Horowhenua
DISTRICT COUNCIL

Land Information Memorandum



Land Information Memorandum

LIM2026/6026

ISSUED UNDER SECTION 44A OF THE LOCAL GOVERNMENT OFFICIAL INFORMATION AND MEETINGS ACT 1987

APPLICANT DETAILS	
Applicant:	Daniel Lawry
Mailing Address:	1097 Queen Street East, Levin 5510
Phone:	021 242 4682
Email Address:	daniel.lawry@homestead.co.nz

LOCATION OF PROPERTY	
Site Address:	1097 Queen Street East Levin Rural 5571
Legal Description:	Lot: 1 DP: 368677
Current Owner:	Daniel James Lawry and Joanne Esther Lawry
Valuation No:	1484008313
Area:	5288 square metres more or less
R/T/Identifier:	279003

Operative District Plan:	Approved 3 June 2015 Operative Date 1 July 2015
Zoning:	Rural
Overlay:	Not Applicable
Structure Plan:	Not Applicable **Note**: Property is adjacent to Tara Ika Structure Plan 13 Area – Refer to attached Map

Permitted Land Use Activities:	See attached. For conditions relating to Permitted Land Use Activities, please see the Operative District Plan available for viewing on Council's website Operative Horowhenua District Plan 2015 - ePlan - Horowhenua District Council

RESOURCE/PLANNING CONSENTS PREVIOUSLY ISSUED:	
Land Use	
For Property	**LUC/2014/3519** - Building Setbacks – Decision Approved 15/08/2014
In Locality *(only refers to contiguous properties and those directly opposite the site)*	None
Subdivision	
For Property	**SUB/2005/20001218** - Create 7 rural allotments. Subdivision of Lots 5 & 7 DP 74728 – Decision Approved 27/06/2005
In Locality *(only refers to contiguous properties and those directly opposite the site)*	**SUB/2005/20001218** - Create 7 rural allotments. Subdivision of Lots 5 & 7 DP 74728 – 1095 Queen Street, Levin Rural and 12 & 20 Wakefield Road, Levin Rural - Decision Approved 27/06/2005 **SUB/2017/15** - Boundary adjustment on versatile soils in rural zone – 1101 Queen Street, Levin Rural – Decision Approved 12/04/2017
For further information on any of the Resource/Planning Consents listed above, files can be viewed at the Planning Department of the Council, 126 Oxford Street Levin.	
Development Contributions Owing – Currently None Please Visit the following for further information regarding Development Contributions Policy and Guidance. Development Contributions - Horowhenua District Council	

Note:
The Horowhenua District Council does not hold formal records in relation to resource consents issued by Horizons Regional Council. If you wish to obtain formal records held by the Regional Council for the subject property or to obtain information on resource consents that have been issued or applied for in the locality of this site, please contact Horizons Regional Council.

District Advice - Horizons Regional Council
11-15 Victoria Avenue
Palmerston North 4410
0508 800 800

Designations Applying to the Property:	No **Note:** Applicants are advised to consult with the New Zealand Transport Agency regarding any queries relating to State Highways (existing or proposed).
Easements over the Property:	Yes - Please refer to attached Record of Title.
Heritage Values:	No

Archaeological Sites	No **Note:** You cannot modify or destroy archaeological sites without first obtaining an archaeological authority from Heritage New Zealand. You can find more information here: Heritage New Zealand - Affecting an archaeological site Please contact the Planning Team at Council for any queries regarding potential impact to future Resource/Planning/Building Consents
Outstanding Natural Features and Landscapes:	No
Council Underground Services Located within the Property:	No

NATURAL HAZARDS THAT AFFECT OR HAVE THE POTENTIAL TO AFFECT THE LAND	
Natural Hazards Identified in District Plan:	
Flood Hazards:	None Known for This Property
Coastal Hazard Area:	None Known for This Property
Subsidence:	None Known for This Property
More information about natural hazards identified in the district plan can be found here Operative District Plan 2015 - Chapter 8 - Objectives/Policies: Natural Hazards **District Plan rules relating to natural hazards specific to the property can be found in the Operative District Plan, which is available for viewing on Council's website.** **Operative Horowhenua District Plan 2015 - ePlan - Horowhenua District Council**	
Natural Hazards Identified in Horowhenua District Council Records:	
Liquefaction Vulnerability Category:	Liquefaction vulnerability has been categorised for this property as **Undetermined.** If you are planning on building new buildings on the property, more detailed site-specific assessments may be required. For more information please visit: https://www.horowhenua.govt.nz/Services/Building-Planning-Services/Building/Building-Consents-Information/Building-Consents/Land-subject-to-natural-hazards#section-3 **Context:** In May 2022 Tonkin & Taylor Ltd were commissioned by Horowhenua District Council to undertake a high-level liquefaction vulnerability assessment of our main urban areas and associated future growth areas identified the Horowhenua Growth Strategy 2040. The report titled "Options for Liquefaction Assessment for Resource and Building Consent" is available on request by email to enquiries@horowhenua.govt.nz.

	Horowhenua District Council commissioned Tonkin & Taylor to carry out a further assessment and a report titled "Options for Liquefaction Assessment for Resource and Building Consent" was undertaken in June 2023 and is available as "Appendix B" through the link above. Horowhenua District Council has made the liquefaction maps available online to assist people wanting to build new buildings with the changes to the New Zealand Building Code that came into effect on 29 November 2021. If you would like more information on the changes to the building code in relation to liquefaction vulnerability and what they mean for you if you are wanting to build a new building then please visit: https://www.horowhenua.govt.nz/Services/Building-Planning-Services/Building/Building-Consents-Information/Building-Consents/Land-subject-to-natural-hazards#section-2
Inundation (flooding/ponding):	None Known for This Property
Fault Lines:	None Known for this Property.
Notices Under Section 133BT of the Building Act 2004	None Known for This Property
Notification of a building consent that relates to a natural hazard on the land concerned	None Known for This Property
Disclaimer: For each potential natural hazard outlined above, the potential impact of climate change that exacerbates the natural hazards is not known nor is the cumulative or combined effects of the hazards and impacts in relation to this property.	
Natural Hazards Identified in Information Provided by Horizons Regional Council:	
Horizons Regional Council hold information on natural hazards and some of this information is accessible from Horizons Natural Hazard Viewer. The Natural Hazard Viewer holds regional scale information about flooding, fault lines, liquefaction, coastal and volcanic hazards. The Natural Hazard Viewer also includes useful website links and access to some technical reports. Please take the time to read the Terms and Conditions.	
Flooding:	Part 3: Horowhenua District - Horizons Commissioned Flood Modelling Information Property is within Flood Hazard 200 yr – Modelled Wet Extent Area Horizons Flood Plain Mapping Refer to Part 3: Technical Report Information and Plain Language Summary for more information and/or contact Horizons Regional Council District Advice Team. https://www.horizons.govt.nz/managing-natural-resources/district-advice

	Part 2: Horizons Flooding Maps in regional Plan and known Flooding Information (Observed) None Known for This Property
Earthquake:	Part 1: Horizons Natural Hazard Viewer None Known for This Property
Liquefaction:	Part 1: Horizons Natural Hazard Viewer None Known - Area Not Modelled
Tsunami:	Part 1: Horizons Natural Hazard Viewer None Known for This Property
Coastal Hazards (and Erosion):	Part 1: Horizons Natural Hazard Viewer None Known
Volcanic & Geothermal Activity:	Part 1: Horizons Natural Hazard Viewer None Known for This Property
DISCLAIMER: The natural hazards noted in this LIM relate only to this property. For more information on any of the natural hazards outlined above, including information about whether there are any natural hazards on adjacent land or in the vicinity of the property, refer to Horizons Regional Council Natural Hazard Viewer Horizons Regional Council Natural Hazard Viewer	
Other Special Land Features:	
Presence of Hazardous Contaminants:	None Known for This Property
Notable Trees:	None Known for This Property

BUILDING CONSENTS/PERMITS PREVIOUSLY ISSUED AND HELD IN HOROWHENUA DISTRICT COUNCIL RECORDS

Note:
Code Compliance Certificate are not required for building permits issued prior to the Building Act 1991. Under the Act the owner is responsible for requesting final inspections and the issue of completed Code Compliance Certificates.

Building Consent and/or Permit	Purpose of Works	Date Approved	Code Compliance Certificate Issued
BC 2014/337	Construction of a new 7-bedroom dwelling, study, sewing room and attached garage	04/08/2014	No CCC Issued "Please refer to Building Team"

QV indicates a dwelling was built circa 2014.

Please refer to the attached plans from Quotable Value New Zealand.

Please Note: Horowhenua District Council accepts no responsibility for floor plans not held at Council.

OTHER CONSENTS (excluding resource/planning consents and building consents), CERTIFICATES, NOTICES, ORDERS, REQUISITIONS OR LICENCES ISSUED UNDER THE RESOURCE MANGEMENT ACT 1991, THE BUILDING ACT 1991 & 2004, THE HEALTH ACT AND OTHER APPROPRIATE ACTS OR POLICY.	
Consent Notice:	Yes - Please refer to copy of Record of Title.
Notice To Fix:	No
Health Act Notice:	No
Abatement Notice:	No
Enforcement Order:	No
Certificates of Compliance:	No
Seismically Assessed Buildings	Earthquake-prone Information: The Territorial Authority has no information held in the Seismic Assessments Register. Please visit https://www.horowhenua.govt.nz for more information on Earthquake-prone buildings.
Building Exemptions:	No
Certificate of Acceptance:	No
Certificate of Public Use:	No
Compliance Schedule:	No
Dangerous Goods Licence:	Council do not hold records – Contact EPA (Environmental Protection Authority) New Zealand – Hazardous Substances 0800 225 537 for further information or visit: https://www.epa.govt.nz
Liquor Licence:	No
Health Registration/Licence:	No
Building (Pools) Amendment Act 2016, Certificate:	No
Note: If a swimming pool over 400mm deep is situated on the property it is required to be fenced under the Building (Pools) Amendment Act 2016 and in accordance with F9 of The Building Code.	

RATES AND VALUATIONS The rating valuations are shown below. The valuations will be used by Horowhenua District Council to determine rating from 1 July 2026.	
Annual Rates (2026/2027):	$4,249.09
Current Rates Instalment Amount for this quarter:	$1,062.28
Date to which Rates Paid:	30/06/2026
Next Rates Due:	15/09/2026

Rate Arrears (if any):	$0.00
Rating Valuations (2025)	The values will be used by Horowhenua District Council to determine rating from 1 July 2026.
Capital Value	$1,870,000
Improvements Value	$1,455,000
Land Value	$415,000

Note:
Horizons Regional Council (trading name of the Manawatu-Wanganui Regional Council) separately charge for Regional Rates. Please contact Horizons Regional Council for this information, quoting the Valuation Number. Contact phone 0508 800 800.

HOROWHENUA DISTRICT COUNCIL SERVICE CONNECTIONS	
WATER SERVICES	
Is this property connected to a Council Water Supply?	Yes - A council-supplied water connection is available up to the property boundary. Any connection to this on the property side of the boundary is the responsibility of the property owner
Are there any conditions or restrictions for supply?	Yes - Council supply. Please refer to table below for applicable charges and or restrictions. Meter Number – 0312609238 Last Reading – 10 Last Reading Date – 21/08/2026 Total Water Balance - $0.00
Are there any known other water suppliers?	Unknown Applicant's are advised to check with Horizons Regional Council regarding rights to any ground or surface water supplies existing or required. District Advice - Horizons Regional Council 11-15 Victoria Avenue Palmerston North 4410 0508 800 800

SEWER SERVICES	
Is this property connected to a sanitary sewer?	No - A council-supplied sewer connection is not available up to the property boundary.
Are there any conditions or restrictions for supply?	Yes, refer to Consent Notice/s identified on copy of Record of Title for conditions.
Advisory Note:	Prior to lodgement of a new building consent or service connection the applicant must satisfy themselves that the connection will meet their design requirements.

LEVIN, WHIROKINO, OHAU, FOXTON, SHANNON AND TOKOMARU WATER SUPPLY METER CHARGES

The water charge in both the urban and rural areas around Levin supplied with town water is the same for all types of properties where a water meter is in place.

Some rural properties have restricted supplies where a fixed amount of water is supplied at a continuous rate.

Each property, whether metered or not, pays an annual amount for the water supply through the property rates per connection. A rate of $804.89 for any rating unit that is connected to a water supply network. A rate of $402.45 for any rating unit that is available to be connected to a water supply network.

Metered properties are entitled to receive an allowance of 91m³ (91,000 litres) during each 3 month charging period at no cost. The balance of any water use beyond the allowance is charged for at the rate of $2.88c/per m³.

These figures include GST.

Signed:

Debbie Key
Customer Support - LIMs and Consenting

DATED AT LEVIN THIS 7TH DAY OF SEPTEMBER 2026

DISCLAIMER/WARNING:

This Land Information Memorandum (LIM) has been prepared in accordance with sections 44A and 44B of the Local Government Official Information and Meetings Act 1987 (LGOIMA). Information contained in this LIM report, including any natural hazard information, is based on historic records held by Horowhenua District Council as at the date of issue. This information may come from a range of internal and external sources and may include data that is incomplete, uncertain, or subject to change over time.

The LIM is based on a search of Council records only. No site inspection has been carried out, and Council records may not include unauthorised or illegal building work or activities. There may also be other information relating to the land that is unknown to Council.

The information is provided in good faith, based on the records available to Council at the time of issue. Council has not independently verified the accuracy or completeness of this information and accepts no responsibility or liability for any errors, omissions, or inaccuracies, or for any loss, damage, or harm that may result from its use or reliance.

Users rely on this information at their own risk. If any details from this LIM or from GIS mapping are to be used in support of a resource consent or other statutory process, they should be independently verified. Independent professional advice is strongly recommended where appropriate.

This LIM is valid as at the date of issue only and is for the recipient's use only.

Map Disclaimer

Digital map data displayed in the GIS is sourced from various databases and mapping systems. The information is provided in good faith but may be incomplete or inaccurate. If the information is relied on in support of a resource consent or other statutory process, it should be verified independently.

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**279003**
Land Registration District	**Wellington**
Date Issued	16 October 2006

Prior References
WN42C/416

Estate	Fee Simple
Area	5288 square metres more or less
Legal Description	Lot 1 Deposited Plan 368677
Registered Owners	

Daniel James Lawry and Joanne Esther Lawry

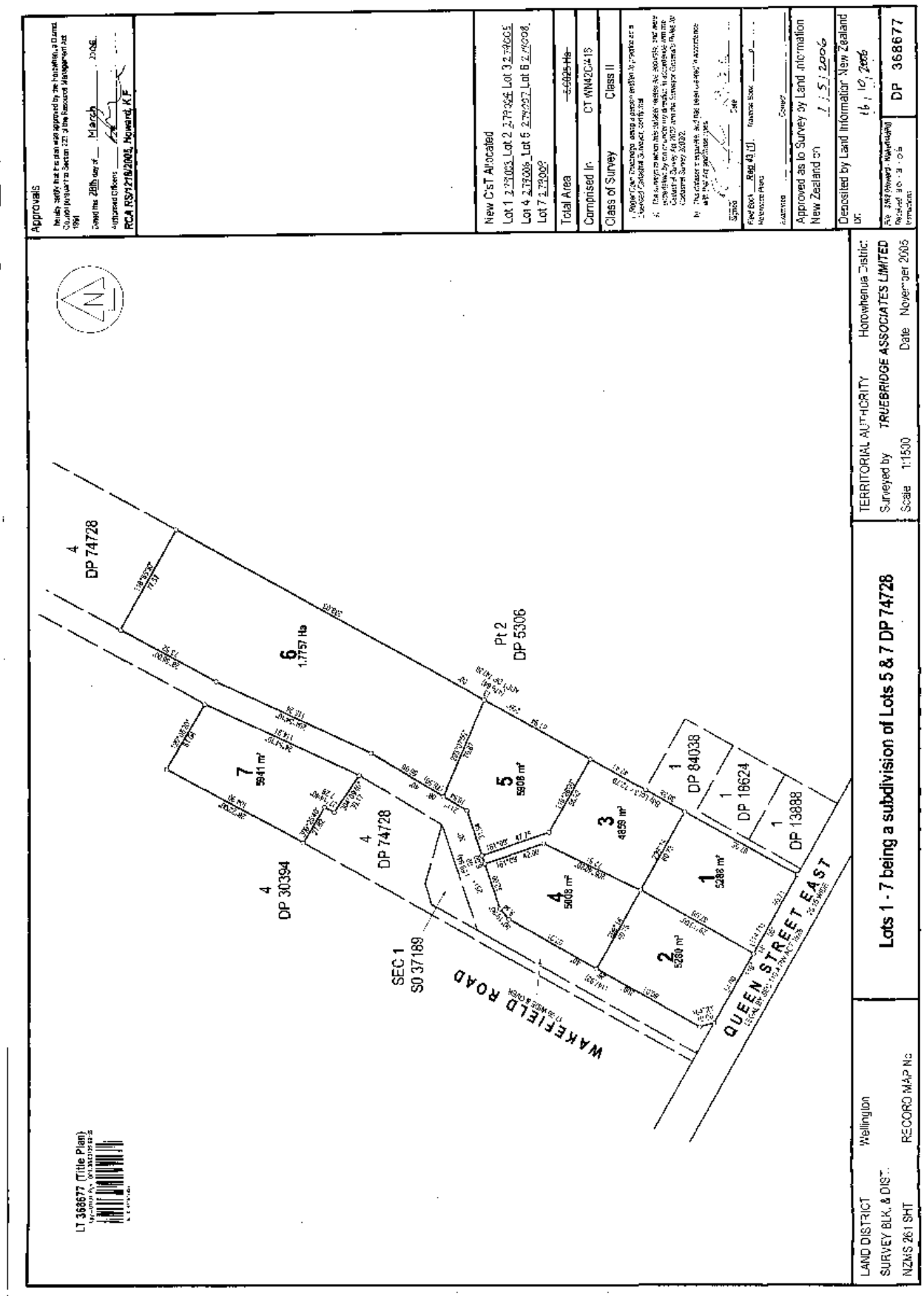
Interests

7072670.2 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 16.10.2006 at 9:00 am

7072670.3 Consent Notice pursuant to Section 221 Resource Management Act 1991 - 16.10.2006 at 9:00 am

Land Covenant in Easement Instrument 7072670.6 - 16.10.2006 at 9:00 am

9946372.1 Mortgage to ASB Bank Limited - 14.5.2015 at 2:51 pm


Approvals
RCA RS3216/2005, Howard, K.F
New CsT Allocated
Lot 1 279004, Lot 2 279005, Lot 3 279006
Lot 4 279007, Lot 5 279008
Lot 7 279009
Total Area
Comprised In: CT WN42C/415
Class of Survey: Class II
Approved as to Survey by Land Information New Zealand
1/5/2006
Deposited by Land Information New Zealand
16/10/2006
DP 368677
LT 368677 (Title Plan)
LAND DISTRICT: Wellington
SURVEY BLK. & DIST.:
NZMS 261 SHT: RECORD MAP No.
Lots 1 - 7 being a subdivision of Lots 5 & 7 DP 74728
TERRITORIAL AUTHORITY: Horowhenua District
Surveyed by: TRUEBRIDGE ASSOCIATES LIMITED
Scale: 1:1500
Date: November 2005
WAKEFIELD ROAD
QUEEN STREET EAST
SEC 1 SO 37189
4 DP 74728
4 DP 30394
6 1.7757 Ha
7 5941 m²
5 5906 m²
4 5906 m²
3 4859 m²
2 5289 m²
1 5286 m²
Pt 2 DP 5306
1 DP 84038
1 DP 18624
1 DP 13888

HOROWHENUA DISTRICT COUNCIL

The Subdivision of Lots 5 & 7 DP 74728

CONO 7072670.2 Cons
Cpy - 01/01, Pgs - 001, 16/10/06, 10:07
DocID: 411754230

Rural Subdivision No. RS 1218

CONSENT NOTICE

In the matter of the plan LT 368677 and pursuant to Section 221(1) of the Resource Management Act 1991, I hereby certify that the Horowhenua District Council has consented to the subdivision of Lots 5 & 7 DP 74728 on condition that :

> "A consent notice shall be registered against the titles of Lots 1,2,3,4,5,6,and 7 stating that any onsite effluent disposal system to be installed on these lots is to be in compliance with the requirements of Horizons Regional Council "Land and Water Regional Plan" (Aug 2003) and the Manawatu Catchments Water Quality Regional Plan (Oct 1998). Written approval of this shall be submitted to Horowhenua District Council. Issuance of the Project Information Memorandum & Building Consent is subject to approval of the wastewater disposal design by the Regional Authority. No works shall commence prior to issuance of the same. It is to be designed and installed by a professional and suitable qualified person experienced in onsite effluent disposal systems. Any on-site system is to comply with the standards set out in the 'Minimum Requirements for On-site Effluent disposal within the Horowhenua' - adopted and endorsed by both the Regional and District Council."

Dated at Levin this 24th day of August 2006

A Thomas
Environmental & Regulatory Services Manager

HOROWHENUA DISTRICT COUNCIL

The Subdivision of Lots 5 & 7 DP 74728

CONO 7072670.3 Cons
Cpy-01/01,Pgs-001,16/10/06,10:08
DocID. 411764231

Rural Subdivision No. RS 1218

CONSENT NOTICE

In the matter of the plan LT 368677 and pursuant to Section 221(1) of the Resource Management Act 1991, I hereby certify that the Horowhenua District Council has consented to the subdivision of Lots 5 and 7 DP 74728 on condition that :

> "A Consent Notice shall be registered against the titles of Lots 1 to 4 requiring that the owners of these lots shall consult with Horizons Regional Council to determine appropriate floor levels for any dwellings located on these lots. This will need to be shown on any building consent application at the time of applying for Building Consent."

Dated at Levin this 24th day of August 2006

A Thomas
Environmental & Regulatory Services Manager

PART 3 Provision of Natural Hazard Information for LIMs from Horizons Regional Council Version 28/10/2025

Horowhenua District

Technical Report Details and Plain Language Summaries for Horizons Commissioned Flood Modelling Information

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East of Levin Flood Model - 2021 2

Ōhau - Manakau Flood Model - 2021 2

Waikawa – Manakau Flood Model - 2008 (Partially Superseded) 3

Breach Models: Aokautere, Whakarongo, Poplar Road, Moutoa Floodway, Dalrymple Road, Flock House and Tangimoana - 2008 4

Horowhenua District Only:

East of Levin Flood Model - 2021

Title: Flood Modelling of the Mangaone Stream and East of Levin - Model Build Report
Author: Jacobs (Jacobs New Zealand Limited)
Date: 3 December 2021
Commissioned by: Horizons Regional Council
Purpose and scope: Horizons Regional Council commissioned Jacobs to develop hydraulic models for two areas:

1. The Mangaone Stream from its headwaters downstream to Milson Line
2. The area bounded by the eastern side of Levin and the foot of the Tararua Ranges, including the Koputaroa Stream but excluding the Ōhau River in the south.

Both of the above catchments areas were modelled for 10%, 0.1% and 0.5% Annual Exceedance Probability (AEP) flood events.

The purpose of this project was to develop models that would identify areas that are subject to flooding and also those areas that have low flood risk and that could provide future development opportunities.

This report describes the model inputs and the outputs from the two models as well as describing the limitations of the models.

The primary output resulting from this modelling were maps of the extent and depth of floodwaters associated with 10%, 1% and 0.5% AEP flood events.

Access: The report can be accessed from Horizons website: www.horizons.govt.nz/managing-natural-resources/district-advice/natural-hazard-technical-reports

Horowhenua District Only:

Ōhau - Manakau Flood Model - 2021

Title: Ōhau-Manakau - Flood Modelling and Level of Service Assessment
Author: Stantec
Date: August 2021
Commissioned by: Horizons Regional Council
Purpose and scope: Horizons Regional Council commissioned Stantec to develop a hydraulic model of the Ōhau River and the Kuku, Waikawa and Manakau Streams to determine:

- The performance of the Ōhau-Manakau Drainage Scheme
- areas and structures that would be require upgrading in order to provide protection from floods with Annual Exceedance Probability (AEP) ranging between 10% and 0.5% .

The purpose of this modelling project was to identify areas of the scheme requiring upgrade and also areas that are subject to flooding and also those areas that have low flood risk and that could provide future development opportunities.

This report describes the model inputs, and the outputs from the model, as well as describing the limitations of the model.

As well as establishing areas of the Ōhau-Manakau Drainage Scheme requiring upgrade, the modelling also provided maps of the extent and depth of flooding associated with 1% and 0.5% flood events.

The primary outputs resulting from this modelling were maps of the extent and depth of floodwaters associated with 1% and 0.5% AEP flood events.

Secondary modelled outputs were maps showing confidence in the modelling associated with 10% and 4% AEP flood events.

Access: The report can be accessed from Horizons website: www.horizons.govt.nz/managing-natural-resources/district-advice/natural-hazard-technical-reports

Horowhenua District Only:

Waikawa – Manakau Flood Model - 2008 (Partially Superseded)

Please note that most of this model has been superseded by the Ohau-Manakau 2021 flood modelling.

Title: Waikawa and Manukau Streams Floodplain Hazard Assessment Hydraulic Modelling and Mapping (Note misspelling of Manakau in title of report)
Author: DHI Water and Environment Limited
Date: November 2008
Commissioned by: Horizons Regional Council
Purpose and scope: Horizons Regional Council commissioned DHI Water and Environment to develop a hydraulic model of the Waikawa and Manakau Streams, between the base of the Tararua range and the coast, to establish the extent and depth of flooding associated with the 1% and 0.5% Annual Exceedance Probability (AEP) flood events.

The purpose of this project was to develop a model that would identify areas that are subject to flooding and also those areas that have low flood risk and that could provide future development opportunities.

This report describes the model inputs and the outputs from the two models as well as describing the limitations of the models.

The primary output resulting from this modelling were maps of the extent and depth of floodwaters associated with 1% and 0.5% AEP flood events.

Secondary modelled outputs were several maps of the extent and depth of flooding as well as level, velocity and hazard associated with events with 1% and 0.5% AEP when coupled with storm surge.
Access: The report can be accessed from Horizons website: www.horizons.govt.nz/managing-natural-resources/district-advice/natural-hazard-technical-reports

Rangitīkei District, Manawatū District, Palmerston North and Horowhenua Districts:

Breach Models: Aokautere, Whakarongo, Poplar Road, Moutoa Floodway, Dalrymple Road, Flock House and Tangimoana - 2008

Title: Manawatū and Rangatīkei Rivers Flood Hazard Assessment: Hydraulic Modelling and Mapping Report (Note misspelling of Rangitīkei in the report title)
Author: Hydro Tasmania Consulting
Date: 15 January 2008
Commissioned by: Horizons Regional Council
Purpose and scope: Horizons Regional Council commissioned Hydro Tasmania Consulting to develop hydraulic models for hypothetical breaches of stopbanks on the Rangitīkei and Manawatū Rivers, during a significant flood event.

The primary purpose of this model development was to inform emergency management of the likely extent and depth of flood waters should a breach occur during a significant flood event at, or near, one of the locations modelled. The modelled outputs are also indicative of some of the extent and depth of floodwaters that would occur in the event of an over design flood event occurring in the Manawatū or Rangitīkei Rivers.

The stopbanks in the vicinity of the breach locations modelled do not have any known weaknesses and these locations were chosen as they would demonstrate the worst-case situation in the event of a breach occurring in the general vicinity.

The primary outputs from the modelling of hypothetical stopbank breaches were maps of extent and depth of flood waters associated with breaches at the following locations:

Model 1 – Manawatū River at Aokautere
Model 2 - Manawatū River at Whakarongo
Model 3 – Manawatū River at Poplar Road
Model 4 – Moutoa Floodway (right bank)
Model 5 – Rangitīkei River at Dalrymple Road
Model 6 – Rangitīkei River at Flock House
Model 7 - Rangitīkei River at Tangimoana

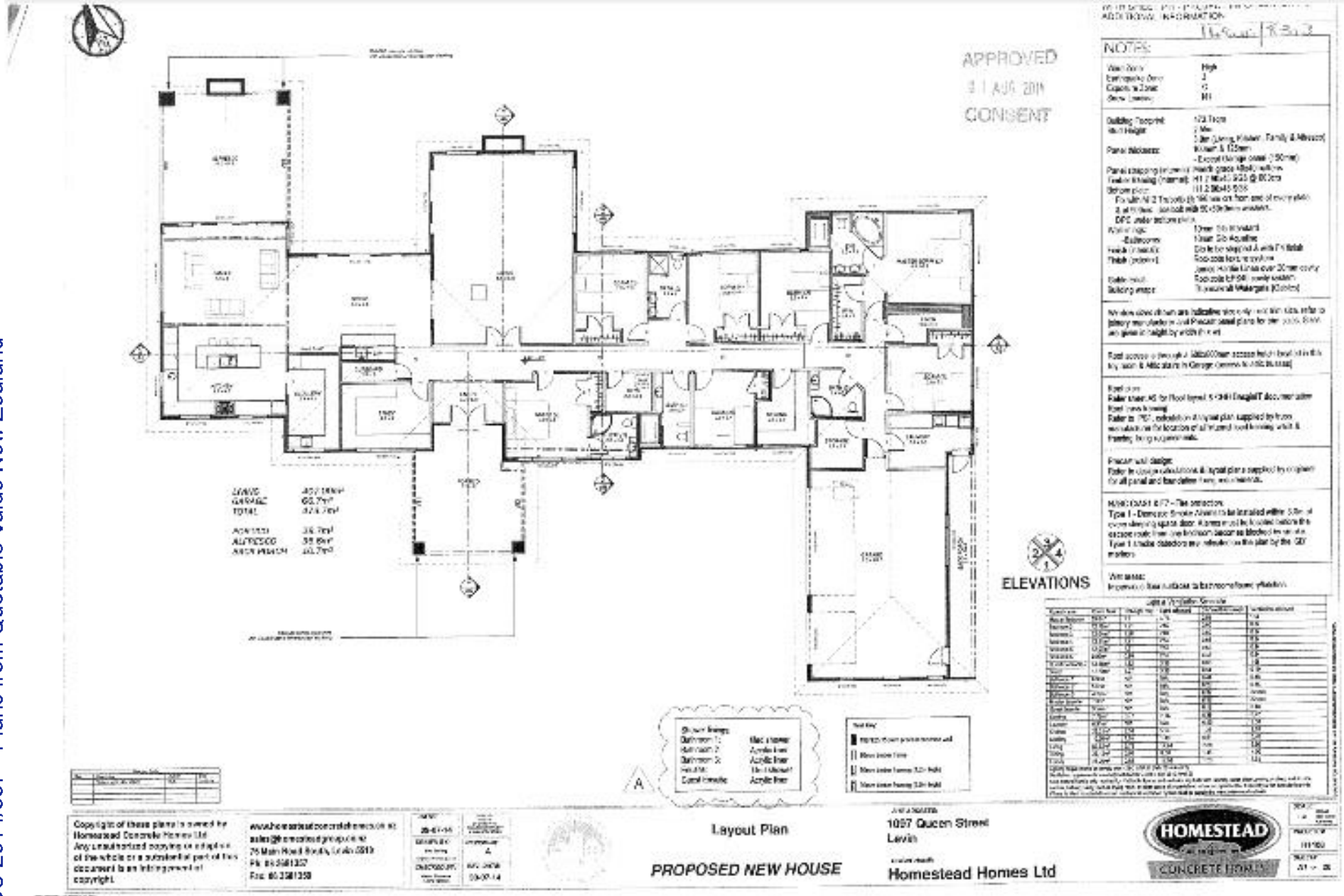
Secondary modelled outputs were maps of the peak flood levels, velocity and hazard associated with the modelled events.

This information only considers out of channel flooding and it does not consider localised, surface or stormwater flooding. As it only represents one of many flooding scenarios, further investigation will most likely be required.

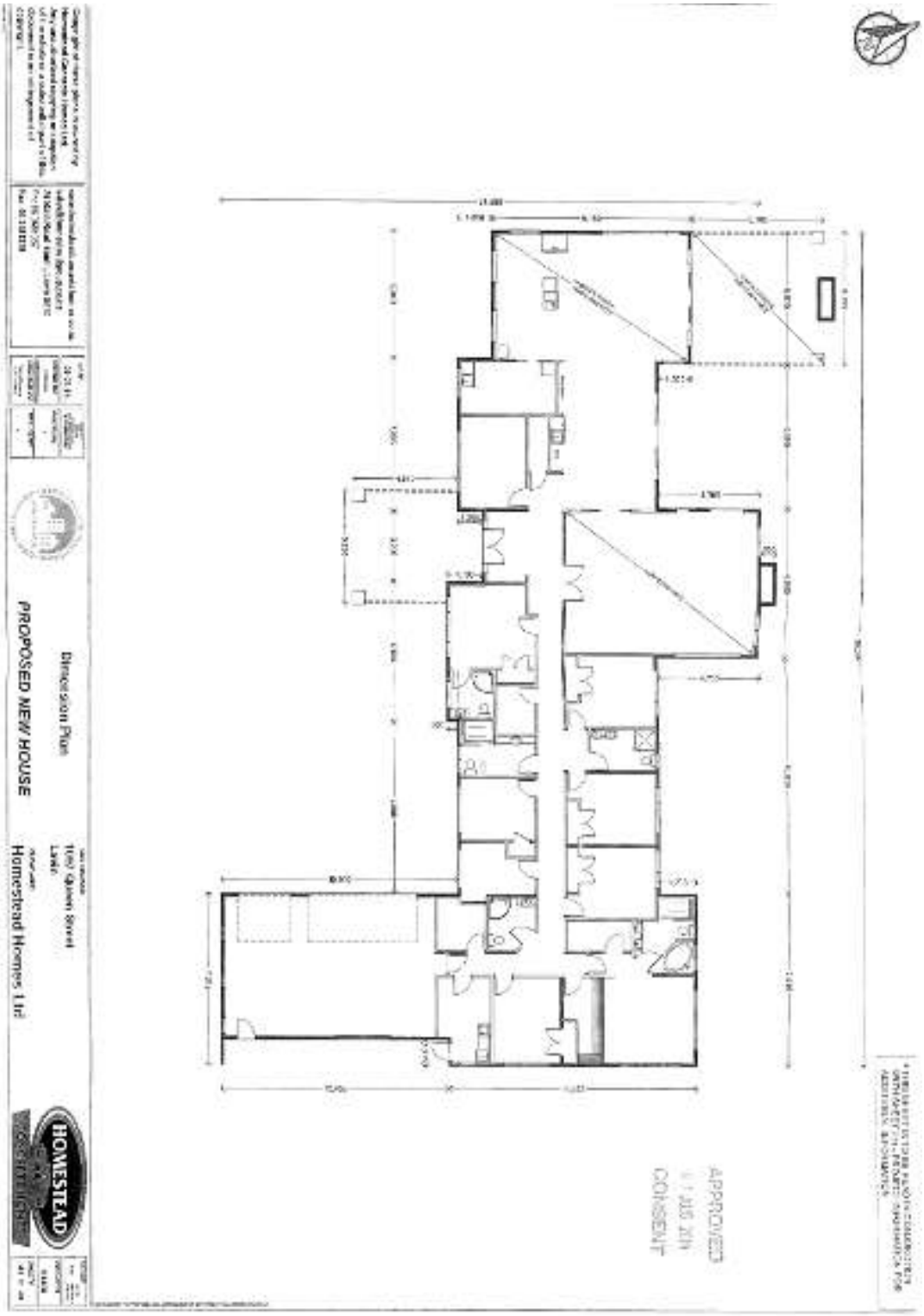
Access: The report can be accessed from Horizons website: www.horizons.govt.nz/managing-natural-resources/district-advice/natural-hazard-technical-reports

END OF DOCUMENT

BC 2014/337 - Plans from Quotable Value New Zealand



BC 2014/337 - Plans from Quotable Value New Zealand



Horowhenua

124 Oxford Street
Levin
Phone 06 366 0999

SITE NOTICE

Consent No: **20140337** Date Printed: **16 March 2015**

Applicant: **Homestead Concrete Homes Limited**

Valuation Ref:

Site Address: **1097 Queen Street East, LEVIN RURAL**

Work Type: **New Residential Dwelling**

Inspection Type: **Final Inspection**

Inspection Status: **Pass**

Inspected By: **Colin Gibbs**

Inspection Date: **16 March 2015**

Passed Items

Interior	
Layout as per plans	**Layout as per plan**
Sinks drain	
Toilets	**all seals held**
Impervious floors to wet areas	
Joinery	
Windows	
Ventilation	
Mechanical vents	
Smoke detectors	**smoke detection hardwired**
Safety glazing to shower doors and panels	
Safety glazing to windows and doors	
Waterproof seal	
Water temperature checked	**55 deg**
Hwc secure	**3 straps**
Hwc relief pipe	
Hwc high or low pressure	**High pressure**
Hwc open or valve vented	**Valve**
Tempering valve	
All valves accessible	
Roof access	
Insulation away from downlights	
Pipework	
1m of copper pipe from cylinder	
B/c memorandum check	
Exterior	
Cladding type	**Concrete Panel**
As per plans	
Roofing	**Pressed tile fixed as required**
Roofing type	**Pressed tile**
Windows flashed/sealed to soffit	**all windows recessed and sealed**
Ground levels ok	**Ground levels good**
Gully heights	**Gulley trap height complies**
Waste pipes sealed through Foundations	

Waste pipes sealed into gullies	
Stormwater	**Stormwater system to soakage pit**
Terminal vents in place	**80 mm vent**
Exterior weatherproof	
Driveway	
Landscaping completed?	
Gutter/downpipe sizes	

Documentation	**Status**
Roof Cladding Warranty	Required
Wall Cladding Warranty	Required
Wet Area membrane Warranty	Required
As built drainage plan	Required
Wastewater Disposal System installers declaration/Service contract	Required
Energy Works Certificate (Electrical)	Required

Licensed Building Practitioners	**Status**
Designer	Accepted
Carpentry	Required
Roofing	Required

Horowhenua DISTRICT COUNCIL

126 Oxford Street, Private Bag 4002, Levin 5540
T 06 366 0999 F 06 366 0983
www.horowhenua.govt.nz

Building Consent
Section 51, Building Act 2004

Building Consent No: 20140337

The Building

Street Address: 1097 Queen Street East, LEVIN RURAL
Legal Description: Lot: 1 DP: 365677
Valuation Number: 1484008313

The Owner

Name: Homestead Concrete Homes Limited
Contact Person: Neil Stirling
Street Addess/Registered Office: 76 Main Road South, Levin 5510
Phone Number: Landline: [redacted] **Mobile:** [redacted]
Fax Number: **Email:**
Website: [redacted]

First Point of Contact

The first point of contact for communications with the building consent authority.

Name: Homestead Concrete Homes Limited
Contact Person: Neil Stirling
Street Addess/Registered Office: 76 Main Road South, Levin 5510
Phone Number: Landline: [redacted] **Mobile:** [redacted]
Fax Number: **Email:**
Website: www.homesteadconcretehomes.co.nz

Building Work

The following building work is authorised by this building consent:

Construction of a new 7 bedroom dwelling with 5 bathrooms, study, sewing room and attached garage

This building consent is issued under section 51 of the Building Act 2004. This building consent does not relieve the owner of the building (or proposed building) of any duty or responsibility under any other Act relating to or affecting the building (or proposed building).

This building consent also does not permit the construction, alteration, demolition, or removal of the building (or proposed building) if that construction, alteration, demolition, or removal would be in breach of any other Act.

This Building Consent is subject to the following conditions:

There are no conditions relating to this building consent

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Building Consent Memorandum

1. Section 52, Building Act 2004 – Work is to commence within 12 months of issuance.

2. Section 92, Building Act 2004 – Owner must apply for Code Compliance Certificate as soon as building work is complete.

3. Section 93, Building Act 2004 – Building Consent Authority must decide whether to issue Code Compliance Certificate within 20 days of either:-

    - Receipt of Code Compliance application for or
    - 24 months from date of issue if no application is received.

4. At least 24 working hours notice shall be given for inspections as detailed in the inspection schedule contained in the job copy plans. No work shall commence or continue until approval is given by the Horowhenua District Council Building Control Officer.

5. Boundary pegs necessary for checking the correct siting of the building are to be exposed and "flagged". Where any doubt arises as to the accuracy of their location a surveyor shall be engaged to check or re-establish the peg position. (Note that fences are not a reliable indication of the boundary position on their own).

6. The engineer shall supervise the specific engineering design and submit a PS4 and site notes on completion before issuance of the Code Compliance Certificate.

7. The wastewater system installer's declaration and a copy of the service contract shall be submitted on completion.

Project Specific Information to be supplied with Code Compliance Application Form 6

Roof Cladding/Gutter/Fascia Warranty
Exterior Joinery Warranty
Exterior Cladding System Warranty
Wet Area Membranes Warranty
As-Built Drainage Plan (endorsed with registration number)
Waste Water Disposal System Installers Declaration and Service Contract
Energy Work Certificate – Electricity
PS3 Producer Statement – Construction - Precast Panels
PS4 Producer Statement – Construction Review/Site Notes

Notes:

Estimated Value:	$570,000.00
Floor Area:	475m2

Compliance Schedule
A compliance schedule is not required for the building.

Attachments
Copies of the following documents are attached to this building consent: Copy of Tax Invoice Stamped Job Copy Plans Development Contribution Notice

Colin Gibbs

Building Advisory Officer

On behalf of Horowhenua District Council

Date: 4 August 2014

THE INSPECTION PROCESS - Issued Consents
Whenever possible someone who has the authority to make decisions or act on behalf of the consent holder, should be on-site during the inspection process. Your approved plans and supporting documents must be on-site at the time of inspection.

WHAT WE WILL BE LOOKING FOR DURING EACH SPECIFIC INSPECTION
What we will be looking for during the inspection, what you need to do in preparation and when you need to call for the inspection is per the attached information sheets that are relevant to your consented works.

Other Considerations
Often byproducts of the construction process create complaints to the Council which can take up a considerable amount of our time.

We appreciate that your focus is generally concentrated on the physical construction of the building project; however many of the complaints the Council receives could be avoided if some simple steps were taken prior to commencement of the work.

If we are responding to a reasonable justifiable complaint relating to something that should have been done the Council reserves the right to recover the cost of the inspection.

Wind Blown Sand
Many of the building sites with the District especially in the beach areas are predominately sand which can cause problems once the grass cover is disturbed.

The resulting loose sand can be a significant nuisance to neighbouring properties and if not contained quickly drifts onto roads and blocks stormwater systems.

This is particularly prevalent during the summer period and the use of water to dampen loose sand is, due to water restriction, not an option.

Restrict the removal of vegetation to the immediate footprint of the building and cover any loose or stock piled sand with scrim or polythene.

Vibration or Shaking
The use of driven timber piles is a common method used for establishing foundations in our predominately sand and peat areas.

The physical driving of the piles can and often has caused a considerable amount of concern and stress to adjoining property owners due to a significant vibration and ground shaking as the piles are driven.

Often the first the Council hears of this occurring is through a call from a distressed neighbour complaining that his or home is being damaged as a result.

If we could suggest a simple early discussion with the neighbours advising of the intent to drive piles and a simple explanation of the resulting effect could avoid a potential confrontation.

Noise
The Council is often contacted over noise issues on building sites and they generally fall into two categories:

- construction noise
- music

Construction noise complaints are normally generated as a result of construction starting or finishing outside the normal 'working hours.'

Noise limits have been established in the Horowhenua District Plan and are controlled under the Resource Management Act 1991 as follows:

Time of Day (7 Days/week)	Limit at Boundary*
7.00 am to 10.00pm	55dBA (L_{10})
10.00 pm to 7.00 am	40dBA (L_{10})
10.00 pm to 7.00 am	65dBA (A) (L_{max})

*Note:

Where a construction site is zoned Industrial or Commercial 1 or 2, these limits apply at any nearby Residential or Rural zone boundary, but otherwise noise is limited to 65dBA (L_{10}) at all hours on all days of the week when measured at adjoining industrial or commercial boundaries.

Noisy construction work in or near Residential or Rural zones is not permitted before 7.00am or after 10.00pm on any day unless it can comply with the above limits when measured at the boundary.

Regardless of these limits, section 16 of the Resource Management Act 1991 states that every person has a duty to avoid unreasonable noise. Council can take enforcement action under this clause of the Act if the noise is viewed by Council as being unreasonable and the best practicable options for controlling noise have not been adopted.

The Council may grant permission for construction work to occur outside these times or noise limits if **emergency** works are necessary, or if work cannot be completed during normal working hours because of public safety or traffic hazards.

If you have special permission to work outside the permitted hours, it is advisable to notify any residents who may be affected by noise, about the times and days of operation and give them an on-site contact phone number.

Music on site is very common and if kept to a reasonable level will not be objectionable. However there are occasions when levels are unacceptable and lead to complaints from neighbours.

All noise generated on a building site whether from a radio or other sources are subject to the same limits. All it takes is some common courtesy and consideration towards neighbours.

DOGS

While it is our opinion that dogs do not belong on building sites we would remind you that if you choose to have your dog with you they must be under control at all times. If they wander or cause a nuisance to passersby or neighbours, you run the risk of being taken to task by the Council Animal Control staff.

TOILETS

Please provide suitable toilet facilities on site. You would be surprised at the number of complaints received by the Council for inappropriate urinating by builders on building sites particularly in built up residential areas.

In conclusion the Council wishes you all the best with your building project and please remember that if in doubt over any matter relating to your project we are only a phone call away on (06) 366 0999.

IPENZ ENGINEERS NEW ZEALAND NEW ZEALAND INSTITUTE OF ARCHITECTS ACENZ

HDC PROCEDURE
Building Code Clause(s) B1
Decision Accept / Decline
Pass / Fail
Procedure Type: Building Consent Structural Design
Reason Query Registered REF: 116573
Outcome Allowed for Building Consent Purposes
DATE: 25-07-14 BCO: TH

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance notes on the use of this form are printed on page 2)

ISSUED BY: KEVIN O'CONNOR & ASSOCIATES LIMITED
(Design Firm)

TO: Homestead Group
(Owner/Developer)

TO BE SUPPLIED TO: Horowhenua District Council
(Building Consent Authority)

IN RESPECT OF: Structural Design for New Residential Dwelling
(Description of Building Work)

AT: 1097 Queen Street East, Levin
(Address)
LOT 1 DP 368677 SO

We have been engaged by the owner/developer referred to above to provide Structural Design for New Residential Dwelling services in respect of the requirements of
(Extent of Engagement)
Clause(s) B1 of the Building Code for
All ☐ or Part only ☒ (as specified in the attachment to this statement), of the proposed building work.

The design carried out by us has been prepared in accordance with:

☒ Compliance Documents issued by the Ministry of Business, Innovation & Employment NZS1170 NZS3101 or
(verification method / acceptable solution)

☐ Alternative solution as per the attached schedule.

The proposed building work covered by this producer statement is described on the drawings titled Proposed New House and numbered SK1 – SK27; together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

(i) Site verification of the following design assumptions safe ground bearing capacity of 100kPa

(ii) All proprietary products meeting their performance specification requirements;

I **believe on reasonable grounds** that a) the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code and that b), the persons who have undertaken the design have the necessary competency to do so. I also recommend the following level of construction monitoring/observation:

☐CM1 ☐CM2 ☒CM3 ☐CM4 ☐CM5 (Engineering Categories) or ☐ as per agreement with owner/developer (Architectural)

I, DAMIAN EDWIN LINEHAN am:
(Name of Design Professional)

☒CPEng No. 1004738 #

☐Reg Arch #

I am a Member of : ☒ IPENZ ☐NZIA and hold the following qualifications CPEng

The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000*.

The Design Firm is a member of ACENZ: ☒

SIGNED BY DAMIAN EDWIN LINEHAN ON BEHALF OF KEVIN O'CONNOR & ASSOCIATES LIMITED
(Design Firm)

Date 3 July 2014 (signature)

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of $200,000.*

This form is to accompany **Form 2 of the Building (Forms) Regulations 2004** for the application of a Building Consent.

THIS FORM AND ITS CONDITIONS ARE COPYRIGHT TO ACENZ, IPENZ AND NZIA

Search the Register

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Disciplinary Actions
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Related links:

- List of current complaints

Current Chartered Professional Engineers

The practice field information listed by a registrant indicates he or she has demonstrated competence within that field - not necessarily across the whole field. Field information is a general guide for consumers seeking to identify a suitable engineer, but it is not suitable for checking if an engineer is competent to undertake a specific task. This may be ascertained by requesting a declaration from the engineer that he or she is competent (or is responsible for supervising engineers who are competent) to perform the specific task.

For a list of all registrants in a particular region, leave the surname/registration and fields of practice blank, select the Region and click Search.

Surname or Registration Number 1004738

Region -- All Regions --

Field of Practice 1 --All--

Field of Practice 2 --All--

Search >> New search/reset all filters

1 result found for your search. All registrants listed have (or are deemed to have) annual registration certificates covering the current calendar year.

Registration number	Name	Business Address	Date Reg'd	Practice Fields
1004738	Linehan, Damian Edwin	New Zealand	11/02/13	Structural

Now Displaying Records 1 to 1

-

"ENGAGE A CHARTERED PROFESSIONAL ENGINEER FOR ADDITIONAL PEACE OF MIND ON YOUR NEXT ENGINEERING PROJECT"

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The Institution of Professional Engineers New Zealand Incorporated is the Registration Authority under the Chartered Professional Engineers Act

MiTek New Zealand Limited

Correspondence from : **AUCKLAND**
40 Neales Road, East Tamaki 2013
PO Box 58-014, Botany 2163
Phone: 09 274 7109
Fax: 09 274 7100

CHRISTCHURCH
14 Pilkington Way, Wigram 8042
PO Box 8387, Riccarton 8440
Phone: 03 348 8691
Fax: 03 348 0314

www.miteknz.co.nz

PRODUCER STATEMENT for MiTek 20/20® TRUSS DESIGN - Version 4.6

ISSUED BY: **MiTek New Zealand Limited**

TO: **CARTERS Manufacturing**

IN RESPECT OF: **MiTek® Truss Designs**

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **UM11718** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

The MiTek 20/20® truss design program has been developed by MiTek New Zealand Limited for the design of MiTek® timber roof, floor and attic trusses in New Zealand. The truss designs computed by MiTek 20/20 ® are prepared using sound and widely accepted engineering principles, and in accordance with compliance documents of the New Zealand Building Code and Verification Method B1/VM1; and internationally accepted standard ANSI/TPI 1 - 2002 as an alternative solution to satisfy the requirements of Clause B1 of the New Zealand Building Code.

On behalf of MiTek New Zealand Limited, and subject to:

i) All proprietary products meeting their performance specification requirements
ii) The provision of adequate roof bracing and overall building stability
iii) Correct selection and placement of GANG-NAIL connector plates
iv) Correct input of Truss Design Data as shown in the Fabricator Design Statement for this job
v) The design being undertaken by the accredited fabricator under the terms of the software licence

I believe on reasonable grounds that the trusses, if constructed in accordance with the MiTek 20/20® truss design and shop drawings, will comply with the relevant provisions of the New Zealand Building Code.

MiTek New Zealand Limited holds a current policy of Professional Indemnity Insurance no less than $500,000.

On behalf of MiTek New Zealand Limited, **Date: Monday, 7 July 2014**

In Ling Ng, BE (Hons), CPEng, IntPE, MIPENZ (ID: 146585)
TECHNICAL SERVICES MANAGER, MiTek New Zealand Limited

HDC PROCEDURE
Decision Accept / Decline
Pass / Fail
Procedure Type: Building Code Compliance Document Assessment
Reason Manufacturer Design Software Approved For Building
Outcome Consent Granting
DATE: 28-7-14 BCO: RT

PDF created with pdfFactory trial version www.pdffactory.com

Search the Register

- Current CPEng
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- Suspended Registrants
- Disciplinary Actions
- Related Quality Marks

Related links:

- List of current complaints

Current Chartered Professional Engineers

The practice field information listed by a registrant indicates he or she has demonstrated competence within that field - not necessarily across the whole field. Field information is a general guide for consumers seeking to identify a suitable engineer, but it is not suitable for checking if an engineer is competent to undertake a specific task. This may be ascertained by requesting a declaration from the engineer that he or she is competent (or is responsible for supervising engineers who are competent) to perform the specific task.

For a list of all registrants in a particular region, leave the surname/registration and fields of practice blank, select the Region and click Search.

Surname or Registration Number 146585

Region -- All Regions --

Field of Practice 1 --All--

Field of Practice 2 --All--

Search >> New search/reset all filters

1 result found for your search. All registrants listed have (or are deemed to have) annual registration certificates covering the current calendar year.

