and one staff bed. It has a driveway which provides access to the rear of the site. There are no formal off street parks though the driveway is used to park the foundation's truck and trailer. The rear of 403 is vacant and contains remains of a historic building, namely concrete steps, back wall and foundation. A bluestone wall is located along the boundary with 409 High Street. Mr Warnock is making contact with Heritage NZ regarding this.

The foundation owns and runs two vans and a truck and trailer. They provide a pick up and drop off service for the impaired driving participants and all Moana House programme participants are provided a Go Bus Pass to facilitate bus travel.

A Preliminary Information Memorandum (PIM-2016-849) has been issued in relation to a new building to be constructed at the rear of 403 High Street.

Moana House currently have two administration staff, and twenty two programme delivery specialists whom work on a rotational basis to cover the 24 hours, 7 days a week programme.

1.04 Reasons for Application

The administration, programme specialists workspaces, and programme services are starting to encroach into the residential spaces of Moana House at 405 High St whilst workshop tools are housed in rented storage offsite. None of the current buildings offer a single room where all staff and residents can meet. Overall, this impacts on the residential experience of the programme participants and the programmes.

Moving to larger existing premises is not an option, due to the nature of the foundation's community philosophy whereby participants reside in houses within the community, just as they will in future on their own.

The land at the rear of 403 High Street is poorly utilised at present. It is intended to construct a new building at the back of 403 High Street as detailed on Warnock Architecture plans attached to this application. This will alleviate the issue of space, allow the existing buildings to be better used and utilise the vacant land.

The applicant seeks land use resource consent for the Moana House operation across three sites as proposed below.

The associated earthworks to construct the building are to involve contaminated soils and as such the applicant also seeks consent for a discretionary activity under the provisions of the National Environmental Standard for Soil.

2.00 DESCRIPTION OF PROPOSAL

2.01 401 High Street

Upon construction of the new building at 403 High Street, Moana House will continue to provide residential living for programme participants and a staff member. The external bedroom will remain as per the status quo.

The external meeting room in the southeast corner of the site will remain a public space for smaller gatherings as needed. The lean-to's along the western boundary will be removed and in time as funding allows, the rear courtyard is to be redeveloped to improve the linkage between the buildings (existing and proposed) as well as improve laundry drying facilities. The garage will continue to be used to teach carving and store the related tools.

Some elements of the programme will continue to be delivered to residents from the public rooms as needed, whilst some minor administration aspects may also continue to be located at 401. This activity will be a mix of residential and community support.

2.02 402 High Street

The upstairs flat at 402 High Street will continue as per the status quo as a residential activity providing 3 beds for programme residents. It is intended that upon construction of the new building at 403 High Street, the downstairs flat (3-4 bedrooms) will also resume being used solely for residential activity.

The two flat arrangement of this dwelling is consistent with its historic use. As funding becomes available some internal reconfiguration of the downstairs flat may occur to improve the residential experience.

This site will contain two residential activities. There is no intention to deliver any part of the programmes from within this building.

2.03 403 High Street

2.31 Existing Building

The existing building will continue to operate as a residential activity providing beds for programme participants. This is considered a residential activity.

There is no intention to deliver any part of the programmes from within this building.

2.32 New Building

The new building will consist of three levels, designed to fit into the existing landform. All training and workshops offered by the Moana House Training Institute to both residents and non-residents will be conducted from the new purpose built building.

The Impaired Drivers course will run 2 – 3 times per year and consists of a group of 12 people meeting once a week for 8 weeks. The workshops to health professionals will consist of day long workshops offered no more than once a fortnight but more than likely only once a month.

It is intended to allow the large multipurpose room to be available to other service groups as required when free. This may equate to 2 – 3 times per week at most.

The lower level will consist of two secure stores and car parking for three vehicles. The larger store will house tools which are used in training and workshops, and will allow the offsite rental storage to be relinquished. The smaller store will house clothing and provide a designated dressing room area where participants whom arrive with very little are able to be provided clothing. This is currently located within the staff bedroom due to the lack of space in Moana House.

The middle level will contain the administration area for Moana House, staff room and toilets along with a large multi-purpose room which will be able to facilitate programme delivery to groups. Due to the site levels, this level will provide access to the rear courtyard of 401 High Street.

On the upper level, four counselling rooms and a sitting area are proposed to facilitate programme delivery on a one to one basis or to very small groups.

This building will not contain a kitchen or living spaces and is considered a community support activity.

2.04 Access and Car Parking

The three properties all front High Street. The foundation owns two vans, which are parked on the street outside 401. The foundation also owns a truck and trailer which currently parks at the rear of 403. The staff numbers vary depending on the time of day and day of week, but all are responsible for their own transport to and from work.

A bus stop is located along High Street outside 403.

Given the circumstances surrounding the participants, it is very rare for them to own and use a vehicle. Those participants of the residential programme that do own a vehicle are required to arrange storage of these prior to their arrival as vehicles are not permitted. Upon entering the programme, participants are given a Go-Bus card to utilise the public bus transport service.

Those participants involved in the impaired drivers programme are not allowed to drive and are offered a pick-up drop-off service as part of the programme.

Overall three parks are to be provided in association with the Moana House activity which operates across the three sites. These are intended for foundation or staff vehicles as required. The practise of parking the vans on the street will continue as this is central to all three sites.

2.05 Signage

The foundation strives to offer a service which blends into the community and as such there is no signage associated with the premises.

2.06 Servicing

The sites are currently served for water, foul sewage, stormwater, telecommunications and electricity. There are no changes proposed to the existing service arrangements other than new internal drains which will be subject to the building consent process.

2.07 Building Bulk and Location

The external envelopes of the three existing buildings are not being altered. The existing lean-to's along the western boundary of 401 will be removed.

The proposed building will be constructed of timber and plaster with a corrugated iron roof. The colour of the proposed plaster is not yet confirmed but will be generally earthy to complement the cedar timber finish and have a standard sponge type finish. The timber is to be finished in natural stain or oil.

The new building will be located within the side yard to 401 High Street being part of this application. The length of the building will be located about 1.5m from the boundary but will only be visible as such along the second floor. The covered porch and associated wing walls on the second floor will extend fully to the boundary which equates to approximately 9m along the common boundary. The building will also breach the 63° height plane from the same boundary. The extent of these encroachments is shown on the attached plans.

The building will be compliant to all other boundaries remaining clear of the southern boundary with 167 Maitland Street by 2.9m and the western boundary by 3.4m.

The total site coverage of 403 High Street upon completion will be 50%.

2.08 Heritage NZ

A bluestone wall is located along the western boundary of 403 High Street, in common with 409 High Street. Reece Warnock is approaching Heritage NZ with respect to this wall.

2.09 Earthworks

Construction of the building will involve earthworks. The location of the proposed building is partially subject to a previous building platform, the remnants of which include a concrete wall, foundation and steps.

Geosolve undertook a geotechnical site investigation for the Downie Stewart Trust and their findings are reported and attached for reference. In summary, key aspects include;

- The site has a 1.1m depth of organic material and foundation design must account for this.
- The historic foundations/walls are not considered adequate for construction and should be removed.
- The slope on the south side is un-retained and care needs to be taken to ensure slope stability is retained.
- Construction and final development must avoid surcharging the bluestone walls running along the western boundary of the site.
- Earthworks design should be agreed with Geosolve prior to construction.
- A Geotechnical Practitioner should oversee the earthworks excavations.

The concept design has been prepared after release of this report. Discussion with the designer has confirmed that as part of the preparation of building consent detailed drawings, advice from structural engineers will provide the necessary confirmations regarding loading of the slope and wall or if necessary provide design criteria to underpin the relevant structures.

The total volume of cut is 210m^3 and 2m^3 of fill. The maximum depth of cut is proposed to be 3.3m and occur at the rear of the new build nearest the boundary with 401 in the location of the storeroom on Level 1.

2.10 NES for Assessing and Managing Contaminants in Soil

The site has been utilised as a residential activity, and visual evidence would lead us to believe that historically this also extended to the rear of the site. We believed that the site may have soils on site that have been contaminated to some degree. This belief comes about as a result of the Geosolve report which identified uncontrolled fill onsite to a maximum depth of 1.1m containing inorganic material, and that a building existed at the rear and that demolition material may have been burnt onsite. As such EC Otago were engaged to complete soil testing, and report findings.

EC Otago tested soil samples and it was found that the site was contaminated with lead and benso(a)pyrene contaminants exceeding permissible residential standards. As the volume of soils to be excavated exceeds the permissible volume associated with the disturbance of soils, the earthworks are considered a discretionary activity under the NES:Soil.

Subsequently EC Otago have undertaken an Assessment of Environmental Effects for the disturbance and disposal of soil which is supplied as supporting documentation to this application. Also provided is the Contaminated Soil Management Plan which has been prepared in order that the Dunedin City Council can concurrently approve the plan rather than require this as part of a condition of consent.

In summary, EC Otago has identified that though several potential effects arise from the proposal to disturb the soils, appropriate controls and management practices will mitigate these and to this end suggest appropriate inspection and reporting to be undertaken to confirm the earthworks were carried out according to the Contaminated Soil Management Plan

EC Otago proposes the following condition of consent;

> "That earthworks be conducted in accordance with the Contaminated Soil Management Plan, in particular that all soils at the property be handled in strict accordance with the provisions of the Contaminated Soil Management Plan under the assumption that they might be contaminated."

Overall it is considered that the earthworks required to be construct this building are characteristic of those required on a sloping site, and in terms of the contaminated material will be beneficial in reducing overall onsite soil contamination.

3.00 PLANNING STATUS

3.01 Current Operative Dunedin City District Plan

The zoning of the land is Residential 1 in the Dunedin City District Plan and has a Townscape overlay. High Street is identified as a Collector Road in the Dunedin City Road hierarchy.

- Moana House offers health services to the community and is considered to fall within the definition of a 'Community Support Activity' as defined in the plan as;

  "... the use of land and buildings or collection of buildings which are used for the primary purpose of supporting the health, welfare, safety, education, culture and spiritual well-being of the community including childcare facilities and community police offices but excludes hospitals, recreational activities, facilities which have or require a liquor licence or which provide restaurant facilities."

  Community Support Activities are discretionary (unrestricted) activities in the Residential 1 zone in accordance with Rule 8.7.5(i).

- The new building is in TH14; High Street Precinct, and new buildings are considered a controlled activity under Rule 13.7.2.

- The new building breaches Rule 8.7.2(i)(a) requiring 2.0m side yards and Rule 8.7.2(ii) requiring a 63° height plane angle to 401 High Street. #401 is part of the application and operates as part of the overall activity.

- The total site coverage for #403 breaches Rule 8.7.2(iv) which specifies a maximum site coverage of 40%. The total is proposed to be 50%.

- The proposed earthworks breach Rule 17.7.3 and Rule 17.7.4 (scale thresholds) by proposing 3.3m of cut depth and a total volume of 210m^3 which is considered a discretionary (restricted) activity under Rule 17.7.5(ii).

- Two residential activities are to be reinstated at 402 High Street which breaches Rule 8.7.1 requiring a minimum of 500m^2 per residential activity. This is considered a non-complying activity.

- The existing buildings on 401, 402 and 403 High Street have yard and height plane non-compliances to neighbouring properties which are existing and not changing as part of the proposal. These are not discussed further.

- The disturbance of contaminated soil in excess of 25m^3 per 500m^2 and disposal offsite of more than 5m^3 per 500m^2 as permitted by the NES:Soil is considered a discretionary activity.

3.02 Second Generation Dunedin City District Plan (2GP)

The three sites are all located in the proposed Inner City Residential Zone in the 2GP. The three development standards of density, yards and site coverage have their proposed provisions detailed for reference.

This zone proposes residential activity at a density of 1 habitable room per 45m^2. The proposed dual flat arrangement on 402 High Street, with total of 6-7 beds would be considered consistent with this density (509m^2/45m^2 =11 habitable rooms).

This zone proposes side and rear yard setbacks of 1.0m, which is less than the current 2.0m rule requirements. The new building on 403 would continue to breach the yard to 401 but would be even more compliant to 167 Maitland Street and 409 High Street.

This zone proposes a maximum site coverage of 60%. The combined site coverage of the existing and new buildings on 403 would be compliant with this site coverage by in excess of 10%.

The second generation district plan is in the hearings process and a formal decision is yet to be released. At this stage some provisions of this zone may become operative but remain subject to appeal. At this stage little weight can be applied to the 2GP hence why we have only detailed the provisions for reference purposes.

4.00 ASSESSMENT OF EFFECTS ON THE ENVIRONMENT

4.01 Consultation/Affected Persons

A PIM (2016-849) was obtained from the DCC with respect to the new building proposed for 403 High Street. This included identification of planning non-compliances associated with the new build.

Further brief consultation was undertaken with Phil Marshall on May 18th to obtain guidance with respect to potentially affected persons and to what extent consent application should cover the three properties.

It was confirmed that 401 was an affected person (Downie Stewart Trust – the applicant), and that the flats on 409 High Street and the dwelling on 167 Maitland Street may be affected if they are shaded by the new building given the new building is to their north.

The owners/occupiers of 167 Maitland Street made contact with Downie Stewart Trust regarding the proposed building early in the process. Their affected persons consent was sought however they declined to sign. We consider the effects of the proposal extend only to those arising from the new building. These effects have been compared to that of a permitted building and are submitted as being less than those arising from a permitted building.

The property of 409 High Street is subdivided into 5 unit titles and they are not owner-occupied. The landlords of all five flats is Chris Zhu and Yong Yang whom reside in Auckland. The tenants are not generally long term tenants according to the director of Downie Stewart Foundation and thus we have not sought their consent. We consider the effects of the proposal extend only to those arising from the new building. These effects have been compared to that of a permitted building and are submitted as being less than those arising from a permitted building.

Adjoining owner's consents were obtained in 2003 for the use of 402 High Street as part of a community support activity when it was altered from its original dual residential activity usage to single residential activity upstairs and training premises downstairs.

No other persons are considered to be adversely affected by this proposal for the reasons outlined below.

4.02 Permitted Baseline

For the purposes of assessing shading, a permitted baseline example has been prepared and shown on Warnock Architecture plans A1.1, A3.2, and A3.3. The zoning is residential and the existing building on 403 High Street is a dwelling hence it can reasonably be expected that an accessory building may be constructed at the rear of the site which accommodates both vehicles and provides for a studio/workshop and storage on upper levels.

The permitted baseline is a proposed garage constructed on the 2m yards to all three adjoining properties. The building walls extend vertically up until just below the 63° height plane. At this point the roof extends at an angle of 63° until it reaches an elevation of 9m above existing ground level. The total site coverage of the existing house and proposed garage combined is 220m² which is in accordance with the permitted 40% site coverage.

4.03 Assessment of Effects

4.31 Townscape Precinct

The existing buildings have been located onsite for a considerable amount of time. The dwelling at 401 High Street was built in 1930's though tends to reflect the earlier period brick gentleman's residences whilst the dwelling at 403 High Street was also built in the 1930's but reflects the Art Deco style.

The building at 402 High Street predates the DCC record of 1925 in its construction and reflects the brick gentleman's residences of the early time. The façade and bulk appearance to High Street of the dwelling at 402 High Street is registered as protected by the District Plan under B324 and has a Heritage NZ Category II status under Registration Number 2176. This dwelling was converted to two flats prior to its purchase by the Downie Stewart Foundation and remains configured as such. The re-use of this dwelling as two flats will not affect any external aspects (bulk/location or appearance) of the building and it is considered that the proposed activity will have no more than minor effects on the surrounding townscape precinct.

Though located within the Townscape precinct, the new building lies on its fringe. The proposed building will not reflect the heritage characteristics of the area, but rather reflect a modern design and finish (cedar timber and plaster in earthy tones). The building will be visible from High Street when viewed in a south easterly direction due to the open driveway of the adjoining neighbour and from one location on High Street where the elevation of High Street allows the rear of the site to be visible. When viewed from private residences across the gully, the new build is to have a brick dwelling and an art deco style dwelling as its backdrop. Given the lack of heritage style dwellings surrounding the new build location, it is considered that the appearance of the building will not detract from its surroundings.

4.32 Density

The potential density of residential units is only changing as a result of the reuse of the house at 402 High St as two flats. The dwelling is currently configured as two flats and until 2003 was used as such. Since then the programme participants only live in the upper flat in a residential activity context.

The reuse of the two flats each for residential purposes will not alter the number of participants in the programme but simply redistribute them around the three properties. Currently the programme is limited in its bed numbers by the Ministry of Health and this would have to be increased prior to any change in resident numbers.

Irrespective of the total number of beds available, the reuse of the dwelling at 402 High Street as two flats will have minimal impact on the surrounding environment. The dwelling can accommodate the same number of programme participants in either a single dwelling or dual flat orientation given its existing layout. The dual flat orientation is preferred as this allows smaller groups of participants to live and interact in an everyday situation to share a kitchen, bathroom and common rooms. Given that vehicles are not associated with the Moana House residents, there is no demand on parking.

Overall the re-use of the dwelling in a two flat scenario for the Moana House programme will have no more than minor adverse effects on the environment and allow re-utilisation of the existing dwelling.

4.33 Bulk and Location - New Build

The new building has been designed to be sympathetic to the lay of the land and the adjoining neighbours as much as possible being that the site is elevated above and north of both neighbours. It will remain compliant with respect to yard and height planes provisions to the properties of 409 High

Street and 167 Maitland Street. By setting the building back against the boundary of 401 High Street, the aim is to minimise all actual and potential effects on the adjoining properties.

4.34 Site Coverage/Shading

The total site coverage will exceed the 40% permissible by the District Plan at 50%. The surrounding environment has site coverages ranging from 25% to 63%. Site coverage is generally controlled to ensure that the overall amenity of a suburb is maintained.

The shading effect on the adjoining neighbours could also be affected by site coverage as it indirectly controls how much light filters between buildings to adjacent properties. In this instance the new building is located to the northwest and northeast of the adjoining neighbours at 167 Maitland Street and 409 High Street respectively. The proposed building is also on a site which is elevated in comparison to both these properties though the block of flats is two storied.

To facilitate the assessment of the effect of shading by the new build on the surrounding properties Warnock Architecture has generated a series of solar studies for December 25th, March 1st and June 19th 2017. These are visual simulations, at 15 minute intervals, which can be provided electronically to the Council upon request. In addition, screen shots have been compiled for comparison and are attached as supporting information for quick reference.

For reference the images take into account the site contours and the baseline/proposed building designs. The contours of the neighbouring properties and greater landscape context such as the Horizon, Peninsula, Highgate and Flagstaff ridgelines are all based on contour data supplied by the DCC. The buildings are 3d and their footprint is based on DCC aerial imagery whilst their height is estimated by the Mr Warnock given his building knowledge.

Generally it can be found that the proposed building has a lessor shading effect on the adjoining properties of 167 Maitland St and 409 High Street compared to the baseline building, irrespective of its larger footprint. This primarily occurs as it has been located as far away from the adjoining properties as possible and the overall design is sympathetic to these properties whilst providing for the needs of Moana House.

<u>409 High Street</u>

December 25th Solar Studies – Summer
The permitted baseline building shades the flats between approximately 7am and 10.20am. Comparatively, the proposed building shades the block of flats for a lessor period and over a shorter length. Refer simulation shading images at 0718 and 1003.

March 1st Solar Studies – Autumn
The proposed building will shade the flats of 409 High Street to some degree, from sunrise until approximately 11.45am but comparatively this remains less in duration and extent than that created by the permitted baseline which is between sunrise and noon/12.15. Refer simulation shading images at 0900 and 1145.

June 19th Solar Studies – Winter
The winter simulation indicates that the existing buildings on 403 High Street currently shade the block of flats until approximately 1.20pm. The baseline building would increase the amount of shading experienced by the flats during the morning through until about 1pm.

The variance of shading created by the proposed building compared to that of the baseline building is difficult to distinguish due to the very low sun angles and as the sites all have a southerly aspect. We

believe that the proposed building clears the flats slightly earlier at approximately 12.45pm compared to the baseline time of about 1pm. Refer simulation shading images at 0837, 1007, 1152 and 1307.

Summary for 409 High Street
Though the footprint of the proposed building is larger than that of the baseline and extends to the boundary of 401, it has no more than minor adverse effects on the 409 High St and 167 Maitland Street in autumn.

The extra length of the proposed building in the north-south direction only creates additional shading over the vehicle manoeuvring areas in the mornings of the summer and autumn simulations. Given the low winter sun angles and the lower elevation of the flats compared to the site, shading will always occur during this time irrespective of the total site coverage. The design is setback beyond minimum requirements in an attempt to minimise winter shading as much as possible.

Overall it is considered that the increased site coverage has no more than minor adverse effects because the increased building footprint to the north generally only shades yards and the shading that is created remains less than that of a permitted baseline building.

167 Maitland Street

December 25th Solar Studies – Summer
The property of 167 Maitland Street receives only minor shading during summer by the proposed building. The maximum extent of shading occurs at around 3pm and the buildings shadow extends to just along the property boundary. The effect of the new building is less than that of the permitted baseline. Refer simulation shading image at 1518.

March 1st Solar Studies – Autumn
The permitted baseline will shade the site to some degree from noon until early evening when all the properties are shaded out by larger topography. The baseline building touches the existing dwelling from about 3.45pm onwards.

Comparatively the proposed building has a lessor shading effect as it commences just after noon but does not reach the dwelling itself until later at approximately 4.00-4.15pm and does not extend as far into the site. As the sun continues around to the west the shadows increase but simultaneously move along the dwelling. The rear courtyard of 167 Maitland Street remains unshaded by the proposed building in the autumn simulation.

June 19th Solar Studies – Winter
The permitted baseline starts to shade the entire rear yard of this neighbour from about 12noon until after 3pm when the whole block is shaded by the larger topography. The shading created by the permitted baseline is comparatively similar on this property due to the angle of the sun.

Given the southerly aspect of the sites and the elevation differences this is not unexpected. However, the additional site coverage of the building makes no difference to the shading on this property as the maximum shading extent occurs when the sun is in line with the building and the shadow is the narrowest.

Summary for 167 Maitland Street
The simulations have shown how the proposed building will have no more than minor effects on 167 Maitland Street in summer and autumn.

Given the low midwinter sun angles and the lower elevation of #167 compared to the subject site, shading will always occur during this time irrespective of the total site coverage. The design is aligned

north-south and is setback more than the minimum provisions in an attempt to increase the daylight penetration in lieu of sunlight.

Overall it is considered that the increased site coverage has no more than minor adverse effects because the shading that is created remains generally similar to that of a permitted baseline building.

4.35 Transportation

The proposal is to provide three parks on 403 for the foundation's use. This compares to nil which are currently offered, though the truck and trailer are parked at the rear of 403 at times. The proposed parking provisions are considered to have positive outcomes on the transportation network as the overall parking provisions for the activity are increased.

The activity as a whole is not greatly changing, but rather being reconfigured upon construction of the new building. Overall, there will be three standalone residential activities (2x 402 and existing 403) one mixed residential activity with minor program delivery to residents and a dedicated programme delivery building to both residents and non-residents.

The three fully residential activities generate no parking requirements from the residents. Most of the residents, if they hold a licence do not own vehicles. Those residents that do own vehicles are not allowed to have them with them. A single staff member resides overnights at 401 and 403 respectively.

Moana House offers training and workshops to both residents and non-residents. The consent for 402, assessed the parking requirements for the training aspect. The consent at that stage assessed the activity on the basis of workshops being held 2 – 3 times per week, for a maximum of 15 people. The consent approved a relaxation of the parking requirements associated with the training from five (two parks for non-resident trainees and three for staff) to nil. The training activity approved is not intended to increase beyond that already approved but simply be relocated to the purpose built facility. The change in location will not generate additional parking needs beyond those that already exist.

Overall the existing parking arrangement for staff will continue whereby they park in Maitland Street or William Street, as there is sufficient on street parking available to accommodate this. The addition of three new covered car parks will provide the capacity for the existing vans to be located onsite as needed or for staff vehicles to be stored securely during night shift.

It is considered that the car parking arrangement is considered suitable for the proposed activity and that overall the proposal will have no more than minor effects on the surrounding transportation network.

4.36 Noise/House of Operation

Moana House generally delivers its training and program deliverables during standard business hours. Two of the four residential activities are staffed overnight and the program is a 24/7 program. The activity as a whole remains subject to the noise standards as laid out in the District Plan which is monitored indirectly by noise complaints. No noise complaints have been received for these three sites.

4.37 Servicing

There are no changes proposed to the existing service connections and thus the proposal will have no adverse effects on the public infrastructure networks. Internal drainage changes may be required to cater for the new building and these will be subject to approval as part of the building consent process.

5.00 OTHER MATTERS

5.01 Draft Decision

We would request that in the interests of trying to avoid possible objections, a draft of the consent decision and conditions is provided to the writer for discussion prior to release of the final decision.

6.00 SUMMARY

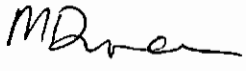
This application has shown how the existing activity as a whole, which is considered a discretionary unrestricted activity in its nature, has been established for some time without cause for concern and that the adverse effects created by the new building over and above the permitted baseline are anticipated to be no more than minor.

This activity meets both limbs of Section 105 in that any adverse effects on the environment are no more than minor and that the activity is not contrary to the objectives and policies of the Dunedin District Plan.

We request land use consent to operate the community support activity from the existing and proposed buildings at 401, 402 and 403 High Street and request that this application be processed on a non-notified basis.

If you have any queries please do not hesitate to contact the undersigned. We look forward to your response in the near future.

Yours faithfully
Terramark Ltd



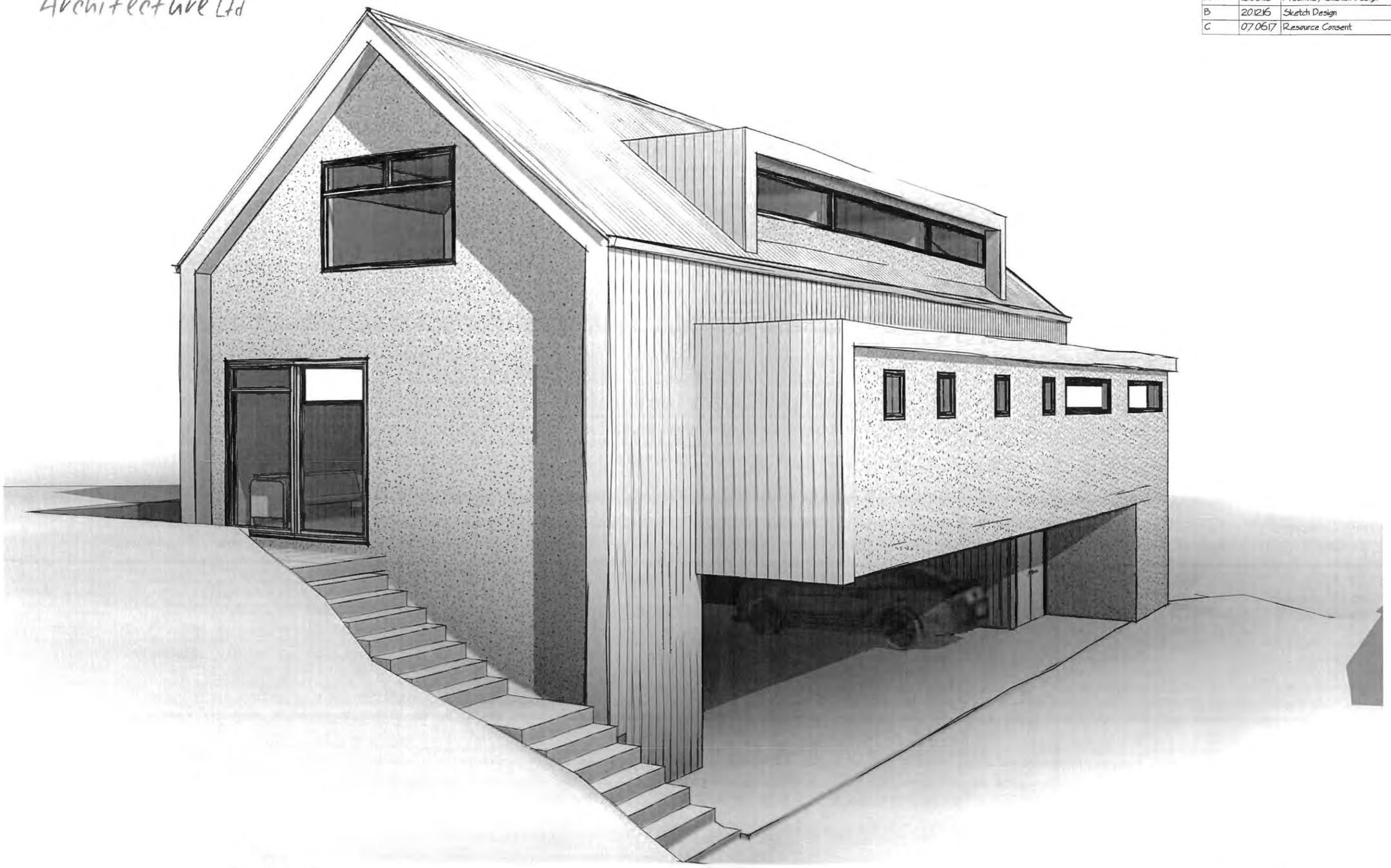
Maaike Duncan
Licensed Cadastral Surveyor
maaike@terramark.co.nz

APPENDIX 1

Warnock Architecture Plans (16 pages)

Warnock
Architecture Ltd

Revision Schedule		
Rev	Date	Description
A	180516	Preliminary Sketch Design
B	201216	Sketch Design
C	070617	Resource Consent



3D View 1

Resource Consent

LICENSED BUILDING PRACTITIONER www.dbh.govt.nz

ADNZ Architectural Designers New Zealand

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Moana Housenedin

SHEET TITLE
3d View

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No.	SHEET No.
May 2016		1521	A0.0
DRAWN	CAD REFERENCE	REVISION	
RJW	1521	C	

ORIGINAL SHEET SIZE A3 [420x297]

Warnock
Architecture Ltd

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Rev	Date	Description
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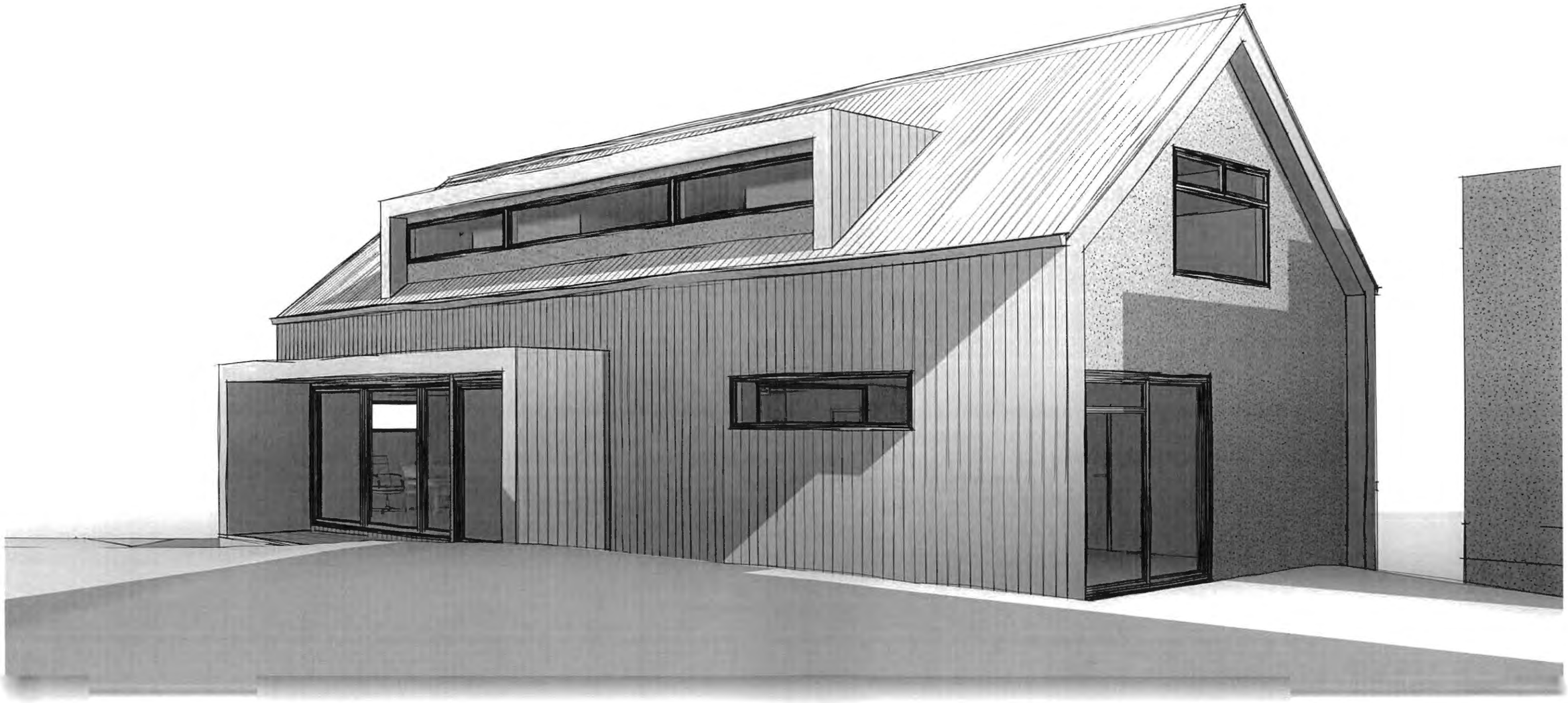
B	201216	Sketch Design
C	070617	Resource Consent



3D View 2

Resource Consent

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JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Moana Housenedin

SHEET TITLE
3d View

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No.	SHEET No.
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DRAWN	CAD REFERENCE	REVISION	
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ORIGINAL SHEET SIZE A3 [420x297]

Warnock
Architecture Ltd

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B	201216	Sketch Design
C	070617	Resource Consent

3D View 3

Resource Consent

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JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Moana Housenedin

SHEET TITLE
3d View

TRADE		DESIGNED	CHECKED
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Revision Schedule		
Rev	Date	Description
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3D View 4

Resource Consent

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JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Moana Housenedin

SHEET TITLE
3d View

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Architecture Ltd

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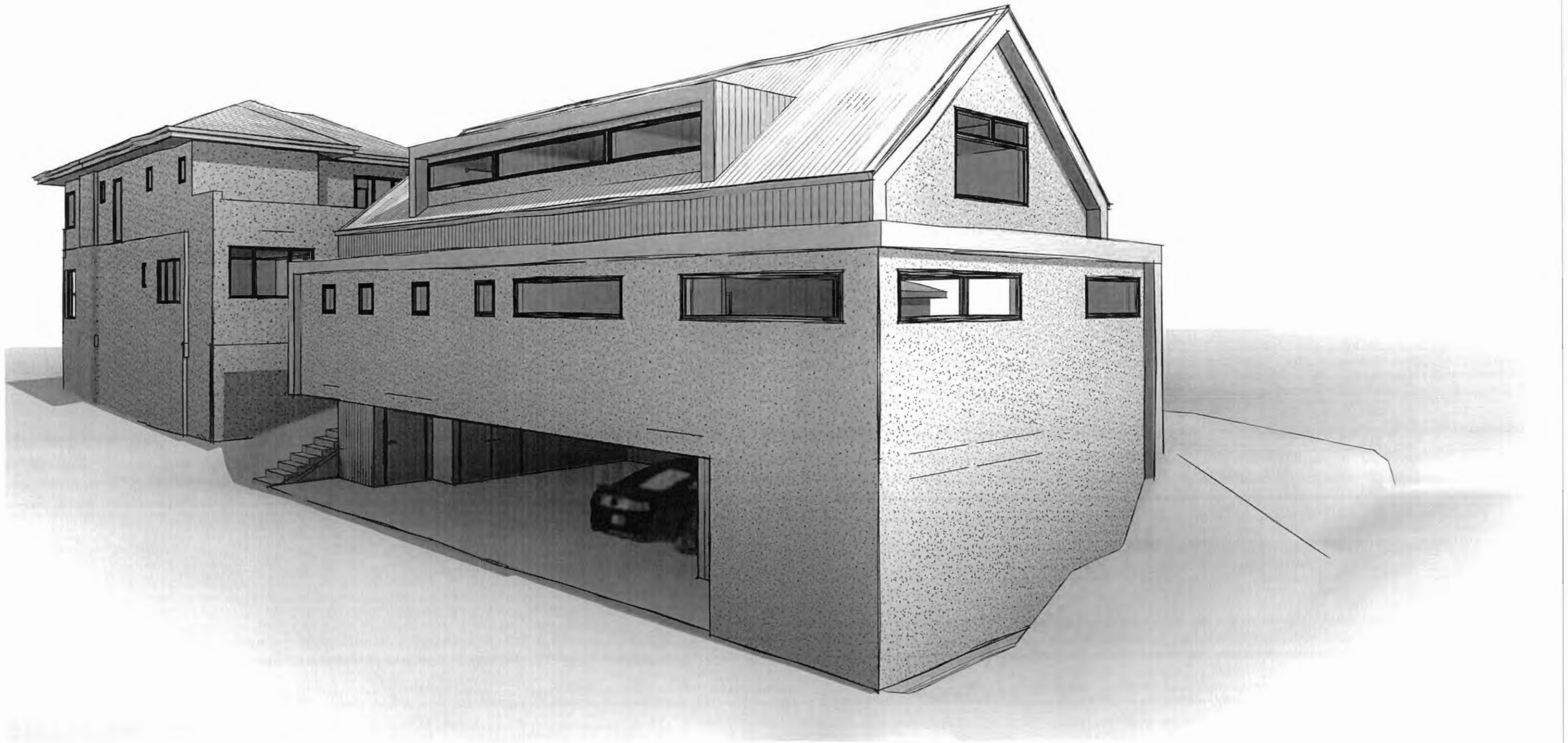

3D View 5

Resource Consent

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JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Moana Housenedin

SHEET TITLE
3d View

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Architecture Ltd

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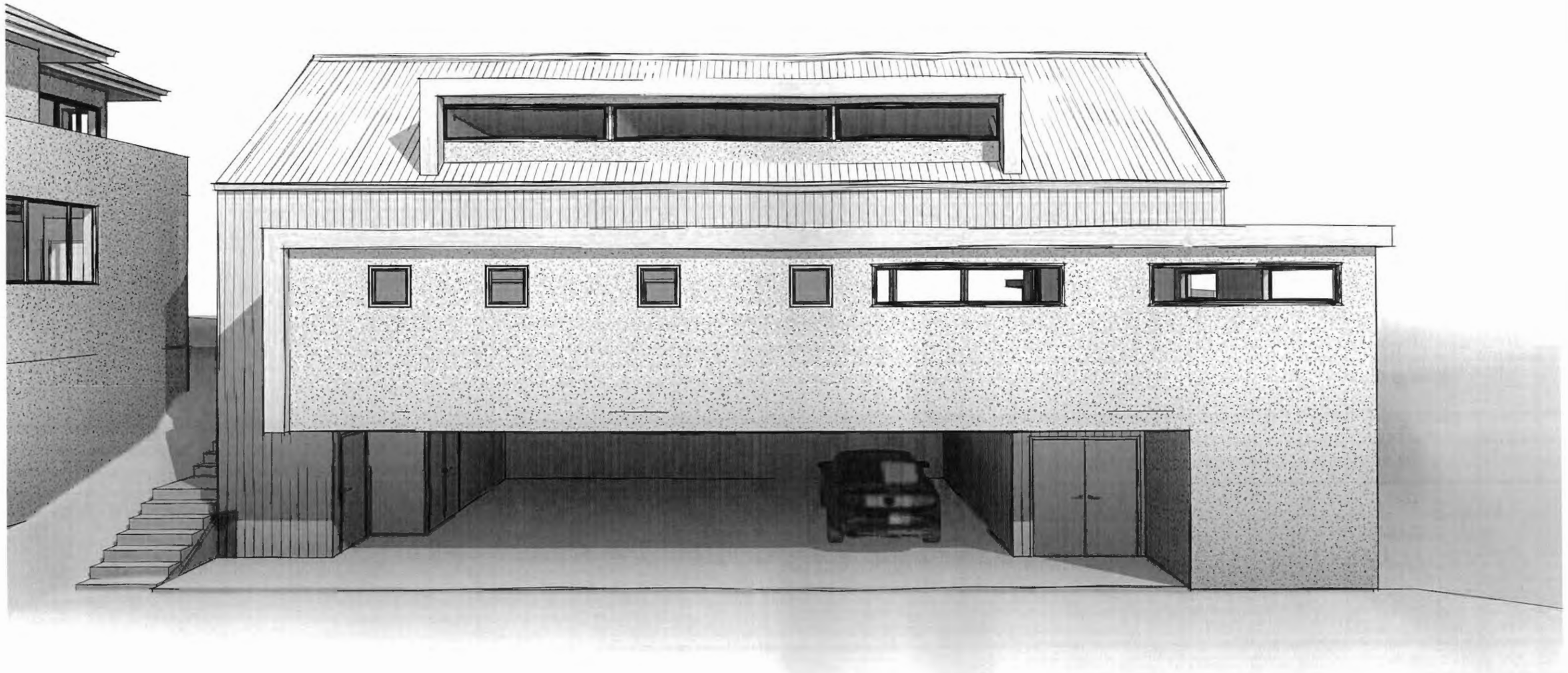
B	201216	Sketch Design
C	070617	Resource Consent



3D View 6

Resource Consent

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ADNZ Architectural Designers New Zealand

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Moana Housenedin

SHEET TITLE
3d View

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ORIGINAL SHEET SIZE A3 [420x297]

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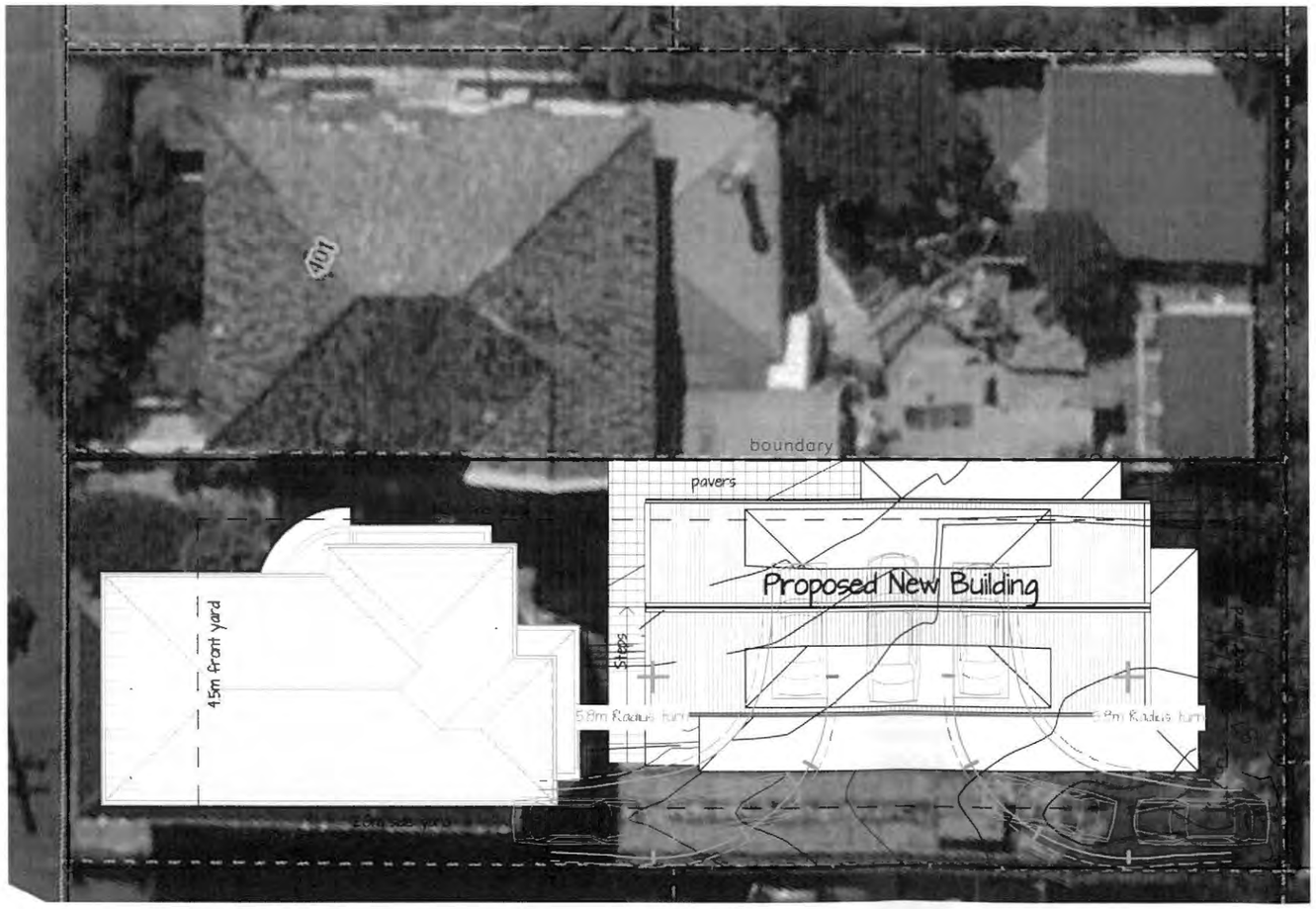
B	20.12.16	Sketch Design
C	07.06.17	Resource Consent



Proposed Site Plan

1 : 200

Legal Description
403 High Street
DUNEDIN
LOT 1
DP 4266
Valuation number - 27150-59700

Site Coverage
Site Area = 551m2
Existing site coverage = Approx 104m2 - 19%
Proposed site coverage = 104m2 + 170m2 = **274m2 - 50%**

Zoning
Wind = Medium
Elevation = 82m
Snow = < 0.9 kpa
Earthquake = Zone 1
Corrosion = Zone C
Zone = R1

Topography Schedule Proposed

Name	Cut	Fill	Net cut/Fill
General Excavation	12.84 m³	2.19 m³	-10.65 m³
Basement Excavation	183.61 m³	0.00 m³	-183.61 m³
Level 2 paving Excavation	13.99 m³	0.16 m³	-13.83 m³
Grand total: 3	210.44 m³	2.35 m³	-208.09 m³