Registration number	Name	Business Address	Date Reg'd	Practice Fields
146585	Ng, In Ling	MiTek New Zealand Limited PO Box 58014 Botany Auckland 2163 New Zealand	05/05/04	Structural

Now Displaying Records 1 to 1

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designIT for houses

CarterHoltHarvey Woodproducts New Zealand

Design Certificate – Technical basis for structural design methodology contained in designIT for houses - New Zealand.

designIT for houses, New Zealand has been developed by experienced timber engineers to assist designers in selecting appropriate sizes of structural laminated veneer lumber products manufactured by Carter Holt Harvey (including hySPAN, hy90, hyONE and hyJOIST) and other generic stress grades of timber, to be used as structural elements for the construction of buildings that fall within the scope of NZS 3604.

The design methodology used for the software complies with the loading and general design requirements contained within AS/NZS 1170 and with timber structural design in accordance with NZS 3603:1993 including Amendment 4 (Verification method B1/VM1, 6.1).

designIT relies on the accurate input of span and loading information by the user. Where accurate inputs are submitted the product and/or stress grade and the size given will comply with the structural requirements of the New Zealand Building Code, provided the installation is in accordance with the installation requirements provided by designIT and/or in product literature and/or NZS 3604, or specific engineering design, as appropriate.

References:

NZS 3603:1993 Timber Structures Standard.
NZS 3604:2011 Timber-framed buildings.
AS 1720.1 – 2010 Timber structures. Part 1: Design methods.
AS 1684.1 – 1999 Residential timber framed construction. Part 1: Design criteria.
AS/NZS 1170:2002 Structural design actions, Parts 0 and 1.
AS/NZS 1170:2011 Structural design actions, Part 2: Wind actions.
AS/NZS 1170:2003 Structural design actions, Part 3: Snow and ice actions.

This Design Certificate, and any associated warranty/certification, is void where there has been substitution of alternate products not detailed within the Member Specification.

Version date: 25 February 2014

For further information or advice please contact:

Carter Holt Havey Woodproducts New Zealand
173 Captain Springs Road, Onehunga. Auckland
Telephone 0800 808 131
Facsimile 0800 808 132
Email: designit@chhwoodproducts.co.nz

Specifier details:

Specifier:	Neil	
Business name:	Homestead Concrete Homes	
Address:	76 Main South Road, Levin	
Email:	neil@homesteadgroup.co.nz	
Phone: 06-3681357	**Mobile:**	**Facsimile:** 06-3651359

Project & Site details:

Project:	New Dwelling	**Ref. no.:** H1408
At (address):	1097 Queen Street	
For (owner/s):	Homestead Concrete Homes	
Wind zone:	High	
Snow loading	Snow Region: N1, Altitude: 100 m (sub-alpine), Ground snow load, Sg = 0.0 kPa	

MEMBER DESIGN DETAILS

HDC PROCEDURE
Decision Accept / Decline
Pass / Fail
Procedure Type: Building Code Surcharging
Reason: Incorrect - Drawings Updated
Outcome: Consent - Granting
DATE: 26-07-14 BCO:

Member 1

1) Member code and description	VB1 - Verandah beams
2) Date prepared	8/07/2014
3) Serviceability criteria	AS 1720.1-2010 and AS 1684.1-1999
4) Design inputs	
Span	4.3 m - single
Roof mass	40 kg/m²
Roof Load Width 'RLW'	3.2 m
5) Member specification	
Size, stress grade/product	Use 300 x 63 hySPAN
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

Sec. 0.5ha

Horowhenua DISTRICT COUNCIL

126 Oxford Street, Private Bag 4002, Levin 5540
T 06 366 0999 F 06 366 0983
www.horowhenua.govt.nz

PROJECT INFORMATION MEMORANDUM
PLANNING CHECK (SHEET A)

This is a **PLANNING CHECK** ☒ or **PIM** ☐ **Date Lodged: 09/07/2014**

APPLICATION DETAILS - *To be completed by SS Staff*	
Applicant:	Homestead Concrete Homes Limited
Mailing Address:	76 Main Road South, Levin 5510
Phone No:	[redacted]

Project	
PIM Number:	100/20140337
BC Application No:	100/20140337
Description of Work:	Construction of a new 7 bedroom dwelling with 5 bathrooms, study, sewing room and attached garage

Site Details			
Site Address:	1097 Queen Street East, LEVIN RURAL		
Legal Description:	Lot: 1 DP: 368677		
Site Area:	0.5288 square metres more or less		
Valuation No:	1484006313		
Estimated DC:	Yes ☐ $	(GST to be added)	Not applicable ☒
Damage Indemnity	Yes ☒		Not applicable ☐

Consent Notices/Encumbrances Yes ☒ No ☐

Consent Notices & Easement identified on copy of Certificate of Title provided to Council

Access and facilities: Is this a Schedule 2 Building as defined by s.118-120 of the Building Act 2004?	Yes ☐	No ☒
Earthquake Risk Building:	Yes ☐	No ☒
Heritage Building:	Yes ☐	No ☒
Evacuation Plan Required:	Yes ☐	No ☒
Section 73 Certificate: (Natural Hazards) REQUIRED	Yes ☐	No ☒
Section 75 Certificate: (2 or more lots) REQUIRED	Yes ☐	No ☒

COMMUNITY ASSETS - *To be provided with copy of site plan and services plan by SS Staff*						
Sewer Available/Connected	Not Available					
Location of Sewer Lateral	Not Applicable					
Water Available/Connected	Water is to be connected					
Location of Water Toby	Not Applicable					
Site Plan of Existing Services (if any)	Refer to attached services map					
Location of Easements (if any)	Refer to copy of CT provided					
Access, Parking, Roading Requirements						
Stormwater Disposal	**On Site**	**On site**	**Drain**		**Channel**	
Check DC Amount:	Yes ☒ $ 4372.00	(GST to be added)	(20% credit)		Not applicable ☐	

Notes:

Water DC also due when water connected

IANZ

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PLANNING ASSESSMENT – HOROWHENUA DISTRICT PLAN			
Zone: Rural	**Designation: No**		
Rules	**Complies**		
	Yes	**No**	**N/A**
Permitted Activity in zone	X		
Height Standard	x		
Day lighting Standard			X
Building Setbacks	x		
Dwelling Separation Standard			X
Accessory Buildings			X
Site Coverage			X
Vehicle Access	X		
Vehicle Parking and Manoeuvring	x		
Other:			

Identified Hazards			
Council is aware of the following:	**Yes**	**No**	**Tick if Consent required** ☐
Potential Inundation (Ponding)		X	**Comments:**
Presence of Hazardous Contaminants/Hail sites		X	
Strathnaver Coastal Hazard Area		X	
Flood Hazard Area		X	
Earthworks/construction Moutoa Floodway		X	
Other:		x	

Natural/Special Feature Protection			
Planning maps indicate site is within or contains:	**Yes**	**No**	**Tick if Consent required** ☐
Outstanding Natural Feature or Landscape	☐	☒	**Comments:**
Strathnaver Coastal Natural Character Area	☐	☒	
High Amenity Landscape Domain	☐	☒	
Heritage Value	☐	☒	
Notable Tree(s)	☐	☒	

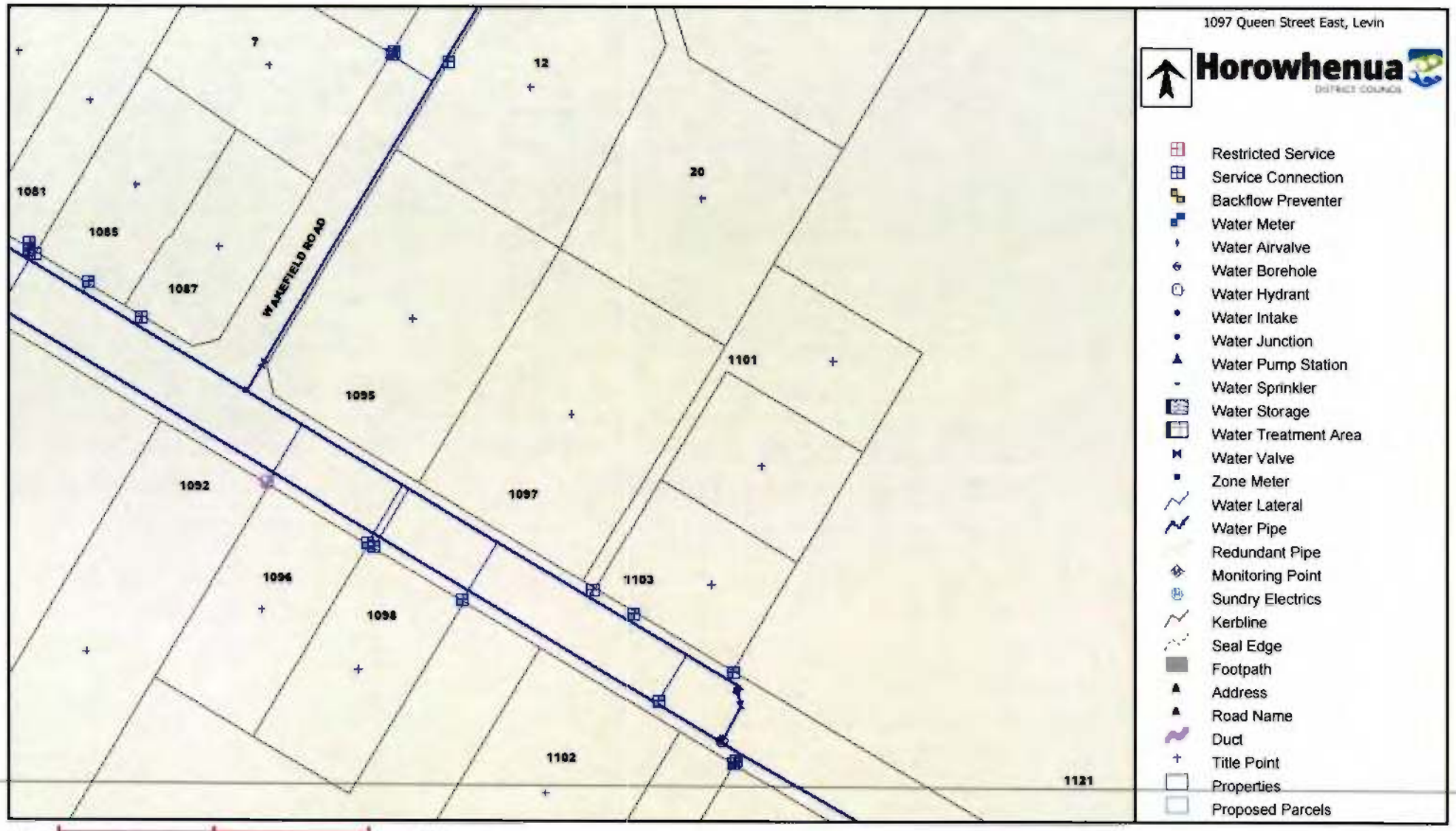
PLANNING ASSESSMENT SUMMARY		
Resource Consent	**Yes** ☐ **No** ☒	
If obtained enter RC No:		
RC Section 37 Building Act 2004 Certificate:	**Yes** ☐	**No** ☒
Check DC Amount:	**Yes** ☒ **$** $ 4372.00 **(GST to be added)**	**Not applicable** ☐

Notes: 20% credit applies to DC as RS 1218 was granted in June 2005. Two consent notices and a land covenant are registered against the title of this property. One consent notice requires effluent disposal to be in line with Horizons requirements. The other requires the owners to consult with Horizons Regional Council to determine appropriate floor levels for any dwelling. The land covenant restricts certain uses of the land, the covenant is private and not enforceable by Council.

Check Completed by: Sue Graham		**Dated: 29/06/2014**
Copy Passed to Support Services	**Yes** ☒	**No** ☐

DEVELOPMENT CONTRIBUTIONS - *To be completed by SS Staff*		
DC Section 36 Building Act 2004 Certificate:	**Yes** ☐	**No** ☐
DC Register Updated:	**Yes** ☐	**No** ☐
DC Invoice Arranged:	**Yes** ☐	**No** ☐

WARNING: Information provided in this document is based solely on historical records held by Horowhenua District Council. The accuracy of the information provided has not been checked. Use of this information for any purpose what so ever is at the discretion of the user.



The information displayed in this map has been taken from HDC's databases. It is made available in good faith but its accuracy or completeness is not guaranteed.

Produced by Horowhenua District Council 14:57 23/07/2014

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14/7/14

SCANNED

Horowhenua DISTRICT COUNCIL

126-148 Oxford Street
Private Bag 4002, Levin 5540
Telephone 06 366 0999
Facsimile 06 355 0977
Email enquiries@horowhenua.govt.nz
www.horowhenua.govt.nz

Building Consent No: 20140337

PIM No: -

Valuation or Property No: 1484008313

Refer to the HDC Website for public information relating to the Building Consent, Inspection, and Compliance Process

Application for Project Information Memorandum and/or Building Consent, or Amendment to Building Consent

Section 33 or Section 45, Building Act 2004

All fields in this application are to be completed

Application:

I request that you issue a: [Delete what is inapplicable]

~~(i) Project Information Memorandum~~
(ii) Building Consent
~~(iii) Project Information Memorandum and Building Consent~~
~~(iv) Amendment to an issued Building Consent~~

for the building work described in this application.

The Building:

Street Address: 1097 Queen street

Legal Description: Lot: 1

DP: 368677

Building Name: [If applicable] n/a

Location within site/block: n/a

Number of levels: 1

Level/Unit No: [If applicable] n/a

Area:[Floor area of building work] 475 M^2

Current Use: n/a

Year first constructed [If applicable] n/a

The Owner:

Name: Homestead Group

Contact Person: Homestead Concrete Homes

Mailing Address: 78 Main Road South
Levin, 5510

Street Address:

Ph: [redacted] Mob: [redacted]

Fax: [redacted] After hrs:

Email: [redacted]

Website:

The following evidence of ownership is attached to this application: [Please delete those not applicable]

I. **Certificate of Title – not more than 3 months old (Consent Notices and Easement Documents to be provided)**
~~II. Lease Agreement~~
~~III. Agreement for Sale and Purchase~~

RECEIVED 11 JUL 2014

First Point of Contact: (mark boxes as appropriate and provide details of any other points of contact)

Further Information: ✓ Agent Owner Other

Name: Homestead Concrete Homes Ph: 06-3681357 Mob: .....

Contact Person: Neil Stirling Fax: 06-3681359 After hrs: .....

Mailing Address: 76 Main Road South Email: neil@homesteadgroup.co.nz

Levin Website: homesteadconcretehomes.co.nz

Correspondence: ✓ Agent Owner Other

Name: ..... Ph: ..... Mob: .....

Contact Person: ..... Fax: ..... After hrs: .....

Mailing Address: ..... Email: .....

..... Website: .....

Invoicing: ✓ Agent Owner Other

Name: ..... Ph: ..... Mob: .....

Contact Person: ..... Fax: ..... After hrs: .....

Mailing Address: ..... Email: .....

..... Website: .....

The Project:

Description of building work: New seven bedroom single level dwelling with attached garage. Onsite wastewater system

Will the building work result in a change of use: ~~Yes~~ / No

If yes provide details of the new use: .....

.....

Specified Intended life of the building if less than 50 years: ..... years

Building Consent numbers of those building consents previously issued for this project: .....

.....

Value of building work inclusive of labour & GST: $ 570,000

Project Information Memorandum:

The following matters are involved in the project: [✓ Tick those applicable]

- ☐ Subdivision
- ☐ Alterations to land contours
- ✓ New or altered access for vehicles
- ✓ New or altered connections to public utilities
- ✓ Onsite stormwater disposal
- ✓ Onsite effluent disposal (Horizons Approval required)
- ☐ Flooding and/or subsidence
- ☐ Building work over existing drains or sewers or in close proximity to wells or water mains
- ✓ Location of a new building
- ☐ Alteration of an existing building
- ✓ Engineered foundations
- ☐ Dwelling Separation
- ☐ Specified Building Platform
- ☐ Easement
- ☐ Consent Notice
- ☐ Building work over or adjacent to any road or public place

Other matters known to the applicant that may require authorisations from the territorial authority as listed below: .....

.....

.....

.....

.....

Do you wish to be included on our Industry e-mail circulation list to receive industry updates and other important information? If so please provide your e-mail address details:

E-mail Address: .....

Applicant Details:

Name: Daniel Lawry (Director of Homestead Concrete Homes)
(Please print)

(Neil Stirling - Homestead Concrete Homes/Agent)

Signature of owner/agent on behalf of and with the authority of the owner

Date: 09/07/14

Building Consent:

The following plans and specifications are attached to this application:

A3 Architectural and Structural plans. A4 specifications, H1 report, Structural design calculations, Truss producer statement and layout, Engineering specifications, drawings and details

The building work will comply with the building code as detailed on pages 5 and 6.

Compliance Schedule: [✓ Tick those applicable:] – See example pages 10 and 11.

✓ There are no specified systems or features in this building:
The specified systems and features for this building are as follows: (Tick appropriate boxes)
The following specified systems and features are being altered, added to, or removed in the course of the building work: (Tick appropriate boxes)

✓	SPECIFIED SYSTEMS INCLUDED IN PROJECT – BOTH EXISTING & PROPOSED Please tick appropriate boxes	
	SS1	Automatic systems for fire suppression
	SS2	Automatic or manual warning systems for fire or other dangers
	SS3	Electromagnetic or automatic doors or windows
	SS4	Emergency lighting systems
	SS5	Escape route pressurisation systems
	SS6	Riser mains for use by fire services
	SS7	Automatic back-flow preventers connected to a potable water supply
	SS8	Lifts, escalators, travelators, or other systems for moving people or goods within buildings
	SS9	Mechanical ventilation or air conditioning systems
	SS10	Building maintenance units providing access to exterior and interior walls of buildings
	SS11	Laboratory fume cupboards
	SS12	Audio loops or other assistive listening systems
	SS13	Smoke control systems
	SS14	Emergency power systems for, or signs relating to, a system or feature specified in any of the SS1 – SS13 systems above
	SS15	Other fire safety systems or features ie: final exits, fire separations, signs, or systems for communicating evacuation information
	SS16	Cable cars (includes residential)

Attachments:

The following documents are attached to this application: [✓]

Plans	✓	Development Contribution Notice	
Specifications	✓	Project Information Memorandum	
Certificate of Title	✓	Certificate attached to PIM	
Consent Notice	✓	Copies of other Authorisations	
Horizons Approval of Waste Water Disposal System		Other (Specify)	

Restricted Building Work and Licensed Building Practitioners:
Includes: Designer, Electricians, Plumbers, Drainlayers
Will the building work include any Restricted Building Work (✓) Yes ( ) No
If Yes, provide the following details of all licensed building practitioners who will be involved in carrying out or supervising the restricted work: *[if these details are unknown at the time of the application, they must be supplied before the work begins]*

Restricted Building Work:	Licensed Building Practitioner:	Licence No:
Designer/Architect	Name: Ernest (Walter) Simmons Address: 14 Easton Way, Levin, 5510 Phone: 06 367 0537	121932
Builder	Name: Homestead Group Address: 76 Main Road South, Levin 5510 Phone: 06 368 1357	115161
Roofing	Name: AllRoof Solutions Address: PO Box 1466 Paraparaumu Phone: 04 297 0449	112371
Plumbing	Name: Kingston & Kemp Address: 23 Hokio Beach Road Phone: 06 368 2681	12554
Engineering	Name: Kevin O'Conner & Assc Address: 71 Pitt Street, P.North Phone: 06 356 7000	261107
External plastering	Name: Reginald Halls Address: 76 Main Road South, Levin 5510 Phone 06 368 1357	124322
	Name: Address: Phone	
	Name: Address: Phone	
	Name: Address: Phone	
	Name: Address: Phone	

Building Consent
Compliance with the Building Code
TO BE FILLED OUT BY APPLICANT

The building work will comply with the building code as follows.

Clause (tick relevant clause numbers of building code)	Means of Compliance (refer to the relevant compliance document(s) or detail of alternative solution in the plans and specifications; if not applicable, put n/a)	Means of Compliance document to be listed below. Where a standard is specified please note the revision or year and ensure that the current version is applied
☑ B1 Structure	☑ Acceptable Solution O Alternative Solution O Verification Method	4/4/11
☑ B2 Durability	☑ Acceptable Solution O Alternative Solution O Verification Method	4/4/11
☑ C1 Outbreak of fire	☑ Acceptable Solution O Alternative Solution ☑ Verification Method	19/12/13
☐ C2 Means of escape	O Acceptable Solution O Alternative Solution O Verification Method	
☐ C3 Spread of fire	O Acceptable Solution O Alternative Solution O Verification Method	
☐ C4 Structural stability during fire	O Acceptable Solution O Alternative Solution O Verification Method	
☑ D1 Access routes	☑ Acceptable Solution O Alternative Solution O Verification Method	10/10/11
☐ D2 Mechanical installations for access	O Acceptable Solution O Alternative Solution O Verification Method	
☑ E1 Surface water	☑ Acceptable Solution O Alternative Solution O Verification Method	14/02/14
☑ E2 External moisture	☑ Acceptable Solution O Alternative Solution O Verification Method	14/02/14
☑ E3 Internal moisture	☑ Acceptable Solution O Alternative Solution O Verification Method	14/02/14
☐ F1 Hazardous agents on site	O Acceptable Solution O Alternative Solution O Verification Method	
☑ F2 Hazardous building materials	☑ Acceptable Solution O Alternative Solution O Verification Method	1/12/00
☐ F3 Hazardous substances and processes	O Acceptable Solution O Alternative Solution O Verification Method	
☐ F4 Safety from falling	O Acceptable Solution O Alternative Solution O Verification Method	
☑ F5 Construction and demolition hazards	☑ Acceptable Solution O Alternative Solution O Verification Method	7/92
☐ F6 Visibility in escape routes	O Acceptable Solution O Alternative Solution O Verification Method	
☑ F7 Warning systems	☑ Acceptable Solution O Alternative Solution O Verification Method	10/04/12
☐ F8 Signs	O Acceptable Solution O Alternative Solution O Verification Method	

The building work will comply with the building code as follows:			
Clause (tick relevant clause numbers of building code)		**Means of Compliance** (refer to the relevant compliance document(s) or detail of alternative solution in the plans and specifications; if not applicable, put n/a)	**Means of Compliance document to be listed below.**
☑ **G1**	Personal hygiene	☑ Acceptable Solution O Alternative Solution O Verification Method	10/10/11
☑ **G2**	Laundering	☑ Acceptable Solution O Alternative Solution O Verification Method	10/10/11
☑ **G3**	Food preparation and prevention of contamination	☑ Acceptable Solution O Alternative Solution O Verification Method	01/07/01
☑ **G4**	Ventilation	☑ Acceptable Solution O Alternative Solution O Verification Method	14/02/14
☐ **G5**	Interior environment	O Acceptable Solution O Alternative Solution O Verification Method	
☐ **G6**	Airborne and impact sound	O Acceptable Solution O Alternative Solution O Verification Method	
☑ **G7**	Natural light	☑ Acceptable Solution O Alternative Solution O Verification Method	14/02/14
☑ **G8**	Artificial light	☑ Acceptable Solution O Alternative Solution O Verification Method	14/02/14
☑ **G9**	Electricity	☑ Acceptable Solution O Alternative Solution O Verification Method	14/02/14
☐ **G10**	Piped services	O Acceptable Solution O Alternative Solution O Verification Method	
☐ **G11**	Gas as an energy source	O Acceptable Solution O Alternative Solution O Verification Method	
☑ **G12**	Water supplies	☑ Acceptable Solution O Alternative Solution O Verification Method	14/02/14
☑ **G13**	Foul water	☑ Acceptable Solution O Alternative Solution O Verification Method	14/02/14
☐ **G14**	Industrial liquid waste	O Acceptable Solution O Alternative Solution O Verification Method	
☐ **G15**	Solid waste	O Acceptable Solution O Alternative Solution O Verification Method	
☑ **H1**	Energy efficiency	☑ Acceptable Solution O Alternative Solution O Verification Method	10/10/11
–	Waiver and Modification Required	O Yes O No	

Building Consent Application Checklist/Residential

TO BE FILLED OUT BY DESIGNER

Site Address: Lot 11 DP383432 - Okatio Avenue

Date: | **Building Category** | 1 | (2) | 3

APPLICATION TYPE			
New building	(YES)	NO	N/A
Alterations	YES	(NO)	N/A
Additions	YES	(NO)	N/A
Demolition	YES	(NO)	N/A
Relocation	YES	(NO)	N/A
Change of use	YES	(NO)	N/A
Stage of	YES	NO	(N/A)

BUILDING CLASSIFICATION			
Housing			
Detached	(YES)	NO	N/A
Multi-unit	YES	(NO)	N/A
Group dwelling	YES	(NO)	N/A
Outbuildings			
Garage, barn, shed	YES	(NO)	N/A
Swimming pool	YES	(NO)	N/A
Glasshouse, pergola, other	YES	(NO)	N/A
Ancillary			
Bridge, Outdoor fire, retaining wall	YES	(NO)	N/A
Commercial / Industrial	YES	(NO)	N/A

CONTACT DETAILS, ADDRESS, PHONE, ETC			
Owner's details	(YES)	NO	
Agent's details	(YES)	NO	N/A
Designer's details	(YES)	NO	
Engineer's details	(YES)	NO	N/A

COMPLIANCE		
Means of compliance completed (as per application form)	(YES)	NO
Standards - Current version specified	(YES)	NO

APPLICATION NUMBER			
Certificate of title Less than 3 months old	(YES)	NO	
Legal description checked	(YES)	NO	
Street address	YES	(NO)	
Name of building (if applicable)			
Floor level	(YES)	NO	N/A
Current lawful use			
Building history - listed	(YES)	NO	N/A
Specified Intended life if less than 50 yrs			
Value of work (including labour & GST)	$ 570,000		

FLOOR AREA		
Ground floor	475	M^2
Basement		M^2
1st floor		M^2
2nd floor		M^2
Outbuildings		M^2
Decks/balconies		M^2
Other		M^2
TOTAL NEW WORK	475	M^2
Total existing buildings on site		M^2

PROPERTY INFORMATION					
Wind Zone	Low	Medium	(High)	Very High	Specific Design
Corrosion Zone as defined NZS3604 4.2.3	Sea spray zone			(Zone 1)	
Earthquake Zone				(A)	
Is the site subject to natural hazards ie: flooding, subsidence, slipping etc				YES	(NO)
Do the plans show how you are mitigating the risk ie: finished floor level etc				YES	(NO)

DETAILED DESCRIPTION OF BUILDING WORK

New single storey, seven bedroom dwelling of precast tilt-slab concrete construction. The building will use an on-site waste-water system and will also utilize a 10,000 litre water tank - the site will be on trickle feed water supply from the Council main

PLANS			
Number of sets required 2	(Yes)		No
SPECIFICATIONS			
Number of sets required 2	(Yes)		No
BRACING CALCULATIONS			
Subfloor/ Deck (2 sets required)	Yes	No	(N/A)
Wall (per floor)	(Yes)	No	N/A
STRUCTURAL ENGINEERING			
Number of sets supplied (2 required)			
Beam layout plan	YES	NO	(N/A)
Connection details	(YES)	NO	N/A
Producer statement	(YES)	NO	N/A
GEOTECHNICAL ENGINEERING			
Number of sets supplied (2 required)			
Site plan	YES	NO	(N/A)
Soils analysis/report	YES	NO	(N/A)
Producer statement	YES	NO	(N/A)
H1 ENERGY EFFICIENCY			
Design	(YES)	NO	N/A
E2 RISK MATRIX – 1 PER FACE/ELEVATION			
• North	(YES)	NO	N/A
• South	(YES)	NO	N/A
• East	(YES)	NO	N/A
• West	(YES)	NO	N/A
CROSS-SECTIONS			
Minimum of one along the length	(YES)	NO	N/A
Minimum of one across the width	(YES)	NO	N/A
Details to include:			
Footing size	(YES)	NO	N/A
Subfloor ventilation and insulation	YES	NO	(N/A)
Foundations steel – size and centres	(YES)	NO	N/A
Wall insulation	(YES)	NO	N/A
Wall framing - sizes, centres, treatment, height	(YES)	NO	N/A
Masonry and slab	(YES)	NO	N/A
Cladding	(YES)	NO	N/A
Cavity and battens	(YES)	NO	N/A
Building paper	(YES)	NO	N/A
Stairs - tread, rise, pitch, height	YES	NO	(N/A)
Decks and balconies	YES	NO	(N/A)
Linings and finishes	(YES)	NO	N/A
Ceiling insulation	(YES)	NO	N/A
ELECTRICAL PLAN			
Smoke detectors	(YES)	NO	N/A
Mechanical light and ventilation	(YES)	NO	N/A
ELEVATIONS			
• North	(YES)	NO	N/A
• South	(YES)	NO	N/A
• East	(YES)	NO	N/A
• West	(YES)	NO	N/A

SITE PLAN			
1:100 1:200 or 1:500	(YES)	NO	N/A
Legal description	(YES)	NO	N/A
Site area	(YES)	NO	N/A
Private drainage	(YES)	NO	N/A
Public drainage showing depth of drains, manholes etc.	(YES)	NO	N/A
Dimensions – 3 minimum	(YES)	NO	N/A
Existing and proposed buildings	(YES)	NO	N/A
North point & building orientation	(YES)	NO	N/A
Contours, datum	(YES)	NO	N/A
Finished floor level	(YES)	NO	N/A
Retaining walls	YES	NO	(N/A)
Extent of cut and fill	YES	NO	(N/A)
Site coverage	(YES)	NO	N/A
Parking and vehicle access	(YES)	NO	N/A
Protected trees	YES	NO	(N/A)
HWC (gas)	YES	NO	(N/A)
Water meter (if applicable)	YES	NO	(N/A)
FLOOR PLAN			
Room use denoted	(YES)	NO	
Window size and position	(YES)	NO	N/A
Fixtures and fittings	(YES)	NO	N/A
Solid fuel heating	(YES)	NO	N/A
HWC	(YES)	NO	N/A
Wall bracing - height, position, type	(YES)	NO	
FOUNDATION PLAN			
Timber floor			
Pile size, centres, treatment	YES	NO	N/A
Footing size	YES	NO	N/A
Bracing layout, type and position	YES	NO	N/A
Joists and bearers	YES	NO	N/A
Concrete floor			
Dimensions, bays, mesh size, plumbing fixtures, point load pads, slab thickenings, etc.	(YES)	NO	N/A
Specific design (raft)	YES	NO	(N/A)
ROOF FRAMING PLAN			
Pitched roof	YES	NO	N/A
Ridge beam, rafters, purlins, building paper, insulation	YES	NO	N/A
Eaves	YES	NO	N/A
Pergola	YES	NO	N/A
Trussed Roof	YES	NO	N/A
Truss type	(YES)	NO	N/A
Point loads identified	(YES)	NO	N/A
Roof bracing	(YES)	NO	N/A
	YES	(NO)	N/A
WEATHERTIGHTNESS - FLASHING DETAILS			
Windows	(YES)	NO	N/A
Balconies	YES	NO	(N/A)
Parapets	YES	NO	(N/A)
Decks	YES	NO	(N/A)

ELEVATIONS				WEATHERTIGHTNESS - FLASHING DETAILS			
Wall cladding	YES	NO	N/A	Roof and wall junctions	YES	NO	N/A
Roof cladding	YES	NO	N/A	More than one cladding	YES	NO	N/A
Finished floor levels	YES	NO	N/A	Pergola	YES	NO	N/A
Height in relation to boundary	YES	NO	N/A	Other penetrations	YES	NO	N/A
Maximum building height	YES	NO	N/A				
DECK CONSTRUCTION				SOLID FUEL HEATING			
Foundation plan	YES	NO	N/A	Specifications	YES	NO	N/A
Pile size, centers, treatment	YES	NO	N/A	Construction details	YES	NO	N/A
Bearer size, span, treatment	YES	NO	N/A	Floor plan	YES	NO	N/A
Joist size, centers, treatment	YES	NO	N/A	Energy source	YES	NO	N/A
Detail at junction of house	YES	NO	N/A	Smoke Detectors	YES	NO	N/A
FENCING OF SWIMMING POOLS				OUTBUILDINGS (also must include SITE PLAN details)			
Pool construction details	YES	NO	N/A	Foundation plan	YES	NO	N/A
Pool specification	YES	NO	N/A	Cross-section	YES	NO	N/A
In-ground or above-ground	YES	NO	N/A	Wall bracing	YES	NO	N/A
Fencing and gate plan	YES	NO	N/A	Roof framing	YES	NO	N/A
Fencing/construction details	YES	NO	N/A	Elevations	YES	NO	N/A
Floor plan if house forms fencing	YES	NO	N/A	Drainage	YES	NO	N/A
Backflow	YES	NO	N/A	Engineer design	YES	NO	N/A

PUBLIC USE BUILDINGS

FIRE SAFETY				PUBLIC SAFETY			
Fire report	YES	NO	N/A	Project management plan details for protection of the public	YES	NO	N/A
Smoke alarms	YES	NO	N/A				
Sprinkler system	YES	NO	N/A	ACCESSIBLE FACILITIES			
Emergency lights	YES	NO	N/A	Carparks	YES	NO	N/A
Fire alarm sounders	YES	NO	N/A	Ramps / Footpaths	YES	NO	N/A
Thermal (heat) detectors	YES	NO	N/A	Kerb Ramps	YES	NO	N/A
Fire alarm call points	YES	NO	N/A	Entrance route	YES	NO	N/A
'Open Path' travel to exits	YES	NO	N/A	Lifts	YES	NO	N/A
Fire cells & demarcation points	YES	NO	N/A	Stair design	YES	NO	N/A
Signage	YES	NO	N/A	Handrails	YES	NO	N/A
				Toilet / bathroom facilities	YES	NO	N/A
				Signage	YES	NO	N/A

Form 2A

✓ Memorandum from licensed building practitioner: Certificate of design work

Section 45 and Section 30C, Building Act 2004

Please fill in the form as fully and correctly as possible.

If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

THE BUILDING

Street address: 1097 Queen Street East	
Suburb:	
Town/City Levin	Postcode: 5517

THE OWNER

Name(s): D & J Lawry	
Mailing address:	
c/o Homestead Concrete Homes Ltd	76 Main Road South
Town/City: Levin	Postcode: 5510
Phone number 06 368 1357	Email address:daniel@homesteadgroup.co.nz

BASIS FOR PROVIDING THIS MEMORANDUM

I am providing this memorandum in my role as the: Please tick the option that applies (√)	
( )	**sole** designer of all of the RBW design outlined in this memorandum – I carried out all of the RBW design myself – no other person will be providing any additional memoranda for the project
( )	**lead** designer who carried out some of the RBW design myself but also supervised other designers – this memorandum covers their RBW design work as well as mine, and no other person will be providing any additional memoranda for the project
✓	**lead** designer for all but specific elements of RBW – this memorandum only covers the RBW design work that I carried out or supervised and the other designers will provide their own memoranda relating to their specific RBW design
( )	**specialist** designer who carried out specific elements of RBW design work as outlined in this memorandum – other designers will be providing a memorandum covering the remaining RBW design work

IDENTIFICATION OF DESIGN WORK THAT IS RESTRICTED BUILDING WORK (RBW)

I ___Walter Simmons_____ carried out / supervised the following design work that is restricted building work

PRIMARY STRUCTURE: B1

Design work that is restricted building work	Description	Carried out/ supervised	Reference to plans and specifications
Tick(√)if included *Cross (X) if*	*[If appropriate, provide details of the restricted building work]*	*[Specify whether you carried out this design work or supervised*	*[If appropriate, specify references]*

excluded		*someone else carrying out this design work]*	
Primary structure			
All RBW Design work relating to B1		( ) Carried out ✓( ) Supervised	
Foundations and subfloor framing		( ) Carried out ✓( ) Supervised	
Walls ( )		( ) Carried out ✓( ) Supervised	
Roof ( )		( ) Carried out ✓( ) Supervised	
Columns and beams ( )		( ) Carried out ( ) Supervised	
Bracing ( )		( ) Carried out ( ) Supervised	
Other ( )		( ) Carried out ✓( ) Supervised	
EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2			
All RBW design work relating to E2 ( )		( ) Carried out ✓( ) Supervised	
Damp proofing ( )		( ) Carried out ✓( ) Supervised	
Roof cladding or roof cladding system ( )		( ) Carried out ✓( ) Supervised	
Ventilation system (for example, subfloor or cavity) ( )	*Air conditioning layout*	( ) Carried out ✓( ) Supervised	
Wall cladding or wall cladding system ( )		( ) Carried out ✓( ) Supervised	
Waterproofing ( )		( ) Carried out ✓( ) Supervised	

Other ( )		( ) Carried out ( ) Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

Emergency warning systems, evacuation and fire service operation systems, suppression or control systems, or other ( )		( ) Carried out ( ) Supervised	

Note: The design of fire safety systems is only restricted building work when it involves small-to-medium apartment buildings as defined by the Building (Definition of Restricted Building Work) Order 2011.

Note: continue on another page if necessary.

WAIVERS AND MODIFICATIONS

Waivers or modifications of the building code are required ( ) Yes ✓ No

If Yes, provide details of the waivers or modifications below:

Clause	**Waiver/modification required**
[List relevant clause numbers of building code]	*[Specify nature of waiver or modification of building code]*

Note: continue on another page if necessary.

ISSUED BY

Name: Walter Simmons	LBP or Registration number: 121932
The practitioner is a: ✓ Design LBP ( ) Registered architect ( ) Chartered professional engineer	
Design Entity or Company (optional): Artline Levin	
Mailing address (if different from below):	
Street address / Registered office: 14 Easton Way	
Suburb:	Town/City: Levin
PO Box/Private Bag:	Postcode:5510
Phone number: (06) 367 0547	Mobile: 021 228 4894
After Hours:	Fax: (06) 367 0537
Email address:walter.simmons@ubteam.com	Website:

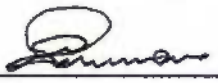
DECLARATION

I WALTER SIMMONS *[name of practitioner]*, LBP,121932

state that I have applied the skill and care reasonably required of a competent design professional

in carrying out or supervising the Restricted Building Work (RBW) described in this form, and that based on this, I also state that the RBW:

- Complies with the building code; or
- Complies with the building code subject to any waiver or modification of the building code recorded on this form.

Signature: 

Date: 2014-09-14

Form 2A

Memorandum from licensed building practitioner: Certificate of design work

Section 45 and Section 30C, Building Act 2004

Please fill in the form as fully and correctly as possible.

If there is insufficient room on the form for requested details, please continue on another sheet and attach the additional sheet(s) to this form.

THE BUILDING

Street address: 1097 Queen Street East	
Suburb:	
Town/City Levin	Postcode: 5571

THE OWNER

Name(s): Homestead Group	
Mailing address: 76 Main Road South	
Suburb:	PO Box/Private Bag:
Town/City: Levin	Postcode: 5510
Phone number:	Email address:

BASIS FOR PROVIDING THIS MEMORANDUM

I am providing this memorandum in my role as the: Please tick the option that applies (✓)	
( )	**sole** designer of all of the RBW design outlined in this memorandum – I carried out all of the RBW design myself – no other person will be providing any additional memoranda for the project
( )	**lead** designer who carried out some of the RBW design myself but also supervised other designers – this memorandum covers their RBW design work as well as mine, and no other person will be providing any additional memoranda for the project
( )	**lead** designer for all but specific elements of RBW – this memorandum only covers the RBW design work that I carried out or supervised and the other designers will provide their own memoranda relating to their specific RBW design
(✓)	**specialist** designer who carried out specific elements of RBW design work as outlined in this memorandum – other designers will be providing a memorandum covering the remaining RBW design work

IDENTIFICATION OF DESIGN WORK THAT IS RESTRICTED BUILDING WORK (RBW)

I Damian Edwin Linehan ~~carried out /~~ supervised the following design work that is restricted building work

PRIMARY STRUCTURE: B1

Design work that is restricted building work	Description	Carried out/ supervised	Reference to plans and specifications
Tick(✓)if included Cross (X) if excluded	*[If appropriate, provide details of the restricted building work]*	*[Specify whether you carried out this design work or supervised someone else carrying out this design work]*	*[If appropriate, specify references]*

Primary structure

All RBW Design work relating to B1 ( )	*N/A*	( ) Carried out ( ) Supervised	
Foundations and subfloor framing (✓)		( ) Carried out (✓) Supervised	
Walls (✓)		( ) Carried out (✓) Supervised	
Roof ( )	*N/A*	( ) Carried out ( ) Supervised	
Columns and beams ( )	*N/A*	( ) Carried out ( ) Supervised	
Bracing (✓)		( ) Carried out (✓) Supervised	
Other ( )	*N/A*	( ) Carried out ( ) Supervised	

EXTERNAL MOISTURE MANAGEMENT SYSTEMS: E2

All RBW design work relating to E2 ( )	*N/A*	( ) Carried out ( ) Supervised	
Damp proofing ( )	*N/A*	( ) Carried out ( ) Supervised	
Roof cladding or roof cladding system ( )	*N/A*	( ) Carried out ( ) Supervised	
Ventilation system (for example, subfloor or cavity) ( )	*N/A*	( ) Carried out ( ) Supervised	
Wall cladding or wall cladding system ( )	*N/A*	( ) Carried out ( ) Supervised	
Waterproofing ( )	*N/A*	( ) Carried out ( ) Supervised	
Other ( )	*N/A*	( ) Carried out ( ) Supervised	

FIRE SAFETY SYSTEMS: C1 – C6

Emergency warning systems, evacuation and fire service operation systems, suppression or control systems, or other ( )	*N/A*	( ) Carried out ( ) Supervised	

Note: The design of fire safety systems is only restricted building work when it involves small-to-medium apartment buildings as defined by the Building (Definition of Restricted Building Work) Order 2011.

Note: continue on another page if necessary.

WAIVERS AND MODIFICATIONS

Waivers or modifications of the building code are required ( ) Yes (✓) No

If Yes, provide details of the waivers or modifications below:

Clause	Waiver/modification required
[List relevant clause numbers of building code]	*[Specify nature of waiver or modification of building code]*

Note: continue on another page if necessary.

ISSUED BY

Name: Damian Edwin Linehan	LBP or Registration number: 1004738
The practitioner is a: ( ) Design LBP ( ) Registered architect (✓) Chartered professional engineer	
Design Entity or Company (optional): Kevin O'Connor & Associates Ltd	
Mailing address (if different from below):	
Street address / Registered office: 71 Pitt Street,	
Suburb:	Town/City: Palmerston North
PO Box/~~Private Bag~~: 600	Postcode: 4440
Phone number: 06 356 7000	Mobile:
After Hours:	Fax:
Email address: reception@koa.co.nz	Website: www.koa.co.nz

DECLARATION

I Damian Edwin Linehan [*name of practitioner*] , LBP 1004738,

state that I have applied the skill and care reasonably required of a competent design professional in carrying out or supervising the Restricted Building Work (RBW) described in this form, and that based on this, I also state that the RBW:

- Complies with the building code; or
- Complies with the building code subject to any waiver or modification of the building code recorded on this form.

Signature: 

Date: 3 July 2014

Neil Stirling

From: Lisa Thomas <Lisa.Thomas@horizons.govt.nz>
Sent: Tuesday, 8 July 2014 2:18 p.m.
To: neil@homesteadgroup.co.nz
Subject: Horizons comments on proposed house at 1097 Queen St East, Levin

Hi Neil

Thank you for your email and your phone message. Based on our discussion on 8 July 2014, I understand that you a proposing a finished floor level of 300mm above the current ground level. This property is not affected by our "indicative" flooding and we have not modelled this location for a 1 in 200 year flood event.

Based on earlier correspondence for nearby properties I understand that the rationale for the consent notice is related to stormwater ponding issues in the area. Based on discussions with land owners in the vicinity I understand that there is a low area to the north of this property that is known to be subject to surface water ponding during high localised rainfall. I earlier provided comments on a building consent at 24 Wakefield Road that required a finished floor level of 400mm above this ponding area. Unfortunately we do not have detailed elevation information, which makes it difficult to compare relative ground levels of this property with the ponding area and nearby houses that have been recently constructed. I understand that a new home at 1087 Queen Street east was recently constructed with a minimum finished floor level of 300mm above the current ground level. This is consistent with what we usually recommend for new houses in areas that are at risk of localised surface flooding.

I visited 1097 Queen Street East on Friday 4 July 2014 to get an understanding of the contours of the site. Based on my observations, this parcel appeared to be locally elevated relative to Wakefield Road properties that we have earlier provided comment on. The land appeared to be highest towards the front and centre of the site, which based on your plans is where you intend to locate this new house. As the house is to be located on an area of higher ground it is likely that stormwater will generally flow away from the proposed building platform. The proposed finished floor level of 300mm above the current ground level is considered to be sufficient to mitigate against any localised flood risk. We therefore do not have any concerns with this proposal.

Please feel free to include a copy of this correspondence in your Building Consent application to be lodged with the Horowhenua District Council.

The following matters may also be of relevance to your Building Consent application:
If reticulated sewer services are not available in this location, the house will require an onsite wastewater disposal system. Any new or upgraded wastewater system needs to be designed in accordance with the Manual for Onsite Wastewater Systems Design and Management (Horizons Regional Council, 2010) and comply with the relevant conditions of Proposed One Plan Rule 13-11. Horizons Environmental Scientist can provide additional advice on these requirements at the time of Building Consent, if required.

The discharge of stormwater to surface water and land is generally permitted by Proposed One Plan Rule 13-15, subject to compliance with conditions. These conditions include ensuring that the discharge does not cause or exacerbate flooding on any other property, and there is no erosion of land at the point of discharge.

Feel free to give me a call if you have any further questions.

Regards,

Lisa Thomas | Coordinator District Advice
Regional Services & Information
T +64 6 952 2908 | **M** +64 21 2277 183
Horizons Regional Council | Private Bag 11025, Palmerston North

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Acceptance of Liability Agreement

Horowhenua DISTRICT COUNCIL

Agreement details

Building Consent

I Daniel Lawry of Homestead Concrete Homes
76 Main Road, Levin 5510

(applicant's full name)
(address of applicant)

Phone 06-3681357 *Email* daniel@homesteadgroup.co.nz

of

give notice that I will be undertaking work at:

1097 Queen Street, Levin 5571

(address of where work is to be carried out)

1. Prior to any work being undertaken on the above property, the Applicant will provide to Council dated photographs ("Inspection Photographs") of Infrastructure Assets along all road frontages to the site and on site. The Inspection Photographs will be provided as part of the application for a building or resource consent. The purpose of the Inspection Photographs is to provide a record of the condition of the Infrastructure Assets prior to work commencing.
2. If the Applicant is not prepared, or otherwise fails to provide Inspection Photographs, then Council will require a bond, in lieu of any damage to its assets in accordance with the schedule of fees.
3. At the completion of the scheduled work, the Applicant will request Council to undertake a final inspection of its Infrastructure Assets to determine whether any damage has occurred when compared to the Inspection Photographs. Where the photographs are insufficient or otherwise unsatisfactory, the work required of the Applicant to fix any damage to Infrastructure Assets will be at the sole discretion of Council.
4. The Applicant shall use best endeavours to ensure that there is no damage to Infrastructure Assets. Where damage does occur, the Applicant is required to fix the damage, at the Applicant's cost and to the satisfaction of Council. The work required to fix any damage must be completed within four (4) weeks of the date of final inspection by Council.
5. Where the Applicant does not, within the required period, fix damage to Infrastructure Assets to the satisfaction of Council, the Council may undertake the work and pass the entire cost, including administration costs, on to the Applicant. That cost will amount to a debt to Council and must be paid within fourteen (14) days of invoice.
6. In addition to costs associated with fixing Infrastructure Assets incurred by Council, the Applicant will be responsible for all collection and debt recovery costs, including all legal and court fees on an indemnity basis. The Applicant will also pay the Council $100.00 in liquidated damages for every day that costs incurred by Council remain unpaid, after the fourteen (14) days required for payment. The liquidated damages required under this clause shall not exceed the total costs incurred by Council to fix damage, together with any collection or debt recovery costs.

Explanation

1. Along the road corridor, on or around most prospective building sites, the Horowhenua District Council ("Council") owns assets including footpaths, kerbing and channel, road surface, street furniture, tobies, trees and berms. These are called **"Infrastructure Assets"**. Whilst acknowledging that on occasion, damage is unavoidable, Council wants to ensure that those assets are not damaged, or that any damage is rectified at no cost to the ratepayer.
2. The purpose of this Agreement is to ensure that those involved in building work use their best endeavours to avoid damage to Infrastructure Assets, and will fix any damage that is caused. A simple example is access to a building site over a Council footpath. The footpath is damaged by heavy machinery. It is the Applicant's responsibility to put the damage right.

Signature

N. Stirling (Agent for Homestead Concrete Homes) 15 / 07 / 14

Name of person signing: *(please print clearly)* Dated

TRIM No: D11/35298

OFFICE USE ONLY

Date received	
Initial photos received on	
Received by	*(print name)*
Final Infrastructure Inspection Date	

COMMENTS

Form IG-001 v2 30 August 2010

View from S-W corner



View towards S-W corner



View towards S-W corner



Acceptance of Liability Agreement

Horowhenua DISTRICT COUNCIL

Agreement details

Building Consent ○

I Daniel Lawry

(applicant's full name)
(address of applicant)

Phone 021 2424 682 Email daniel@homesteadgroup

of

give notice that I will be undertaking work at:

1097 Queen St Levin

(address of where work is to be carried out)

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Signature

Daniel Lawry — 9/7/14

Name of person signing: *(please print clearly)* — Dated

TRIM No: D11/35298

OFFICE USE ONLY

Date received	
Initial photos received on	
Received by	*(print name)*
Final Infrastructure Inspection Date	

COMMENTS

Form IG-001 v2 30 August 2010

Homestead Concrete Homes Ltd

SPECIFICATION of work to be done and materials to be used in carrying out the works shown on the accompanying drawings

New Dwelling

Project Specification

1097 Queen Street, Levin, New Zealand
Project Ref: H1408
Printed: 08 July 2014

APPROVED
01 AUG 2014
CONSENT



Specification built using masterspec software
Masterspec ID: 103835; Version ID: 15683

masterspec

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1013 DOCUMENT CONTROL

1. DOCUMENT CONTROL

Document Control

1.1 PREPARED BY

Company:	Homestead Concrete Homes
Postal Address:	76 Main Road South, Levin
Street Address:	as above
City:	Levin
Telephone:	06-3681357
Email:	neil@homesteadgroup.co.nz

1.2 DOCUMENT DETAILS

Project Name:	New Dwelling
Project Number:	H1408
File Reference:	H1408
Client:	Homestead Concrete Homes
Client Contact:	06-3681357
Version:	n/a

1.3 REVISION CONTROL

Issue:	Building Consent
Revision:	~
Amendment Details:	~
Issued to:	Horowhenua District Council
Date of Issue:	08-07-2014
Reviewed by:	~
Approved by:	~

1.4 AUDIT CONTROL

Date:	~
Author:	~
Approved by:	~

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1220 PROJECT

1. **GENERAL**
This general section describes the project including:
- A description of the work
- Site description, features and restrictions
- Design parameters for design by contractor
- Archaeological discovery

1.1 READ ALL SECTIONS TOGETHER
Read all general sections together with all other sections.

Description of the work

1.2 SCOPE OF THE WORK
New Precast concrete wall designed dwelling with seven bedrooms and attached garage.

1.3 RESTRICTED BUILDING WORK
This project includes Restricted Building Work.

Site

1.4 SITE
The site consists of: flat site with no major height changes
as shown on drawing no. L1 - Site Plan

1.5 LEGAL DESCRIPTION
The site of the works, the street address and the legal description are shown on the drawings.

Site environment - Wind

1.6 WIND DESIGN PARAMETERS - NON SPECIFIC DESIGN
The design wind pressures are to NZS 3604, Table 5.4 Determination of wind zone, up to and including Extra High Wind Zone.
Building wind zone High (refer to NZS 3604, table 5.4)

Site environment - Durability

1.7 EXPOSURE ZONE
The exposure zone is to NZS 3604, Section 4 Durability, 4.2 Exposure zones and NZBC E2/AS1.
The site zone is: C

Site environment - Seismic

1.8 EARTHQUAKE ZONE - NON SPECIFIC DESIGN
The zone is to NZS 3604, Section 5 Bracing design, 5.3 Earthquake bracing demand.
The earthquake zone is: 3

Archaeological discovery

1.9 ANTIQUITIES AND ITEMS OF VALUE
Report the finding of any fossils, antiquities and other items of value, to the Contract Administrator. All to remain undisturbed until approval is given for removal.

Pre-1900, items or evidence of human activity on the site, come under the Historic Places Trust Act 1993. If such items or evidence is discovered work must stop immediately and the Contract Administrator must be notified immediately. The site maybe classified as an Archaeological Site under the Act, and the Contract Administrator or Owner must contact the NZ Historic Places Trust for authority to proceed.

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Post-1900 items remain the property of the owner, pre-1900 items may remain the property of the owner or the Crown subject to what is found.
Known archaeological information relating to this site includes the following: -
~

APPROVED
0 1 AUG 2014
CONSENT

1234 DOCUMENTATION

1. GENERAL

This general section relates to documentation required by the Territorial Authority/Building Consent Authority for compliance with the New Zealand Building Code. It also includes documentation relating to:
- Substitutions
- Manufacturers documents

Building Consent Authority documentation

1.1 BUILDING CONSENT
Obtain the original or copies of the building consent forms and documents from the owner and keep them on site. Liaise with the BCA for all notices to be given and all inspections required during construction to ensure compliance. Return the consent form and documents to the owner on completion.

1.2 BUILDING CONSENT COMPLIANCE
It is an offence under the Building Act 2004
- to carry out any work not in accordance with the building consent.
- to carry out Restricted Building Work by anyone other than a Licensed Building Practitioner licensed for that type of work.

The resolution of matters concerning building code compliance to be referred to the contract administrator for a direction in writing and then to the BCA for consent.

Where any alteration is requested by the territorial authority or any other authority, do not undertake such alteration until the matter has been referred to the Contract administrator for direction.

1.3 PROJECT PERSONNEL
Provide names and contact detail of the contractor's key personnel and tradespersons who are involved with the project. Provide the names in the form required in the general section of the specification. Review the list once a month and reissue it if changes have been made.

Licensed Building Practitioner documentation

1.4 LICENSED BUILDING PRACTITIONERS
On behalf of the Owner, provide details of LBP's to carry out or supervise Restricted Building Work. Provide names, LBP numbers, areas of practice and other required information. Provide this to the BCA and the Contract Administrator before commencing work on the Restricted Building Work. Provide the information in the form required in the general section 1222L PROJECT PERSONNEL LBP'S. Review the list once a month and reissue it if changes have been made.

Include the following which are considered applicable to this project:
- Site LBP
- Carpenter
- Foundations 1 Concrete foundation walls and concrete slab-on-ground constructor
- Roofing 3 Metal tile roofer
- External plastering 2 Proprietary Plaster Cladding Systems (PPCS) plasterer

Also provide names and contact details of the following
- Registered drainlayer
- Registered plumber
- Registered gasfitter
- Registered electrician

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1.5 NOTIFICATION OF BREACHES OF BUILDING CONSENT
Provide to the Contract Administrator and the Contractor a copy of any advice given to the BCA under s.89 of the Building Act. Provide this advice no later than the time the advice is given to the BCA.

1.6 RECORD OF BUILDING WORK
Where Restricted Building Work is carried out by a LBP, on completion of the RBW provide a Record of Building Work for inclusion with the documentation required for Code Compliance. Provide copies to both the BCA and the Contract Administrator.

Compliance Information

1.7 DOCUMENTATION REQUIRED FOR CODE COMPLIANCE
Information may be required either as a condition of the contract documents or as a condition of the building consent may include the following: -
- Applicators approval certificate from the manufacturer / importer / distributor
- Manufacturer's, importer's or distributors warranty
- Installer / applicator's warranty
- LBP Record of Work
- Producer Statement - Construction from the applicator / installer

Producer Statement - Construction review from an acceptable suitably qualified person

Refer to the general sections for the requirements for compliance information to be provided by the contractor.

Refer to the building consent for the requirements for compliance information to be provided by the contractor.

Obtain required documents from the relevant parties for delivery to the contract administrator after the final inspection has been carried out by the Building Consent Authority.

Substitutions

1.8 ACCEPTABLE PRODUCT/MATERIAL SUPPLIERS
Where a product or material supplier is named in SELECTIONS, the product/material must be provided by the named supplier. Where more than one named supplier, any one of the named suppliers will be acceptable.

1.9 NO SUBSTITUTIONS
Where specifically stated in a section, substitutions are not permitted to any of the specified systems, components and associated products listed in that section.

1.10 PROPOSED SUBSTITUTIONS
A substitution may be proposed where specified products are not reasonably available. A substitution may also be proposed by the Contractor where the Contractor considers a proposed substitution to be an alternative to the specified product. Except where a specified product is not available, the Contract administrator is not bound to accept any substitutions. Where branded work sections are included in this specification, substitution of those products or systems will not be allowed.

1.11 NOTIFICATION OF SUBSTITUTIONS
Notify proposed substitution of specified products. Notification to include but not be limited to:
- Product identification
- Manufacturer's name, address, telephone and facsimile numbers, website and email address
- Detailed comparison between the properties and characteristics of the specified product and the proposed substitution
- Statement of NZBC compliance including durability
- Details of manufacturer warranties

plus an assessment of

- Any changes required to the programme including any extension of time required
- Any consequential effects of the proposed substitution
- Allowance for time and cost for re-design and documentation (if applicable)
- Allowance for time and cost for obtaining an amendment to the Building Consent (if applicable)
- Any change in cost associated with the proposed substitution

and if requested
- All current manufacturer's literature on the product
- Accreditations and appraisals available
- Reference standards
- Product limitations
- Samples
- List of existing installations in the vicinity of the project

1.12 ACCEPTANCE OF SUBSTITUTIONS
The Contract administrator must advise of acceptance of substitutions in writing.

Amendment to issued Building Consent

1.13 CONTRACTOR AMENDMENTS TO BUILDING CONSENT
Where the contactor has sought acceptance of a substitution or a variation which is for the contractor's own convenience and the substitution or variation requires an amendment to the Building Consent, the contractor must apply for and obtain the required amendment.

The contractor must:
- Obtain approval for substitutions from the Contract administrator.
- Prepare and provide to the BCA all documentation required for the amendment.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

1.14 PRINCIPALS AMENDMENTS TO BUILDING CONSENT
Where the principal is proposing a substitution or a variation which requires an amendment to the Building Consent, the contractor must provide to the principal information that the contractor has that is required for the amendment.

The principal will:
- Prepare and provide to the BCA all documentation required for the amendment.
- Pay all fees and other costs associated with this amendment.
- Where the amendment affects other approved plans, also amend those plans.

Manufacturer's documents

1.15 BRANDED WORK SECTIONS
Branded sections may be included in this specification relating to specific products and systems to be installed as part of the contract works. Where branded sections are included, substitutions to the branded products and systems will not be allowed.

1.16 CROSS REFERENCED WORK SECTIONS
If any related work is cross referenced to a generic work section, but only the equivalent branded section is included in the specification, use that branded section. Confirm with the Contract administrator if there is any doubt.

1.17 MANUFACTURER'S AND SUPPLIER'S REQUIREMENTS
Manufacturers and supplier's requirements, instructions, specifications or details mean those issued by them for their particular material, product or component and are the latest edition.

1.18 MANUFACTURER'S AND SUPPLIER'S DOCUMENTS
Refer to individual sections for a detailed list of manufacturer's and supplier's documents relating to work on this project. Retain current copies of the documents listed, and all other relevant manufacturer's technical literature, on site. Make this information available

to all personnel and ensure they are familiar with requirements for handling, storing, preparing for, fixing and finishing all products before commencing work. Provide a copy of all listed manufacturer's literature to the Contract administrator.

1.19 ONGOING MAINTENANCE REQUIREMENTS
Refer to individual sections for details of manufacturer's and supplier's requirements for ongoing maintenance necessary to ensure continuing compliance with the durability requirements of the NZBC. Provide a copy of literature detailing ongoing maintenance and inspection requirements to the Contract administrator.

As built drawings

1.20 PROVIDE AS BUILT DRAWINGS
Provide as built drawings where specified in the work sections and as required by the BCA.

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3101 CONCRETE WORK - BASIC

1. GENERAL

This section relates to formwork, reinforcement, concrete mixes and the placing of concrete.

Documents

1.1 DOCUMENTS
Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B1/AS1	Structure
NZBC E2/AS3	External moisture
AS 1366.3	Rigid cellular plastics for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
NZS 3101.1	Concrete structures standard
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3114	Specification for concrete surface finishes
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 4858	Wet area membranes
CCANZ CP 01	Code of practice for weathertight concrete and concrete masonry construction

2. PRODUCTS

2.1 NORMAL CONCRETE
Normal concrete 17.5, 20 or 25 MPa grade, (refer to SELECTIONS), maximum aggregate size 19mm ready-mixed to NZS 3104. Provide delivery dockets listing mix and despatch details.

2.2 PRESCRIBED MIX CONCRETE
Prescribed mix concrete 17.5, 20 or 25 MPa grade (refer to SELECTIONS) minimum strength, using either separate batching of sand and builder's mix or coarse aggregate to NZS 3104, table 3.1, Grading recommendations for combined and uncombined coarse aggregates.

2.3 REINFORCEMENT
Bars to AS/NZS 4671. Grade 300E deformed, other than for ties, stirrups and spirals, unless shown otherwise on the drawings. Welded reinforcing mesh Class E to AS/NZS 4671.

2.4 MESH FOR SLABS TO NZS 3604 OR NZS 4229
For slabs on ground mesh to be welded reinforcing mesh to AS/NZS 4671, Class E, minimum to B1/AS1 - Grade 500E, 2.27kg/m2 (1.14kg/m2 in each direction).

2.5 TYING WIRE
Mild drawn steel wire not less than 1.2mm diameter.

2.6 SPACERS AND CHAIRS
Precast concrete or purpose made moulded PVC to approval. Where concrete spacer blocks are used in exposed concrete work use blocks matching surrounding concrete.

2.7 DAMP-PROOF MEMBRANE
0.25mm minimum polyethylene to NZS 3604, 7.5.4, Damp-proof membrane.

2.8 CELLULAR POLYSTYRENE INSULATION
Proprietary expanded polystyrene (EPS) foam board to AS 1366.3.

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Accessories

2.9 WATERPROOFING FOR EXTERIOR OPENINGS
Unreinforced wet area membrane to AS/NZS 4858 for waterproofing around openings for windows, doors, meters and other services openings, at or above floor level, also parapets and ends of masonry walls abutting other claddings to CCANZ CP 01. Refer to SELECTIONS.
Do not use bituminous coatings.

3. EXECUTION

3.1 HANDLE AND STORE
Handle and store reinforcing steel and accessories without damage or contamination. Store on timber fillets on hard ground in a secure area clear of any building operation. Lay steel fabric flat.

Ensure reinforcement is clean and remains clean so that at the time of placing concrete it is free of all loose mill scale, loose rust and any other contamination that may reduce bonding capacity.

3.2 FALSEWORK AND FORMWORK
Use falsework and formwork of sufficient strength to retain and support the wet concrete to the required profiles and tolerances. Select formwork finish to produce the specified finished quality. Ensure timber or plywood used for formwork is non-staining to the set concrete.

Securely fix and brace formwork sufficiently to support loads and with joints and linings tight enough to prevent water loss. Do not use tie wires or rods unless approved in writing by the Contract Administrator. Unless detailed otherwise, provide a 19mm chamfer or fillet strip at all interior and exterior angles of beam and column forms. Mitre at intersections.

Water blast to clean formwork. Keep formwork wet before concrete is placed.

Unless detailed otherwise, set up soffit boxing for beams and slabs to provide a camber when forms are stripped, of 3mm rise for every 3 metres of total clear span.

3.3 INSTALL DAMP-PROOF MEMBRANE
Apply polythene membrane to prepared basecourse with 150mm laps between sheets. Tape seal laps and penetrations with 50mm wide pressure sensitive plastic tape. Refer to drawings for perimeter details.

3.4 INSTALL CELLULAR POLYSTYRENE INSULATION
Install EPS insulation system to manufacturer's requirements.

3.5 CUT AND BEND REINFORCEMENT
Cut and bend bars using proper bending tools to avoid notching and to the requirements of NZS 3109: 3.3 Hooks and bends. Minimum radii of reinforcement bends to NZS 3109, table 3.1, Minimum radii of reinforcement bends. Do not rebend bars. Where rebending is approved, use a purpose built tool, proper preparation and preheating.

3.6 ADJUSTMENTS
Use a purpose built tool for on site bending and to deal with minor adjustments to steel reinforcement.

3.7 TOLERANCES, BENDING
To NZS 3109, 3.9, Tolerances for reinforcement.

3.8 SECURE REINFORCEMENT
Secure reinforcement adequately with tying wire and place, support and secure against displacement when concreting. Bend tying wire back well clear of the formwork. Spacing as dimensioned, or if not shown, to the clear distance minimums in NZS 3109, 3.6, Spacing of reinforcement.

3.9 LAPPED SPLICES
Length of laps where not dimensioned on the drawings in accordance with the SELECTIONS. Increase laps of plain round steel by 100%. Provide laps only where indicated on the drawings. Tie all lapping bars to each other.
Welded wire mesh laps to NZS 3101, lap one mesh square plus 50mm minimum (do not count bar extention beyond the outermost wire).

3.10 MESH LAPS FOR SLABS TO NZS 3604 OR NZS 4229
For slabs on ground the welded reinforcing mesh to be lapped such that the outermost wires overlap by the greater of:
- the spacing of the cross wires plus 50mm
- 150mm or
- manufacturer's requirements
Do not count bar extensions beyond the outermost cross wire.

3.11 REINFORCEMENT COVER
Minimum cover to all reinforcing bars, stirrups, ties and spirals, as shown on drawings. Where cover is not shown on drawings provide minimum cover to NZS 3101.1, table 3.6, Minimum required cover for a specified intended life of 50 years. Fix chairs for top reinforcement in slabs at 1.0 metre centres or to ensure adequate support. Cover tolerances to NZS 3109, 3.9, Tolerances for reinforcement.
Welded mesh for slabs to extend to within 50mm to 75mm of the slab outside edge or as shown on drawings.

3.12 CASTING IN
Build in all grounds, bolts and fixings for wall plates and bracing elements, holding down bolts, pipes, sleeves and fixings as required by all trades and as shown on the drawings, prior to pouring the concrete.

Do not use grounds exceeding 100mm in length. Location and form of conduits to be approved in writing by the Contract Administrator. Minimum cover 40mm. Do not encase aluminium items in concrete. Do not paint steel embedded items more than 25mm into the concrete encasement. Cut back form ties to specified cover and fill the cavities with mortar.

Form all pockets, chases and flashing grooves as required by all trades and as shown on the drawings.

Wrap all pipes embedded in concrete with tape to break the bond and to accommodate expansion. Do not embed pipes for conveying liquids exceeding a temperature of 50°C in concrete.

3.13 CONSTRUCTION JOINTS
Locate and construct as shown on the drawings or in accordance with NZS 3109, 5.6, Type B.

3.14 PRE-PLACEMENT INSPECTION
Do not place concrete until all excavations, boxing and reinforcing have been inspected and passed by the Building Consent Authority.

3.15 SURFACE FINISHES
To NZS 3114, 105, Specification of finishes, as scheduled or as denoted on the drawings.

3.16 EXPOSED CONCRETE
Formwork linings and surface finishes as nominated for both fair face and concealed or exposed surfaces. Unless detailed, obtain written confirmation of the type and pattern of all joints.

3.17 CONCRETE SURFACE TOLERANCES
To NZS 3114, 104, Surface tolerances and NZS 3114, 105, Specification of finishes, with the suggested tolerances becoming the required tolerances.

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3.18 PUMPING CONCRETE

Set up and supervise pump operation, placing and compaction of the mix to NZS 3109, 7.4, Handling and placing and NZS 3109, 7.6, Compaction Advise the ready-mix supplier of the type of pump and the slump required, in addition to the concrete grade, strength and quantity.

3.19 COMPACTION

Use power operated vibrators on foundations, vertical constructions and beams.

3.20 FLOOR SLABS TO NZS 3604

Generally for slabs on ground to NZS 3604 as modified by NZBC B1/AS1 and NZBC E2/AS3.
Construct to NZS 3604, 4.5 **Concrete and concrete masonry** and NZS 3604, 7.5, **Concrete slab-on-ground floors in timber buildings** as modified by NZBC B1/AS1, 3.0 **Timber**. Lay to true and straight surfaces, screeded, floated and steel (manual or power) trowelled finish. Tolerance on flatness: maximum 3mm gradual deviation over a 3 metre straight-edge, to NZS 3114, 304, **Surface tolerances**.
Allow for free joints maximum 24m centres to NZBC B1/AS1, 3.1.13 **NZS 3604 New clause**.

3.21 SAW CUTS

Cut slabs where indicated on the drawings and as required to control shrinkage cracking. Carry out cutting as soon as possible, without causing tear-out of aggregate and before shrinkage cracking has occurred, generally within 24 hours of pouring. Where saw cuts are made, cut out 100mm of every second wire of the mesh for a length of 50mm each side of the saw cut position. Saw cuts: 1/3 slab depth or 30mm minimum.

Spacing of sawcuts

Floor situation	Maximum spacing of sawcuts both ways
Industrial floor	5m
Architectural, exposed floor, thin finishes, rigid finishes	4m
Carpet on underlay flooring	6m

3.22 SURFACE DEFECTS

Make good surface defects immediately after forms are stripped. Make good hollows or bony areas with 1:2 mortar or plaster, finished to the same tolerances as the parent concrete. Fill any tie rod holes with 1:2 mortar.

3.23 CURING OF CONCRETE

Keep damp for not less than seven days. Ensure curing of slabs commences as soon as possible after final finishing, by the use of continuous water sprays, or ponding. Alternately, apply a curing membrane. Ensure any membrane used will not affect subsequent applied finishes.

3.24 STRIKE FORMWORK

Strike formwork without damaging or overloading structure. Do not remove formwork before the following minimum periods:

12 hours:	Sides of beams, walls and columns
4 days:	Slabs in beam and slab construction (leave props under slab spans over 2 metres)
10 days:	Props from under slab spans over 2 metres
18 days:	Beams, soffits and slab spans over 5 metres

3.25 WATERPROOFING EXTERIOR OPENINGS

Apply waterproofing to the exposed face of openings for, windows, doors, meters etc, also if necessary the top of parapets/balustrades and ends of masonry walls abutting other claddings. To CCANZ CP 01, waterproofing manufacturer's requirements and as detailed.
Provide temporary protection from direct sunlight.

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3.26 CLEAN OUT
Clean out saw cuts. Fill with cement grout where the floor will be covered with carpet or vinyl.

3.27 REMOVE
Remove all unused materials and all concrete and reinforcing debris from the site.

4. SELECTIONS

4.1 DAMP-PROOF MEMBRANE
Brand/type: 250um black polythene

4.2 CELLULAR POLYSTYRENE INSULATION
Brand: Lanwoods
Grade: S grade
Thickness: 150mm

4.3 REINFORCEMENT LAPS
Where reinforcement laps are not shown on the drawings, lap as follows:

Bar diameter	Grade 300E deformed
10mm	400mm
12mm	500mm
16mm	650mm

4.4 CONCRETE
Normal concrete:
25 MPa: for slab floor

Prescribed concrete:
25 MPa: As required by NZS 3604 and for exposed concrete in sea spray zone

4.5 WATERPROOFING FOR EXTERIOR OPENINGS
Location: Window jamb and sill
Brand/name: Resene X200
Type: Quick curing elastomeric unreinforced waterproofing membrane to AS/NZS 4858

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3130 PRECAST CONCRETE

1. GENERAL

This section relates to the off site manufacture and on site installation of precast panels for housing and small scale commercial projects.

1.1 RELATED WORK
Refer to the appropriate concrete section for concrete requirements.

1.2 DOCUMENTS
Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC D1/VM1	Access routes
NZS 3104	Specification for concrete production
NZS 3109	Concrete construction
NZS 3112.1	Methods of test for concrete - Tests relating to fresh concrete
NZS 3114	Specification for concrete surface finishes
NZS 3121	Water and aggregate for concrete
AS/NZS 3661.1	Slip resistance of pedestrian surfaces - Requirements
AS/NZS 4671	Steel reinforcing materials
AS/NZS ISO 9001	Quality management systems - Requirements
Precast CoP	Approved Code of Practice for Safe Handling, Transportation and Erection of Precast Concrete (OSH)

Requirements

1.3 PREPLANNING
Prior to shop drawing/manufacture of the precast panels the Contractor, Precaster and other relevant parties, must liaise, to ensure installation/on-site requirements are coordinated with the panel production.

1.4 SHOP DRAWINGS
Refer to the general section 1235 SHOP DRAWINGS for the requirements for submission and review and the provision of final shop drawings.

Provide shop drawings to show the general arrangement including, but not be limited to:
- size, spacing and cover of reinforcement
- details, position and layout of cast in items, including those for, lifting, handling, fastening and connecting
- details of panel edges
- surface finish requirements and locations
- location and size of rebates, recesses and penetrations
- grout ducts
- concrete mix requirements and strength
- concrete volume and weight of finished unit for lifting
- for insulated panels, details of insulation, low conduction connectors/ties, vapour barrier

Submit shop drawings for review to Homestead Group.

- 3 working days (at least) before fabrication is planned to commence, provide shop drawings for review.
- Do not commence fabrication of any panel before shop drawing review of the panel is complete.
- Shop drawing review (and subsequent fabrication) can be carried out on an agreed sectional/staged basis.

1.5 MANUFACTURERS STATEMENT OF COMPLIANCE
Provide a Manufacturer's Statement of Compliance from the Precast CoP.

1.6 PANEL SURFACE
Use appropriate mould materials, moulding systems and casting methods to achieve the specified surface finishes. Refer to SELECTIONS for surface finishes.

1.7 QUALIFICATION, PRECAST MANUFACTURE
Precast concrete panels manufactured by either;

- a Precast NZ Certified Plant
- or an off-site precast manufacturer with, an established record of panel production to a similar standard, suitable plant and an appropriate quality assurance system.

Use only precast concrete workers skilled and experienced in precast panel production.

1.8 QUALIFICATION, ON-SITE WORK
Use only concrete tilt up panel, crane and rigging, contractors skilled and experienced in the erection of tilt up panels.

Performance

1.9 TESTING - CONCRETE
Carry out sampling and concrete acceptance tests during construction to NZS 3109: section 9, Concrete acceptance tests during construction.
Conduct 7 day strength tests. After a 7 day test result of less than 60% of the specified strength, concrete placement to stop until it is shown the suspect concrete complies with the specification.

Carry out slump tests, yield tests and air content tests to NZS 3112.1, sections 4, 5 and 9, and evaluate to NZS 3104.2.15. Control tests and their evaluation. Make available all test records to the contract administrator on request.

1.10 CONFIRM STEEL REINFORCING COMPLIANCE
Provide written confirmation that the steel reinforcing supplied complies with the grades specified on the drawings, by producing test results to AS/NZS 4671

1.11 QUALITY ASSURANCE
Carry out the whole of this work to the requirements of NZS 3109 and under the regime of a quality systems for quality assurance in production and erection.
Advise name of the suitably experienced and qualified representative who is responsible for quality control of the concrete work. The representative is to sign a written quality control checklist for each concrete pour.

1.12 SITE LOADINGS, PERMANENT STRUCTURE
Prevent damage to supporting structure from stacking of precast items.

2. PRODUCTS

2.1 CONCRETE
To NZS 3104.
Refer to CONCRETE section for concrete supply and to SELECTIONS for concrete strength.

2.2 GRADE 300E STEEL
To AS/NZS 4671. Round bars are shown by symbol "R" and deformed bars by symbol "D", followed by the diameter in millimetres.

2.3 GRADE 500E STEEL
To AS/NZS 4671. Round bars shown by symbol "HR" and deformed bars by symbol "HD" followed by diameter in millimetres.

2.4 WELDED WIRE FABRIC
Hard drawn steel wire spot welded with correct gauge to AS/NZS 4671, smooth or deformed and to the spacing and dimensions either specified or shown on the drawings.

2.5 SPACERS AND CHAIRS
Precast concrete or purpose made moulded PVC to approval. Where concrete spacer blocks are used in exposed concrete work use blocks matching surrounding concrete.

2.6 INSULATION FOR INSULATED PANELS
Rigid insulation sandwiched between concrete panels.

2.7 PANEL CONNECTORS FOR INSULATED PANELS
Low thermal conductivity connectors/ties to connect the faces of sandwich insulated panels.

Components

2.8 LIFTING INSERTS
Proprietary lifting inserts to the Precast CoP, minimum finish galvanised mild steel.

2.9 CAST IN STEEL ITEMS
Cast in items as detailed and required. Ensure items are prefinished where required.

2.10 GASKETS
Proprietary type.

2.11 LEVELLING SHIMS
Rigid plastic or other suitable levelling shims to Precast CoP.

2.12 SEALANTS
Polysulphide, polyurethane or silicone gap filling proprietary sealants.

3. EXECUTION

Conditions

3.1 HANDLE, TRANSPORT AND STACK
Handle, transport and stack panels to ensure support that avoids distortion and stress and at the same time protects the finished surfaces from chipping, scoring, cracking or other disfigurement. Storage methods and packing between panels should minimise colour variations to exposed surfaces.
Arrange delivery and erection of precast panels to minimise handling, storage or restacking on site.

Manufacture

3.2 TOLERANCES, OFF-SITE PRECAST, STANDARD
Manufacture panels with tolerances to NZS 3109, table 5.1, Tolerance for precast components.

3.3 SECURE REINFORCEMENT
Secure adequately with tying wire, spacers or other suitable means, and place accurately where detailed, supported and secured against displacement. Ensure minimum concrete cover is maintained.

3.4 CONCRETE PLACING
Carefully place concrete to ensure all parts of the mould are completely filled and full contact is made with the mould surface. Use appropriate compaction techniques to achieve the required finish.

3.5 CASTING IN ITEMS
Accurately cast in all embedded items and fixings as detailed, all securely located to avoid displacement during concrete placement and compaction. Where bolts are cast in, also provide the nut (free moving on the bolt).

3.6 CURING
Confirm in writing the system to be used for curing concrete. Cure panels, for a minimum of 7 days and until minimum strength is achieved for safe lifting, handling, transportation and erection.

Installation

3.7 INSTALLATION
Carry out work in accordance with the Precast CoP.
Prior to lifting any panels from the truck, check and make a record of any damage to the panels, and obtain approval from the Contract Administrator before incorporating a damaged panel into the work.

3.8 SETTING OUT
Confirm panel dimensions, set out and site conditions. Also check starter bars, grout tube positions and fixing points. Check all temporary support work is ready, correct and capable of taking imposed loads.

3.9 TOLERANCES, ON - SITE EXECUTION
Locate precast items to the following tolerances:

Plan:	± 10mm
Vertical:	± 1mm/metre
Panel Joint width:	± 1mm/metre; but no panel joint shall be less than 10mm, or more than 20mm (unless indicated otherwise on drawings)

3.10 LIFTING
Mobile crane positions to be arranged and prepared prior to panel delivery to provide safe lifting. Ensure that all cranes can provide safe and easy movement of panels, as well as careful positioning. Check that rigging, straps, etc, suit the panel design and lifting points. Panels are to remain attached to the crane until they are either fully fixed into their final position or adequately secured by temporary means.

3.11 PROPPING AND BRACING
Provide temporary adjustable props or braces to secure the panel in position until final support is provided. They must be able to withstand the expected wind loads on the panel for the site and position.

3.12 PLACING
On positioning of the panel, check that all reinforcing and fixings line up with the appropriate items on the preceding work. Also check fixings will function as intended, in particularly fixings required to accommodate seismic movement. Ensure that there is no damage caused to the panel, surrounding surfaces or fixings during placing.

3.13 FINAL POSITION
Adjust panels into final position, check alignment, verticality, joint widths etc, and fix into place.

3.14 GROUT DUCTS
Fill grout ducts with expansive grout, ensure ducts are completely filled.

3.15 POST PLACING ADJUSTMENTS
After permanent placing check and adjust as necessary;
- all fixings for correct alignment and operation, and check the torque on all nuts and bolts - not less than 1 day after final fixing.
- recheck that all props, braces and fastenings are secure and capable of performing as required - not less than 1 day and not more than 7 days after a panel is fixed into position and held by temporary means.
- if panels are subject to, high wind loads, unintended or accidental loads during construction, recheck props braces and fastenings.

3.16 FIT GASKETS
Fit gaskets to panel joints in sequence and achieve the flexibility required by the gasket manufacturer.

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3.17 SEALANTS
Ensure at time of erection, that the limits of acceptable joint variation (from the manufacturer's requirements) for each product are maintained. Prepare joints, protect adjoining surfaces, seal joint surfaces, fit limiting rods and insert sealant to the manufacturer's requirements and temperature limits.

3.18 CLEAN AND DRESS
Clean and dress panels externally and internally to leave them to the standard of finish specified and without blemish, ensuring following work can be completed to the required standard.

3.19 CLEAN UP
Clean up surrounding areas of trade waste and remove temporary works required for the installation of the precast concrete items.

3.20 REMOVE
Remove debris, unused materials and elements from the site.

4. SELECTIONS

4.1 SURFACE FINISHES
Formed surfaces: F4 finish to NZS 3114
Unformed surfaces: U3 finish to NZS 3114

4.2 GASKETS
Manufacturer: Sika - PEF Rod
Type/number: ~

4.3 LEVELLING SHIMS
Manufacturer: N/A
Brand name: Vaires on site

4.4 SEALANTS
Location: Panel joints
Manufacturer/type: MS Sealant

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3820 CARPENTRY

1. GENERAL

This section relates to the supply and erection of light timber framing, floors, flooring underlays and decking.

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
AS/NZS 1328.1	Glued laminated structural timber - Performance requirements and minimum production requirements
AS/NZS 1860.1	Particleboard flooring - Specifications
AS/NZS 2269.0	Plywood - Structural - Specification
AS/NZS 2904	Damp-proof courses and flashings
AS/NZS 2918	Domestic solid fuel burning appliances - Installation
NZS 3602	Timber and wood-based products for use in building
NZS 3603	Timber structures standard
NZS 3604	Timber-framed buildings
NZS 3622	Verification of timber properties
NZS 3640	Chemical preservation of round and sawn timber
FTMA CoP	Frame and Truss Manufacturers Association Code of Practice

***A copy of NZS 3604 Timber-framed buildings, must be held on site.**

1.2 SAMPLES

Provide samples of the following for review prior to ordering:
- Boarding for exterior decks
- Timber strip flooring.

1.3 DIMENSIONS

All timber sizes except for battens are actual minimum dried sizes.

2. PRODUCTS

2.1 TIMBER FRAMING, TREATED

Species, grade and in service moisture content to NZS 3602, NZBC B2/AS1 and treatment to NZS 3640, NZBC B2/AS1. Structural grade (SG) to NZS 3604, NZS 3622 with properties to NZS 3603.

2.2 LAMINATED TIMBER

Radiata pine laminations to AS/NZS 1328.1; treated as required by NZS 3602, NZBC B2/AS1, to the requirements of NZBC B2/AS1, NZS 3640, with special attention to Appendix B "Specification advisory notes". Supply weather resistant sealed.

2.3 NAILS

Type to NZS 3604, section 4, **Durability**, and of the size and number for each particular types of joint as laid down in the nailing schedules of NZS 3604, sections 6-10.

2.4 BOLTS AND SCREWS

Bolts and screws of engineering and/or coach type complete with washers, to the requirements of NZS 3604, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6-10.

2.5 NAIL PLATES

Comply with the requirements of NZS 3604, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6-10. Plates to the plate manufacturer's design for the particular locations as shown on the drawings.

2.6 CONNECTORS

Comply with the requirements of NZS 3604, section 4, **Durability**, and of the number and form required for each particular junction to NZS 3604, sections 6-10. Connectors and

structural brackets to the connector manufacturer's design for particular locations shown on drawings.

2.7 CORROSION RISKS
For exterior timber, timber in damp areas and timber subject to occasional wetting, use only stainless steel (or equivalent) fixings and connectors, when the timber is treated with; Copper Azole (CuAz, Preservative code 58), Alkaline Copper Quaternary (ACQ, Preservative code 90), Micronise Copper Azole (code 88) or Micronised Copper Quaternary (code 89).

2.8 DPC
Refer to 4161 UNDERLAYS, FOIL AND DPC section

3. EXECUTION

3.1 EXECUTION GENERALLY
To NZS 3603 and NZS 3604 except as varied in this specification. Execution to include those methods, practices and processes contained in the unit standards for the National Certificate in Carpentry and the National Certificate in Joinery (cabinetry, exterior joinery, stairs).

3.2 SEPARATION
Separate all timber framing timbers from concrete, masonry and brick by: -
- a full length bituminous damp-proof membrane overlapping timber by at least 6mm; or
- a 12mm minimum free draining air space

3.3 ATTENDANCE
Provide and fix blocks, nogs, openings and other items as required by other trades.

3.4 MOISTURE CONTENT
Maximum allowable equilibrium moisture content (EMC) for non air-conditioned or centrally heated buildings for framing to which linings are attached.

Framing at erection:	24% maximum
Framing at enclosure:	20% maximum
Framing at lining:	16% maximum
Timber strip flooring:	10% at time of laying

3.5 SET-OUT
Set out framing in accordance with the requirements of NZS 3604 and as required to support sheet linings and claddings.

3.6 FRAMING WALLS
Frame to required loading and bracing complete with lintels, sills and nogs, all fabricated and fastened to NZS 3604, section 8, **Walls**.

3.7 FRAMING ROOFS
Frame to required loading and bracing complete with valley boards, ridge boards and purlins. Design and fit roof trusses complete with anchorage. All fabricated and fastened to NZS 3604, section 9, **Posts** and 10, **Roof framing**.

3.8 FRAMING CEILINGS
Frame to required loading and bracing complete with runners and battens set out to support ceiling lining. All fabricated and fastened to NZS 3604, section 13, **Ceilings**. Trim for openings in ceilings and hatches to NZS 3604 section 13.3, **Openings in ceilings**. Provide blocking for water tanks located in the ceiling space to NZS 3604, section 13.4, **Water tanks in roof space**.

3.9 INSTALLING WALL UNDERLAYS
Refer to 4161 UNDERLAYS, FOIL AND DPC section

3.10 FIT CAVITY BATTENS
Fit and fix 20mm cavity battens over wall underlay or rigid air barrier, fully nail to timber studs to the requirements of the manufacturer or to NZS 3604. Fit and fix related

flashings. Fit and fix cavity closers to base of walls, open horizontal (or raking) junctions and over openings (windows, meters etc).

3.11 DPC TO LOSP TREATED TIMBER
Refer to 4161 UNDERLAYS, FOIL AND DPC section.

3.12 DPC TO TIMBER
Refer to 4161 UNDERLAYS, FOIL AND DPC section.

4. SELECTIONS

4.1 EXTERIOR WALL FRAMING

Member	Species	Grade	Treatment
Exterior walls:	Radiata pine	SG8	H1.2
	Douglas fir	SG8	H1.2
Parapets:	Radiata pine	SG8	H1.2
	Douglas fir	SG8	H1.2
Enclosed decks and balconies:	Radiata pine	SG8	H1.2
Cantilevered joists enclosed decks and balconies:	Radiata pine	SG8	H3.2
Wall battens:	Radiata pine	Merch	H3.1
Jamb battens:	Radiata Pine	Merch	H3.1

4.2 CAVITY BATTENS

Cavity battens	Species	Grade	Treatment
Timber - Non Structural:	Radiata pine	Merchantable	H3.1
Proprietary - non structural:	Manufacturer ~	Type ~	Reference ~
Cavity closer:	Manufacturer ~	Type ~	Reference ~

4.3 ROOF FRAMING

Member	Species	Grade	Treatment
Rafters:	Radiata pine	SG8	H1.2
	Douglas fir	SG8	H1.2
Trusses:	Radiata pine	SG8	H1.2
	Douglas fir	SG8	H1.2
Purlins:	Radiata pine	SG8	H1.2
	Douglas fir	SG8	H1.2
Ceiling joists and battens:	Radiata pine	SG8	H1.2
	Douglas fir	SG8	H1.2
Valley boards:	Radiata pine	Merchantable	H1.2
Sarking:	Radiata pine	Merchantable	H1.2
Skillion roof framing:	Radiata pine	SG8	H1.2
Enclosed flat roof framing:	Radiata pine	SG8	H1.2

4.4 SPECIAL FRAMING ELEMENTS

Member	Species	Grade	Treatment
~			

4.5 LAMINATED TIMBER

Member	Timber/grade/treatment	Finish
~		

4.6 LAMINATED VENEER LUMBER (LVL)

Member	Brand	Type
Joists:	~	
Rafters:	~	
Lintels:	~	

4.7 ENGINEERED WOOD PRODUCTS (EWP)

Member	Brand	Type
Joists:	~	

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Rafters:	~	
Lintels:	~	

4.8 INTERIOR FRAMING

Member	Species	Grade	Treatment
Non structural walls:	Radiata pine	SG8	H1.2
	Douglas fir	SG8	H1.2
Structural and braced walls:	Radiata pine	SG8	H1.2
	Douglas fir	SG8	H1.2

4.9 INTERIOR FINISHING TIMBERS

Member	Species	Grade
Architraves:	Radiata pine	Dressing
Skirtings:	Radiata pine	Dressing
Cornices:	Radiata pine	Dressing

4.10 DPC

Refer to 4161 UNDERLAYS, FOIL AND DPC section.

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4282R ROCKCOTE MASONRY RENDER SYSTEM

1. GENERAL

This section relates to **Rockcote Systems** exterior coatings of a polymer-modified cement-based plaster rendering system, applied by hand spray over:
- solid concrete
- masonry
- brick

Rockcote Systems products must be installed by an approved applicator.

1.1 ABBREVIATIONS AND DEFINITIONS
Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

PPCS	Proprietary Plaster Cladding Standard
AAC	Autoclaved aerated concrete
LRV	Light reflectance value
MPNZA	Master Painters New Zealand Association

Documents

1.2 DOCUMENTS
Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
NZS 4210	Masonry construction: materials and workmanship

1.3 MANUFACTURER/SUPPLIER DOCUMENTS
Manufacturer's and supplier's documents relating to work in this section are:

Rockcote:	Technical manual
	Rockcote Systems TradeSpec™
	Rockcote Systems Project Guide
Resene:	Total Colour System

Materials and execution to **Rockcote Systems** specification except where varied by this specification and supported by architectural detailing.

Copies of the above literature are available at

Web:	www.rockcote.co.nz
Telephone:	0800 50 70 40

Copies of Resene literature are available at

Web:	www.resene.co.nz
Telephone:	0800 RESENE (0800 737 363)

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER
Provide a material manufacturer/supplier warranty:
15 years: For materials by **Rockcote Systems**

- Provide this warranty on the **ROCKCOTE SYSTEMS** standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR
Provide an installer/applicator warranty:
5 years: For execution/workmanship - by Registered Plasterer

- Provide this warranty on the **ROCKCOTE SYSTEMS** standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS
Use only PPCS (Proprietary Plaster Cladding Standard) Registered Plasterers licensed to apply the **Rockcote Masonry Render System**.

1.7 NO SUBSTITUTIONS
Substitutions are not permitted to any specified **Rockcote Systems**.

1.8 ON GOING MAINTENANCE INSTRUCTIONS
Provide ongoing maintenance instructions required to meet the performance requirements of the NZBC B2/AS1 Durability.

1.9 FINISH SAMPLE
Submit one 300mm x 300mm standard panel of the selected finish texture and colour for approval. Obtain signature of acceptance on sample and return to the Registered Plasterer.

1.10 MAINTENANCE INSTRUCTIONS
Provide **Rockcote Systems** Maintenance Guide on or before practical completion of the contract for issuing to the building owner. **Rockcote Systems** Maintenance Guide to be provided on request.

1.11 HEALTH AND SAFETY
Refer to the requirements of the Health and Safety in Employment Act and OSH: Guidelines for the provision of facilities and general safety in the construction industry. If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as required in the MPNZA Painters hazard handbook. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put into place procedures for dealing with emergencies. Obtain from **Rockcote Systems** the material safety data sheets for each product. Keep sheets on site and comply with the required safety procedures.

1.12 PRODUCER STATEMENT
Provide the producer statement compiled by the Registered Plasterer in the form as required by the Building Consent Authority.

Compliance information

1.13 DURABILITY
The work covered by this part of the specification has been designed and constructed to achieve a durability of 15 years.

Performance

1.14 PERFORMANCE
Accept responsibility for the structural and weather-tight performance of the **Rockcote Masonry Render System**.

1.15 PROTECTION OF NEW PLASTER
Confirm the protection systems to be applied to fresh plaster coats. Plastering not to begin until systems are confirmed.

1.16 INSPECTIONS
Allow to inspect the whole of the work at each stage. Determine a programme for inspections including notification when each part and stage of the work is ready for inspection prior to the work commencing. Permit representatives of **Rockcote Systems** to inspect the work in progress and to take samples of their products from site.

2. PRODUCTS

Materials

2.1 ROCKCOTE ACRYLBOND (PLASTER MODIFIER)
Waterborne co-polymer resin.

2.2 ROCKCOTE PM 100 QUICK RENDER
Polymer modified cement-based dry plaster mix.

2.3 ROCKCOTE RENDER PRIME
Waterborne acrylic polymer dispersion tinted to the colour (optional) of **Rockcote** Texture.

2.4 RESENE LIMELOCK
Water-based 100% acrylic sealer.

2.5 ROCKCOTE ACRYLIC TEXTURE
Waterborne mineral filled acrylic polymer-based high build coating with fungicide colour tinted.

2.6 ROCKCOTE ARMOUR
Waterborne acrylic based breathable standard protective colour tinted finish coat.

2.7 RESENE X-200
Resene X-200 waterproof membrane colour selection from Resene Total Colour System.

Accessories

2.8 FLASHINGS
Head and cap flashings made from powder coated aluminium supplied by main contractor for both recessed and face-fixed timber, aluminium and PVC joinery to NZBC and masonry construction requirements.

2.9 SEALANT
BRANZ appraised modified silicon (MS) sealant.

2.10 ADHESION PRIMER (uPVC)
Rockcote MultiStop bedding compound.

2.11 REINFORCING MESH
Rockcote alkali-resistant fibreglass woven mesh.

3. EXECUTION

Conditions

3.1 DELIVERY
Keep plaster products dry in transit. Take delivery of plaster products dry and undamaged. Reject all damaged materials.

3.2 STORAGE
Deliver all materials in original unopened packaging with labels intact. Provide dry storage on site, stack carefully, protect from mechanical damage. Keep bagged render off concrete surfaces.

3.3 PLASTERING CONDITIONS
Carry out plastering to **Rockcote Systems** specification under conditions which will not adversely affect the finished work.

3.4 PROTECT
Before application of plaster, apply masking film and tape to all joinery, pipes, roofs and all areas likely to be marked by the plaster. Use drop cloths and ground covers to keep the working areas clean. Clean off droppings onto finished work immediately.

3.5 SUBSTRATE
Do not commence work until openings and apertures have been cut, pipes, fixtures, fixing pads and plugs have been fixed and flashings and other preparations are complete. All defects in substrate must be rectified by the trades applicable prior to application of plaster coatings. Ensure that backgrounds and adjoining surfaces are, after the preparation called for in this section, is of the standard required by **Rockcote Systems**. All mortar joints to be flush finished with all nibs and protrusions ground off by the brick / blocklayer.

3.6 FLASHING AND DETAILING
To NZBC E2/AS1, 4.0 **Flashings**. Comply with **Rockcote Systems** penetration flashing guidelines. Carry out to the required standard of execution to NZBC E2/AS1 to ensure water does not penetrate. Concrete masonry block openings must be flashed by the main contractor in accordance with the Concrete Masonry specification.

3.7 STANDARDS AND TOLERANCES
Comply with the tolerances laid down in NZS 4210 Table 2.2. To have no deviation more than 3mm from a straight edge 1200mm long.

3.8 CONFIRM LAYOUT
Before commencing work confirm the layout with the owner the position of expansion joints and other visual detailing of the finished work.

Application - conditions - background

3.9 PREPARE SURFACE
Before plastering is commenced, eliminate surface contaminants, remove dust, debris, oils, greases, retarders, and paint from already painted surfaces and loose material. Leave the surface dust free and clean. Make good any defects in the background which may adversely affect the quality of the plaster coating.

3.10 IRREGULARITIES
Fill voids, hollows and honeycomb with a mix not stronger than the background or weaker than the first coat.

3.11 ETCH PRIME FLASHINGS AND ACCESSORIES
Etch prime all uPVC flashings and accessories with MultiStop bedding compound and water. Leave 24 hours minimum before installation.

3.12 INSTALL uPVC FLASHINGS AND ACCESSORIES
Install all uPVC flashings and tapes necessary and to **Rockcote Systems** requirements prior to plaster application commencing.

Application - joints and junctions

3.13 EXPOSED CONTROL JOINTS
Provide movement control joints in the plaster to coincide with movement joints in the background and/or junctions between dissimilar backgrounds in the same plane and/or where shown on the drawings. Reinforcing mesh is to terminate each side of control joints. Exposed control joints to be reflected through final coatings from substrate.

Application - plaster systems

3.14 PRE-PLASTER PREPARATION
Control suction by dampening with water if necessary but without over-wetting. Allow the surface to dry back to a surface-dry condition before plastering.

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3.15 CURING
Confirm the curing and protection systems to be applied to fresh plaster coats. Plastering not to begin until systems are confirmed.

Rockcote Render System

3.16 BASE AND MESH COAT
Apply base plaster coat 5mm thickness maximum based on **Rockcote** PM100 Quick Render. Embed fibreglass mesh into the wet plaster. Overlap each successive length by 100mm minimum. Apply sticky mesh around all external corners and into all window reveals. Apply diagonal reinforcement strips at all corners of windows, doors and other exterior openings.

3.17 SECOND LAYER OF BASE COAT
Apply second layer of base plaster coat evenly at 2mm thickness maximum based on **Rockcote** PM100 Quick Render when first base coat layer is touch dry.

Application - acrylic selection

3.18 SEAL COAT ACRYLIC TEXTURE FINISH
For **Rockcote Systems** acrylic texture finish seal the base coats with one coat of **Rockcote** Render Prime or **Resene** Limelock within 14 days of applying the second base coat.

3.19 TEXTURED FINISH COAT
Apply **Rockcote** Texture coat 1mm thickness minimum to achieve the specified finish and colour (optional) to **Rockcote Systems** requirements.

3.20 PROTECTIVE FINISH COAT
Apply one coat of **Rockcote Systems** Armour or two coats of **Resene** X-200 reinforced waterproof membrane to achieve a protective acrylic based finish.

3.21 FINISHING
Refer to SELECTIONS for system texture and colour.

Completion

3.22 CLEANING
Remove debris, unused materials and elements from the site relating to the plaster system application. Replace damaged, cracked or marked elements. Leave the whole of this work to the required standard.

3.23 FINAL INSPECTION
A final inspection by **Rockcote Systems** authorised applicator and project assessor of the entire finished cladding to take place immediately after completion of the wall cladding work and any defects or subsequent damage made good immediately.

4. SELECTIONS
Substitutions are not permitted to the following, unless stated otherwise.

4284RE ROCKCOTE CAVITY BASED EIFS CLADDING SYSTEM

1. GENERAL

This section relates to the supply and fixing of **RockcoteSystems** cavity based exterior wall cladding system based on polystyrene fixed over a drained cavity to timber or steel framing and with an applied textured surface finish.

1.1 ABBREVIATIONS AND DEFINITIONS
Refer to the general section 1232 INTERPRETATION & DEFINITIONS for abbreviations and definitions used throughout the specification.

The following abbreviations apply specifically to this section:

EPS	Expanded polystyrene
XPS	Extruded polystyrene
PPCS	Proprietary Plaster Cladding Standard
MPNZA	Master Painters NZ Association
LRV	Light Reflectance Value

Documents

1.2 DOCUMENTS
Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
AS/NZS 1170.2	Structural design actions - Wind actions
AS 1366.3	Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Moulded (RC/PS - M)
AS 1366.4	Rigid cellular plastics sheets for thermal insulation - Rigid cellular polystyrene - Extruded (RC/PS-E)
AS 3566	Self-drilling screws for the building and construction industries
NZS 3602	Timber and wood-based products for use in building
NZS 3604	Timber-framed buildings

1.3 MANUFACTURER/SUPPLIER DOCUMENTS
Manufacturer's and supplier's documents related to this section are:

Rockcote:	Technical manual
	Rockcote Systems TradeSpec™
	Rockcote Systems Project Guide
Resene:	**Total** Colour System

BRANZ Appraisal 476 - Rockcote Insulated Façade System

Materials and execution to **Rockcote** Systems specification except where varied by this specification and supported by architectural detailing.

Copies of the above literature are available at

Web:	www.rockcote.co.nz
Telephone:	0800 50 70 40

Copies of Resene literature are available at

Web:	www.resene.co.nz.
Telephone:	0800 RESENE (0800 737 363)

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER
Provide a material manufacturer/supplier warranty:
15 years: For materials by **Rockcote Systems**

- Provide this warranty on the **ROCKCOTESYSTEMS** standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

1.5 WARRANTY - INSTALLER/APPLICATOR
Provide an installer/applicator warranty:
5 years: For execution/workmanship - by Registered Plasterer

- Provide this warranty on the **ROCKCOTESYSTEMS** standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS
Use only PPCS (Proprietary Plaster Cladding Standard) registered applicators licensed to apply the **Rockcote Systems** exterior render systems.

1.7 NO SUBSTITUTIONS
Substitutions are not permitted to any specified **Rockcote Systems** EIFS cladding system.

1.8 ON GOING MAINTENANCE INSTRUCTIONS
Provide ongoing maintenance instructions required to meet the performance requirements of the NZBC B2/AS1 Durability.

1.9 FINISH SAMPLE
Submit one 300mm x 300mm sample of the selected texture finish and colour for approval. Obtain signature of acceptance on sample and return to the Registered Plasterer.

1.10 MAINTENANCE INSTRUCTIONS
Provide **Rockcote Systems** Maintenance Guide on or before practical completion of the contract for issuing to the building owner. **RockcoteSystems** Maintenance Guide to be provided on request.

1.11 HEALTH AND SAFETY
Refer to the requirements of the Health and Safety in Employment Act and OSH: Guidelines for the provision of facilities and general safety in the construction industry. If the elimination or isolation of potential hazards is not possible then minimise hazards in this work on site by using the proper equipment and techniques as required in the MPNZA Painters hazard handbook. Supply protective clothing and equipment. Inform employees and others on site of the hazards and put into place procedures for dealing with emergencies. Obtain from **RockcoteSystems** the material safety data sheets for each product. Keep sheets on site and comply with the required safety procedures.

1.12 PRODUCER STATEMENT
Provide the producer statement compiled by the licensed applicator in the form as required by the Building Consent Authority.

Compliance information

1.13 DURABILITY
The work covered by this part of the specification has been designed and constructed to achieve a durability of 15 years. Refer to the following;
BRANZ Appraisal 476 - Rockcote Insulated Façade System

1.14 INFORMATION REQUIRED FOR CODE COMPLIANCE
Provide the following compliance documentation:
- Applicators approval certificate from the manufacturer / importer / distributor
- Manufacturer's, importers or distributors warranty
- Installer's / applicator's warranty
- Producer Statement - Construction from the applicator / installer
- Other information required by the BCA in the Building Consent Approval documents.

Performance

1.15 PERFORMANCE
Accept responsibility for the structural and weather-tight performance of the cladding installation.

1.16 FIXINGS, WIND
Design and use the fixings appropriate for the wind zone and topographical classification (T) of this site and building height; as required by NZS 3604 and the wind loads on various wall areas as given by AS/NZS 1170.2.

1.17 INSPECTIONS
Allow to inspect the whole of the work at each stage. Determine a programme for inspections including notification when each part and stage of the work is ready for inspection prior to the work commencing. Permit representatives of **RockqoteSystems** to inspect the work in progress and to take samples of their products from site if requested refer **Rockcote Systems** Project Guide.

2. PRODUCTS

Materials

2.1 ROCKCOTE ACRYL BOND (PLASTER MODIFIER)
Waterborne co-polymer resin.

2.2 ROCKCOTE PM100 QUICK RENDER
Polymer modified cement-based dry plaster mix.

2.3 ROCKCOTE RENDER PRIME
Waterborne acrylic polymer dispersion tinted to the colour (optional) of **Rockcote** Texture.

2.4 ROCKCOTE ACRYLIC TEXTURE
Waterborne mineral filled acrylic polymer-based high build coating with fungicide colour tinted.

2.5 ROCKCOTE ARMOUR
Waterborne 100% acrylic based protective colour tinted finish coat.

Components

2.6 POLYSTYRENE SHEET FOR EIFS CLADDING
Rigid cellular polystyrene made from fire-retardant virgin beads. 40mm thick polystyrene sheet, either EPS to AS1366.3 class H or XPS to AS1366.4.