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Proposed Site Plan

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No.	SHEET No.
June 17	1 : 200	1521	A1.0
DRAWN: RJW	CAD REFERENCE: 1521	REVISION: C	

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Resource Consent

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Revision Schedule		
Ref.	Date	Description
A	07.06.17	Resource Consent

Proposed Site Plan - Baseline

1 : 200

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Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House

403 High Street, Dunedin

SHEET TITLE
Site Plan - Baseline

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No.	SHEET No.
June 17	1 : 200	1521	A1.1
DRAWN: RJW	CAD REFERENCE: 1521	REVISION: A	

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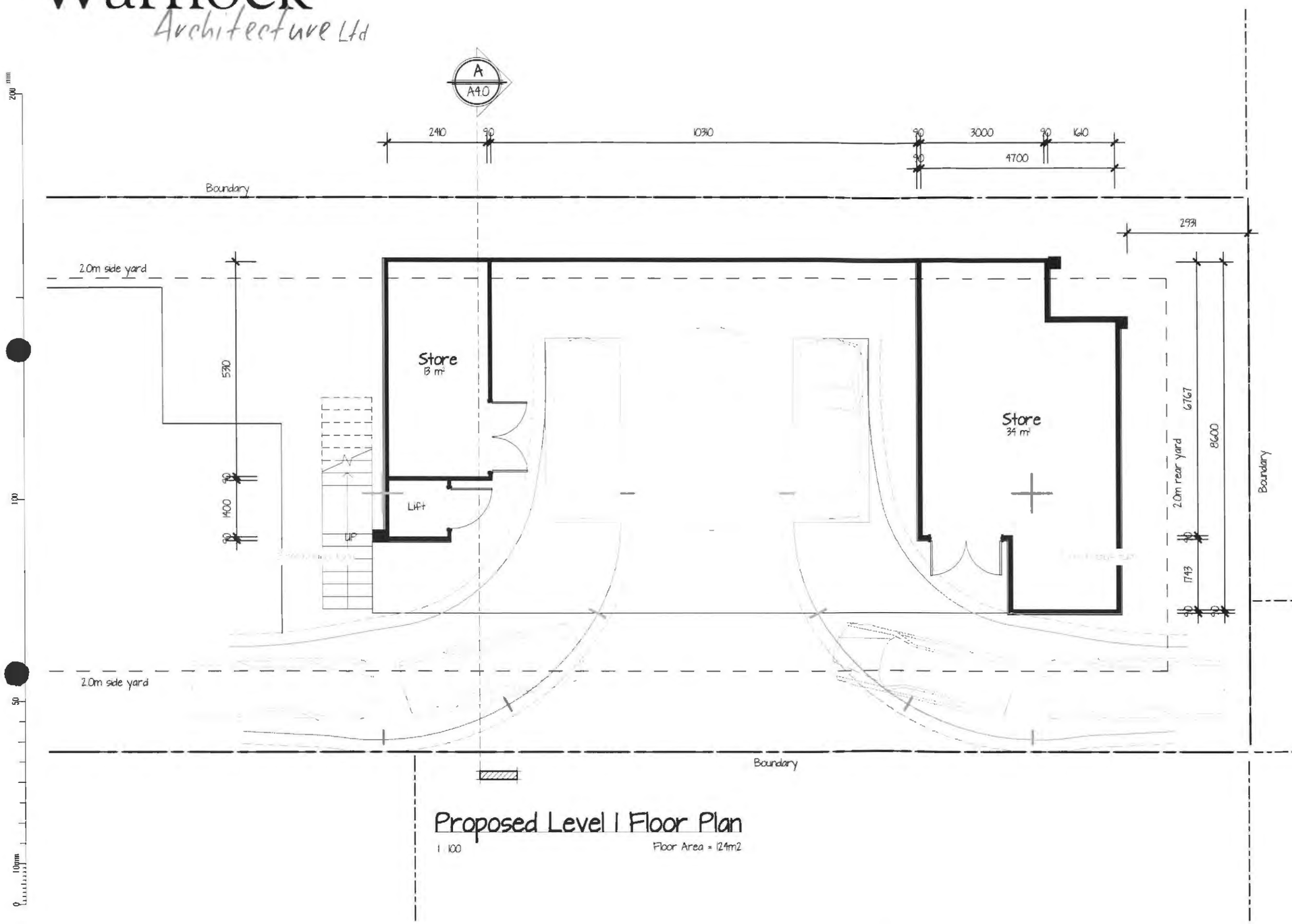
B	20.12.16	Sketch Design
C	07.06.17	Resource Consent



Proposed Level 1 Floor Plan

1 : 100

Floor Area = 124m2

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Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House

403 High Street, Dunedin

SHEET TITLE
Proposed Level 1 Floor Plan

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No.	SHEET No.
June 17	1 : 100	1521	A2.0
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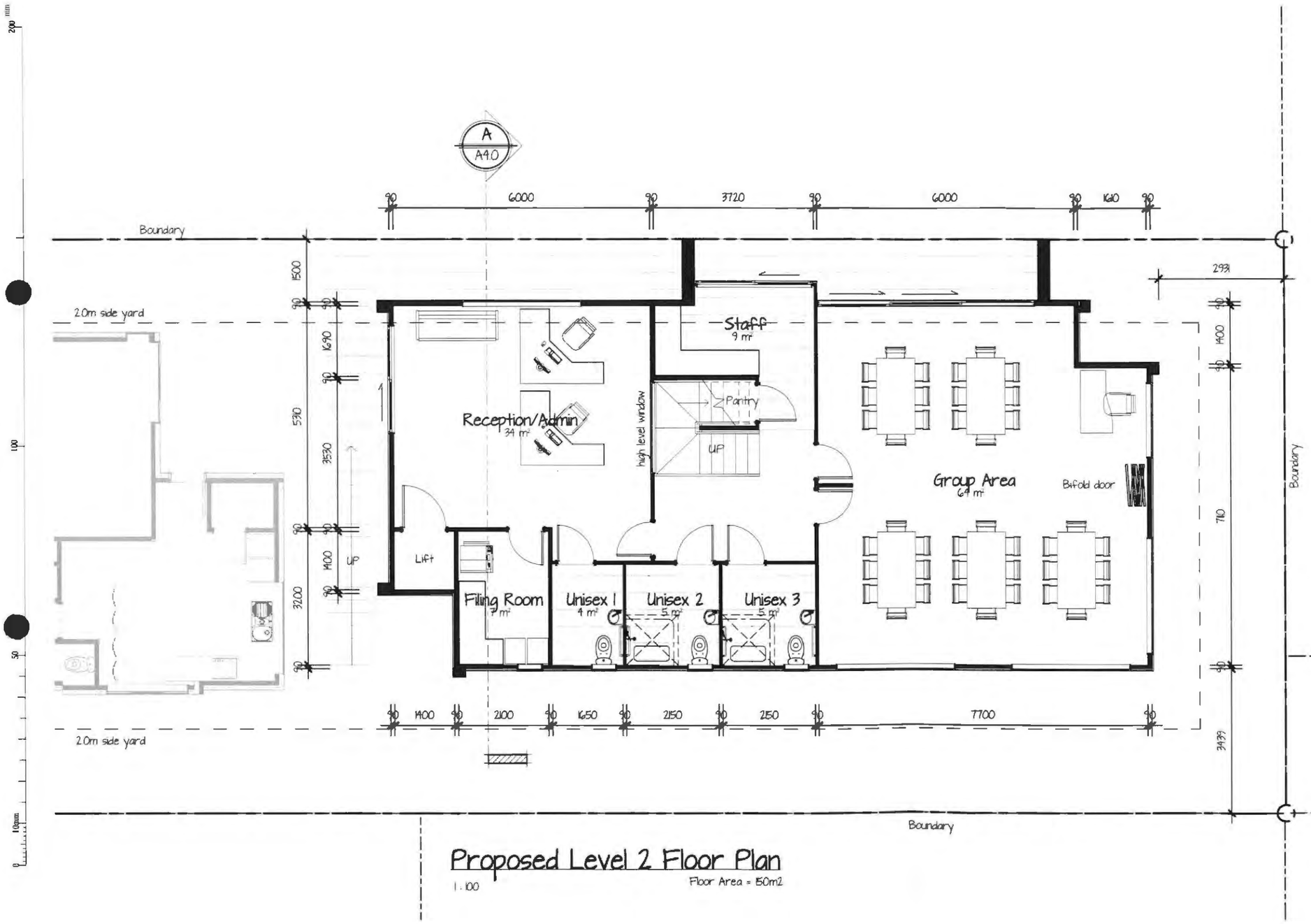

Proposed Level 2 Floor Plan

1:100

Floor Area = 150m2

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE
Proposed New Whare for
Downie Stewart
Foundation Moana House

403 High Street, Dunedin

SHEET TITLE
Proposed Level 2 Floor Plan

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No.	SHEET No.
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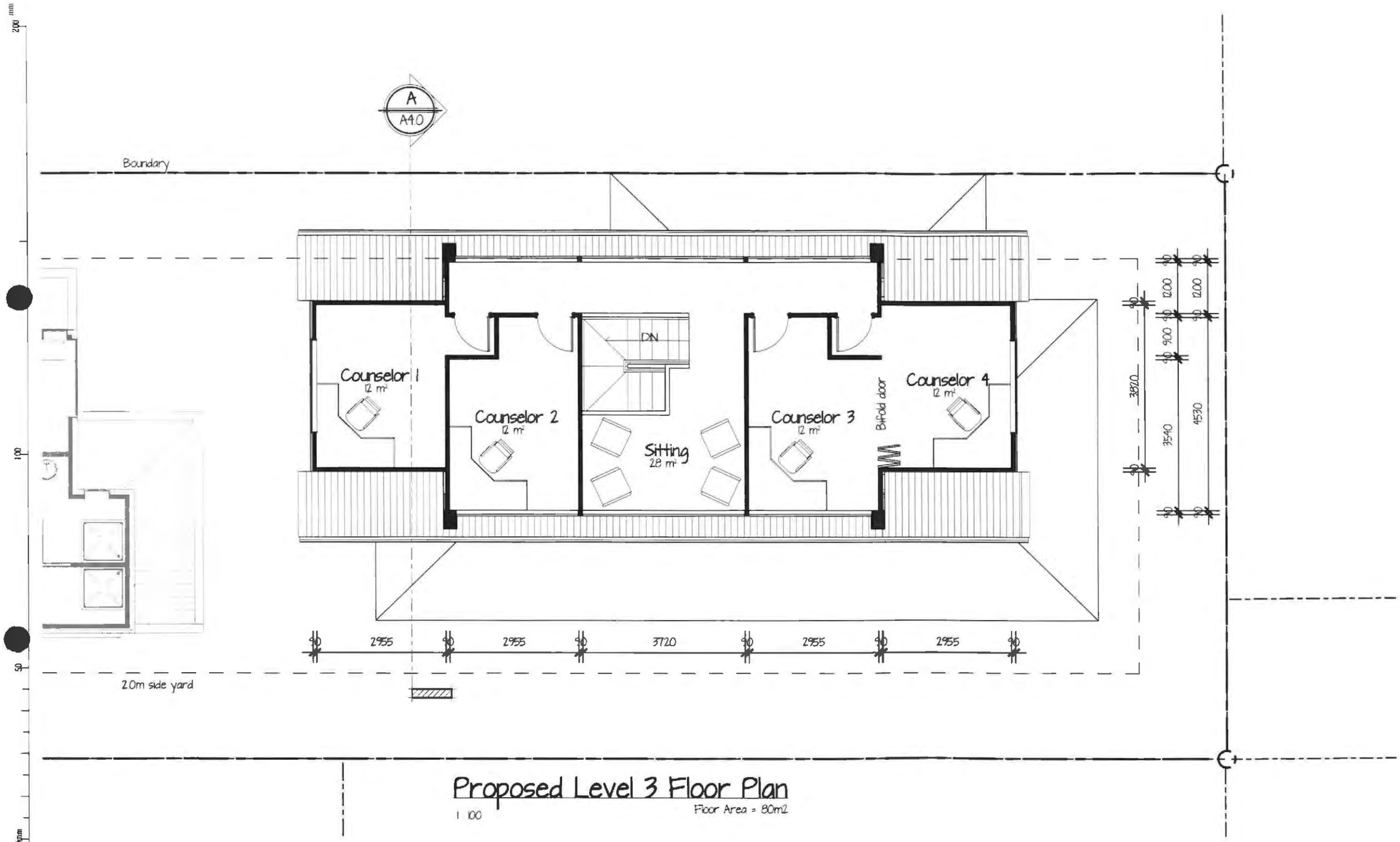

Proposed Level 3 Floor Plan

1 : 100

Floor Area = 80m2

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE

Proposed New Whare for Downie Stewart Foundation Moana House

403 High Street, Dunedin

SHEET TITLE

Proposed Level 3 Floor Plan

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No.	SHEET No.
June 17	1 : 100	1521	A2.2
DRAWN	CAD REFERENCE	REVISION	
RJW	1521	C	

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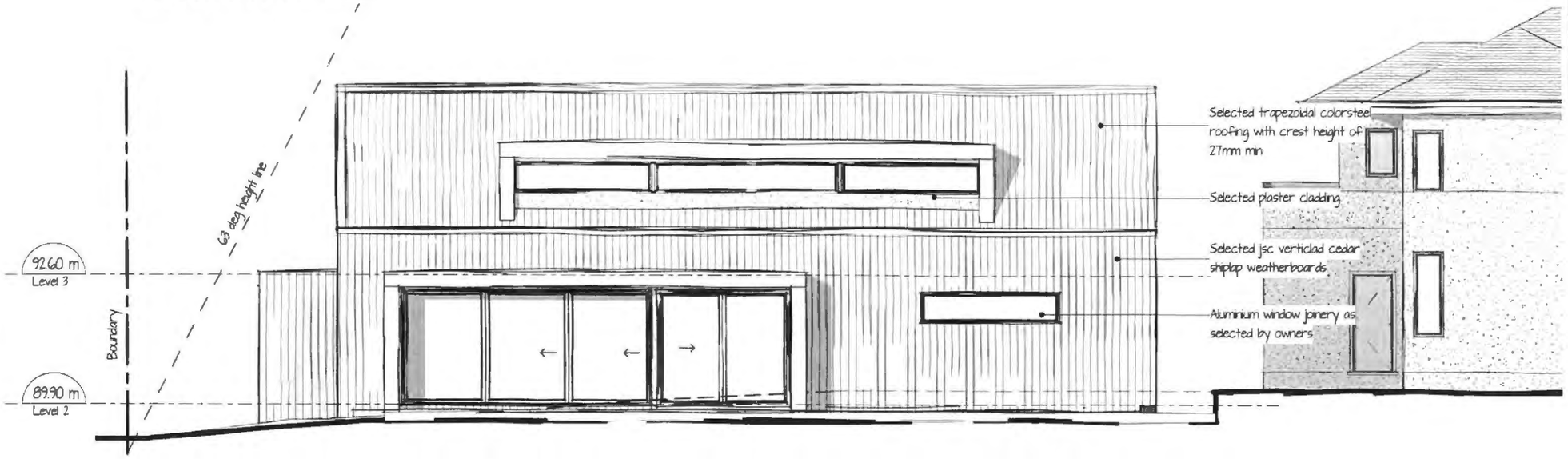
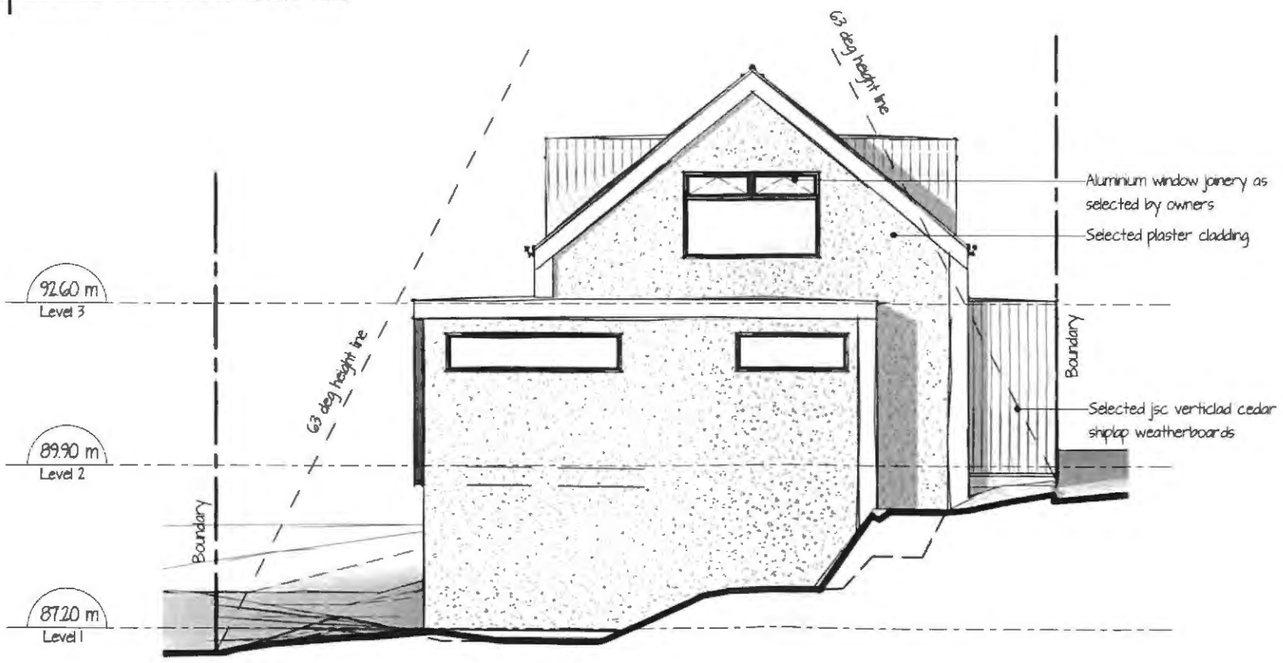
C	07.06.17	Resource Consent



Proposed East Elevation

1 : 100



Proposed South Elevation

1 : 100

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE

Proposed New Whare for Downie Stewart Foundation Moana House

403 High Street, Dunedin

SHEET TITLE

Proposed Elevations

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No.	SHEET No.
June 17	1 : 100	1521	A3.0
DRAWN: RJW	CAD REFERENCE: 1521	REVISION: C	

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Warnock Architecture Ltd

ARNZ Architectural Designers New Zealand

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Revision Schedule		
Ref.	Date	Description
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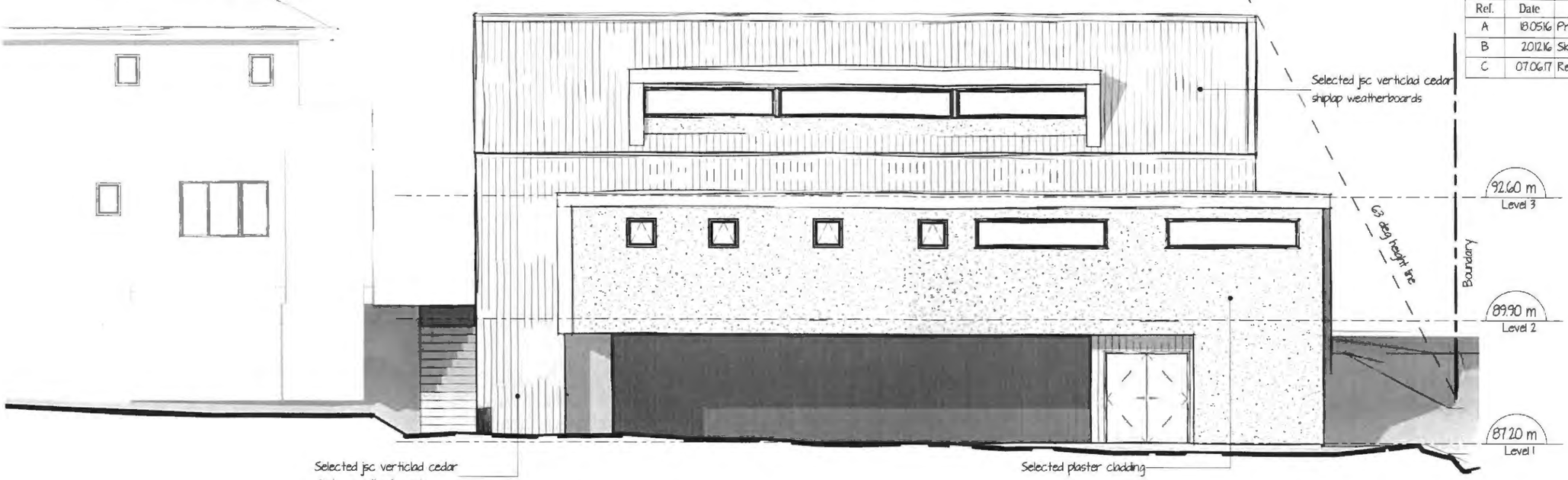
B	20.12.16	Sketch Design
C	07.06.17	Resource Consent



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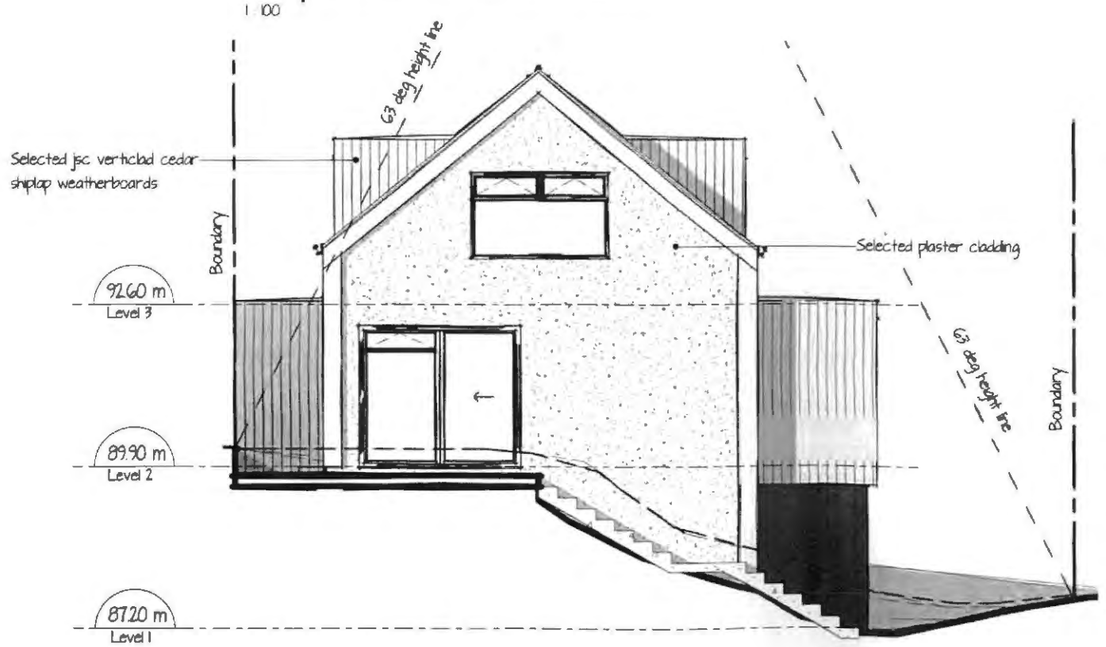

Proposed North Elevation

1 : 100

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE

Proposed New Whare for Downie Stewart Foundation Moana House

403 High Street, Dunedin

SHEET TITLE

Proposed Elevations

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No.	SHEET No.
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DRAWN	CAD REFERENCE	REVISION	
RJW	1521	C	

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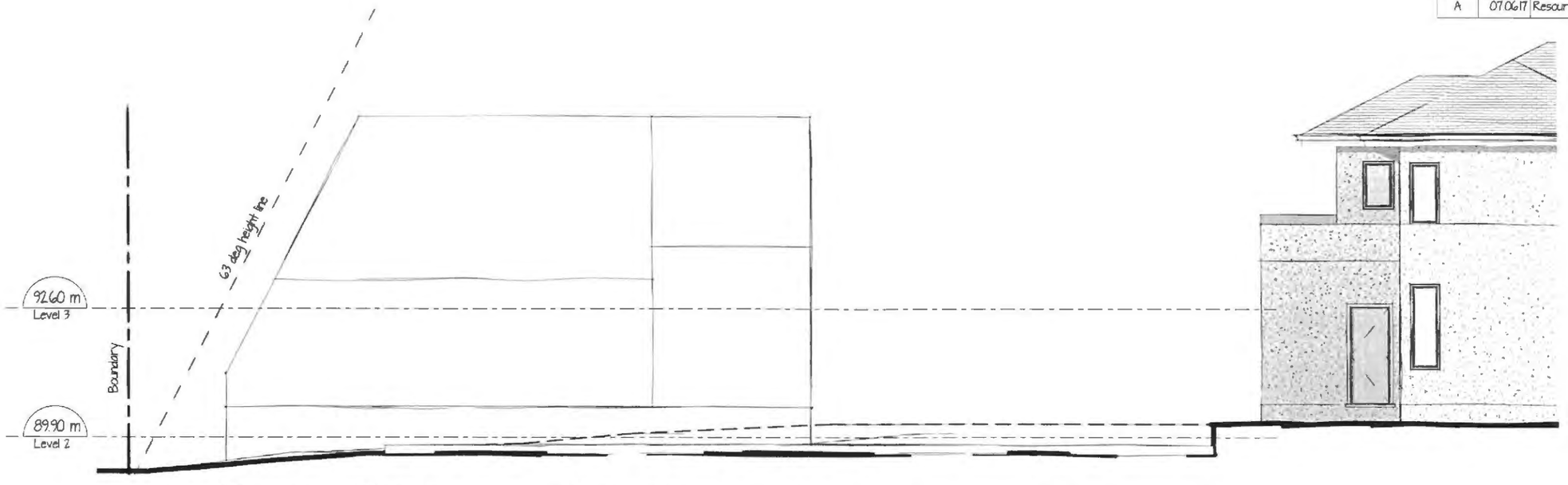
Warnock Architecture Ltd

Revision Schedule		
Ref.	Date	Description
A	070617	Resource Consent



Proposed East Elevation - Baseline

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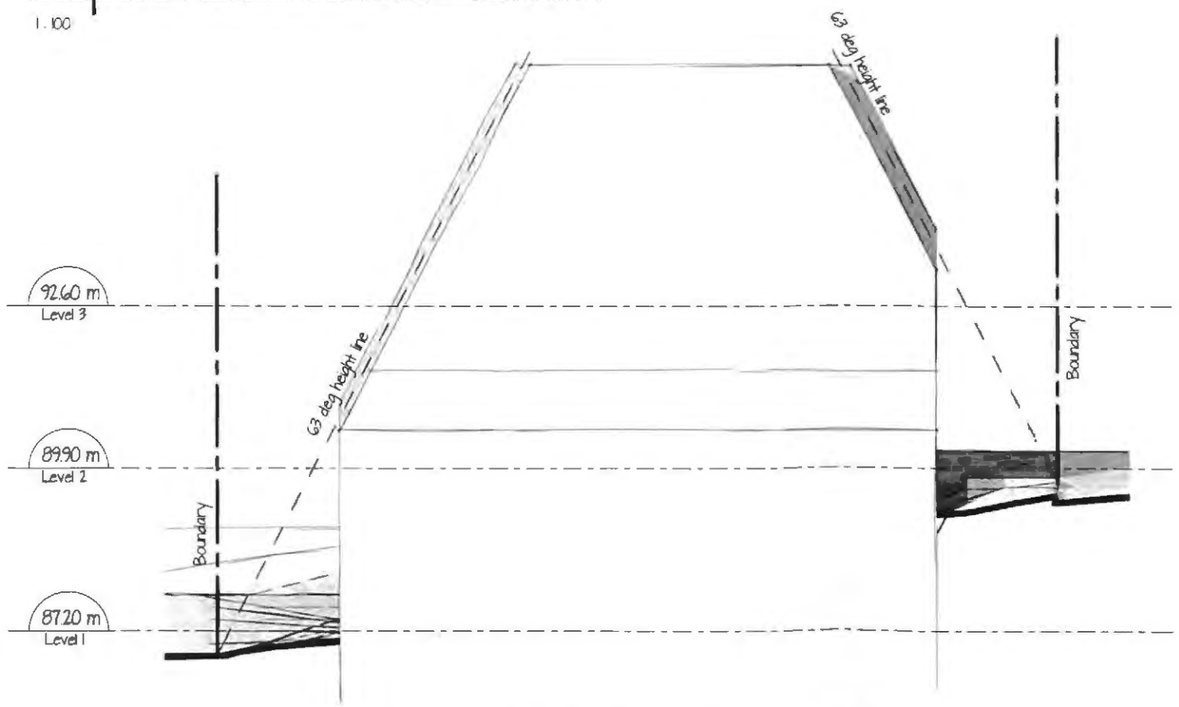

Proposed South Elevation - Baseline

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The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE

Proposed New Whare for Downie Stewart Foundation Moana House

403 High Street, Dunedin

SHEET TITLE

Baseline Elevations

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No.	SHEET No.
June 17	1 : 100	1521	A3.2
DRAWN	CAD REFERENCE	REVISION	
RJW	1521	A	

Warnock
Architecture Ltd

ADNZ Architectural Designers New Zealand

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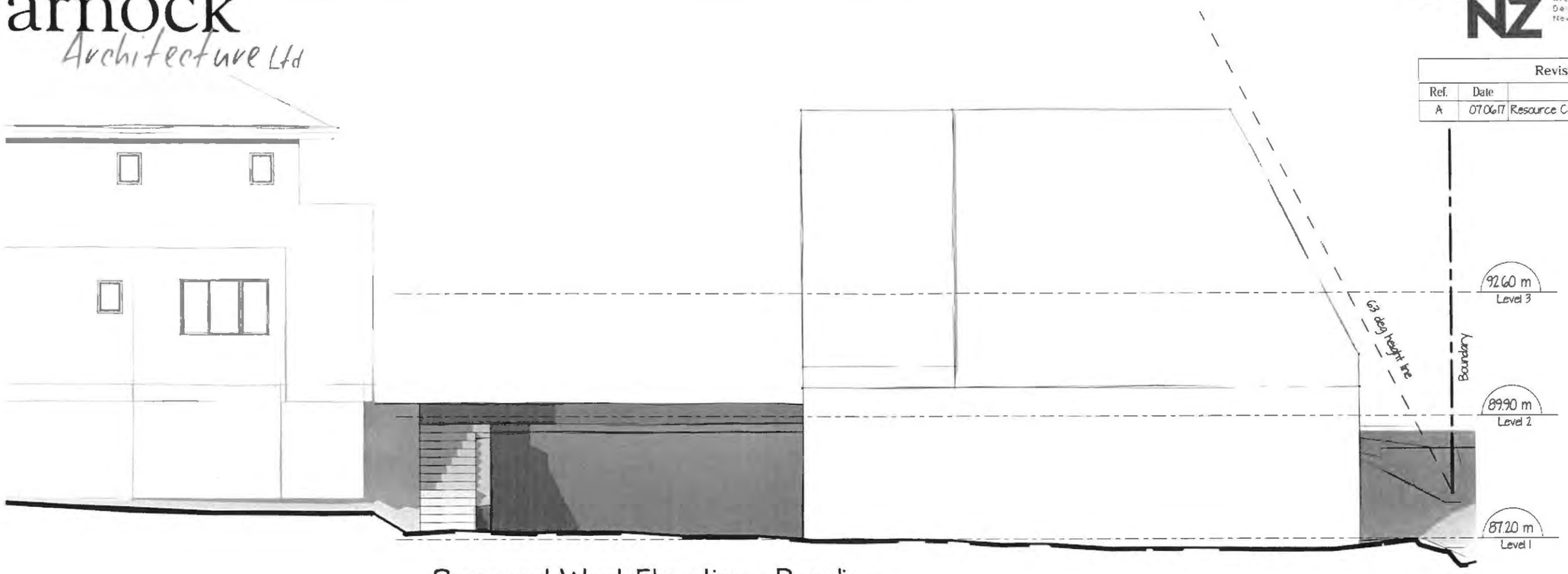
Revision Schedule		
Ref.	Date	Description
A	070617	Resource Consent



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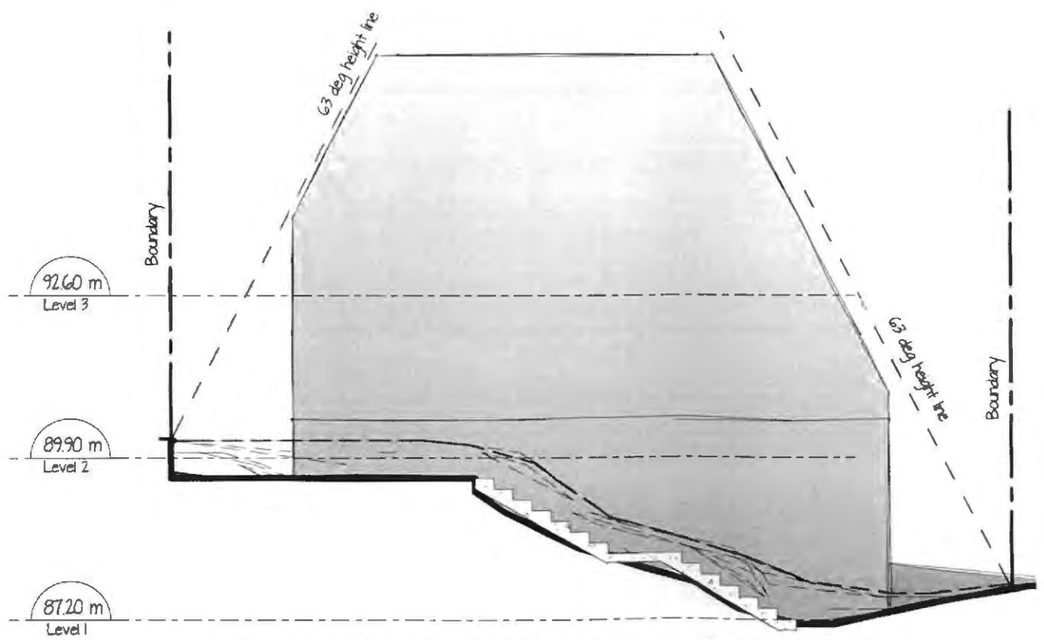

Proposed North Elevation - Baseline
1 : 100

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Baseline Elevations

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No.	SHEET No.
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Warnock Architecture Ltd

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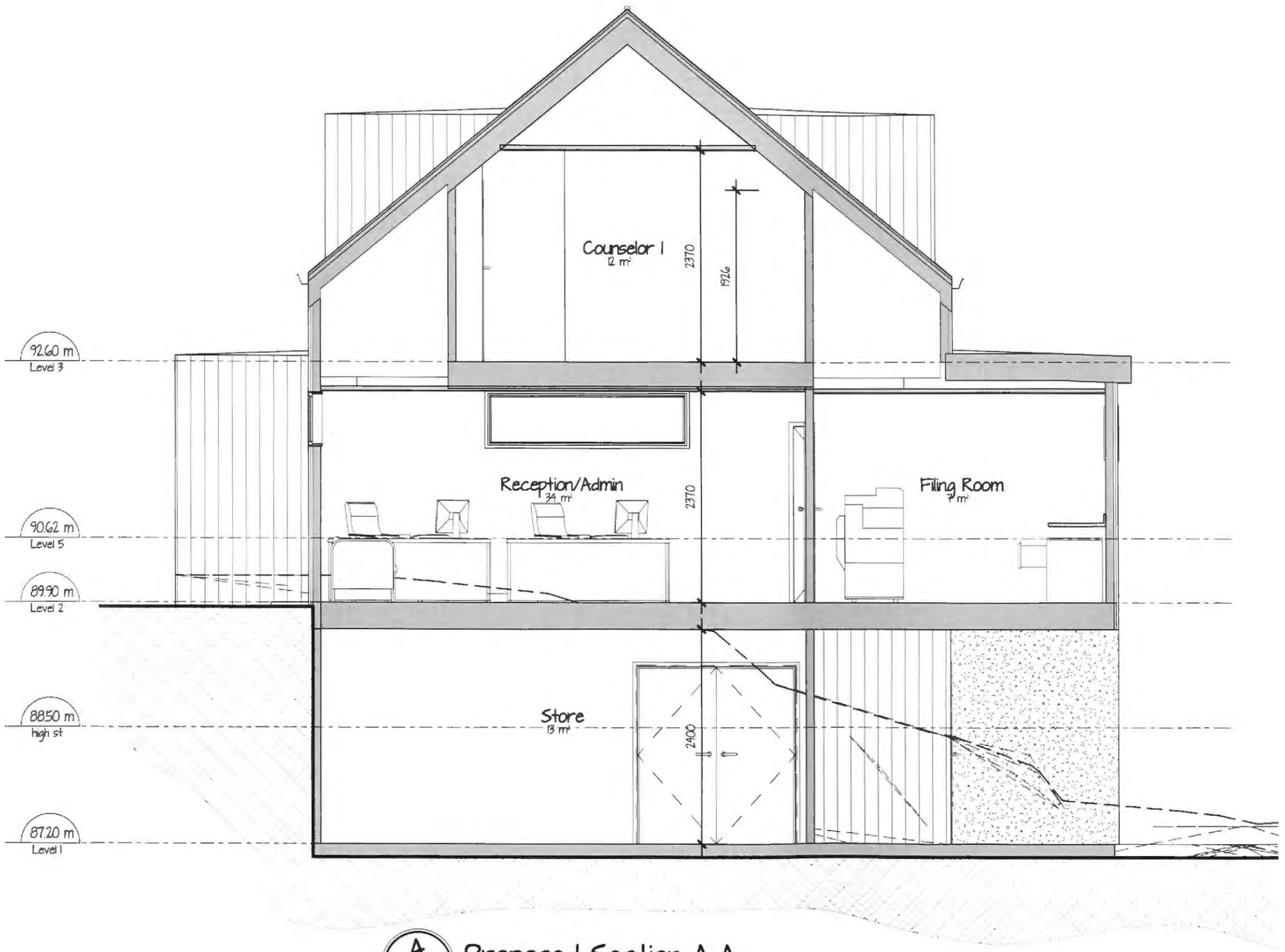
B	20.12.16	Sketch Design



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The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Proposed Sections

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No.	SHEET No.
June 17	1 : 50	1521	A4.0
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APPENDIX 2

Solar Studies

December 25th Solar Studies

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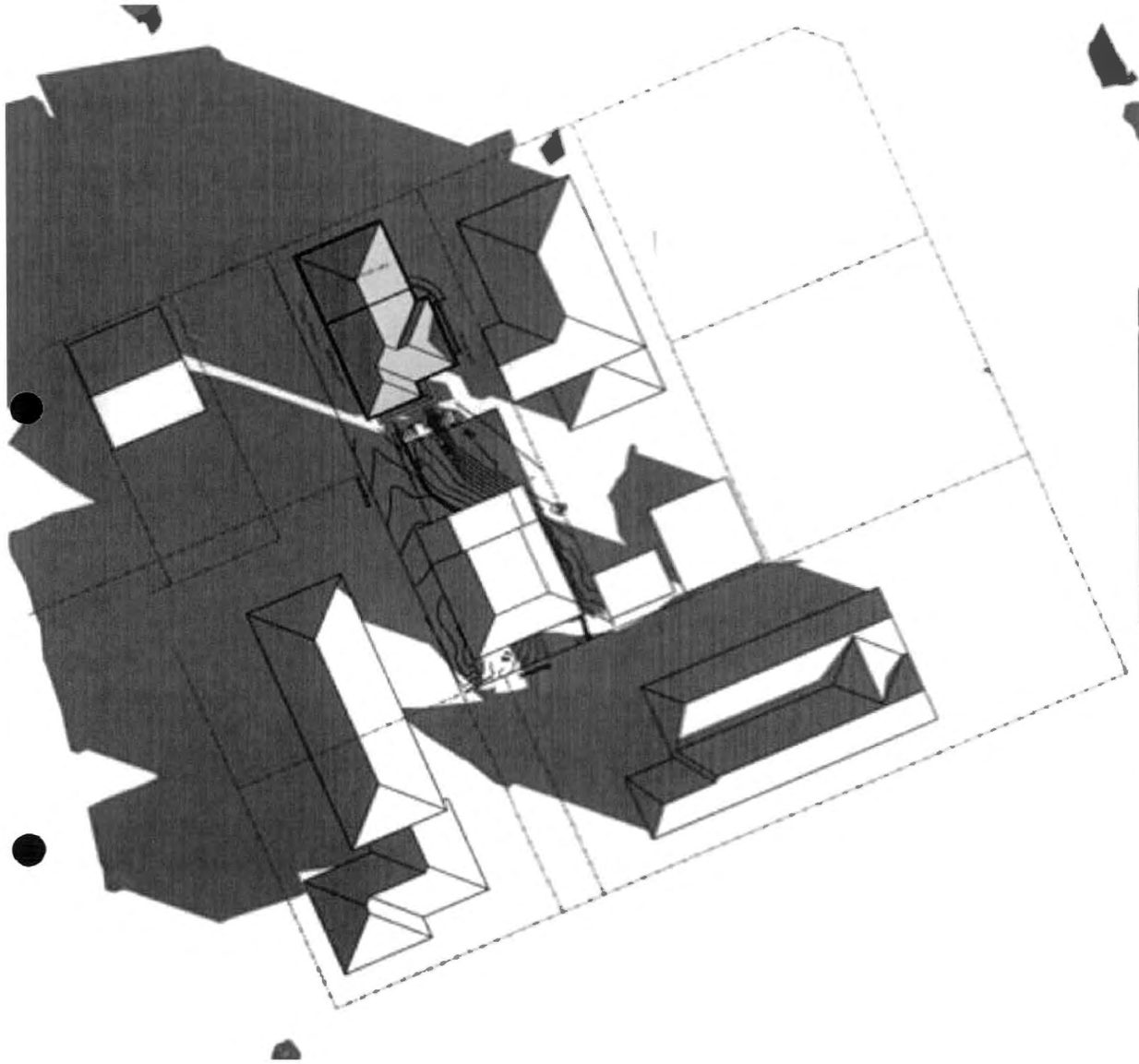

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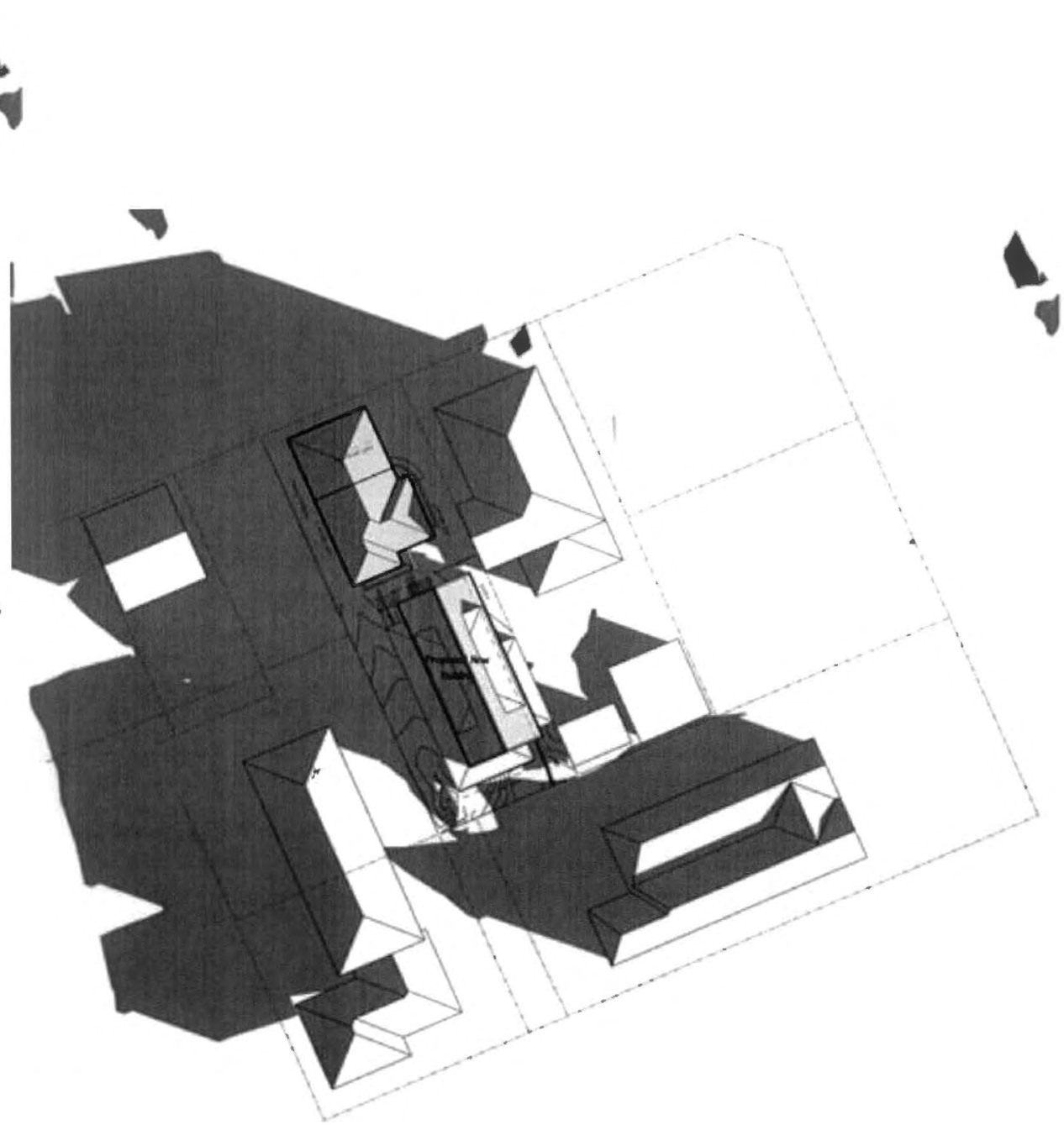

December 25th Solar Studies

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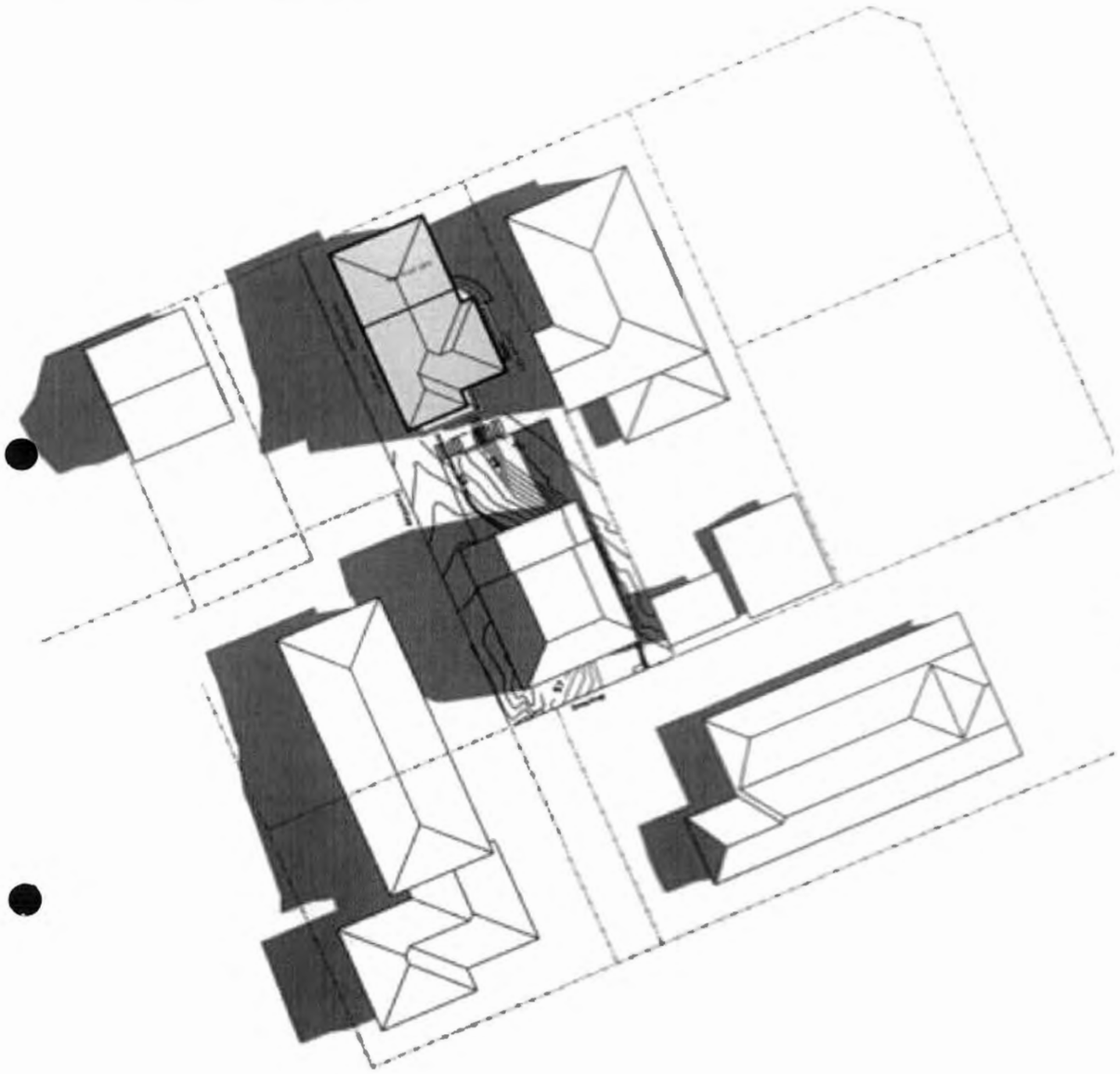

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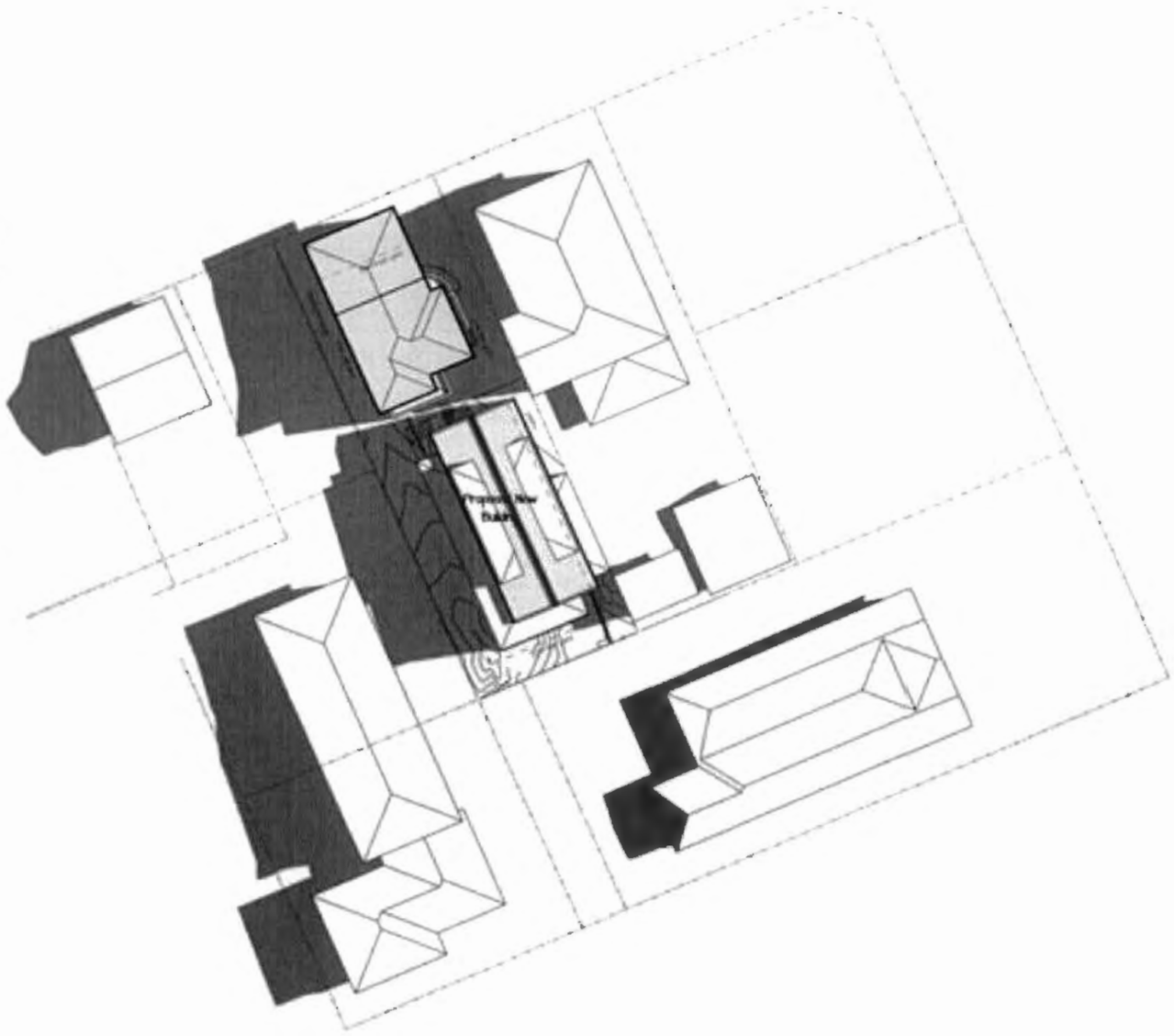

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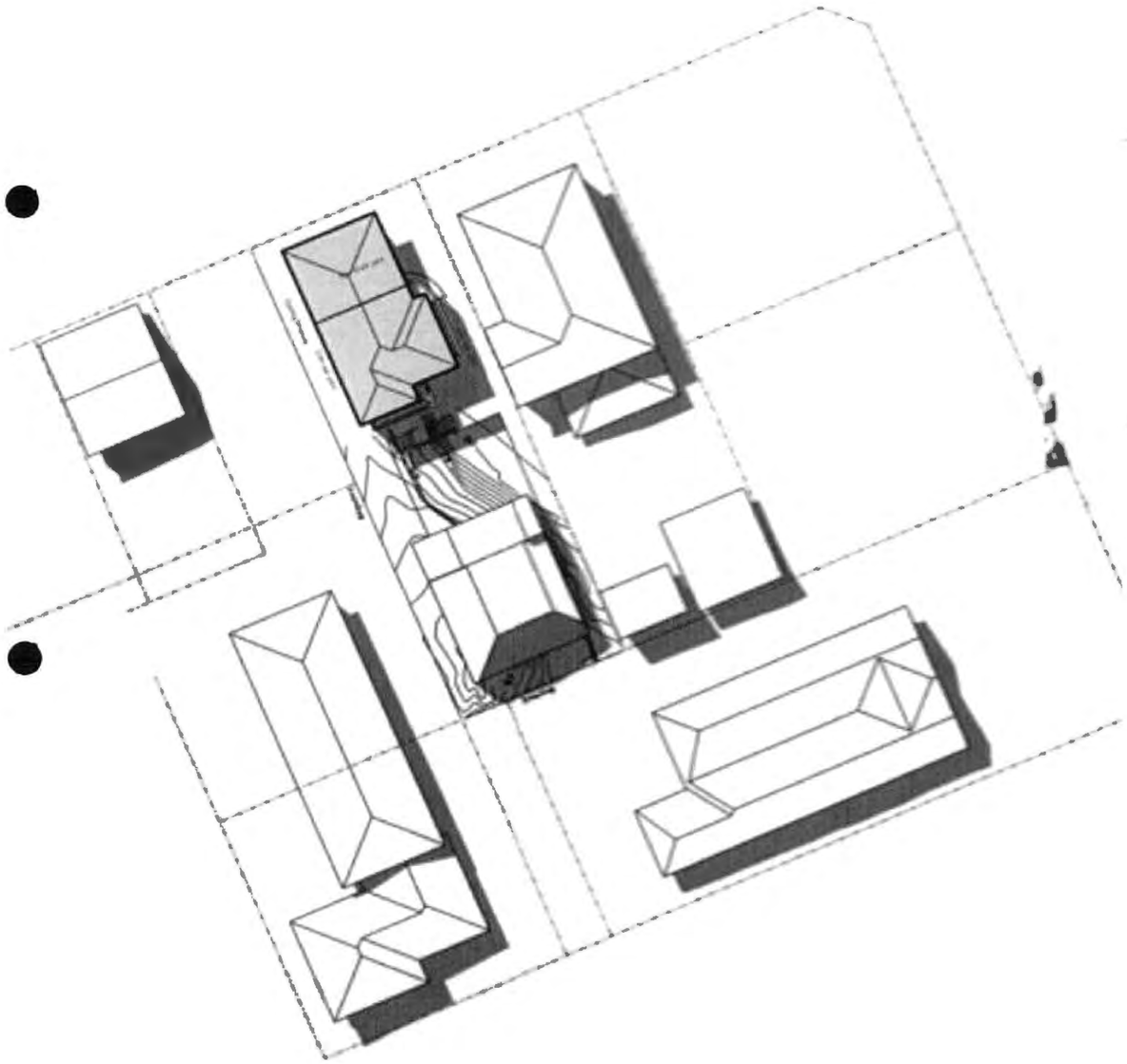

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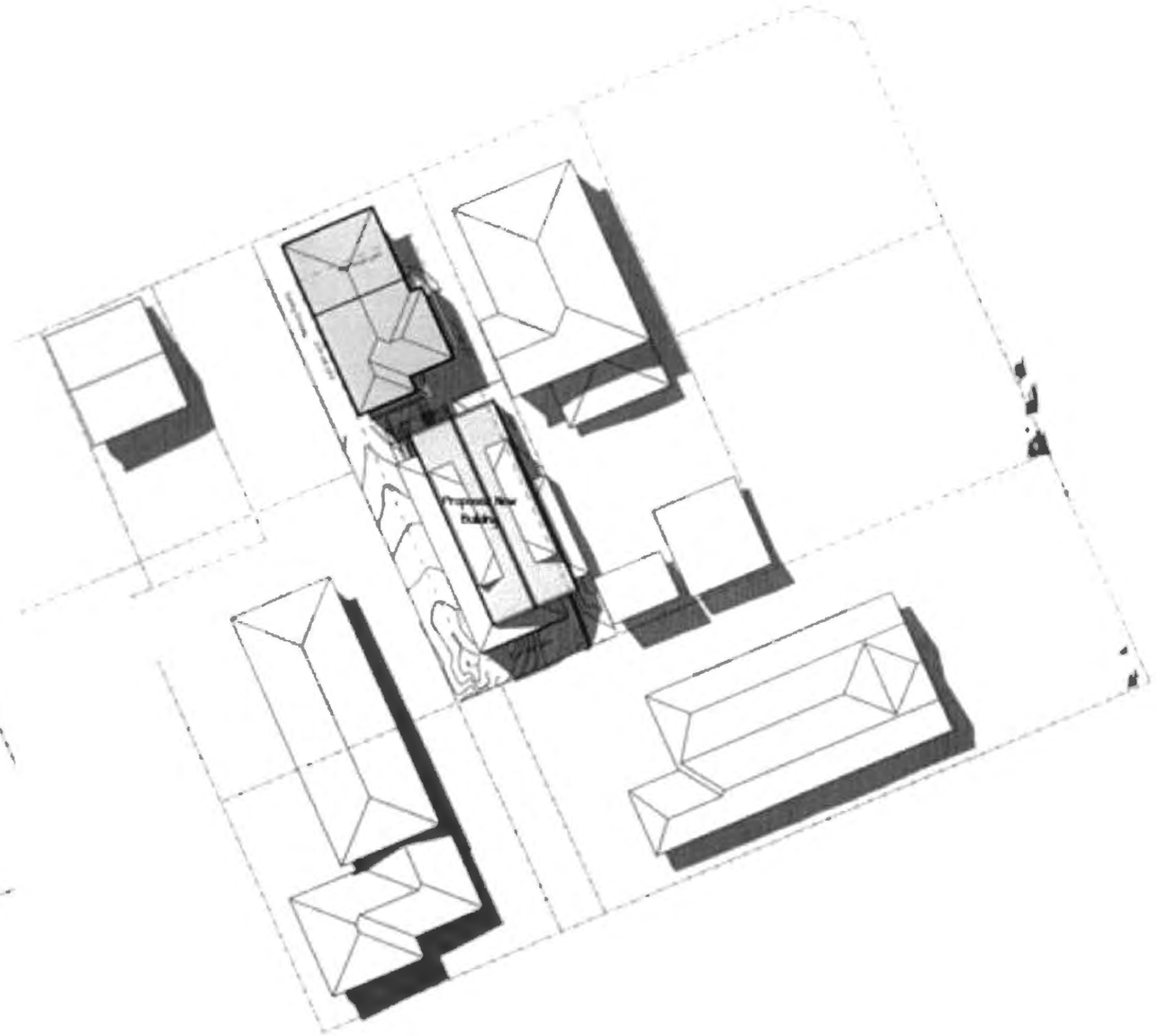
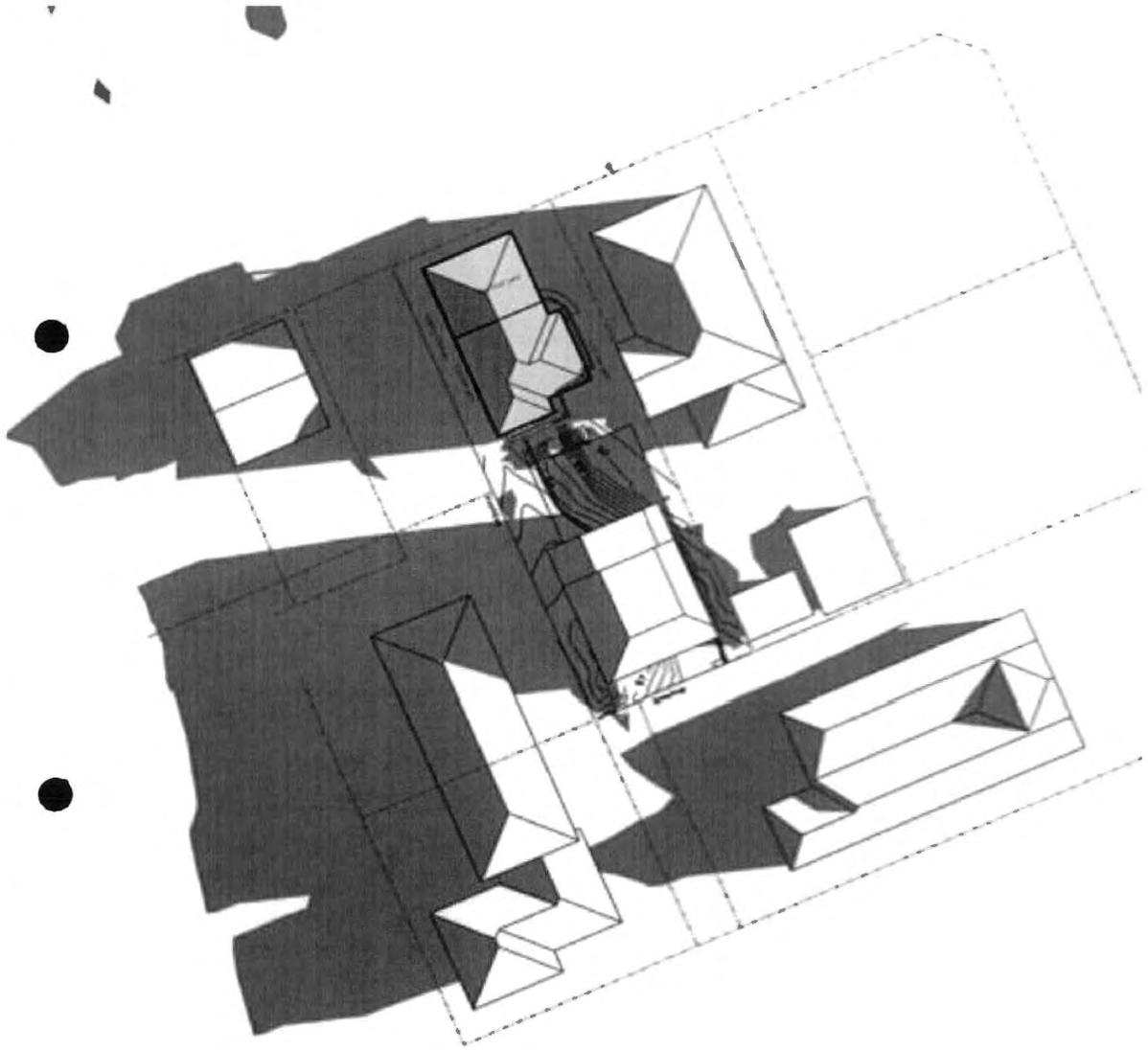


March 1st Solar Studies

Baseline Building, Time = 0900



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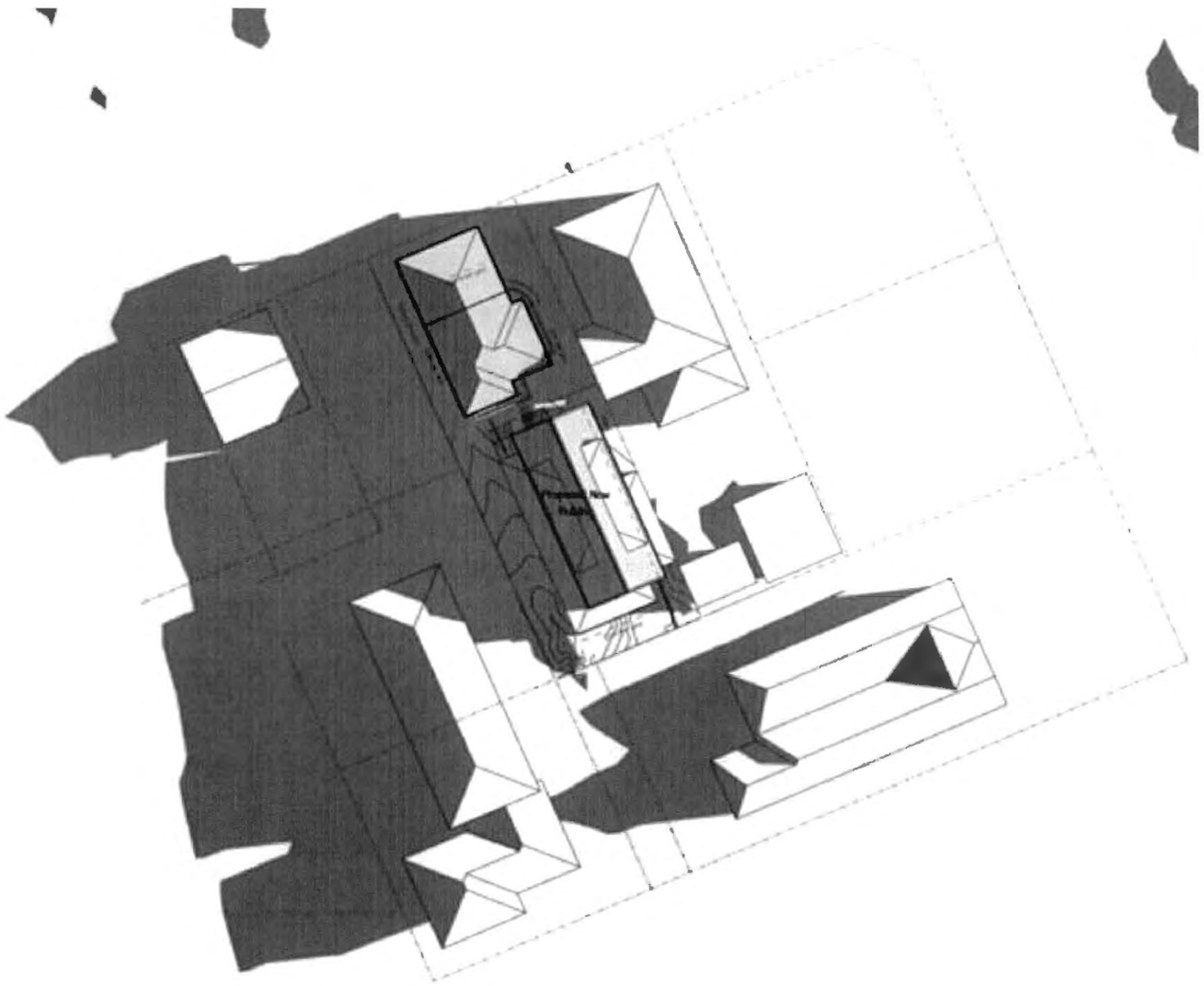

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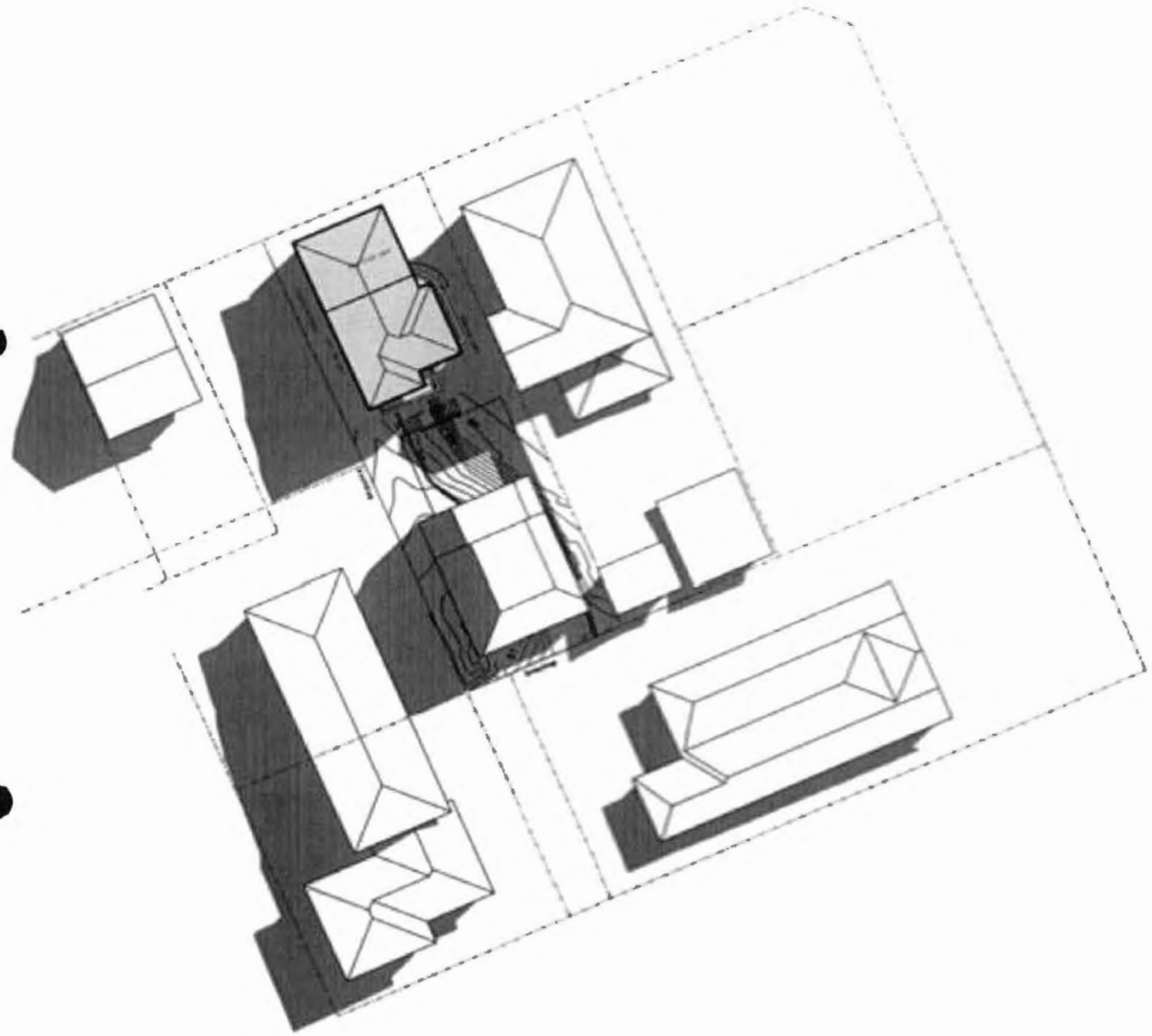

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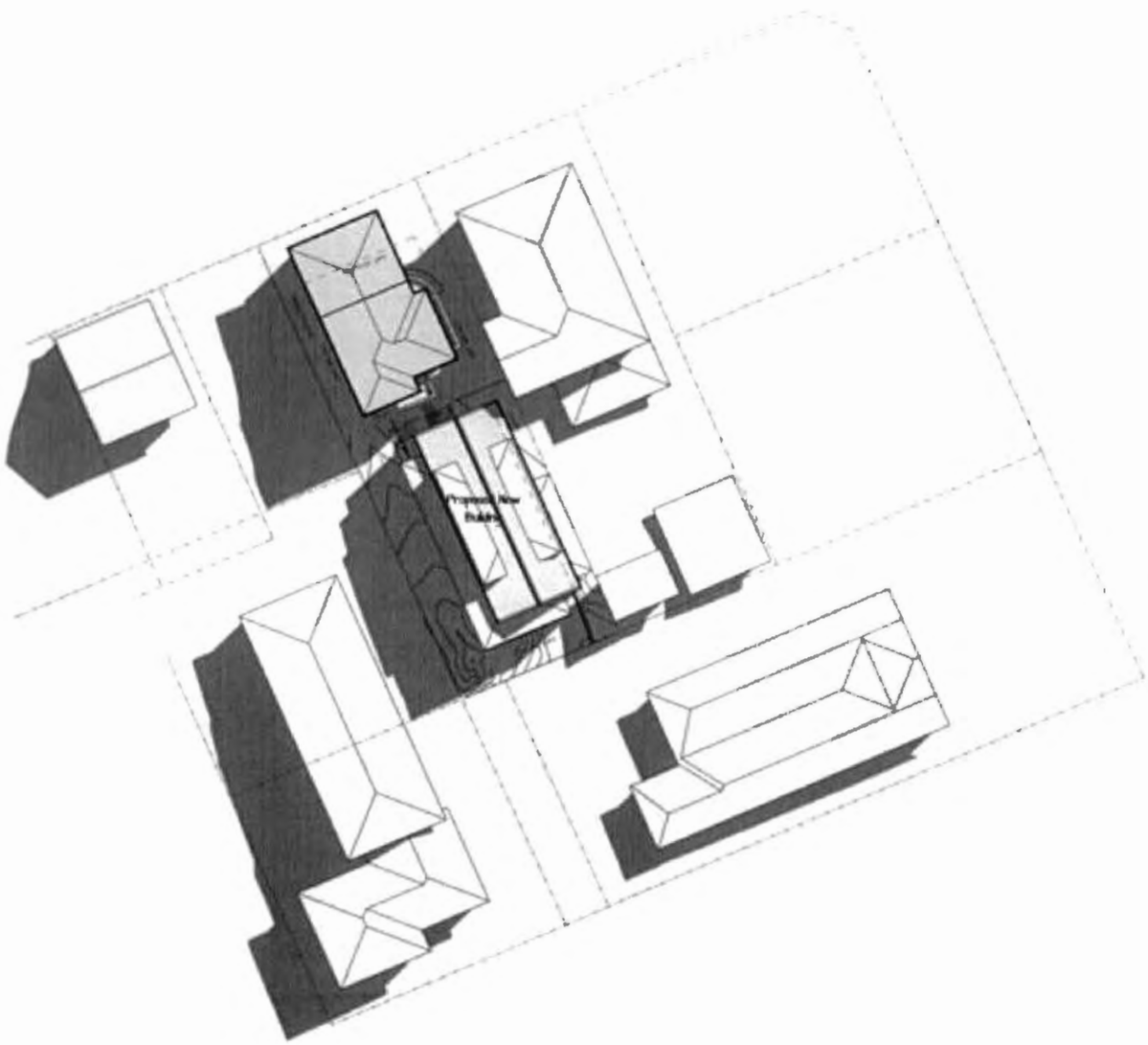

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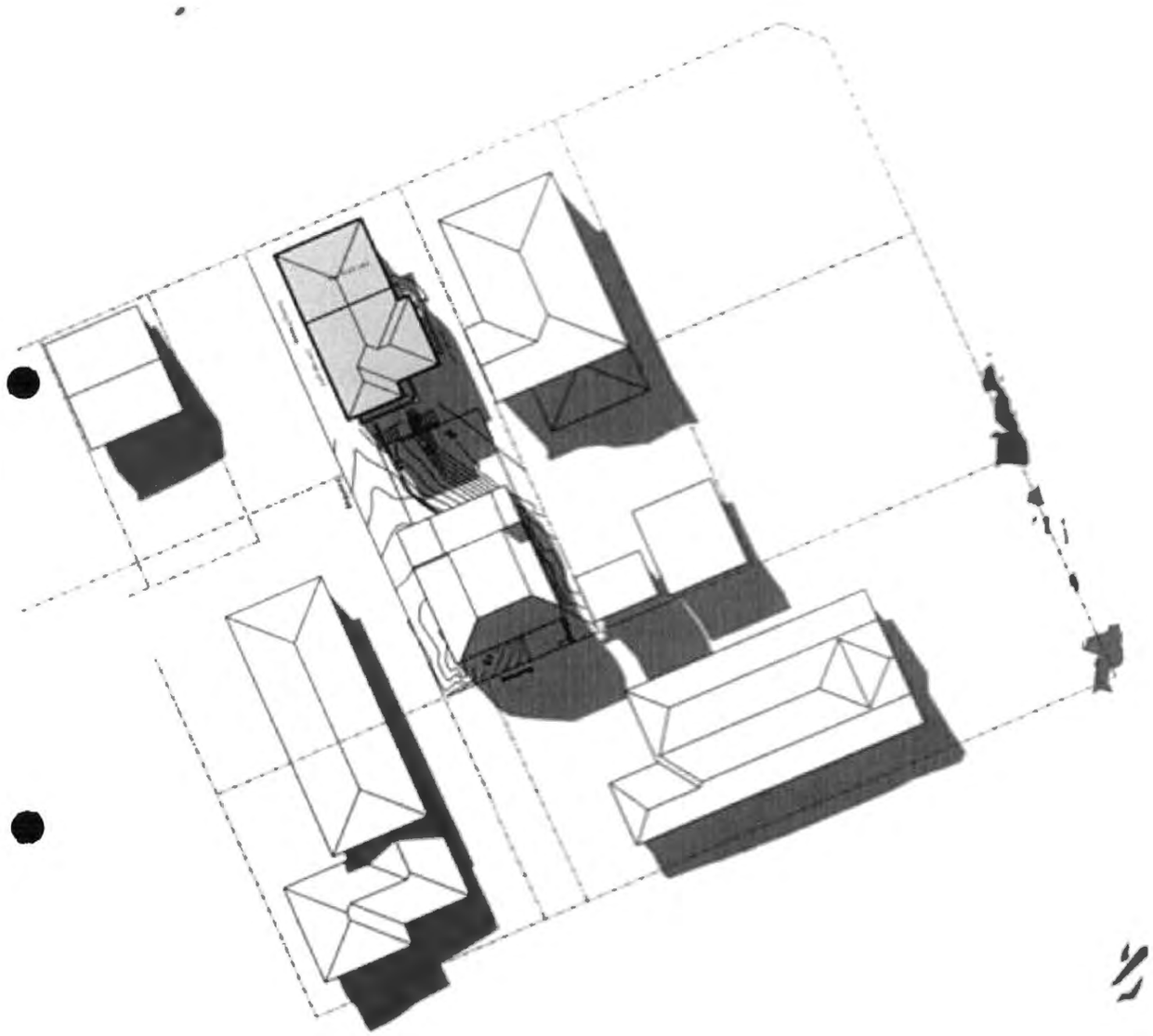

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March 1st Solar Studies

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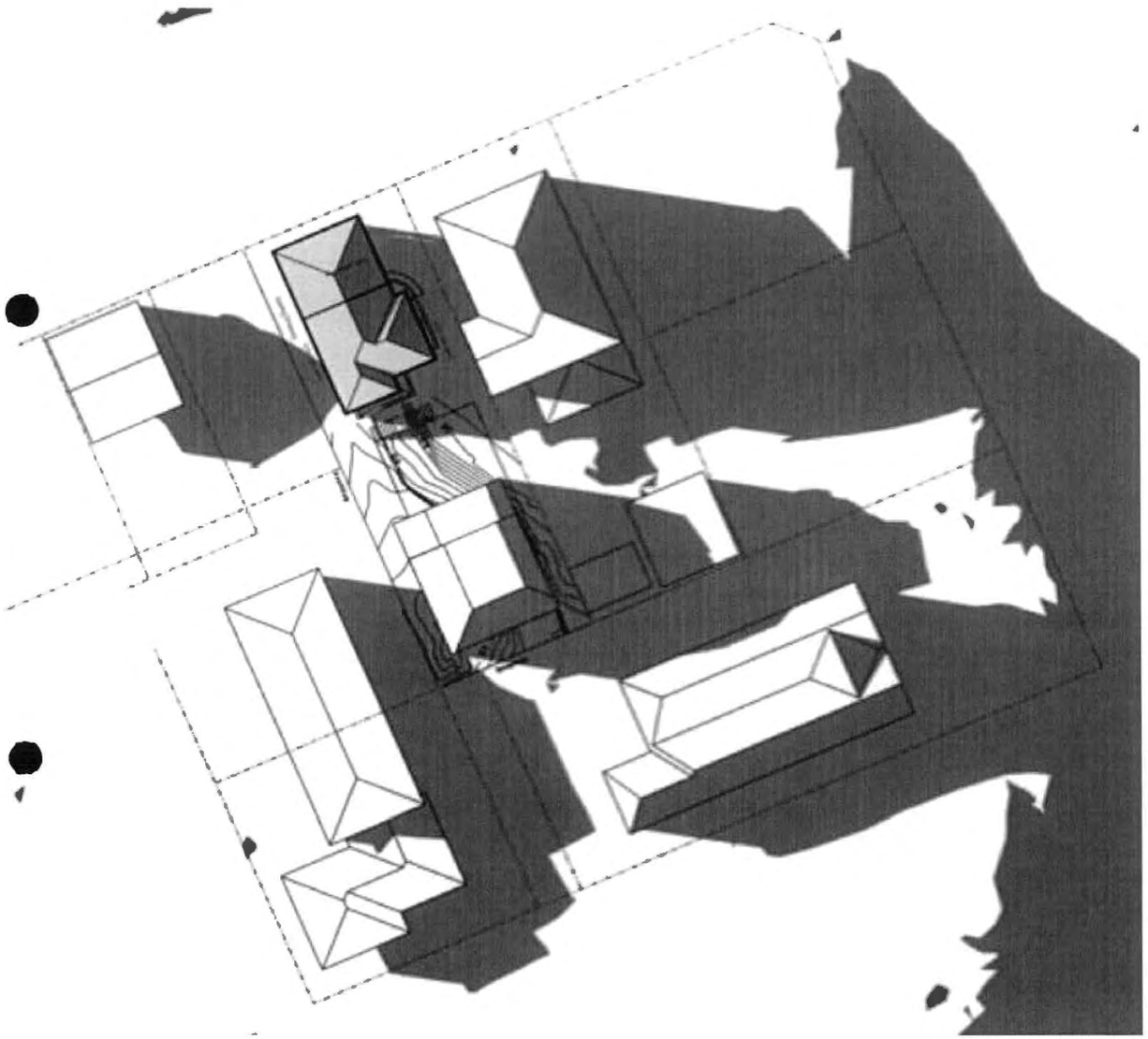

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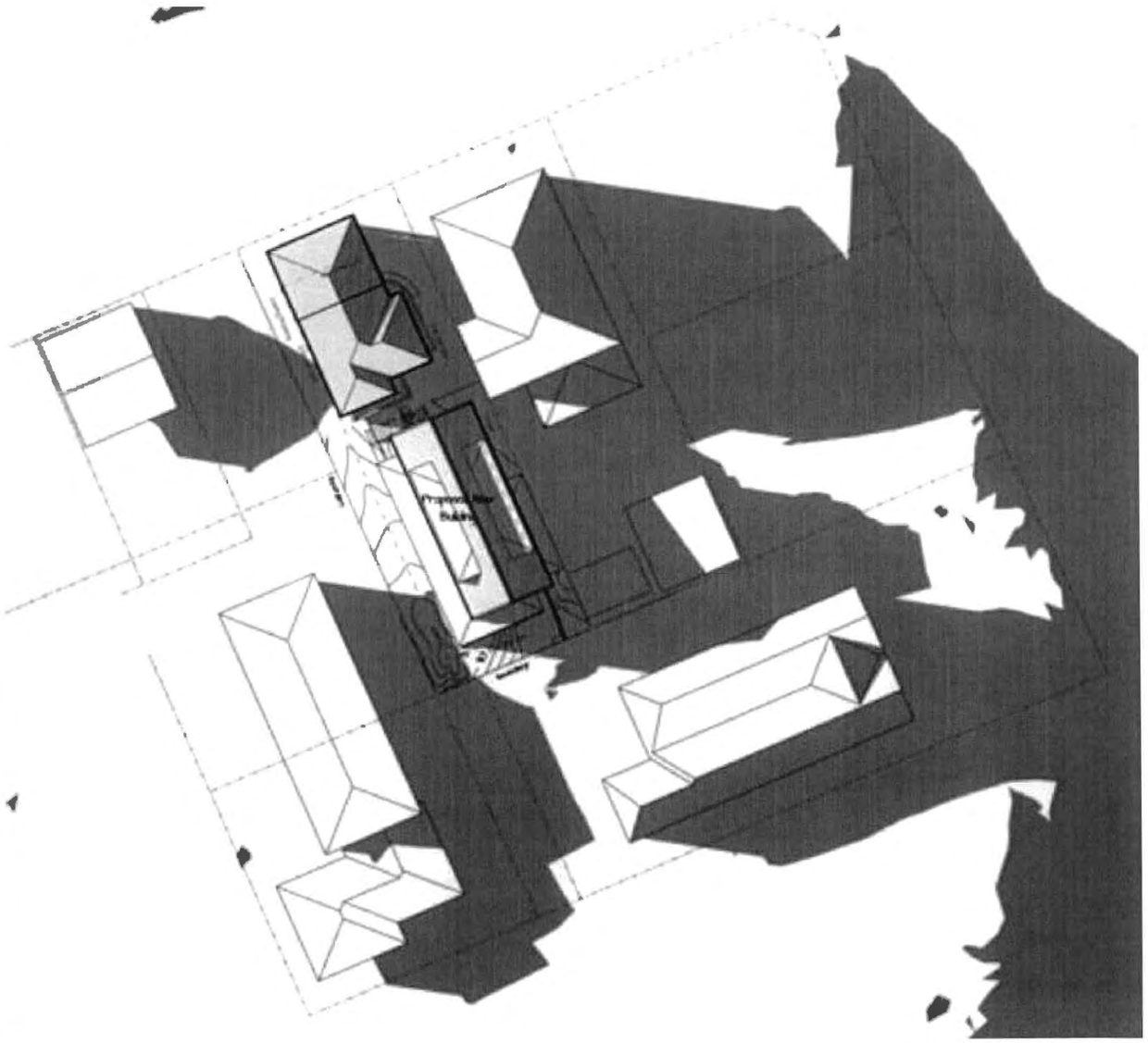

March 1st Solar Studies

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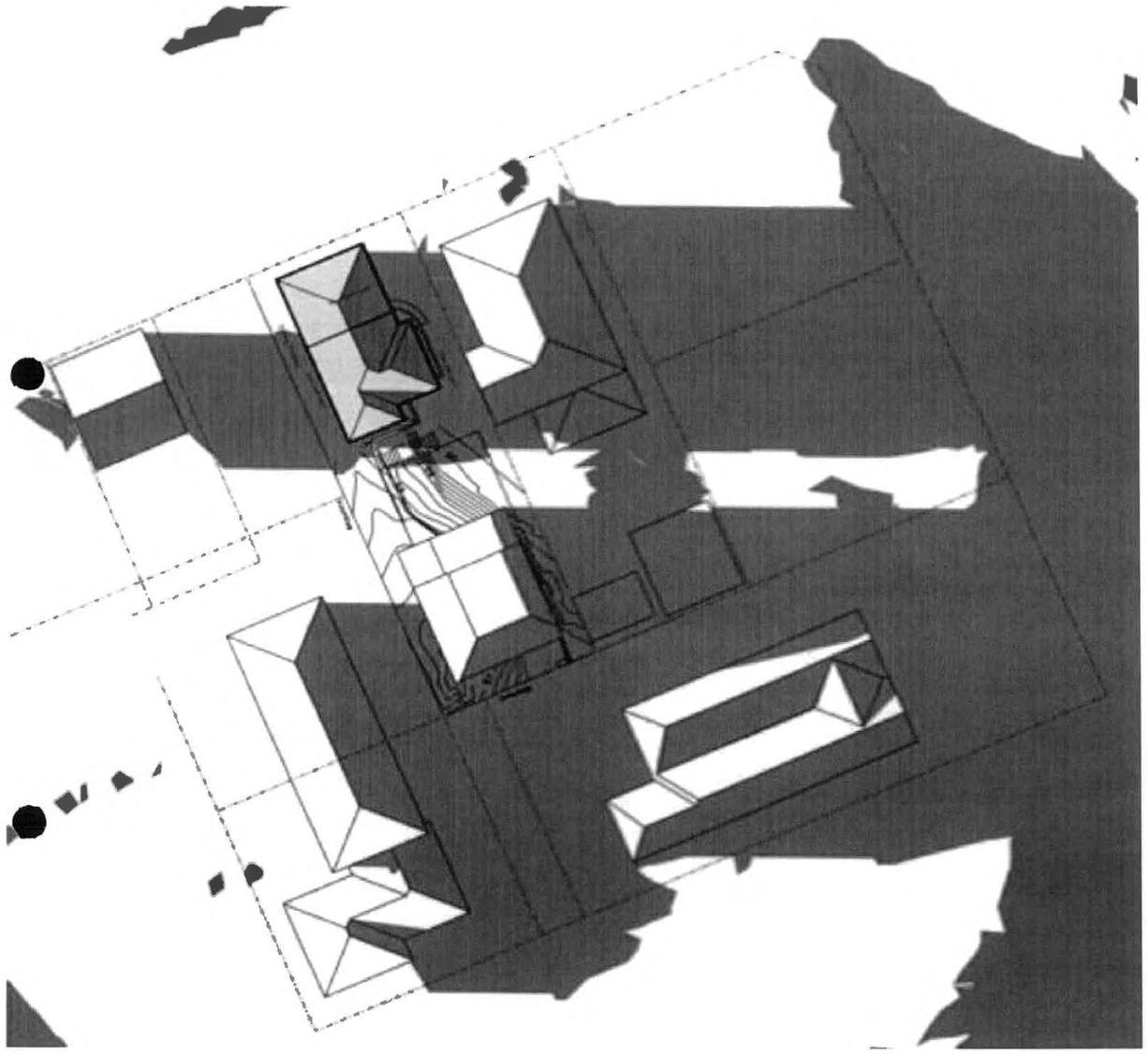