2.7 EXTERIOR CAVITY WALL BATTENS
40mm x 20mm polystyrene battens to AS 1366.3, class H with fire retardant, width and height to match timber framing studs to NZS 3602, table 1, reference 1D.10.

2.8 FIXINGS, TIMBER

40mm system:	90mm x 4.00mm hot-dipped galvanized flat head nails with 40mm diameter plastic washers.
60mm system:	110mm x 4.00mm hot-dipped galvanized flat head nails with 40mm diameter plastic washers.

2.9 REINFORCING MESH
Rockcote alkali-resistant fibreglass woven mesh.

Accessories

APPROVED
01 AUG 2014
CONSENT

2.10 EXTERIOR CAVITY BASE VENTED STARTER STRIP
Rockcote perforated uPVC ventilated starter strip bottom channel with upstands for base of walls, open horizontal (or raking) junctions, over openings (windows, meters, etc. Length and width to suit cavity.

2.11 FLASHINGS AND ACCESSORIES
Rockcote proprietary profiles made from rigid uPVC for head, sill, jamb, starter strips (vermin proofing); expansion and control joints; jamb sill and head jamb soakers; corner and base exterior applications.

2.12 FIXING BLOCKS
H3.2 timber blocks to match polystyrene thickness, for the fixing of outside fittings (e.g. downpipes, hose taps, lights, etc)

2.13 SEALANT
BRANZ appraised modified silicon (MS) sealant.

2.14 ADHESION PRIMER (UPVC)
Rockcote MultiStop bedding compound.

2.15 ADHESIVE
Liquid non solvent polymer based construction adhesive to the **RockcoteSystems** requirements.

3. EXECUTION

Conditions

3.1 DELIVERY
Keep plaster products dry in transit. Take delivery of plaster products dry and undamaged. Reject all damaged materials.

3.2 STORAGE
Deliver all materials in original unopened packaging with labels intact. Provide dry storage on site, stack carefully, protect from mechanical damage. Do not store PVC corner beads in direct sunlight.

3.3 PLASTERING CONDITIONS
Carry out plastering to **RockcoteSystems** specification under conditions which will not adversely affect the finished work.

3.4 PROTECT
Before application of plaster, apply masking film and tape to all joinery, pipes, roofs and all areas likely to be marked by the plaster. Use drop cloths and ground covers to keep the working areas clean. Clean off droppings onto finished work immediately.

3.5 SUBSTRATE
Do not begin the application until required openings and apertures have been cut, pipes, fixtures, fixing pads and plugs have been fixed and flashings and other preparation are complete. Do not commence plastering until substrate is of the required standard. All defects in substrate must be rectified prior to application of plaster coatings commencing.

3.6 FLASHING AND DETAILING
Comply with the **Rockcote Systems** penetration flashing guidelines. Carry out to the required standard of execution to ensure water does not penetrate.

3.7 ALIGNMENT OF FRAMING
To the standard required by the **RockcoteSystems**, plumb, level and in true alignment.

3.8 CONFIRM LAYOUT
Before commencing work confirm the layout of expansion joints and other visual detailing of the finished work.

Application

3.9 CAVITY BATTENS
Temporary fix EPS battens full length to studs to achieve a 20mm minimum thickness drained cavity to NZBC E2/AS1: 9.0 Wall claddings. The battens are fixed by the cladding fixings which will penetrate the wall framing studs over the wall underlay. Seal the top of the cavity. Install cavity closer/vermin-proofing at base of walls, open horizontal (or raking) junctions, over openings (windows, meters etc). Horizontal cavity battens must be no longer than 100mm. Use cavity spacers where fixing is required between cavity battens. Fix additional battens to internal and external corners and around openings to **RockcoteSystems** standard details.

3.10 PENETRATIONS
Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames and other penetrations through the cladding. Required preparatory work includes the following:
- wall underlay to openings finished and dressed off ready for the installation of window and door frames and other penetrations
- claddings neatly finished off to all sides of openings
- installation of flashings (those required to be installed prior to installation of penetrating elements).
- where electrical cables pass through cladding, ensure that there is no direct contact with the polystyrene, conduit required to be installed by electrician.
- Slope down to outside, pipes and conduits etc.

3.11 PENETRATION FLASHINGS
Fix in place required uPVC trims, profiles flashings and control joints. Service penetrations such as piping and light fittings to be sealed by specific trade.

3.12 POLYSTYRENE SUBSTRATE BOARD
Butt-joint, continuously support all edges and nail/screw with heads flush, the polystyrene board to the **RockcoteSystems** details. Install timber fixing blocks where required and apply a patch over to NZBC E2/AS1, 9.9.4.4 or manufacturer's requirements.

3.13 MOVEMENT CONTROL JOINTS
Provide movement control joints in the plaster to coincide with movement joints in the background and/or junctions between dissimilar backgrounds in the same plane and/or where shown on the drawings and to **RockcoteSystems** requirements. Reinforcing mesh is not continuous across control joints. Exposed control joints to be reflected through final coatings from substrate. Confirm locations in writing to the owner before work commences.

3.14 FIT FLASHINGS AND ACCESSORIES
Check and ensure head flashings have been installed. Fit flashings to jambs and sill on recessed joinery using **RockcoteSystems** proprietary flashings. Reinforce external corners and bottom edges of polystyrene sheets with uPVC angles and channel extrusions to **RockcoteSystems** technical and installation manual.

Rockcote EPS 40 cavity plus render system
Rockcote EPS 60 cavity plus render system
Rockcote XP 40 cavity plus render system
Rockcote XP 60 cavity plus render system

3.15 BASE AND MESH COAT
Apply base plaster coat 5mm thickness maximum based on **Rockcote** PM100 Quick Render. Embed fibreglass mesh into the wet plaster. Overlap each successive length by 100mm minimum. Apply sticky mesh around all external corners and into all window reveals. Apply diagonal reinforcement strips at all comers of windows, doors and other exterior openings.

3.16 SECOND LAYER OF BASE COAT
Apply second layer of base plaster coat evenly at 2mm thickness minimum based on **Rockcote** PM100 Quick Render when first base coat layer is dry.

Application - acrylic selection

3.17 SEAL COAT ACRYLIC TEXTURE FINISH
For **Rockcote Systems** acrylic texture finish seal the base coats with one coat of **Rockcote** Render Prime or **Resene** Limelock within 14 days of applying the second base coat.

3.18 TEXTURED FINISH COAT
Apply **Rockcote** Texture coat 1mm thickness minimum to achieve the specified finish and colour (optional) to **RockcoteSystems** requirements.

3.19 PROTECTIVE FINISH COAT
Apply one coat of **Rockcote Systems** Armour or two coats of **Resene** X-200 reinforced waterproof membrane to achieve a protective acrylic based finish.

3.20 FINISHING
Refer to SELECTIONS for system texture and colour.

Completion

3.21 CLEANING
Remove debris, unused materials and elements from the site relating to the plaster system application. Replace damaged, cracked or marked elements. Leave the whole of this work to the required standard.

3.22 FINAL INSPECTION
A final inspection by **RockcoteSystems** authorised applicator and project assessor of the entire finished cladding to take place immediately after completion of the wall cladding work and any defects or subsequent damage made good immediately.

4. SELECTIONS

4.1 WIND ZONE
Building wind zone: High (as determined from table 5.4 of NZS 3604)

4.2 CAVITY BATTENS
Type: 40mm x 20mm Polystyrene

4.3 CAVITY BASE VENTED STARTER STRIP
Type: uPVC **Rockcote** starter strip

4.4 ROCKCOTE EPS40 CAVITY PLUS RENDER SYSTEM - ACRYLIC FINISH

Location:	Living room Gable End
Substrate:	EPS 40mm FR H Grade polystyrene
Basecoat 1st layer:	**Rockcote** PM100 Quick Render; plus Fibreglass mesh
Second coat:	**Rockcote** PM100 Quick Render
Sealer coat:	**Rockcote** Render Prime or **Resene** Limelock
Texture coat:	**Rockcote** Acrylic Texture
Texture finish:	Casmenti swirl
Texture colour:	TBC
Paint coat:	**Resene** X-200 or **Rockcote** Armour
Paint colour:	TBC

4323G GERARD® STEEL TILE ROOFING

1. GENERAL

This section relates to GERARD® interlocking pressed metal roofing tiles complete with underlay, battens and accessories including:
- GERARD® Klass fascia rainwater systems.

1.1 RELATED WORK
Refer to 7411 RAINWATER SPOUTING SYSTEMS for downpipes.

1.2 ABBREVIATIONS
The following abbreviations are used throughout this part of the specification:
NZMRM New Zealand Metal Roofing Manufacturers Inc

Documents

1.3 DOCUMENTS
Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
NZBC E2/AS1	External moisture
NZS 3602	Timber and wood based products for use in building
NZS 3604	Timber-framed buildings
NZS 4217	Pressed metal tile roofs
NZMRM CoP	NZ metal roof and wall cladding Code of Practice

1.4 MANUFACTURER'S DOCUMENTS
Manufacturer's and supplier's documents relating to work in this section are:

GERARD® Roofs Technical Specifications for the installation of GERARD® Roofs

Copies of the above literature are available from GERARD® Roofs
Telephone: 0800 104 868

Warranties

1.5 MANUFACTURER'S WARRANTY
Warrant this work under normal environmental and use conditions against failure.

Materials:		25 years full weatherproof warranty; plus a diminishing pro rata warranty for the next 25 years
Coating:	Satin:	15 years pro rata GERARD® Roofs warranty 5 years full warranty; plus a diminishing pro rata warranty for the next 10 years
	Textured:	20 years pro rata GERARD® Roofs warranty 10 years full warranty; plus a diminishing pro rata warranty for the next 10 years
Execution:		5 years installation warranty

The required form of warranty agreement is the GERARD® Roofs Warranty and Maintenance Guide for your GERARD® roof. Refer to the general section 1237 WARRANTIES for details of when completed warranties must be submitted.

Requirements

1.6 NO SUBSTITUTIONS
Substitutions are not permitted to any specified GERARD® system, or associated components and products.

1.7 QUALIFICATIONS
Carry out the roofing work with trained, experienced, competent installers familiar with the products being used, employed by or contracted to a GERARD® Certified Roofing Company.

Performance

1.8 FIXINGS, WIND
Design and use the fixings appropriate to the manufacturers requirements and as appropriate for the project wind design stated in the general section 1220 PROJECT. To NZS 3604 table 10.12 **Tile Battens for all wind zones.**

1.9 CO-ORDINATE
Co-ordinate to ensure substrate and preparatory work is complete and other work programmed in the order required for access and completion of the roof.

1.10 PERFORMANCE
Accept responsibility for the weather-tight performance of the completed roofing system, including all penetrations through the roof and junctions with walls and parapets. Comply with the NZMRM CoP NZ metal roof and wall cladding Code of Practice, sections 2 to 7 (Performance, Loadings, Design, Flashings, Penetrations and Installation), and section 10, Pressed metal Tiles.

2. PRODUCTS

Materials

2.1 UNDERLAY
Breather type roof underlay.

2.2 BATTENS
To NZS 3604, 10.2.1.16 **Purlins and tile battens**. Radiata Pine or Douglas Fir, SG6, treated H1.2. Moisture content to NZS 3602, size, spacing and fixing to NZS 3604 table 10.12 **Tile Battens for all wind zones.**

2.3 PRESSED METAL TILES
To NZS 4217, and NZBC E2/AS1, 8.3 Pressed metal tiles. Refer to SELECTIONS for type.

Components

2.4 NAILS
Hot-dipped galvanized steel flat head 50mm x 2.8mm nails to GERARD® Roofs specification.

2.5 FLASHINGS, CAPPINGS AND COVERS
To NZS E2/AS1, 4.0 **Flashings**. Use ridge and hip caps, barge covers, general purpose malleable-edged flashings and side flashings supplied by GERARD® Roofs as part of the selected tile roofing system.

Materials - Klass fascia/barge system

2.6 GERARD® KLASS FASCIA RAINWATER SYSTEM
Fascia/barge type complete with jointing, brackets, fittings and accessories, brand matched and complete to GERARD® requirements.

3. EXECUTION

Conditions

3.1 INSPECTION
Inspect the roof framing and supporting structure and do not start work until it is complete and fully braced ready for tiling, all to the requirements of NZS 3604 or specific design where required.

3.2 STORAGE
Stack tiles on a level, hard base, ventilated and protected from damage and weather.

3.3 HANDLING
Unload and handle tiles without soiling, scratching, crushing or other damage.

3.4 COMPLY
Comply with the preparation, laying and fixing requirements of NZS 4217, NZBC E2/AS1 8.0 **Roof claddings**, and the GERARD® Roof's requirements where these are of a higher standard.

Application

3.5 SET-OUT
Carefully set out the roof with a measuring rod to position the battens accurately taking account of rafter lengths, overhangs into gutters and spoutings and verge overhangs, all to minimise tile cutting.

3.6 LAY UNDERLAY
Lay roof underlay, drawn tight, over rafters from ridges and hips, over fascia into gutters and into valleys to NZS 4217 and NZBC E2/AS1: 8.1.5 **Underlays**. Fix to GERARD® Roof's requirements, without any damage. If damaged make good with full lap inserts as the work proceeds.

3.7 FIX BATTENS
To NZS 3604. Fix battens over the underlays in straight courses, spanning at least 3 rafters, between fascia and ridge and elsewhere to GERARD® Roof's required details. Nail at every crossing to NZS 3604, table 10.12. Square cut ends to form butt joint over rafters with joints staggered.

3.8 LAYING
Do not take heavy equipment onto the roof. Plan work to minimise foot traffic. Work on the roof only using appropriate footwear. Interlock, lap and lay tiles to NZBC E2/AS1: 8.3 **Pressed metal tiles**, and GERARD® Roof's requirements. Finish ridge, hip, valley, barge and eaves to GERARD® Roof's required details if not detailed elsewhere.

3.9 NAILING TILES
Nail tiles to battens generally through the upstand and downturn of the tile lap as well as all elements to GERARD® Roof's details and to NZBC E2/AS1. Fix bottom course of satin finish tiles with vertical nails with butyl/EPDM washers. Fix the bottom course of textured tiles with vertical nails and cover heads with touch up materials.

3.10 CUTTING AND BENDING
Cut, bend and straighten tiles neatly to finish true to line and plane when in place, using installation equipment maintained in the proper condition, all to NZS 4217 and to GERARD® Roof's details.

3.11 FIT FLASHINGS, COVERS AND CAPPINGS
Cut, fit and fix all elements true to line and plane, to NZBC E2/AS1: 4.0 **Flashings**, NZBC E2/AS1: 5.0 **Roof/wall junctions**, to GERARD® Roof's details and the NZMRM CoP NZ metal roof and wall cladding Code of Practice, section 10, if not detailed elsewhere.

3.12 PENETRATIONS
Form to NZBC E2/AS1: 8.1.7 **Roof penetrations**, and to the NZMRM CoP NZ metal roof and wall cladding Code of Practice.

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3.13 PENETRATIONS AND JUNCTIONS

Check that adjoining walls and parapets are prepared ready for the installation of the roofing. Confirm that openings have been prepared ready for the installation of skylights and other penetrations through the roof. Required work includes the following:

- underlay turned up at wall and parapet lines
- underlay finished and dressed off to all openings, ready for the installation of skylights and other penetrations
- roofing installation neatly finished to all sides of openings and to all wall and parapet junctions including proprietary GERARD® PVC stop ends.
- installation of flashings (those required to be installed prior to installation of penetrating elements and/or wall linings).

Completion

3.14 MAKE GOOD

Touch up all damaged coatings with GERARD® Roof's finishing kit.

3.15 LEAVE

Leave this work complete with all necessary flashings, valleys, ridges and hips all properly installed as the work proceeds so the finished roof is completely weathertight.

3.16 REMOVE

Remove trade rubbish and unused materials from the roof and surrounds regularly during the work. Sweep down the completed roof and clean out spoutings, gutters and rainwater pipes. Remove debris, unused materials and elements from the site.

4. SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

4.1 UNDERLAY

Brand: Thermakraft 215

Steel tiles

4.2 GERARD® CORONA SHAKE STEEL TILES

Finish: Textured
Colour: Pepper

4.3 FLASHINGS, CAPPINGS AND COVERS

Trim type: Angle

4.4 EXTERNAL/INTERNAL FASCIA/BARGE SYSTEM

Brand/type: GERARD® Klass fascia external/internal system
Gutter: Continuous spouting
Colour: TBC

4521 ALUMINIUM WINDOWS AND DOORS

1. GENERAL

This section relates to the manufacture, supply, and installation of :-
- aluminium windows
- aluminium doors and frames
- hardware and furniture
- overhead glazing
- flashings

1.1 ABBREVIATIONS AND TERMS

SLS	Serviceability limit state
ULS	Ultimate limit state
WANZ	Windows Association of Zealand
PQAS	Powder Coating Quality Assurance System

Documents

1.2 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC E2/AS1	External moisture
NZBC F4/AS1	Safety from falling
NZBC H1/VM1	Energy efficiency
NZBC H1/AS1	Energy efficiency
AS/NZS 1580.108.1	Methods of test for paints and related materials - Determination of dry film thickness on metallic substrates - Non destructive methods
AS/NZS 1170.2	Structural design actions - Wind loads
NZS 1170.5	Structural design actions - Earthquake actions - New Zealand
AS/NZS 1734	Aluminium and aluminium alloys - flat sheets, coiled sheet and plate
AS/NZS 1866	Aluminium and aluminium alloys - Extruded rod, bar, solid and hollow shapes
NZS 3604	Timber-framed buildings
AS 3715	Metal finishing - Thermoset powder coatings for architectural applications
BS 3900	Methods of tests for paints, Part C5: Determination of film thickness
NZS 4211	Specification for performance of windows
NZS 4223.3	Glazing in buildings - Human impact safety requirements
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated ferrous articles
WANZ Installation Guide:	The WANZ Guide to Window Installation as described in E2/AS1 Amendment 5.
WANZ PQAS	Powder Coating Quality Assurance System
WANZ SFA 3503-03	Anodic Oxide coatings on wrought aluminium for external architectural application (2005).
BRANZ BU 337	Protecting Window Glass from Surface Damage
AAMA 2604	Voluntary specification, performance requirements and test procedures for high performance organic coatings on aluminium extrusions and panels.
AAMA 2605	Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels.

US Federal Specification

TT-S-001543A	Sealing compound, silicone rubber base (for caulking, sealing and glazing in buildings and other structures)
TT-S-00230C	Sealing compound, elastomeric type, single component (for caulking, sealing and glazing in buildings and other structures)

1.3 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

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Copies of the above literature are available from Finer Aluminium
Web: vantagejoinery.com
Email: senol@fineraluminium.co.nz
Telephone: 06 368 7650
Facsimile: n/a

Warranties

1.4 WARRANTY - MANUFACTURER/SUPPLIER
Provide a material manufacturer/supplier warranty:
5 years: For fabrication
Refer to the general section for the required form of 1237WA WARRANTY AGREEMENT and details of when completed warranty must be submitted.

1.5 WARRANTY - INSTALLER
Provide an installer/applicator warranty:
2 years: For installation

- Provide this warranty in the installer/applicator standard form.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.6 QUALIFICATIONS
Work to be carried out by tradesmen experienced, competent and familiar with the materials and techniques specified.

1.7 COMPLIANCE
Windows and doors to be manufactured and installed to NZBC E2/AS1.

1.8 SHOP DRAWINGS AND INSTALLATION DETAILS
Shop drawings to show the general arrangement of the aluminium joining including, but not be limited to:
Construction details (minimum scale 1:5) showing the interface between joinery elements and the building structure including: -
- Jointing details and method of fixing between individual elements and between this installation and adjacent work
- Interaction between claddings and linings
- Flashing details
- Sealants and air seals
- Non standard fixing details including bracketing

And where required the following:
- Design calculations
- Producer Statement in the form PS1 Producer Statement Design
- Rebate sizes
- Dimensions of all typical elements and of any special sizes and shapes
- Provision for the exclusion and/or drainage of moisture
- Provision for adjustment of fixings to ensure true alignment of windows and doors
- Sealant types and full size sections of all sealants and backing rods
- Provision for thermal movement
- Provision for seismic movement and movement under wind loads
- Sequence of installation
- Glazing specification and details

Where requested provide the following additional information
- Information of Professional Indemnity Insurance held by the person providing the shop drawings

Refer to the general section 1235 SHOP DRAWINGS for the requirements for submission and review and the provision of final shop drawings.

Complete shop drawing review before commencing fabrication.

1.9 CERTIFICATION
Provide evidence of a certificate by a laboratory accredited by International Accreditation of New Zealand that the windows and doors offered comply with the requirements of NZS 4211.

Performance

1.10 PERFORMANCE - WINDOWS AND DOORS
To NZS 4211, including:
- deflection, opening sashes, air infiltration, water penetration, ultimate strength, torsional strength of sashes, marking.

Refer to SELECTIONS.

1.11 PERFORMANCE - STRUCTURAL/WEATHER-TIGHTNESS
The structural and weather-tight performance of the completed joinery, the glazing and infill panels is the responsibility of the window manufacturer.

Performance - Wind (design by contractor)

1.12 WIND - NON SPECIFIC DESIGN
Design the installation to the wind zone parameters of NZS 3604, table 5.4.
Refer to SELECTIONS for wind zone.

Finishes

1.13 CERTIFY COATINGS - POWDER COATING
Certify on request, compliance with this specification and support with control and sampling records. Test for film thickness to BS 3900, part C5, method No. 4, using method (b) or to AS/NZ 1580.108.1 for certifying thickness and method (a) where any dispute arises as to the thickness provided.
The coating should be applied by an applicator who can certify that the coating has been applied in accordance with the specification.

2. **PRODUCTS**

Materials

2.1 WINDOWS
Refer to SELECTIONS for type and finish.

2.2 DOORS
Refer to SELECTIONS for type and finish.

2.3 ALUMINIUM EXTRUSIONS
Alloy designation to comply with AS/NZS 1866. Branded and extruded for anodising or powder coating.

2.4 ALUMINIUM SHEET AND STRIP
Complying with AS/NZS 1734 of suitable thickness. Rolled for anodising or powder coating.
Alloy designation: 5251 - H16 or 5005 - H16

2.5 STAINLESS STEEL SHEET AND STRIP
Type: 316 austenitic steel
Finish grade: 2B (satin lustre)

2.6 GLASS
Refer to the glazing section for glass types and installation.

2.7 REVEALS - TIMBER PAINTED
Timber reveals for paint finish with all sides primed grooved for wall linings or flush finished for architraves.

2.8 FLASHINGS GENERALLY
To NZBC E2/AS1, 9.1.10 **Windows and Doors**. Material, grade and colour of head flashings to match the window frames. Ensure that materials used for head, jamb and sill flashings are compatible with the window frame materials and fixings and cladding materials.

Components - for direct fix systems

2.9 SILL PAN FLASHING
To NZBC E2/AS1, 9.1.10.5 Window and Door Sills. Flashing for direct fix claddings to collect and drain water that may penetrate through the window or door unit. Size to extend from the inner most point of the aluminium frame out over the external face of the cladding.

2.10 WANZ SUPPORT ANGLE
Support angle, for use below the sill pan, for deeper claddings to transfer the weight of the window back to the frame. Size to suit cladding thickness.

Components

2.11 GLAZING GASKETS
Thermoplastic rubber. Do not stretch glazing gaskets during installation. Measure and cut gaskets 5-10% over length before installation.

2.12 HARDWARE AND FURNITURE
Hinges, stays, catches, fasteners, latches, locks and furniture as offered by the window and door manufacturer. Refer to SELECTIONS for type and finish. Key alike all lockable window hardware able to be keyed alike.

2.13 SAFETY STAYS
Stainless steel non releasable restrictors to limit window opening to NZBC F4/AS1, Table 2, Acceptable opening sizes for barriers.

Sealants

2.14 STRUCTURAL SEALANT
Silicone chemically curing sealant specifically formulated and tested or approved equivalent with not less than a ± 40% movement factor complying with US Federal Specification TT S 001543A.

2.15 WEATHERING/INSTALLATION SEALANT
Building sealant used in accordance with manufacturer's instructions for weather sealing aluminium frames to the cladding, complying with US Federal Specification TT S 0011534A, or a one-part polyurethane moisture curing, elastic joint sealant of medium modulus (± 25% movement) to US Federal Specification TT S 00230C.

2.16 FOAM TAPE
Foam tape to NZBC E2/AS1, 9.1.10.7 **Closed cell foam tape**.

Finishes

2.17 POWDER COATED ALUMINIUM - EXTRA DURABLE
Polyester powder organic coating in accordance with WANZ PQAS and AS 3715.

2.18 POWDER COATED ALUMINIUM - HIGH DUTY
Polyester powder coating in accordance with WANZ PQAS and AAMA 2604.

3. EXECUTION

Conditions - generally

3.1 DO NOT DELIVER
Do not deliver to site any elements which cannot be unloaded immediately into suitable conditions of storage.

3.2 UNLOAD WINDOW JOINERY
Unload, handle and store elements in accordance with the window manufacturer's requirements.

3.3 AVOID DISTORTION
Avoid distortion of elements during transit, storage and handling.

3.4 PREVENT DAMAGE
Prevent prefinished surfaces rubbing together, and contact with mud, plaster and cement. Keep paper and cardboard wrappings dry.

3.5 PROPRIETARY ELEMENTS
Fix in accordance with the window manufacturer's requirements.

3.6 PROTECTIVE COVERINGS
Retain protective coverings and coatings to BRANZ BU 337 and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades. Remove protection on completion.

3.7 ADDITIONAL PROTECTION
Supply and fix additional protection as necessary to prevent marking of surfaces which will be visible on completed work.

Conditions - fixings and fastenings

3.8 SUPPLY OF FIXINGS
Use only fixings and fastenings recommended by the manufacturer of the component being fixed and to comply with the ULS wind pressure stated in SELECTIONS. Ensure fixings and fastenings exposed to the weather are of aluminium, or Type 316 stainless steel or if not exposed to the weather may they be hot-dip galvanized steel with a coating weight of 610 g/m² complying with AS/NZS 4680.

3.9 INSTALLATION FIXING
To NZBC E2/AS1, 9.1.10.8, **Attachments for windows and doors.** Fix windows/doors through reveal to frame with a pair of 75 x 3.15mm minimum galvanised jolt head nails or a pair of 8 gauge x 65mm minimum stainless steel screws. Fix at a maximum of 450 centres along all reveals and a maximum of 150mm from reveal ends. Ensure fixings do not penetrate metal flashings.
Install packers between reveals and framing at fixing points, except at the head.

Assembly

3.10 FABRICATION
Fabricate frames as detailed on shop drawings. Install glazing, hinges, stays and running gear as scheduled. Provide temporary bracing and protection. Temporarily secure all opening elements for transportation.

3.11 TIMBER / PVC REVEALS
Before fixing to aluminium frames, ensure that timber reveals which are being painted have been primed on all surfaces.

3.12 HARDWARE GENERALLY
Factory fit all required and scheduled hardware. Account for all keys and deliver separately to the site manager.

3.13 SAFETY STAYS
Factory fit safety stays to all windows scheduled for safety stays and to all windows where safety stays are required to comply with NZBC F4/AS1 4.0, Opening windows.

Installation - windows and doors

3.14 CORROSION PROTECTION
Before fixing, apply suitable barriers of bituminous coatings, stops or underlays between dissimilar metals in contact, or between aluminium in contact with concrete.

3.15 CONFIRM PREPARATION OF EXTERIOR WALL OPENINGS
Confirm that exterior wall openings have been prepared ready for the installation of all window and door frames. Do not proceed with the window and door installation until required preparatory work has been completed.

Required preparatory work includes the following:
- wall underlay/building wrap to openings finished and dressed off ready for the installation of window and door frames to NZBC E2/AS1:9.1.5 **Wall underlays to wall openings**.
- Full height 20mm jamb battens to NZBC E2/AS1 figure 72A (direct fix only)
- claddings neatly finished off to all sides of openings
- installation of flashings (those which are required to be installed prior to frames).

3.16 INSTALLATION
Fix to comply with the reviewed shop drawings and installation details including flashings and bedding compounds, pointing sealants and weathering sealants.

3.17 INSTALLATION DIRECT FIX
Install to window manufacturers details and drawings including sill pans to window and door units.

3.18 INSTALL FLASHINGS
Install flashings to heads, jambs and sills of frames as supplied and required by the window manufacturer and as detailed on the drawings. Finish head flashings to match window finish.

Place all flashings so that the head flashing weathers the jamb flashings, which in turn weathers over the upstand of the sill flashing. Ensure that sill flashings drain to the outside air.

Except where window/door frames are recessed, ensure that head flashings over-sail unit by 20mm minimum plus any jamb scriber width at each end.

3.19 COMPLETE AIR SEAL
To NZBC E2/AS1:9.1.6 Air seals. Form an air-tight seal by means of a proprietary expanding foam or sealants used with backing rods, applied between the window / door reveal and structural framing to a depth of 10 - 20mm, to provide a continuous air tight seal to the perimeter of the window or door.

3.20 FIX HARDWARE
Fix all sash and door hardware and furniture as scheduled.

Application - jointing and sealing

3.21 SEAL FRAMES ON SITE
Seal frames to each other and to adjoining structure and finishes, all as required by the window manufacturer and to make the installation weathertight. In very high and extra high or greater wind zones, seal between the window head and the head flashing. Do not seal the junction between the sill member and the cladding or sill flashing which must remain open.

3.22 PREPARE JOINTS
Ensure joints are dry. Remove loose material, dust and grease. Prepare joints in accordance with the sealant manufacturer's requirements, using required solvents and primers where necessary. Mask adjoining surfaces which would be difficult to clean if smeared with sealant.

3.23 BACK UP
When using back-up materials do not reduce depth of joint for sealant to less than the minimum required by the manufacturer of the sealant. Insert polyethylene rod or tape back-up behind joints being pointed with sealant.

3.24 SEALANT FINISH
Tool sealant to form a smooth fillet with a profile and dimensions required by the sealant manufacturer. Remove excess sealant from adjoining surfaces, using the cleaning materials nominated by the sealant manufacturer and leave clean.

Completion - cleaning

3.25 REMOVE TRADE DEBRIS
Remove trade debris by appropriate means on a floor by floor basis as each floor is completed and again before any work is covered up by others. Arrange for general removal.

3.26 TRADE CLEAN
Trade clean window frames, operable windows and doors, glass and other related surfaces inside and out at the time of installation to remove marks, dust and dirt, to enable a visual inspection of all surfaces.

Completion

3.27 PROTECTIVE COVERINGS
Retain protective coverings and coatings and keep in place during the fixing process. Provide protective coverings and coatings where required to prevent marking of surfaces visible in the completed work and to protect aluminium joinery from following trades.

3.28 SAFETY
Indicate the presence of transparent glasses for the remainder of the contract period, with whiting, tape or signs compatible with the glass type. Indicators other than whiting must not be applied to the glass surface. Masking tape must not be used for this purpose.

3.29 IN SITU TOUCH-UP TO POWDER COATED ALUMINIUM
In situ touch-up of polyester or fluoropolymer coated aluminium is only permitted only to minor surface scratching. Otherwise replace all damaged material.

3.30 REMOVE
At the appropriate stage of the project, remove safety indicators and protective coverings and wipe down all joinery thoroughly.

3.31 REPLACE
Replace damaged, cracked or marked elements.

3.32 MANIFESTATIONS
Apply manifestations to comply with NZS 4223.3, 303.1 Manifestations.

4. SELECTIONS

Performance

4.1 THERMAL PERFORMANCE
R-value: 0.26 (as determined from NZBC H1/VM1 or H1/AS1)

Performance - Wind (design by contractor)

4.2 WIND - NON SPECIFIC DESIGN
Building wind zone High (refer to NZS 3604, table 5.4)

Window and door system

4.3 WINDOWS AND DOORS TYPE
Manufacturer: Vantage
Type/location: Residential series

Finishes

4.4 FLASHINGS
Material/type: Colorsteel
Pattern: Formed to suit details provided

4.5 WEATHERING SEALANT
Brand/type: MS Sealant 1-part polyurethane moisture curing, elastic joint sealant
Colour: clear

4710K EARTHWOOL THERMAL AND ACOUSTIC INSULATION

1. GENERAL

This section relates to **Earthwool® Insulation by Knauf** installed, fixed or fitted as thermal and acoustic insulation:
It includes:
- Earthwool® Wall Insulation
- Earthwool® Ceiling Insulation

Documents

1.1 DOCUMENTS
Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC H1/AS1	Energy efficiency
AS/NZS 3000	Electrical installations
NZS 4218:2004	Energy efficiency - Small building envelope
NZS 4220	Code of practice for energy conservation in non-residential buildings
NZS 4243.1	Energy efficiency - Large buildings - Building thermal envelope
NZS 4246	Energy efficiency - Installing insulation in residential buildings
AS/NZS 4859.1	Materials for the thermal insulation of buildings - General criteria and technical provisions
AS/NZS 60598.2.2	Luminaires- Particular Requirements - Recessed luminaires
AS/NZS 60695.11.5	Fire hazard testing - Test flames - Needle-flame test method - Apparatus, conformity test arrangement and guidance

1.2 MANUFACTURER/SUPPLIER DOCUMENTS
Manufacturer's and supplier's documents relating to this part of the work:
Knauf Insulation Product Guide New Zealand
Earthwool® Wall and Ceiling Datasheets (roll and segments)
Earthwool® Acoustic Insulation Datasheet
Earthwool® Ceiling Blanket Datasheet
Earthwool® Underfloor Datasheet
Earthwool® Installation Instructions
BRANZ Appraisal 648 - Knauf Earthwool Insulation

Manufacturer/supplier contact details

Company:	**Knauf Insulation New Zealand**
Web:	www.knaufinsulation.co.nz
Email:	info.nz@knaufinsulation.com
Telephone:	0800 KNAUFi (562 834)
Technical Support:	tech.nz@knaufinsulation.com
Customer Service:	sales.nz@knaufinsulation.com

Warranties

1.3 WARRANTY - MANUFACTURER/SUPPLIER
Provide a material manufacturer/supplier warranty:
50 years: For materials

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- Provide this warranty on the manufacturer/supplier standard form.
- Commence the warranty from the date of practical completion of the contract works.

Refer to the general section 1237 WARRANTIES for additional requirements.

Requirements

1.4 QUALIFICATIONS
Work to be carried out by tradesmen experienced, competent and familiar with the Knauf Insulation materials and techniques specified.

1.5 NO SUBSTITUTIONS
Substitutions are not permitted to any specified Knauf Insulation, associated products, components or accessories.

2. PRODUCTS

Materials - thermal insulation

2.1 EARTHWOOL CEILING INSULATION
Earthwool® Ceiling Insulation to AS/NZS 4859.1, NZS 4218, NZS 4243.1 and NZS 4220. A bio-soluble glasswool manufactured with ECOSE® Technology bonded glasswool fibres to form rectangular insulating segments and rolls.
Refer to SELECTIONS for location, type, R-value and thickness.

2.2 EARTHWOOL WALL INSULATION
Earthwool® Wall Insulation to AS/NZS 4859.1, NZS 4218, NZS 4243.1 and NZS 4220. A bio-soluble glasswool manufactured with ECOSE® Technology bonded glasswool fibres to form rectangular insulating segments.
Refer to SELECTIONS for location, type, R-value and thickness

Components

2.3 FASTENERS
Staple gun/tacker to fix underfloor strapping.

2.4 TAPES
Polypropylene or similar strapping stapled across framing to retain insulation in wall and ceiling applications. Underfloor insulation requires polythene banding, 12mm wide with a 50 kg breaking strain.

3. EXECUTION

Conditions

3.1 STORAGE
Accept materials undamaged and dry and store in a location that protects them from the weather and damage. Avoid distortion, stretching, puncturing and compression. Do not use damaged or wet insulation material.

3.2 HANDLING
Wear protective clothing as necessary and when handling, avoid delamination or distortion of the rectangular form. Maintain full thickness unless compression is an installation system requirement.

3.3 INSPECTION
Before starting installation of Earthwool®, check that the location and framing are dry, that the cavities are not interconnected and that mesh, wall and roof underlays and vapour barriers are in place. Install when the building is enclosed and when the construction materials have achieved the maximum permitted moisture content or less.

Application - general

3.4 INSTALL INSULATION - GENERAL
Lay, install, fit and fix to NZBC H1/AS1: Energy efficiency, 2.0 Building thermal envelope, and to manufacturer's requirements. Install in housing to NZS 4218 and NZS 4246. Install in large buildings to NZS 4243.1 and NZS 4220. Allow insulation to re-loft/relax prior to installation. Do not cover vents. Allow a clear gap around metal flues as recommended by the fireplace manufacturer. Where possible lift up electrical wires, lighting transformers/controllers and lay the insulation underneath. Refer to manufacturer's installation instructions and NZS 4246 for further details.

3.5 RECESSED LIGHT FITTINGS - CLEARANCE
Non-residential applications;

The clearance between insulation and recessed downlights
- 100mm gap to AS/NZS 3000, figure 4.9.
- Provide larger clearances where required by the light manufacturer.

Residential applications;
- Ensure new recessed downlights are one of the new classes classified in AS/NZS 60598.2.2; CA 80, CA 135, IC and IC - F
- Classification type CA 80, CA 135, to AS/NZS 60598.2.2; insulation can abut the sides
- Classification type IC and IC - F, to AS/NZS 60598.2.2; insulation can abut and cover over the top of the downlight
- Classification type NON IC to AS/NZS 60598.2.2; insulation cannot abut or cover the downlight. This class of downlights is banned from residential applications.
- Provide larger clearances where required by the light manufacturer.
- In a retrofit situation where recessed downlights are unclassified or unknown, ensure 100mm clearance between insulation and downlights to AS/NZS 3000, figure 4.9.

3.6 CHECK WALL AND ROOF UNDERLAYS
Ensure these are dry, clean, undamaged and free of debris before being covered.

3.7 CHECK VAPOUR BARRIERS
Ensure these form one homogeneous sheet vapour barrier and remain as such throughout the ensuing construction process.

Application - walls

3.8 FIT EARTHWOOL - TIMBER FRAMING
Friction fit **Earthwool® Wall** segments between framing members and linings. Cut on site to fill cavity and provide a close even fit. When cutting to fill a void, oversize by up to 10mm to ensure a tight fit. Ensure there is a friction fit on all faces of the insulation. If cavity depth is greater than the insulation nominal thickness, fix or strap the product to secure in accordance with installation instructions. Cut into smaller pieces for smaller spaces and around penetrations to achieve efficient thermal performance. Do not fold, tuck or compress the insulation. Refer to NZS 4246 for installation guidelines and Earthwool® Product Data Sheets, for detailed installation instructions.

Application ceiling

3.9 FIT EARTHWOOL SEGMENTS - BETWEEN CEILING FRAMING
Friction fit **Earthwool® Ceiling** segments between framing members. Cut across the roll to fit nogs and small spaces around penetrations. Leave no gaps and maintain full thickness of insulation over the whole of the installation. Leave gap around metal flues to the manufactures requirements.

3.10 CEILING INSULATION EDGE DETAIL
Where perimeter of ceiling space is too low to allow full depth of insulation plus the 25mm air gap, provide reduced perimeter insulation to NZS 4246.5.2, **Ceilings - lined**.

Completion

3.11 CLEAN UP
Clean up as the work proceeds. Ensure no spare off cuts or any other materials remain behind claddings or linings.

3.12 LEAVE
Leave work to the standard required by following procedures.

3.13 REMOVE
Remove debris, unused materials and elements from the site. Earthwool® packaging is recyclable.

4. **SELECTIONS**
For further details on selections go to www.knaufinsulation.co.nz
Substitutions are not permitted to the following, unless stated otherwise.

Wall insulation

4.1 EARTHWOOL WALL INSULATION

Location:	Between garage and storage & Laundry rooms
Brand:	**Earthwool® Wall**
R-value:	R2.6
Thickness:	90mm

Ceiling insulation

4.2 EARTHWOOL CEILING INSULATION SEGMENTS

Location:	Ceiling (Except garage)
Brand:	**Earthwool® Ceiling Segment**
R-value:	R3.6
Thickness:	175mm

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5113G GIB® PLASTERBOARD LININGS

1. GENERAL

This section relates to the supply, fixing and jointing of GIB® plasterboard linings and accessories to timber and steel framed walls and ceilings to form:
- standard systems
- superior finish quality systems
- bracing systems
- fire rated garage boundary wall systems
- wet area systems

1.1 ABBREVIATIONS

The following abbreviations are used throughout this part of the specification:

AWCINZ	Association of Wall and Ceiling Industries New Zealand

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

NZBC E2/AS1	External moisture
AS 1397	Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium
AS/NZS 2588	Gypsum plasterboard
AS/NZS 2589	Gypsum linings - Application and finishing
NZS 3604	Timber-framed buildings
AS/NZS 4600	Cold-formed steel structures
BRANZ Technical Paper P21	BRANZ Technical Paper P21: A wall bracing test and evaluation procedure (2010)
NASH	Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

1.3 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents which refer to work in this section are:
- GIB® Site Guide (Jan 2010)
- GIB Ultraline® Plus lining system (February 2006)
- GIB® Noise Control Systems (March 2006)
- GIB Aqualine® Wet Area Systems (March 2007)
- GIB® Ezybrace® Systems (June 2011)
- GIB® Ezybrace® Software (2011)
- GIB® Ezybrace® for Steel Frame Housing (NASH) Software (2011)
- GIB® Residential Garage Boundary Walls (March 2009)
- GIB® Rondo® Metal Ceiling Batten Systems
- GIB-Cove®
- GIB® Goldline® Platinum Tape-on Trims
- GIB® UltraFlex high impact corner mould

BRANZ Appraisal 294 (2011) - GIB® Ezybrace® Systems
BRANZ Appraisal 427 - GIB Aqualine® Wet Area Systems

Copies of the above literature are available at

Web:	www.gib.co.nz
Telephone:	0800 100 442

Requirements

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified GIB® systems, GIB® system components, GIB® plasterboard, associated GIB® products or GIB® accessories.

1.5 INSTALLER WORK SKILLS AND QUALIFICATIONS
GIB® plasterboard fixers and plasterers to be experienced competent workers, familiar with GIB® plasterboard lining systems installation and finishing techniques. Submit evidence of experience on request. For example:
- National Certificate of Interior Systems; or
- Certified Business member of AWCINZ.

Performance

1.6 INSPECTIONS AND ACCEPTANCE
Allow for inspection of the finished plasterboard surface:
- before applying sealer and
- before applying finish coatings or decorative papers,
so that after assessment of the type and/or angle of illumination and its effect on the completed decorative treatment, group approval and acceptance of the surface can be given.

2. PRODUCTS

Materials

2.1 GIB® PLASTERBOARD
Gypsum plaster core encased in a face and backing paper formed for standard and water resistance use to AS/NZS 2588. Refer to SELECTIONS for location, type, thickness and finish.
GIB® Standard plasterboard
GIB Wideline® plasterboard
GIB Ultraline® and/or GIB® Ultraline PLUS high quality surface plasterboard
GIB Fyreline® fire resistant plasterboard
GIB Braceline® & GIB® Noiseline dual purpose wall bracing & noise control plasterboard
GIB Aqualine® wet area plasterboard
GIB Fibrerock® Impact Resistant Gypsum lining

2.2 CORNICE
GIB-Cove® plasterboard cornice. Refer to SELECTIONS for profile and size.

Components

2.3 CEILING BATTENS
GIB® Rondo® metal ceiling battens, batten joiners and perimeter channel.

2.4 SCREWS
GIB® Grabber® drywall screws.

2.5 NAILS
GIB® Nails (gold passivated).
Size: 30mm, 40mm

2.6 TAPE ON TRIMS AND EDGES
GIB® Goldline® tape-on trims
GIB® UltraFlex high impact corner mould

2.7 METAL ANGLE TRIMS
GIB® galvanized steel slim angle trims.

2.8 CONTROL JOINTS
GIB® Rondo® P35 control joints.
GIB® Goldline® tape-on trims

Accessories

2.9 ADHESIVE
Timber frame and/or steel frame:
GIBFix® One ultra low VOC water based wallboard adhesive
GIBFix® All-Bond solvent based wallboard adhesive

2.10 JOINTING COMPOUND

Bedding compound:	GIB Tradeset®, GIB Lite Blue®, GIB MaxSet®, GIB ProMix® All Purpose, GIB Plus 4®
Finishing compound:	GIB ProMix® All Purpose, GIB® Trade Finish®, GIB® Trade Finish® Lite, GIB ProMix® Lite, GIB® U-Mix, GIB Plus 4®
Cove:	GIB-Cove® Bond

2.11 JOINTING TAPE
GIB® paper jointing tape.

2.12 GAP FILLER
GIB® Gap Filler ultra low VOC multi-purpose acrylic flexible filler

3. EXECUTION

Conditions

3.1 STORAGE
Store GIB® plasterboard sheets and accessories in dry conditions stored indoors out of direct sunlight in neat flat stacks on either an impervious plastic sheet or clear of the floor with no sagging and avoiding damage to ends, edges and surfaces. Reject damaged material. Refer to GIB® Site Guide (Jan 2010).

3.2 LEVELS OF PLASTERBOARD FINISH
Provide the selected plasterboard surfaces to the pre decorative levels of finish specified in AS/NZS 2589.

3.3 CONFIRM LEVELS OF PLASTERBOARD FINISH ACCEPTANCE
Before commencing work, agree in writing upon the surface finish assessment procedure towards ensuring that the quality of finish expectations are reasonable and are subsequently obtained and acceptable.

Do not apply decorative treatment until it is agreed in writing by the contractor, subcontractors and decorator that the specified plasterboard Level of Finish has been achieved.

"Levels of plasterboard finish" is a tool for specifying the required quality of finish when installing and flush stopping GIB® plasterboard **prior** to the application of a range of decorative finishes under various lighting conditions. Refer to **AS/NZS** 2589.

3.4 SUBSTRATE
Do not commence work until the substrate is plumb, level and to the standard required by the sheet manufacturer's requirements. Refer to GIB® Site Guide (Jan 2010).

3.5 TIMBER FRAME MOISTURE CONTENT
Maximum allowable moisture content to AS/NZS 2589 for timber framing at lining: 18% or less for plasterboard linings. Refer to NZBC E2/AS1 and GIB® Site Guide (Jan 2010).

3.6 METAL FRAMING
Metal framing, to which gypsum lining is fixed, shall comply with AS 1397, AS/NZS 4600, or NASH Residential and Low-Rise Steel Framing Part 1 2010 Design Criteria, as applicable. Where adhesion of gypsum linings is required, surfaces shall be free of oil, grease, dust and other foreign materials. Refer to the metal framing manufacturers specifications where high density gypsum linings (>800 kg/m³) such as GIB Braceline® and GIB Noiseline® are specified for fixing to light gauge steel framing.

3.7 PROTECTION
Protect surfaces; cabinetwork, fittings, equipment and finishes already in place from the possibility of water staining and stopping damage. Refer to GIB® Site Guide.

Application

3.8 INSTALL CEILING BATTENS
Install to GIB® Rondo® Ceiling Batten Systems.

3.9 LINING WALLS AND CEILINGS GENERALLY
Form to GIB® Site Guide (Jan 2010). Ensure bulk insulation thickness shall not exceed that of the wall framing.

3.10 BOARD ORIENTATION
Minimise joints by careful sheet layout using the largest sheet sizes possible, and generally fixing horizontally. Where part sheets are required for various stud heights they should be positioned so the cut sheet is as low as possible to keep joints below eye level.

3.11 FORM CONTROL JOINTS
Form control joints to GIB® Site Guide.

3.12 INSTALL COVES
Install to GIB-Cove® literature using GIB-Cove® Bond.

3.13 INSTALL TAPE-ON TRIMS
Install to GIB® Goldline® Tape-on trims literature and/or GIB® Ultraflex high impact corner mould literature.

Finishing

3.14 FINISHING GENERALLY
To GIB® Site Guide (Jan 2010) and AS/NZS 2589.

Completion

3.15 REPLACE
Replace damaged sheets or elements.

3.16 CLEAN DOWN
Clean down completed surfaces to remove irregularities and finally sand down with fine paper to the sheet manufacturer's requirements, to leave completely smooth and clean.

3.17 REMOVE
Remove debris, unused materials and elements from the site.

3.18 LEAVE
Leave work to the standard required by following procedures.

4. SELECTIONS

Plasterboard

4.1 STANDARD SYSTEMS WALLS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level
internal walls	GIB® Standard plasterboard	10mm	4
Showers/Bathrooms	GIB Aqualine® plasterboard	10mm	4

4.2 STANDARD SYSTEMS CEILINGS

Location	Plasterboard type / Lining requirements	Thickness	Finish Level

All areas except bathrooms	GIB® Standard plasterboard	13mm	4
Bathrooms	GIB Aqualine® plasterboard	13mm	4

Accessories

4.3 CORNICE
Size/brand/type: 75mm

4.4 CEILING BATTENS
Brand/type: 70x35 timber battens

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7120 HOT AND COLD WATER SYSTEM

1. GENERAL

This section relates to piped potable water supply systems from the network utility supply authority water main to designated points and appliances, the installation of hot water heating appliances, distributing piped hot water to other appliances, and the installation of valves.

Documents

1.1 DOCUMENTS

Refer to the general section 1233 REFERENCED DOCUMENTS. The following documents are specifically referred to in this section:

NZBC B2/AS1	Durability
NZBC C/AS1-AS7	Protection from fire
NZBC G4/AS1	Ventilation
NZBC G12/VM1	Water supplies
NZBC G12/AS1	Water supplies
NZBC H1/AS1	Energy Efficiency
AS 1432	Copper tubes for plumbing, gasfitting and drainage applications
AS/NZS 2492	Cross Linked Polyethylene (PE-X) pipe for pressure applications
AS/NZS 2537.2	Mechanical joining fittings for use with crosslinked Polyethylene (PE-X) for pressure applications - Plastics piping systems for hot and cold water installations - Crosslinked Polyethylene (PE-X) - Fittings
AS/NZS 2642.1	Polybutylene pipe systems - Polybutylene (PB) pipe extrusion compounds
AS/NZS 2642.2	Polybutylene pipe systems - Polybutylene (PB) pipe for hot and cold water applications
AS/NZS 2642.3	Polybutylene pipe systems - Mechanical jointing fittings for use with polybutylene (PB) pipes for hot and cold water applications
AS/NZS 2845.1	Water supply - Backflow prevention devices - Materials, design and performance requirements
AS 2845.3	Water supply - Backflow prevention devices - Field testing and maintenance
AS/NZS 3500.1	Plumbing and drainage - Water services
AS/NZS 3500.4	Plumbing and drainage - Heated water services
AS/NZS 3500.5	Plumbing and drainage - Housing installations
NZS 3501	Specification for copper tubes for water, gas and sanitation
AS 3688	Water supply - Metallic fittings and end connectors
AS/NZS 4130	Polyethylene (PE) pipes for pressure applications
NZS 4305	Energy efficiency domestic type hot water systems
NZS 4602	Low pressure copper thermal storage electric water heaters
NZS 4607	Installation of thermal storage electric water heaters: valve-vented systems
NZS 4617	Tempering (3-port mixing) valves
AS/NZS 5601.1: 2010	Gas installations - general installations
DIN 8077	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - Dimensions
DIN 8078	Polypropylene (PP) Pipes - PP-H, PP-B, PP-R, PP-RCT - General quality requirements and testing.

Gas (Safety and Measurement) Regulations 2010

Plumbers, Gasfitters and Drainlayers Act 2006

NZ Backflow Testing Standard: NZ Backflow Testing Standard 2011, Field testing of backflow prevention devices and verification of air gaps

1.2 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

~

Copies of the above literature are available from ~

Web: ~

Email: ~

Telephone: ~
Facsimile: ~

Requirements

1.3 QUALIFICATIONS
Plumbers to be experienced competent workers, familiar with the materials and the techniques specified. Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

1.4 INFORMATION FOR OPERATION AND MAINTENANCE
Provide the following general operation and maintenance information as electronic PDF format documents:
~

Provide this information prior to practical completion.

Warranties

1.5 WARRANTY
Provide warranty for:
2 years: For the supply and installation of the plumbing system and fixtures

- Provide the warranty in the standard form in the general section 1237WA WARRANTY AGREEMENT.
- Commence the warranty from the date of practical completion of the contract works.

Performance

1.6 TESTING
Confirm the timing before carrying out any tests. Supply potable water and the apparatus needed.
Slowly fill service pipes with water to exclude air. Test and ensure there is no measurable loss of pressure for the minimum period. Slowly fill distribution pipes with water to exclude air. Ensure that with draw-off taps closed the system must remain water-tight.