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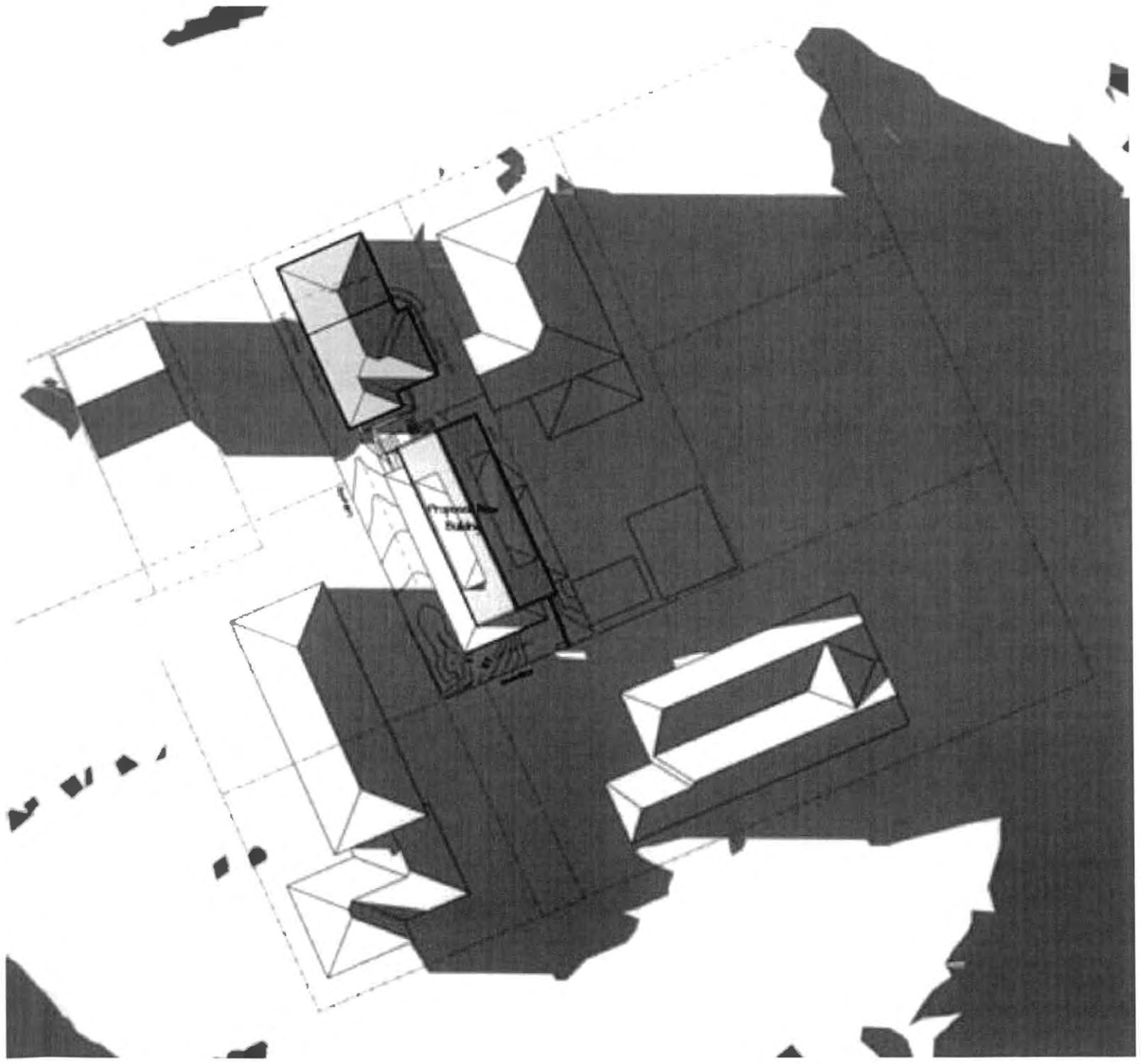

June 19th Solar Studies

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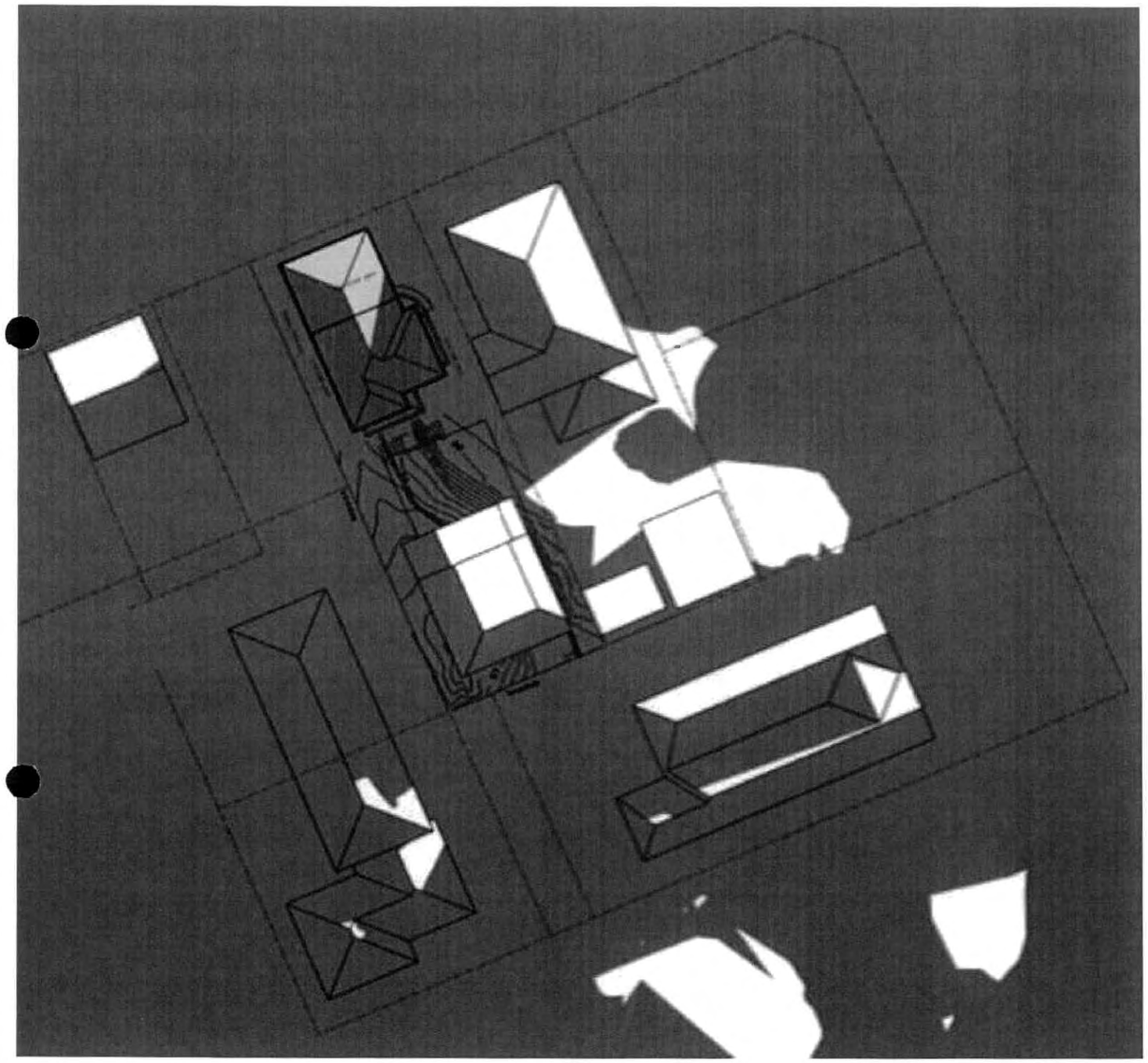

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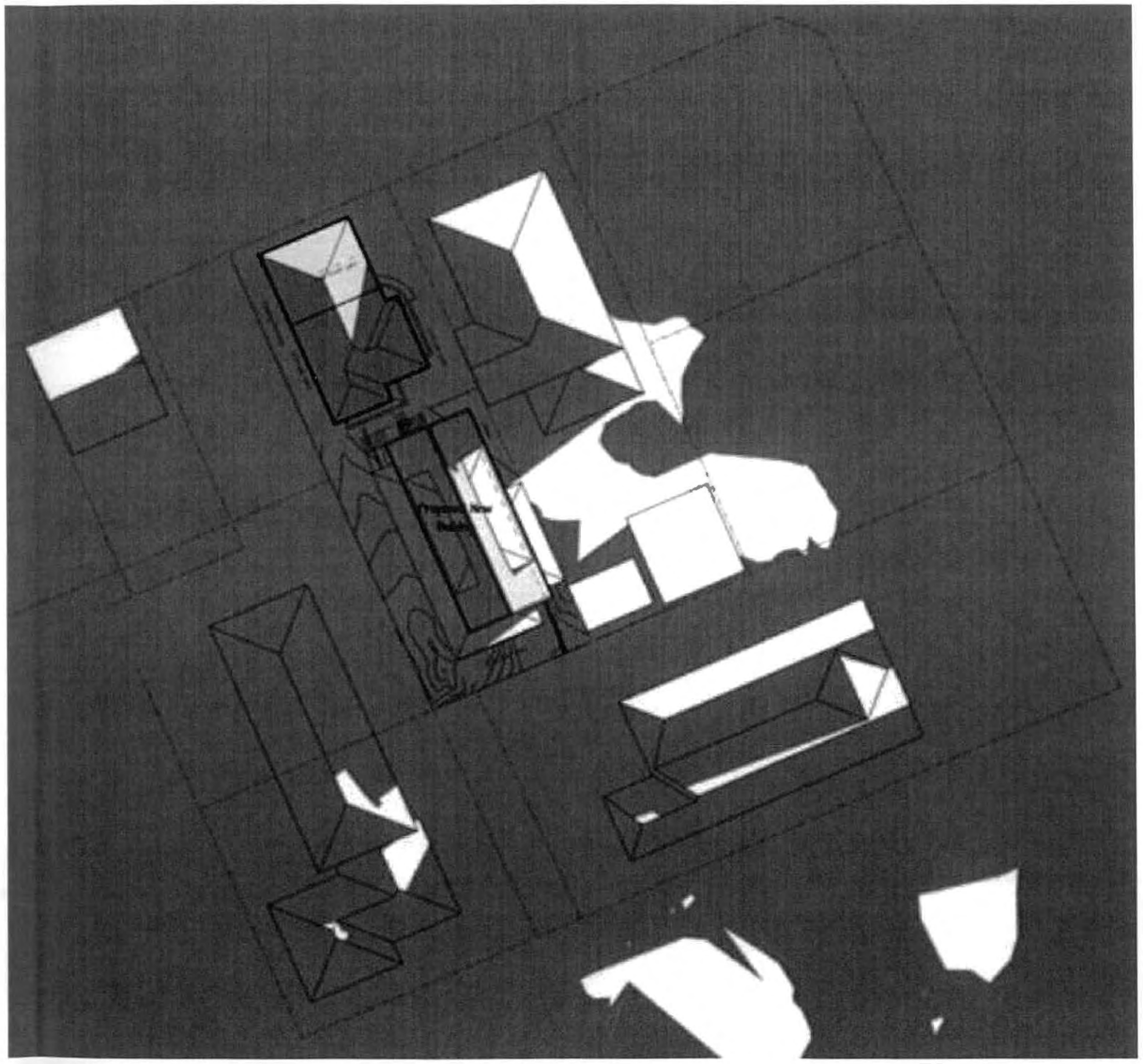

June 19th Solar Studies

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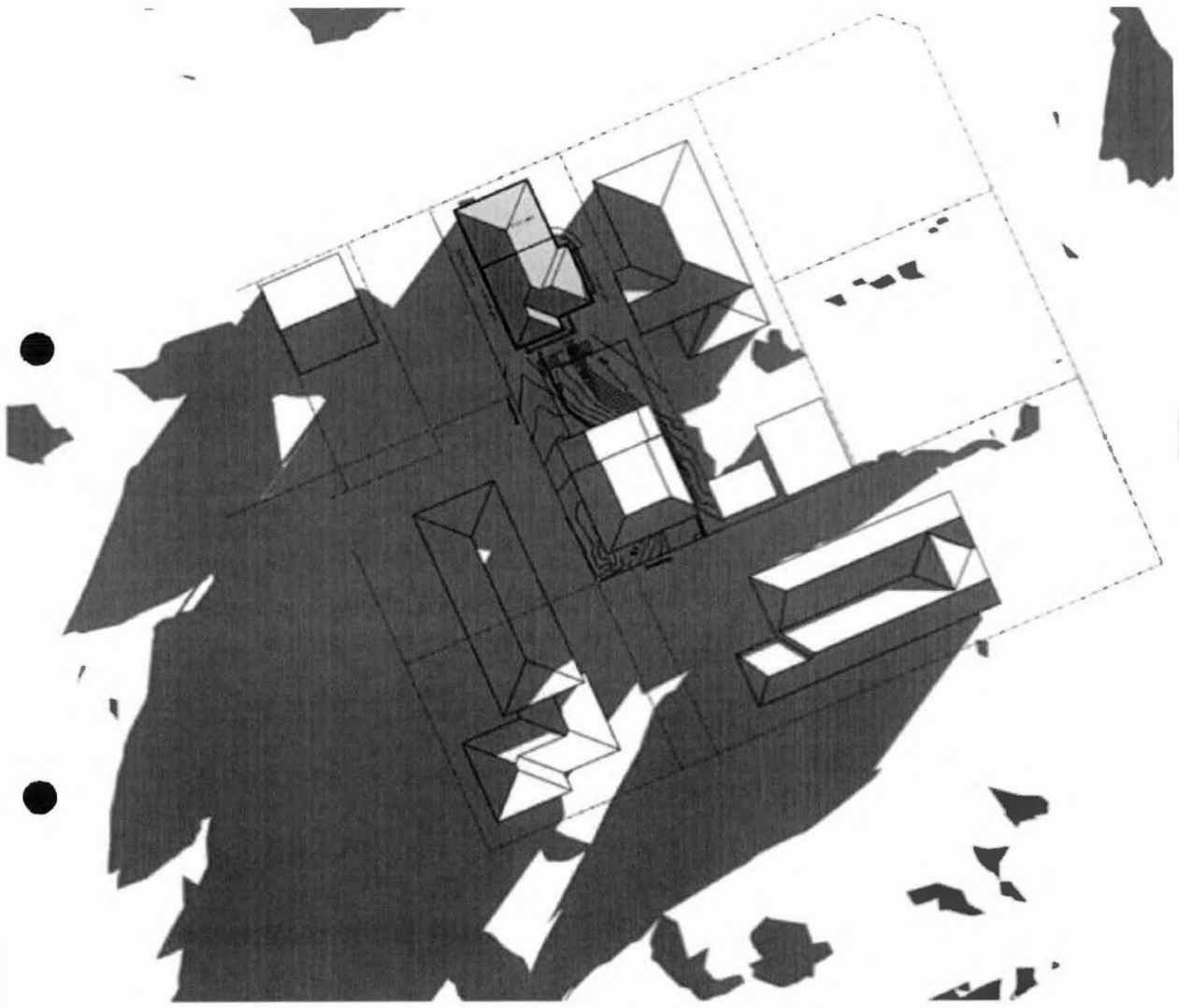

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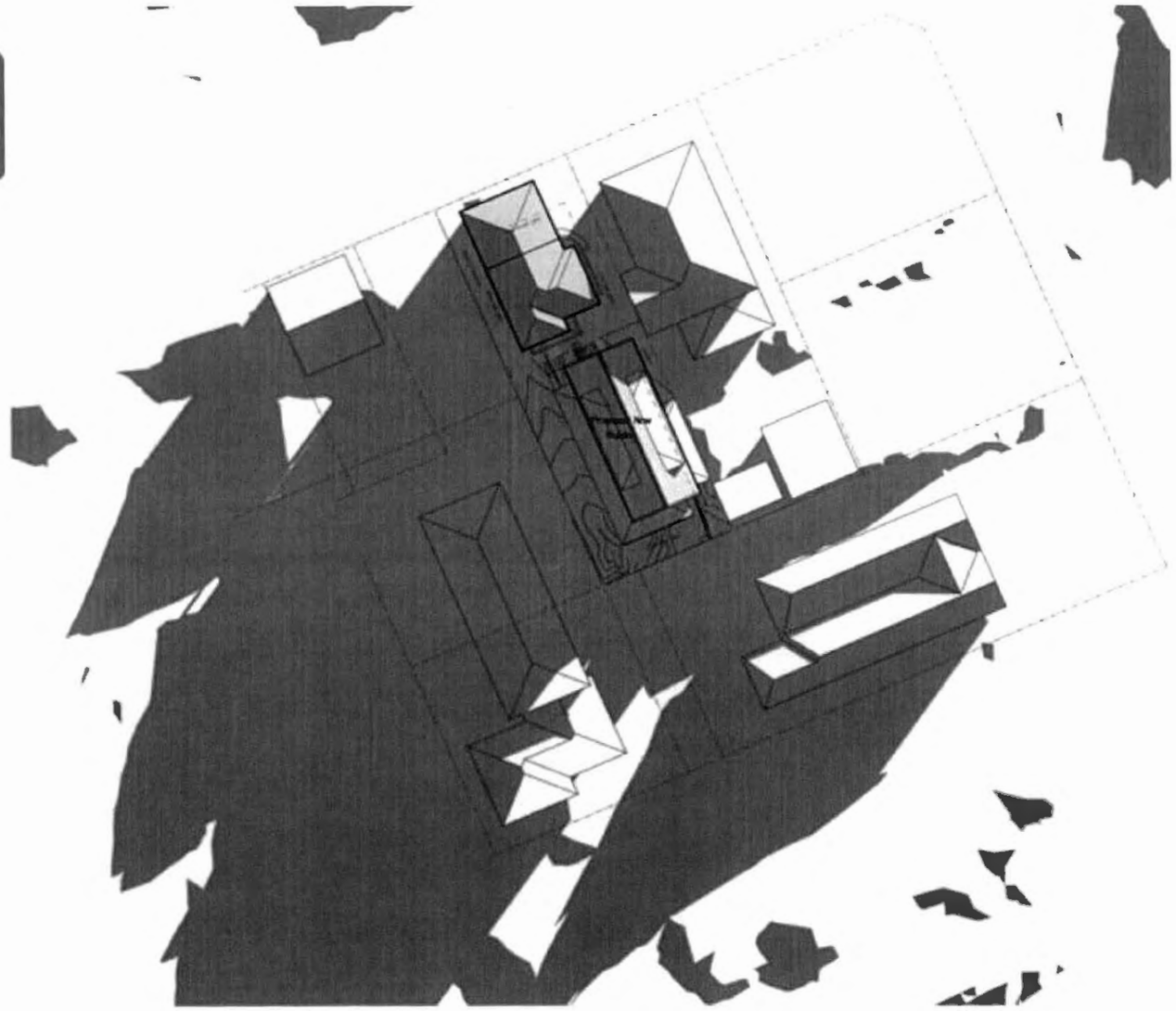

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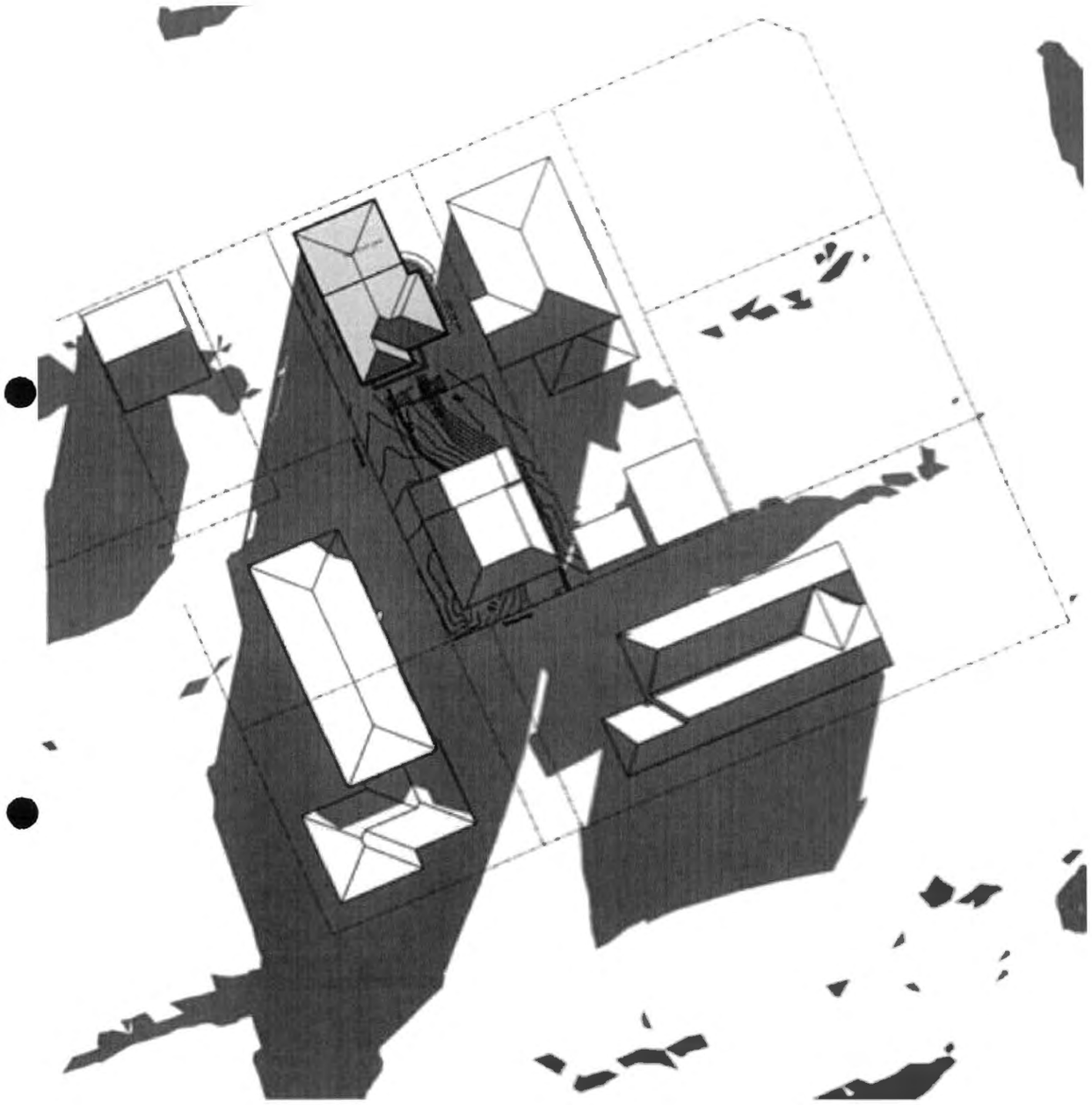

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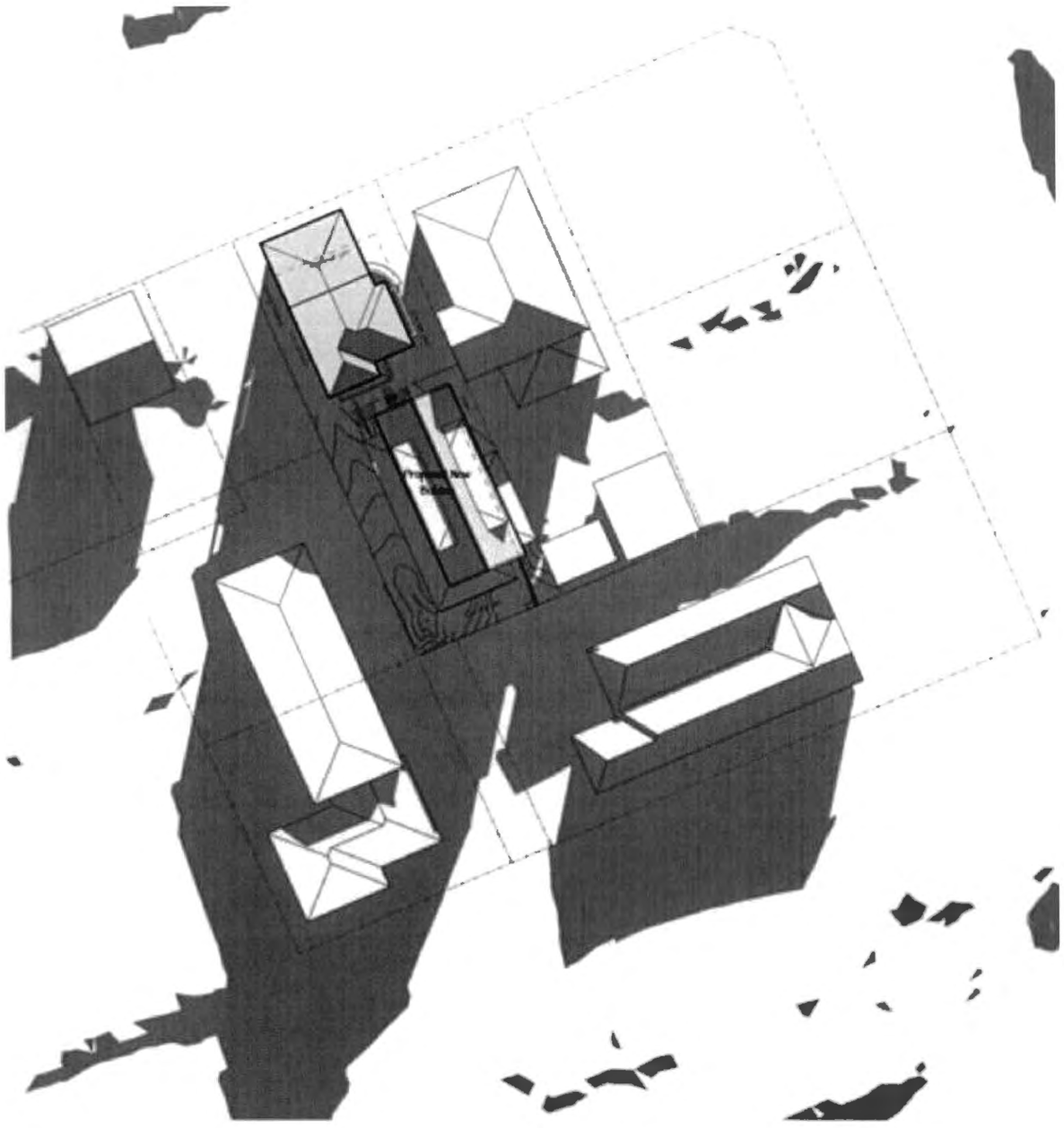

June 19th Solar Studies

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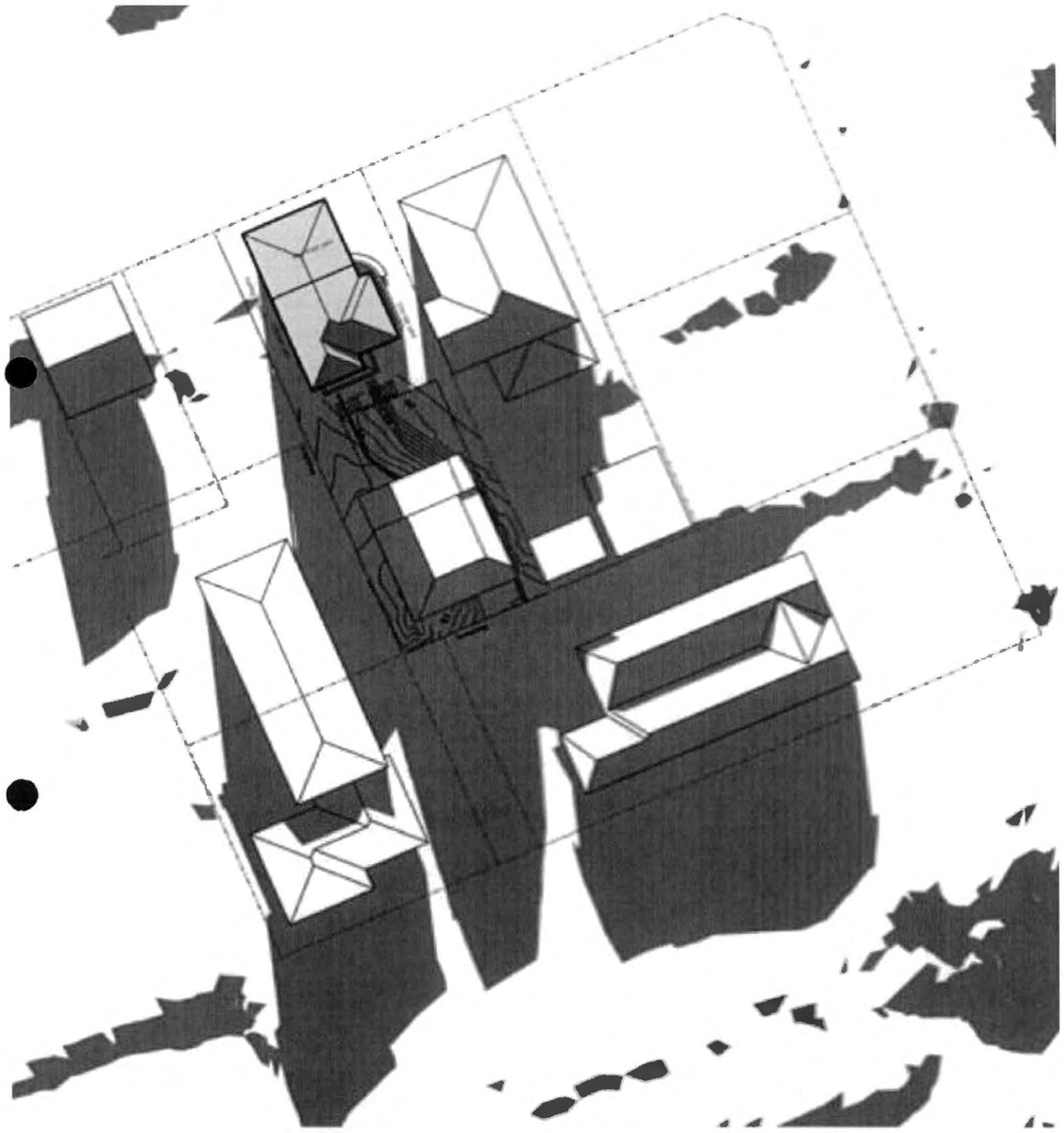

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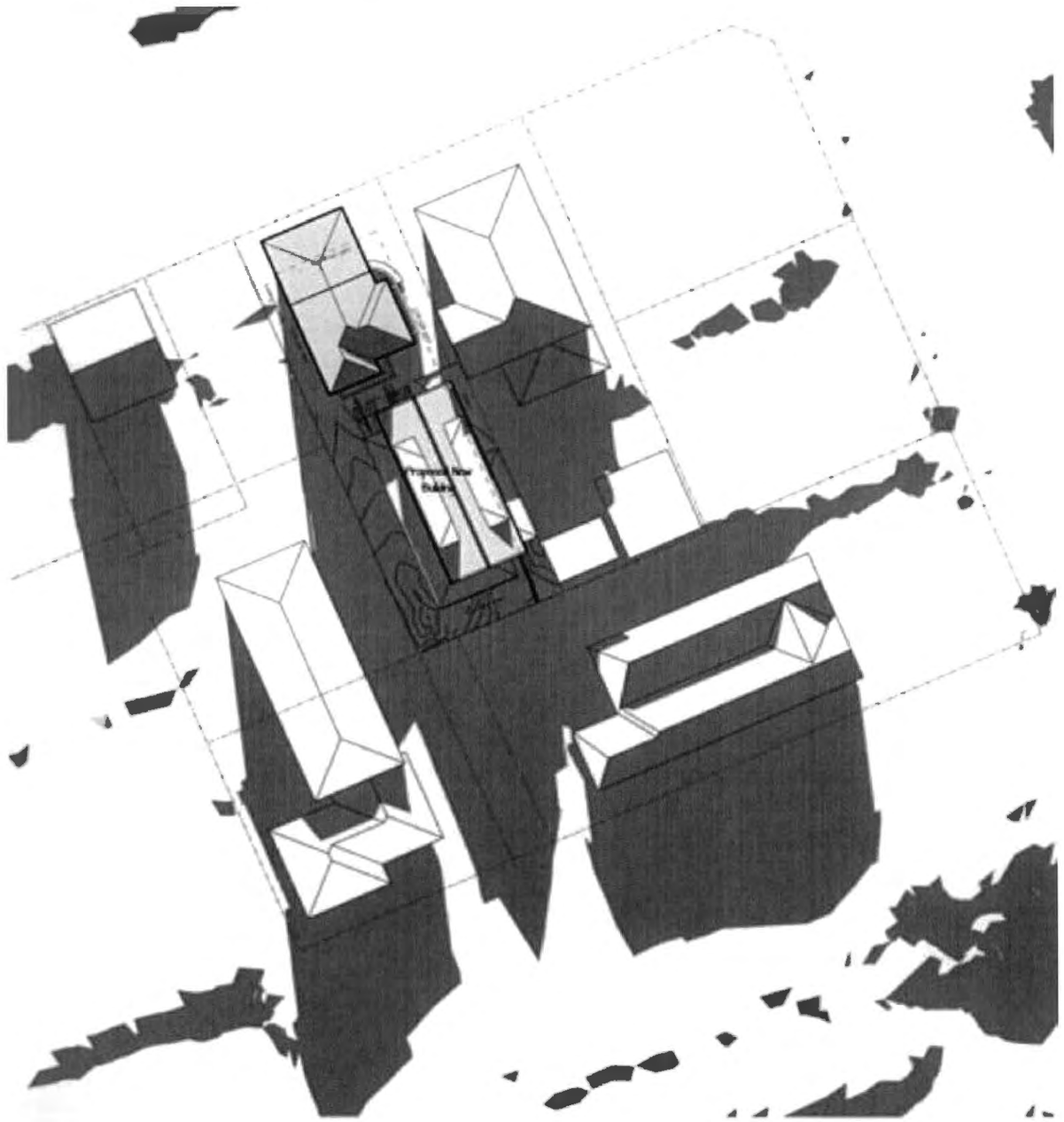

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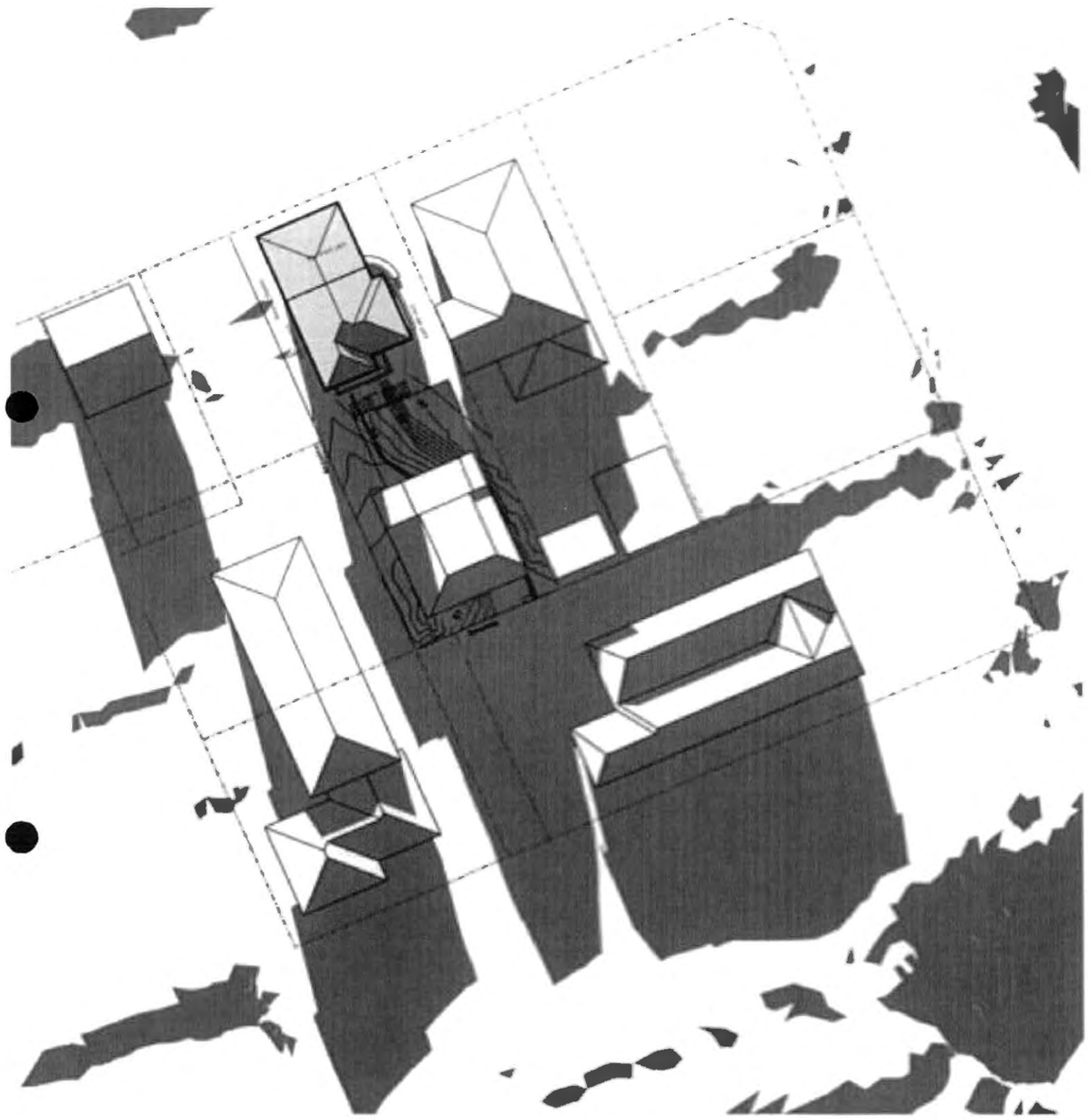

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June 19th Solar Studies

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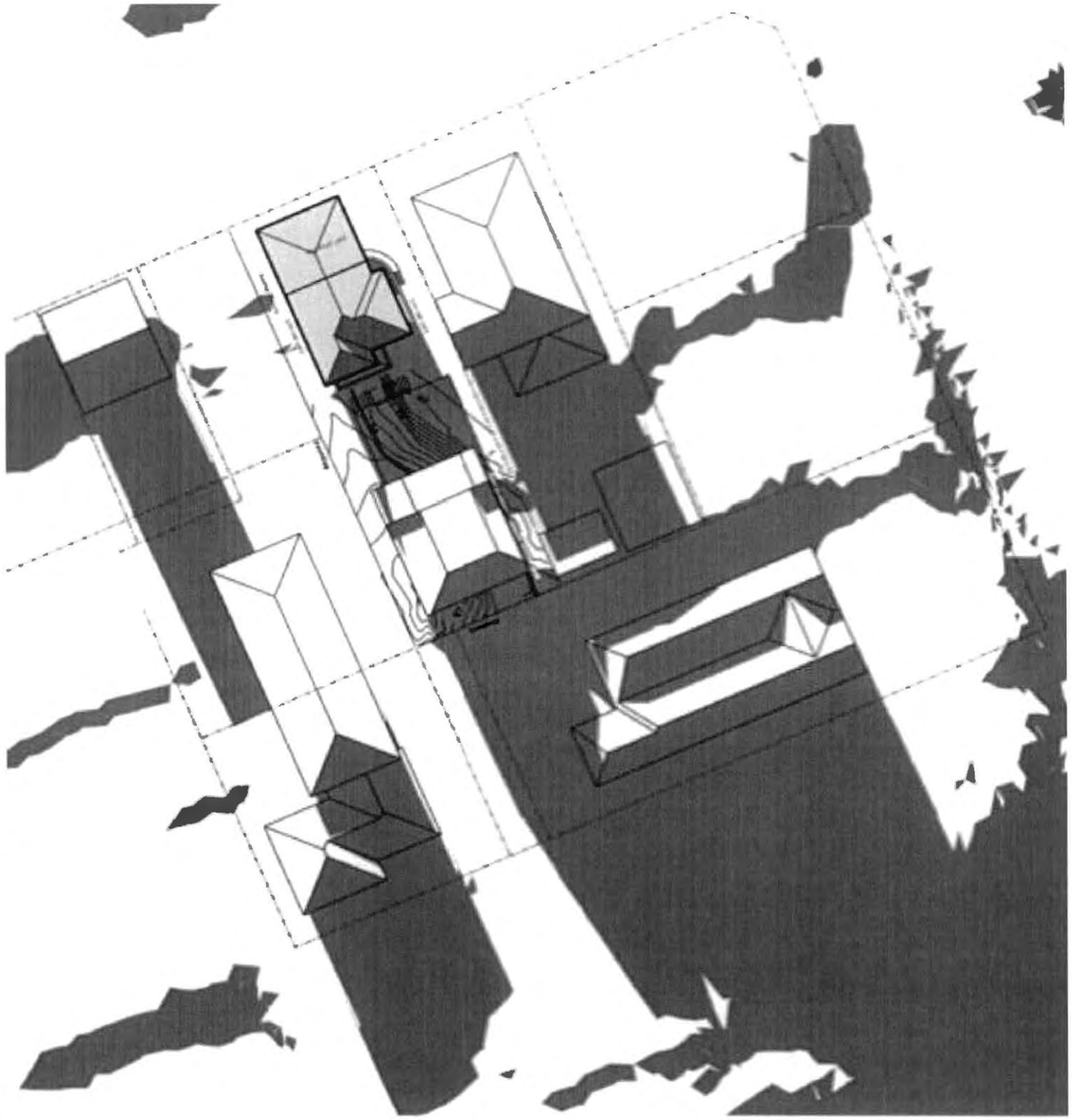

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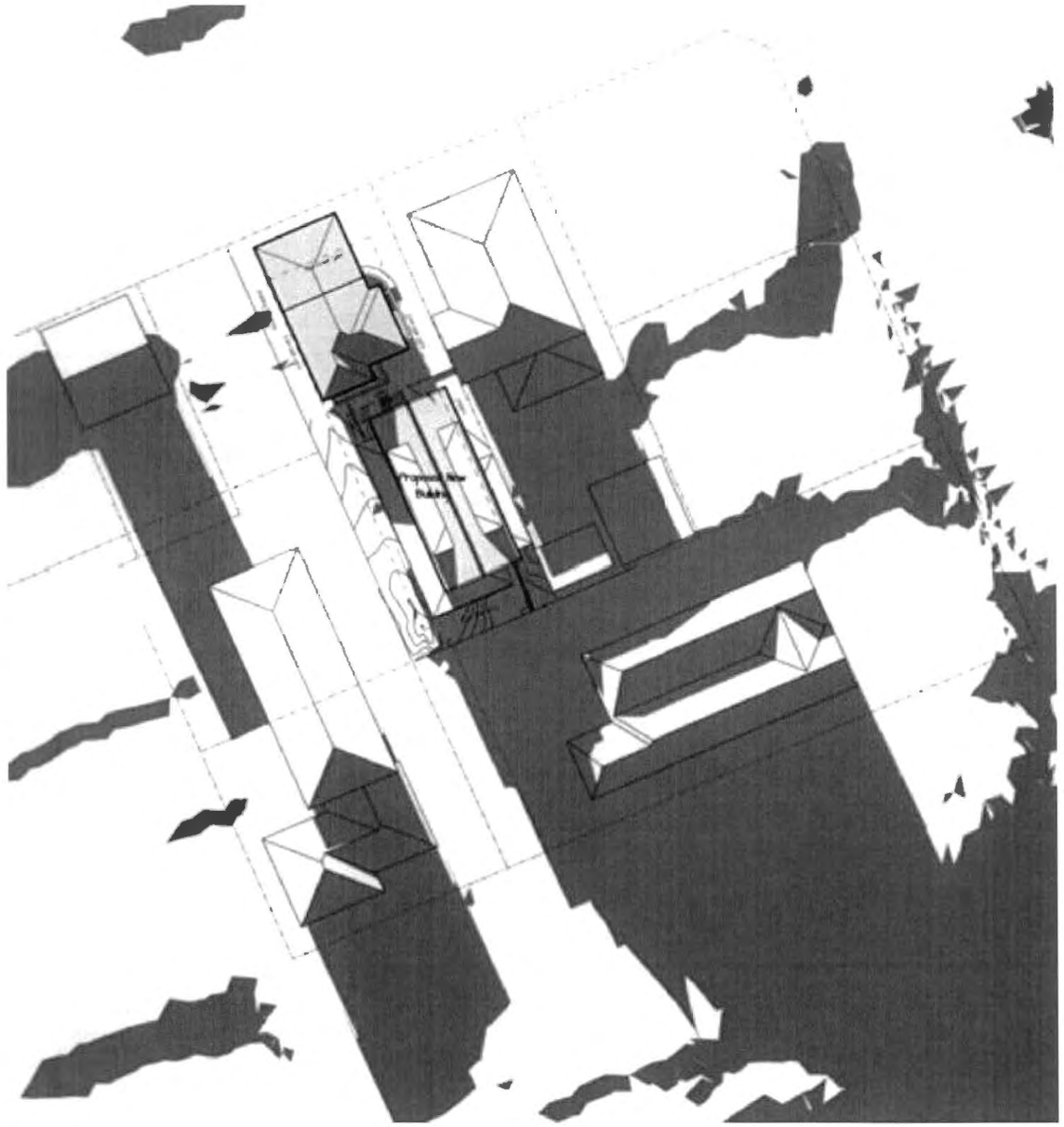

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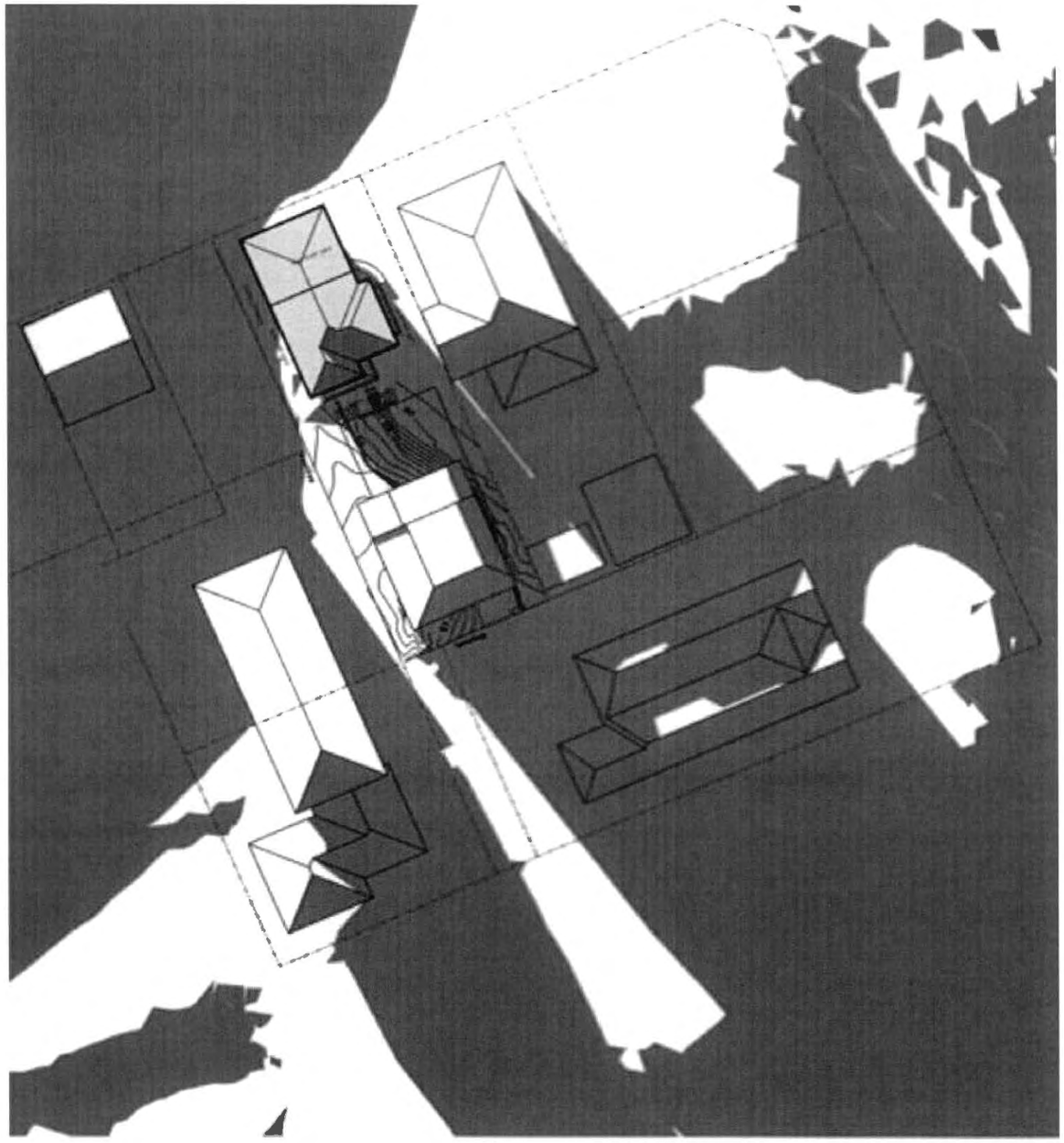

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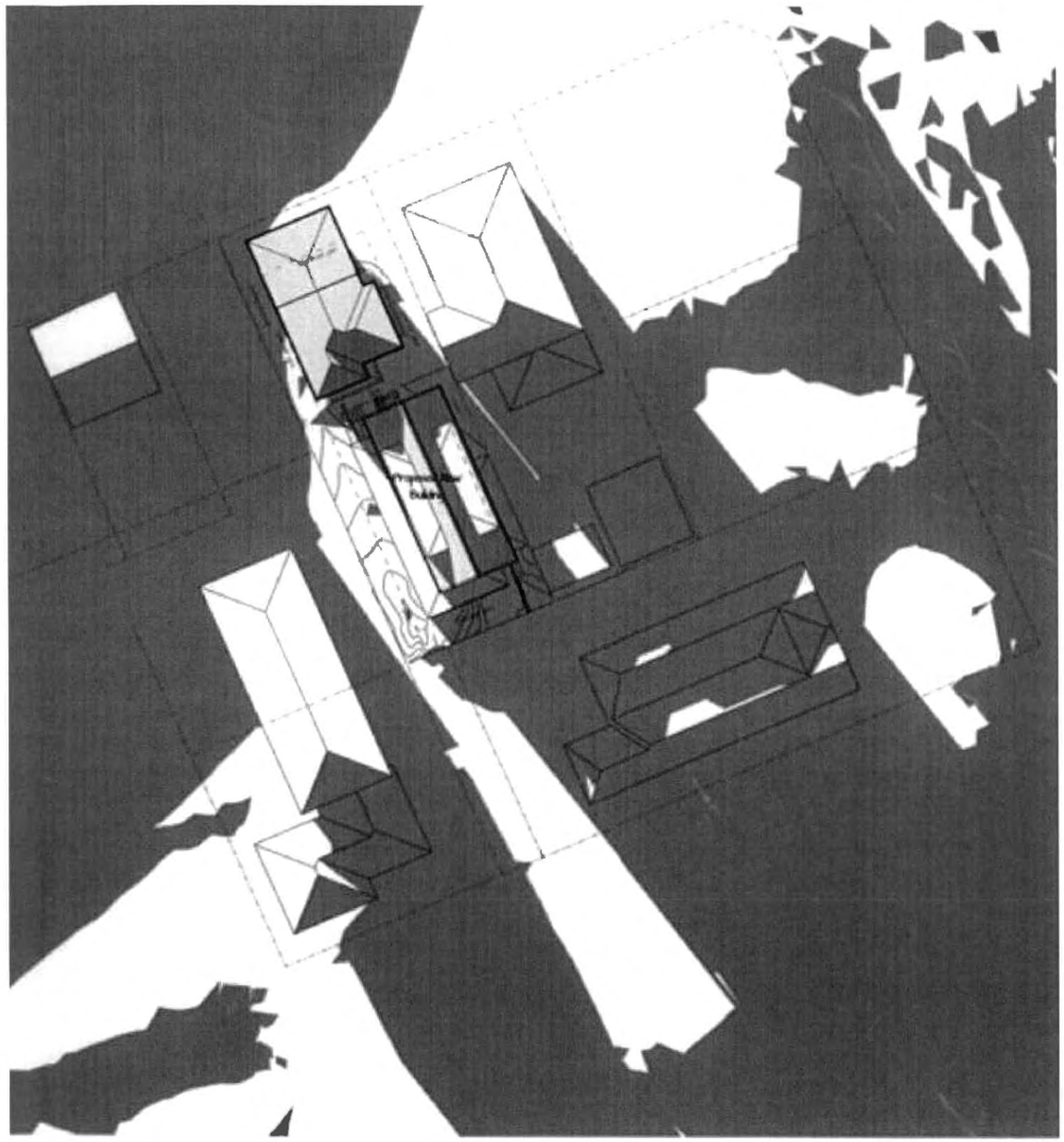

APPENDIX 3

Geosolve Geotechnical Investigation

GEOSOLVE
GEOTECHNICAL ENGINEERING | ENGINEERING GEOLOGY | PAVEMENTS | HYDROGEOLOGY | HYDROLOGY

ACENZ
MEMBER

GeoSolve Ref: 150820.01
9 February 2016

Downie Stewart Foundation
401 High Street
Dunedin 9016

Attn: Reece Warnock

Dear Reece

Stage 2 Geotechnical Investigations – 403 High Street, Dunedin

1 Introduction

This report presents the results of geotechnical investigations carried out by GeoSolve Ltd in order to determine subsoil conditions and provide geotechnical inputs for a proposed office building at 403 High Street in Dunedin. Geotechnical design parameters for retaining wall design are also provided.