Test to either;
NZBC G12/AS1, 7.5, **Watertightness**, for hot and cold water.
- Test to a pressure of1500 kpa for period not less than 15 minutes.

or
AS/NZS 3500.1, Section 16, **Testing and commissioning**, for cold water.
- Test reticulation system to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.1, 16.3.1 **Hydrostatic test**. Test storage tanks to AS/NZS 3500.1, 16.3.2 **Storage tanks.**

and
AS/NZS 3500.4, Section 11, **Testing and commissioning**, for hot water.
- Test reticulation system (excluding tanks, water heaters, and some fixtures, valves etc) to a pressure of 1500 kpa for period not less than 30 minutes, to AS/NZS 3500.4, 11.3 **Testing**. Test complete system (including valves, pumps, water heaters etc) under normal working conditions for a minimum of 48 hours, then check visually, to AS/NZS 3500.4, 11.3 **Testing.**

2. PRODUCTS

2.1 POLYETHYLENE PIPE
To AS/NZS 4130 Series 1 complete with fittings and accessories brand matched to the pipe manufacturer's requirements with durability to NZBC B2/AS1, table 1 and NZBC G12/AS1, table1.

2.2 WATER METER
To the requirements of the network utility operator.

2.3 VALVES
Pressure reducing or limiting valve, filter, non-return valve, cold water expansion valve, pressure relief or temperature valve, pressure relief valve and isolating valves to NZBC G12/AS1.

2.4 TEMPERING VALVE
Tempering valve to NZS 4617 to NZBC G12/AS1.

2.5 HEADER TANKS
Pre-formed black polyethylene or stainless steel tank, complete with access opening and lid and overflow tray.

Materials - Hot water heating appliances

2.6 ELECTRIC HOT WATER CYLINDER, LOW PRESSURE
To NZS 4305 and NZS 4602, copper thermal storage cylinder insulated and complete with pressure reducing valve and required fittings.

Components

2.7 INSULATION
Pre-formed pipe sections complete with bends and fittings, with fixing tape to the manufacturer's requirements and to NZBC H1/AS1.

2.8 PROTECTIVE TAPE
Plasticised PVC tape system with primer, mastic fixing and outer coating.

3. EXECUTION

3.1 EXECUTION GENERALLY
Generally carry out the whole of this work and tests to NZBC G12/VM1 or NZBC G12/AS1.

3.2 HANDLE AND STORE
Handle and store pipes, fittings and accessories to avoid damage. Store on site, under cover on a clean level area, stacked to eliminate movement and away from work in progress.

Store tapware in a shelved, dry and securely locked area. Retain tapware in the manufacturer's original packaging, complete with all fixings and installation instructions. Label each unit separately with its space/fixture number to match.

3.3 CORE HOLES AND SLEEVES
Review location and fit core holes and sleeves as needed throughout the structure in conjunction with the boxing, reinforcing and placing of concrete. Strip core holes and make good after installation of pipework.

3.4 CONCEAL
Conceal pipework within the fabric of the building unless detailed otherwise. Satin finish chrome plate exposed work, complete with matching ferrule at the surface penetration.

3.5 CORROSION
Separate all metals subject to electrolytic action from each other and from treated timber, concrete and other lime substances by space, painting of surfaces, taping, or separator strips.

3.6 THERMAL MOVEMENT
Accommodate movement in pipes resulting from temperature change by the layout of the pipe runs, by expansion joints and by sleeving through penetrations.

3.7 PIPE SIZE
Flow rates to each outlet to be no less than those given in NZBC G12/VM1 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures. Pipe size as determined in NZBC G12/AS1, table 4, Tempering valve and nominal pipe diameters.

3.8 ELECTROLYTIC ACTION
Avoid electrolytic action by eliminating contact or continuity of water between dissimilar metals.

3.9 EXCAVATE
Excavate for the water main to a firm, even trench base in straight runs. Allow to backfill.

Application - Jointing

3.10 JOINTING POLYETHYLENE PIPE
Seal ring compression joints and electrofusion to NZBC G12/AS1.

Application - Pipework installation

3.11 WATER SUPPLY CONNECTION
Arrange with the network utility operator for a connection to the water main and from there through a water meter and gate valve. Provide back flow prevention to NZBC G12/AS1.

3.12 POTABLE WATER SUPPLY PIPEWORK INSTALLATION
From connection point, run pipes complete with all fittings, support and fixing, joins and install to manufacturers specifications. Size the pipes and branches in straight runs to deliver the acceptable flow rate to NZBC G12/VM1 or NZBC G12/AS1, table 3, Acceptable flow rates to sanitary fixtures at each outlet. Allow for the expected concurrent use of adjoining fixtures and size the piping layout to eliminate loss of pressure at any point by simultaneous draw-off. Pipework support spacing to be firmly fixed and buffered to eliminate noise and hammer, with preformed tee-connection take-offs and branches, with machine made 3 diameter bends, complete with necessary valves and fittings. Conceal pipework and pressure test before the wall linings are fixed.

3.13 HOT WATER PIPEWORK
Use a take-off spigot to give separate branches to each fitting, lay out pipes with support spacing to NZBC G12/VM1 or NZBC G12/AS1, table 7 Water supply pipework support spacing. Fix firmly and buffer to eliminate noise and hammer, with preformed tee-connection take-offs and branches, and preformed 3 diameter bends, complete with all necessary valves and fittings

Lag all pipes with rigid insulation to the manufacturer's requirements and G12/VM1 or G12/AS1.

3.14 EQUIPOTENTIAL BONDING
Earth metallic water supply pipe and metallic sanitary fixtures to NZBC G12/AS1, 9.0.

3.15 IN-LINE FILTER
Install an in-line filter immediately adjacent to the main isolating valve at the point of entry to the building, in an accessible position to allow for easy cleaning.

Application - Hot water systems

3.16 HOT WATER CYLINDER INSTALLATION GENERALLY
Install hot water cylinders complete to the manufacturer's requirements and to NZBC G12/AS1, 6. 11, Water heater installation. Valve-vented systems to NZS 4607.

3.17 SEISMIC RESTRAINTS - NON-GAS WATER HEATING APPLIANCES
Non-gas (electric, wet-back, solar etc) water heating appliances to be restrained to manufacturer's requirements and NZBC G12/AS1, 6.11, Water Heater Installation.

3.18 INSTALLING HOT WATER PIPE INSULATION
Insulate all hot water pipes to NZBC H1/AS1, AS/NZS 3500.5, 3.33 **Water and Energy Efficiency**, and to the insulation manufacturer's instructions. Cut insulation sections tight between timber framing and tight between the webs of steel studs.

3.19 INSTALL ELECTRIC HOT WATER CYLINDERS AND BOILING CYLINDERS
Install where shown complete with all the necessary fittings to the cylinder manufacturer's requirements and in accordance with NZBC G12/AS1: 6.11. Valve-vented systems to NZS 4607.

3.20 INSTALL HOT WATER CYLINDER OVERFLOW TRAY
Install drained overflow tray to hot water cylinder to NZBC G12/AS1.

3.21 INSTALL TEMPERING VALVE
Install 1 metre minimum from outlet of hot water cylinder and to manufacturer's instructions. Install copper pipework for 1 metre minimum downstream of tempering valve prior to connection of non-metallic pipework.

3.22 PENETRATIONS
Provide and fit collars and escutcheon plates to match the pipework at all penetrations through constructions.

Installation - Valves

3.23 INSTALLING BELOW GROUND ISOLATING VALVE
Install all below ground items such as main isolating valves and water meters in preformed concrete pits or approved equivalent.

3.24 INSTALLING APPLIANCE ISOLATING VALVES - CONCEALED
Install isolating valves for appliances in accessible positions. Locate in adjacent cupboards and position to allow for easy connection and operation.

Completion

3.25 LABEL
Label all pipework with permanent adhesive markers at 3 metre minimum intervals.

3.26 CLEAN IN-LINE FILTER
Clean all in-line filters on completion of works.

3.27 REPLACE
Replace damaged or marked elements.

3.28 LEAVE
Leave work to the standard required by following procedures.

3.29 REMOVE
Remove debris, unused materials and elements from the site.

4. SELECTIONS

Water main

4.1 POLYETHYLENE WATER MAIN
Size: 25mm outside diameter (i.e. DN 25 in AS/NZS 4130)

Pipework

Hot water systems

4.2 ELECTRIC HOT WATER CYLINDER, LOW PRESSURE
Brand: Rheems
Model size: 300 litre

Valves and accessories

4.3 MAIN ISOLATING VALVE
Location: Hot water tank
Brand/type: TBC

4.4 APPLIANCE ISOLATING VALVES - EXPOSED
Appliance: Washing machine
Brand/type: Refer to tapware selections

7420 SANITARY SYSTEMS

1. GENERAL

This section relates to above ground gravity flow sanitary systems;
- for foul water
- from sanitary fixtures to first underground drain connection
- including system wastes, floor wastes, floor waste gullies, traps, vents and valves
- with associated components and accessories to make the system work

1.1 DOCUMENTS
Documents referred to in this section are:

NZBC G1/AS1	Personal hygiene
NZBC G13/AS1	Foul water - Sanitary plumbing
AS 2887	Plastic waste fittings
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage

Plumbers, Gasfitters and Drainlayers Act 2006

1.2 QUALIFICATIONS
Carry out all work under the direct supervision of a certifying plumber under the Plumbers, Gasfitters and Drainlayers Act 2006.

2. PRODUCTS

2.1 PVC-U WASTE, DISCHARGE AND VENT PIPES
PVC-U pipe to AS/NZS 1260 complete with fittings brand-matched to the pipe manufacturer's requirements.

2.2 EXPOSED PIPES AND TRAPS
Chrome plate on copper pipes and associated copper and brass fittings.
White polybutylene or PVC, including all associated fittings.

3. EXECUTION

3.1 EXECUTION GENERALLY
Carry out this work and complete all tests to NZBC G1/AS1: 2.0, 3.0 and NZBC G13/AS1.

3.2 ELECTROLYTIC ACTION
Avoid electrolytic action by eliminating actual contact or continuity of water between dissimilar metals.

3.3 INSTALL TRAPS, WASTE AND VENT PIPES
Connect waste outlets to traps and run waste pipes and back vents concealed, sized and fixed to AS/NZS 3500.2 /NZBC G13/AS1 and AS/NZS 2032. Discharge wastes into the drainage system stack, soil pipe, or gully trap as shown. Bird proof mesh to all roof vents and vermin proof mesh to all untrapped waste pipes.

3.4 PENETRATIONS
At penetrations through constructions provide and fit collars and escutcheon plates to match pipework.

3.5 TEST
Test soil and waste disposal systems to ensure no leakage exists and leave in proper working order.

3.6 CLEAN UP
Remove labels and clean fittings. Remove unused materials from the site.

4. SELECTIONS

7430 DRAINAGE

1. GENERAL

This section relates to the supply and laying of gravity foul water (sewage), stormwater and field drains.

1.1 DOCUMENTS REFERRED TO
Documents referred to in this section are:

NZBC B1/AS1	Structure
NZBC E1/AS1	Surface water
NZBC G13/AS2	Foul Water
NZBC G13/AS3	Plumbing and Drainage
AS/NZS 1254	PVC-U pipes and fittings for Stormwater and Surface Water applications
AS/NZS 1260	PVC-U pipes and fittings for drain, waste and vent applications
AS/NZS 2032	Installation of PVC pipe systems
AS/NZS 2033	Installation of Polyethylene pipe systems
AS 2439.1	Perforated Plastics Drainage and Effluent Pipes and Fittings - Perforated drainage pipe and associated fittings
AS/NZS 2566.1	Buried Flexible Pipelines - Structural Design
AS/NZS 2566.2	Buried Flexible Pipelines - Installation
NZS 3104	Specification for concrete production
AS/NZS 3500.2	Plumbing and drainage - Sanitary plumbing and drainage
AS/NZS 3500.3	Plumbing and drainage - Stormwater drainage
NZS 3604	Timber-framed buildings
NZS 4229	Concrete masonry buildings not requiring specific engineering design
AS/NZS 4671	Steel reinforcing materials
AS/NZS 5065	Polyethylene and polypropylene pipes and fittings for drainage and sewerage applications

Plumbers, Gasfitters and Drainlayers Act 2006

1.2 AS-BUILT DRAWINGS
Supply a 1:100 scale as-built drawing of drains and fittings to the territorial authority and to the owner on completion.

1.3 QUALIFICATIONS
Drainlayers to be experienced, competent and familiar with the materials and techniques specified. Carry out all work under the direct supervision of a certifying drainlayer under the Plumbers, Gasfitters and Drainlayers Act 2006.

2. PRODUCTS

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2.1 CONCRETE
17.5 MPa prescribed mix to NZS 3104.

2.2 REINFORCEMENT
Plain round and/or deformed steel bars, Grade 300 to AS/NZS 4671.

2.3 PVC-U PIPES
PVC-U pipes bends, junctions, fittings and joints to AS/NZS 1254 and AS/NZS 1260.

2.4 POLYETHYLENE PIPES
Polyethylene pipes and fittings to AS/NZS 5065.

2.5 GULLY TRAPS
To NZBC G13/AS2: 3.3 Gully traps, complete with grating.

2.6 SURFACE WATER SUMP GRATINGS
Cast iron frame with lift-up grating.

2.7 INSPECTION COVERS
Cast iron frame with screw-down cover.

2.8 DRAINAGE AND FILLING MATERIALS

Granular:	Clean gravel or crushed stone or a blend of these. Particle size from minimum 7mm to maximum 20mm.
Selected:	Fine grain soil or granular material suitable for bedding; excluding topsoil.
Ordinary:	Top soil or other excavated materials.

3. EXECUTION

3.1 EXCAVATE
Excavate for drains to a firm even base with correct gradients set in straight runs. To NZBC G13/AS2, 5.6 or NZBC E1/AS1 3.9.7, **Proximity of Trench to Building**, when buildings constructed to NZS 3604 or NZS 4229.

3.2 MANUFACTURER'S REQUIREMENTS
All drainage installations to the pipe and fitting manufacturer's requirements.

3.3 DRAINAGE GENERALLY
Carry out drainage work and tests to AS/NZS 3500.2 (sanitary drainage) as modified by NZBC G13/AS3, NZBC G13/AS2 (foul water), AS/NZS 3500.3 (stormwater drainage) as modified by NZBC B1/AS1: 6.0. Lay uPVC pipe systems to relevant sections of AS/NZS 2032, NZS 2566.1 and AS/NZS 2566.2. Lay polyethylene pipes and fittings to relevant sections of AS/NZS 2033 and NZS 2566.1.

3.4 LAY FOUL WATER DRAINS
Lay drains in straight runs to correct gradients, to discharge into the network utility operator's sewer. Set inspection fittings on a concrete base.

3.5 INSTALL GULLY TRAPS
Set on concrete 50mm above the surrounding ground or paving and brought up to protect the top of the fitting. Trowel off.

3.6 LAY STORMWATER DRAINS
Confirm the required location of downpipes and finished ground levels before commencing pipework. Set downpipe bends in concrete with the concrete brought up to protect the top of the bend from damage. Lay drains in straight runs to correct gradients to discharge into the network utility operator's stormwater system.

3.7 INSTALL STORMWATER INSPECTION CHAMBERS
To NZBC E1/AS1, with a 75mm fall across the chamber and with channels to form a cascade where necessary. Channel top should be 100mm above the pipe soffit. Bench from channels at 1V on 10H. Benching should be made of 17.5 MPa concrete vibrated to smooth finish. Plastering is not allowed. Fit a cast iron cover and frame.

3.8 INSTALL FOUL WATER INSPECTION CHAMBERS
To NZBC G13/AS2, with ceramic channels to form a 75mm fall across the chamber. Channel top should be 100mm above the pipe soffit. Bench from channels 1V on 10H. Benching should be made of 17.5 MPa concrete vibrated to smooth finish. Plastering is not allowed. Fit a cast iron cover and frame.

3.9 CONCRETE ENCASEMENT
Concrete encase shallow drains and drains under driveways, on a 100mm deep 17.5 MPa concrete bed reinforced with three 10mm mild steel bars. Surround pipes with a polythene membrane to allow movement and encase in 100mm 17.5 MPa concrete.

3.10 FIELD TEST
Field test drains for watertightness (PVC-U to AS/NZS 2032 or AS/NZS 2566. 2 Appendix N) to the satisfaction of the territorial authority inspector.

3.11 BACKFILL

Backfill drain lines in 150mm layers, well tamped but without disturbing the drains. Finish off with 150mm of topsoil, slightly mounded above the finished ground line.

4. SELECTIONS

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1 AUG 2014
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DATE: Fri 1 Aug 2014	**TO:** Colin Gibbs, Tim Taylor, Rob Tyler, Dorston Hayman, Adam Herlihy, Neil Stirling & Craig Rall
TIME SENT :	**ORGANISATION :** Horowhenua DC, Kingston Kemp Ltd, Homestead Concrete Homes & Envirolutions Ltd
SENDER : Harold Barnett	**FAX NUMBER :** 06 366 0983; 06 368 9863 & 07 572 2396

We are transmitting 3 page(s) including this one.
If you do not receive all pages in a legible condition please call back as soon as possible.

MESSAGE: **FILE NO: RAI 2.01**

Dear Colin, Tim, Rob, Dorston, Adam, Neil and Craig

RS No 1218 ONSITE WASTEWATER SYSTEM FOR THE D and J LAWRY DWELLING
1097 QUEEN STREET EAST, LEVIN 14840/083.13 LOT 1 DP 368677 5288m^2

Ref: Envirolutions Ltd (Craig Rall) On-site Wastewater Treatment and Disposal Assessment Report emailed to Council on 31 July 2014.

This property has resulted from the subdivision of Lots 2 and 7 DP 74728 into seven lots. HDC Consent Notices RS 1218 dated 24 August 2006 provides the criteria for floor levels (for new lots 1-4) and onsite wastewater design and management. These notices require any new wastewater system to have the Regional Council's written approval prior to the issuance of a HDC building permit. The system had to comply with the Regional Rules (Horizons Land & Water Plan and One Plan) and standards set in the Minimum Requirements for On-site Effluent Disposal within the Horowhenua. The system design, location and installation needed to be done by suitably qualified wastewater professionals with the system maintained thereafter to avoid adverse effects on groundwater, human health, environment and nuisance to neighbouring properties. This was to be achieved under Service Contract that involved regular inspections (6-monthly) by the supplier or his agent. The Land Application Area (LAA) needed to be sited 20m away from a natural watercourse.

A brief description of the proposed wastewater system (Devan 9000 AWTS) and some comments follow:

Dwelling Proposed new 7-bedroom dwelling plus office with an assessed occupancy of up to 10-persons. The 5288m^2 lot is located in a semi-rural environment. No reticulated sewage connection available at this location – application for trickle feed connection to the Levin water supply has been made).

Wastewater 10 x 180L/head = 1800 L/day; Water source – roof / tank (Mr Lawry has applied to HDC for a trickle feed connection to the Levin town supply that runs past the gate).

Soil The soil at this property is mapped in Horizons Compass database as Kawhatau stony silt loam soil (76b) – found on medium height stony alluvial terraces. The soil is a yellow-brown shallow and stony soil associated with intergrades between yellow-grey earths and yellow-brown earths. The profile is 300mm of good topsoil overlying 700mm of coarse to medium sand with stones. No groundwater was encountered to 1m depth at the time of inspection – assessed as greater than 1.5m depth at all times (Adam Herlihy, 8 April 2014). The soil has a LUC of 3s2 and drainage is assessed at Category 2 (AS/NZS 1547:2000) - well draining (Adam Herlihy *pers comm*,, 1 August 2014). The LTAR is assessed

as 12-15 litres of secondary treated wastewater per square metre per day. Wastewater application at this location therefore should be at a conservative rate with an evaporation component for sustainable wastewater assimilation.

System The Devan DW 9000 AWTS is a multi chambered (4) wastewater treatment plant with a nominal operating capacity of 5,500L. It has a primary chamber (3600L), an aeration chamber (2100L), clarification chamber (2100L) and a Pump chamber of 300L. It also has 2000L of emergency storage capacity. It can treat up to $2m^3$ of wastewater a day and has a holiday / vacation mode. The plant includes a biological filter and produces a high quality effluent – better than $20g/m^3$ BOD and $30g/m^3$ TSS (secondary standard). The Devan AWTS is to be located approximately 3m to the east of the dwelling. See attached Homestead Site Plan which shows the locations of the wastewater infrastructure.

Land Application Area The LAA has been sized using a design application rate of $3mm/m^2/day$. The LAA will be $600m^2$, made up of three equally dosed zones using sequencing valves, and be located along the northern property boundary. It will need to contain at least 600m of Wasteflow® pressure compensating drip line ((10 lines at 60m or similar configuration) that incorporates a herbicide and bactericide. The drip has 2 L/hr capacity emitters at 600mm centres and will be installed at 150mm depth with the lines 1m apart (See attached Site Plan).

The LAA is required to be at least 1.5m away from the boundary, planted with appropriate small trees and shrubs to aid the uptake water and nutrients and be fenced. A 50% reserve disposal area is mandatory should this be necessary in the future.

Hydraulic Loading The design application rate is $3mm/m^2/day$ – this rate is HRC's permitted activity rate.

Notes

I wish to stress some important points with regard to the location and the day-to-day management and ongoing maintenance of the wastewater treatment system and disposal area.

- The LAA is required to be 20m from natural watercourse or bore. Also, there needs to be at least 600mm separation between the high winter water table and the level of drip irrigation line.
- The LAA is also required to be planted with appropriate plants to assist with evapo-transpiration and the uptake of nutrients and fenced to exclude children, pets and vehicles from public health and infrastructure damage perspectives. The plants are too be maintained in a healthy condition.
- An 'as-built' plan of the wastewater system, needs to be logged with the Horowhenua District Council within 3-months of installation;
- The owner is required to have a current and on-going **Service Contract** with the supplier or an approved service agent of the wastewater system to ensure it operates efficiently at all times. Six - monthly inspections are mandatory to allow for the checking of pumps and screens, purging of disposal lines, checking of sludge levels in the primary chamber and effectiveness of the LAA.
- The disposal of strong chemicals (cleaners, solvents etc) and gross solids (nappies, sanitary products and solids from kitchen-waste grinders) into the wastewater system is not desirable; and
- Finally household water usage should be minimised where possible.

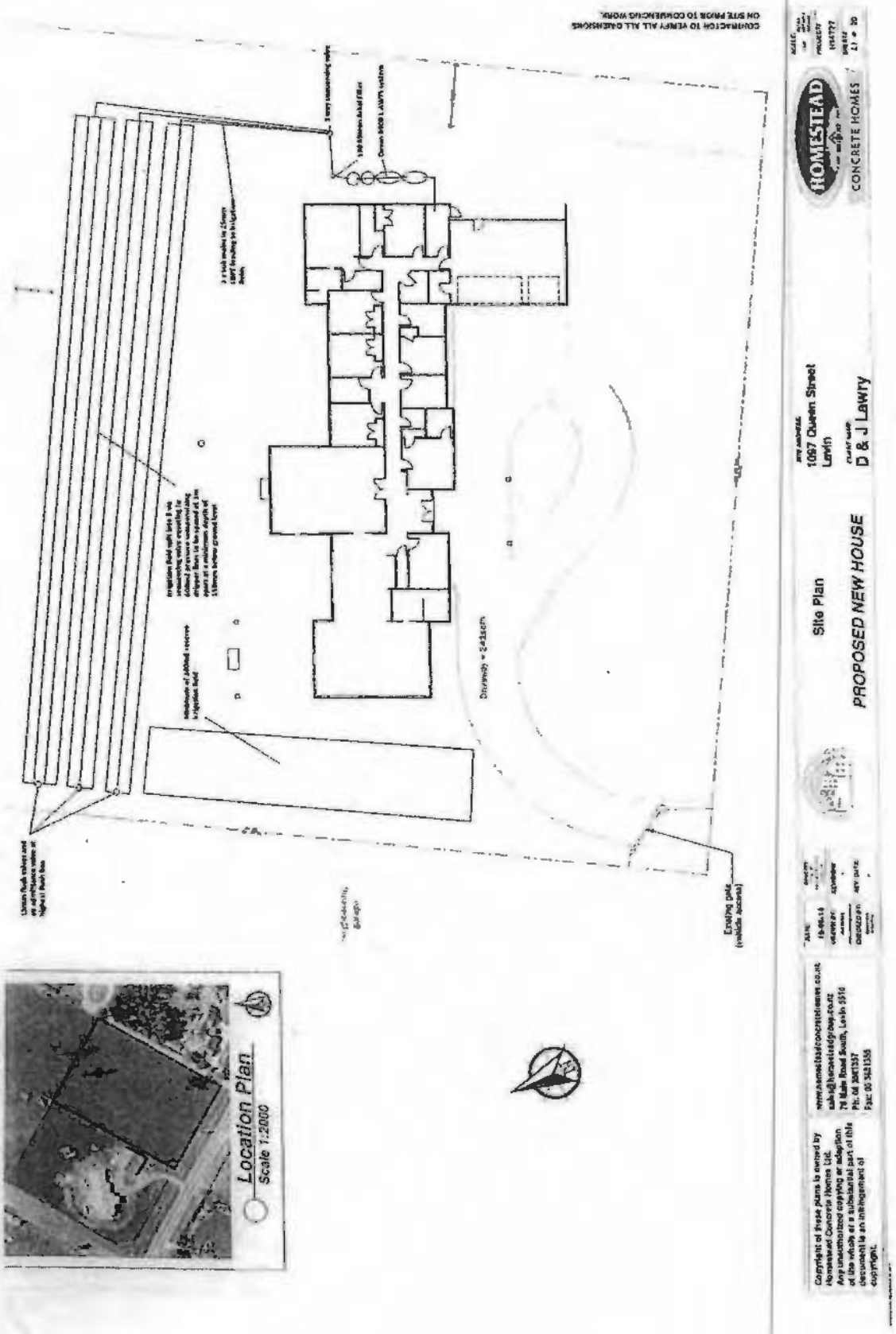
Conclusion / Acceptance of wastewater design

The Craig Rall design for the Lawry dwelling at 1097 Queen Street East comprising a Devan 9000 AWTS and $600m^2$ of LAA using a reduced design application rate of $3mm/m^2/day$ is accepted. The treatment plant and LAA are required to be installed to Industry Standards by a registered drainlayer (HDC Plumbing and Drainage Inspectors to ensure please). The LAA is also required to be fenced and planted with appropriate plants and maintained thereafter at 6-monthly intervals under a Service Contract with the supplier or agent (Kingston and Kemp Ltd) to meet Horizons requirements.

Regards

Harold Barnett
Environmental Scientist

Homestead Concrete Homes Site Plan (dated 19/6/2014) showing the locations of the Lawry dwelling and the wastewater treatment infrastructure (the Devan 9000 AWTS and the 600m^2 LAA), at 1097 Queen Street East, Levin.



ENVIROLUTIONS
SOLUTIONS THAT WON'T COST THE EARTH

ON-SITE WASTEWATER TREATMENT & DISPOSAL ASSESSMENT

For
Kingston and Kemp Limited
Site at
1097 Queen street
Levin
Horowhenua

For customer
Lawry Residence

APPROVED
01 AUG 2014
CONSENT

Report by
Craig Rall

Customer Ref: Lawry Residence

Date: 30th July 2014

ON-SITE WASTEWATER TREATMENT
and DISPOSAL ASSESSMENT

For: Kingston and Kemp Limited

Site: 1097 Queen Street East
Levin

Postal: Kingston and Kemp Limited

By: Craig Rall
Envirolutions Limited
(Environmental Sewage and Wastewater Treatment Systems)
Site and Soil Assessor for On-site Wastewater Management Systems

- Centre for Environmental Training – 2007 courses.
- Site and Soil Assessment for On-site Wastewater Management System Design 2007
- Servicing and Maintenance of On-site Wastewater Management Systems
- Certifying Drain layer licence no:17972.
- Member of the New Zealand Land Treatment Collective
- Member of Water New Zealand
- Member of the International Ecological Engineering Society
- Farm Dairy Effluent Design and Management accredited Massey University 2012
- Auckland Council accredited producer statement author no :2404
- Bay of Plenty Regional Council Accredited OSET designer 2014
- NZWETA Opus Onsite Effluent Disposal Design courses 2014

ON-SITE WASTEWATER TREATMENT and DISPOSAL ASSESSMENT and SUBMISSION

Customer Name – Lawry Residence

The following report has been based on the information provided in the Australian/New Zealand Standard AS/NZS 1547:2012 for On-site domestic-wastewater management, and on-site inspection by Kingston and Kemp Limited.

The proposed building site meets with the Horowhenua District Council subdivision criteria for unsewered sites. The site is at 1097 Queen Street , Levin being Lot 1 DP 368677 Comprising 5288 m2 of area

1097 Queen Street East LEVIN RURAL

Property ID:	36667	**Status:**	Current
Assessment:	1038470	**VG Number:**	1484008313
Legal Description:	Lot: 1 DP: 368677	**Capital Value:**	$ 166,000.00
Land Value:	$ 165,000.00	**Last Valuation Date:**	1/08/2013
Improvements Value:	$ 1,000.00	**Has Water Meter:**	No
Land Area:	0.5288 (Hectares)	**Ward:**	Waiopehu

The following report demonstrates that the site is sustainable for on-site treatment and disposal of waste water.

The site has a rain water supply; the owners propose to build a 7 bedroom house with a study and to connect to a Devan 9000L Aerated Wastewater Treatment System. We suggest that water saving devices be installed to all tap ware, and dual flush toilet cisterns be installed; this will ensure lower daily water consumption.

Soil profile (AS/NZS 1547:2012) Site inspection/soil tests

Horizon A – 0- 300 mm Top soil
Horizon B – 300- 1000mm Orthic brown soils being free draining stony soil

We have identified a category 4 soil 'Clayey loams'.

On this information we have designed the following wastewater treatment and disposal system (Australian/New Zealand Standard AS/NZS 1547:2012 for On-site domestic-wastewater management).

Water table – No water found down to 1500mm

There are no water ways or water courses within 20m of the disposal field. The disposal field has a minimal slope with no slope stability issues.

Disposing of waste water will have no environmental impact to the surrounding properties with regards to the waste water disposal or storm water runoff.

The recommended design irrigation rate for irrigation system with secondary treated waste water is 28mm/week.

On these findings the following formula will apply for the footprint of the irrigation field.

The treatment plant system will produce a quality of effluent better than 20g/m³ BOD and 30g/m³ TSS.

The following irrigation field will require an on-site treatment system.

- 7 bedroom house with a study (10 people) @ 180 ltr per day per person.
  (180 lpd per person x 10 people = 1800 lpd)
  (1800 lpd / 3 mm loading rate = 600 sqm)

There is significant room for a 100% reserve irrigation field if required in the future.

The treatment plant (Devan 9000L AWTS) has the capability of treating up to 2 cubes per day and will incorporate a holiday/vacation mode. This mode will allow the system to cope with peak loadings along with extended periods of the house not being used. This mode is critical for the treatment system to function correctly.

The installation of the dripper line disposal system (which can utilise excess soil on site) . This should be installed below the ground at 150mm, due to the size of the field we require a 3 way sequencing valve to be installed splitting the field into 3 equally dosed areas . Ensure to hoe up the existing ground to free the existing top layer of soil from compaction. The grasses and plants will maximize absorption along with evapotranspiration taking place. There will be no environmental impact surrounding the irrigation field as the irrigation system will achieve a ground water clearance greater than 600mm as water table was found to be below 1.5m in winter.

The irrigation field will be located as per the plan and a minimum of 1.5m off the boundary.

Cut off drains will not be required for this site.

The dripper rate of the waste flow pipe is 2 litres per hour at 600mm spacing's and the distance between the installed pipes will be 1000mm. The dripper pipe also incorporates the following features –

a) Herbicide incorporated in the emitter to prevent root intrusion.
b) Bactericide extruded into the lining of the drip line to inhibit slime growth within the drip line.
c) Advanced filter on the emitter reducing clogging potential.

d) Heavy wall thickness.
e) Pressure compensating emitters.

The installation of a back flush valve to the inline filter is a requirement along with the installation of a 130 micron long body 25mm disc filter. This will prevent possible solid particles entering the irrigation field causing potential blockages of the dripper.

The dripper line irrigation system will be installed at a precipitation rate of 2mm / day or 2 .litres/m²/day.

A full service and maintenance schedule will be required for the on-site disposal system and treatment plant.

Only a registered drainage contractor is permitted by Council and legislation to install drainage works.

APPROVED
01 AUG 2014
CONSENT



Location Plan
Scale 1:2000

15mm flush valves and air admittance valve at highest flush box

Minimum of 300m2 reserve irrigation field

Irrigation field split into 3 via sequencing valve equating to 600m2 pressure compensating dripper lines to be spaced at 1m apart at a minimum depth of 150mm below ground level

4 x Sub mains in 25mm LDPE feeding to irrigation fields

3 way sequencing valve

150 Micron Arkal Filter

Nexus 1000 LAWTS system

Driveway = 341sqm

Existing gate (vehicle access)

CONTRACTOR TO VERIFY ALL ALL DIMENSIONS ON SITE PRIOR TO COMMENCING WORK

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www.homesteadconcretehomes.co.nz
sales@homesteadgroup.co.nz
76 Main Road South, Levin 5510
Ph: 06 3681357
Fax: 06 3681358

DATE: 18-08-14
DRAWN BY:
CHECKED BY:
REVISION
REV DATE

Site Plan

PROPOSED NEW HOUSE

SITE ADDRESS
1097 Queen Street
Levin

CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE
PROJECT
H14727
SHEET
L1 = 20

Lawry Residence- 6

Irrigation calculations

Daily Loading rate	3 mm
Daily flow rate	1800 litres per day
Emitter type	Waste flow 16
Emitter flow rate	2lph
Emitter spacing	600mm
Drip line spacing	1000mm
Distance from plant to irrigation field	10 - 50m

Head Loss Table		
Item	**Head loss (m)**	**Comments**
Emitter	5	Minimum pressure required
Lateral	0	Head loss insignificant
Sub main	1	Using waste flow
Main	0.6	25mm x 50m LDPE
Water Meter	0	25mm turbine water meter
Filter	3	For semi blocked filter
Tank depth	2	Standard
Elevation	2	Uphill slope / downhill slope
Total	13.6	
13.6m + 10% = 14.96m		

Calculation

Field size:	1800 lpd / 3 mm/day =600 m² field size
Total emitter number	600 / 0.6 = 1000 drippers
Total flow rate required	1000 x 2lph = 2000 lph (600mm spacings)

Pump duty: 2000 lph @ 14.96m head

Registered drainage contractor to install drainage works.
Install as per site plan or contact designer.

Designer – Craig Rail



APP
01 AUG 2014
CONSENT

Envirolutions Limited
"Solutions that won't cost the earth"

027 622 9796

HOROWHENUA DISTRICT COUNCIL

The Subdivision of Lots 5 & 7 DP 74728

CONO 7072670.2 Cons

Rural Subdivision No. RS 1218

CONSENT NOTICE

In the matter of the plan LT 388677 and pursuant to Section 221(1) of the Resource Management Act 1991, I hereby certify that the Horowhenua District Council has consented to the subdivision of Lots 5 & 7 DP 74728 on condition that :

"A consent notice shall be registered against the titles of Lots 1,2,3,4,5,6,and 7 stating that any onsite effluent disposal system to be installed on these lots is to be in compliance with the requirements of Horizons Regional Council "Land and Water Regional Plan" (Aug 2003) and the Manawatu Catchments Water Quality Regional Plan (Oct 1998). Written approval of this shall be submitted to Horowhenua District Council. Issuance of the Project Information Memorandum & Building Consent is subject to approval of the wastewater disposal design by the Regional Authority. No works shall commence prior to issuance of the same. It is to be designed and installed by a professional and suitable qualified person experienced in onsite effluent disposal systems. Any on-site system is to comply with the standards set out in the 'Minimum Requirements for On-site Effluent disposal within the Horowhenua' - adopted and endorsed by both the Regional and District Council."

Dated at Levin this 24th day of August 2006

A Thomas
Environmental & Regulatory Services Manager

HOROWHENUA DISTRICT COUNCIL

The Subdivision of Lots 5 & 7 DP 74728



Rural Subdivision No. RS 1218

CONSENT NOTICE

In the matter of the plan LT 368677 and pursuant to Section 221(1) of the Resource Management Act 1991, I hereby certify that the Horowhenua District Council has consented to the subdivision of Lots 5 and 7 DP 74728 on condition that :

> "A Consent Notice shall be registered against the titles of Lots 1 to 4 requiring that the owners of these lots shall consult with Horizons Regional Council to determine appropriate floor levels for any dwellings located on these lots. This will need to be shown on any building consent application at the time of applying for Building Consent."

Dated at Levin this 24th day of August 2006

A Thomas
Environmental & Regulatory Services Manager

APPROVED
01 AUG 2014
CONSENT

Assessment of Environmental Effects of the Devan 9000 AWTS

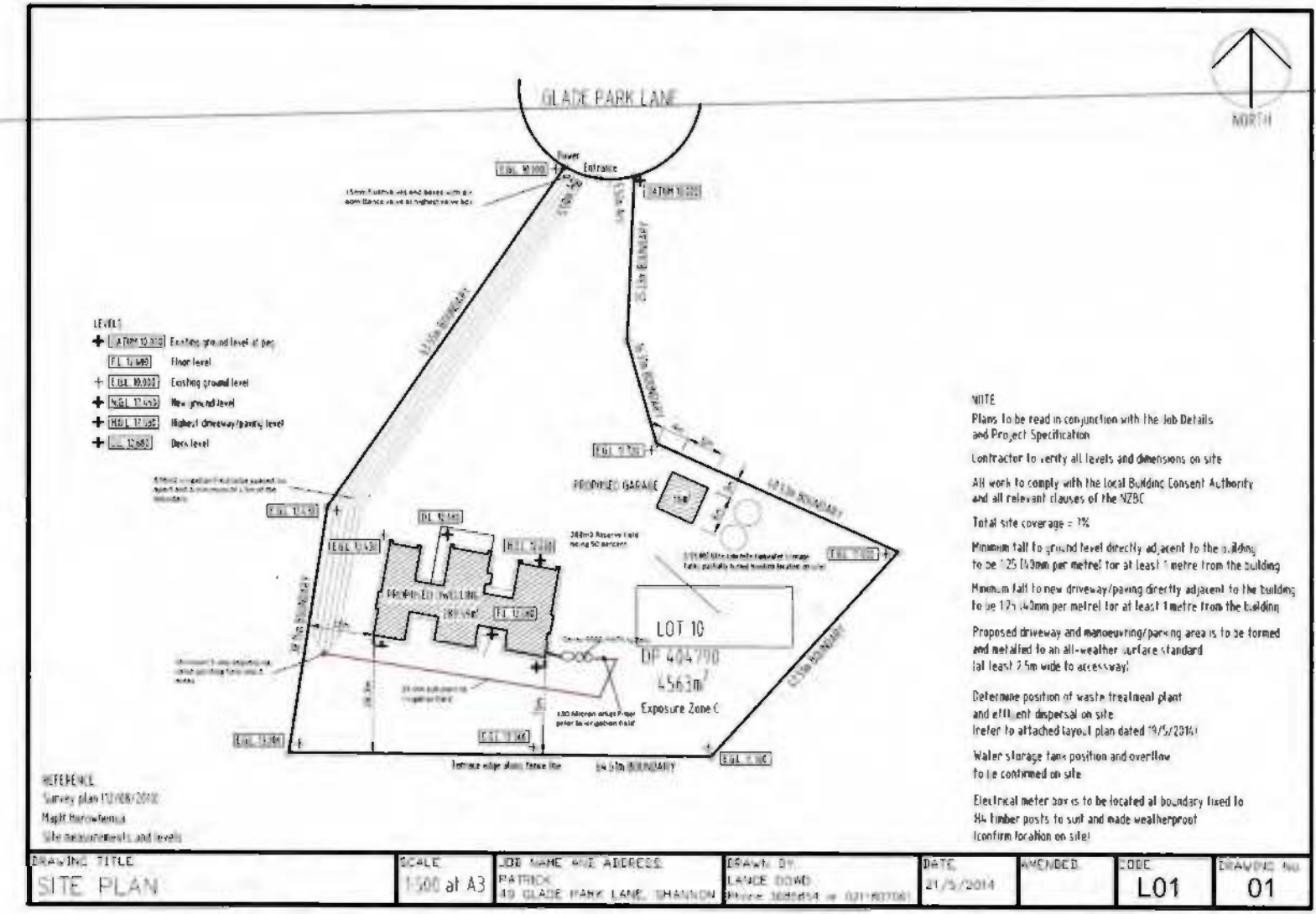
- The Devan 9000 AWTS Wastewater Treatment System has the capacity to treat up to 2000 litres per day with standard appliances and no sink waste disposal.
- The Treatment System is designed to perform to a quality of 15-20mg/L BOD5 and 20-30mg/L Suspended Solids.
- The Treatment System has an audible and visible alarm systems which indicates high water level, air interruption and pump failure.
- The waste water is distributed through pressure compensating drip irrigation tube which is designed to evenly distribute the liquid over the designed area. The design of the irrigation field is laid to ensure ponding does not occur.
- Slope, Aspect and Planting of suitable water and nutrient tolerant plants or vegetation to suit the application to maximise the evapotranspiration, have been recommended.
- All separation distances have been maintained as per AS/NZ 1547:2012.
- Irrigation is laid in an area where there is no foot, animal or vehicle traffic. Where location offers fenced areas, these are mostly considered.
- Odour effects are eliminated by sealed lids on the system, or the application of a carbon filter if requested.
- The Devan system is within a sealed container and is considered extremely low noise. The irrigation pump is submerged which does not produce a noise effect.
- The Devan Management Plan includes 6 monthly servicing. The system is maintained to ensure efficient functioning resulting in the quality of the waste water being consistently high. This is also required by Local Councils' and New Zealand Health legislation.

- The System is wired to an alarm panel which alerts the customer to any problems occurring within their system.

- Each homeowner receives a user guide on the system at commissioning date. Commissioning date is used for education of the system for the client including cleaning , product usage and general filter maintenance.

- The visual effect on the surrounding environment is minimal with only a small dome shaped lid and box visual above ground that can simply be disguised with planting.

Site Plan and As builts



NOTE

Plans to be read in conjunction with the Job Details and Project Specification

Contractor to verify all levels and dimensions on site

All work to comply with the local Building Consent Authority and all relevant clauses of the NZBC

Total site coverage = 1%

Minimum fall to ground level directly adjacent to the building to be 1:25 (43mm per metre) for at least 1 metre from the building

Minimum fall to new driveway/paving directly adjacent to the building to be 1:20 (43mm per metre) for at least 1 metre from the building

Proposed driveway and manoeuvring/parking area is to be formed and metalled to an all-weather surface standard (at least 2.5m wide to accessway)

Determine position of waste treatment plant and effluent dispersal on site (refer to attached layout plan dated 19/5/2014)

Water storage tank position and overflow to be confirmed on site

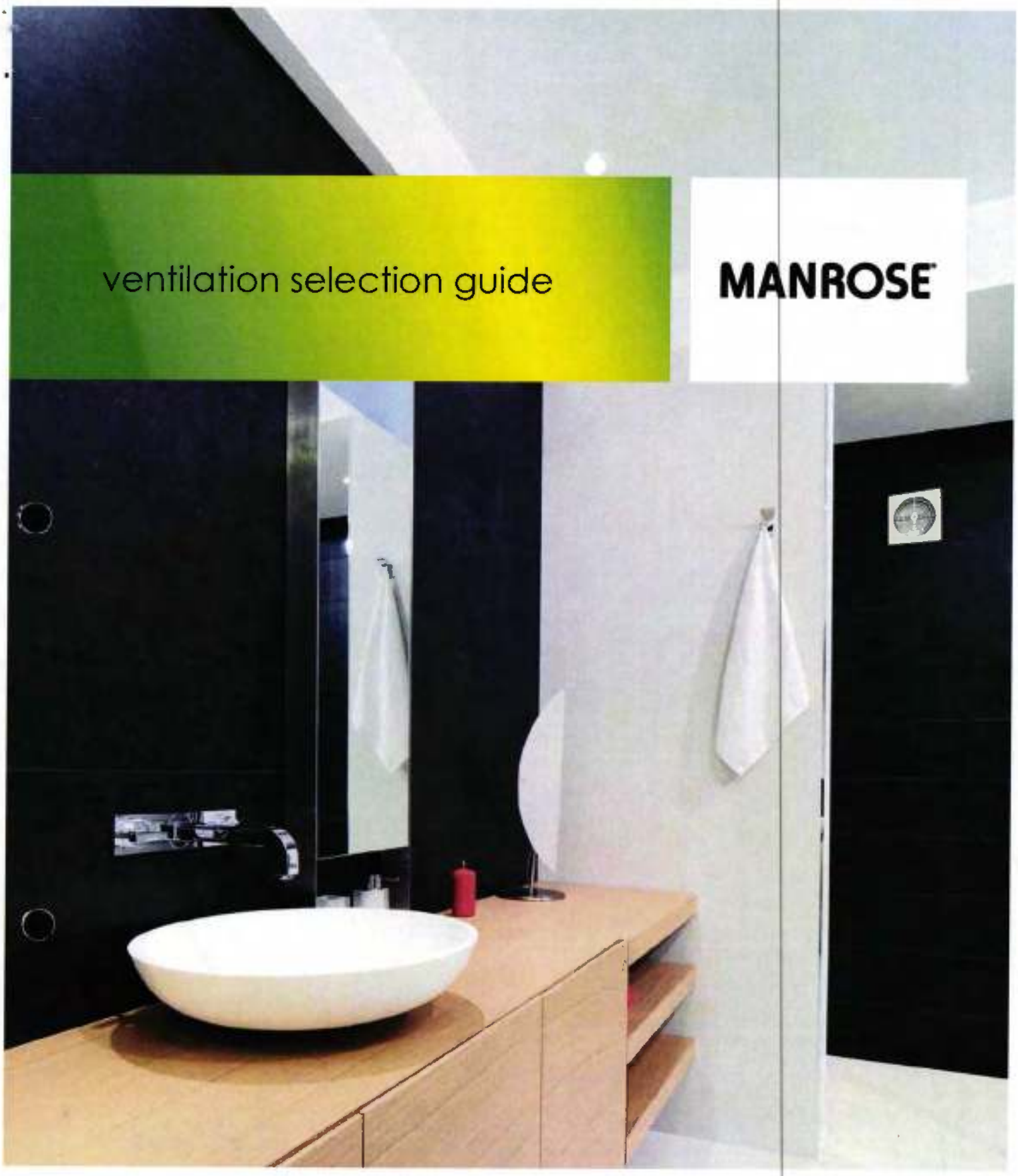
Electrical meter box is to be located at boundary fixed to H4 timber posts to suit and made weatherproof (confirm location on site)

DRAWING TITLE	SCALE	JOB NAME and ADDRESS	DRAWN BY	DATE	AMENDED	CODE	DRAWING No
SITE PLAN	1:500 at A3	PATRICK 49 GLADE PARK LANE, SHANNON	LANCE DOWD	21/5/2014		L01	01

Lawry Residence- 12

ventilation selection guide

MANROSE



MANROSE BATHROOM FANS

www.simx.co.nz

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0 1 AUG 2014
CONSENT

"proven reliable solutions"

Choose the Right Fan

Extraction fans should preferably be placed as close as possible to the steam source (eg. over or near the shower). Inline fans are the most common solution as the grille can be placed directly above the steam source.

Which application you choose will be determined by the physical constraints of the room, then work through the steps below and ultimately personal preference and aesthetics will determine your fan selection.

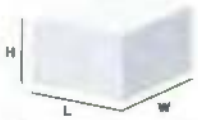
Select your required application:
Eg: Bathrooms (11 - 15 air changes per hour).



"Air Changes per Hour" means an airflow rate sufficient to remove/replace the total volume of air in a given room at a specified number of times each hour.

Calculate the volume of the room in cubic metres (m^3) by multiplying the length x width x height.
Eg: 2.8m x 2.6m x 2.4m = 17.47m^3.

(Select a room volume range of 16-20m^3).



Follow the selected room size row across & select one of the fan kits available based on your mounting requirements.
(See top headings and photos)
Eg: If you require a Thru Wall Kit then you can choose either the XP150 or XPLP150 kits.



Note: to calculate the fan performance:
Multiply the room volume (eg: 17.47m^3) by the maximum recommended air changes (eg: bathroom = 15).
Eg: 17.47m^3 x 15 = 262.083/hr.
An XP150 with a performance of 313m^3/hr achieves this level.

Fan models

Fan switching options

S - Standard models - are generally switched from a light switch.

T - Timer models - this option incorporates a timer which will run on for up to 20 minutes after you switch off the fan.

P - Pull-Cord models - Pull-cord mechanism switches the fan.

A - Automatic Shutter models - When powered the fan starts immediately & the shutters open slowly after approx 20 seconds.

Ball bearing motors

All Manrose fans include ball bearing motors, as these are the highest quality bearing option available for fans. Fan reliability is a critical factor in fan performance, our quality ball bearing motors will ensure Manrose fans perform consistently over a number of years.

We are proud to support all Manrose fans with a 5 year warranty.
All Manrose fans comply to required AS/NZS Standards.

5 YEAR WARRANTY

MANROSE

5468

Fan Selection Guide

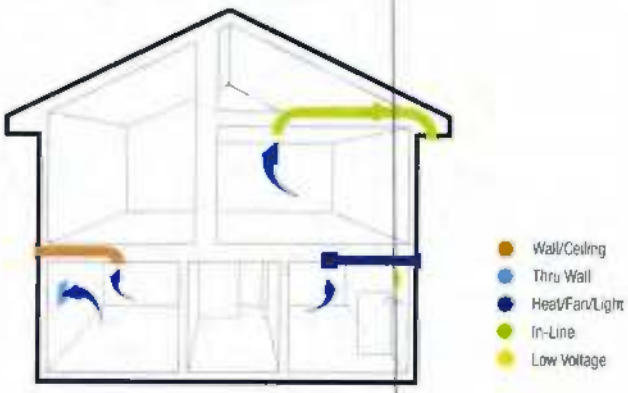
Application		Wall/Ceiling Mounted Fans	
		PRO SERIES	CLASSIC
Room Type	**Room Size (m^3)**		
• Toilets • Laundries - No Dryer • Cellar • Offices	1 - 5m^3	XFLP125	XF125
These rooms require between 6 and 10 ACH (Air Changes per Hour)	6 - 10m^3	XFLP125	XF125
	11 - 15m^3	XFLP150	XF150
	1 - 10m^3	XFLP150	XF150
• Bathrooms • Showers • Ensuites	11 - 15m^3	XFLP150	XF150
These rooms require between 11 and 15 ACH (Air Changes per Hour)	16 - 20m^3	XFLP150 (18)	XF150 (18)
	21 - 30m^3		XFS230
	1 - 5m^3	XFLP150	XF150
• Kitchens • Laundries - With Dryer	6 - 10m^3	XFLP150	XF150
These rooms require between 15 and 20 ACH (Air Changes per Hour)	11 - 20m^3		XFS230

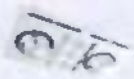
To help prevent condensation

Warm moist air is attracted to colder surfaces, where it condenses into water droplets. Cold surfaces include glass, mirrors, tiles, wet wall linings, cold uninsulated ceiling linings, etc.

You cannot remove all of this air at a rate fast enough to stop this happening & if you could, you would be standing in a wind tunnel. Using a bathroom heater to warm the room prior to use greatly assists in reducing condensation by increasing the temperature of these cold surfaces.

Placement of your ventilation fan

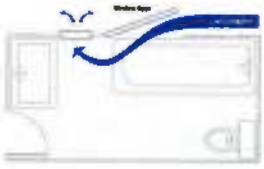


Thru Wall Fan Kits		Heat/Fan/Light Units		In-Line Fan Kits		Extract-A-Lite Kits	
PRO SERIES	CLASSIC	DESIGNER	PRO SERIES	PRO SERIES	CLASSIC	PRO SERIES	CLASSIC
							
XPLP125	XP125	LED HFL 2	Heat 'n Vent 2	SFLP125	SF125	ELLP125	EL100
XPLP125	XP125	LED HFL 2	Heat 'n Vent 2	SFLP125	SF125	ELLP125	EL125
XPLP150	XP150	LED HFL 2	Heat 'n Vent 4	SFLP150	SF150	ELLP150	EL150
XPLP150	XP150	LED HFL 2	Heat 'n Vent 2	SFLP150	SF150	ELLP125	EL150
XPLP150	XP150	LED HFL 2	Heat 'n Vent 4	SFLP150	SF150	ELLP150	EL150
XPLP150 (18)	XP150 (18)	LED HFL 2		SFLP150/ MKLP125	SF150	ELLP150	EL150
	XPS230	LED HFL 4		MKLP150			
XPLP150	XP150			SFLP150	SF150	ELLP125	EL150
XPLP150	XP150			SFLP150/ MKLP125	SF150	ELLP150	EL150
	XPS230			MKLP150			

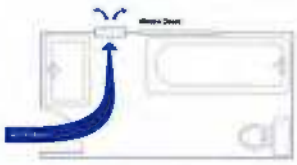
nsider your location within the room

Careful location of an extraction fan will ensure maximum air-flow through the room. Air extracted from a room should be replaced with dry air drawn from an adjacent room or hallway.