The investigations were carried out for the Downie Stewart Foundation in accordance with GeoSolve Ltd's proposal dated 17 December 2015, which outlines the scope of work and conditions of engagement.

Figure 1 – Site photo, looking southeast

1.1 Proposed Development

We understand the proposed development is for the construction of a one or two storey office building on the rear of the site, which presently includes a two-storey dwelling adjacent to the High Street road frontage. We understand conceptual designs for the structure have not yet been drafted.

2 Topography and Surface Drainage

The site is situated at the rear of a dwelling located at 403 High Street, and measures approximately 24m by 13m. Existing topography is partially subhorizontal on its western extents, with slopes rising up to the eastern extents. The natural slope of the site is towards the west and topographical contours suggest that it may occupy the flanks of a former gully. The maximum elevation differential is approximately 2.9m.

Remnants of a strip footing/basement wall foundation measuring approximately 11.5m x 9m are situated adjacent to the southern site boundary. The existing building and former building have excavations that have been made with some retention by basement walls.

The site is naturally free draining and no spring flows were evident on the property during the site investigations.

3 Geotechnical Investigations

Six machine auger holes were drilled within the site to expose subsurface soils for characterisation on 22 January 2015, though two of these holes were terminated within approximately 1 metre of the subsurface when they encountered obstructions. The remaining four holes were extended to between 2.4m and 3.3m bgl (below ground level). In addition, five Scala penetrometer tests were carried out on 21 January 2016 to determine subsoil density/stiffness.

Scala penetrometer and machine auger locations and logs are appended to this report.

4 Subsurface Conditions

4.1 Geological Setting

4.1.1 Regional Geology

The geology of the Dunedin area is dominated by volcanic rock types of basaltic to andesitic composition that were intruded through pre-existing marine sediments during Miocene times. Extensive volcanism at that time produced lava flows and bedded volcanoclastic materials were widely distributed by eruptions. The generalized stratigraphic profile comprises schist at depth, overlain by a Cretaceous to Tertiary-age sequence; initially by thin non-marine sediments and then a thick accumulation of marine sediments including sandstones and mudstones. The volcanic rock types cross cut these sediments where vents were present and extensively mantle them where lava flows or volcanic ejecta were deposited.

More recently (Pleistocene times), the hills of Dunedin have been extensively mantled by windblown loess to depths of up to several metres, with some aeolian sand deposition in coastal areas. Watercourses and tidal embayments such as Otago Harbour have locally deposited alluvial,

estuarine and marine deposits and generally modified the volcanic landscape by deep incision and sedimentation. Fill and refuse has been placed locally during post-settlement times.

4.1.2 Seismicity

Dunedin has traditionally been considered to have lower than average seismic activity when compared to other areas in New Zealand, however nearby active faults are known and strong shaking is certain to occur periodically, with potential for liquefaction and settlement where land is reclaimed or contains susceptible natural alluvium, estuarine deposits or marine infill.

McCahon et al (1993)[1] states that the earthquake hazard in Dunedin is dominated by relatively infrequent moderate to large earthquakes (magnitude up to M_w 7.5) in eastern Otago, and large to very large earthquakes in the much more seismically active Fiordland and Westland regions.

The nearest active faults with demonstrated Late Quaternary movement history are the Green Island Fault and the Akatore Fault. The Green Island Fault is currently considered to be the cause of the 1974 earthquake that caused damage in Dunedin. It is mapped approximately 8km to the southwest of the subject site, but its projection is believed to continue through South Dunedin and may run northeast up the harbour in which case it would pass within about 2km of the site. The Akatore Fault has also been projected beneath South Dunedin; the nearest mapped trace of the fault is truncated about 2km south of the site, but the fault likely continues beneath South Dunedin and may run northeast up the harbour as well. Sheared fault rocks have been identified in recent drilling near Portsmouth Drive indicating that continuation of fault traces up the harbour is very probable. It should be noted that the fault terminations shown on fault trace maps are often approximations (owing to lack of data) and that the presence of other active faults may be unknown because they may be obscured by overburden soils. Both of these faults are likely to be capable of generating magnitude 7.5 earthquakes in Dunedin. Other known faults that have some potential to cause strong shaking in Dunedin are the Titri Fault and the North Taieri Fault, located roughly 4km and 6km northwest of the site, respectively.

The above faults are not included in Table 3.6 of NZS 1170.5:2004 as a major fault requiring near fault factors when assessing structural design actions. Recent events in Canterbury have highlighted the issue that previously unidentified faults may be very significant factors in the actual future risk that applies to any particular site.

Strong ground shaking throughout the South Island is likely to be associated with a rupture of the Alpine Fault, located along the West Coast of South Island. There is a high probability that an earthquake with an expected magnitude of over 8 will occur along the Alpine Fault within the next 50 years.

Estimated average return periods for shaking intensity are: MM 7 = 100 years, MM 8 = 450 years and MM 9 = >2,500 years. The most recent major earthquake to affect Dunedin occurred in 1974 and produced damage consistent with MM 7 intensity.

4.2 Site Stratigraphy

Site stratigraphy was fairly consistent across the site, with the generalised profile consisting of up to 1.0m of soft to firm **uncontrolled fill** overlying firm to very stiff **colluvium**, overlying Dunedin Volcanic Group bedrock (**weathered basalt**). Topsoil coverage across the site is nil to up to 200mm deep.

[1] The Earthquake Hazard in Dunedin I F McCahon, M D Yetton, D R L Cook (EQC funded report 91/56 - June 1993

Uncontrolled fill on site consisted mostly of soft SILT or soft sandy SILT with some gravel, and does not appear to extend to more than 1.1m bgl. This fill contained occasional glass, ceramic and brick fragments, rare shell fragments and some organics, but this accounted for less than 1 - 2% of the material during our sampling.

A relatively thin layer of **uncontrolled fill** was found at AH6 which consisted of a very soft to soft dark grey SILT with some clay, unlike the other fills on site. The Scala penetrometer sunk under its own weight in part of this unit, indicating a very soft consistency.

Colluvium consisted of firm to very stiff SILT with trace gravel, which contained occasional cobbles & boulders near the base of this unit prior to a transition to completely to highly **weathered basalt.**

Within and adjacent to the remnants of the demolished dwelling's basement wall, a horizontal layer of what is assumed to be concrete exists which the 600mm auger used during the investigations could not penetrate. Adjacent to the paved driveway, fill included 200x200x100 pavers and whole bricks in the upper 0.5m.

Full details of the subsurface stratigraphy can be found within the appended auger hole logs.

4.3 Groundwater

No groundwater seepage was encountered in any of the auger holes, and the soils observed were predominantly moist in condition. Perched groundwater is likely to develop at the contact between fill and colluvium or colluvium and weathered basalt during times of high rainfall, though the latter is likely to be well below any earthworks on site.

4.4 Slope Stability

The colluvium deposits in this area appear to be relatively stable on moderate to steep slopes that are not affected by spring flows. As noted previously, no evidence of spring flows were found on the site. However, when exposed to destabilising influences such as heavy prolonged rainfall the soft topsoil and fill on site has the potential to become unstable.

The cast in-situ concrete perimeter wall which appears to have formed the eastern wall of a now demolished building retains a slope now up to 1.2m in height, with a moderate backslope approximately 2m wide leading up to the boundary with 401 High Street where the ground surface becomes subhorizontal. Up to 1.1m of this wall is buried by fill that has been placed in what would have been the southeastern corner of the demolished building.

A steep slope exists on neighbouring property along the southern site boundary. It is heavily vegetated, but appears to slope up to 35° - 45° to a maximum height of 2.5 – 3.5m. No evidence of instability was noted on the crest of this slope at the time of our inspections, though much of the slope was obscured by the presence of fencing, vegetation and a plastered brick masonry wall.

The western site boundary is lined by a stacked bluestone wall (partially bound by some masonry) which is supporting the driveway to the site, retaining soils up to 1.3m in height. This wall is topped by a plastered brick masonry wall up to approximately 1m in height which serves as a boundary fence. The southern end of this wall is butted up against a more recently constructed concrete block wall. The junction between the two walls is immediately adjacent to a large mound of uncontrolled fill 0.9m in height which occupies the southwestern corner of the site; in this location both walls are showing signs of considerable distress. These retaining walls have partially failed in this location (particularly the concrete block wall) and should not be expected to retain the slope adequately in the medium to long term. The failure will most likely be a result of inadequate design for the fill being retained behind the wall and possibly softened colluvium beneath foundations.

5 Engineering Considerations

5.1 General

The recommendations and opinions contained in this report are based upon ground investigation data obtained at discrete locations and historical information held on the GeoSolve database. The nature and continuity of subsoil conditions away from the investigation locations is inferred and cannot be guaranteed.

5.2 Geotechnical Parameters

Table 5.1 provides a summary of the recommended geotechnical design parameters for the soil materials expected to be encountered during construction of the proposed dwelling.

Table 5.1 – Recommended geotechnical design parameters

Unit	Thickness (m)	Bulk Density γ (kN/m^3)	Effective Cohesion c' (kPa)	Effective Friction ϕ' (deg)	Elastic Modulus E (kPa)	Poissons Ratio ν
Topsoil (black organic SILT)	0 – 0.2	16	NA	NA	NA	NA
Uncontrolled Fill (soft to firm SILT with some gravel)	0.4 – 1.0	16	NA	NA	NA	NA
Uncontrolled Fill (very soft to soft SILT with some clay)	0.6	16	NA	NA	NA	NA
Colluvium (stiff to very stiff SILT with rare sand and gravel, firm in places)	1.7 – 2.2	18	0	30	5,000 – 10,000	0.3
Weathered Basalt (highly to completely weathered rock/very stiff SILT with some gravel, cobbles and boulders)	(unproven)	20	2 – 50	32	20,000 – 50,000	0.3

5.3 Site Preparation

During earthworks operations all topsoil, organic matter, fill and other unsuitable materials should be removed from the construction areas in accordance with the recommendations of NZS 4431:1989 or otherwise managed with appropriate construction detailing.

Owing to the moderately erodible nature of some of the soils and the steep slopes present across the site, sediment control measures should be instigated during earthworks construction.

Water should not be allowed to pond or collect near or under a foundation slab. Positive grading of the subgrade should be undertaken to prevent water ingress or ponding.

All fill that is utilised as bearing for foundations should be placed and compacted in accordance with the recommendations of NZS 4431:1989 and certification provided to that effect. The colluvium or weathered basalt could be used as engineered fill on site (during good weather and in accordance with an earthfill specification). Boulders and cobbles over 75mm in size will need to be screened from engineered fill sources. An earthfill specification can be provided on request.

We recommend topsoil stripping and subsequent earthworks be undertaken only when a suitable interval of fair weather is expected, or during the earthworks construction season.

5.4 Excavations

We recommend that all excavations should be inspected by a geotechnical practitioner during earthworks construction.

No seepage was encountered during test pitting and hence groundwater is unlikely to be encountered during excavations. However a geotechnical practitioner should inspect any seepage, spring flow or under-runners that may be encountered during construction.

Recommendations for permanent batters are detailed in Table 5.2.

Table 5.2 – Recommended batters for permanent cuts up to 3m in height (subject to construction inspection)

Material Type	Recommended Maximum Batter for Permanent Cuts Less than 3m High in Dry Ground (horizontal to vertical)
Fill, Topsoil	3 : 1
Colluvium	2 : 1
Weathered Basalt	1.5 : 1

All proposed earthworks should be carried out under the supervision of a geotechnical practitioner.

The subsurface materials will be relatively easy to excavate by conventional methods. Unweathered volcanic bedrock will be encountered at relatively shallow depths but excavations are unlikely to encounter this.

5.5 Ground Retention

Owing to the partially sloping nature of the site and the presence of some uncontrolled fill, some ground retention is likely to be required. Any retaining wall proposed should be designed by a chartered professional engineer.

All temporary slopes for retaining wall construction should be battered at 1:1 provided these are within the colluvium or weathered basalt deposits and under the supervision of a geotechnical practitioner.

All retaining walls should be designed using the geotechnical parameters recommended in Table 5.1 of this report. Due allowance should be made during the detailed design of all retaining walls for any additional loads upslope of the wall (i.e. surcharge due to backslope, vehicles or buildings). To ensure potential groundwater seeps and flows are properly controlled behind the retaining walls, the following recommendations are provided:

- A minimum 0.3m width of durable free draining granular material should be placed behind all retaining structures;

- A heavy duty non-woven geotextile cloth, such as Bidim A14, should be installed between the natural ground surface and the free draining granular material to prevent siltation and blockage of the drainage media; and
- A heavy-duty (TNZ F/2 Class 500) perforated pipe should be installed within the drainage material at the base of all retaining structures to minimise the risk of excessive groundwater pressures developing. This drainage pipe should be connected to the permanent piped storm water system.

- Comprehensive waterproofing measures should be provided to the back face of retaining walls forming changes in floor level within the dwelling to minimise groundwater seepage into the finished buildings.

Care must be taken to avoid imparting a surcharge to the existing retaining walls lying parallel to the western site boundary, as these walls have partially failed and will not remain stable in the medium to long term. Care will be required to ensure that the walls are not disturbed during construction by temporary surcharges or other site disruption such as vibration. Ownership of the walls is currently unclear and may require confirmation by survey, however replacement of the walls should be considered, depending on development requirements and site performance expectations.

5.6 Groundwater Issues

The regional watertable is expected to lie well below excavations up to 2.5m in depth. Dewatering or other groundwater-related construction issues are therefore unlikely to be required. Perched groundwater has the potential to develop and destabilise the existing fill soils if upslope drainage is inadequate.

A search of the site and the subsurface observations did not yield any evidence of spring flows that could affect the proposed development.

It is important that GeoSolve be contacted should there be any seepage, spring flow or under-runners encountered during construction.

5.7 Slope Stability

No slope instability was identified during the time of inspection other than apparent creep movement in the some surficial topsoil and fill. Minor tension cracking is evident upslope of where some landscaping edging bounding a white pebble path has rotated downslope on the eastern slope of the property. Although this soil movement is surficial in nature, the slope between the concrete patio and the white pebble path is oversteepened, and should be re-profiled or retained to arrest any further movement.

Care will be required to ensure the development does not promote slope instability on the unretained slope south of the property. Adequate setbacks should be defined for structures and areas of surcharge adjacent to moderate or steep slopes.

The remnant basement wall is not considered to be a formally engineered retaining wall, has been left in a condition that is not capable of adequately retaining the slope, and should be removed as part of the proposed development. The temporary and long-term stability of this slope must be considered, and ground retention will likely be required.

All cuts should be subject to inspection during construction and if higher than outlined in Table 5.2 should be subject to specific design.

The retaining walls along the south-west boundary have partially failed should not be expected to retain the slope adequately in the medium to long term.

5.8 Settlement and Foundations

The presence of uncontrolled fill in the upper 1.1m of the soil profile on site should be considered when designing the foundation system for the dwellings.

Owing to the presence of the fill, foundation loads could be transferred to the underlying colluvium deposits, and allowances should be made for the negative skin friction (NSF) of the soft topsoil and fill during pile design.

Pile design should be carried out by a structural engineer with assistance from a geotechnical practitioner.

Table 5.3 summarises the recommended parameters for pile design for piles embedded into stiff or very stiff colluvium. Note the piles should be embedded a minimum embedment to diameter ratio (L/D) of 3 into the bearing strata (below any fill) to mobilise the end bearing loads indicated.

Table 5.3 – Ultimate pile design parameters

Ultimate end bearing (kPa)	Ultimate skin friction (kPa)
450	35

Driven piles could be considered, however the vibrations may result in more potential for damage to adjacent structures such as the unstable retaining walls. For driven piles, a site specific set count (displacement/blow of the pile driver) can be determined prior to construction once loadings and construction equipment have been confirmed.

A strength reduction factor should be applied to the above when comparing to factored structural loadings. A strength reduction factor (SRF) of 0.5 is recommended for both static and seismic load cases. As noted above NSF will need to be taken into account. A value of 15kPa should be adopted for NSF.

The pile should be designed so that the following criteria are satisfied:

(1.2*NSF + Factored structural loadings) < (ultimate pile capacity * SRF)

Alternatively, consideration could be given to removal and/or replacement of the fill soils. Shallow foundations could be designed to occupy the now demolished dwelling footprint. This would require the removal of significant quantities of fill from the site, as well as import of soil for the engineered fill. If total earthworks volumes are greater than 100m^3 then this is likely to trigger a requirement for resource consent.

It is recommended the foundation excavations be inspected by a suitably qualified and experienced geotechnical specialist to confirm the conditions are in accordance with the assumptions and recommendations provided in this report.

All unsuitable materials identified in any foundation excavations, particularly those softened by exposure to water, should be undercut and replaced with engineered fill during construction. Any fill that is utilised as bearing for foundations should be placed and compacted in accordance with NZS 4431:1989 and certification provided to that effect.

5.9 Site Subsoil Category

For detailed design purposes it is recommended the magnitude of seismic acceleration be estimated in accordance with the recommendations provided in NZS 1170.5:2004.

The site is Class C (Shallow soil site) in accordance with NZS 1170.5:2004 seismic provisions. The soil parameters for static conditions given above require no downgrading for seismic bearing. (The materials are not subject to liquefaction or other strength loss on cyclic loading.)

6 Neighbouring Structures/Hazards

Natural Hazards: The development is not located within any previously identified area of slope instability, so the risk of future deep-seated land movement is low.

Fill Site: Ground contamination inputs are beyond the scope of this report. Owing to the fill on site, we recommend an environmental engineering consultant should advise further on possible requirements of the National Environmental Standard (Soil).

Distances to adjoining structures: Providing adequate retention is provided for any cut slopes and setbacks are defined for any neighbouring moderate or steep slopes, no adverse geotechnical implications apply for neighbouring properties during construction of the dwelling. The unstable retaining walls require replacement or measures to ensure that they are not destabilised as a result of construction works.

Aquifers: No aquifer resource will be adversely affected by the development.

Erosion and Sediment Control: The site presents some potential to generate silt runoff and this would naturally drain downslope. Effective systems for erosion control are runoff diversion drains and contour drains, while for sediment control, options are earth bunds, silt fences, hay bales, vegetation buffer strips and sediment ponds. Only the least amount of subsoil should be exposed at any stage and surfacing established as soon as practical. Details for implementation are given within the following link:

http://ecan.govt.nz/publications/General/FullErosionandSedimentControlGuideline.pdf

Noise: Rock-breaking and/or blasting is unlikely to be required.

Dust: Regular dampening of soil materials with sprinklers should be effective if required.

Vibration: No vibration induced settlement is expected in these soil types, though the effects of vibration should be considered if driven piles are considered as a foundation option.

7 Conclusions and Recommendations

- The site is underlain by a mixture of uncontrolled fill and topsoil to a maximum depth of 1.1m, overlying firm to very stiff colluvium, overlying completely to highly weathered basalt. Unweathered volcanic bedrock is expected to underlie the site at relatively shallow depths.
- We recommend that all excavations should be inspected by a geotechnical practitioner during earthworks construction, particularly to confirm subgrade conditions inferred to exist beneath the demolished building's foundations.
- Care will be required to ensure the development does not promote slope instability on the unretained slope south of the property. Adequate setbacks should be defined for structures and areas of surcharge adjacent to moderate or steep slopes.
- The remnant basement wall is not considered to be a formally engineered retaining wall, has been left in a condition that is not capable of adequately retaining the slope, and should be removed as part of the proposed development. The temporary and long-term stability of this slope must be considered, and ground retention will likely be required.
- Care must be taken to avoid disturbing or imparting a surcharge to the existing retaining walls lying parallel to the western site boundary, as these walls have partially failed and will not remain stable in the medium to long term. Replacement of the walls should be considered, depending on development requirements and site performance expectations.
- The stiff to very stiff colluvium or weathered basalt on site will provide adequate bearing for piled foundations. Shallow foundations could be considered, though the uncontrolled fill will need to be removed from site and required levels re-established, possibly with imported fill.
- Foundation options for the proposed dwellings include piling through existing fill with embedment into and bearing on the stiff or very stiff colluvium (or weathered basalt) below. Pile design in this case would require detailed design by a structural and geotechnical engineer. Ultimate geotechnical bearing capacity of bored piles are presented in Table 5.3.
- Alternatively the foundation could be constructed on a cut or cut to fill platform which would require significant fill removal from site and the need for retention, but for which shallow footings could be utilised.
- Retention design should be carried out with reference to the geotechnical parameters outlined above.
- Cut batters in moist colluvium should be formed at 2:1 (horizontal to vertical) if cuts are less than 3m. Specific design will be required for any larger cuts.
- The proposed earthworks design should be agreed with GeoSolve prior to construction.
- All unsuitable materials identified in foundation excavations, particularly those softened by exposure to water, should be undercut and replaced with engineered fill during construction. Any fill that is utilised as bearing for foundations should be placed and compacted in accordance with NZS 4431:1989 and certification provided to that effect.
- A geotechnical practitioner should inspect all excavations and additionally any seepage, spring flow or under-runners that may be encountered during construction.

8 Applicability

This report has been prepared for the benefit of the Downie Stewart Foundation with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

It is important that we be contacted if there is any variation in subsoil conditions from those described in this report.

GeoSolve Ltd

Geotechnical Engineering Consultants

Report prepared by:

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Rob Stuff

Engineering Geologist

Reviewed for GeoSolve Ltd by:

.....

Mark Walrond

Senior Engineering Geologist

Authorised for GeoSolve Ltd by:

.....

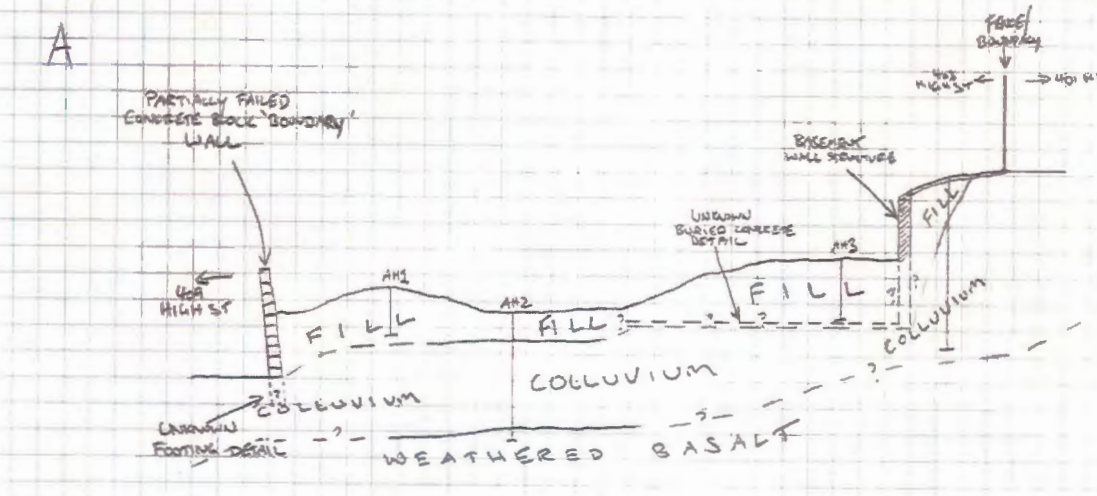
Colin Macdiarmid

Senior Geotechnical Engineer

Attachments:

- Site Plan
- Cross Section A – A'
- Investigation Logs


Key
BORE/AUGER HOLE
SCALA
SECTION LOCATION AND FACING
GEOSOLVE
Downie Stewart Foundation
Proposed New Offices
403 High Street
Site Plan



DRAWN BY: RS
GEOSOLVE REF 160820.01

PROPOSED NEW OFFICES - DOMINO STEWART FOUNDATION
403 HIGH ST
CROSS-SECTION A-A'
FIGURE 2

GeoSolve Ltd
AUGER HOLE LOG

EXCAVATION NUMBER: **AH 1**

PROJECT: 403 High Street			Job Number: 150820.01
LOCATION:		Inclination: Vertical	Direction:

EASTING:	mE	EQUIPMENT: 8t excavator/ 600mm aguer	OPERATOR: Andrew Hollands
NORTHING:	mN	INFOMAP NO.	COMPANY: Hollands Excavation
ELEVATION:	m	DIMENSIONS:	HOLE STARTED: 22-Jan-16
METHOD:		EXCAV. DATUM: GL	HOLE FINISHED: 22-Jan-16

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
	NO SEEPAGE	0.9		Brown, sandy SILT with some gravel. Sand and gravel are fine to coarse, subangular. Some ~50mm chunks of silt (colluvium). Some buried topsoil/organics dispersed throughout. Rare shells. Some brick, ceramic pipe, 200x200x100 bluestone blocks. Non-plastic. Soft.	Dry to moist	FILL

Total Depth = 0.9 m

COMMENT: Refusal on concrete or bricks (?)	Logged By: RS
	Checked Date: 29-Jan-16
	Sheet: 1 of 1

GeoSolve Ltd

AUGER HOLE LOG

EXCAVATION NUMBER: **AH 2**

PROJECT: 403 High Street			Job Number: 150820.01
LOCATION:		Inclination: Vertical	Direction:

EASTING:	mE	EQUIPMENT: 8t excavator/ 600mm aguer	OPERATOR: Andrew Hollands
NORTHING:	mN	INFOMAP NO.	COMPANY: Hollands Excavation
ELEVATION:	m	DIMENSIONS:	HOLE STARTED: 22-Jan-16
METHOD:		EXCAV. DATUM: GL	HOLE FINISHED: 22-Jan-16

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.1		Black, organic SILT.		TOPSOIL
		0.5		Light brown/black, sandy SILT with some gravel. Sand and gravel are fine to coarse, subangular. Some ~50mm chunks of silt (colluvium). Some buried topsoil/organics dispersed throughout. Rare shells. Some brick, ceramic pipe, 200x200x100 bluestone blocks. Non-plastic. Soft.	Dry	FILL
		2.2		Light brown and mottled orange, SILT with trace gravel. Gravel is fine, angular to subangular. Non-plastic. Firm to very stiff.	Moist	COLLUVIUM
	NO SEEPAGE	2.4		Red and brown, SILT with some gravel. Completely becoming highly weathered basalt. Gravel is coarse. Some cobbles, becoming bouldery. Non-plastic. Very stiff.	Moist	WEATHERED BASALT

Total Depth = 2.4 m

COMMENT:	Logged By: RS
	Checked Date: 29-Jan-16
	Sheet: 1 of 1

GeoSolve Ltd

AUGER HOLE LOG

EXCAVATION NUMBER: **AH 3**

PROJECT: 403 High Street			Job Number: 150820.01
LOCATION:		Inclination: Vertical	Direction:

EASTING:	mE	EQUIPMENT: 8t excavator/ 600mm aguer	OPERATOR: Andrew Hollands
NORTHING:	mN	INFOMAP NO.	COMPANY: Hollands Excavation
ELEVATION:	m	DIMENSIONS:	HOLE STARTED: 22-Jan-16
METHOD:		EXCAV. DATUM: GL	HOLE FINISHED: 22-Jan-16

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.1		Black, organic SILT.		TOPSOIL
	NO SEEPAGE	1.1		Brown, sandy SILT with some gravel. Sand and gravel are fine to coarse, subangular. Some ~50mm chunks of silt (colluvium). Some buried topsoil/organics dispersed throughout. Rare shells. Some brick, ceramic pipe, glass, ~50mm chunks of asphalt. Non-plastic. Soft.	Dry to moist	FILL

Total Depth = 1.1 m

COMMENT: Refusal on concrete (?)	Logged By: RS
	Checked Date: 29-Jan-16
	Sheet: 1 of 1

GEOSOLVE

GeoSolve Ltd
AUGER HOLE LOG

EXCAVATION NUMBER: **AH 4**

PROJECT: 403 High Street			Job Number: 150820.01
LOCATION:		Inclination: Vertical	Direction:

EASTING:	mE	EQUIPMENT: 8t excavator/ 600mm aguer	OPERATOR: Andrew Hollands
NORTHING:	mN	INFOMAP NO.	COMPANY: Hollands Excavation
ELEVATION:	m	DIMENSIONS:	HOLE STARTED: 22-Jan-16
METHOD:		EXCAV. DATUM: GL	HOLE FINISHED: 22-Jan-16

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.1		Black, organic SILT.		TOPSOIL
		0.9		Light brown/black, SILT with some gravel. Gravel is medium to coarse, subangular to subrounded. Some brick fragments. Tabular concrete near surface (old pathway?). Soft to firm.	Dry	FILL
	NO SEEPAGE	3.3		Light brown and mottled orange, SILT with trace gravel. Gravel is fine, angular to subangular. Rare rootlets. Cobbles from 3.0m. Non-plastic. Firm to very stiff.	Moist	COLLUVIUM

Total Depth = 3.3 m

COMMENT: Ran out of reach on boom/auger extension.

Logged By: RS
Checked Date: 29-Jan-16
Sheet: 1 of 1

GeoSolve Ltd
AUGER HOLE LOG

EXCAVATION NUMBER: **AH 5**

PROJECT: 403 High Street			Job Number: 150820.01
LOCATION:		Inclination: Vertical	Direction:

EASTING:	mE	EQUIPMENT: 8t excavator/ 600mm aguer	OPERATOR: Andrew Hollands
NORTHING:	mN	INFOMAP NO.	COMPANY: Hollands Excavation
ELEVATION:	m	DIMENSIONS:	HOLE STARTED: 22-Jan-16
METHOD:		EXCAV. DATUM: GL	HOLE FINISHED: 22-Jan-16

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.2		Black, organic SILT.		TOPSOIL
		0.6		Light brown, SILT with trace gravel. Gravel is fine, subangular. Trace brick fragments, shells, ceramic pipe fragments. Non-plastic. Firm.	Moist	FILL
		2.5		Light brown and mottled orange, SILT with trace gravel. Gravel is fine, angular to subangular. Non-plastic. Firm to very stiff.	Moist	COLLUVIUM
	NO SEEPAGE	2.8		Red and brown, SILT with some gravel. Completely becoming highly weathered basalt. Gravel is coarse. Some cobbles, becoming bouldery. Non-plastic. Very stiff.	Moist	WEATHERED BASALT

Total Depth = 2.8 m

COMMENT:	Logged By: RS
	Checked Date: 29-Jan-16
	Sheet: 1 of 1

GeoSolve Ltd
AUGER HOLE LOG

EXCAVATION NUMBER: **AH 6**

PROJECT: 403 High Street			Job Number: 150820.01
LOCATION:		Inclination: Vertical	Direction:

EASTING:	mE	EQUIPMENT: 8t excavator/ 600mm aguer	OPERATOR: Andrew Hollands
NORTHING:	mN	INFOMAP NO.	COMPANY: Hollands Excavation
ELEVATION:	m	DIMENSIONS:	HOLE STARTED:
METHOD:		EXCAV. DATUM: GL	HOLE FINISHED:

SCALA PENETRATION	GROUNDWATER / SEEPAGE	DEPTH (m)	GRAPHIC LOG	SOIL / ROCK CLASSIFICATION, PLASTICITY OR PARTICLE SIZE CHARACTERISTICS, COLOUR, WEATHERING, SECONDARY AND MINOR COMPONENTS	WATER CONTENT	GEOLOGICAL: SOIL / ROCK TYPE, ORIGIN, MINERAL COMPOSITION, DEFECTS, STRUCTURE, FORMATION
		0.1		Black, organic SILT.		TOPSOIL
		0.5		Brown, sandy SILT with some gravel. Sand and gravel are fine to coarse, subangular. Some buried topsoil/organics dispersed throughout. Rare shells. Some brick, ceramic pipe, glass fragments. Non-plastic. Soft.	Dry to moist	FILL
		1.1		Dark grey, SILT with some clay. Organic smell. Moderate plasticity. Very soft to soft.	Moist	FILL
		2.9		Light brown and mottled orange, SILT with trace gravel. Gravel is fine, angular to subangular. Non-plastic. Firm to very stiff.	Moist	COLLUVIUM
	NO SEEPAGE	3.3		Red and brown, SILT with some gravel. Completely becoming highly weathered basalt. Gravel is coarse. Some cobbles, becoming bouldery. Non-plastic. Very stiff.	Moist	WEATHERED BASALT

Total Depth = 3.3 m

COMMENT:	Logged By: RS
	Checked Date: 29-Jan-16
	Sheet: 1 of 1

GeoSolve Ltd

SCALA PENETROMETER LOG

Job No: *150820.01*
Project: *403 High St, Dunedin*

Date: *21/01/2016*
Operated by: *RC*
Logged by: *RC*

Test Number	*SC1*
Sheet	*1*
of	*5*

SC1
Location: See Site Plan
RL: 0 m

mm Driven	No. of Blows
50	*0.5*
100	*0.5*
150	*0.5*
200	*0.5*
250	*1*
300	*1*
350	*1*
400	*1*
450	*1*
500	*1*
550	*1.5*
600	*1.5*
650	*1*
700	*1*
750	*1*
800	*1*
850	*1*
900	*1*
950	*1.5*
1000	*1.5*
1050	*2*
1100	*2*
1150	*2*
1200	*2*
1250	*2.5*
1300	*2.5*
1350	*3*
1400	*3*
1450	*4.5*
1500	*4.5*
1550	*4*
1600	*4*
1650	*5.5*
1700	*5.5*
1750	*8.5*
1800	*8.5*
1850	*Refusal*
1900	
1950	
2000	
Inferred Soil Type	
Watertable Depth	

Location:
RL:

mm Driven	No. of Blows
50	
100	
150	
200	
250	
300	
350	
400	
450	
500	
550	
600	
650	
700	
750	
800	
850	
900	
950	
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1500	
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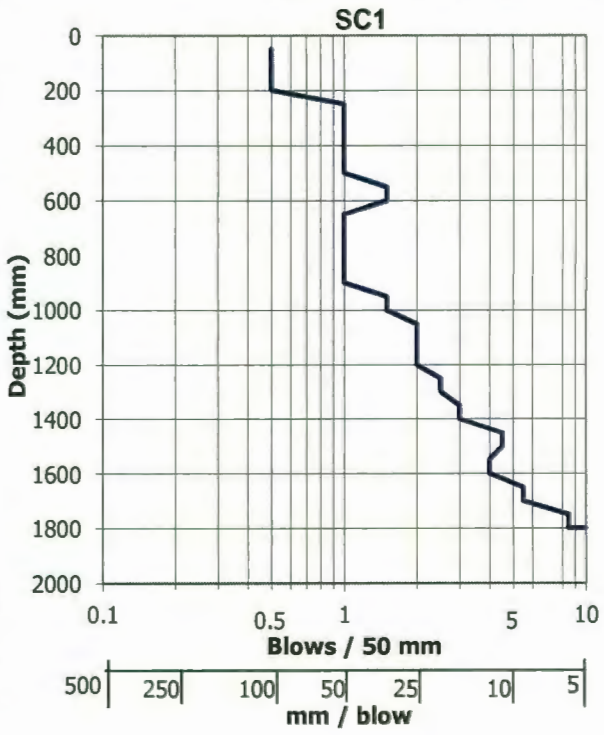
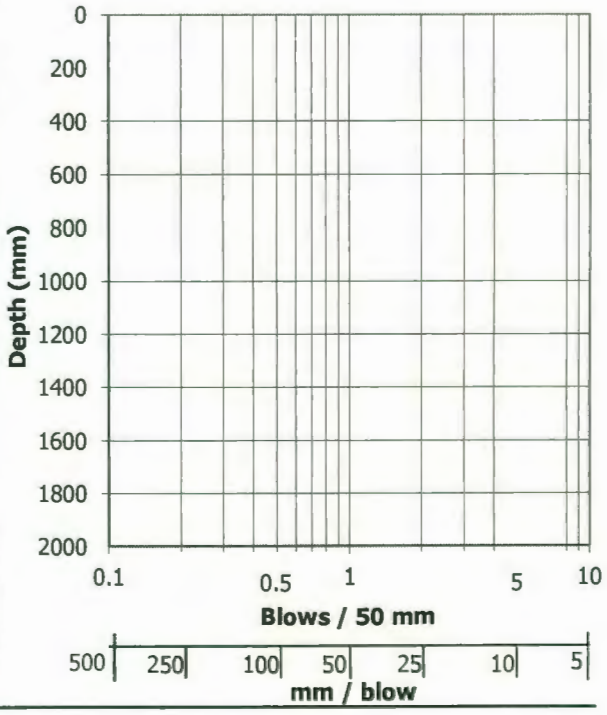
1600	
1650	
1700	
1750	
1800	
1850	
1900	
1950	
2000	
Inferred Soil Type	
Watertable Depth	





GEOSOLVE LTD

SCALA PENETROMETER LOG

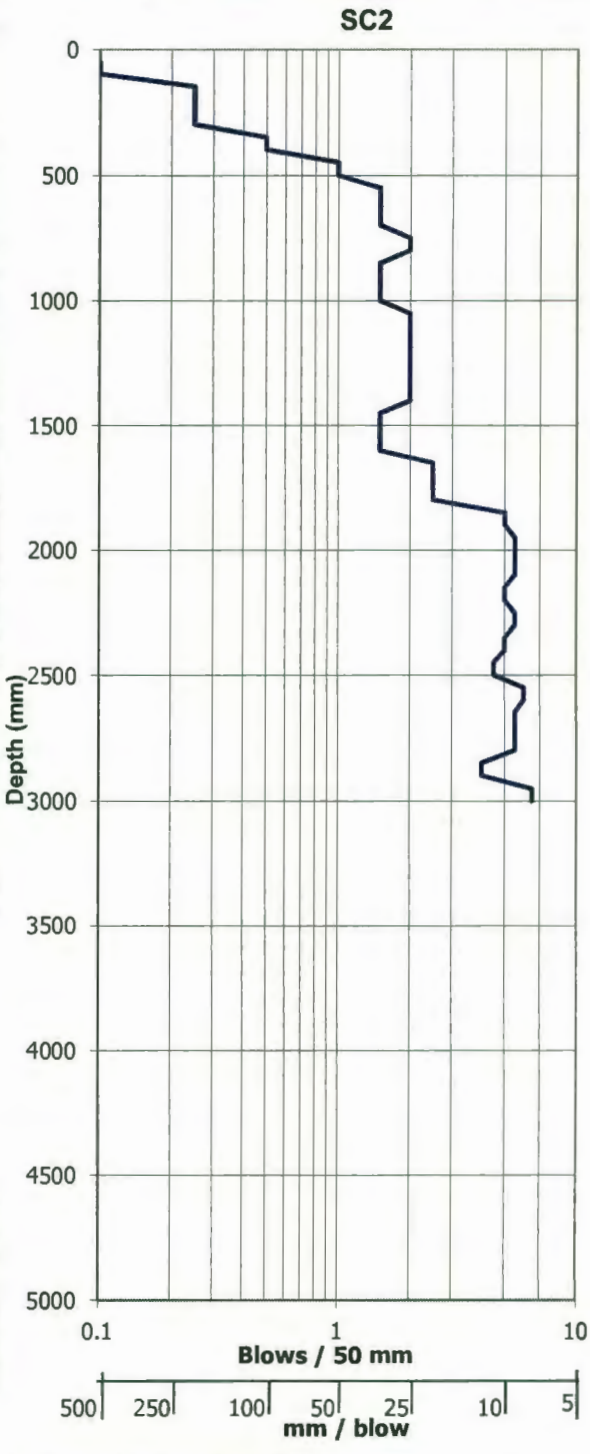
Job No: *150820.01*
Project: *403 High St, Dunedin*
Location: *See Site Plan*
RL: *0m*