Make up air is the amount of air that needs to enter the room in order for the fan to work effectively.



Poor Circulation



Medium Circulation



Best Circulation

"Makeup air" is required for a fan to function efficiently. This is simply air that replaces the air that has already been extracted and can be achieved with a gap under the door or a grill in the door. we do not recommend opening a window.

Wet areas & recommended fan types

When considering where in the room to place an extractor fan, you must consider the wet areas.

For example a fan mounted directly over a bath or shower must be a low voltage fan if less than 2.25m off the floor.

In New Zealand, the height of Zone 1 is 2.25m or, the height of the fixed plumbing connection, whichever is higher.



Zone 1: Requires a Low Voltage Fan
Zone 2: Any model fan can be used
Zone 3: Any fan can be used

MANROSE

Manrose Classic products offer trusted performance and quality to meet the requirements of the market. These products are denoted in Black Text below.

Manrose Pro Series products have been designed to meet the requirements of the professional market with higher specifications and performance of the product. These products are denoted in Red Text below.

Manrose Designer units offer consumers the functionality of a high performance fan with a slim line design and energy efficient LED lamps. These products are denoted in Blue Text below.

MANROSE CLASSIC SERIES

MANROSE PRO-SERIES

MANROSE DESIGNER SERIES

WALL/CEILING MOUNTED FANS

Duct Size	Model No.	Switching Method	Fan Type	Free Air Performance	Order Code
PRO SERIES					
150mm	XFLP150SS*	Standard	Axial	87l/s, 313m³/hr	FAN0594
125mm	XFLP125SS*	Standard	Axial	36l/s, 130m³/hr	FAN0589
CLASSIC					
150mm	XF150S	Standard	Axial	87l/s, 313m³/hr	FAN0120
150mm	XF150A	Standard (Auto Shutter)	Axial	87l/s, 313m³/hr	FAN0121
125mm	XF125S	Standard	Axial	36l/s, 130m³/hr	FAN0072
100mm	XF100S	Standard	Axial	23l/s, 85m³/hr	FAN0046



XFLP150



Circular Fascia Option



XF150



XF125

Options available:
Timer | Pull-cord | PIR | Automatic Shutter | Low Voltage

Please Note:
1. If the Pro Series fans are mounted in the wall, you will need a minimum 110mm wall thickness.
2. Low Voltage models available for installation in damp areas.
3. *Circular fascia low profile option available, please request at point of order.

THRU WALL FAN KITS

Duct Size	Model No.	Switching Method	Fan Type	Free Air Performance	Order Code
PRO SERIES					
150mm	XPLP150SS	Standard	Axial	87l/s, 313m³/hr	FAN0621
125mm	XPLP125SS	Standard	Axial	36l/s, 130m³/hr	FAN0614
CLASSIC					
150mm	XP150S	Standard	Axial	87l/s, 313m³/hr	FAN0135
150mm	XP150A	Standard (Auto Shutter)	Axial	87l/s, 313m³/hr	FAN0136
125mm	XP125S	Standard	Axial	36l/s, 130m³/hr	FAN0080
100mm	XP100S	Standard	Axial	23l/s, 85m³/hr	FAN0053

UPGRADE **150mm models upgraded with Weatherproof Cowl.**



XPLP150



XPLP125



XP150



XP125

Options available:
Timer | Pull-cord | PIR | Automatic Shutter | Low Voltage

Please Note:
1. If the Pro Series fans are mounted in the wall, you will need a minimum 110mm wall thickness.
2. If you require the circular low profile model please request a circular fascia at point of order.
3. Low Voltage Thru Wall Fans models available for installation in damp areas.

APPROVED
01 AUG 2014
CONSENT

HEAT/FAN/LIGHT UNITS

Duct Size	Model No.	Switching Method	Free Air Performance	Performance	Order Code
DESIGNER					
150mm	LED Heat Fan Light 2	Centrifugal	86l/s, 310m³/hr	73l/s, 263m³/hr	FAN4463
150mm	LED Heat Fan Light 4	Centrifugal	86l/s, 310m³/hr	73l/s, 263m³/hr	FAN4465
PRO SERIES					
125mm	Pro Series Heat 'n Vent 4	Centrifugal	67l/s, 240m³/hr	60l/s, 216m³/hr	FAN0955
125mm	Pro Series Heat 'n Vent 2	Centrifugal	63l/s, 226m³/hr	50l/s, 180m³/hr	FAN0940
CLASSIC					
100mm	Heat 'n Vent 2	Centrifugal	54l/s, 194m³/hr	35l/s, 126m³/hr	FAN2162
100mm	2 Heat 'n Light	N/A	N/A	N/A	FAN2200



DESIGNER LED HFL 2



HEAT 'n VENT 2

Options available:
Silver

Please Note:
1. *Installed fan performance results tested with typical installation using 3m of duct and one bend.
2. All Heat/Fan/Light kits include 3 metres of duct, an exterior grille & switch plate.

IN-LINE FANS KITS

Duct Size	Model No.	Switching Method	Fan Type	Performance in free air	Order Code
PRO SERIES					
150mm	MKLP150S	Standard	Mixflow	156l/s, 560m3/hr	FAN2051
150mm	SFLP150S	Standard	Axial Whisp	94l/s, 340m3/hr	FAN0618
125mm	MKLP125S	Standard	Mixflow	89l/s, 320m3/hr	FAN2050
125mm	SFLP125S	Standard	Centrifugal	39l/s, 140m3/hr	FAN0616
100mm	MKLP100S	Standard	Mixflow	69l/s, 250m3/hr	FAN2049
CLASSIC					
150mm	SF150	Standard	Axial Hyper	89l/s, 320m3/hr	FAN0101
125mm	SF125S	Standard	Axial	36l/s, 130m3/hr	FAN0064
100mm	SF200S	Standard	Centrifugal	31l/s, 110m3/hr	FAN0328
100mm	SF100S	Standard	Axial	23l/s, 85m3/hr	FAN0017


MKLP150


SFLP150


SF150


SF100/SF125

These systems are designed so the interior grille can be mounted directly above your steam source, ie shower or bath.

Upgraded Shower Fan Kits are now supplied with a choice of grilles in the Pro Series models, and with a stylish circular interior grille in the Classic models.

Models upgraded with Circular Interior Grille.

Options available:
Timer

Please Note:
1. All kits include duct and interior & exterior grilles
2. *These Timer models include a fixed timer, which will operate for up to 12 minutes dependant on length of operation

EXTRACT-A-LITE HALOGEN KITS

Duct Size	Model No.	Switching Method	Fan Type	Performance in free air	Order Code
PRO SERIES					
150mm	ELLP150WS - White	Standard	Axial Whisp	94l/s, 340m³/hr	FAN2033
150mm	ELLP150SS - Silver	Standard	Axial Whisp	94l/s, 340m³/hr	FAN2034
125mm	ELLP125WS - White	Standard	Centrifugal	39l/s, 140m³/hr	FAN2029
125mm	ELLP125SS - Silver	Standard	Centrifugal	39l/s, 140m³/hr	FAN2030
CLASSIC					
150mm	EL150S - White	Standard	Axial Hyper	89l/s, 320m³/hr	FAN0803
125mm	EL125S - White	Standard	Axial	36l/s, 130m³/hr	FAN2037
100mm	EL100S - White	Standard	Centrifugal	31l/s, 110m³/hr	FAN0420


ELLP150 HALOGEN


EL150 HALOGEN

HALOGEN LAMP

These systems are designed so the Extract-a-Lite can be mounted directly above your steam source, ie shower or bath.

Upgraded Shower Fan Kits are now supplied with a choice of grilles in the Pro Series models, and with a stylish circular interior grille in the Classic models.

Options available:
Timer

Please Note:
1. All kits include duct, Extract-a-lite diffuser include lamp & exterior grille
2. Timer Options are available for all Extract-a-lite models

EXTRACT-A-LED KITS

Duct Size	Model No.	Switching	Fan Type	Performance in free air	Order Code
PRO SERIES					
150mm	LED-ELLP150WS - White	Standard	Axial Whisp	94l/s, 340m³/hr	FAN5375
150mm	LED-ELLP150SS - Silver	Standard	Axial Whisp	94l/s, 340m³/hr	FAN5376
125mm	LED-ELLP125WS - White	Standard	Centrifugal	39l/s, 140m³/hr	FAN5379
125mm	LED-ELLP125SS - Silver	Standard	Centrifugal	39l/s, 140m³/hr	FAN5380
CLASSIC					
150mm	LED-EL150S - White	Standard	Axial Hyper	89l/s, 320m³/hr	FAN5369
125mm	LED-EL125S - White	Standard	Axial	36l/s, 130m³/hr	FAN5371
100mm	LED-EL100S - White	Standard	Centrifugal	31l/s, 110m³/hr	FAN5373


ELLP150 LED


EL150 LED

LED LAMP

These systems are designed so the Extract-a-LED can be mounted directly above your steam source, ie shower or bath.

Options available:
Timer

Please Note:
1. All kits include duct, Extract-a-LED diffuser include LED's & exterior grille
2. Timer Options are available for all Extract-a-LED models

DUCTING

ALUDUCT - Aluminium Flexible Duct

Spiral wire reinforced laminate construction. Properties include: vapour-proof, fire resistant, aluminium/polyester laminate, non collapsing, non rotting, retains extended length. Temperature range -30°C to 140°C, silver finish.



100mm diameter x 3m	DCT0328
125mm diameter x 3m	DCT0329
150mm diameter x 3m	DCT0330

Complies with NZ Building Code fire rating requirements.

PVC Flexible Duct

Spiral wire reinforced PVC construction. Properties include: fire retardant, non collapsing, non rotting, vapour-proof. Temperature range: -6°C to 50°C, white finish.



100mm diameter x 3m	DCT0336
125mm diameter x 4m	DCT0337
150mm diameter x 5m	DCT0338

Complies with NZ Building Code fire rating requirements.

SEMIDUCT - Semi-Rigid Duct

Flexible but strong corrugated aluminium, spiral wound with a unique interlocked & knurled continuous seam. Light yet self-supporting over long lengths.
Temperature range: -30°C to 250°C, silver finish.



100mm diameter x 1.5m	DCT0333
125mm diameter x 1.5m	DCT0334
150mm diameter x 1.5m	DCT0335

Complies with NZ Building Code fire rating requirements.

UNILOK - FR1 Ducting

A UV resilient fire retardant 100µm black low density polyethylene material mechanically locked into an outer metal helix with a copper coated spring steel wire.
Temperature range: -10°C to 80°C, black finish.



100mm diameter x 3m	DCT1133
125mm diameter x 3m	DCT1134
150mm diameter x 3m	DCT0561

Complies with NZ Building Code fire rating requirements.

WALL/CEILING GRILLES



EGGCRATE GRILLES

100mm white eggcrate	DCT0375
125mm white eggcrate	DCT0472
150mm white eggcrate	DCT0473



LOW PROFILE GRILLES

100mm white low profile	DCT1089
125mm white low profile	DCT1090
150mm white low profile	DCT1067

Also available in satin silver & chrome.



FIXED LOUVRE GRILLES

100mm white fixed louvre	DCT0025
125mm white fixed louvre	DCT0041
150mm white fixed louvre	DCT0063

Also available in grey & terracotta.



GRAVITY SHUTTER GRILLES

100mm white gravity shutter	DCT0029
125mm white gravity shutter	DCT0044
150mm white gravity shutter	DCT0066

Also available in grey & terracotta.



WEATHERPROOF COWLS
(Includes flap and bird mesh)

100mm diameter	DCT0018
125mm diameter	DCT1030
150mm diameter	DCT1031



CIRCULAR EXTRACTION GRILLES

100mm diameter	DCT2185
125mm diameter	DCT2186
150mm diameter	DCT2187

Manrose has an extensive range of ducting and accessories designed for residential applications.

From market leading flexible acoustic ducting, designed for low noise air transfer, to a complete range of air diffusion there is a product for every ventilation application.

ACCESSORY COMPONENTS



BACK DRAUGHT SHUTTERS

100mm diameter	FAN0213
125mm diameter	DCT0036
150mm diameter	DCT0511



DUCT CONNECTORS

100mm plastic connector	DCT0159
125mm metal connector	DCT0037
150mm metal connector	DCT0059



FAN TIMER

Fixed fan timer that will automatically switch the appliance off after approximately 7 minutes.

Time Air	FAN0372



FULLY ADJUSTABLE RUN-ON TIMER

An easy to install Run-on Timer which can be fitted to most 'STANDARD' fans. Adjustable from 1 second to 90 minutes. Also includes a delay switch from 1 second to 5 minutes.

Run-On Timer	FAN2444

DOOR GRILLE

Fit to internal doors to allow make-up or replacement air into the room. 450mm x 150mm x 33mm (min) door thickness.

Door Vent	FAN0159



DUCT FASTENERS

Duct Strap 100mm diameter	FAN0274
Duct Strap 125mm diameter	FAN0281
Duct Strap 150mm diameter	FAN0282
Duct Tape 48mm x 5m	DCT0173
Duct Tape 48mm x 30m	DCT0807
Duct Tape AS4254 48mm x 50m	DCT1132

Dealers Stamp

MANROSE

For the full range of Manrose Fans, Hand Dryers, Ducting, Grilles and Accessories visit our website: **www.simx.co.nz** | **www.manrose.com.au**

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We reserve the right to alter technical specifications without notice.

PUB0076 ISS 15 11/13

Design Navigator H1 Compliance Report

Project Summary

H1 Report created by:	Homestead Concrete Homes
Project Name:	H1418
Client:	D & J Lawry
Lot No:	1 DP 368677
Comment:	
Project Id:	63848
Report Date:	03/07/2014

Compliance Result

This building complies with H1 via the following methods:

- the Calculation Method in NZS4218:2004 (Sept 2008 R-values)

H1 Compliance Details

NZS4218:2004 Calculation Method Compliance

The use of the Calculation Method is permitted .

In order to comply the Actual Heat Loss must be the same or smaller than the Reference Heat Loss AND all component R-values must be the same or larger than 60% of the R-values in the '60% Rule' table below. This design **complies** with the NZS4218:2004 Calculation Method.

HeatLoss:

Reference building	Proposed building
972	803

Minimum R-values ("60% rule"):

	Permitted Minimum	Proposed Minimum	
Floor:	0.8	2.76	✓
Non-solid Walls:	1.1	1.44	✓
Glazing in Non-solid Walls:	0.15	0.26	✓
Roof:	1.7	3.01	✓
Skylights:	0.15		✓

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The Reference building has the following areas and R-values.

					Non-solid	Solid Timber	Other Solid
					100.0	0.0%	0.0%
Floor:	Area:	474.2	m²	R-values:	1.3	1.3	1.5
Walls excl. glazing:	Area:	211.5	m²	R-values:	1.9	1.2	1
Glazing (up to 30%):	Area:	91.6	m²	R-values:	0.26	0.26	0.26
Glazing (surplus of 30%):	Area:	2.2	m²	R-values:	0.31	0.31	0.31
Roof:	Area:	395	m²	R-values:	2.9	3.5	3.5
Skylights:	Area:	0	m²	R-values:	0.31	0.31	0.31
Heat Loss:					972	1013	1000

For mixed constructions the heat loss of the reference building is calculated as the sum of the heat losses for each type of wall construction multiplied by the fraction of the wall area of each type. This approach is based on clause 4.2.6 of NZS4218:2009 because NZS4218:2004 has no clear guidance on mixed constructions. Note that all other requirements (window area (30%) and skylight area (1.2m²) threshold for Schedule Method, maximum R-value tradeoff (40%), etc.) are still using NZS4218:2004 including the 2007 H1 amendments because this is the Acceptable Solution for Clause H1.

Compliance with Clause E3

This building complies with the R-value targets in NZBC Clause E3 .

Component	Minimum R-value	Project R-value
Framed wall constructions with cavities	1.5	
Single skin masonry wall without a cavity	0.6	
Solid timber wall no less than 60 mm thick	0.6	
Roof or ceilings	1.5	

Design Details

Building Dimensions

Floor Area	474.2
Gross Wall Area	305.3
Net Wall Area	211.5
Wall (North) Area	68.2
Wall (East, South and West) Area	143.3
Gross Roof Area	395
Net Roof Area	395
Glazing Area	93.8
Window (North) Area	35.4
Window (East, South and West) Area	58.4
Skylight Area	0

Glazing Area Percentages

Total Glazing Percentage	30.7
East, South and West Window Percentage	29%
Total over 30%	yes
East, South and West over 30%	no
Total over 50%	no

Information required for BPI calculation

Living Floor Area	0	Note: This includes also internal floors.
Average Room Height	0	
Thermal Mass Level	Light weight	Suspended timber floor with timber framed walls or a heavily carpeted slab floor with timber framed walls.

Climate

Location	Levin
Climate Zone	2

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Heat Loss Details

	ID	Orient.	Width	Height	Gross Area	Net Area	R-value*	Heat Loss	Shad. Coeff.**	Solid Wall***
Floors										
Floor 1					474.2	474.2	2.76	171.8		
Walls										
Wall 1	Entry	S	3.2	2.5	8.2	2.7	1.44	1.9		C
Window 1-1	D01		2.4	2.3		5.5	0.26	21.0	0.00	
Wall 2	Guest (7)	W	2.5	1.6	4.1	4.1	1.44	2.8		C
Wall 3	Guest (7)	S	2.3	2.5	5.9	1.5	1.47	1.1		C
Window 3-1	W12		2.8	1.2		3.4	0.26	12.9	0.00	
Window 3-2	W15		0.8	1.2		1.0	0.26	3.7	0.00	
Wall 4	Guest Ens	E	0.6	2.5	1.5	1.5	1.44	1.1		C
Wall 5	Bath (1)/BDRM	S	7.9	2.5	20.1	14.5	1.44	10.0		C
Window 5-1	W15		1.2	0.8		1.0	0.26	3.7	0.00	
Window 5-2	W06		2.1	1.2		2.5	0.26	9.7	0.00	
Window 5-3	W08		1.8	1.2		2.2	0.26	8.3	0.00	
Wall 6	Storage	W	1.1	2.5	2.8	2.8	1.44	1.9		C
Wall 7	Storage	S	2.5	2.5	6.3	6.3	2.95	2.1		C
Wall 8	Storage	E	0.5	2.5	1.2	1.2	2.95	0.4		C
Wall 9	Hall	S	1.0	2.5	2.5	2.5	2.95	0.9		C
Wall 10	Laundry	W	0.5	2.5	1.2	1.2	2.95	0.4		C
Wall 11	Laundry	S	2.8	2.5	7.1	7.1	2.95	2.4		C
Wall 12	Laundry	E	0.6	2.5	1.4	1.4	1.44	1.0		C
Wall 13	Laundry	E	1.2	2.5	3.1	-4.1 (?)	1.44	-2.8		C
Window 13-1	D03		6.0	1.2		7.2	0.26	27.7	0.00	
Wall 14	Laundry/BDRM	E	11.4	2.5	29.2	24.5	1.44	17.0		C
Window 14-1	W10		0.7	1.0		0.7	0.26	2.7	0.00	
Window 14-2	W06		2.1	1.2		2.5	0.26	9.7	0.00	
Window 14-3	W12		2.8	0.5		1.4	0.26	5.4	0.00	
Wall 15	Master BDRM/E	N	7.9	2.5	20.2	16.1	1.44	11.2		C
Window 15-1	W12		2.8	1.2		3.4	0.26	12.9	0.00	
Window 15-2	W14		1.5	0.5		0.8	0.26	2.9	0.00	
Wall 16	Ens	W	1.7	2.5	4.4	4.4	1.44	3.0		C
Wall 17	BDRM3-5/WC	N	10.8	2.5	27.7	20.0	1.44	13.9		C
Window 17-1	W05		1.7	1.2		2.0	0.26	7.8	0.00	
Window 17-2	W06		2.1	1.2		2.5	0.26	9.7	0.00	
Window 17-3	W16		0.7	0.8		0.6	0.26	2.2	0.00	
Window 17-4	W06		2.1	1.2		2.5	0.26	9.7	0.00	
Wall 18	Living	E	4.7	3.0	14.1	8.7	1.47	5.9		C

	ID	Orient.	Width	Height	Gross Area	Net Area	R-value*	Heat Loss	Shad. Coeff.**	Solid Wall***
Window 18-1	W07		3.0	1.8		5.4	0.26	20.8	0.00	
Wall 19	Living	N	6.9	3.0	20.7	15.7	1.47	10.7		C
Window 19-1	W04		1.4	1.8		2.5	0.26	9.7	0.00	
Window 19-2	W04		1.4	1.8		2.5	0.26	9.7	0.00	
Wall 20	Living	W	4.7	3.0	14.1	6.9	1.47	4.7		C
Window 20-1	D04		3.0	2.4		7.2	0.26	27.7	0.00	
Wall 21	Dining	N	6.6	2.5	16.7	8.7	1.47	5.9		C
Window 21-1	D05		4.0	2.0		8.0	0.26	30.8	0.00	
Wall 22	Family	E	1.5	3.0	4.5	3.1	1.47	2.1		C
Window 22-1	W01		1.0	1.4		1.4	0.26	5.4	0.00	
Wall 23	Family	N	6.1	3.0	18.2	7.7	1.47	5.2		C
Window 23-1	D02		4.4	2.4		10.6	0.26	40.6	0.00	
Wall 24	Family/Kitchen	W	9.2	3.0	27.5	19.1	1.47	13.0		C
Window 24-1	W09		3.6	1.8		6.5	0.26	24.9	0.00	
Window 24-2	W03		1.4	1.4		2.0	0.26	7.6	0.00	
Wall 25	Kitchen	S	5.8	3.0	17.5	13.5	1.47	9.2		C
Window 25-1	W11		1.4	1.4		2.0	0.26	7.6	0.00	
Window 25-2	W11		1.4	1.4		2.0	0.26	7.6	0.00	
Wall 26	Scullery	W	1.6	2.5	4.1	4.1	1.47	2.8		C
Wall 27	Scullery/Study	S	7.0	2.5	17.9	13.1	1.47	8.9		C
Window 27-1	W02		1.4	1.0		1.4	0.26	5.4	0.00	
Window 27-2	W12		2.8	1.2		3.4	0.26	12.9	0.00	
Wall 28	Study	E	1.2	2.5	3.1	3.1	1.47	2.1		C
Roofs										
Roof 1					395.0	395.0	3.01	131.2		
Total Heat Loss								802.6		

* Any concrete slab-on-ground floor regardless of its dimensions can be assumed to have an R-value of at least R-1.3 (H1/VM1 and H1/AS1, Replacement Table 1, Note (4)).

** The Shading Coefficient is only required for BPI calculations.

*** C: Cavity Construction (any construction that is not solid), T: Solid Timber, S: Other Solid Construction (Note that the use of solid timber and other solid construction types is discretional, i.e. solid timber walls and other solid walls can be treated as if they are non-solid (NZS4218:2004 section 3.1.4.).)

Floor Construction Details

1: Slab floor

internal surface 0.09

Flooring: none (Example: polished surface of a concrete floor)

R-value: 0

Insulation value of the slabfloor

Slab floor area [m²]:	474.2		
Perimeter length [m]:	138.6		
External wall thickness [mm]:	100		
Soil conductivity [W/m C]:	1.2		
Underslab insulation:	Total slab	Insulation:	4.41
Piles Footings:	Number:	Penetration Diameter: mm	
Slab edge insulation:	none	Insulation:	

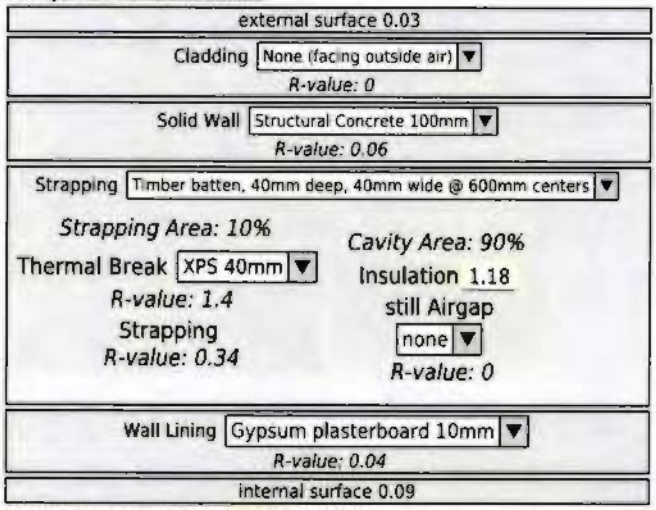
R-value: 2.67

Construction R-value: 2.76 m²K/W.

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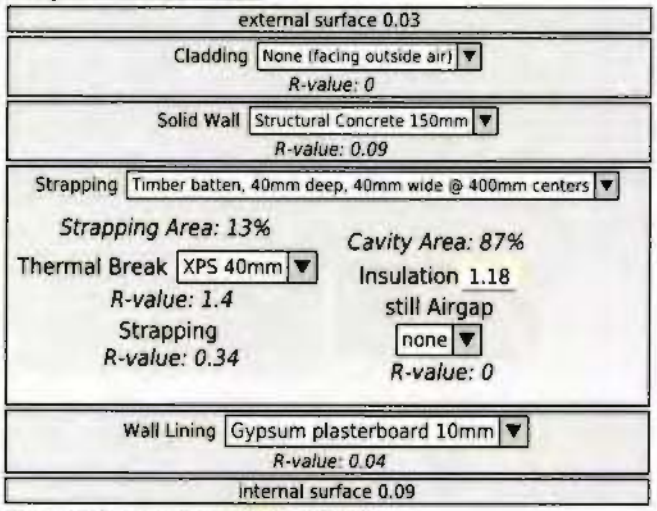
Wall Construction Details

1: Solid wall (concrete, masonry or other) without vented cavity, internal insulation



Construction R-value: 1.44 m²K/W.

2: Solid wall (concrete, masonry or other) without vented cavity, internal insulation



Construction R-value: 1.48 m²K/W.

3: Timber frame with direct fixed insulated cladding

external surface 0.03

Cladding: Gypsum plasterboard 10mm into still air (garage, etc.)
R-value: 0.1

Insulation 2.6

Air Barrier: none
R-value: 0

Timber Frame & Cavity: 45mm, studs @ 600mm, no dwangs

Frame Area: 11.4 %
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Timber Frame
R-value: 0.37

Cavity Area: 88.6%
15-90mm vented cavity (all R-values on ext. side of cavity will be halved), R: 0.08
Insulation
still Airgap: none
R-value: 0

Wall Lining: Gypsum plasterboard 10mm
R-value: 0.04

internal surface 0.09

Construction R-value: 2.95 m²K/W.

4: Solid wall (concrete, masonry or other) without vented cavity, internal insulation

external surface 0.03

Cladding: None (facing outside air)
R-value: 0

Solid Wall: Structural Concrete 125mm
R-value: 0.08

Strapping: Timber batten, 40mm deep, 40mm wide @ 400mm centers

Strapping Area: 13%
Thermal Break: XPS 40mm
R-value: 1.4
Strapping
R-value: 0.34

Cavity Area: 87%
Insulation 1.18
still Airgap
none
R-value: 0

Wall Lining: Gypsum plasterboard 10mm
R-value: 0.04

internal surface 0.09

Construction R-value: 1.47 m²K/W.

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Roof Construction Details

1: Timber framed roof, direct fixed or battened flat ceiling

external surface 0.03

Roofing: Metal tiles with building paper

R-value: 0.01

Insulation: 0

Timber Frame & Cavity

94mm rafters or joists @ 900mm, blocking @ 900mm

Frame Area: 10%	*Cavity Area: 90%*
Roof space (still air) 0.11	Roof space (still air) 0.11
Trusses and dwangs *R-value: 0.78*	Insulation 3.6

Ceiling Lining: Gypsum plasterboard 13mm

R-value: 0.06

internal surface 0.09

Recessed downlights

Ceiling area [m²]:	Number of downlights:	Clearance from lamp holder side [m]:
395		

Construction R-value: 3.01 m²K/W.

Design Certificate – Technical basis for structural design methodology contained in designIT for houses - New Zealand.

designIT for houses, New Zealand has been developed by experienced timber engineers to assist designers in selecting appropriate sizes of structural laminated veneer lumber products manufactured by Carter Holt Harvey (including hySPAN, hy90, hyONE and hyJOIST) and other generic stress grades of timber, to be used as structural elements for the construction of buildings that fall within the scope of NZS 3604.

The design methodology used for the software complies with the loading and general design requirements contained within AS/NZS 1170 and with timber structural design in accordance with NZS 3603:1993 including Amendment 4 (Verification method B1/VM1, 6.1).

designIT relies on the accurate input of span and loading information by the user. Where accurate inputs are submitted the product and/or stress grade and the size given will comply with the structural requirements of the New Zealand Building Code, provided the installation is in accordance with the installation requirements provided by designIT and/or in product literature and/or NZS 3604, or specific engineering design, as appropriate.

References:

NZS 3603:1993 Timber Structures Standard.
NZS 3604:2011 Timber-framed buildings.
AS 1720.1 – 2010 Timber structures. Part 1: Design methods.
AS 1684.1 – 1999 Residential timber framed construction. Part 1: Design criteria.
AS/NZS 1170:2002 Structural design actions, Parts 0 and 1.
AS/NZS 1170:2011 Structural design actions, Part 2: Wind actions.
AS/NZS 1170:2003 Structural design actions, Part 3: Snow and ice actions.

This Design Certificate, and any associated warranty/certification, is void where there has been substitution of alternate products not detailed within the Member Specification.

Version date: 25 February 2014

For further information or advice please contact: Carter Holt Harvey Woodproducts New Zealand
173 Captain Springs Road, Onehunga. Auckland
Telephone 0800 808 131
Facsimile 0800 808 132
Email: designit@chhwoodproducts.co.nz

Specifier details:

Specifier:	Neil	
Business name:	Homestead Concrete Homes	
Address:	76 Main South Road, Levin	
Email:	neil@homesteadgroup.co.nz	
Phone: 06-3681357	**Mobile:**	**Facsimile:** 06-3651359

Project & Site details:

Project:	New Dwelling	**Ref. no.:** H1408
At (address):	1097 Queen Street	
For (owner/s):	Homesteed Concrete Homes	
Wind zone:	High	
Snow loading	Snow Region: N1, Altitude: 100 m (sub-alpine), Ground snow load, Sg = 0.0 kPa	

MEMBER DESIGN DETAILS

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Member 1

1) Member code and description VB1 - Verandah beams

2) Date prepared 8/07/2014

3) Serviceability criteria AS 1720.1-2010 and AS 1684.1-1999

4) Design inputs

Span	4.3 m - single
Roof mass	40 kg/m²
Roof Load Width 'RLW'	3.2 m

5) Member specification

Size, stress grade/product	Use 300 x 63 hySPAN
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

6) Serviceability

Load case	Limit[3] on average deflection[2]	Estimated average deflection[2]	Rigidity ratio[4]
Long term load - $G+\psi_L Q$ *	10.0 mm	7.6 mm (long term)	$\frac{10.0}{7.6} = 1.31$
*Critical serviceability load case			

See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	k_1[1]	Limit states design reaction[2,3] End[4] kN
1.35G	0.60	-4.9
1.2G + 1.5Q	0.80	-7.1
$1.2G + W_U + \Psi_C Q$	1.00	-7.6
$0.9G + W_U$	1.00	6.9

See 'Notes for interpretation of reaction data' at the end of this report

8) Installation requirements Provide at least 30 mm bearing at end supports

Member 2

1) Member code and description VB2 - Verandah beams

2) Date prepared 30/07/2014

3) Serviceability criteria AS 1720.1-2010 and AS 1684.1-1999

4) Design inputs

Span	3.8 m - single
Roof mass	20 kg/m²
Roof Load Width 'RLW'	3.2 m

5) Member specification

Size, stress grade/product	Use 300 x 63 hySPAN
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

6) Serviceability

Load case	Limit[3] on average deflection[2]	Estimated average deflection[2]	Rigidity ratio[4]
Long term load - $G+\psi_L Q$ *	9.5 mm	2.9 mm (long term)	$\frac{9.5}{2.9} = 3.29$
*Critical serviceability load case			

See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	k_1[1]	Limit states design reaction[2,3] End[4] kN
1.35G	0.60	-2.6
1.2G + 1.5Q	0.80	-5.0
$1.2G + W_U + \Psi_C Q$	1.00	-5.4
$0.9G + W_U$	1.00	7.3

See 'Notes for interpretation of reaction data' at the end of this report

8) Installation requirements Provide at least 30 mm bearing at end supports

Member 3

1) Member code and description VB3 - Verandah beams

2) Date prepared 8/07/2014

3) Serviceability criteria AS 1720.1-2010 and AS 1684.1-1999

4) Design inputs

Span	5.6 m - single
Roof mass	20 kg/m²
Roof Load Width 'RLW'	3.6 m

5) Member specification

Size, stress grade/product	Use 360 x 63 hySPAN
Material type	Structural Laminated Veneer Lumber to AS/NZS 4357

6) Serviceability

Load case	Limit[3] on average deflection[2]	Estimated average deflection[2]	Rigidity ratio[4]
Long term load - $G+\psi_L Q$ *	10.0 mm	9.0 mm (long term)	$\frac{10.0}{9.0} = 1.12$
*Critical serviceability load case			

See 'Notes for interpretation of serviceability data' at the end of this report

7) Reactions

Load case	k_1[1]	Limit states design reaction[2,3] End[4] kN
1.35G	0.60	-4.3
1.2G + 1.5Q	0.80	-7.7
$1.2G + W_U + \Psi_C Q$	1.00	-8.6
$0.9G + W_U$	1.00	11.4

See 'Notes for interpretation of reaction data' at the end of this report

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CONSENT

8) Installation requirements Provide at least 30 mm bearing at end supports

Notes for interpretation of serviceability data

1. "average deflection" is an engineering concept based upon a notional estimated load, notional member rigidity and, in some cases, an approximate model of material response to environmental conditions. These parameters are, 'standardised' in AS/NZS 1170, AS 1684.1 and AS 1720. Deflections calculated using this methodology cannot therefore be usefully compared with deflections calculated using other methods, eg GLTAA design methodology.
2. Deflection is the flexural response to load – 'out-of-level' measurements of installations are not necessarily deflections and can incorporate 'initial out-of-straightness', whether intended or not. Furthermore, loads can be higher/lower than the notional estimate and in any comparison with measured levels, meterial variability needs to also be considered. AS 1720 gives the following basis for estimation of upper bound deflections for various materials.

No 1 Framing – visually graded to NZS 3631	Average + 100%
SG grades - mechanically graded to AS/NZS 1748	Average + 43%
GL grades for glulam to AS/NZS 1328	Average + 33%
LVL to AS/NZS 4357 (includes hySPAN and hyJOIST)	Average +18%

As can be seen, comparison of the 'average deflection' for different materials, even if calculated on the same basis, does not give the whole picture!

3. The limits referred are those specified in AS 1684.1 for the stated loed case.
4. 'Rigidity ratio' expresses the rigidity of the specified beam relative to the rigidity of a notional beam just meeting the serviceability requirements of AS 1684.1

Notes for interpretation of reaction data

1. Duration of load factor 'k_1' for strength as per NZ 3603:1993
2. Negative (-) reactions relate to the 'gravity' or 'downwards' force on the support
3. Positive reactions relate to the 'upwards' forces or 'tie-down' requirement on the support
4. End reaction includes allowance for overhang/cantilever where one has been designed

MQ

Installation and operating instructions

GB D F I E P GR NL S FIN DK
PL RU H SI HR HR RO BG CZ SK TR

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(GB) Declaration of Conformity

We, Grundfos, declare under our sole responsibility that the products MQ, to which this declaration relates, are in conformity with these Council directives on the approximation of the laws of the EC member states:

- Machinery Directive (2006/42/EC).
  Standards used: EN 809: 1998 and EN 60204-1: 2006
- Low Voltage Directive (2006/95/EC)
  Standards used: EN 60335-1 2002 and EN 60335-2-41 2003
- EMC Directive (2004/108/EC)
  Standards used: EN 61000-6-2 and EN 61000-6-3

(D) Konformitätserklärung

Wir, Grundfos, erklären in alleiniger Verantwortung, dass die Produkte MQ, auf die sich diese Erklärung bezieht, mit den folgenden Richtlinien des Rates zur Angleichung der Rechtsvorschriften der EU-Mitgliedsstaaten übereinstimmen:

- Maschinenrichtlinie (2006/42/EG).
  Normen, die verwendet wurden: EN 809: 1998 und EN 60204-1: 2006
- Niederspannungsrichtlinie (2006/95/EG)
  Normen, die verwendet wurden: EN 60335-1 2002 und EN 60335-2-41: 2003
- EMV-Richtlinie (2004/108/EG)
  Normen, die verwendet wurden: EN 61000-6-2 und EN 61000-6-3.

(F) Déclaration de Conformité

Nous, Grundfos, déclarons sous notre seule responsabilité, que les produits MQ, auxquels se réfère cette déclaration, sont conformes aux Directives du Conseil concernant le rapprochement des législations des Etats membres CE relatives aux normes énoncées ci-dessous

- Directive Machines (2006/42/CE).
  Normes utilisées : EN 809 : 1998 et EN 60204-1 : 2006.
- Directive Basse Tension (2006/95/CE).
  Normes utilisées : EN 60335-1 : 2002 et EN 60335-2-41 : 2003
- Directive Compatibilité Electromagnétique CEM (2004/108/CE).
  Normes utilisées : EN 61000-6-2 et EN 61000-6-3

(I) Dichiarazione di Conformità

Grundfos dichiara sotto la sua esclusiva responsabilità che i prodotti MQ, ai quali si riferisce questa dichiarazione, sono conformi alle seguenti direttive del Consiglio riguardanti il ravvicinamento delle legislazioni degli Stati membri CE:

- Direttiva Macchine (2006/42/CE)
  Norme applicate: EN 809: 1998 e EN 60204-1: 2006
- Direttiva Bassa Tensione (2006/95/CE).
  Norme applicate: EN 60335-1: 2002 e EN 60335-2-41: 2003
- Direttiva EMC (2004/108/CE).
  Norme applicate: EN 61000-6-2 e EN 61000-6-3

(E) Declaración de Conformidad

Nosotros Grundfos, declaramos bajo nuestra entera responsabilidad que los productos MQ, a los cuales se refiere esta declaración, están conformes con las Directivas del Consejo en la aproximación de las leyes de las Estados Miembros del EM.

- Directiva de Maquinaria (2006/42/CE).
  Normas aplicadas: EN 809: 1998 y EN 60204-1: 2006.
- Directiva de Baja Tensión (2006/95/CE).
  Normas aplicadas: EN 60335-1: 2002 y EN 60335-2-41: 2003
- Directiva EMC (2004/108/CE)
  Normas aplicadas: EN 61000-6-2 y EN 61000-6-3

(P) Declaração de Conformidade

A Grundfos declara sob sua única responsabilidade que os produtos MQ, aos quais diz respeito esta declaração, estão em conformidade com as seguintes Directivas do Conselho sobre a aproximação das legislações dos Estados Membros da CE

- Directiva Máquinas (2006/42/CE).
  Normas utilizadas: EN 809: 1998 e EN 60204-1: 2006
- Directiva Baixa Tensão (2006/95/CE)
  Normas utilizadas: EN 60335-1: 2002 e EN 60335-2-41: 2003.
- Directiva EMC (compatibilidade electromagnética) (2004/108/CE).
  Normas utilizadas: EN 61000-6-2 e EN 61000-6-3.

(GR) Δήλωση Συμμόρφωσης

Εμείς, η Grundfos, δηλώνουμε με αποκλειστικά δική μας ευθύνη ότι τα προϊόντα MQ στα οποία αναφέρεται η παρούσα δήλωση, συμμορφώνονται με τις εξής Οδηγίες του Συμβουλίου περί προσέγγισης των νομοθεσιών των κρατών μελών της ΕΕ:

- Οδηγία για μηχανήματα (2006/42/ΕΚ)
  Πρότυπα που χρησιμοποιήθηκαν: EN 809: 1998 και EN 60204-1: 2006.
- Οδηγία χαμηλής τάσης (2006/95/ΕΚ).
  Πρότυπα που χρησιμοποιήθηκαν: EN 60335-1: 2002 και EN 60335-2-41: 2003.
- Οδηγία Ηλεκτρομαγνητικής Συμβατότητας (ΕΜC) (2004/108/ΕΚ).
  Πρότυπα που χρησιμοποιήθηκαν: EN 61000-6-2 και EN 61000-6-3

(NL) Overeenkomstigheidsverklaring

Wij, Grundfos, verklaren geheel onder eigen verantwoordelijkheid dat de producten MQ waarop deze verklaring betrekking heeft, in overeenstemming zijn met de Richtlijnen van de Raad in zake de onderlinge aanpassing van de wetgeving van de EG Lidstaten betreffende:

- Machine Richtlijn (2006/42/EC).
  Gebruikte normen: EN 809: 1998 en EN 60204-1 2006.
- Laagspanninge Richtlijn (2006/95/EC)
  Gebruikte normen. EN 60335-1: 2002 en EN 60335-2-41: 2003
- EMC Richtlijn (2004/108/EC).
  Gebruikte normen: EN 61000-6-2 en EN 61000-6-3.

(S) Försäkran om överensstämmelse

Vi, Grundfos, försäkrar under ansvar att produkterna MQ, som omfattas av denna försäkran, är i överensstämmelse med rådets direktiv om inbördes närmande till EU-medlemsstaternas lagstiftning, avseende

- Maskindirektivet (2006/42/EG).
  Tillämpade standarder: EN 809: 1998 och EN 60204-1: 2006
- Lågspänningsdirektivet (2006/95/EG).
  Tillämpade standarder: EN 60335-1: 2002 och EN 60335-2-41: 2003.
- EMC-direktivet (2004/108/EG).
  Tillämpade standarder: EN 61000-6-2 och EN 61000-6-3.

(FIN) Vaatimustenmukaisuusvakuutus

Me, Grundfos, vakuutamme omalla vastuullamme, että tuotteet MQ, jotka tämä vakuutus koskee, ovat EY n jäsenvaltioiden lainsäädännön yhdenmukaistamiseen tähtäävien Euroopan neuvoston direktiivien vaatimusten mukaisia seuraavasti

- Konedirektiivi (2006/42/EY).
  Sovellettavat standardit: EN 809: 1998 ja EN 60204-1: 2006
- Pienjännitedirektiivi (2006/95/EY).
  Sovellettavat standardit: EN 60335-1: 2002 ja EN 60335-2-41: 2
- EMC-direktiivi (2004/108/EY).
  Sovellettavat standardit: EN 61000-6-2 ja EN 61000-6-3

(DK) Overensstemmelseserklæring

Vi, Grundfos, erklærer under ansvar at produkterne MQ som denne erklæring omhandler, er i overensstemmelse med disse af Rådets direktiver om indbyrdes tilnærmelse til EF-medlemsstaternes lovgivning:

- Maskindirektivet (2006/42/EF).
  Anvendte standarder: EN 809: 1998 og EN 60204-1: 2006
- Lavspændingsdirektivet (2006/95/EF).
  Anvendte standarder: EN 60335-1: 2002 og EN 60335-2-41: 2003.
- EMC-direktivet (2004/108/EF)
  Anvendte standarder: EN 61000-6-2 og EN 61000-6-3.

(PL) Deklaracja zgodności

My, Grundfos, oświadczamy z pełną odpowiedzialnością, że nasze wyroby MQ, których deklaracja niniejsza dotyczy, są zgodne z następującymi wytycznymi Rady d/s ujednolicenia przepisów prawnych krajów członkowskich WE.

- Dyrektywa Maszynowa (2006/42/WE).
  Zastosowane normy: EN 809: 1998 oraz EN 60204-1: 2006
- Dyrektywa Niskonapięciowa (LVD) (2006/95/WE)
  Zastosowane normy: EN 60335-1: 2002 oraz EN 60335-2-41: 2003.
- Dyrektywa EMC (2004/108/WE)
  Zastosowane normy: EN 61000-6-2 oraz EN 61000-6-3

(RU) Декларация о соответствии

Мы, компания Grundfos, со всей ответственностью заявляем, что изделия MQ, к которым относится настоящая декларация, соответствуют следующим Директивам Совета Евросоюза об унификации законодательных предписаний стран-членов ЕС:

- Механические устройства (2006/42/EC)
  Применявшиеся стандарты: EN 809: 1998 и EN 60204-1: 2006
- Низковольтное оборудование (2006/95/EC).
  Применявшиеся стандарты: EN 60335-1: 2002 и EN 60335-2-41: 2003.
- Электромагнитная совместимость (2004/108/EC).
  Применявшиеся стандарты: EN 61000-6-2 и EN 61000-6-3.

(H) Megfelelőségi nyilatkozat

Mi, a Grundfos, egyedüli felelősséggel kijelentjük, hogy a MQ termékek amelyekre jelen nyilatkozik vonatkozik, megfelelnek az Európai Unió tagállamainak jogi irányelveit összehangoló tanács alábbi előírásainak:

- Gépek (2006/42/EK)
  Alkalmazott szabványok: EN 809: 1998 és EN 60204-1: 2006.
- Kisfeszültségű Direktíva (2006/95/EK).
  Alkalmazott szabványok: EN 60335-1: 2002 és EN 60335-2-41: 2003.
- EMC Direktíva (2004/108/EK).
  Alkalmazott szabványok: EN 61000-6-2 és EN 61000-6-3.

(SI) Izjava o skladnosti

V Grundfosu s polno odgovornostjo izjavljamo, da so naši izdelki MQ, na katere se ta izjava nanaša, v skladu z naslednjimi direktivami Sveta o približevanju zakonodaje za izenačevanje pravnih predpisov držav članic ES:

- Direktiva o strojih (2006/42/ES).
  Uporabljeni normi: EN 809: 1998 in EN 60204-1: 2006.
- Direktiva o nizki napetosti (2006/95/ES)
  Uporabljeni normi: EN 60335-1: 2002 in EN 60335-2-41: 2003
- Direktiva o elektromagnetni združljivosti (EMC) (2004/108/ES).
  Uporabljeni normi: EN 61000-6-2 in EN 61000-6-3.

(HR) Izjava o usklađenosti

Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod MQ, na koji se ova izjava odnosi, u skladu s direktivama ovog Vijeća o usklađivanju zakona država članica EU.

- Direktiva za strojeve (2006/42/EZ)
  Korištene norme: EN 809: 1998 i EN 60204-1: 2006.
- Direktiva za niski napon (2006/95/EZ)
  Korištene norme: EN 60335-1: 2002 i EN 60335-2-41: 2003
- Direktiva za elektromagnetsku kompatibilnost (2004/108/EZ).
  Korištene norme: EN 61000-6-2 i EN 61000-6-3.

(SER) Deklaracija o konformitetu

Mi, Grundfos, izjavljujemo pod vlastitom odgovornošću da je proizvod MQ, na koji se ova izjava odnosi, u skladu sa direktivama Saveta za usklađivanje zakona država članica EU.

- Direktiva za mašine (2006/42/EC).
  Korišćeni standardi: EN 809: 1998 i EN 60204-1: 2006.
- Direktiva niskog napona (2006/95/EC)
  Korišćeni standardi: EN 60335-1: 2002 i EN 60335-2-41: 2003.
- EMC direktiva (2004/108/EC)
  Korišćeni standardi: EN 61000-6-2 i EN 61000-6-3.

(RO) Declaraţie de Conformitate

Noi, Grundfos, declarăm pe propria răspundere că produsele MQ, la care se referă această declaraţie, sunt în conformitate cu aceste Directive de Consiliu asupra armonizării legilor Statelor Membre CE:

- Directiva Utilaje (2006/42/CE)
  Standarde utilizate: EN 809: 1998 şi EN 60204-1: 2006.
- Directiva Tensiune Joasă (2006/95/CE).
  Standarde utilizate: EN 60335-1: 2002 şi EN 60335-2-41: 2003.
- Directiva EMC (2004/108/CE)
  Standarde utilizate: EN 61000-6-2 şi EN 61000-6-3.

(BG) Декларация за съответствие

Ние, фирма Grundfos, заявяваме с пълна отговорност, че продуктите MQ, за които се отнася настоящата декларация, отговарят на следните указания на Съвета за уеднаквяване на правните разпоредби на държавите членки на ЕС

- Директива за машините (2006/42/EC).
  Приложени стандарти: EN 809: 1998 и EN 60204-1: 2006.
- Директива за нисковолтови системи (2006/95/EC).
  Приложени стандарти: EN 60335-1: 2002 и EN 60335-2-41: 2003.
- Директива за електромагнитна съвместимост (2004/108/EC).
  Приложени стандарти: EN 61000-6-2 и EN 61000-6-3.

(CZ) Prohlášení o shodě

My firma Grundfos prohlašujeme na svou plnou odpovědnost, že výrobky MQ, na něž se toto prohlášení vztahuje, jsou v souladu s ustanovením směrnice Rady pro sbližení právních předpisů členských států Evropského společenství v oblastech:

- Směrnice pro strojní zařízení (2006/42/ES).
  Použité normy: EN 809: 1998 a EN 60204-1: 2006.
- Směrnice pro nízkonapěťové aplikace (2006/95/ES).
  Použité normy: EN 60335-1: 2002 a EN 60335-2-41: 2003.
- Směrnice pro elektromagnetickou kompatibilitu (EMC) (2004/108/ES).
  Použité normy: EN 61000-6-2 a EN 61000-6-3.

(SK) Prehlásenie o konformite

My firma Grundfos prehlasujeme na svoju plnú zodpovednosť, že výrobky MQ, na ktoré sa toto prehlásenie vzťahuje, sú v súlade s ustanovením smernice Rady pre zbližovanie právnych predpisov členských štátov Európskeho spoločenstva v oblastiach:

- Smernica pre strojové zariadenie (2006/42/EC)
  Použité normy: EN 809: 1998 a EN 60204-1: 2006.
- Smernica pre nízkonapäťové aplikácie (2006/95/EC)
  Použité normy: EN 60335-1: 2002 a EN 60335-2-41: 2003.
- Smernica pre elektromagnetickú kompatibilitu (2004/108/EC).
  Použité normy: EN 61000-6-2 a EN 61000-6-3.

(TR) Uygunluk Bildirgesi

Grundfos olarak bu beyannameye konu olan MQ ürünlerinin, AB Üyesi Ülkelerin kanunlarını birbirine yaklaştırma üzerine Konsey Direktiflerine uyumlu olduğunun yalnızca bizim sorumluluğumuz altında olduğunu beyan ederiz.

- Makineler Yönetmeliği (2006/42/EC).
  Kullanılan standartlar: EN 809: 1998 ve EN 60204-1: 2006.
- Düşük Voltaj Yönetmeliği (2006/95/EC).
  Kullanılan standartlar: EN 60335-1: 2002 ve EN 60335-2-41: 2003.
- EMC Direktifi (2004/108/EC).
  Kullanılan standartlar: EN 61000-6-2 ve EN 61000-6-3.

Bjerringbro, 22nd December 2009

Svend Aage Kaae
Technical Director
Grundfos Holding A/S
Poul Due Jensens Vej 7
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Person authorised to compile technical file and empowered to sign the EC declaration of conformity.

MQ

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Original installation and operating instructions.

GB

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Before beginning installation procedures, these installation and operating instructions should be studied carefully. The installation and operation should also be in accordance with local regulations and accepted codes of good practice.

1. General description

The MQ is a compact water supply system consisting of a pump, motor, pressure tank and controller combined in an integral unit.

The pump starts automatically when water is consumed in the installation and stops when the consumption ceases. The MQ is a low-noise pump which can be installed both indoors and outdoors.

The pump is self-priming and has a non-return valve incorporated in the suction port, see fig. 1. The pump features a user-friendly control panel.

The pressure tank incorporated in the pump reduces the number of starts and stops in case of leakage in the installation.