Date: *21/01/2016*
Operated by: *RC*
Logged by: *RC*
Inferred Soil Type:

Test No.	SC2
Sheet	2
of	5

SC2	
mm Driven	No. of Blows
50	0.1
100	0.1
150	0.25
200	0.25
250	0.25
300	0.25
350	0.5
400	0.5
450	1
500	1
550	1.5
600	1.5
650	1.5
700	1.5
750	2
800	2
850	1.5
900	1.5
950	1.5
1000	1.5
1050	2
1100	2
1150	2
1200	2
1250	2
1300	2
1350	2
1400	2
1450	1.5
1500	1.5
1550	1.5
1600	1.5
1650	2.5
1700	2.5
1750	2.5
1800	2.5
1850	5
1900	5
1950	5.5
2000	5.5
2050	5.5
2100	5.5
2150	5
2200	5
2250	5.5
2300	5.5
2350	5
2400	5
2450	4.5
2500	4.5

SC2 cont...	
mm Driven	No. of Blows
2550	6
2600	6
2650	5.5
2700	5.5
2750	5.5
2800	5.5
2850	4
2900	4
2950	6.5
3000	6.5
3050	
3100	
3150	
3200	
3250	
3300	
3350	
3400	
3450	
3500	
3550	
3600	
3650	
3700	
3750	
3800	
3850	
3900	
3950	
4000	
4050	
4100	
4150	
4200	
4250	
4300	
4350	
4400	
4450	
4500	
4550	
4600	
4650	
4700	
4750	
4800	
4850	
4900	
4950	
5000	



Test Method Used: NZS 4402:1988 Test 6.5.2 Dynamic Cone Penetrometer

GeoSolve Ltd

SCALA PENETROMETER LOG

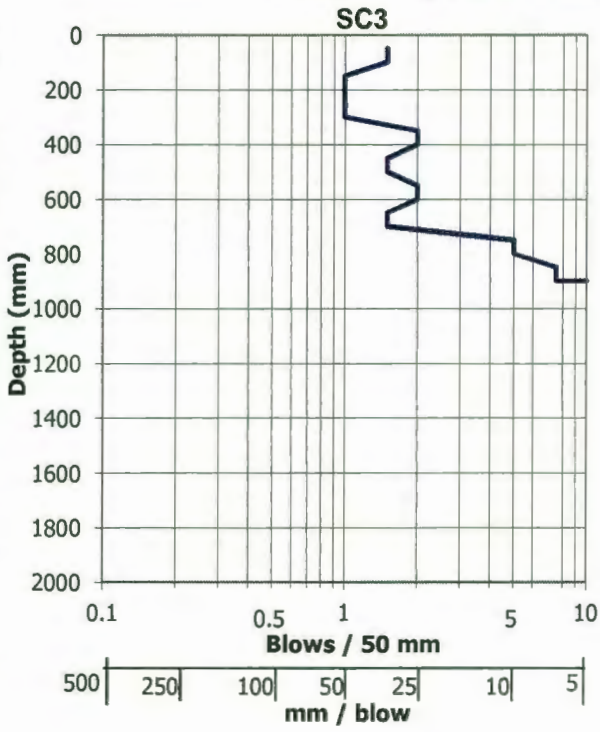
Job No: *150820.01*
Project: *403 High St, Dunedin*

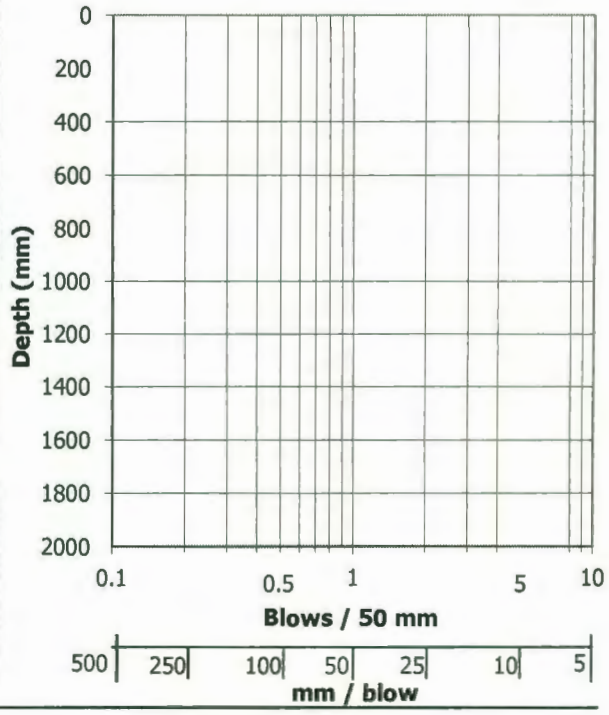
Date: *21/01/2016*
Operated by: *RC*
Logged by: *RC*

Test Number	SC3
Sheet	3
of	5

SC3 Location: See Site Plan RL: 0 m	
mm Driven	No. of Blows
50	1.5
100	1.5
150	1
200	1
250	1
300	1
350	2
400	2
450	1.5
500	1.5
550	2
600	2
650	1.5
700	1.5
750	5
800	5
850	7.5
900	7.5
950	Refusal
1000	
1050	
1100	
1150	
1200	
1250	
1300	
1350	
1400	
1450	
1500	
1550	
1600	
1650	
1700	
1750	
1800	
1850	
1900	
1950	
2000	
Inferred Soil Type	
Watertable Depth	

Location: RL:	
mm Driven	No. of Blows
50	
100	
150	
200	
250	
300	
350	
400	
450	
500	
550	
600	
650	
700	
750	
800	
850	
900	
950	
1000	
1050	
1100	
1150	
1200	
1250	
1300	
1350	
1400	
1450	
1500	
1550	
1600	
1650	
1700	
1750	
1800	
1850	
1900	
1950	
2000	
Inferred Soil Type	
Watertable Depth	





GEOSOLVE LTD

SCALA PENETROMETER LOG

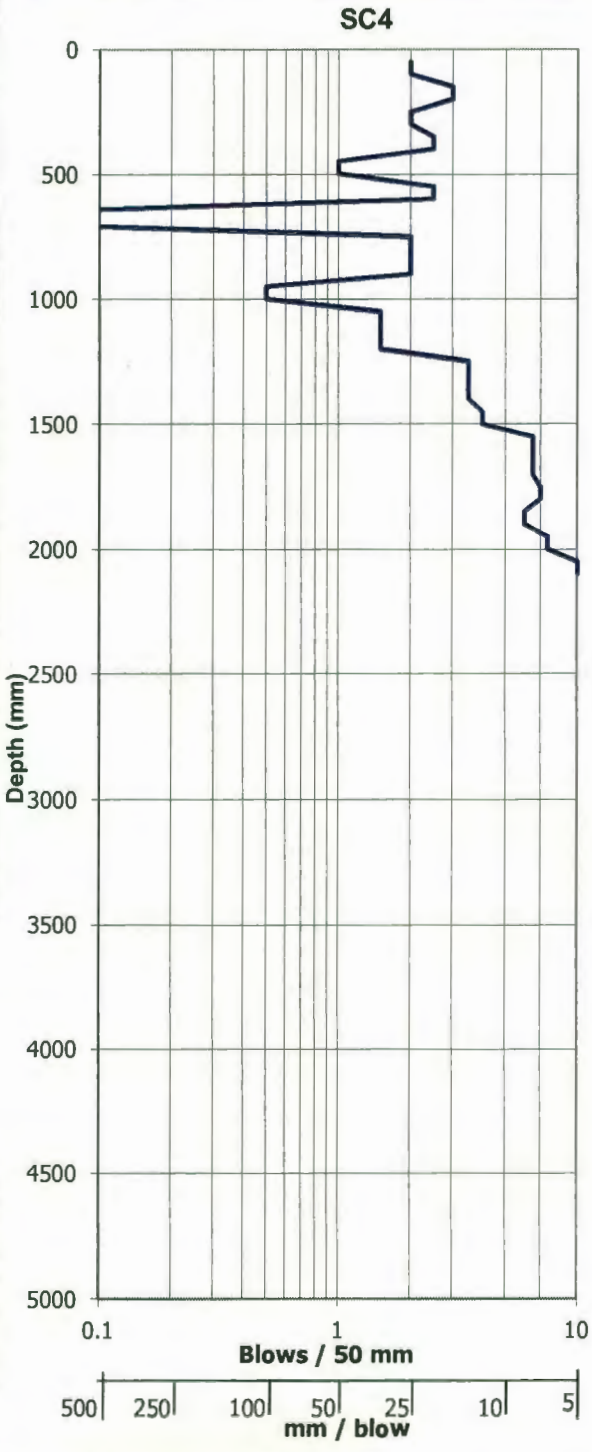
Job No: *150820.01*
Project: *403 High St, Dunedin*
Location: *See Site Plan*
RL: *0m*

Date: *21/01/2016*
Operated by: *RC*
Logged by: *RC*
Inferred Soil Type:

Test No.	*SC4*
Sheet	*4*
of	*5*

SC4	
mm Driven	No. of Blows
50	2
100	2
150	3
200	3
250	2
300	2
350	2.5
400	2.5
450	1
500	1
550	2.5
600	2.5
650	0.05
700	0.05
750	2
800	2
850	2
900	2
950	0.5
1000	0.5
1050	1.5
1100	1.5
1150	1.5
1200	1.5
1250	3.5
1300	3.5
1350	3.5
1400	3.5
1450	4
1500	4
1550	6.5
1600	6.5
1650	6.5
1700	6.5
1750	7
1800	7
1850	6
1900	6
1950	7.5
2000	7.5
2050	10
2100	10
2150	Refusal
2200	
2250	
2300	
2350	
2400	
2450	
2500	

SC4 cont...	
mm Driven	No. of Blows
2550	
2600	
2650	
2700	
2750	
2800	
2850	
2900	
2950	
3000	
3050	
3100	
3150	
3200	
3250	
3300	
3350	
3400	
3450	
3500	
3550	
3600	
3650	
3700	
3750	
3800	
3850	
3900	
3950	
4000	
4050	
4100	
4150	
4200	
4250	
4300	
4350	
4400	
4450	
4500	
4550	
4600	
4650	
4700	
4750	
4800	
4850	
4900	
4950	
5000	



Test Method Used: NZS 4402:1988 Test 6.5.2 Dynamic Cone Penetrometer

GEOSOLVE LTD

SCALA PENETROMETER LOG

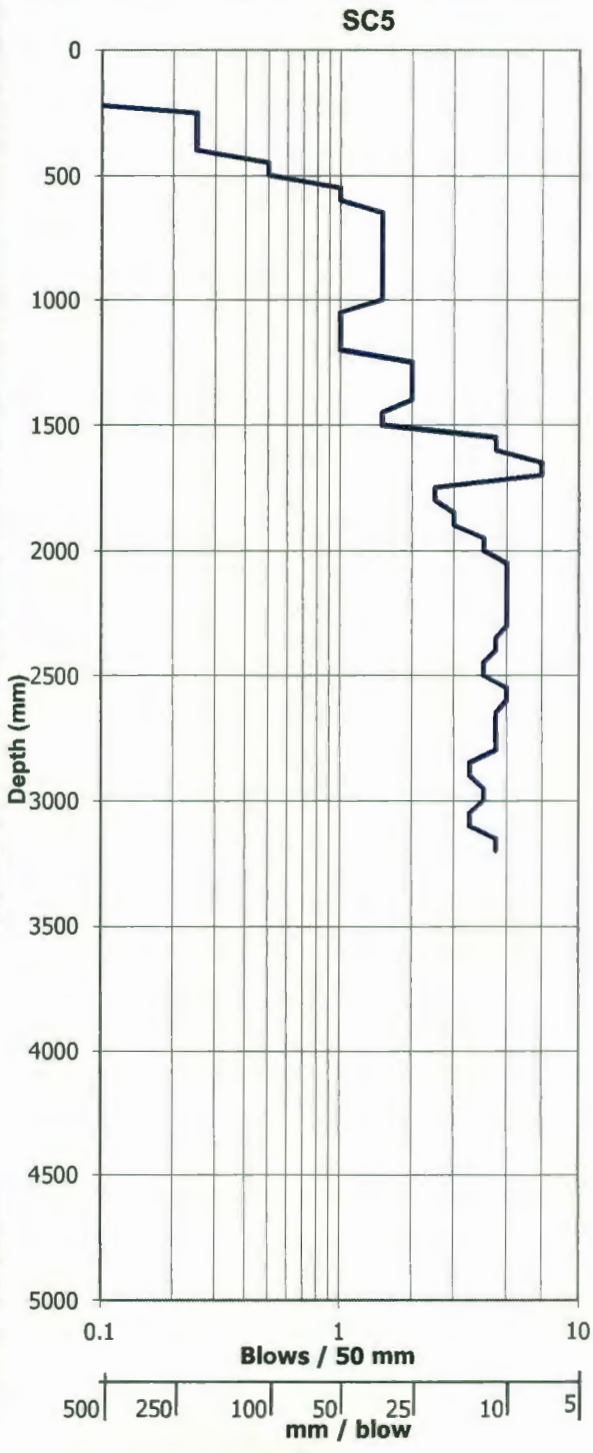
Job No: *150820.01*
Project: *403 High St, Dunedin*
Location: *See Site Plan*
RL: *0m*

Date: *21/01/2016*
Operated by: *RC*
Logged by: *RC*
Inferred Soil Type:

Test No.	SC5
Sheet	5
of	5

SC5	
mm Driven	No. of Blows
50	0.05
100	0.05
150	0.05
200	0.05
250	0.25
300	0.25
350	0.25
400	0.25
450	0.5
500	0.5
550	1
600	1
650	1.5
700	1.5
750	1.5
800	1.5
850	1.5
900	1.5
950	1.5
1000	1.5
1050	1
1100	1
1150	1
1200	1
1250	2
1300	2
1350	2
1400	2
1450	1.5
1500	1.5
1550	4.5
1600	4.5
1650	7
1700	7
1750	2.5
1800	2.5
1850	3
1900	3
1950	4
2000	4
2050	5
2100	5
2150	5
2200	5
2250	5
2300	5
2350	4.5
2400	4.5
2450	4
2500	4

SC5 cont...	
mm Driven	No. of Blows
2550	5
2600	5
2650	4.5
2700	4.5
2750	4.5
2800	4.5
2850	3.5
2900	3.5
2950	4
3000	4
3050	3.5
3100	3.5
3150	4.5
3200	4.5
3250	
3300	
3350	
3400	
3450	
3500	
3550	
3600	
3650	
3700	
3750	
3800	
3850	
3900	
3950	
4000	
4050	
4100	
4150	
4200	
4250	
4300	
4350	
4400	
4450	
4500	
4550	
4600	
4650	
4700	
4750	
4800	
4850	
4900	
4950	
5000	



Test Method Used: NZS 4402:1988 Test 6.5.2 Dynamic Cone Penetrometer

APPENDIX 4

Environmental Consultants Otago - Hail Assessment of Effects

ECOtago

Environmental Consultants Otago Ltd

Assessment of Environmental Effects for Undertaking Earthworks on a HAIL Site at 403 High Street, Dunedin

for

Downie Stewart Foundation

July 2017

Environmental Consultants Otago Ltd
Environmental and Contaminated Site Assessment • Planning and Urban Design • Landscape Architecture
PO Box 5522 Dunedin 9058 • 64 3 4728875

Task	Responsibility	Signature
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Prepared By:	Bernice Chapman, PhD	
Reviewed By:	Ciaran Keogh	
Approved For Issue By:	Ciaran Keogh	

Prepared By:
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Client: Downie Stewart Foundation
Job Ref.: 60-17 High403
Date: 7 July 2017

Table of Contents

Abbreviations

AEE	Assessment of Environmental Effects
BaP	Benzo(a)pyrene
BaP_{eq}	Equivalent Benzo(a)pyrene
CSMP	Contaminated Soil Management Plan
DCC	Dunedin City Council
DCDP	Dunedin City District Plan
HAIL	Hazardous Activities and Industries List
MfE	New Zealand Ministry for the Environment
NES Soil	Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
PAH	Polycyclic Aromatic Hydrocarbons
RMA	Resource Management Act 1991
SCS	Soil Contaminant Standards
SGV	Soil Guideline Values
TCLP	Toxicity Characteristic Leaching Procedure

1 Introduction

1.1 Background

The Downie Stewart Foundation owns the property at 403 High Street, Dunedin (Figure 1). The property contains a residential building which is operated as part of the Moana House Programme, and the Downie Stewart Foundation is planning to construct a whare (office/meeting room) to the rear of the property.

Figure 1: General location of 403 High Street, marked with a black circle.

The property has been residential for over 70 years. Geotechnical investigations carried out to assess the suitability of ground conditions for the new construction identified remnants of a basement wall from a former building on the southern boundary of the site, and the presence of up to 1 m fill across the site[1]. The presence of uncontrolled fill may have resulted in ground contamination, depending on the source and nature of the fill material. As a result, landfilling is one of the activities described in the New Zealand Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL), and the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES Soil) apply when five specific activities (including soil disturbance, subdivision or change of use) take place at the property.

The HAIL is a compilation of activities and industries that are considered to have the potential to cause land contamination as a result of hazardous substance use, storage or disposal. The presence of such activities on a property does not automatically mean contamination will be present on the property.

A specific trigger for this Assessment of Environmental Effects (AEE) is that the proposed works will involve disturbing soil on a property that has had prior HAIL land use. The proposed earthworks are likely to disturb more than 25 m^3 per 500 m^2, with more than 5 m^3 per 500 m^2 being disposed of, both of which exceed the

[1] GeoSolve Ltd. *Geotechnical Report, 403 High Street;* 9 February 2016. GeoSolve ref: 150820.01

permitted activity limit defined in clause 8(3)(c) of the NES Soil, and therefore are discretionary activities in accordance with clause 11.1 of the NES Soil.

Environmental Consultants Otago Limited (EC Otago) have been engaged to prepare this AEE to address the effects of disturbance and disposal of soil at a property with a history of HAIL activity, in accordance with the NES Soil, and to present the measures proposed to avoid, remedy or mitigate any potential adverse effects on the environment. This AEE is in support of a resource consent application for a discretionary activity.

The scope of this AEE is based on EC Otago's proposal to Downie Stewart Foundation, dated 26 May 2017, and subsequent discussions, and is limited to matters related to the disturbance and disposal of potentially contaminated soils. All other aspects of the works are addressed within the resource consent application prepared by others.

The area in which the subject property is located is a residential neighbourhood that has sustained long-standing effects of development permitted under the Dunedin City District Plan (DCDP). The natural environment once present is already significantly modified, and ambient conditions are assumed as a baseline for assessment. As such, the scope of this AEE will take this ambient baseline into account and the wider environmental considerations as pre-existing.

1.2 Property Details and Description

The property details are shown in Table 1 below.

Table 1: Property Details.

Owner	Downie Stewart Foundation
Address	403 High Street, Dunedin
Legal description	LOT 1 DP 4266
Certificate of Title	276/233
District Plan / zoning	Residential 1 Zone in the existing DCDP; Inner City Residential in the Proposed Second Generation Plan

The property has an area of 551 m^2, and is shown in Figure 2. All references to the property in this report refer to the area outlined in turquoise in Figure 2, being the extent of 403 High Street. All references to the site refer to the area outlined with a red dashed line in Figure 2, being the rear approximately 315 m^2 of the property.

1.3 Property Use History

A detailed use history is beyond the scope of this report. However historical aerial photography was reviewed, and confirm the property has been used for residential purposes since prior to 1947.

Aerial photography from 1947, part of the Dunedin City Council (DCC) GIS taken by New Zealand Aerial Mapping, shows the existing house was present at that time, in addition to what appears to be another building to the rear of the property along the southern border (Figure 3). The building appears to have been demolished by 1982 (Figure 4), and the rear of the property remains in garden in 2005 (Figure 5).

Figure 2: The property at 403 High Street, outlined with a turquoise line, showing the site to the rear of the property outlined with a red dashed line.

Figure 3: The property in 1947, outlined with a turquoise line. The house currently on the property can be seen, as well as what appears to be another building on the southern end of the property (Source: DCC GIS Archive).

Figure 4: The property in 1982, outlined with a turquoise line. The building to the rear appears to have been demolished by this date, although the resolution is relatively poor (Sourced from http://retrolens.nz and licensed by LINZ CC-BY 3.0).

Figure 5: The property in 2005, confirming the building to the rear is no longer present (Source Google Earth, DigitalGlobe, 14 January 2005).

The historical activities on the property do not typically present a potential for contamination, however the identification of uncontrolled fill during the geotechnical survey does, as summarised in Table 2.

Table 2: Summary of HAIL Land Use and Potential Associated Contaminants.

Land Use	HAIL Code and Description	Potential Contaminants
Uncontrolled Fill	G3. Landfill sites	Dependent on original waste composition, wide range of hydrocarbons and metals, organic acids, landfill gas, and ammonia

2 Description of Project and Development

The Downie Stewart Foundation propose to construct a new whare consisting of three levels to the rear of the property. The proposed building layout, with a floor area of approximately 170 m^2, is shown in Figure 6. The development plans are shown in Appendix A. The new building will be on the southern part of the property, constructed adjacent to the east boundary of the property. Level 1 of the building will consist primarily of uncover parking, with the second and third levels being offices and meeting rooms. The building will be clad with a combination of plaster and cedar shiplap weatherboards, with Colorsteel® roofing. The area of land along the western boundary will be a driveway providing vehicle access to the undercover parking, connecting to the existing driveway and access to the property from High Street.

Earthworks will be required to remove the fill, and provide a level building platform and foundations. The total volume of excavated soil for off-site disposal is anticipated to be 210 m^3, exceeding the permitted disturbance volume of 27.6 m^3, and disposal volume of 5.5 m^3.

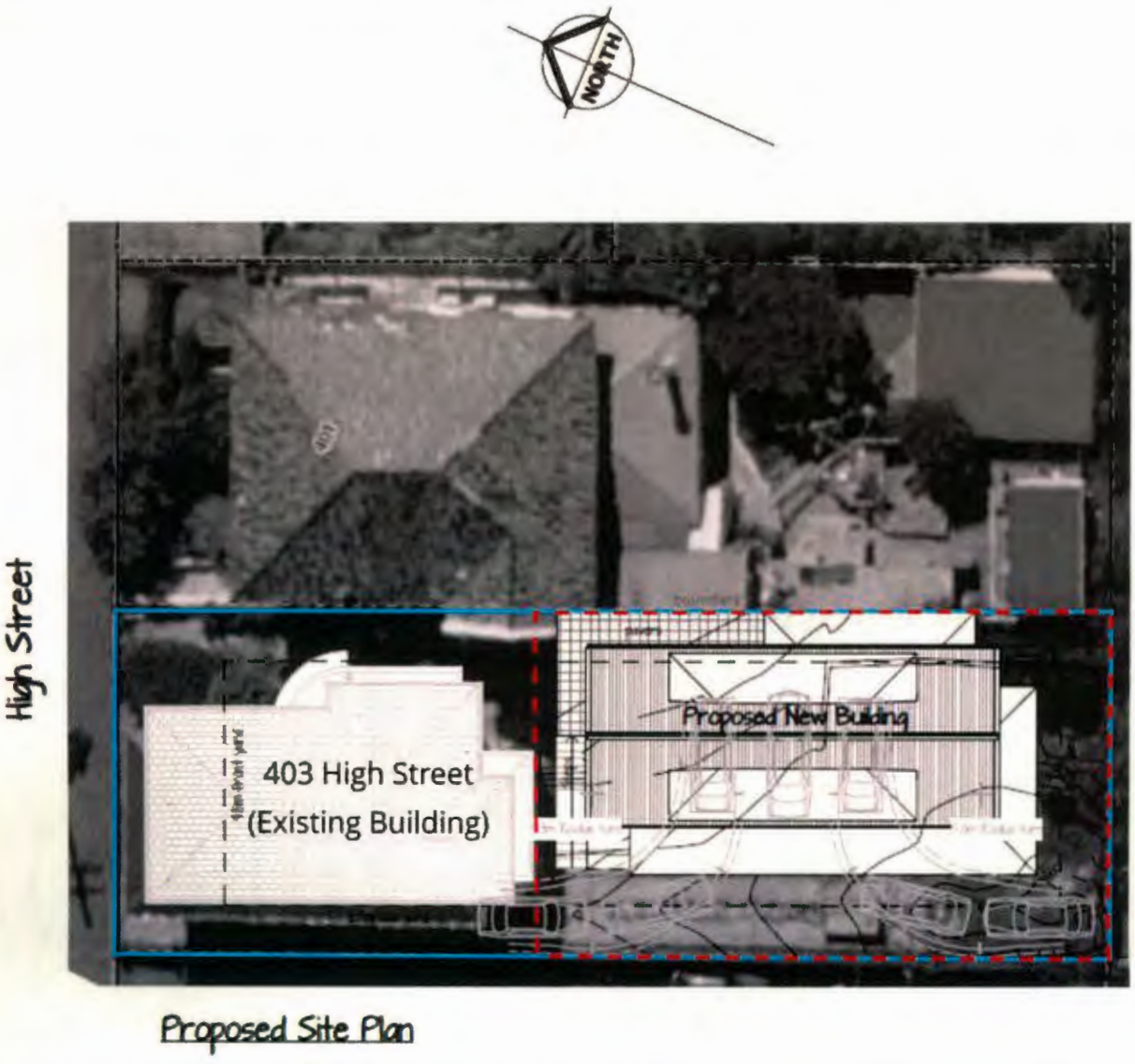

Figure 6: Proposed site plan for 403 High Street, Dunedin. The property is outlined in turquoise, the site with a red dashed line (Drawing from Warnock Architecture Ltd Proposed Site Plan).

3 Description of the Current Environment

This section provides a general overview of the current environment, with more detailed comments in Section 4 where environmental baselines and impacts are discussed.

The property is located on the southern side of High Street, in residential area close to the Dunedin central business district. The property is bordered by residences. It is approximately 82 m above sea level with the Dunedin Harbour lying approximately 1.2 km to the east, and the coastline lying 3.2 km to the south.

The site, located to the rear of the existing house, has terraced slopes rising up to the eastern boundary, and dropping off to the western boundary. The natural slope of the site is towards the west. The maximum elevation differential across the site is approximately 2.9 m.

The site is covered with grass, and remnants of building foundations and retaining walls are evident. Figure 7 and Figure 8 provides a recent view of the area to be developed.

Figure 7: South-western boundary of the site, showing the drop to the west (9 June 2017).

Figure 8 (A+B): Eastern/south-eastern section of the site, showing the terraced slopes to the east (9 June 2017).

4 Environment – Baseline Condition and Impacts

4.1 Regional Geology and Soils

The GeoSolve geotechnical report notes:

"The geology of the Dunedin area is dominated by volcanic rock types of basaltic to andesitic composition that were intruded through pre-existing marine sediments during Miocene times. Extensive volcanism at that time produced lava flows and bedded volcanoclastic materials were widely distributed by eruptions. The generalized stratigraphic profile comprises schist at depth, overlain by a Cretaceous to Tertiary-age sequence; initially by thin non-marine sediments and then a thick accumulation of marine sediments including sandstones and mudstones. The volcanic rock types cross cut these sediments where vents were present and extensively mantle them where lava flows or volcanic ejecta were deposited.

More recently (Pleistocene times), the hills of Dunedin have been extensively mantled by windblown loess to depths of up to several metres, with some aeolian sand deposition in coastal areas. Watercourses and tidal embayments such as Otago Harbour have locally deposited alluvial, estuarine and marine deposits and generally modified the volcanic landscape by deep incision and sedimentation. Fill and refuse has been placed locally during post-settlement times."

In relation to the site itself, GeoSolve noted a "generalised profile consisting of up to 1.0 m of soft to firm uncontrolled fill overlying firm to very stiff colluvium, overlying Dunedin Volcanic Group bedrock (weathered basalt). Topsoil coverage across the site is nil to up to 200 mm deep."

While the colluvium consisted of firm to very stiff silt, the uncontrolled fill was generally soft silt or soft sandy silt and contained occasional glass, ceramic and brick fragments, rare shell fragments and some organics, as well as whole pavers and bricks in places.

The presence of uncontrolled fill indicated that potentially-contaminating landfill activity (a HAIL activity) had occurred on the site. As a result, during the preparation of this AEE, 15 soil subsamples were collected from the site, composited into 5 samples containing 3 subsamples each by the laboratory, and analysed for heavy metal and Polycyclic Aromatic Hydrocarbon (PAH) contamination. Heavy metals and PAHs represent a broad range of potential contaminants, and their concentrations were assessed against the Soil Contaminant Standards (SCSs) or Soil Guideline Values (SGVs) for the appropriate use scenario. As per the current guidelines, when considering composite samples, the SCSs and SGVs were adjusted to reflect the use of compositing techniques (i.e. divided by three, which was the number of sub-samples per composite).

As the fill material is to be removed from site, the samples were also analysed by toxicity characteristic leaching procedure (TCLP) to assess against the Landfill Acceptance Criteria[2] and determine suitability for disposal.

The sampling locations from this work are shown in Figure 9, and the results are summarised in Table 3. Samples were collected at a depth of 0.3 - 0.5 m, except where prohibited by buried debris/rock/concrete which resulted in shallower samples being collected (subsample 2B taken at 0 - 0.2 m, and subsample 3C taken at 0.2 - 0.4 m). The full laboratory results are in Appendix B.

As shown in Table 3, the majority of samples exceed the residential SCS for Lead, but are below the commercial/industrial outdoor worker SCS. One composite sample (2A, 2B & 2C) exceeded both the

[2] Ministry for the Environment. *Module 2: Hazardous Waste Guidelines - Landfill Waste Acceptance Criteria and Landfill Classification*; May 2004. ME number: 510.

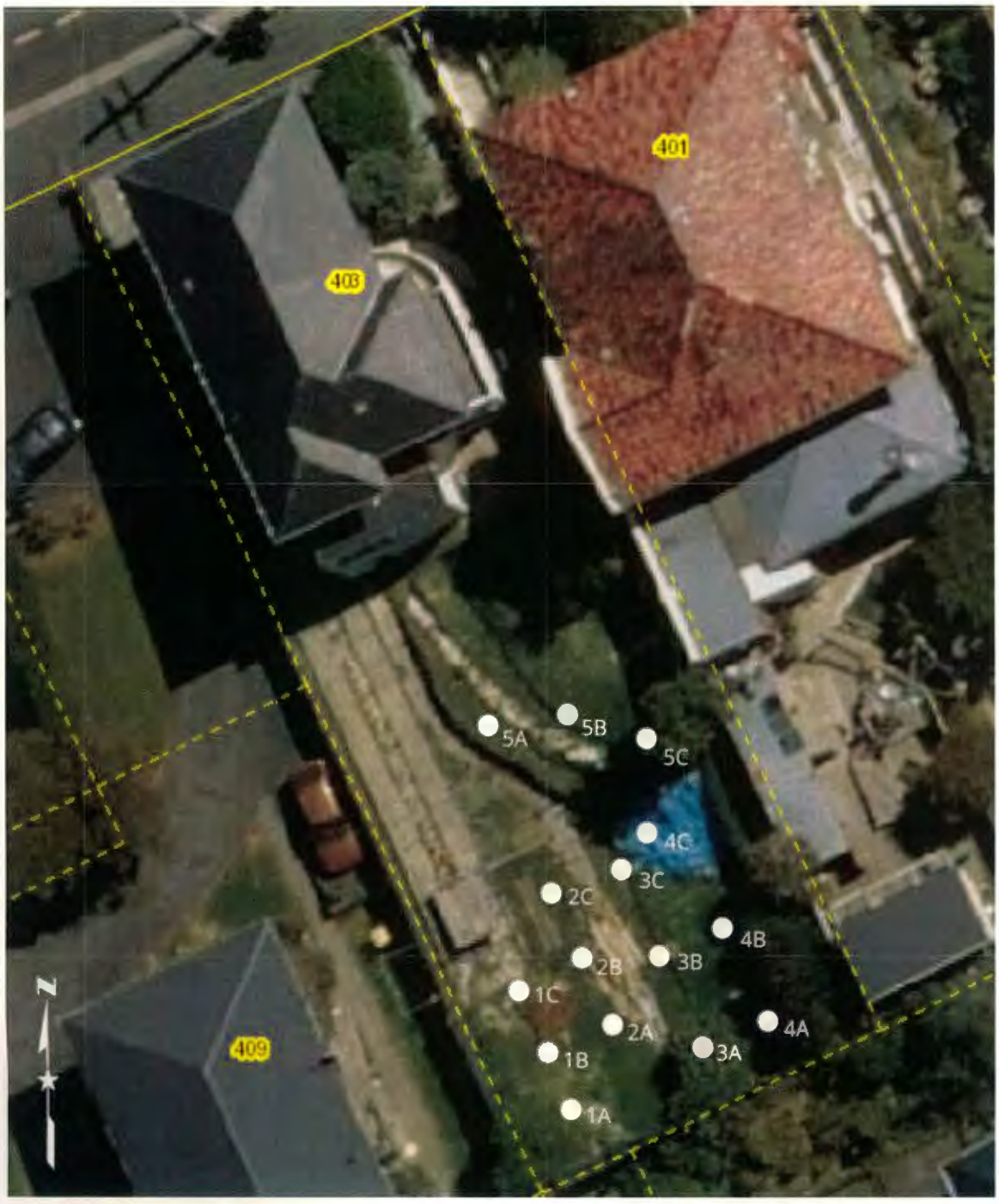

Figure 9: Soil sampling locations for each of the fifteen subsamples collected on 9 June 2017.

residential and commercial/industrial SCS for the equivalent benzo(a)pyrene (BaP_{eq}) value (representing the 9 carcinogenic PAHs). As a result of the commercial/industrial SCS exceedance for BaP_{eq}, the three individual subsamples 2A, 2B and 2C were reanalysed, as shown in Table 4. The individual analysis confirmed that the residential SCS was exceeded for samples 2A and 2C, but the commercial/industrial SCS was not exceeded for the individual samples.

Table 3: Results from Analysis of Soils at 403 High Street, Dunedin.

Sample[A]	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	BaP	Naphthalene	BaP_{eq}[B]
Total Concentration (mg/kg dry weight)										
Composite of 1A, 1B & 1C	4	< 0.10	**15**	7	23	7	**46**	0.047	< 0.07	0.07
Composite of 2A, 2B & 2C	4	0.19	**27**	**19**	**770**	**26**	**195**	9.6	0.19	**14.2**
Composite of 3A, 3B & 3C	4	0.32	**20**	**19**	**310**	12	**189**	2.1	< 0.06	2.9
Composite of 4A, 4B & 4C	6	0.69	**21**	**47**	**310**	18	***430***	1.22	0.08	1.75
Composite of 5A, 5B & 5C	5	0.33	**23**	**125**	**360**	17	***280***	1.67	< 0.07	2.4
Average	5	0.32	**21**	**44**	**355**	16	***229***	2.91	0.05	**4.3**
Composite Residential SCS/SGV	7[C]	1[C]	153[C]	> 3,333[C]	70[C]	60[D]	2,467[E]	NA	NA	3[C]
Composite Commercial/ Industrial SCS/SGV	23[C]	433[C]	2,100[C]	> 3,333[C]	1,100[C]	327[D]	133,333[E]	NA	NA	12[C]
Landfill Acceptance Criteria Class A[F]	100	20	100	100	100	200	200	300	200	300
Landfill Acceptance Criteria Class B[F]	10	2	10	10	10	20	20	30	20	30
TCLP Extract (g/m³)										
Composite of 1A, 1B & 1C	< 0.021	< 0.0011	< 0.011	< 0.011	0.0046	< 0.011	0.026	-	-	-
Composite of 2A, 2B & 2C	< 0.021	< 0.0011	< 0.011	< 0.011	**0.64**	< 0.011	0.164	-	-	-
Composite of 3A, 3B & 3C	< 0.021	0.0022	< 0.011	< 0.011	0.072	< 0.011	0.38	-	-	-
Composite of 4A, 4B & 4C	< 0.021	< 0.0011	< 0.011	0.014	0.034	< 0.011	0.48	-	-	-
Composite of 5A, 5B & 5C	< 0.021	0.0012	< 0.011	0.092	0.074	< 0.011	0.32	-	-	-
Average	< 0.021	0.0011	< 0.011	0.024	0.166	< 0.011	0.28	-	-	-
Landfill Acceptance Criteria Class B[F]	0.5	0.1	0.5	0.5	0.5	1	1	-	-	-

[A] Sample numbers are as marked in Figure 9. Grey cells indicate an exceedance of the SCS, with black text representing the residential SCS, and red text the commercial/industrial SCS. Bold text indicates an exceedance of the Class B landfill acceptance criteria, and bold italics an exceedance of the Class A landfill acceptance criteria. – indicates "no value" (not analysed), NA is non-applicable.

[B] For benzo(a)pyrene (BaP), the equivalent BaP concentration is calculated as the sum of each of the detected concentrations of nine carcinogenic PAHs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene and indeno(1,2,3-cd) pyrene), multiplied by their respective potency equivalency factors from Table 40 in the Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (Ministry for the Environment. 2011. Wellington).

[C] Ministry for the Environment, 2012. Users' Guide, National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health. Wellington. ME number: 1092. Cr SCS is reported as Cr(VI).

[D] LQM/CIEH 'Suitable 4 Use Levels' (S4ULs) Nickel Update 2015, for commercial land use. http://www.lqm.co.uk/uploads/documents/Nickel_S4UL_Update_Aug_2015_Final.pdf.

[E] NEPM/NEPC 2014. National Environment Protection Measures of Australia (http://www.scew.gov.au/node/941). Note: The Australian SGVs are under review for updating.

[F] Ministry for the Environment, 2004. *Module 2: Hazardous Waste Guidelines - Landfill Waste Acceptance Criteria and Landfill Classification*. ME number: 510.

Table 4: Individual PAH analysis of samples 2A, 2B and 2C.

Sample[A]	2A	2B	2C	Residential SCS/SGV[B]	Commercial/ Industrial SCS/SGV[B]
1-Methylnaphthalene	0.111	< 0.012	0.21	NA	NA
2-Methylnaphthalene	0.081	< 0.012	0.199	NA	NA
Perylene	4.1	0.055	2.0	NA	NA
Acenaphthylene	2.7	0.032	1.43	NA	NA
Acenaphthene	0.45	< 0.012	0.127	NA	NA
Anthracene	11.9	0.118	2.5	NA	NA
Benzo[a]anthracene	18.8	0.23	7.8	NA	NA
Benzo[a]pyrene (BAP)	17.9	0.24	8.4	NA	NA
Benzo[b]fluoranthene + Benzo[j]fluoranthene	8.2	0.27	9.0	NA	NA
Benzo[e]pyrene	11.0	0.174	6.0	NA	NA
Benzo[g,h,i]perylene	8.3	0.121	4.5	NA	NA
Benzo[k]fluoranthene	6.9	0.104	3.6	NA	NA
Chrysene	16.5	0.25	7.8	NA	NA
Dibenzo[a,h]anthracene	2.1	0.030	1.02	NA	NA
Fluoranthene	50	0.65	16.8	NA	NA
Fluorene	2.4	0.019	0.70	NA	NA
Indeno(1,2,3-c,d)pyrene	9.2	0.144	4.9	NA	NA
Naphthalene	0.18	< 0.06	0.37	NA	NA
Phenanthrene	46	0.47	10.6	NA	NA
Pyrene	44	0.61	16.7	NA	NA
BaP_{eq}[C]	25	0.35	12.2	10	35

[A] Sample numbers are as marked in Figure 9. Grey cells indicate an exceedance of the SCS, with black text representing the residential SCS. NA is non-applicable.

[B] Ministry for the Environment, 2012. Users' Guide, National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health. Wellington. ME number: 1092.

[C] For benzo(a)pyrene (BaP), the equivalent BaP concentration is calculated as the sum of each of the detected concentrations of nine carcinogenic PAHs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(j)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, fluoranthene and indeno(1,2,3-cd) pyrene), multiplied by their respective potency equivalency factors from Table 40 in the Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health (Ministry for the Environment. 2011. Wellington).

The other contaminants tested were below the SCSs/SGVs. While the use of compositing has the effect of averaging the results, it can still be seen that there is a high degree of variability across the site. As a result, other locations within the property may also exceed the SCSs.

The proposed works plan to remove the fill material from site. Clean fill will be imported as required, and the majority of the area will be sealed or covered by the new building and driveway on completion of the works. This is likely to result in an improvement to the existing soil conditions with respect to the overall status of contamination, as the contaminants will be removed.

The use of earthworks machinery, and the exposure of bare ground, have the potential to provide human exposure to contaminated soils during the earthworks. The primary risk of more than minor effects is through exposure of site workers to contaminated soils. As contaminants have been, controls for managing contaminated soils to ensure the safety of workers on the site are planned and described in the Contaminated Soil Management Plan (CSMP) in Appendix C. Given careful adherence to appropriate controls, adverse effects from soil is anticipated to be less than minor.

4.2 Surface water, storm water and groundwater

The property is approximately 82 m above sea level, and is not within a flood zone. Typically, most surface water on the property originates from rain. The site is naturally free draining and no spring flows were evident on the property during the site investigations by GeoSolve. Storm water is mostly likely collected in the High Street storm water main, and discharged to the harbour at the Mason Street outfall, or may drain towards the Stafford Street storm water main which is discharged to the harbour at the Kitchener Street outfall. These catchments are locally impacted by urban storm water inputs, and storm water monitoring in June 2016[3] reported an exceedance of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000) guidelines for both outfalls for Copper, Lead, Zinc and *E.Coli* since 2007.

The baseline status of groundwater at the property is not known. No groundwater seepage was encountered during geotechnical investigations. Perched groundwater is considered likely to develop as a result of high rainfall at the contact between fill and colluvium, or colluvium and weathered basalt.

Because the proposed works will expose contaminated soil, surface and storm water might transport contaminants off-site during earthworks. Controls to manage these effects are provided in the CSMP. Given appropriate controls, adverse effects to surface and storm water are anticipated to be less than minor. As the site is currently not impervious, no additional adverse effects are anticipated from vertical infiltration and recharge into groundwater. Much of the site will be sealed on completion of the works, with storm water management in place, which has the potential to improve storm water management and reduce infiltration into groundwater, which might be a positive effect.

4.3 Air

The baseline air quality in the Dunedin may be said to be generally acceptable for a coastal urban setting. The use of earthworks machinery, the exposure of bare ground and transportation of soil off-site all have the potential to generate dust, which may pose a risk of unacceptable environmental effects and localised temporal change to the ambient baseline environmental air quality. The primary risk of more than minor effects is through exposure of workers to contaminated soils and for contaminants to be dispersed in sediment or dust during earthworks. Therefore, controls for these effects are planned, as described in detail in the CSMP, and summarised in Section 6. Given appropriate controls, adverse effects to air are anticipated to be less than minor.

4.4 Human health and ecology (flora and fauna)

The property has experienced a number of human impacts that have created the current baseline state of today. As such, no effects to current flora and fauna, in respect of the ambient baseline, are anticipated. The major potential effects from this project concern human exposure, and some exposure pathways are noted in the sections on air and soils. Exposure risks shall therefore be managed on a precautionary basis over the site, as covered by the CSMP in Appendix C. The works are likely to present acceptable human exposure risk to workers if the CSMP is strictly observed. The direct risk of human exposure to soils upon completion of the proposed development will be reduced, as the contaminated soils will be removed and much of the site will be fully sealed.

If human exposure to soils during earthworks is avoided, per the controls as set out in CSMP, effects to humans from the proposed development are likely to be less than minor.

4.5 Transport

The site will be accessed from High Street, connecting either to Eglington Road or Princes Street. While High Street is primarily residential, these roads provide access to commercial areas and are considered District

[3] Ryder Consulting Ltd. *Stormwoter Compliance Monitoring 2016 - Stormwater Discharges from Dunedin City*; June 2016.

Roads in the road hierarchy. As such, they are relatively busy and truck movements are not uncommon. The expected additional traffic load generated by the off-site disposal of surplus soil is anticipated to be a maximum of 20 trucks over the duration of the works, which is likely to be minor in its effects to the transport network.

The use of earthworks machinery and the transport off-site of soil has the potential for deposition of soil onto the surrounding road network. This has the potential to pose a human health risk to the general public, and is an effect that requires suitable controls that are provided for in the CSMP. Under the controls set out in the CSMP, adverse effects to humans from transport are likely to be less than minor.

4.6 Noise

The daytime noise limit for the site is 50 dBA, as identified on the DCC Noise Map 64. Noise associated with the earthworks has the potential to exceed the zone standard, and will need to be controlled by the Site Manager (role and responsibility as stipulated in the CSMP) to comply with the Resource Management Act 1991 (RMA) and the Health and Safety in Employment Act 1992. Under careful management, the effects of the earthworks and removal of contaminated soils, in accordance with the CSMP, are anticipated to be no more than minor.

4.7 Landscape and amenity values

The site is located in the High Street Heritage Precinct. While the new building will have limited visibility from the street due to being located behind the existing residential building, the design of the building has taken into account the heritage nature of the area. With proper consideration, the impact of construction of the new building is unlikely to result in any adverse effect.

4.8 Social and economic environment

There will be positive social effects from the proposed development, as the development is part of the Moana House Programme. Moana House is a well-established residential therapeutic community for adult male offenders who want to change their lives and behaviour for the betterment of themselves, their whanau and their communities.

4.9 Archaeological, heritage, cultural values, and Tangata Whenua Perspective

The site has been heavily modified from its natural state by the historic and existing site developments, and no heritage or cultural values are anticipated to exist on the site. The site is within a Heritage Precinct, and two heritage buildings are located near the property at 389 and 413 High Street (B320 and B327 as identified on the DCDP Map 47). The proposed works should not have any impact on the heritage buildings. The site itself is not known to be an archaeological site as defined by Heritage New Zealand Pouhere Taonga Act 2014, therefore no archaeologic authority is required to disturb the site. No adverse effects are anticipated from the proposed development.

5 Assessment of Alternatives

The proposed earthworks are necessary for the proposed development of the property. The primary alternative would be to not develop the property. Not developing the property results in contaminated soils, with exceedances of the residential SCSs/SGVs, being retained within a residential area. To remedy the situation, soil disturbance and disposal is required.