The MQ pump has built-in overtemperature and dry-running protection.

1.1 Applications

Typical applications:

- Water pressure boosting in storage tanks (maximum inlet pressure 3 bar) and
- water supply from wells (maximum suction lift 8 metres), e.g.
  - in private homes,
  - in summer houses and weekend cottages,
  - on farms,
  - in market gardens and other large gardens.

The pump can be used for rain water and has been approved for drinking water.

The maximum suction lift of the pump can be determined from the diagram on page 197.

Example:

If the suction lift is 2.5 metres, the length of the suction pipe must not exceed 24 metres.

1.2 Type key

Example	MQ	3	-35	A	-O	-A	BVBP

- Pump type
- Nominal flow rate [m³/h]
- Head [m]
- Code for pump version
  A: Standard
- Code for pipework connection
- Code for materials
  A: Standard
- Code for shaft seal

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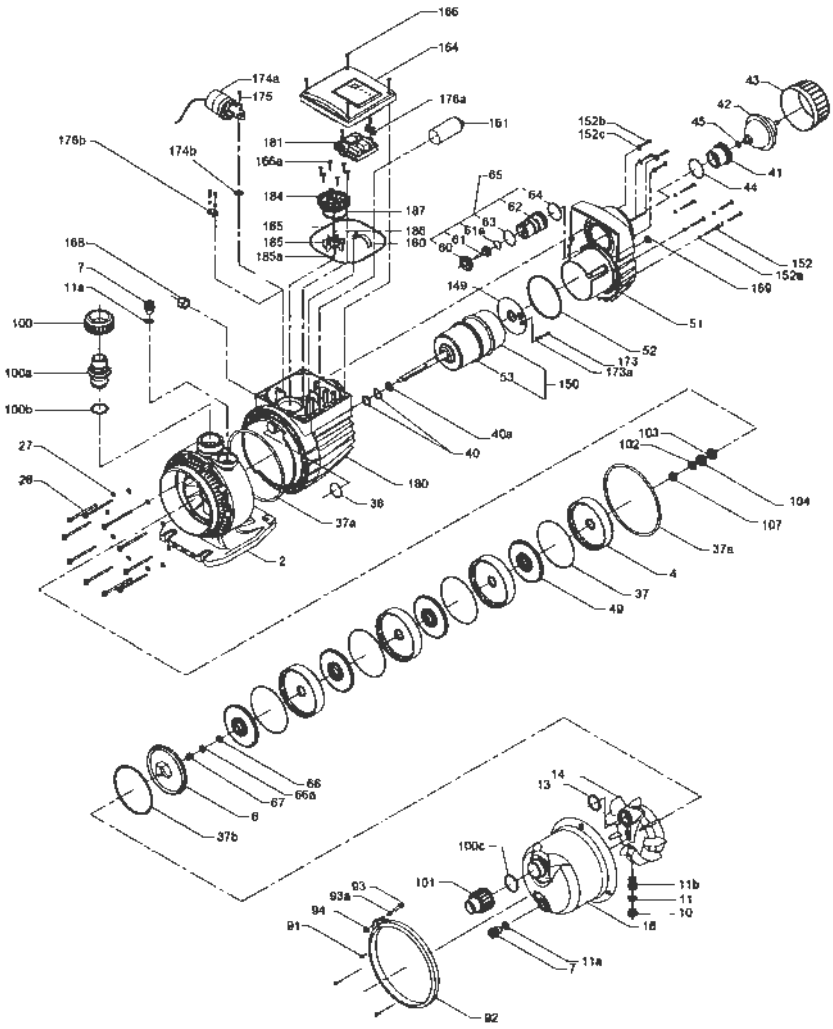
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Exploded view



BE > THINK > INNOVATE >

Being responsible is our foundation
Thinking ahead makes it possible
Innovation is the essence

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Repl. V7164915 0104 V7164916 0104	

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1.3 MQ pump



Fig. 1

2. Pumped liquids

Thin, clean, non-aggressive liquids, not containing solid particles or fibres.

3. Technical data

3.1 Operating conditions

	MQ 3-25	MQ 3-35	MQ 3-45
Maximum pressure [bar]	2.5	3.5	4.5
Maximum system pressure [bar]	7.5		
Maximum suction lift [m], see page 197	8		
Minimum ambient temperature [°C]	0		
Maximum ambient temperature [°C]	45		
Minimum liquid temperature [°C]	0		
Maximum liquid temperature [°C]	35		
Net weight [kg]	13.0		
Sound pressure level [dB(A)]	< 70		
Tank volume [l]	0.16		
Air pressure in tank [bar]	1.0	1.5 to 1.7	
50 Hz:			
Maximum flow rate [m³/h]	4.5		
Connections	G 1		
60 Hz:			
Maximum flow rate [m³/h]	5		
Connections	1" NPT		

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3.2 Electrical data

		MQ 3-25	MQ 3-35	MQ 3-45
Enclosure class		IP 54		
Insulation class		B		
Supply cable		2 m H07RN-F with/without plug		
50 Hz:				
Voltage [VAC]		1 x 220-240 V –10/+6%		
Power consumption, P_1 [W]		600	850	1000
60 Hz:				
Voltage, power consumption, P_1 [W]	1 x 110-120 V –10/+6%	–	800	1000
	1 x 220-240 V –10/+6%	550	850	1050

3.3 Dimensions

See dimensions at the end of these instructions.

3.4 Approvals

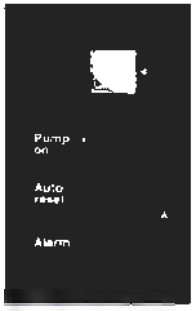
Materials in contact with the pumped liquid have been approved by the British Water Regulations Advisory Scheme (WRAS) according to BS 6920 for use in drinking water.

Other approvals: See pump nameplate.

4. Functions

4.1 Control panel

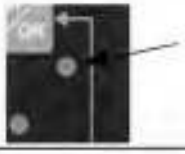
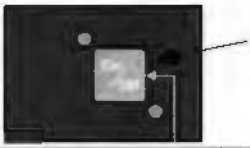
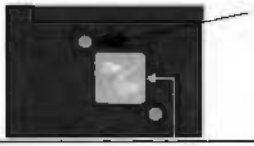
The MQ pump is operated entirely by means of the control panel, see fig. 2. The control panel offers the possibility of starting/stopping the pump. The pump settings and operating condition are indicated by indicator lights.



TM01 9684 2600

Fig. 2

The functions of the control panel are described in the following table:

Illustration	Description
1 	**Indicator light (red):** When the indicator light is on, the pump is on standby.
2 	**On/off button:** The pump is started/stopped by means of the on/off button. The on/off button can also be used for manual resetting in case of an alarm condition: • press once for resetting and • press once more for starting.
3 	**Indicator light (green):** Indicates that the pump is ready for operation. When the indicator light is on, the pump will start automatically when water is consumed. The pump will stop a few seconds after the water consumption has ceased.
4 	**Pump on (green):** The indicator light is on when the pump is running.
5 	**Auto-reset (green):** As standard, this function is activated on delivery (does not apply to pump versions for Australia). When the indicator light is • on, the Auto-reset function is activated. The pump will automatically attempt to restart every 30 minutes after an alarm/fault over a period of 24 hours. After this period, the pump will remain in the alarm condition. • off, the Auto-reset function is deactivated. The pump will not restart after an alarm/fault. The Auto-reset function can be activated/deactivated by pressing the on/off button for 5 seconds. **Note:** When water is consumed, the pump will start and stop automatically, whether the Auto-reset light is on or off.
6 	**Alarm (red):** The indicator light is on when the pump is in alarm condition. The alarm condition may have been caused by: • dry running, • overtemperature, • overloaded motor, • seized-up motor/pump or • frequent starts/stops (the indicator light flashes). See section *4.2 Pump stop*.

Note: The pump settings are stored. After supply failure, the pump will automatically revert to its operating condition when the electricity supply is connected again.

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4.2 Pump stop

The pump incorporates an electronic protective function which will stop the pump in case of

- dry running,
- overtemperature,
- overloaded motor,
- seized-up motor/pump,
- frequent starts/stops (the "Alarm" indicator light flashes) caused by
  - leakage in suction pipe,
  - dripping tap or
  - running toilet.

The pump will restart automatically after 30 minutes (for 24 hours) in case of any type of fault if the Auto-reset function is activated (the green indicator light on the control panel is on, see point 5 in the table in section *4.1 Control panel*).

5. Mounting and connection

5.1 Mounting the pump

The pump is resistant to sunlight and can be installed both indoors and outdoors. When installed outdoors, it is recommended to protect the pump by means of a suitable cover.

Always mount the pump on the base plate with horizontal suction port and vertical discharge port.

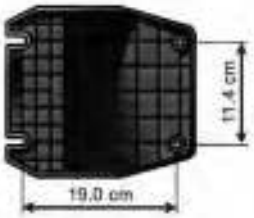
The pump must be mounted horizontally. Maximum permissible inclination angle: ±18°, see fig. 3.



TM01 9691 2600

Fig. 3

The pump must be secured to a solid foundation by bolts through the holes in the base plate, see fig. 4.



TM01 9692 2600

Fig. 4

The pump discharge is flexible, ±5°, to facilitate the connection. Never apply unnecessary force when connecting the pipes.

The pump is supplied with G 1 (50 Hz) or 1" NPT (60 Hz) screwed connections to be fitted in the suction and discharge ports, see fig. 5.



TM01 9690 1

Fig. 5

The pump incorporates a non-return valve which prevents backflow during priming and operation.

Installations with long suction pipes: A non-return valve is supplied with the pump. It is recommended to fit this non-return valve in the pump suction port.

If the pump is installed in long pipes, the pipes must be adequately supported on either side of the pump in order not to strain the pump connections. If the pump draws water from a well, it is recommended also to fit a foot valve to the end of the suction pipe, see fig. 6.



TM01 9693 2600

Fig. 6

If a hose is used for suction pipe, it must be of a non-collapsible type.

As the pump is self-cooling, no space is required around the pump and no ventilation is required.

5.2 Electrical connection

The electrical connections and additional protection should be carried out by qualified persons in accordance with local regulations.



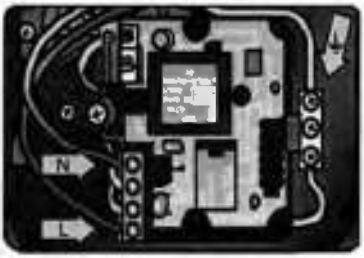
Never make any connections in the pump terminal box unless the electricity supply has been switched off for at least 5 minutes.

The pump must be earthed (PE).

Do not start the pump until it has been filled with water (primed).

The operating voltage and frequency are marked on the nameplate. Make sure that the motor is suitable for the electricity supply on which it will be used.

The pump must be connected to the mains via a rubber-sheathed cable with a protective earth lead. It is possible to replace the mains supply cable, see fig. 7.



TM01 9694 2600

Fig. 7

Connect the mains supply cable of the pump to the electricity supply. When the cable is connected, a red and a green indicator light on the control panel will be on, see fig. 8.



TM01 9695 2600

Fig. 8

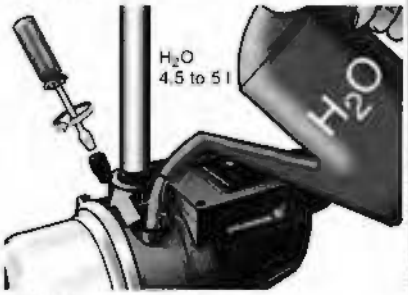
* Does not apply to pump versions for Australia.

5.3 Generator or inverter

Note: The MQ can be powered by a generator or an inverter. However, the pump will only operate satisfactorily if the generator or inverter generates a true sinusoidal wave with the necessary power and voltage input.

5.4 Start-up

Before start-up, the pump must be filled with 4.5 to 5 litres of water to enable it to self-prime, see fig. 9. The pump is self-priming with a maximum suction lift of 8 metres.



TM01 9696 2600

Fig. 9

When the pump is started, it will start to self-prime. When the pump has been primed, it will automatically change over to normal operation. If the priming has not been completed within 5 minutes, the pump will stop automatically and attempt to restart after
30 minutes. It is possible to reset the pump manually, see point 2 in the table in section *4.1 Control panel*.

6. Maintenance

Under normal operating conditions, the pump is maintenance-free. However, it is recommended to keep the pump clean.



Do not remove the pressure tank from the pump unless it has been vented through the air escape valve.

Never touch the electronics unless the pump has been switched off for at least 5 minutes.

If there is any risk of frost damage, drain the pump through the drain hole and slacken the union nut on the discharge pipe, see fig. 10. The pump must be filled with liquid before it is started up again, see fig. 9.



TM01 9697 4403

Fig. 10

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6.1 Service kits

Service kits are available for the MQ pump. The service kits consist of the following replaceable parts:

- shaft seal,
- motor,
- electronic units,
- hydraulic components.

6.2 Start-up after a long time of inactivity

The end cover incorporates a plug which can be removed by means of a suitable tool. It is then possible to free the pump rotor if it has seized up as a result of inactivity. If the pump has been drained, it must be filled with liquid before start-up, see fig. 9.

7. Service

Note: If a pump has been used for a liquid which is injurious to health or toxic, the pump will be classified as contaminated.

If Grundfos is requested to service the pump, Grundfos must be contacted with details about the pumped liquid, etc. *before* the pump is returned for service. Otherwise Grundfos can refuse to accept the pump for service.
Possible costs of returning the pump are paid by the customer.

However, any application for service (no matter to whom it may be made) must include details about the pumped liquid if the pump has been used for liquids which are injurious to health or toxic.

8. Disposal

Disposal of this product must be carried out according to the following guidelines:

1. Use the local public or private waste collection service.
2. In case such waste collection service does not exist or cannot handle the materials used in the product, please deliver the product or any hazardous materials from it to your nearest Grundfos company or service workshop.

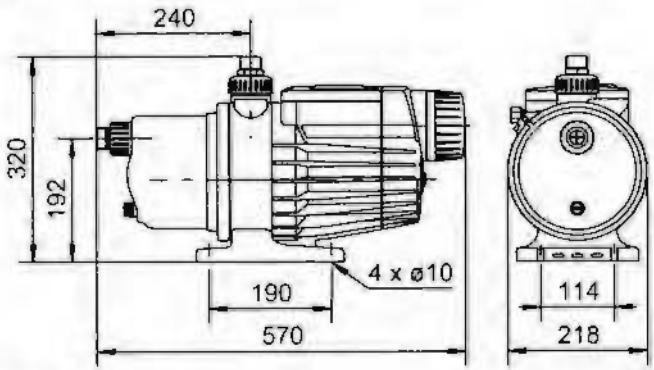
9. Fault finding chart

Fault	Cause	Remedy
1. The pump does not start.	a) Insufficient water.	Check the water supply/suction pipe.
	b) Overheating due to excessive liquid temperature (above +35°C).	Supply cold liquid to the pump.
	c) Overheating due to seized-up/ choked-up pump.	Contact your pump supplier.
	d) Too low or too high supply voltage.	Check the supply voltage and correct the fault, if possible.
	e) No electricity supply.	Connect the electricity supply.
	f) No water consumption.	Open a tap. Check that the height between the top point of the discharge pipe and the pump does not exceed 15 metres.
	g) The pump is in alarm condition.	Reset the pump by means of the on/off button. See point 2 in the table in section *4.1 Control panel*.
2. The pump does not stop.	a) The existing pipework is leaking or defective.	Repair the pipework.
	b) The non-return valve is blocked or missing.	Clean the valve or fit a new non-return valve.
3. The pump cuts out during operation.	a) Dry running.	Check the water supply/suction pipe.
	b) Overheating due to excessive liquid temperature (above +35°C).	Supply cold liquid to the pump.
	c) Overheating caused by: - high ambient temperature (> 45°C), - overloaded motor or - seized-up motor/pump.	Contact your pump supplier.
	d) Too low supply voltage.	Check the supply voltage and correct the fault, if possible.
4. The pump cuts out during operation. The "Alarm" indicator light flashes.	a) Frequent starts/stops caused by - leakage in suction pipe, - dripping tap or - running toilet.	Check the water supply/suction pipe.
5. The pump starts and stops too frequently.	a) Leakage in suction pipe or air in the water.	Check the water supply/suction pipe.
	b) Too low or too high pressure in pressure tank.	Check pressure in pressure tank, see section *3.1 Operating conditions*.
6. The pump gives electric shocks.	a) Defective earth connection.	Connect the earth connection to the pump in accordance with local regulations.
7. The pump starts when no water is consumed.	a) Defective non-return valve or the existing pipework is leaking or defective.	Clean the valve or fit a new non-return valve.

If the pump does not start when the fault has been corrected, contact your pump supplier or Grundfos for further information.

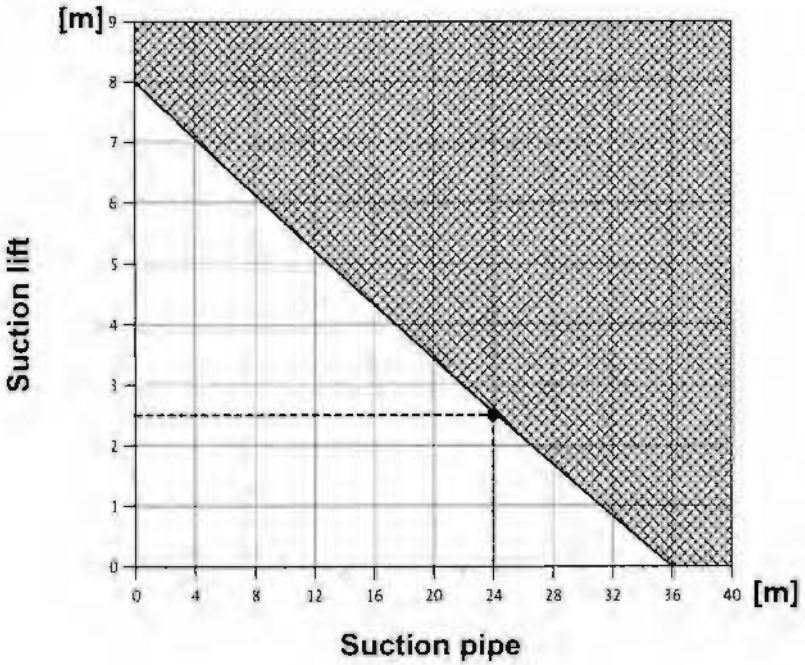
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Dimensions



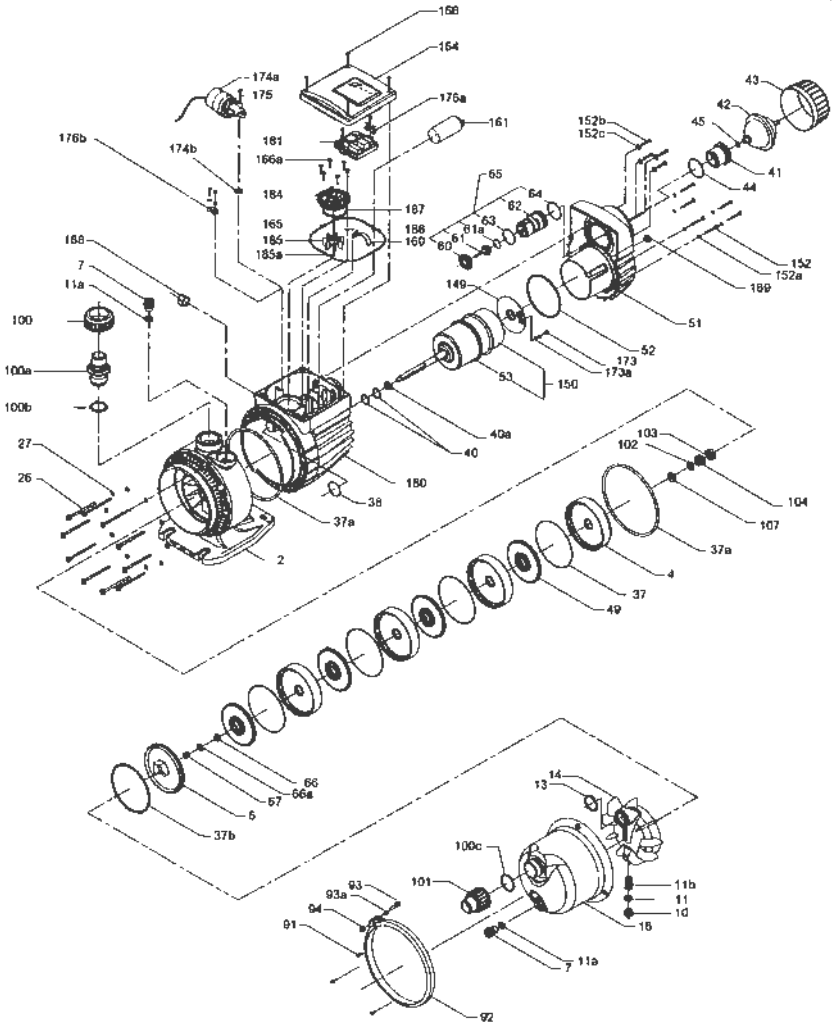
TM02 7856 3300

Suction lift/suction pipe



TM02 7856 4303

Exploded view



TM02 8410 5103

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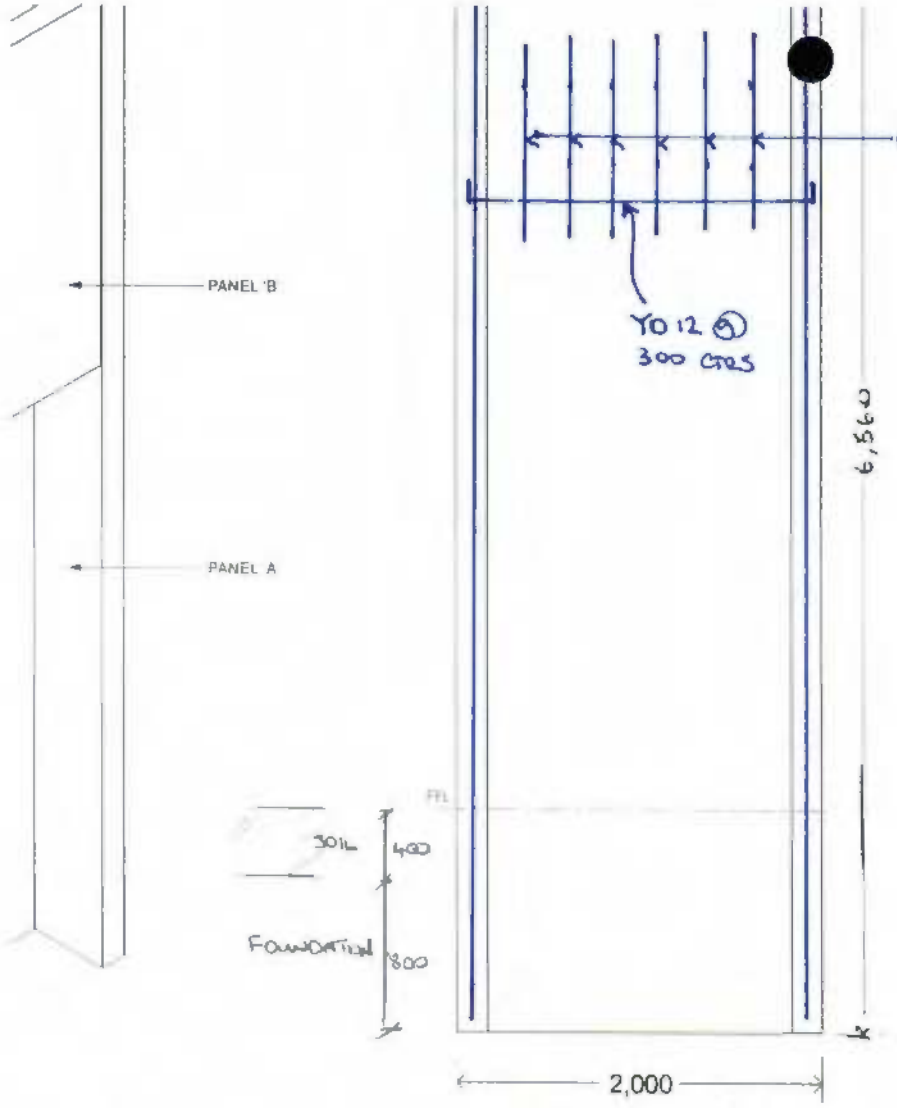
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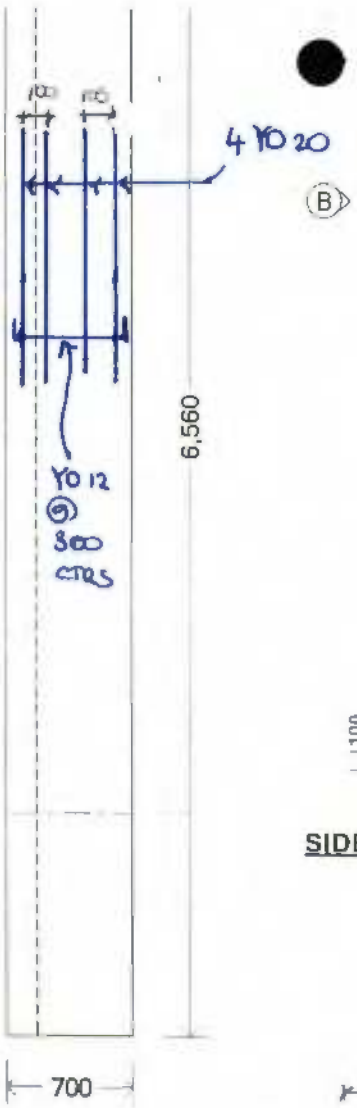
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Repl. V7164915 0104 V7164916 0104	

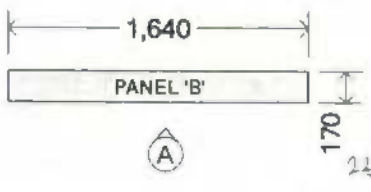
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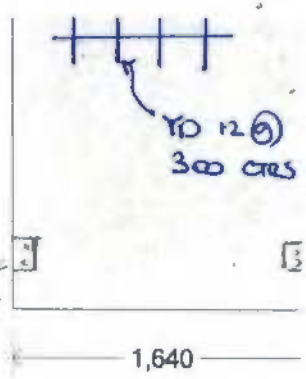
VIEW A - PANEL 'A'



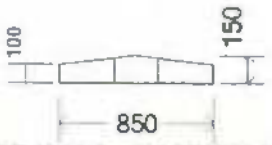
VIEW B - PANEL 'A'



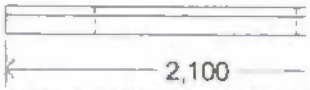
PLAN VIEW PANEL 'B'



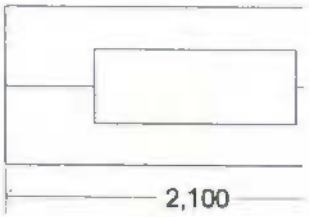
VIEW A - PANEL 'B'



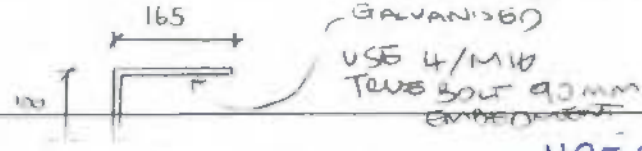
SIDE VIEW - CHIMNEY CAP



FRONT VIEW - CHIMNE



PLAN VIEW - CHIMNEY

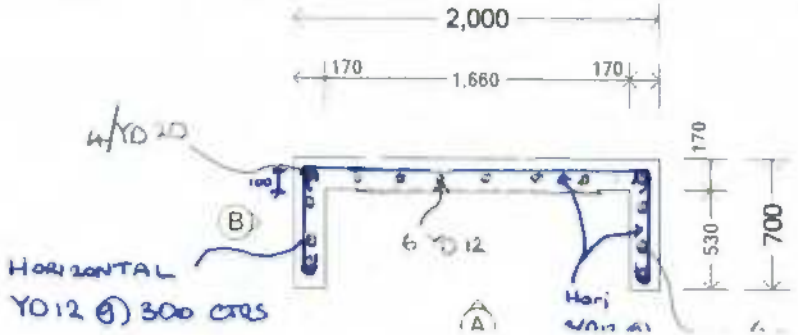


CHIMNEY

65mm

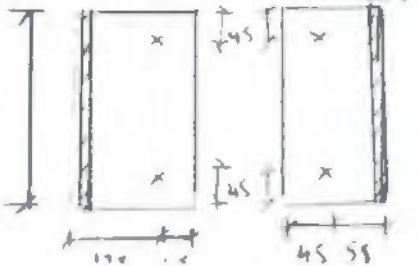
ETS

ETS



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01 AUG 2014
CONSENT

PLAN VIEW BRACKET



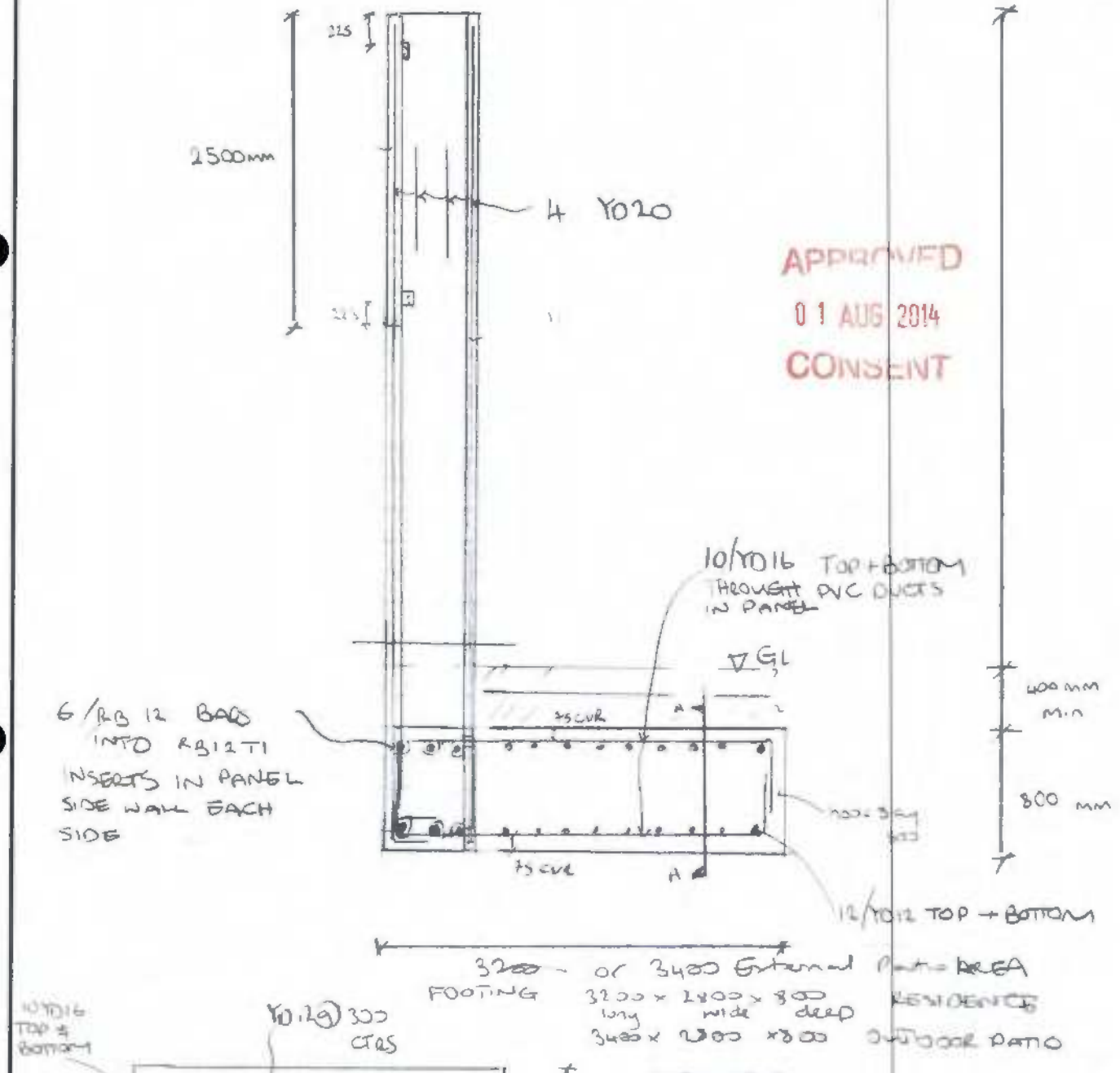
113573
Chimney Panel

P 06 356 7000 E info@koa.co

CLIENT	LAWRY RESIDENCE				
SUBJECT	1097 QUEEN STREET EAST / LEVIN				
FILE No. 113573	DATE JULY 14	PAGE	OF	BY CD	CKD

KOA

- PC CHIMNEY PANELS 50MPa CONCRETE STRENGTH
- FOUNDATION 30MPa CONCRETE STRENGTH



113573
LAWRY RESIDENCE
1097 QUEEN ST EAST/LEVIN

FOUNDATION

SK29

Kevin O'Connor & Associates Ltd

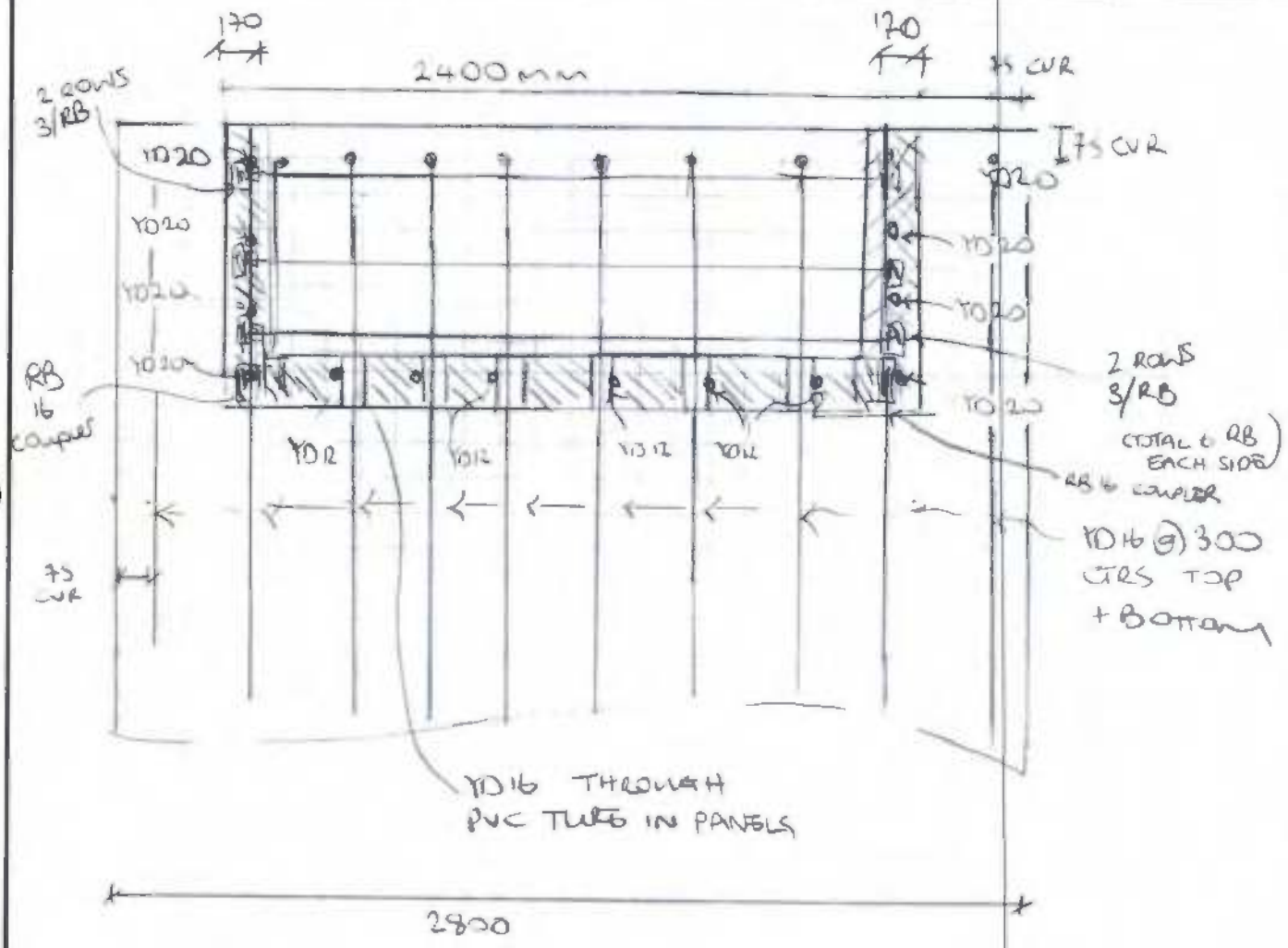
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SUBJECT	1097 QUEEN STREET EAST / LEVIN				
FILE No. 113573	DATE 7/04/14	PAGE —	OF	BY CJ	CKD

KOA



PLAN VIEW SECTION B–B

PATIO

EXTERNAL CHIMNEY FOOTING SIZE

3400 x 2800 x 800 OK

30 MPa FOUNDATION CONCRETE STRENGTH

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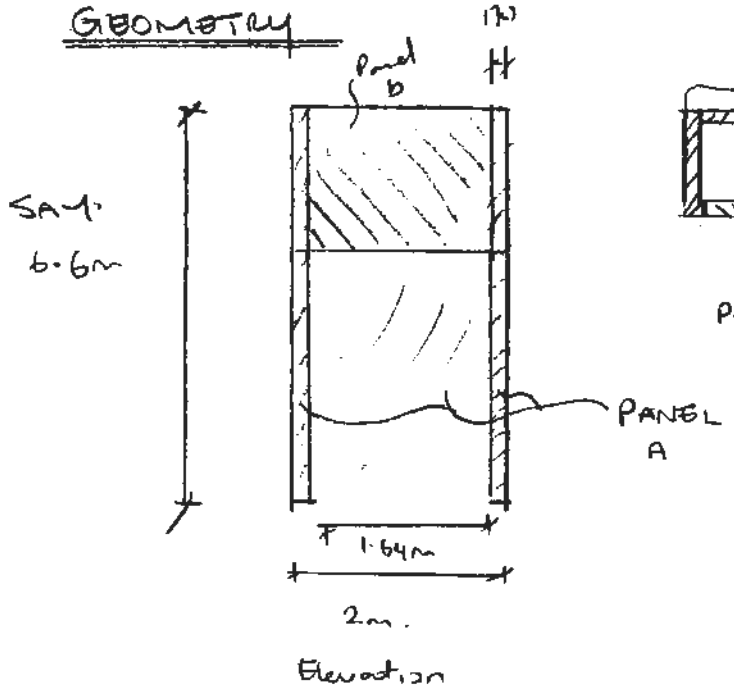
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SUBJECT	1097 QUEEN STREET EAST / LEVIN				
FILE No. 113573	DATE JULY 14	PAGE G1 OF	BY CLR	CKD	

KOA

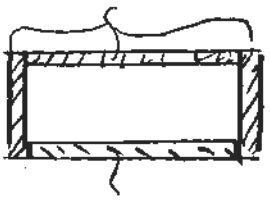
CHIMNEY DESIGN

NOTE - DESIGN CHIMNEY FOUNDATION TO BE INDEPENDANT OF BUILDING WITH CHIMNEY CANTILEVERING FROM FOUNDATION

GEOMETRY

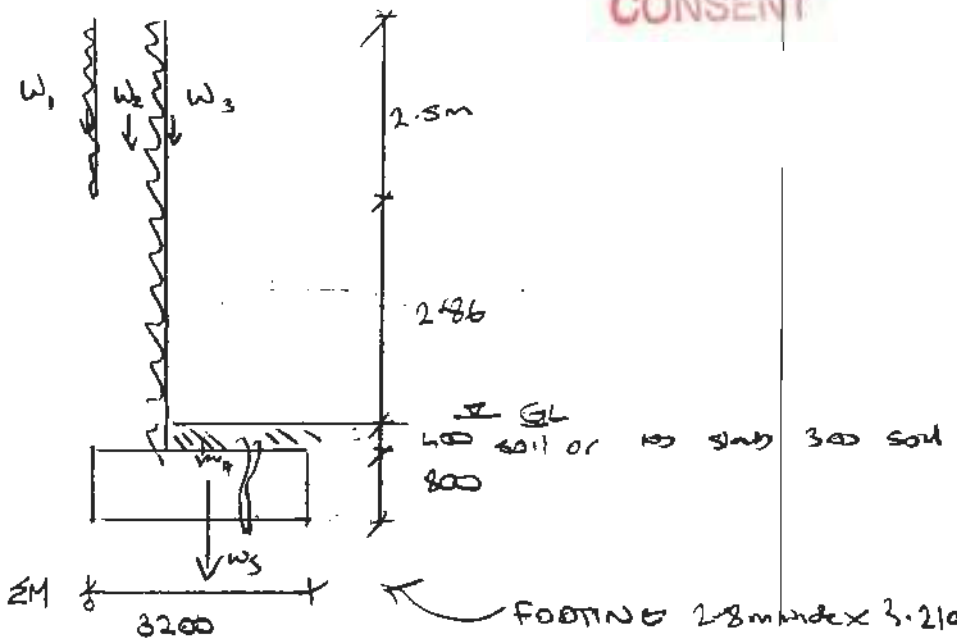


Elevation



PLAN VIEW

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FOOTING 2.8m wide x 3.2long x 0.8 deep

CLIENT LAWRY RESIDENCE

SUBJECT 1097 QUEEN STREET EAST LEVIN

FILE No. 113573 | DATE JULY 14 | PAGE G2 OF | BY CLB | CKD

KOA

CHIMNEY DESIGN
SEISMIC LATERAL LOADS ON CHIMNEY

WEIGHT (kN)

Panel B front = W_1 $24 \times 0.17 \times 1.64 \times 2.5 = 17$ kN

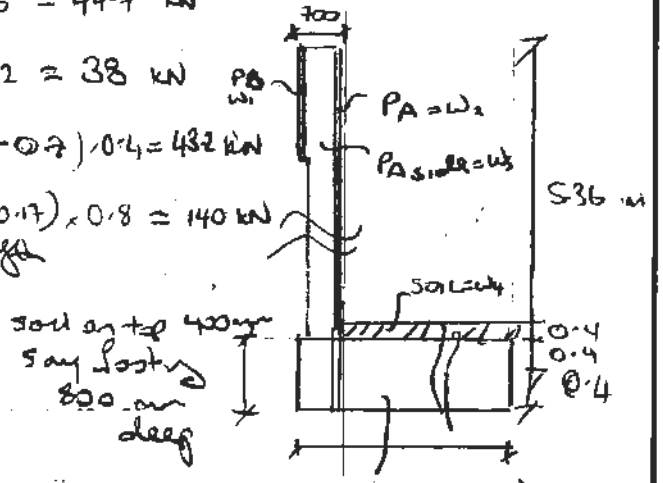
Panel A back = W_2 $24 \times 0.17 \times 1.66 \times 6.6 = 44.7$ kN

Panel A side = W_3 $24 \times 0.17 \times 0.7 \times 6.6 \times 2 = 38$ kN

Soil = W_4 $18 \times \underset{\text{wide}}{2.4} \times (3.2 - 0.7) \times 0.4 = 43.2$ kN

Footing = W_5 $24 \times 24 \times \underset{\text{length}}{(3.2 - 0.17)} \times 0.8 = 140$ kN

$\Sigma W = 283$ kN



Overturning Moment

Panel A

$24 \times [0.17 \times 1.66 + 0.17 \times 0.7 \times 2] = 12.5$ kN/m

Panel B

$24 \times [0.17 \times 1.64] = 6.7$ kN/m

NOTE

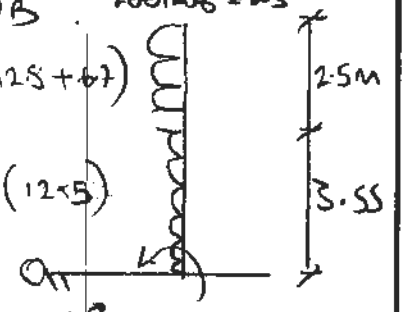
$\mu = 1.25 \Rightarrow C_d(T) = 0.97$

Simplified

PA + PB

$0.97(12.5 + 6.7)$

$0.97(12.5)$



$M^* = 301$ kNm excl fireboxes

$V^* = 90$ kN

Check Right to Left

$W_1 = 17$	$L_1 = .170/2$	$= 0.085$	$M_1 =$	1.45 kNm
$W_2 = 45$	$L_2 =$	0.615	M_2	28.0 kNm
$W_3 = 38$	$L_3 =$	$= 0.35$	$M_3 =$	13.3 kNm
$W_4 = 43$	$L_4 = 0.7 + \frac{2.5}{2}$	$= 1.95$	$M_4 =$	84.0
$W_5 = 140$	$L_5 = \frac{3.2}{2}$	$= 1.6$	$M_5 =$	224.0 kNm

RESTORING MOMENT (RM) 350.75 kNm

$0.9\,RM = 0.9\,(350.8) = 315 > M^*$ Stability check OK

SAY FIRE PLACE UNIT 1.5 kN acting $\frac{3.55}{2}$

$W_{\text{FIRE BOX}} = 1.5$ $L_{\text{Fire box}} = 0.35$ $M = 0.53$ kNm

$F_{\text{on fire}} = 1.5 \times \frac{3.55}{2} = 2.66$ kNm $\Rightarrow M^*_{OM} = 301 + 2.66 = 303.6$ kNm

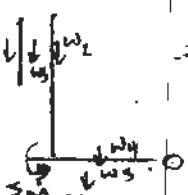
M^* 304 kNm

stability check OK incl fireboxes

CLIENT	LAWRY RESIDENCE				
SUBJECT	10 93 QUEEN STREET EAST KEVIN				
FILE No. 113573	DATE Jun 14	PAGE G3	OF	BY CHS	CKD

KOA

CHIMNEY DESIGN CONTINUED



Check L-R

W_1 =	17	$L_1 = 3.2 - 0.085 = 3.115$ m	M_1 =	53	kNm
W_2 =	45	L_2 = " = 2.985	M_2' =	116	kNm
W_3 =	38	$L_3 = 3.2 - 0.35 = 2.85$ m	M_3 =	108	kNm
W_4 =	43	$L_4 = 2.3/2 = 1.15$ m	M_4 =	49	kNm
W_5 =	140	$L_5 = 1.6$	M_5 =	224	kNm
	RESTORING MOMENT RM			550	kNm

$0.9 \times 550 = 495$ kNm > OM* OK
Stability check OK.

By inspection fire box 1.5W OK

Check Ground Pressures

q safe = 100 kPa ASSUMED GOOD GROUND

q ult = $100 \times 3 = 300$ kPa

ϕ q ult = $100 \times 3 \times 0.8 = 240$ kPa
ϕ = seismic

L-R

$l_{cc} = \frac{\text{Net Moment}}{\Sigma V \times l} = \frac{550 - 301}{(283 \times 2.4)} = 0.366$ kPa =

R-L
Ecc 0.47
L/6 = 0.533m
D' = 3.37
P max 170kPa

$\frac{L}{6} = \frac{3.2}{6} = 0.53$

$D' = 3\left[\left(\frac{3.2}{2}\right) - 0.366\right] = 3.69$

APPROVED
01 AUG 2014
CONSENT

ok
fire box
by inspector
OK.

ULS $P_{max} = \left(\frac{2 \times 283}{3.69}\right) = 154$ kPa OK < ϕ q ult

SLS

$\frac{G}{2\pi \times 3.2} = 37$ kPa < q safe OK. L-R

By inspection fire box not OK $P_{max} = \frac{2 \times 283}{3.57} = 160$ kPa OK

FOUNDATION USE 2.8 kPa wide 3.2m long x 0.8m deep

NOTE FOOTING below 400 mm of soil or 100 slab 300 soil

CLIENT: LA WAY RESIDENCE

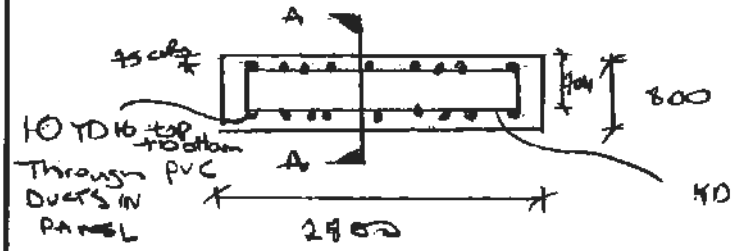
SUBJECT: 1093 QUEEN STREET EAST / LEVIN

FILE No. 113573 | DATE July 14 | PAGE 6.4 OF | BY CAB | CKD

KOA

Chimney

DESIGN ^ FOUNDATION



- SAY 25 MPa
- 75 mm COVER FOUNDATION

A_s mm $= \frac{\sqrt{f'c}}{4fy} bd = 5600$ mm^2.

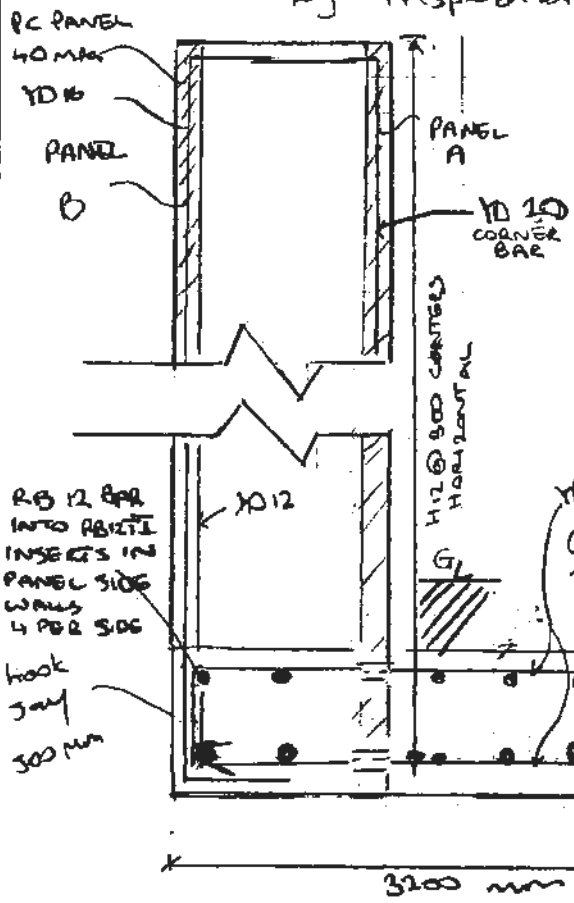
A_s provide 4021 mm^2 OK $\phi M_n > 1\frac{1}{3} M^*$ OK

$\phi M_n = 534$ kN $> 1\frac{1}{3} M^*$ OK. refer G5

$\phi V \Rightarrow \phi(V_c + V_s)$

$V_c = V_c \times A_{cv} = \sqrt{f'c} \times A_c = 9600$ kN

by inspection $V^* < \phi V_n$. OK both directions



SECTION A-A

YD 16 lap length

hook $Ldh = 0.24 \alpha_1 d_b \alpha_2 \frac{f_{yd}}{\sqrt{f'c}} < \frac{USE}{500 mm}$ OK

straight USE 800 mm - mm

YD 12 lap length

hook USE 350 mm

straight 600 mm -

GS

Chimney foundation

Moment Capacity

Beam	Depth H mm	800		0.800
	Width B mm	2400		2.400
	As (bottom face)	1809.6	mm2	0.001809 m2
	F'c	25	MPa	
	Fy	500	MPa	
	d mm	704	mm	
	Phi (Bending)	0.85		

2800

9 N16 Top + bottom

a = (As.Fy)/(0.85F'c.B) =	17.74	mm
jd =	695.13	mm

Say 10 OK.