The development of the site for the expansion of the Moana House Programme offers a social benefit to the community, and the site is in the ideal location given the proximity to other buildings which form part of the programme.

The negative effects of the proposed development are no more than minor, and any potential adverse effects are able to be subject to control. Therefore, the preferred alternative is to proceed with the proposed development.

6 Mitigation, Monitoring, and Proposed Consent Conditions

Several potential impacts from the proposed development have been identified in Section 4. The appropriate controls and management practices for mitigation of these impacts are set out in detail in the CSMP in Appendix C. The mitigation procedures are summarised as follows:

- General worksite establishment and management procedures. These include restricting access to the worksite and the requirement to induct site workers prior to commencement of earthworks, so that all persons entering the property are aware of appropriate control procedures to mitigate human exposure risks;
- On-site soil handling procedures to manage and contain potentially contaminated soils;
- Measures to manage surface, storm and groundwater, in addition to silt and sediment control, to limit contamination of surface, storm and groundwater from potentially contaminated dust and soil;
- Dust control procedures to mitigate risks of human exposure to potentially contaminated dust; and
- Noise management procedures.

The following procedures are stipulated to ensure that the control provisions are appropriately followed and monitored:

- Appropriate inspection and reporting shall be conducted to confirm that earthworks were carried out according to the CSMP;

The following consent condition is recommended:

- That earthworks be conducted in accordance with the CSMP attached as Appendix C, in particular that all soils at the property be handled in strict accordance with the provisions of the CSMP under the assumption that they might be contaminated.

7 AEE Statement

Downie Stewart Foundation is planning to construct a whare to the rear of the property at 403 High Street, Dunedin. The proposed development will require earthworks in soils where known HAIL land use has previously occurred. The potential effects of the proposed development are summarised herein, along with potential alternatives. A consideration of effects indicates that there are potential negative effects to soils, water, air, human health, and noise values, associated with disturbance of soils on the property. Control measures are described that enable these effects to be avoided, remedied, or mitigated, such that the overall negative effects are less than minor. Positive effects are associated with the proposed development, and these are associated with community and social values, in addition to removal of contaminants and improved storm water management. Sealing of the majority of the property will reduce the risks of direct human exposure to soils in the future, as long as the seal is maintained. An assessment of potential alternatives has not found a preferred alternative course of action to the development proposed herein. In summary, this AEE concludes that it is likely that the development of the property as proposed, with appropriate controls and under the conditions recommended above, is feasible with less than minor negative environmental effects.

Appendix A	**Development Plans**
Appendix B	**Hill Laboratories Analysis Report**
Appendix C	**Contaminated Soil Management Plan**

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Revision Schedule		
Rev	Date	Description
A	15.07.16	Preliminary Sketch Design
B	20.12.16	Sketch Design
C	07.06.17	Resource Consent

3D View 1

Resource Consent

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Moana Housenedin

SHEET TITLE
3d View

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No	SHEET No
May 2016		1521	A0.0
DRAWN	CAD Reference	REVISION	
RJW	1521	C	

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Revision Schedule		
Rev	Date	Description
A	15.07.16	Preliminary Sketch Design
B	20.12.16	Sketch Design
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3D View 2

Resource Consent

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JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Moana Housenedin

SHEET TITLE
3d View

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No	SHEET No
May 2016		1521	A0.1
DRAWN	CAD Reference	REVISION	
RJW	1521	C	

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Revision Schedule		
Rev	Date	Description
A	15.05.16	Preliminary Sketch Design
B	20.12.16	Sketch Design
C	07.06.17	Resource Consent

3D View 3

Resource Consent

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Hīmoana Housenedin

SHEET TITLE
3d View

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No	SHEET No
May 2016		1521	A0.2
DRAWN	CAD Reference	REVISION	
RJW	1521	C	

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Rev	Date	Description
A	15.05.16	Preliminary Sketch Design
B	20.12.16	Sketch Design
C	07.06.17	Resource Consent

3D View 4

Resource Consent

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JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Hīmoana Housenedin

SHEET TITLE
3d View

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No	SHEET No
May 2016		1521	A0.3
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RJW	1521	C	

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Revision Schedule		
Rev	Date	Description
A	18/2/16	Preliminary Sketch Design
B	20/2/16	Sketch Design
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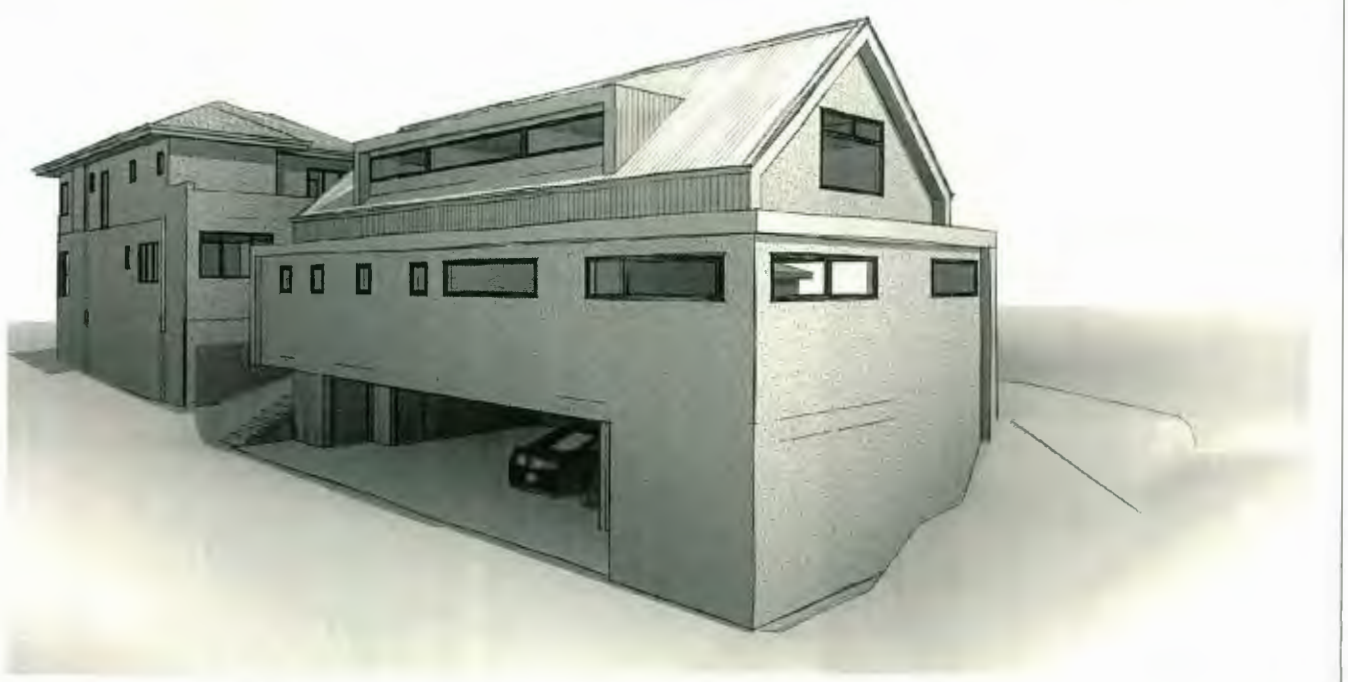

3D View 5

Resource Consent

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JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Moana Rd Dunedin

SHEET TITLE
3d View

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No.	SHEET No.
May 2016		1521	A0.4
DRAWN	CAD Reference	REVISION	
RJW	1521	C	

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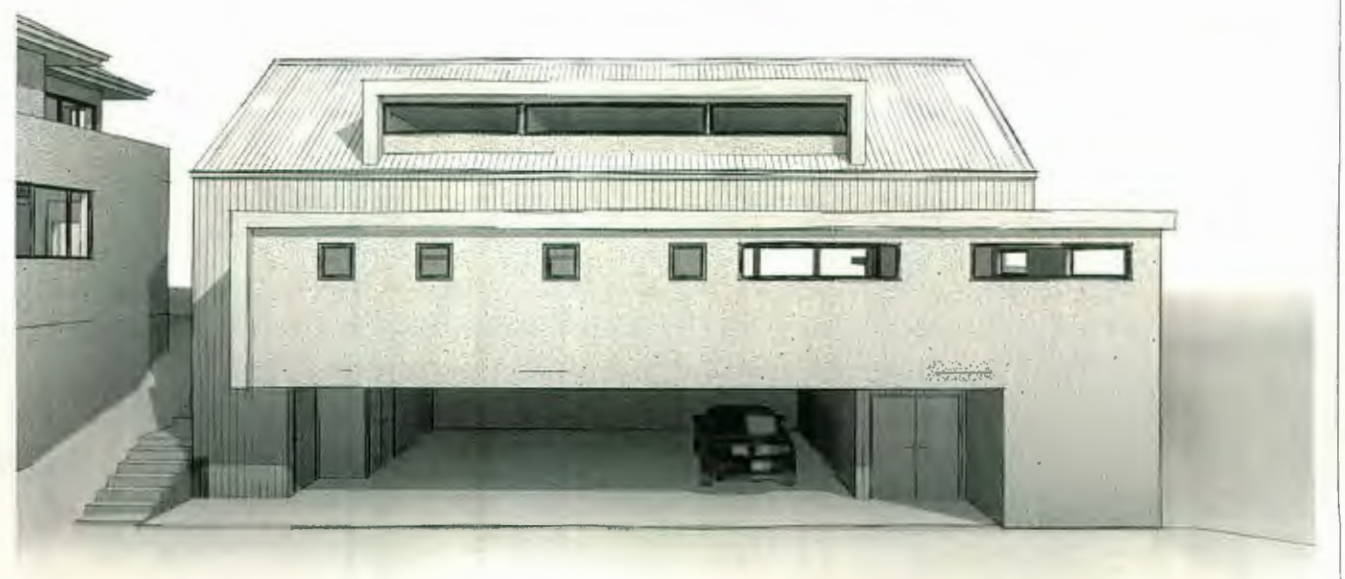
B	20/2/16	Sketch Design
C	07/06/17	Resource Consent



3D View 6

Resource Consent

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

JOB TITLE
Proposed New Whare for Downie Stewart Foundation
403 Moana Rd Dunedin

SHEET TITLE
3d View

TRADE		DESIGNED	CHECKED
Architectural		RJW	RJW
DATE	SCALE	JOB No.	SHEET No.
May 2016		1521	A0.5
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RJW	1521	C	

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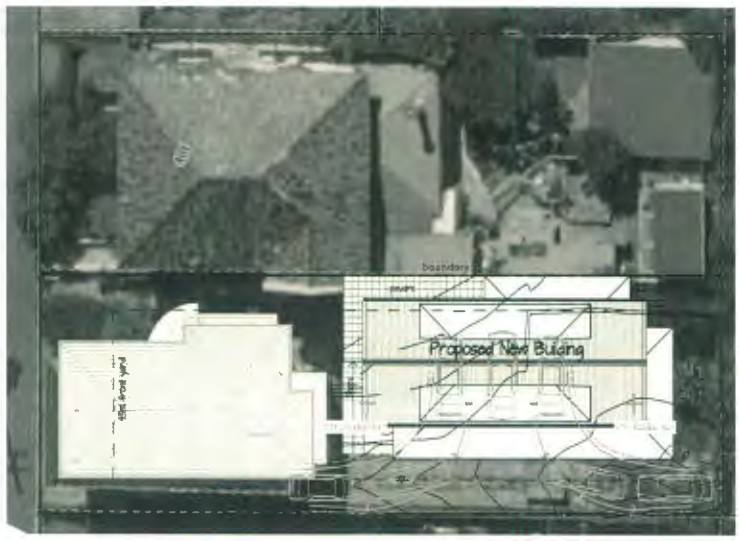
Revision Schedule		
Ref.	Date	Description
A	8.05.16	Preliminary Sketch Design
B	20.2.6	Sketch Design
C	07.06.17	Resource Consent

Legal Description
403 High Street
DUNEDIN
LOT 1
DP 9266
Valuation number 27150.59700

Site Coverage
Site Area = 95m2
Existing site coverage = Approx. 69m2 72%
Proposed site coverage = 69m2 + 170m2 = 239m2 50%

Zoning
Wind = Medium
Elevation = 62m
Snow = 1.09 kpa
Earthquake = Zone 1
Corrosion = Zone C
Zone = R1

NORTH



High Street

Proposed Site Plan
1 : 200

Topography Schedule Proposed			
Name	Cut	Fill	Net cut-Fill
General Excavation	1289 m³	215 m³	1065 m³
Basement Excavation	1256 m³	0.00 m³	1256 m³
Level 2 paving Excavation	599 m³	66 m³	533 m³
Grand total: 3	2644 m³	281 m³	2363.09 m³

JOB TITLE
Proposed New Whare for
Downie Stewart
Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Proposed Site Plan

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No	SHEET No
June 17	1 : 200	1521	A1.0
DRAWN	CAD REFERENCE	REVISION	
RJW	1521	C	

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Resource Consent

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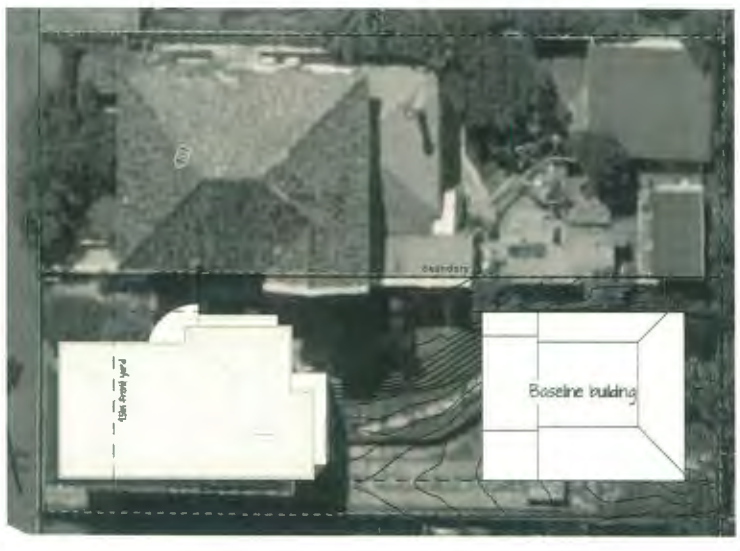
ADNZ

Revision Schedule		
Ref.	Date	Description
A	07.06.17	Resource Consent

NORTH



High Street

Proposed Site Plan - Baseline
1 : 200

JOB TITLE
Proposed New Whare for
Downie Stewart
Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Site Plan - Baseline

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No	SHEET No
June 17	1 : 200	1521	A1.1
DRAWN	CAD REFERENCE	REVISION	
RJW	1521	A	

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Revision Schedule		
Ref.	Date	Description
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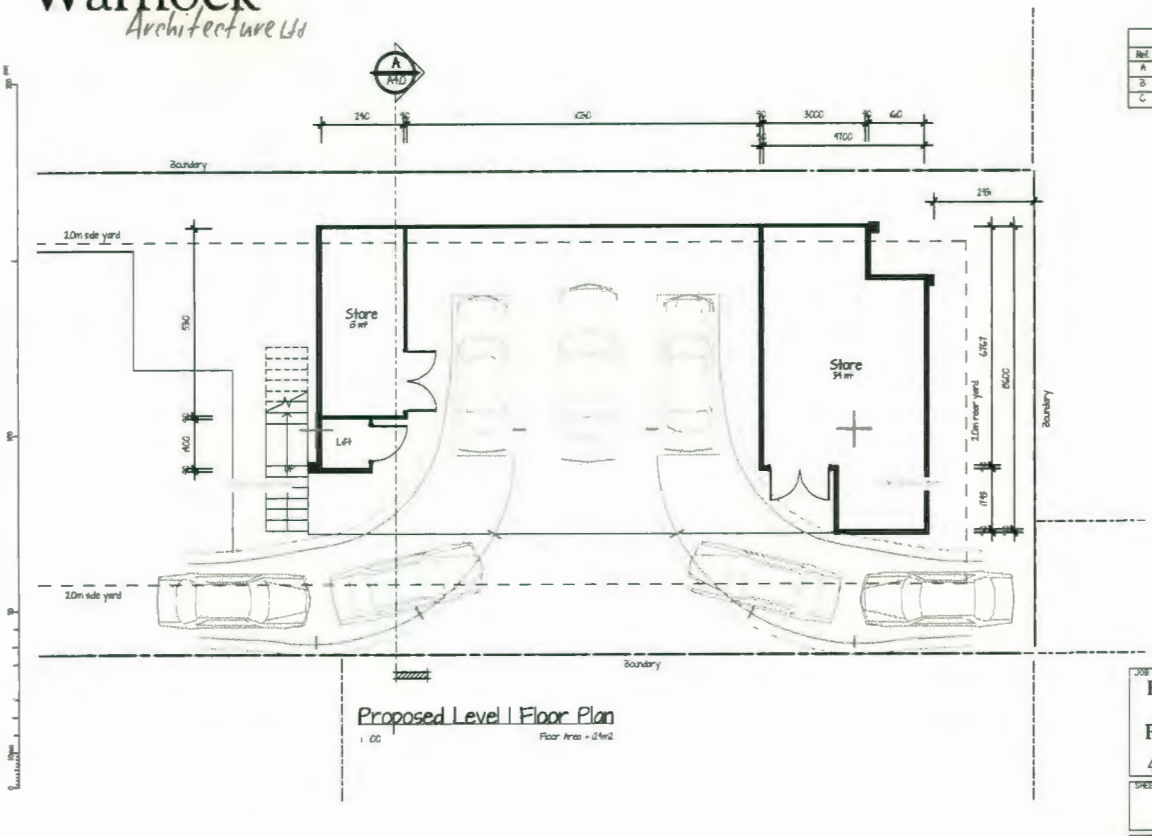
B	20.6.16	Sketch Design
C	07.06.17	Resource Consent



Proposed Level 1 Floor Plan
1 : 00
Floor Area - 124m2

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Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Proposed Level 1 Floor Plan

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No	SHEET No
June 17	1 : 100	1521	A2.0
DRAWN	CAD Reference	REVISION	
RJW	1521	C	

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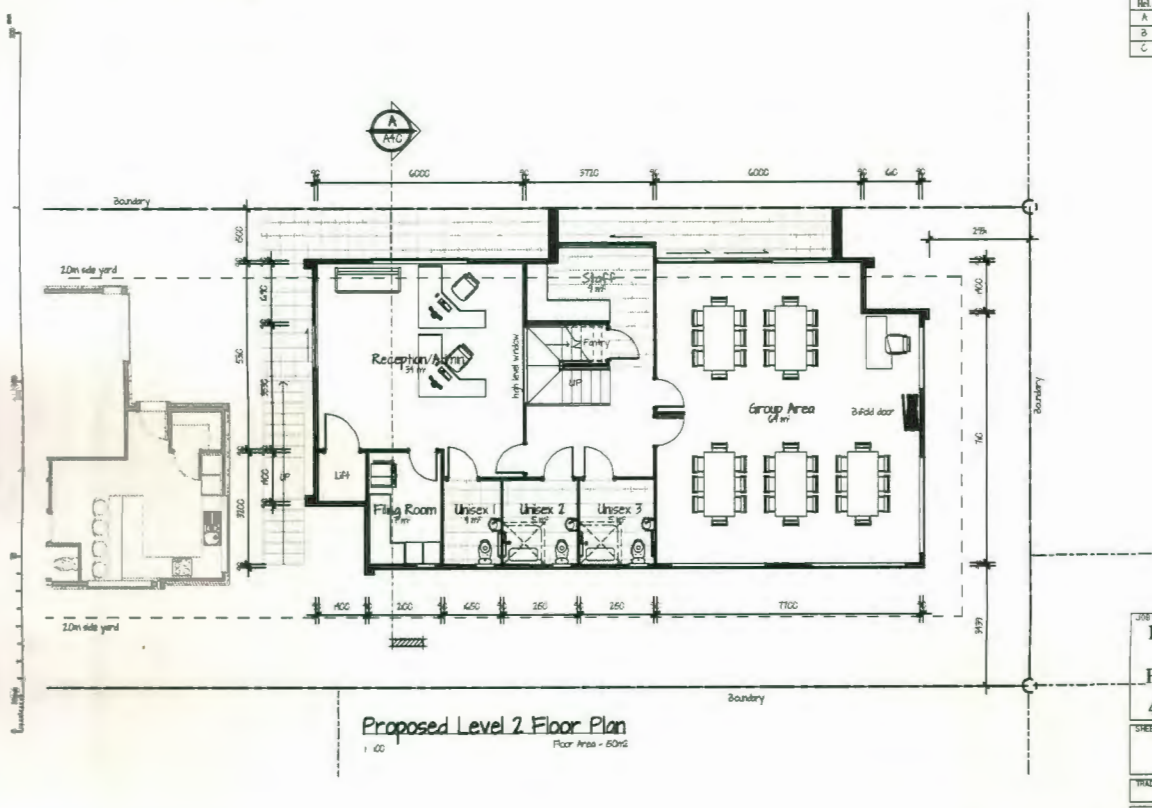
B	20.6.16	Sketch Design
C	07.06.17	Resource Consent



Proposed Level 2 Floor Plan
1 : 00
Floor Area - 60m2

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Proposed Level 2 Floor Plan

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No	SHEET No
June 17	1 : 100	1521	A2.1
DRAWN	CAD Reference	REVISION	
RJW	1521	C	

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Revision Schedule		
Ref	Date	Description
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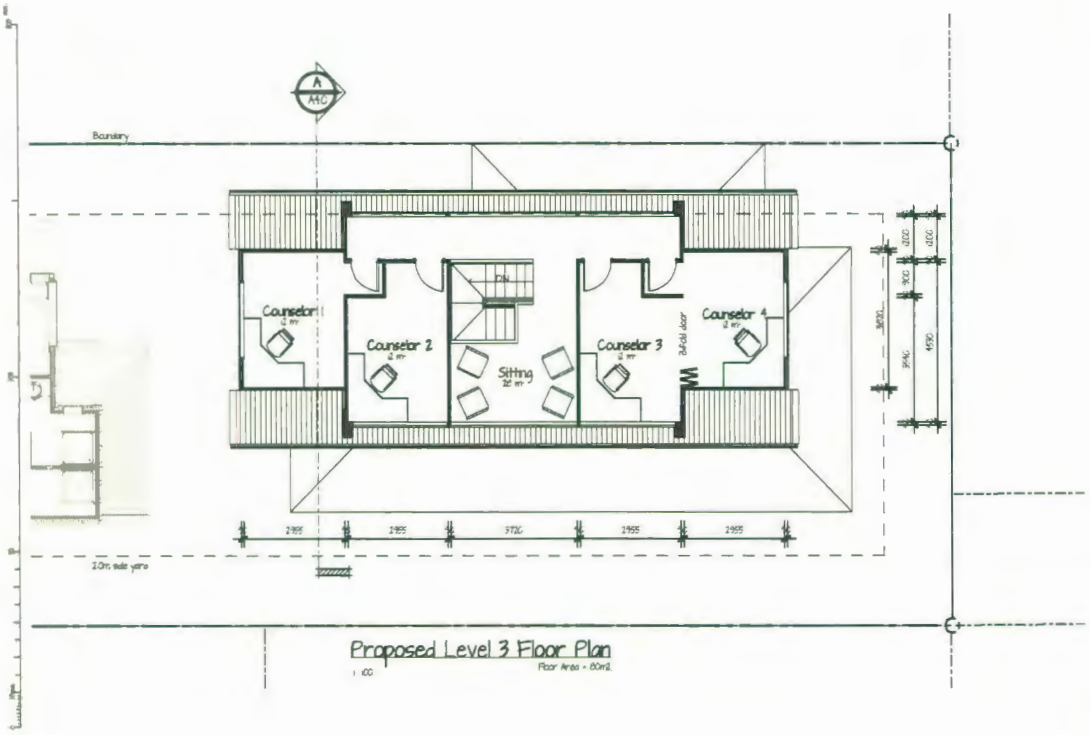
B	20/2/16	Sketch Design
C	07/06/17	Resource Consent



Proposed Level 3 Floor Plan
1 : 100
Floor Area = 80m2

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Proposed Level 3 Floor Plan

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB NO	SHEET No
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DRAWN: RJW	CAD REFERENCE: 1521	REVISION: C	

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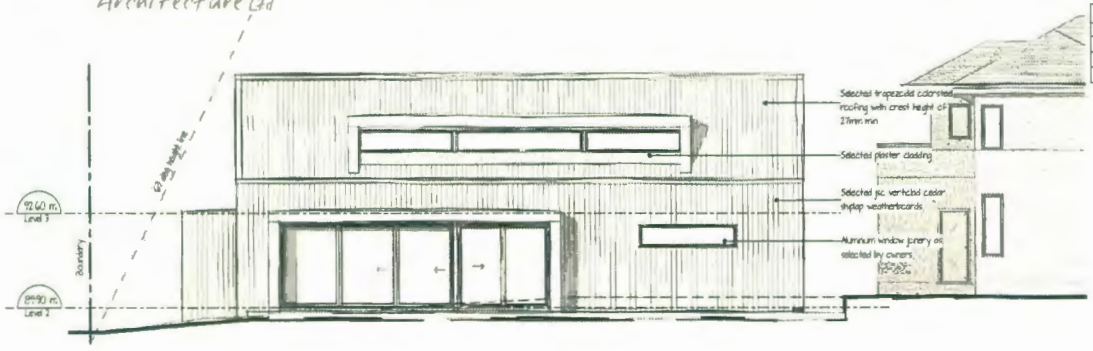
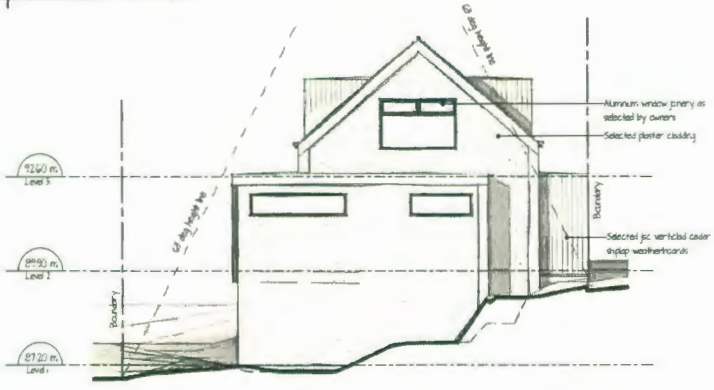
B	20/2/16	Sketch Design
C	07/06/17	Resource Consent



Proposed East Elevation
1 : 100



Proposed South Elevation
1 : 100

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Proposed Elevations

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB NO	SHEET No
June 17	1 : 100	1521	A3.0
DRAWN: RJW	CAD REFERENCE: 1521	REVISION: C	

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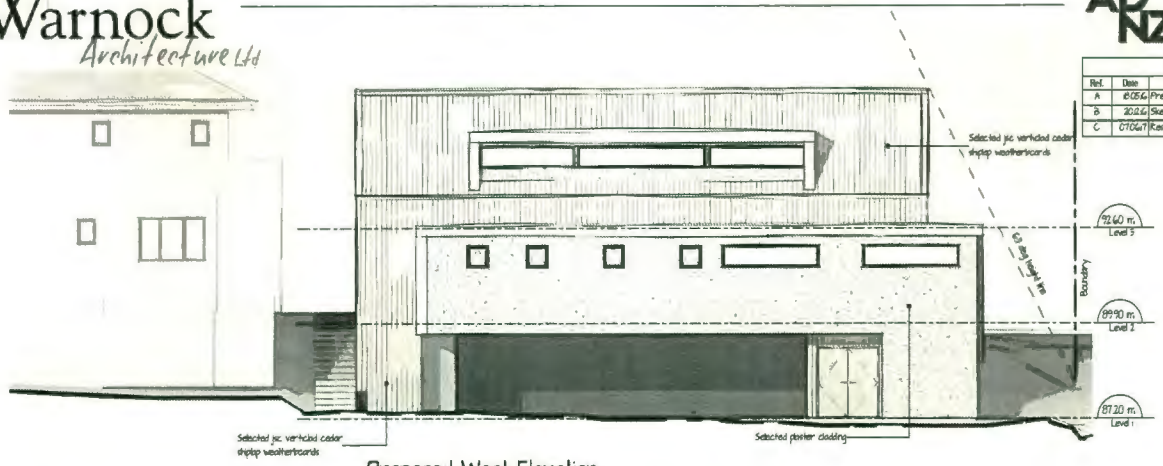
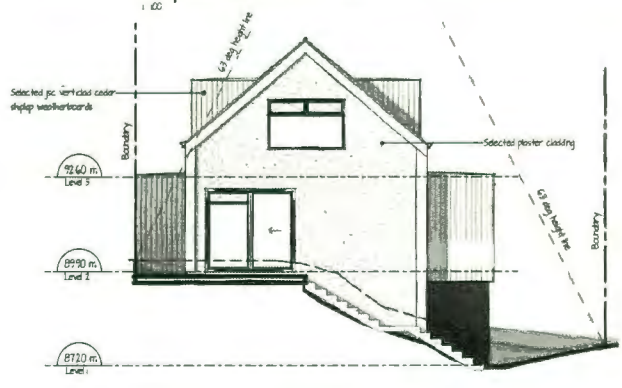
Revision Schedule		
Ref.	Date	Description
A	18.05.16	Preliminary Sketch Design
B	20.12.16	Sketch Design
C	07.06.17	Resource Consent



Proposed West Elevation
1 : 100



Proposed North Elevation
1 : 100

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Proposed Elevations

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No	SHEET No
June 17	1 : 100	1521	A3.1
DRAWN: RJW	CAD REFERENCE: 1521	REVISION: C	

ORIGINAL SHEET SIZE A3 (297x420) 21/06/2017 9:28:42 p.m. © COPYRIGHT

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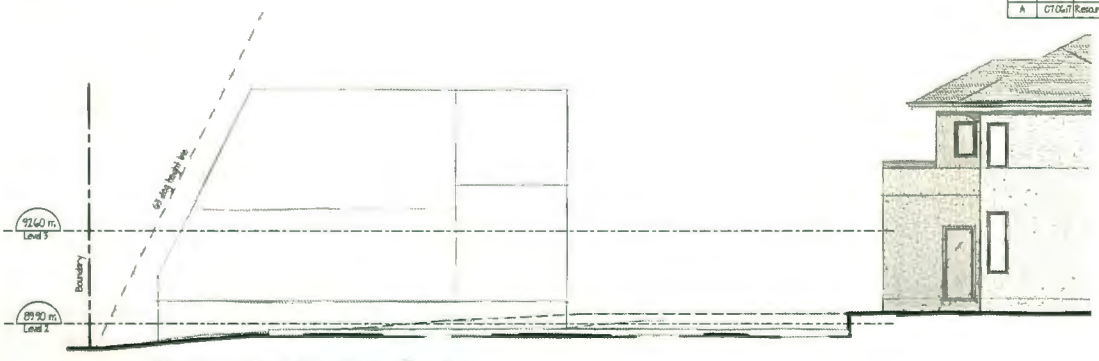
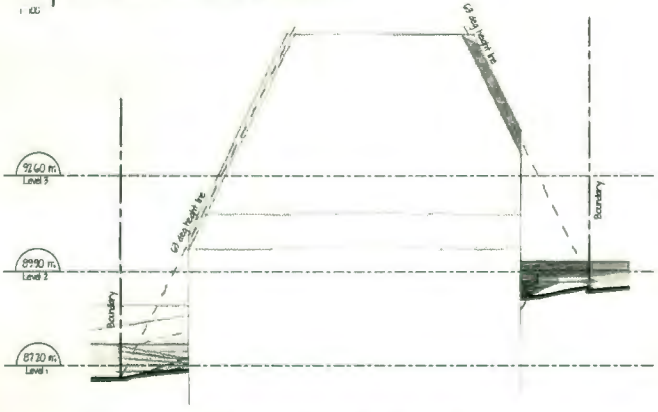
Revision Schedule		
Ref.	Date	Description
A	07.06.17	Resource Consent



Proposed East Elevation - Baseline
1 : 100



Proposed South Elevation - Baseline
1 : 100

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes

Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Baseline Elevations

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No	SHEET No
June 17	1 : 100	1521	A3.2
DRAWN: RJW	CAD REFERENCE: 1521	REVISION: A	

ORIGINAL SHEET SIZE A3 (297x420) 21/06/2017 9:28:42 p.m. © COPYRIGHT

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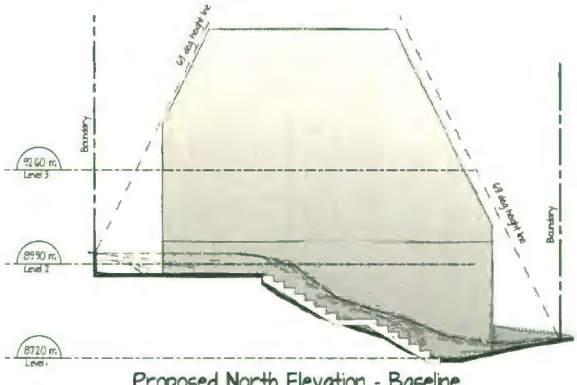
Revision Schedule		
Ref.	Date	Description
A	07.06.17	Resource Consent

Proposed West Elevation - Baseline
1 : 100



Proposed North Elevation - Baseline
1 : 100

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes.

Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Baseline Elevations

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No	SHEET No
June 17	1 : 100	1521	A3.3
DRAWN	CAD REFERENCE	REVISION	
RJW	1521	A	

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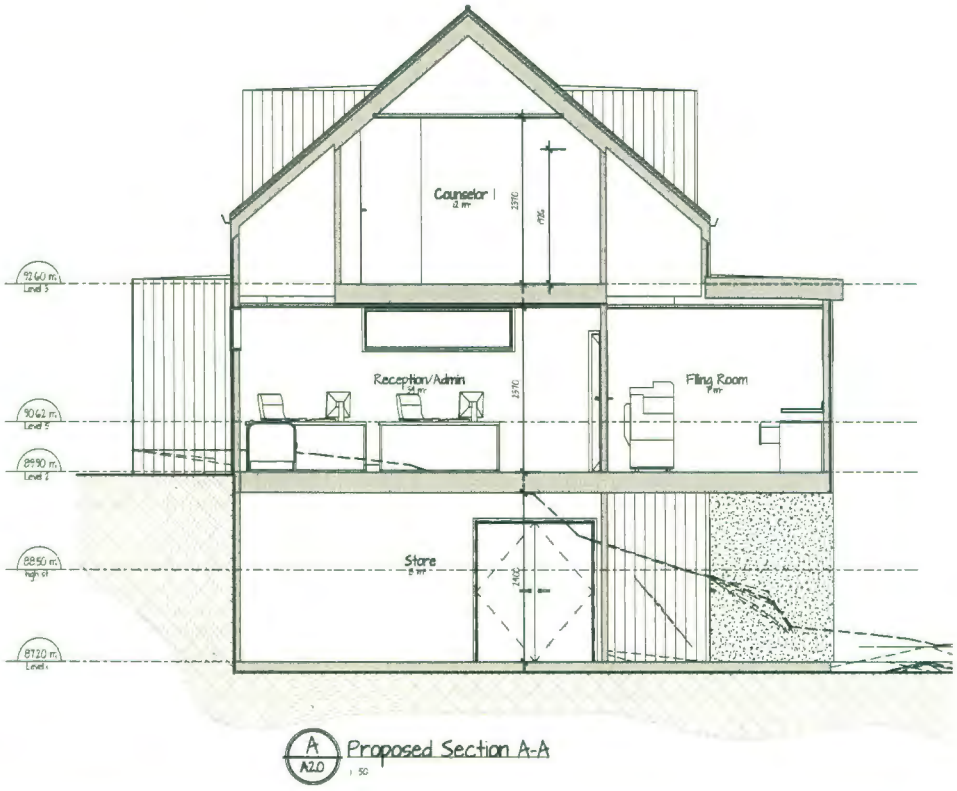
Revision Schedule		
Ref.	Date	Description
A	12.05.17	Preliminary Sketch Design
B	20.06.17	Sketch Design



A
A2.0
Proposed Section A-A
1 : 50

The Contractor shall verify all dimensions on site before commencing construction. Do not scale off drawings. Documents are for obtaining building consent and construction not suitable for fixed price contracts or quotes.

Resource Consent

JOB TITLE
Proposed New Whare for Downie Stewart Foundation Moana House
403 High Street, Dunedin

SHEET TITLE
Proposed Sections

TRADE	DESIGNED	CHECKED
Architectural	RJW	RJW

DATE	SCALE	JOB No	SHEET No
June 17	1 : 50	1521	A4.0
DRAWN	CAD REFERENCE	REVISION	
RJW	1521	B	

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ANALYSIS REPORT

Client:	Environmental Consultants Otago Limited	**Lab No:**	1790298	SPv2
Contact:	Ciaran Keogh	**Date Received:**	10-Jun-2017	
	C/- Environmental Consultants Otago Limited	**Date Reported:**	03-Jul-2017	**(Amended)**
	PO Box 5522	**Quote No:**	85694	
	Dunedin 9058	**Order No:**		
		Client Reference:	High403	
		Submitted By:	Ciaran Keogh	

Sample Type: Soil

Sample Name:		2A 09-Jun-2017 3:25 pm	2B 09-Jun-2017 3:28 pm	2C 09-Jun-2017 3:30 pm	Composite of 1A, 1B & 1C	Composite of 2A, 2B & 2C
Lab Number:		1790298.4	1790298.5	1790298.6	1790298.16	1790298.17
Individual Tests						
Dry Matter	g/100g as rcvd	82	83	85	82	82
TCLP Weight of Sample Taken	g	-	-	-	50	70
TCLP Initial Sample pH	pH Units	-	-	-	7.1	7.2
TCLP Acid Adjusted Sample pH	pH Units	-	-	-	1.5	1.4
TCLP Extractant Type*		-	-	-	NaOH/Acetic acid at pH 4.93 +/- 0.05	NaOH/Acetic acid at pH 4.93 +/- 0.05
TCLP Extraction Fluid pH	pH Units	-	-	-	4.9	4.9
TCLP Post Extraction Sample pH	pH Units	-	-	-	5.0	5.0
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	mg/kg dry wt	25	0.35	12.2	0.07	14.2
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	-	-	-	4	4
Total Recoverable Cadmium	mg/kg dry wt	-	-	-	< 0.10	0.19
Total Recoverable Chromium	mg/kg dry wt	-	-	-	15	27
Total Recoverable Copper	mg/kg dry wt	-	-	-	7	19
Total Recoverable Lead	mg/kg dry wt	-	-	-	23	770
Total Recoverable Nickel	mg/kg dry wt	-	-	-	7	26
Total Recoverable Zinc	mg/kg dry wt	-	-	-	46	195
Polycyclic Aromatic Hydrocarbons Screening in Soil						
1-Methylnaphthalene	mg/kg dry wt	0.111	< 0.012	0.21	< 0.013	0.127
2-Methylnaphthalene	mg/kg dry wt	0.081	< 0.012	0.199	< 0.013	0.122
Perylene	mg/kg dry wt	4.1	0.055	2.0	0.016	2.3
Acenaphthylene	mg/kg dry wt	2.7	0.032	1.43	< 0.013	1.34
Acenaphthene	mg/kg dry wt	0.45	< 0.012	0.127	< 0.013	0.22
Anthracene	mg/kg dry wt	11.9	0.118	2.5	0.012	8.1
Benzo[a]anthracene	mg/kg dry wt	18.8	0.23	7.8	0.052	10.9
Benzo[a]pyrene (BAP)	mg/kg dry wt	17.9	0.24	8.4	0.047	9.6
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	8.2	0.27	9.0	0.049	9.9
Benzo[e]pyrene	mg/kg dry wt	11.0	0.174	6.0	0.036	6.4
Benzo[g,h,i]perylene	mg/kg dry wt	8.3	0.121	4.5	0.032	4.6
Benzo[k]fluoranthene	mg/kg dry wt	6.9	0.104	3.6	0.027	4.6
Chrysene	mg/kg dry wt	16.5	0.25	7.8	0.047	8.8
Dibenzo[a,h]anthracene	mg/kg dry wt	2.1	0.030	1.02	< 0.013	1.19
Fluoranthene	mg/kg dry wt	50	0.65	16.8	0.097	26
Fluorene	mg/kg dry wt	2.4	0.019	0.70	< 0.013	1.16
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	9.2	0.144	4.9	0.037	5.8
Naphthalene	mg/kg dry wt	0.18	< 0.06	0.37	< 0.07	0.19

Sample Type: Soil						
Sample Name:		2A 09-Jun-2017 3:25 pm	2B 09-Jun-2017 3:28 pm	2C 09-Jun-2017 3:30 pm	Composite of 1A, 1B & 1C	Composite of 2A, 2B & 2C
Lab Number:		1790298.4	1790298.5	1790298.6	1790298.16	1790298.17
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Phenanthrene	mg/kg dry wt	46	0.47	10.6	0.035	25
Pyrene	mg/kg dry wt	44	0.61	16.7	0.093	27

Sample Name:		Composite of 3A, 3B & 3C	Composite of 4A, 4B & 4C	Composite of 5A, 5B & 5C		
Lab Number:		1790298.18	1790298.19	1790298.20		
Individual Tests						
Dry Matter	g/100g as rcvd	82	80	79	-	-
TCLP Weight of Sample Taken	g	30 #1	50	50	-	-
TCLP Initial Sample pH	pH Units	8.3	8.2	6.7	-	-
TCLP Acid Adjusted Sample pH	pH Units	1.5	1.6	1.5	-	-
TCLP Extractant Type*		NaOH/Acetic acid at pH 4.93 +/- 0.05	NaOH/Acetic acid at pH 4.93 +/- 0.05	NaOH/Acetic acid at pH 4.93 +/- 0.05	-	-
TCLP Extraction Fluid pH	pH Units	4.9	4.9	4.9	-	-
TCLP Post Extraction Sample pH	pH Units	5.0	5.1	5.1	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	mg/kg dry wt	2.9	1.75	2.4	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	4	6	5	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.32	0.69	0.33	-	-
Total Recoverable Chromium	mg/kg dry wt	20	21	23	-	-
Total Recoverable Copper	mg/kg dry wt	19	47	125	-	-
Total Recoverable Lead	mg/kg dry wt	310	310	360	-	-
Total Recoverable Nickel	mg/kg dry wt	12	18	17	-	-
Total Recoverable Zinc	mg/kg dry wt	189	430	280	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil						
1-Methylnaphthalene	mg/kg dry wt	< 0.012	0.061	0.016	-	-
2-Methylnaphthalene	mg/kg dry wt	< 0.012	0.056	< 0.013	-	-
Perylene*	mg/kg dry wt	0.44	0.26	0.36	-	-
Acenaphthylene	mg/kg dry wt	0.115	0.29	0.175	-	-
Acenaphthene	mg/kg dry wt	< 0.012	0.039	0.019	-	-
Anthracene	mg/kg dry wt	0.45	0.52	0.79	-	-
Benzo[a]anthracene	mg/kg dry wt	1.74	1.08	1.64	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	2.1	1.22	1.67	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	1.96	1.20	1.67	-	-
Benzo[e]pyrene	mg/kg dry wt	1.31	0.79	1.10	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	1.08	0.66	0.83	-	-
Benzo[k]fluoranthene	mg/kg dry wt	0.85	0.51	0.74	-	-
Chrysene	mg/kg dry wt	1.39	0.90	1.30	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	0.23	0.138	0.185	-	-
Fluoranthene	mg/kg dry wt	3.4	2.5	3.9	-	-
Fluorene	mg/kg dry wt	0.057	0.194	0.072	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	1.30	0.80	1.06	-	-
Naphthalene	mg/kg dry wt	< 0.06	0.08	< 0.07	-	-
Phenanthrene	mg/kg dry wt	1.68	2.1	2.9	-	-
Pyrene	mg/kg dry wt	3.6	2.5	3.9	-	-

Sample Type: Aqueous						
Sample Name:		Composite of 1A, 1B & 1C [TLCP extract]	Composite of 2A, 2B & 2C [TLCP extract]	Composite of 3A, 3B & 3C [TLCP extract]	Composite of 4A, 4B & 4C [TLCP extract]	Composite of 5A, 5B & 5C [TLCP extract]
Lab Number:		1790298.21	1790298.22	1790298.23	1790298.24	1790298.25
Heavy metals, totals, screen As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Arsenic	g/m³	< 0.021	< 0.021	< 0.021	< 0.021	< 0.021
Total Cadmium	g/m³	< 0.0011	< 0.0011	0.0022	< 0.0011	0.0012
Total Chromium	g/m³	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Total Copper	g/m³	< 0.011	< 0.011	< 0.011	0.014	0.092

Sample Type: Aqueous						
Sample Name:		Composite of 1A, 1B & 1C [TLCP extract]	Composite of 2A, 2B & 2C [TLCP extract]	Composite of 3A, 3B & 3C [TLCP extract]	Composite of 4A, 4B & 4C [TLCP extract]	Composite of 5A, 5B & 5C [TLCP extract]
Lab Number:		1790298.21	1790298.22	1790298.23	1790298.24	1790298.25
Heavy metals, totals, screen As,Cd,Cr,Cu,Ni,Pb,Zn						
Total Lead	g/m³	0.0046	0.64	0.072	0.034	0.074
Total Nickel	g/m³	< 0.011	< 0.011	< 0.011	< 0.011	< 0.011
Total Zinc	g/m³	0.026	0.164	0.38	0.48	0.32

Analyst's Comments

#1 It should be noted that the TCLP extraction has been scaled down to 30g because of insufficient sample. The ratio of solid to extractant has been kept constant (1:20).

Amended Report: This report replaces an earlier report issued on 19 Jun 2017 at 3:36 pm
Reason for amendment: PAH analysis has been added to samples 1790298.4 - .6 at the client's request.

SUMMARY OF METHODS

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively clean matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Individual Tests			
TPH in Soil extraction by Sonication	Sonication extraction, Silica cleanup, GC-FID analysis.	-	16-20
TPH/SVOC/OC/PAH Extraction Vial*	.	-	16-20
TPH/SVOC/OC/PAH Intermediate Vial*	.	-	16-20
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	4-6, 16-20
Composite Environmental Solid Samples*	Individual sample fractions mixed together to form a composite fraction.	-	1-15
1-Methylnaphthalene	Sonication extraction, SPE cleanup, GC-MS SIM analysis. Modified US EPA 8270.	0.010 mg/kg dry wt	4-6, 16-20
2-Methylnaphthalene	Sonication extraction, SPE cleanup, GC-MS SIM analysis. Modified US EPA 8270.	0.010 mg/kg dry wt	4-6, 16-20
Perylene	Sonication extraction, SPE cleanup, GC-MS SIM analysis. Modified US EPA 8270.	0.010 mg/kg dry wt	4-6, 16-20
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	BaP Potency Equivalence calculated from Benz(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1 + Chrysene x 0.01 + Dibenz(a,h)anthracene x 1 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.002 mg/kg dry wt	4-6, 16-20
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	16-20
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. [KBIs:5786,2805,2695]	0.010 - 0.05 mg/kg dry wt	4-6, 16-20
TCLP Profile*	Extraction at 30 +/- 2 rpm for 18 +/- 2 hours, (Ratio 1g sample : 20g extraction fluid). US EPA 1311	-	16-20
TCLP Profile			
TCLP Weight of Sample Taken	Gravimetric. US EPA 1311.	0.1 g	16-20
TCLP Initial Sample pH	pH meter. US EPA 1311.	0.1 pH Units	16-20
TCLP Acid Adjusted Sample pH	pH meter. US EPA 1311.	0.1 pH Units	16-20
TCLP Extractant Type*	US EPA 1311.	-	16-20
TCLP Extraction Fluid pH	pH meter. US EPA 1311.	0.1 pH Units	16-20
TCLP Post Extraction Sample pH	pH meter. US EPA 1311.	0.1 pH Units	16-20

Sample Type: Aqueous

Test	Method Description	Default Detection Limit	Sample No
Individual Tests			
Total Digestion of Extracted Samples*	Nitric acid digestion. APHA 3030 E 22nd ed. 2012 (modified).	-	21-25
Heavy metals, totals, screen As,Cd,Cr,Cu,Ni,Pb,Zn	Nitric acid digestion, ICP-MS, screen level. APHA 3125 B 22nd ed. 2012.	0.0011 - 0.021 g/m^3	21-25

These samples were collected by yourselves (or your agent) and analysed as received at the laboratory.

Samples are held at the laboratory after reporting for a length of time depending on the preservation used and the stability of the analytes being tested. Once the storage period is completed the samples are discarded unless otherwise advised by the client.

Carole Rodgers-Carroll BA, NZCS
Client Services Manager - Environmental

ECOtago

Environmental Consultants Otago Ltd

Contaminated Soil Management Plan
403 High Street
Dunedin
for
Downie Stewart Foundation

July 2017

Environmental Consultants Otago Ltd

Environmental and Contaminated Site Assessment • Urban Planning & Design • Landscape Architecture • Project Management

PO Box 5522 Dunedin 9058 • 64 3 4728875 • office@ecotago.co.nz

ECOtago

Task	Responsibility	Signature
Project Manager:	Ciaran Keogh	
Prepared By:	Bernice Chapman, PhD	
Reviewed By:	Ciaran Keogh	
Approved For Issue By:	Ciaran Keogh	

Prepared By:
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Client: Downie Stewart Foundation
Job Ref.: 60-17 High403 CSMP
Date: 7 July 2017

Contents

Abbreviations

AEE	Assessment of Environmental Effects
BaP_{eq}	Equivalent Benzo(a)pyrene
CSMP	Contaminated Soil Management Plan
DCC	Dunedin City Council
HAIL	Hazardous Activities and Industries List
H&S	Health & Safety
MfE	New Zealand Ministry for the Environment
NES Soil	Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
PAH	Polycyclic Aromatic Hydrocarbons
PPE	Personal Protection Equipment
RMA	Resource Management Act 1991
SCS	Soil Contaminant Standards

1 Introduction

1.1 Background

The Downie Stewart Foundation owns the property at 403 High Street, Dunedin (Figure 1). The property contains a residential building which is operated as part of the Moana House Programme, and the Downie Stewart Foundation is planning to construct a whare to the rear of the property.

Figure 1: The property at 403 High Street, outlined with a turquoise line, showing the site to the rear of the property outlined with a red dashed line.

The project will involve earthworks which will disturb more than the permitted 25 m^3 of soil per 500 m^2 (i.e. more than 27 m^3 across the property), and dispose of more than 5 m^3 of soil per 500 m^2 (i.e. more than 5.5 m^3 across the property). Geotechnical investigations identified the presence of up to 1 m fill across the site[1]. The presence of uncontrolled fill may have resulted in ground contamination depending on the source and nature of the fill material, as described in the Assessment of Environmental Effects (AEE)[2] prepared by Environmental Consultants Otago Limited (EC Otago).

Landfilling is one of the activities described in the New Zealand Ministry for the Environment (MfE) Hazardous Activities and Industries List (HAIL), and the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES Soil) apply when five specific activities (including soil disturbance, subdivision or change of use) take place at the property.

---

[1] GeoSolve Ltd. *Geotechnical Report, 403 High Street;* 9 February 2016. GeoSolve ref: 150820.01

[2] EC Otago Ltd. *Assessment of Environmental Effects for Undertaking Earthworks on a HAIL Site - 403 High Street, Dunedin;* June 2017. Job Reference 60-17 High403 AEE

Soil testing conducted on the property have confirmed areas of contamination with elevated chromium, copper, lead, nickel, zinc and equivalent benzo(a)pyrene (BaP_{eq}) relative to background levels. One sample contained BaP_{eq}, representing carcinogenic polycyclic aromatic hydrocarbons (PAHs) at concentrations approaching the Industrial/Commercial Outdoor Soil Contaminant Standards (SCS). While the remaining elevated metals are all below the SCSs, the variability of the results indicate that soil in other areas may exceed the SCSs. The SCSs are contaminant concentrations in soil at or below which people's exposure to soil is judged to be acceptable. As a result of the known contamination of the soil, this Contaminated Soils Management Plan (CSMP) has been prepared in support of a resource consent application and Assessment of Environmental Effects (AEE).

This CSMP has been developed to set out responsibilities for soil handling, management and disposal procedures and controls to minimise or mitigate the effects of earthworks, in accordance with consent conditions that may be imposed by the Dunedin City Council (DCC), and to address the requirements of the NES Soil.

1.2 Location of Earthworks

The legal description of the property at 403 High Street, Dunedin, on which earthworks will occur, is LOT 1 DP 4266. For the purposes of this CSMP, the earthworks site is defined as the rear approximately 315 m^2 of the property, as shown outlined with a red dashed line in Figure 1.

1.3 Proposed Works

The proposed earthworks involve providing a level building platform and foundations for the new building, and the total volume of earthworks is estimated to be 210 m^3. All excavated fill material will be disposed off-site. Soil sampling and analysis during the preparation of the AEE has indicated that the soil for disposal meets Class B Landfill Waste Acceptance Criteria[3].

On completion of the project, much of the site will be covered by the new building. Sealing of the greater part of the site will reduce any direct exposure risk to humans.

1.4 Summary of Property Use History and Hazard Identification

The property has been residential for over 70 years. Geotechnical investigations by GeoSolve identified the presence of up to 1 m fill across the site. The presence of uncontrolled fill is a HAIL activities. Soil testing identified elevated heavy metal and PAH concentrations for a residential setting. In addition, PAHs approached the Commercial/ Industrial Outdoor Worker SCS in one sample, at 25 mg/kg dry weight being 70% of the SCS. As a result, additional care in Health & Safety (H&S) planning and practice is required (Section 4).

1.5 Limitations

The information contained in this document is intended solely for the use of the Downie Stewart Foundation and their agents for the purpose for which it has been prepared, and no representation is made or is to be implied as being made to any third party. Other than for the exclusive use of Downie Stewart Foundation and their agents, no part of this report may be reproduced, stored in a retrieval system or transmitted in any form or by any means.

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[3] Ministry for the Environment. *Module 2: Hazardous Waste Guidelines - Landfill Waste Acceptance Criteria and Landfill Classification*; May 2004. ME number: 510.

2 Responsibilities and Basis for CSMP Procedures

2.1 Responsibilities

The overall responsibility for the implementation of this CSMP shall be held by Downie Stewart Foundation and their agents, however, the specific requirements and provisions of this CSMP shall be under the control of Downie Stewart Foundation's nominated agent or contractor (hereafter Site Manager). The Site Manager shall be responsible for management of the works and implementation of the procedures set out below during earthworks at 403 High Street, Dunedin. Additional provisions regarding responsibility apply, as follows:

- Downie Stewart Foundation shall be responsible for providing the contents of previous investigations relevant to soils within the earthworks site to the Site Manager;
- Downie Stewart Foundation or their Site Manager shall engage a Suitably Qualified and Experienced Practitioner in the area of contaminated land management to observe works and sample soils as required;
- While this CSMP is intended to assist the Site Manager in meeting legal obligations related to potentially contaminated soils with respect to health, safety and the environment, this CSMP does not and shall not relieve the Site Manager of legal responsibilities in this respect and it does not cover the general site safety procedures required for typical excavation and construction activities within the earthworks site;
- The Site Manager shall ensure that any conditions imposed by regulatory authorities must be adhered to, however, this CSMP shall be incorporated into any consent/permit involving excavation/disturbance work at the earthworks site to ensure the risks associated with contaminated soils are managed appropriately;
- All personnel involved in the earthworks shall be familiar with this CSMP and ensure that the requirements of this CSMP have been followed; and
- Additional responsibilities for work safety with contaminated soils are delineated in Sections 3 and 4 below.

2.2 Basis for Procedures

The rationale behind procedures set out herein is to ensure appropriate controls are in place during earthworks to manage the potential for exposure effects to workers and to the general public. Potential off-site human health and environmental effects are addressed by ensuring that potential discharges are avoided during earthworks and by disposing excavated soil to an appropriately consented landfill. Both general and specific management and control procedures and requirements shall be considered as directives. General management directives are as follows:

- This CSMP applies to the whole earthworks site, as defined in Section 1 above;
- A copy of this CSMP is to remain available on-site at all times so that reference can be made to it when undertaking any earthworks; and
- This CSMP shall be enforced throughout the duration of the earthworks.

3 Earthworks Controls and Management

Material exists within the site that does present a risk to H&S. Routine personal hygiene, including the washing of hands before breaks or after contact with the site soils, and daily changing of overalls during earthworks shall be mandated.

The NES Soil requires active prevention of discharges of materials during works; procedures to ensure this are detailed below and shall be implemented by the Site Manager. All procedures are to comply with the relevant regulatory conditions, Council bylaws, and conditions of land use and earthworks consent conditions, as detailed in Section 2.

3.1 Earthworks Site Establishment and Management

Prior to works' commencing, the Site Manager shall ensure the following to aid in the management of aspects of site safety and environmental compliance:

- The terms stipulated in this CSMP for H&S planning are incorporated into the overall worksite H&S Plan;
- That security fencing is instated to prevent unauthorised access to the earthworks site;
- That access to the earthworks site is restricted to authorised personnel, and that access is only allowed following appropriate induction procedures;
- That, as the earthworks site is under the Site Manager's control, staff and visitors shall also fulfil the Site Manager's Site Safe requirements;
- That signage is posted, including earthworks site information, H&S requirements, and earthworks site reporting requirements – signage shall include a large notice board at the entrance to the earthworks site, providing site management contact details;
- That H&S facilities and equipment such as washing facilities for earthworks site staff, appropriate personal protection equipment (PPE) and first aid points are in place;
- That dust control systems are in place;
- That storm water (surface runoff) diversion and collection systems and silt control measures are in place;
- That a noise management plan is in place to comply with the RMA and the Health and Safety in Employment Act 1992;
- That any needed stockpiling plans are in place and ready for implementation;
- That equipment required for vehicle cleaning is in place;
- That provisions are made in order to maintain the earthworks site in an orderly, litter-free, condition at all times; and
- Further, the Site Manager shall ensure that existing formed access for truck entry and exit from the earthworks site are used.

The following contact details shall be provided on the site entrance notice board:

- Site Manager's contact;
- Alternate contact if the Site Manager is unavailable; and
- Contact of Practitioner responsible for earthworks site monitoring.

3.2 Dust Control Procedures

Dust generated by earthworks, excavation and loading has the potential to contain levels of contaminants above background levels, and this could result in the discharge of contaminated airborne particulate matter. To control this risk, the Site Manager shall ensure that the following practices are enforced:

- The earthworks site is to be kept free of dust and mud by minimising earthworks when adverse site conditions exist (e.g. wind or heavy rain);
- Any existing sealed surfaces are to be maintained around excavations and at the earthworks site entry and exit points to the greatest extent possible;
- Vehicles entering and exiting the earthworks site are to remain on the existing hard surface, and whenever this is not possible clean aggregate roadways are to be formed and used to provide all-weather access free of contaminated material;
- Reduced vehicle speeds are maintained in order to minimise dust;
- Material to be excavated is to be maintained in a damp (not wet) condition during excavation and cartage;
- Drop heights from loaders and diggers are to be minimised as far as possible; and
- Any stockpiles formed are to be covered when not being actively worked.

3.3 Storm/surface, Groundwater and Silt/sediment Control Procedures

Off-site transport of contaminated or potentially contaminated soils via water or erosion of exposed silt/sediments is a risk during earthworks. To control this risk, the Site Manager shall ensure that the following practices are adhered to:

- The Site Manager shall undertake inspections on a daily basis, and after every significant rainfall event, and shall ensure that consent conditions are adhered to;
- That excavation of earthworks site soils shall not occur when it is raining or when free water is present in any excavated area;
- That the movement of saturated soils is avoided;
- That erosion and sediment controls are installed prior to the commencement of earthworks or excavation and that these are suitable to ensure that no silt or sediments are transported off-site, including during unpredictably high rain events;
- That all soil, silt or sediment exposed or generated on the property during development shall be construed as part of earthworks, and within the earthworks site, as defined above, and that all such material captured by erosion controls are managed in the same manner as other earthworks site soils, as described in Section 3.4.
- That surface water in contact with exposed earthworks is contained within the earthworks site and prevented from entering any nearby watercourses or storm water drains;
- That surface water entering excavations is avoided (by working in dry conditions);
- That any surface water entering excavations is allowed to soak into the ground;
- If groundwater is encountered during earthworks, the Site Manager shall ensure it is contained within the site and shall be allowed to soak back into the ground; and
- For persistent groundwater, dewatering is required, and the pumped groundwater shall be treated as potentially contaminated until demonstrated otherwise or removed by an appropriately licensed contractor.

3.4 Soil Handling Control Procedures

Contaminated and potentially contaminated soils, geomaterials, and buried wastes at the earthworks site potentially pose a high exposure risk, and earthworks have great potential to exacerbate risks if not properly controlled, particularly during off-site disposal. To control these risks, the Site Manager shall ensure that the terms herein are strictly adhered to.

3.4.1 On-site management and control

- The Site Manager shall ensure that records are kept of all excavations and soil movements on-site including the location and dimensions of the excavation, ground conditions, relocation or reuse of soil, and whether waste materials, or other visual or olfactory indicators of potential contamination are observed. Visual and olfactory indicators include:
    - Unusual odours;
    - Discolouration, stained water seeps and soils;
    - Suspected petroleum hydrocarbon contaminated soil and/or free product;
    - Any material that might appear to be hazardous waste (liquid or solid), putrescible waste, household refuse, or combustion by-products;
    - Intact or broken drums or other containers;
    - Inclusions of non-clean fill allowable deleterious materials (i.e. plastic, rubber, metal - refer to Table 4.1 MfE Cleanfill Guidelines[4], attached);
    - Suspected asbestos containing materials (ACM); and
    - Groundwater with an oil sheen, odour or discolouration.
- Any potentially contaminated material that is to be reused at the earthworks site shall be placed to ensure that future human exposure risk is highly unlikely, as determined by a Suitably Qualified and Experienced Practitioner in contaminated land management;
- Any observation of unexpected waste materials or visual or olfactory indicators of potential contamination shall be treated as an incident, works in the affected area shall cease, and a Suitably Qualified and Experienced Practitioner in contaminated land management shall be consulted immediately. Works shall only resume in the affected area again once the Practitioner has indicated that works' resumption is suitable;
- Any base course that is intermixed with soil is to be managed as contaminated soil;
- Recycled masonry or clean hard fill is to be removed or stored separately on-site prior to re-use on-site (if applicable);
- Any vehicle in contact with earthworks site soils shall have its wheels either swept down or washed before leaving the earthworks site; and
- Any excavated material that is stockpiled on the earthworks site shall be subject to stockpile control procedures outlined below.

3.4.2 Off-site management and control

Soil disposal must adhere to the following procedures:

- When off-site disposal is proposed, plans for off-site disposal shall be in place prior to the removal of any material;
- All material must be demonstrated to have been disposed of at an appropriately consented landfill;

[4] Ministry for the Environment. *A Guide to the Management of Cleanfills*; January 2002. ME number: 418.

- Material scheduled for off-site disposal shall be excavated and removed directly where reasonably possible. Alternatively, soil must be stockpiled on the earthworks site, and subject to stockpile control procedures outlined in Section 3.4.3;
- Trucks shall be loaded within the earthworks site in locations where runoff and possible spills/dust during loading can be controlled and contained;
- Trucks that have come into contact with earthworks site soils shall have their wheels either swept down or washed before they leave the earthworks site. Should the earthworks site become wet, wheels shall be washed before a vehicle exits the earthworks site;
- The site manager shall maintain a log of each truck transporting material off-site;
- Trucks shall have their loads covered during transport; and
- All weighbridge dockets shall be retained by the Site Manager and copies provided to the relevant authority with the Site Soil Disposition Report.

3.4.3 Stockpile management and control

- Stockpiles shall be maintained at minimum reasonable heights to reduce chances for erosion in the event of unforeseen precipitation;
- Stockpiles shall not be placed in an area where runoff cannot be controlled, and shall be located in a manner to avoid off-site transport and on-site remobilization;
- Stockpiled materials shall be placed on suitable material (e.g. polyethylene sheet) to prevent contaminants leaching into clean soils;
- Stockpiles shall be located to minimise potential contact by earthworks site workers; and
- Stockpiled material, when not being actively worked, shall be covered by a suitable material (e.g. polyethylene sheet) to prevent the ingress of rainwater into the stockpile.

3.5 Imported Material Procedure

Material imported to the earthworks site for the purposes of filling shall be clean fill, and the Site Manager shall maintain records to demonstrate that any imported material is obtained from a quarry or other certified source. Any material not meeting this criterion shall be demonstrated to be acceptable to the client and relevant regulatory authorities subsequent to high-density sampling and analysis by a Suitably Qualified and Experienced Practitioner in contaminated land management. No material shall be imported from any location that is or might be considered to constitute a HAIL site.

4 Health & Safety Plan – Contaminated Soils

4.1 Introduction

This H&S plan provides guidance that the Site Manager shall adhere to when working with contaminated or potentially contaminated soil or geomaterials during the earthworks associated with the excavation at 403 High Street, Dunedin. It should be read in accordance with and in addition to the WorkSafeNZ guide *Managing Occupational Health on Contaminated Sites,* a copy of which is appended to this CSMP. The guidance has been developed to provide a framework for managing potential contamination-related effects at the earthworks site; however, this CSMP H&S plan does not replace or supersede the Site Manager's overall responsibility for the H&S of people within or adjoining the earthworks site or their responsibility for protecting the environment, as outlined in other relevant guidance documents or H&S plans and legislation. General H&S based on the requirements of the *Health and Safety in Employment Act*, 1992 shall be covered in the Site H&S Plan. The H&S procedures described in this section of the CSMP shall be implemented by the Site Manager, however, this shall not be taken as absolving either Downie Stewart Foundation or their agent from the overarching responsibility of ensuring that the earthworks site is managed appropriately.

The purpose of this contaminated land-related H&S Plan is as follows:

- To provide and maintain a safe working environment for workers while handling contaminated soils;
- To ensure provision of facilities and procedures to prevent exposure to contaminated soil by workers, residents and the general public;
- To ensure awareness of potential exposure and harm resulting from handling contaminated soils; and
- To provide guidance on relevant industrial hygiene procedures.

4.2 Earthworks Site Establishment

The Site Manager shall ensure the following with respect to contaminated land-related H&S during earthworks site establishment:

- Hazard identification signage is in place to warn workers that the earthworks site soils are contaminated;
- A washing facility is established and appropriate PPE is available and used by earthworks site workers; and
- First aid points are in place.

4.2.1 Hazard management

The hazard of contaminated soil shall be managed by minimising exposure to contaminated soils *AT ANY TIME*. Adherence to all of the controls/directives herein is essential to contaminated soil hazard management.

4.3 Responsibility for Work Safety with Contaminated Soils

All staff at the earthworks site shall be required to undergo a contaminated soil safety induction before commencing work. The purpose of the safety induction is to make sure each worker is aware of the exposure risk related to the contaminated soil, of safe working procedures, of safety equipment and requirements, and of the action plan in case of an emergency. An environmental

H&S officer (HSO) shall be appointed by the Site Manager for the duration of the works so that in the event contaminated soils are encountered there is a person responsible for ensuring the contaminated land-related H&S procedures are adhered to, alongside of those required under the Site H&S Plan. The HSO shall ensure that all personnel are familiar with the application and use of PPE and procedures specified in this CSMP before commencement of site work.

4.4 Contaminated Soils Safety and Hazard Minimisation Procedures

The following safety and hazard minimisation procedures that are specific to the issue of contaminated soil at the earthworks site shall be followed by all staff working on-site:

- Any incidents shall be reported to the HSO; incidents involving discovery of unexpected waste materials or unexpected visual or olfactory indicators of potential contamination shall result in immediate cessation of works in the affected area, a Suitably Qualified and Experienced Practitioner in contaminated land management shall be consulted immediately, and works shall only resume in the affected area again once the Practitioner has indicated that works' resumption is suitable;
- Earthworks site workers shall avoid unnecessary contact with contaminated soil or suspected contaminated soil;
- Earthworks site workers shall wear gloves and dust masks at any time they might be in contact with contaminated soils or if there is any breach of dust control. Failure of dust control shall constitute an H&S incident;
- Overalls are to be worn by workers at the earthworks site when exposed soils exist and the worker is involved in earthworks, or if the worker might otherwise be in contact with soils at the earthworks site;
- Contact with water at the earthworks site that has been in contact with soils shall be avoided;
- Appropriate footwear is to be worn and if this has come in contact with the earthworks site soils, is to be washed before leaving the earthworks site or entering a vehicle or earthworks site building;
- Overalls are to be removed on-site at the end of each day and these are to be laundered daily or disposable overalls are to be worn and disposed of daily;
- There shall be no eating, drinking or smoking in the works area other than in an appropriately designated location (earthworks site office or other location outside of earthworks site) in order to prevent contaminated soil's contacting food or being ingested directly via soiled hands;
- Food, drink, and any other item that might be in oral contact, shall not be allowed within the works area other than in an appropriately designated location, as defined above;
- Hand to mouth and hand to face contact shall be avoided during work; and
- Hands are to be washed before eating, drinking or smoking, and on every occasion wherein a person on site leaves the site.

Based on the hazard minimisation procedures above, the Site Manager shall ensure availability and supply of the following contaminated land-related PPE that is to be used when working with earthworks site soils:

- Overalls;
- P2 dust masks; and
- Disposable nitrile/latex/rubber gloves or construction gloves.

PPE shall be used and replaced as appropriate to site conditions.

4.5 Emergency Procedures

Direct contact of any person with potentially contaminated dust, soil or groundwater shall be treated as an incident and a potential emergency situation, and shall be reported to the HSO for immediate assessment and action.

5 Closure

On completion of earthworks, a Site Soil Disposition Report shall be provided to the consent authority providing confirmation of the following:

- That the earthworks works are complete;
- That all earthworks were carried out according to this CSMP and the conditions of consent, and that there were no variations during the works;
- That any failure to carry out work as specified herein is detailed, along with measures taken to rectify the failure and/or mitigate effects;
- That test results for soils removed from the earthworks site are provided along with a statement of the disposition of soils with respect to contamination; and
- The disposal destination for contaminated soils removed from the earthworks site is specified and that guidelines for disposal at landfill are confirmed to have been met.

6 Applicability

This plan has been prepared for the benefit of Downie Stewart Foundation with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement.

Site Manager Checklist: 403 High Street, Dunedin

Note: this checklist does not absolve the Site Manager from responsibility to read, fully understand,

and abide by all of the terms of this CSMP.

Prior to commencement of works

- Establish earthworks (dust, erosion, sediment, storm water, odour) controls as per CSMP;
- Provide hazard board to state contaminated soil may be present and indicating H&S requirements for workers;
- Obtain PPE appropriate to the extent of exposure/contact;
- Arrange disposal permits.

During works

- Maintain earthworks controls as per CSMP;
- Implement CSMP H&S procedures, in addition to all other needed and applicable H&S procedures;
- Retain all weighbridge dockets;
- Cease work and contact a Suitably Qualified and Experienced Practitioner (contaminated land) in the event of potential unforeseen contamination incidents, including encountering visual and or olfactory indicators of contamination, as follows:
    - Unusual odours;
    - Discolouration, stained water seeps and soils;
    - Suspected petroleum hydrocarbon contaminated soil and/or free product;
    - Any material that might appear to be hazardous waste (liquid or solid), putrescible waste, household refuse, or combustion by-products;
    - Intact or broken drums or other containers;
    - Inclusions of non-clean fill allowable deleterious materials (i.e. plastic, rubber, metal - refer Table 4.1 MfE Cleanfill Guidelines, attached);
    - Suspected asbestos containing materials (ACM); and
    - Groundwater with an oil sheen, odour or discolouration;
- Dispose of contaminated soil to an appropriately licensed landfill in accordance with the terms herein and the operator's requirements.

Within two weeks of completion of earthworks, if soil disposal off-site has occurred

- Document and report the following for the Site Soil Disposition Report:
    - Any incidents relating to discharges during the works;
    - Details of unexpected encounters/events and the action taken;
    - Details of visits made by DCC representatives;
    - Summary of weighbridge information for disposal verification; and
    - Confirmation that all other records of earthworks and tracking of potentially contaminated soils was undertaken, as described herein.

Table 4.1: Cleanfills - acceptable materials

(Taken from the MfE "A Guide to the Management of Cleanfills")

Material	Discussion
Asphalt (cured)	Weathered (cured) asphalt is acceptable: After asphalt has been exposed to the elements for some time, the initial oily surface will have gone and the asphalt is considered inert.
Bricks	Inert – will undergo no degradation.
Ceramics	Inert.
Concrete – unreinforced	Inert material. Ensure that other attached material is removed.
Concrete –reinforced	Steel reinforcing bars will degrade. However, bars fully encased in intact concrete will be protected from corrosion by the concrete. Reinforced concrete is thus acceptable provided protruding reinforcing steel is cut off at the concrete face.
Fibre cement building products	Inert material comprising cellulose fibre, Portland cement and sand. Care needs to be taken that the product does not contain asbestos, which is unacceptable.
Glass	Inert, and poses little threat to the environment. May pose a safety risk if placed near the surface in public areas, or if later excavated. The safety risk on excavation should become immediately apparent, so glass is considered acceptable provided it is not placed immediately adjacent to the finished surface.
Road sub-base	Inert.
Soils, rock, gravel, sand, clay, etc	Acceptable if free of contamination (see 4.3.2 for definition of contaminated soil in this context).
Tiles (clay, concrete or ceramic)	Inert.

WORKSAFE
NEW ZEALAND | MAHI HAUMARU AOTEAROA

HSWA

POSITION STATEMENT

MANAGING OCCUPATIONAL HEALTH ON POTENTIALLY CONTAMINATED SITES

Purpose of position statement

This document clarifies WorkSafe New Zealand's position on small-scale work that disturbs soil on potentially contaminated land. These are sites that have been used for activities in the Hazardous Activities and Industries List (HAIL)[1].

This position statement is for

People and PCBUs working on potentially contaminated sites, including:

> PCBUs and workers
> agents such as insurance companies and project management officers
> local and regional government agencies.

Relevant industries or workplaces

Demolition, construction, repair, excavation and site preparation activities and industries across New Zealand.

Legal obligations

PCBUs must ensure that workers have their exposure to contaminants minimised as per the Health and Safety at Work Act 2015.

Contact your regional council to check whether you are working on a HAIL site and to make sure you comply with the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES)[2] before starting earthworks.

ISSUE: SOIL DISTURBANCE ON POTENTIALLY CONTAMINATED SITES

Concerns have been raised about health and safety hazards on potentially contaminated sites. Many of these sites are being redeveloped, or have structures that need repair, which may disturb the soil (for example, re-piling foundations, repairing driveways).

Detailed site investigation has not been required on many of these sites, so the extent and exact nature of the contamination and its risks are not known.

Managing the health and safety risks of people working on potentially contaminated sites

Workers and other people must be protected from risks associated with exposure to soil, including breathing in, ingesting or skin contact with contaminants. In the absence of detailed risk assessments, which identify the nature and extent of contamination, basic health precautions are needed.

[1] The Hazardous Industries and Activity List is available at www.mfe.govt.nz.

[2] The NES is available at www.mfe.govt.nz.

WSNZ_2215_APR 16

SOLUTION

For any work where sites are suspected to be contaminated, but the exact nature and extent of contamination is not known:

- Workers must have personal protective equipment (PPE) including protective coveralls, non-laced boots, gloves and appropriate respiratory protective equipment (RPE) where required. RPE must be at least P2[3].
- Workers must be trained and educated in how to use RPE effectively.
- Provide washing facilities.
- Tell workers about hygiene practices to avoid possible contamination.
- If required undertake appropriate health monitoring.
- Talk to the resident about why workers are using PPE.

Warning: If there are signs that the soil is contaminated such as discolouration, buried waste, dying or dead vegetation, unidentified odour or geotextile markers, stop work and reassess the situation.

This may require more detailed testing, including soil analysis or other tests. Contact local and regional councils.

Refer to Ministry for the Environment guidelines on contaminated land.

When contamination is known or strongly suspected

A detailed site investigation is needed on sites with known contamination. The requirements for worker protection are covered in guidance such as the *Health and Safety Guidelines on the Clean-up of Contaminated Sites*[4].

If the site is contaminated with asbestos and there is a risk that the asbestos is friable, WorkSafe may need to be notified and specialist staff engaged to properly supervise this work.

SUMMARY

PCBUs must ensure that the risks that arise form their work activities are effectively managed. Risks must be eliminated so far as is reasonably practicable. If a risk cannot be eliminated, it must be minimised so far as is reasonably practicable.

FURTHER INFORMATION

For information on contaminated land, the NES and HAIL, contact the Ministry for the Environment:

Phone: 0800 499 700

Email: info@mfe.govt.nz

Website: www.mfe.govt.nz

WORKSAFE NEW ZEALAND GUIDANCE

To view the following publications, go to www.worksafe.govt.nz:

- *An Introduction to the Guidelines for Workplace Health Surveillance*
- *Health and Safety Guidelines on the Clean-Up of Contaminated Sites*
- *New Zealand Guidelines for the Management and Removal of Asbestos (3rd edition)*
- *Best Practice Guidelines for Demolition in New Zealand*

For information on occupational health, phone WorkSafe New Zealand on 0800 030 040.

PUBLISHED: APRIL 2016. CURRENT UNTIL REVIEW IN 2018.

[3] Respiratory equipment should be certified and comply with AS/NZS 1716 *Respiratory Protective Devices*. USA and European certification is also suitable.

[4] There are other international sources of information such as: WorkSafe Australia (2005) *Industry Standard Contaminated Construction Sites. Construction and Utilities*. Australia: Victoria.

APPENDIX 5

Certificates of Title
OT368/120
OT276/233
OT14C/712

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**OT368/120**
Land Registration District	**Otago**
Date Issued	15 December 1953

Prior References
OT227/112 OT255/23

Estate	Fee Simple
Area	509 square metres more or less
Legal Description	Lot 4 Deposited Plan 2281, Part Section 40 Block II Town of Dunedin, Part Lot 3 Deposited Plan 2281 and Part Lot 5 Deposited Plan 1266

Proprietors
Downie Stewart Foundation

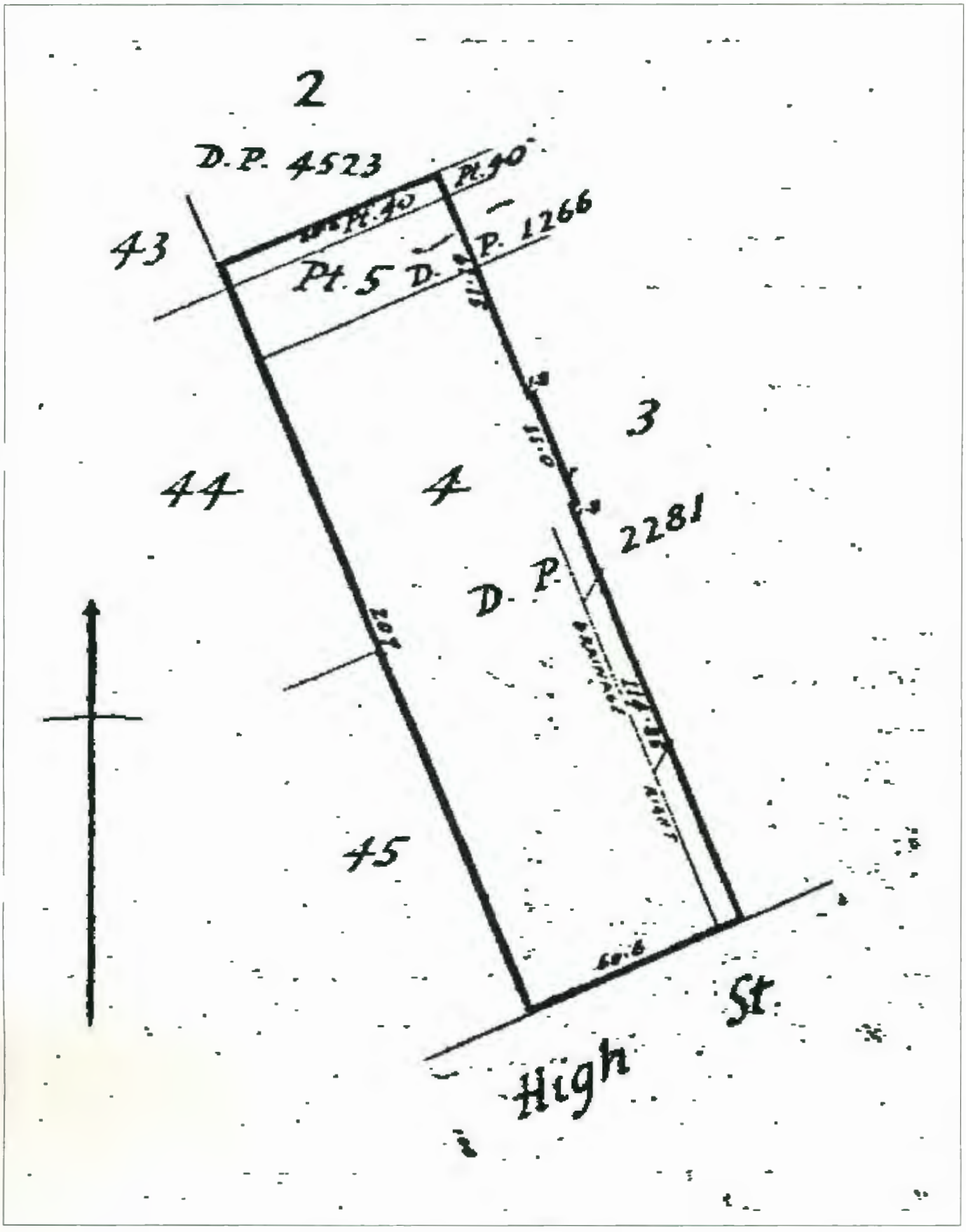
Interests

Subject to a drainage right over part Lot 4 appurtenant to other part said Lot 3 (CT OT368/121) created by Transfer 57861

Subject to a right to project eaves over part Lot 3 herein appurtenant to other part said Lot 3 (CT OT368/121) created by Transfer 57861

923890.2 Mortgage to (now) Westpac New Zealand Limited - 31.1.1997 at 12.40 pm

6629826.4 Variation of Mortgage 923890.2 - 1.11.2005 at 9:00 am


2
D. P. 4523
Pt. 40
Pt. 40
43
Pt. 5 D.
P. 1266
3
44
4
2281
D. P.
45
High
St.

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

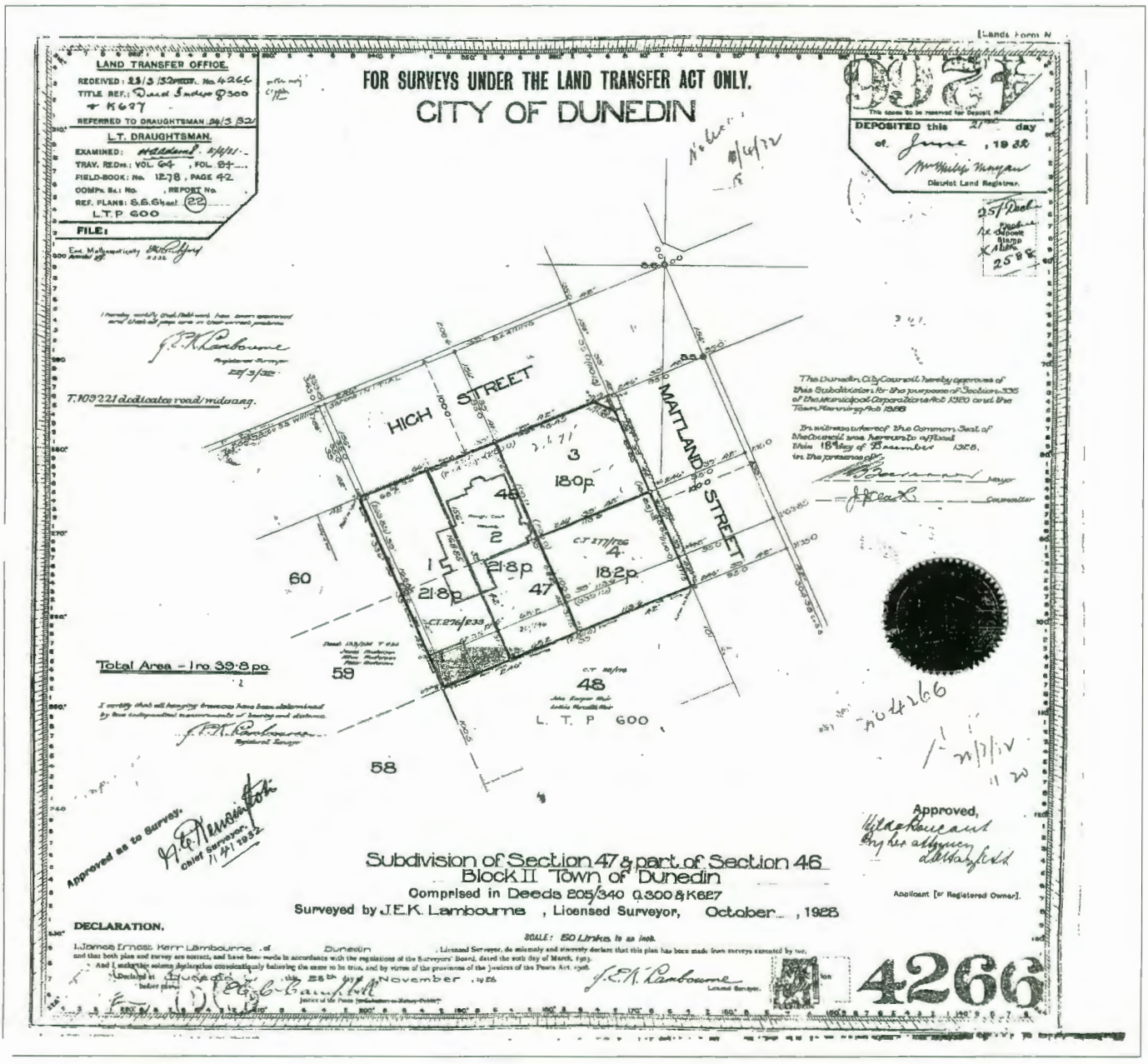
Identifier	**OT276/233**
Land Registration District	**Otago**
Date Issued	08 May 1936

Prior References
OT252/291

Estate	Fee Simple
Area	551 square metres more or less
Legal Description	Lot 1 Deposited Plan 4266

Proprietors
Downie Stewart Foundation

Interests
6629826.2 Mortgage to (now) Westpac New Zealand Limited - 1.11.2005 at 9:00 am


FOR SURVEYS UNDER THE LAND TRANSFER ACT ONLY.
CITY OF DUNEDIN
LAND TRANSFER OFFICE.
L.T. DRAUGHTSMAN.
L.T.P 600
FILE:
DEPOSITED this 27th day of June, 1932
District Land Registrar.
HIGH STREET
MATLAND STREET
180p
218p
218p
182p
Total Area - 1ro 39·8 po.
L. T. P 600
Approved as to Survey.
Chief Surveyor.
Approved,
Subdivision of Section 47 & part of Section 46
Block II Town of Dunedin
Comprised in Deeds 205/340 0.300 & K627
Surveyed by J.E.K. Lambourne, Licensed Surveyor, October, 1928
DECLARATION.
SCALE: 50 Links to an inch.
4266

COMPUTER FREEHOLD REGISTER UNDER LAND TRANSFER ACT 1952

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**OT14C/712**
Land Registration District	**Otago**
Date Issued	29 June 1992

Prior References
GN 435253 GN 806488

Estate	Fee Simple
Area	551 square metres more or less
Legal Description	Lot 2 Deposited Plan 4266

Proprietors
Downie Stewart Foundation

Interests

Subject to Section 11 Crown Minerals Act 1991

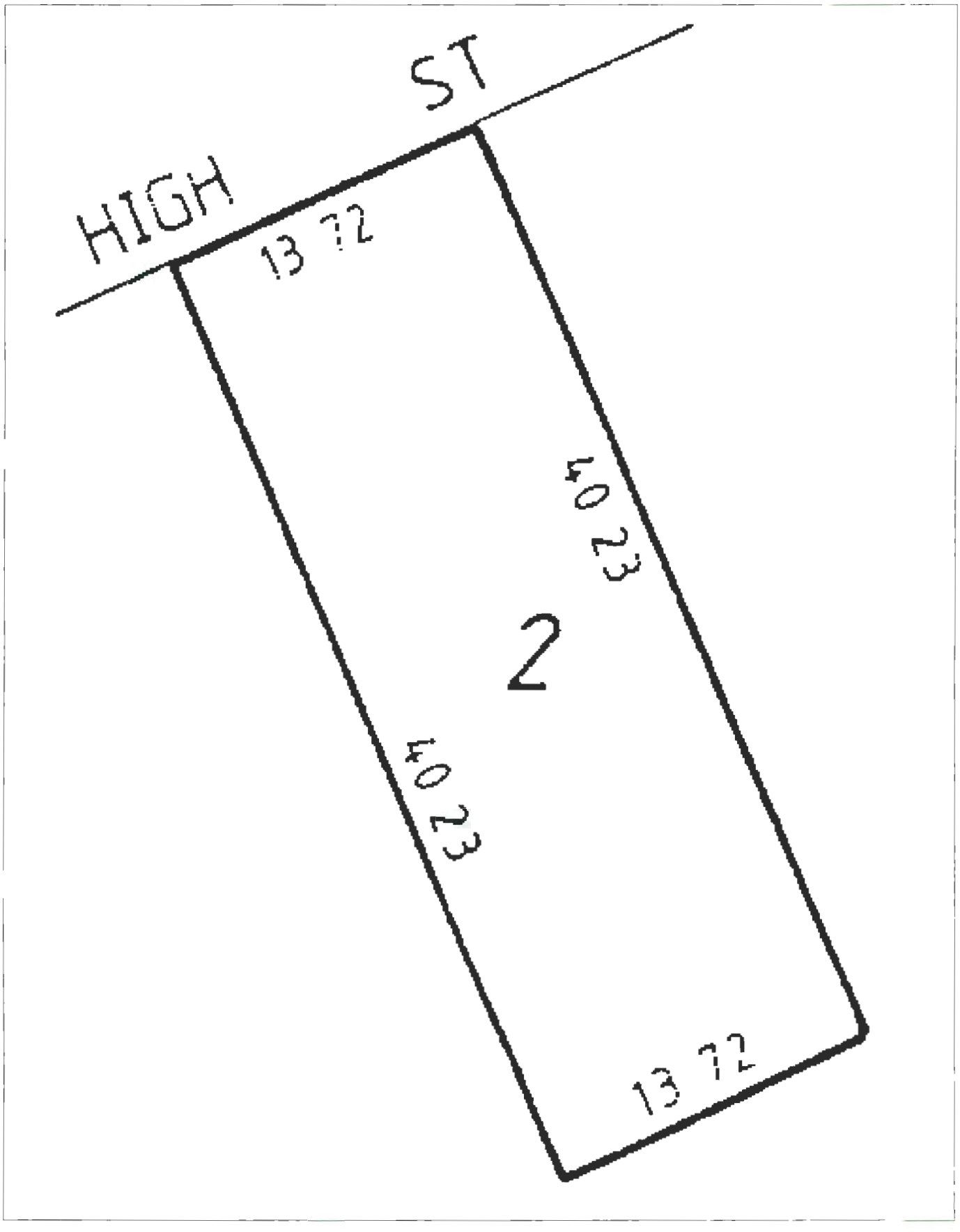
Subject to Part IV A Conservation Act 1987

942727.3 Mortgage to (now) Westpac New Zealand Limited - 26.1.1998 at 3.02 pm

982823.1 Variation of Mortgage 942727.3 - 8.2.2000 at 11.08 am

984749.1 Variation of Mortgage 942727.3 - 9.3.2000 at 3.29 pm

6629826.3 Variation of Mortgage 942727.3 - 1.11.2005 at 9:00 am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