Phi M = phi.As.Fy.jd = 534.44 kN.m > M* OK

phi T = phi.Fy.As = 768.8 kN/m

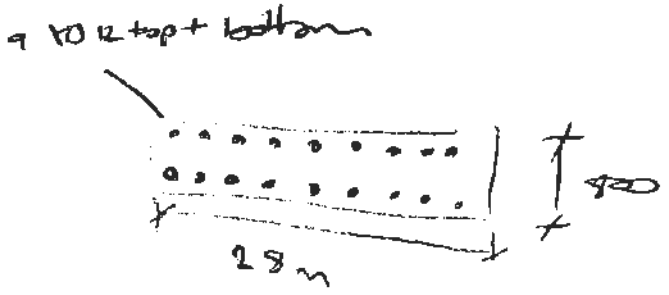
I effective to NZS 3101:1982

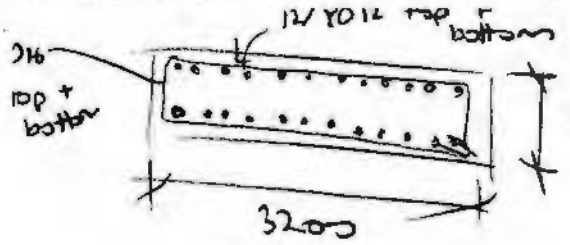
Ma (G & .7Qu) 412 kN.m

	I gross	**0.1024 m4**	**1.02E-01 m4**
	fr	3.00 MPa	
	M cr	**768.0 kN.m**	
Section	a	18 mm	0.018 m
	x top	21 mm	0.021 m
	x bot	683 mm	0.683 m
		12 mm	0.012 m
	A c'	15075 mm2	0.015 m2
	I cracked	**0.0070 m4**	**7.04E-03 m4**
	I e	**0.1024 m4**	**1.02E-01 m4**

100% I gross

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa





G5a

RC BEAM Moment Capacity

Beam	Depth H mm	800		0.800
	Width B mm	3200		3.200
	As (bottom face)	1356.0	mm2	0.001356 m2
	F'c	25	MPa	
	Fy	500	MPa	
	d mm	704	mm	
	Phi (Bending)	0.85		

12 Y012 top + bottom ok

a = (As.Fy)/(0.85F'c.B) =	9.97	mm
jd =	699.01	mm
Phi M = phi.As.Fy.jd =	**402.84**	**kN.m**
phi T = phi.Fy.As =	576.3	kN/m

$\phi M_n > 1.3 M^*$ ok

I effective to NZS 3101:1982

Ma (G & .7Qu) 12 **kN.m**

As provided ok

	I gross	**0.1365 m4**	**1.37E-01 m4**
	fr	3.00 MPa	
	M cr	**1024.0 kN.m**	
Section	a	10 mm	0.010 m
	x top	12 mm	0.012 m
	x bot	692 mm	0.692 m
		7 mm	0.007 m
	A c'	11300 mm2	0.011 m2
	I cracked	**0.0054 m4**	**5.42E-03 m4**
	I e	**0.1365 m4**	**1.37E-01 m4**
		100% I gross	

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

CLIENT LAWRY RESIDENCE

SUBJECT 1097 QUEEN STREET EAST / LEVIN

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KOA

DESIGN CHIMNEY PC Panels

DESIGN SIDE PANELS — (Panel A)

SEISMIC

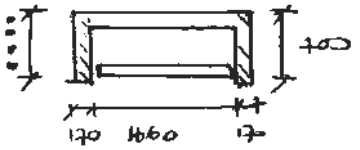
Panel A back = 12.5 × 0.97 × 6.06²/2 (top & bottom) = 223 kNm

Panel B = (6.7 × 2.5 × 0.97) × (2.5/2 + 3.5) = 78.8 kNm

In the Across 801.8 kNm

SEISMIC RESTRAINT PROVIDED BY TWO RETURN WALLS

d = 605
b = 170 mm
f'c = 40MPa
fy = 500MPa
ϕ = 0.85



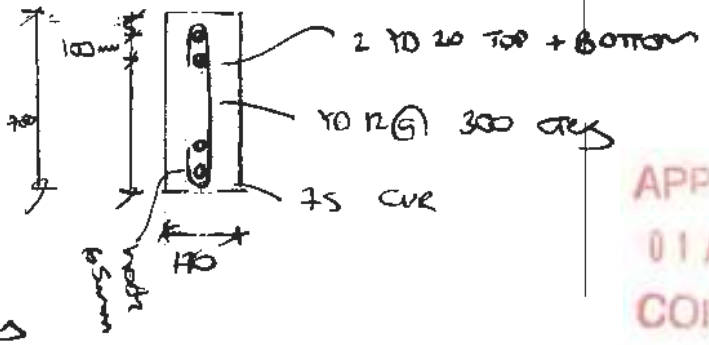


f'c = 40MPa
fy = 500MPa
a = 54.8mm

$$\text{min } A_s = \frac{\sqrt{f'_c}}{4 f_y} bd = 376 \text{ mm}^2 < A_s \text{ provided}$$

301/2 = 150 kNm per wall USE

2 HD 20



ϕMn > M* OK

SHEAR IN SIDE WALLS

V* = (12.5 × 6.06) + (6.7 × 2.5) × 0.97 = 90 kN

$$\phi V_n = \phi(V_c + V_s)$$

k = 1

$V_c = k \times \sqrt{f'_c} \times A_c = 150.5$ kN

$V_s = A_v f_y d (d/s) = 131.3$ kN

USE HD (2 @) 300
$A_{sv} = 226 \text{ mm}^2$

$\phi V_n > V^*$ OK

$\therefore A_{sv\,min} < A_{sv\,provided}$ OK = 113 mm²

APPROVED
01 AUG 2014
CONSENT

G6a

RC BEAM Moment Capacity

Beam	Depth H mm	700		0.700
	Width B mm	170		0.170
	As (bottom face)	628.0	mm2	0.000628 m2
	F'c	40	MPa	
	Fy	500	MPa	
	d mm	605	mm	
	Phi (Bending)	0.85		

a = (As.Fy)/(0.85F'c.B) = 54.33 mm

jd = 577.84 mm

Phi M = phi.As.Fy.jd = 154.22 kN.m

phi T = phi.Fy.As = 266.9 kN/m

I effective to NZS 3101:1982

Ma (G & .7Qu) 112 kN.m

	I gross	**0.0049 m4**	**4.86E-03 m4**
	fr	3.79 MPa	
	M cr	**52.7 kN.m**	
Section	a	54 mm	0.054 m
	x top	64 mm	0.064 m
	x bot	541 mm	0.541 m
		37 mm	0.037 m
	A c'	5233 mm2	0.005 m2
	I cracked	**0.0015 m4**	**1.55E-03 m4**
	I e	**0.0049 m4**	**4.86E-03 m4**
		100% I gross	

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

CLIENT LAWEY RESIDENCE

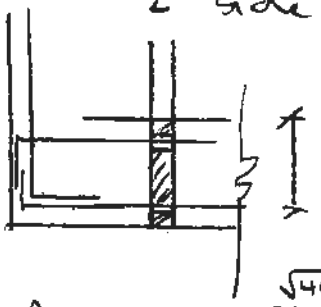
SUBJECT 1097 QUEEN STREET EAST / KEVIN

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KOA

DESIGN SIDE WALL REINF / FOOTING

$M^* = \frac{301}{2}$ side walls = 150 kNm

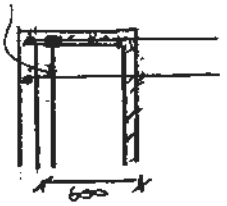


b = 125 f_{sy} = 500

$A_{s\,req} = \frac{\sqrt{40}}{5 \times 500 \times 170 \times 700} = 376\ mm^2$

1 YD 20 = 314 mm^2
1 YD 16 = 201 mm^2

CAN ONLY FIT 1 H20 IN SIDE WALL SO MUST TRANSFER LOAD TO NEXT FOOTING BAR VIA SHEAR FRICTION OF TRANSVERSE BARS



SHEAR IN TRANSVERSE BAR

$V = \frac{150}{0.6}\ kNm = 250\ kN = 125\ kN$ / 2

$A_{vf} = \frac{V^*}{\phi f_{sy} \mu} = \frac{125 \times 10^3}{0.75 \times 500 \times 1} = 333 mm^2$

$\mu = 1$

4 HD12 = 452 mm^2 or 2 YD 16 = 402 mm^2

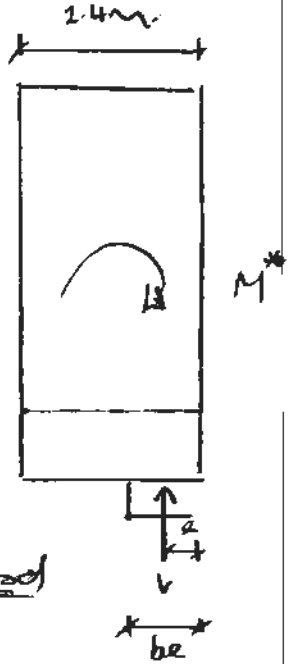
CLIENT LAWRY RESIDENCE

SUBJECT 1097 QUEEN STREET EAST / LEVIN

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KOA

Check RESTORING MOMENT IN OTHER DIRECTION



$b_e = \frac{283}{240 \times 3.2m} = 0.368$

$\phi q_{ult} = 240$ kPa

$\ell = 0.184$

$M_{res} = 0.9\left(283\ kN \times \left(\frac{2.4}{2} - 0.184\right)\right)$

$= 259$ kN m, No good

Try 2.8 m wide include 1m bay.

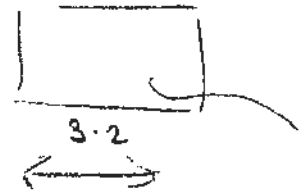
$\Sigma V = 143 + \underset{SW}{163} + \underset{\text{Fill \& slab}}{19} = 309.5$ kN $\quad \ell = 0.2$

$M_{res} = 0.9\left(309.5 \times \left(\frac{2.8}{2} - 0.19\right)\right) = 332$ OK

SLAB / FLOOR ABOVE.

USE 2.8 wide x 3.2 long x 0.8 deep.

Across



by 0.8 m deep

Along

CLIENT LAWRY RESIDENCE

SUBJECT 1097 QUEEN STREET EAST / LEVIN

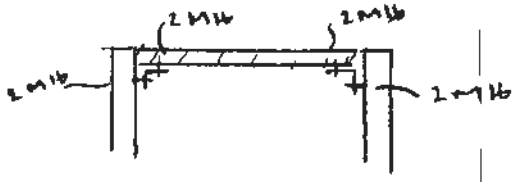
FILE No. 113573 | DATE JULY 16 | PAGE 9 OF | BY CLD | CKD

KOA

PANEL B (SUSPENDED) CONNECTION

Say 1.64 (say 1.7) x 2.5m. Panel.

Design connection for seismic force load & vertical loads



SEISMIC $\mu = 1.25$ $C(d) = 0.97$

$F_H = 0.97 \times 0.17 \times 1.7 \times 2.5\,m \times 24\,kN/m^3 = 17\,kN \rightarrow$

$V^* = \quad 1 \quad = 17\,kN \downarrow$

SAY 4 - BRACKETS WITH 2 - TRUBOLTS TO PANEL

TOTAL 8 BOLTS typ M16 trubolt or similar

TENSILE M16 trubolt x8

$\phi N_{uc} = (24 \times 1 \times 1 \times 0.53) 8 \text{ bolts} = 105\,N > 17\,kN$ OK

(k_{nc} (ramset table 3) (40 mpa) k_{1e} say > 125 edge distance)

SHEAR M16 trubolt x8 90mm Embedment

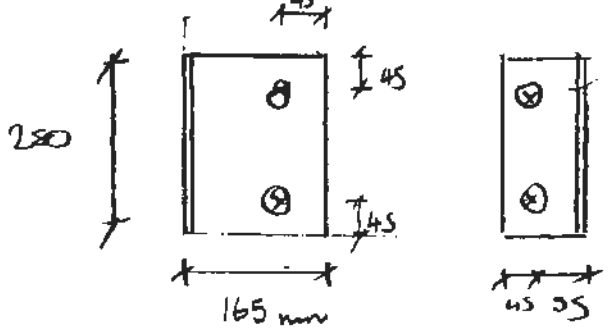
(say edge of sheet ≥ 250)

CONCRETE $\phi V_{uc} = 65.5 \times 1.12 \times 2 \times 1 \times 1 \times 8 = 1173\,kN$ OK.

(k_{vc} (ramset table 7))

STEEL $V_{us} = 8 \times 288 = 230\,kN > V^*$ OK

(ramset table 5)



MS 10mm bracket

USE M16 TRUE BOLT GALVANISED

TRUBOLT 4/M16 90mm Embedment + BRACKETS

PANEL B
2.5 m long
USE 4 brackets
4.8 m long
USE 8 brackets

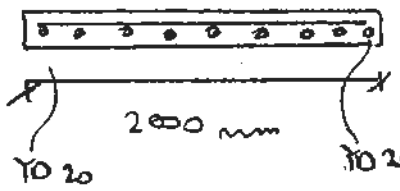
CLIENT	LAWRY RESIDENCE			
SUBJECT	1097 QUEEN STREET EAST (LEVIN			
FILE No. 113573	DATE July 14	PAGE 610 OF	BY GLB	CKD

KOA

DESIGN CHIMNEY PC PANEL CONTINUED

PANEL A — SEISMIC RESTRAINT ALONG

$M^* = 301$ kNm



$\ddagger$ 190 mm.

$A_{s\,min} = 1095$ mm

$A_{s\,provide} = 1306$ mm ✓

$\phi M_n = 524$ kNm $> M^*$
of Fig 11.

check shear

$\phi V_n = \phi(V_c + V_s)$

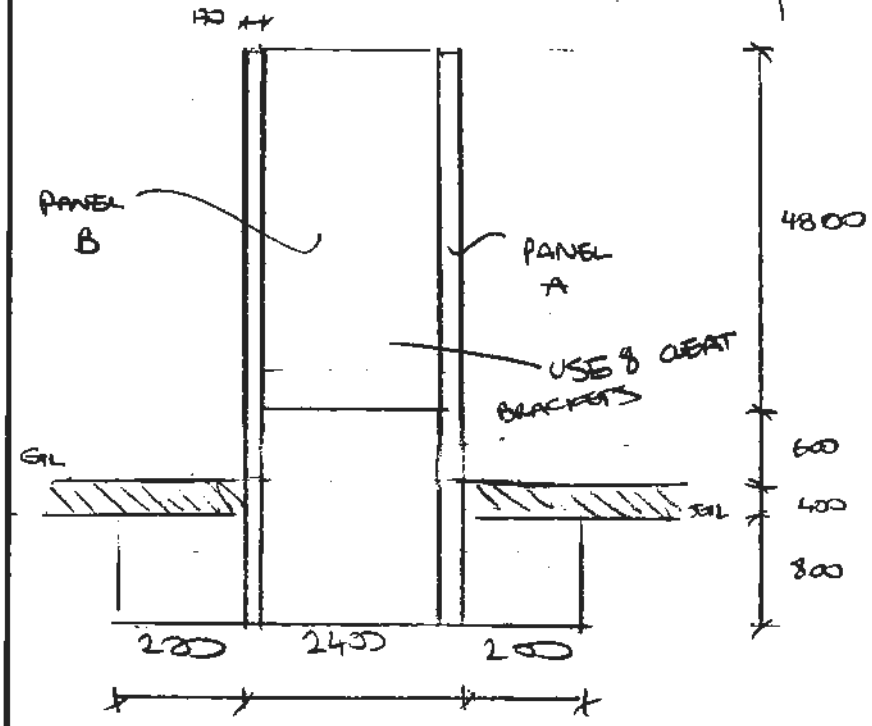
horizontal use R10 @ 300

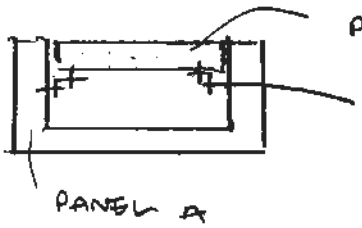
BY INSPECTION $\phi V_n > V^*$ ok

CLIENT	LAWRY RESIDENCE			
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KOA

Check outside chimney / Patio Area





EACH BRACKETS USE 4/ M16 trubolt 90 mm Embedment

4.8 m long USE 8 brackets

$W_1 = 24 \times 0.17 \times 1.64 \times 4.8 = 32$ kN

$W_2 = 44.7$ kN

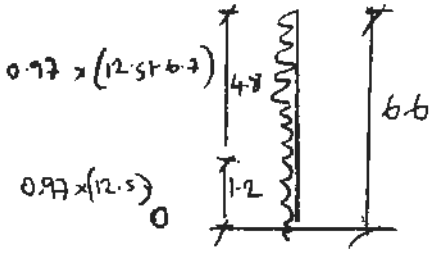
$W_2 = 38$ kN

$W_4 = 43.2$ kN

W_3 TRY $3.4 \times 2.8 = 183$ kN $\Rightarrow \Sigma V_{ot} = 341$

Panel A: = 12.5kN/m

Panel B = 6.7 kN/m



$M^A = 331$ kNm

$V^A = 101$ kN

KOA

neg page G

M^* < restoring moment ok

L-R = 0.9 RM = 378 kN m > 331 kN m ok

R-L = 0.9 RM = 599 kN m > 331 kN m ok

check ground pressure

q safe = 100 kPa

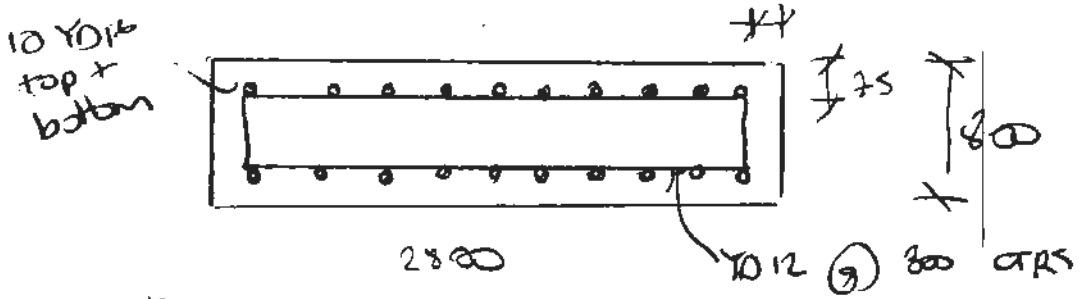
q ult = 333 kPa ϕ q ult 240 kPa

$e_{cc} = \frac{\text{net moment}}{\Sigma \text{vert} \times l} = \frac{269}{341 \times 2.8} = 0.3$

$y_G = 0.567$ $0' = 4.2$ m

$p_{max} = 163$ kPa < 240 kPa ok

USE FOOTING 2800 x 3400 x 800 deep



$M^* = 331$ < ϕM_n 574 kN m ok

As provided ok greater than required 1/3 M^*

$V^* > \phi V_n$ ok

GT 13

RM		la			
w1=	32		0.085	2.7	
w2=	45		0.615	27.7	
w3=	38		0.35	13.3	For M* left to right
w4=	43		1.95	83.9	
w5=	183		1.6	292.8	
W=	341	RM=		420.3	kNm
		0.9RM=		378.3	kNm Stability check ok

RM		la			
w1=	32		3.115	99.7	
w2=	45		2.585	116.3	
w3=	38		2.85	108.3	For M* right to left
w4=	43		1.15	49.5	
w5=	183		1.6	292.8	
W=	341	RM=		666.6	kNm
		0.9RM=		599.9	kNm Stability check ok

Check ground pressures

qsafe=	100	kPa	gravels
qult=	300	kPa	
$\Phi_{qult=}$	240	kPa	

For M* left to right

ecc=	0.3	m	
L/6=	0.566667	m	outside mid third
D'=	4.2	m	
pmax=	162.381	kPa	OK

APPROVED
01 AUG 2014
CONSENT

G14

Foundation

RC BEAM Moment Capacity

Beam	Depth H mm	[redacted]		0.800
	Width B mm			2.800
	As (bottom face)		mm2	0.00201 m2
	F'c		MPa	
	Fy		MPa	
	d mm		mm	
	Phi (Bending)			

a = (As.Fy)/(0.85F'c.B) = 16.89 mm

jd = 695.55 mm

Phi M = phi.As.Fy.jd = 594.18 kN.m

phi T = phi.Fy.As = 854.3 kN/m

$M^* > \phi M_n$ OK

I effective to NZS 3101:1982

Ma (G & .7Qu) [redacted] **kN.m**

	I gross	**0.1195 m4**	**1.19E-01 m4**
	fr	3.00 MPa	
	M cr	**896.0 kN.m**	
Section	a	17 mm	0.017 m
	x top	20 mm	0.020 m
	x bot	684 mm	0.684 m
		11 mm	0.011 m
	A c'	16750 mm2	0.017 m2
	I cracked	**0.0078 m4**	**7.85E-03 m4**
	I e	**0.1195 m4**	**1.19E-01 m4**
		100% I gross	

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

MiTek New Zealand Limited

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14 Pilkington Way, Wigram 8042
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Fax: 03 348 0314

www.miteknz.co.nz

PRODUCER STATEMENT for MiTek 20/20® TRUSS DESIGN - Version 4.6

ISSUED BY: **MiTek New Zealand Limited**

TO: **CARTERS Manufacturing**

IN RESPECT OF: **MiTek® Truss Designs**

This producer statement covers the MiTek 20/20® truss design and the structural performance of the GANG-NAIL® connector plate for the job reference **UM11718** and may be used by a Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

The MiTek 20/20® truss design program has been developed by MiTek New Zealand Limited for the design of MiTek® timber roof, floor and attic trusses in New Zealand. The truss designs computed by MiTek 20/20 ® are prepared using sound and widely accepted engineering principles, and in accordance with compliance documents of the New Zealand Building Code and Verification Method B1/VM1; and internationally accepted standard ANSI/TPI 1 - 2002 as an alternative solution to satisfy the requirements of Clause B1 of the New Zealand Building Code.

On behalf of MiTek New Zealand Limited, and subject to:

i) All proprietary products meeting their performance specification requirements
ii) The provision of adequate roof bracing and overall building stability
iii) Correct selection and placement of GANG-NAIL connector plates
iv) Correct input of Truss Design Data as shown in the Fabricator Design Statement for this job
v) The design being undertaken by the accredited fabricator under the terms of the software licence

I believe on reasonable grounds that the trusses, if constructed in accordance with the MiTek 20/20® truss design and shop drawings, will comply with the relevant provisions of the New Zealand Building Code.

MiTek New Zealand Limited holds a current policy of Professional Indemnity Insurance no less than $500,000.

On behalf of MiTek New Zealand Limited, **Date: Monday, 7 July 2014**

In Ling Ng, BE (Hons), CPEng, IntPE, MIPENZ (ID: 146585)
TECHNICAL SERVICES MANAGER, MiTek New Zealand Limited

APPROVED
01 AUG 2014
CONSENT

PDF created with pdfFactory trial version www.pdffactory.com

MITEK FABRICATOR DESIGN STATEMENT

This statement is issued by MiTek accredited fabricator **CARTERS Manufacturing**, being licensed to use the MiTek 20/20® software, to the client listed above and may be used by the Building Consent Authority to assist in determining compliance with the New Zealand Building Code.

MiTek 20/20® TRUSS DESIGN DATA

The MiTek 20/20® computer design for this job is based on the following design parameters entered into the program. The Fabricator shall ensure that these job details are current and relevant to the project for the design of the MiTek® trusses.

Job Details

		Importance Level :	2	Design Working Life :	50 years
Roof Truss					
Timber Group:	MSG8 DDP H1.2	Pitch:	25.000 deg	Nominal Overhang:	600 mm
Roof		**Ceiling**		**Wind**	
Material:	Corona Shake	Material:	Standard	Area:	High (44.0 m/s)
Dead Load:	0.300 kPa	Dead Load:	0.200 kPa	Pressure Coeff:	Cpa = varies; Cpi = -0.30, 0.20
Restraints:	400 mm centres	Restraints:	600 mm centres		
Live Load:	Qur = 0.250 kPa	Live Load:	Qc = 1.400 kN		
	Qc = 1.100 kN	**Occupancy Live Load**			
		Distributed:	Quf = 0.500 kPa		
		Concentrated:	Qcf = 1.400 kN		
Attic Floor		**Attic Room Ceiling**		**Attic Wall**	
Material:	20mm Particle Board	Material:	Gib Board 12mm	Material:	Gib Board
Dead Load:	0.200 kPa	Dead Load:	0.200 kPa	Dead Load:	0.300 kPa
Restraints:	Continuous	Restraints:	600 mm centres	Restraints:	Continuous

The timber for these MiTek® trusses shall be treated to the requirements of NZS 3602:2003 and shall be graded to the requirements of NZS 3603:1993. Unless otherwise noted, this design assumes that the steel fixings and timber connectors proposed are located in a **"closed environment"**, as defined by NZS3604:2011 Section 4.

MiTek® Truss List

Legend: * = detail only, ? = input only, ~~Tnx~~ = failed design, Ø = non certified, Unmarked trusses = designed successfully, LB = lateral bracing required GB = gable brace required

Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)	Truss	Qty	Span (mm)	Pitch (deg)	Spacing (mm)
AJ1	12	855	0.000	900	T9	1	5518	25.000	900	S3A	1	3400	25.000	900
AJ2	6	2630	0.000	900	T10	1	7286	25.000	900	T2	1	3555	25.000	900
CT1	3	7680	25.000	710	T11	1	7318	25.000	900	T6A	1	7915	25.000	900
CT2	3	9780	25.000	900	T14	3	3335	25.000	900	T6B	1	7915	25.000	900
CT3	3	5390	25.000	900	T15	1	3555	25.000	900	T6C	1	7915	25.000	900
CT4	1	5290	25.000	900	T16	1	6418	25.000	900	T11A	1	7318	25.000	900
EN1	1	5240	25.000	900	T17	9	9280	25.000	900	T15A	1	3555	25.000	900
EN2	1	6075	25.000	900	T19	2	6075	25.000	900	T17B	1	9280	25.000	900
ET1	1	6909	25.000	900	T21	1	9180	25.000	900	T17C	1	9280	25.000	900
*HB1	4	6391	18.249	900	T22	5	6900	25.000	900	T22A	1	6900	25.000	900
*HB2	3	1187	18.248	900	T23	1	3090	25.000	900	T22B	3	6900	25.000	900
*HB3	1	5542	18.249	900	V1	1	2015	25.000	900	T23A	3	3090	25.000	900
*HB4	1	7356	18.249	900	V2	1	1115	25.000	900	J2	1	2135	25.000	900
*HB5	1	2460	18.249	900	V3	1	2915	25.000	900	J6A	1	2435	25.000	900
J1	4	3035	25.000	900	V4	1	1121	25.000	900	J11	1	2510	25.000	900
J3	4	1235	25.000	900	V5	2	1485	25.000	900	T4	1	6770	25.000	900
J4	1	1537	25.000	900	V6	1	3128	25.000	900	T5	1	7915	25.000	900
J5	1	4617	25.000	900	V7	1	2228	25.000	900	T20	1	3500	25.000	900
J6	1	2435	25.000	900	V8	1	1328	25.000	900	TG2	1	9280	25.000	900
J7	1	1535	25.000	900	V9	1	2967	25.000	900	HTG1	1	4235	25.000	900
J9	1	3717	25.000	900	V10	1	2067	25.000	900	J2A	1	2135	25.000	900
J10	1	1917	25.000	900	V11	1	1167	25.000	900	J2B	1	2135	25.000	900
*R1	1	926	25.000	900	V12	1	1770	25.000	900	J2C	1	2135	25.000	900
*R2	1	1226	25.000	900	V13	2	1364	25.000	900	J2D	1	2135	25.000	900
*R3	2	891	25.000	900	V14	1	2264	25.000	900	J2E	1	2135	25.000	900
*R4	7	1800	25.000	900	J1C	1	3035	25.000	900	J2F	1	2135	25.000	900
R5	1	901	25.000	900	J1F	1	3035	25.000	900	J1A	1	3035	25.000	900
*R6	1	1608	25.000	900	J3A	4	1235	25.000	900	J1B	1	3035	25.000	900
*R7	1	6740	0.000	900	J6B	1	2435	25.000	900	J1D	1	3035	25.000	900
S1	6	6075	25.000	900	J7A	1	1535	25.000	900	J1E	1	3035	25.000	900
S2	5	5240	25.000	900	J8	1	1217	25.000	900	T13	1	3335	25.000	900
S3	1	3400	25.000	900	J10A	1	1917	25.000	900	T18	1D	2980	0.000	900
T1	1	6770	25.000	900	*R1A	2	926	25.000	900	T12	1	7680	25.000	900
T3	2	4617	25.000	900	*R1B	1	926	25.000	900	TG1	1	6770	25.000	900
T6	1	7915	25.000	900	*R3A	1	891	25.000	900	TG3	1	7915	25.000	900
T7	7	7915	25.000	900	*R3B	2	891	25.000	900	T8	1	6075	25.000	900

Total quantity : 190

PDF created with pdfFactory trial version www.pdffactory.com

Job: UM11718

Client: Homestead Concrete Homes
Phone:

Site: Lawry House
1097 Queen St
Levin

Description:
Building Consent No:

Phone:

MiTek New Zealand Limited

Printed: 14:48:11 07 Jul 2014

The computer design input has been carried out by:

Name of Computer Operator: Geoff. S (06) 348-1755

Qualifications and Title: Truss Detailer

Signed:

CARTERS

A Division of Carter Holt Harvey

Dated: Monday, 7 July 2014

PDF created with pdfFactory trial version www.pdffactory.com

MiTek® Truss: CT2

CARTERS Manufacturing

Qty: 3 of 3 Ply: 1 Bundle: None
Job: UM11718
Description:
Building Consent No:
MiTek 20/20 Engineering 4.8.6.210

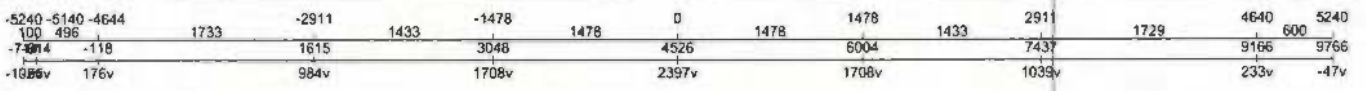
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Phone:

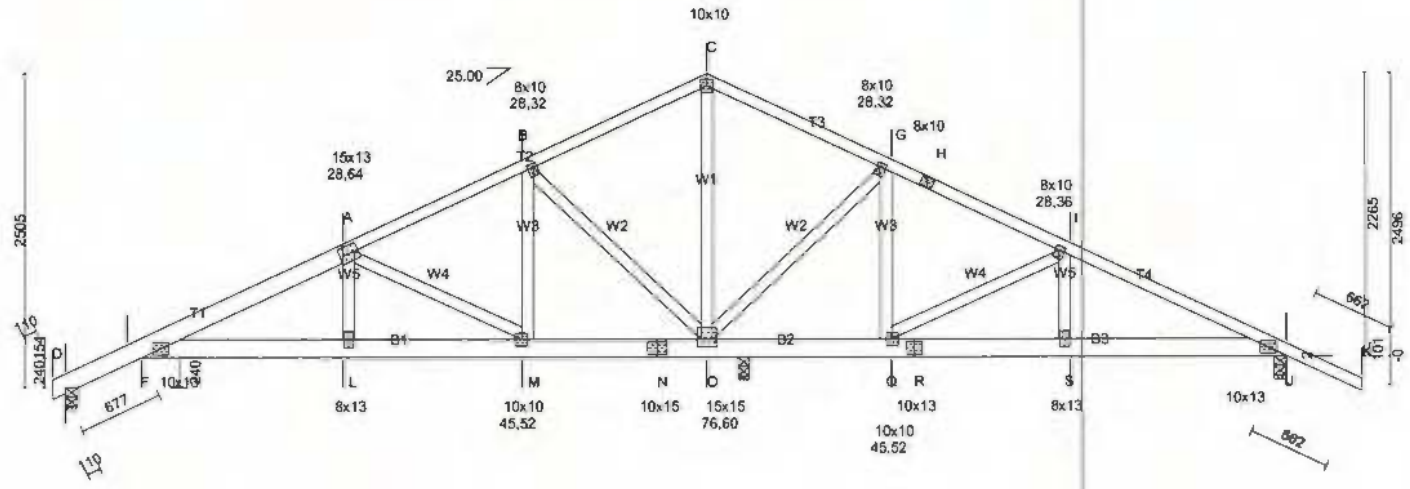
Site: Lawry House
1097 Queen St
Levin

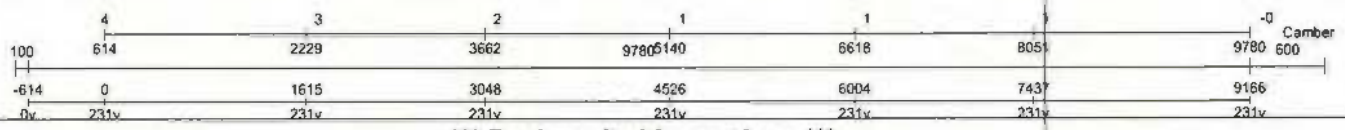
Phone:

MiTek New Zealand Limited

Printed: 15:24:37 07 Jul 2014







*** Designed with warnings ***

Uplift at joint(s) P exceeds the capacity of two wire dogs. Please ensure that adequate fixing is provided
All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 2598 mm

Plate Offsets (X,Y): [A:28,64], [B:28,32], [G:28,32], [I:28,36], [M:45,52], [O:76,60], [Q:45,52]

CHORDS			WEBS	
All:		140x45 DDP MSG8 H1.2	All:	90x45 DDP MSG8 H1.2
Except:	T3, T2, T4	90x45 DDP MSG8 H1.2		

===<<<< CHORDS >>>>===(Sq.Cut=90)

Piece: T3 — 3 Off
90x45 MSG8 DDP -H1.2
65.0 42 | 65.0 42
OL:1986 TS:1944 BS:1944

Piece: T2 — 3 Off
90x45 MSG8 DDP -H1.2
65.0 42 | 65.0 42
OL:3254 TS:3212 BS:3212

Piece: T4 — 3 Off
90x45 MSG8 DDP -H1.2
65.0 42 | 65.0 42
OL:3880 TS:3838 BS:3838

Piece: T1 — 3 Off
140x45 MSG8 DDP -H1.2
65.0 65 | 65.0 65
OL:2635 TS:2570 BS:2570
110 110 2349
42 98 25.000

Piece: B2 — 3 Off
140x45 MSG8 DDP -H1.2
90.0 | 90.0
OL:2056 TS:2056 BS:2056

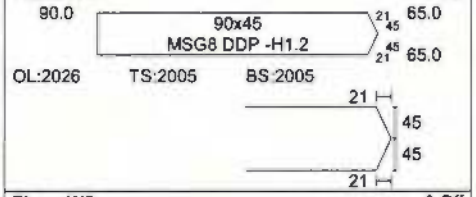
Piece: B1 — 3 Off
140x45 MSG8 DDP -H1.2
25.0 300 | 90.0
OL:4130 TS:4130 BS:3830

Piece: B3 — 3 Off
140x45 MSG8 DDP -H1.2
90.0 | 25.0 | 90.0
296 138 2
OL:2980 TS:2684 BS:2980
296
138
2

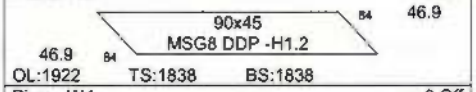
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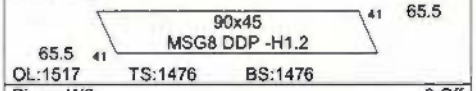
Piece: W1 — 3 Off



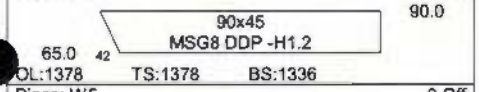
Piece: W2 — 6 Off



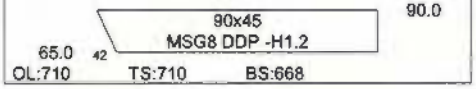
Piece: W4 — 6 Off



Piece: W3 — 6 Off



Piece: W5 — 6 Off



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01 AUG 2014
CONSENT

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MiTek® Truss: S2

CARTERS Manufacturing

Qty: 5 of 5 Ply: 1 Bundle: None
Job: UM11718
Description:
Building Consent No:
MiTek 20/20 Engineering 4.8.6.210

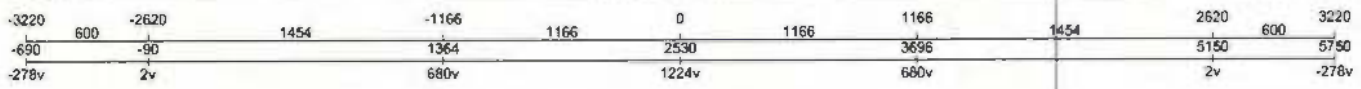
Client: Homestead Concrete Homes
Phone:

Site: Lawry House
1097 Queen St
Levin

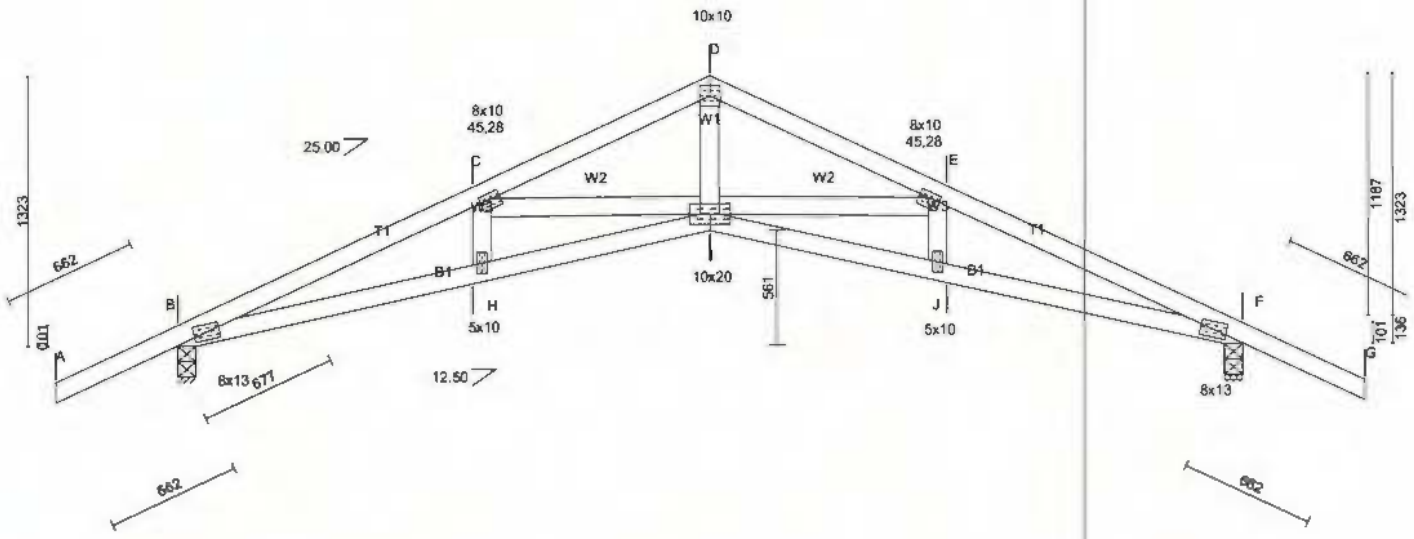
Phone:

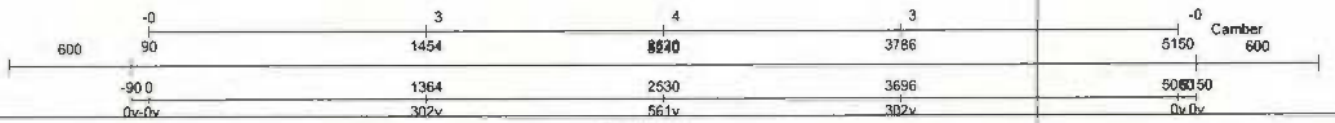
MiTek New Zealand Limited

Printed: 15:24:40 07 Jul 2014



282 490





Designed

All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 1601 mm

Plate Offsets (X,Y): [C:45,28], [E:45,28]

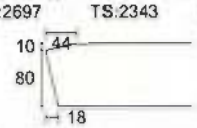
CHORDS
All: 90x45 DDP MSG8 H1.2

WEBS
All: 90x45 DDP MSG8 H1.2

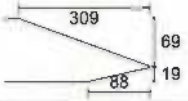
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Piece: T1 — 10 Off
90x45 MSG8 DDP -H1.2
65.0 42 — 42 65.0
OL:3595 TS:3553 BS:3553

Piece: B1 — 10 Off
12.5 10 — 44 — 80 — 77.5 18 — 90x45 MSG8 DDP -H1.2 — 12.5 — 77.5 — 12.5
OL:2697 TS:2343 BS:2591 PL:2684



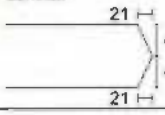
TS: 2343
SCARF:317
BUTT: 2
SEAT: 90
BS: 2591



===<<<< WEBS >>>>===(Sq.Cut=90)

Piece: W2 — 10 Off
90x45 MSG8 DDP -H1.2
89.4 1 — 1 89.4
OL:1032 TS:1031 BS:1031

Piece: W1 — 5 Off
90.0 — 90x45 MSG8 DDP -H1.2 — 21 45 65.0 — 21 45 65.0
OL:581 TS:560 BS:560



Piece: W3 — 10 Off
90x45 MSG8 DDP -H1.2
65.0 42 — 20 77.5
OL:327 TS:307 BS:285

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MiTek® Truss: S1

CARTERS Manufacturing

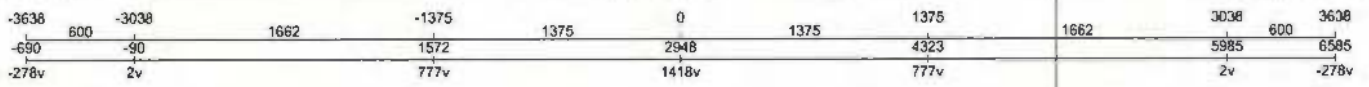
Qty: 6 of 6 Ply: 1 Bundle: None
Job UM11718
Description:
Building Consent No

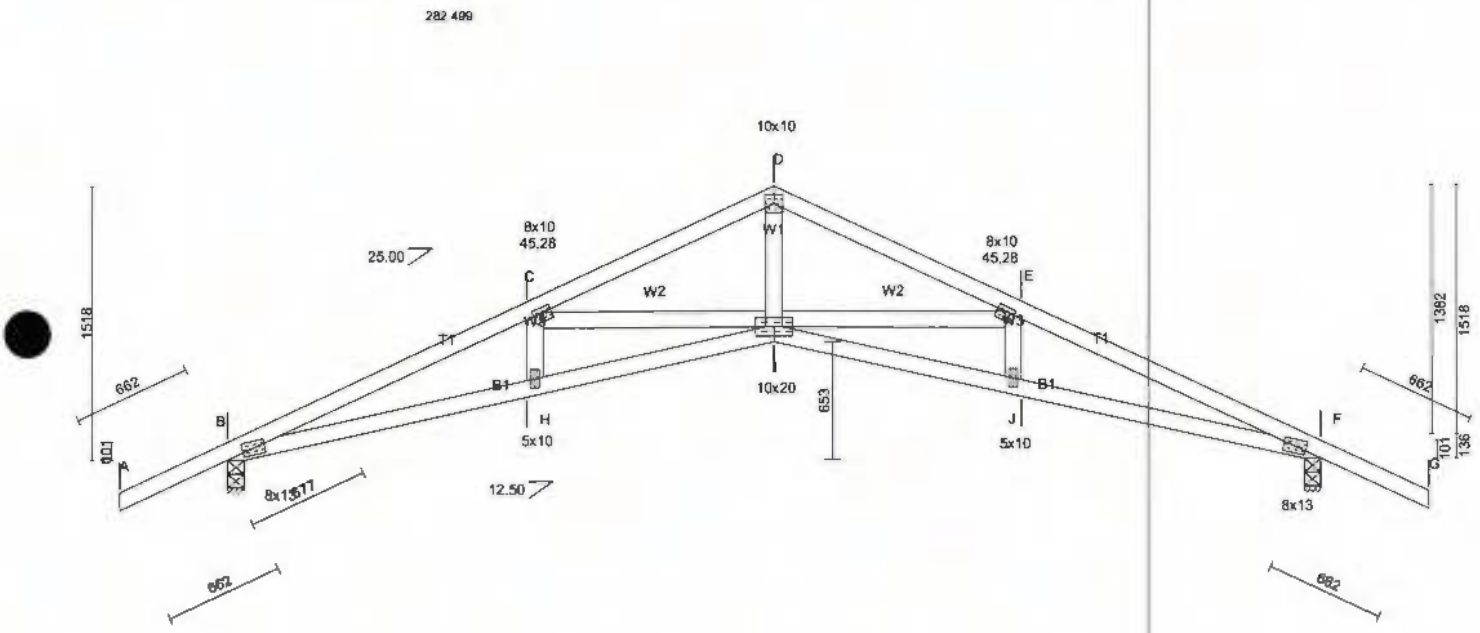
Client Homestead Concrete Homes
Phone

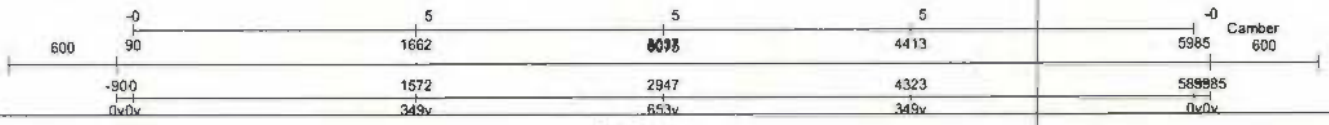
Site Lawry House
1097 Queen St
Levin

Phone

MiTek 20/20 Engineering 4.6.6.210
MiTek New Zealand Limited
Printed: 15:24:59 07 Jul 2014







Designed

All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 1796 mm

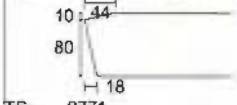
Plate Offsets (X,Y): [C:45,28], [E:45,28]

CHORDS		WEBS	
All:	90x45 DDP MSG8 H1.2	All:	90x45 DDP MSG8 H1.2

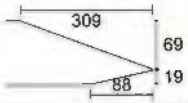
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Piece: T1 — 12 Off
90x45 MSG8 DDP -H1.2
65.0 42 | 42 65.0
OL:4056 TS:4014 BS:4014

Piece: B1 — 12 Off
12.5 10 44 | 80 | 77.5 18
90x45 MSG8 DDP -H1.2
12.5 | 77.5 | 12.5
OL:3125 TS:2771 BS:3019 PL:3111



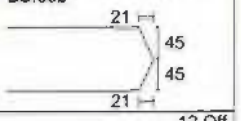
TS: 2771
SCARF:317
BUTT: 2
SEAT: 90
BS: 3019



===<<<< WEBS >>>>===(Sq.Cut=90)

Piece: W2 — 12 Off
90x45 MSG8 DDP -H1.2
89.7 0 | 0 89.7
OL:1241 TS:1240 BS:1240

Piece: W1 — 6 Off
-90.0
90x45 MSG8 DDP -H1.2
21 45 65.0
21 45 65.0
OL:683 TS:662 BS:662



Piece: W3 — 12 Off
90x45 MSG8 DDP -H1.2
65.0 42 | 20 77.5
OL:378 TS:358 BS:336

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MiTek® Truss: S3

CARTERS Manufacturing

Qty: 1 of 1 Ply: 1 Bundle: None
Job UM11718
Description
Building Consent No.
MiTek 20/20 Engineering 4.6.6.210

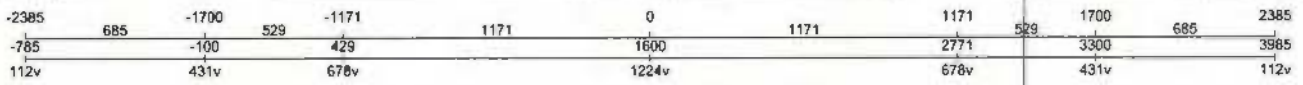
Client: Homestead Concrete Homes
Phone:

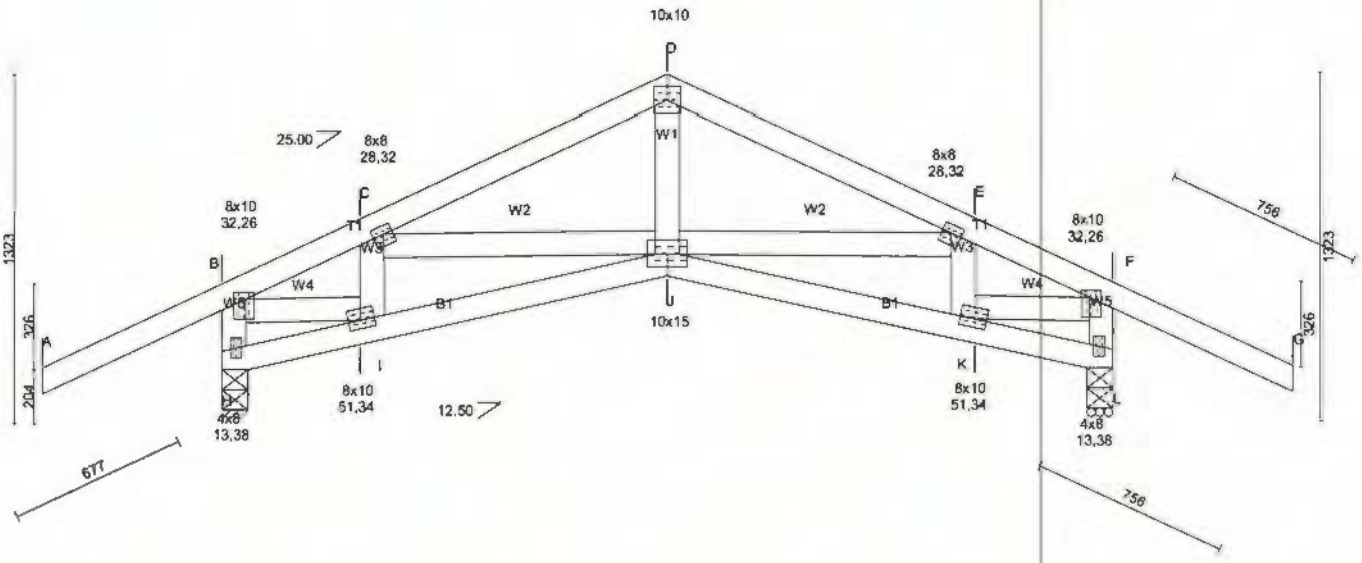
Site: Lawry House
1097 Queen St
Levin

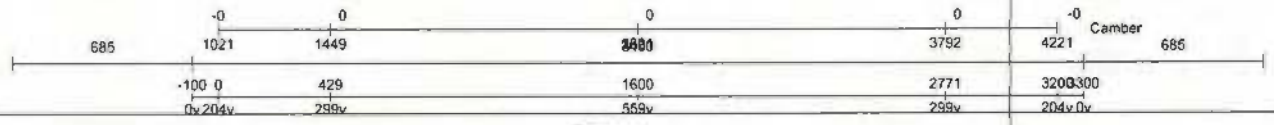
MiTek New Zealand Limited

Phone:

Printed: 15:24:40 07 Jul 2014







Designed

All cambers shown on Elevation are factored by 1.00
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 1211 mm

Plate Offsets (X,Y): [B:32,26], [C:28,32], [E:28,32], [F:32,26], [H:13,38], [I:51,34], [K:51,34], [L:13,38]

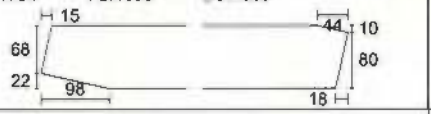
CHORDS
All: 90x45 DDP MSG8 H1.2

WEBS
All: 90x45 DDP MSG8 H1.2

<=====<<<< CHORDS >>>>>====(Sq.Cut=90)

Piece: T1 — 2 Off
90x45 MSG8 DDP -H1.2
65.0 42 — 42 65.0
OL:2674 TS:2632 BS:2632

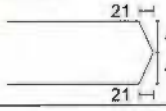
Piece: B1 — 2 Off
90x45 MSG8 DDP -H1.2
77.5 15 — 44 10 80 — 12.5
12.5 22 — 98 — 18 77.5
OL:1754 TS:1695 BS:1639



<=====<<<< WEBS >>>>>====(Sq.Cut=90)

Piece: W2 — 2 Off
90x45 MSG8 DDP -H1.2
89.4 1 — 1 89.4
OL:1037 TS:1036 BS:1036

Piece: W1 — 1 Off
90x45 MSG8 DDP -H1.2
-90.0 — 21 45 65.0
21 45 65.0
OL:583 TS:562 BS:562



Piece: W4 — 2 Off
90x45 MSG8 DDP -H1.2
88.9 2 — 2 88.9
OL:440 TS:439 BS:439

Piece: W3 — 2 Off
90x45 MSG8 DDP -H1.2
65.0 42 — 20 77.5
OL:328 TS:309 BS:287

Piece: W5 — 2 Off
90x45 MSG8 DDP -H1.2
77.5 20 — 42 65.0
OL:199 TS:157 BS:179

PDF created with pdfFactory trial version www.pdffactory.com

MiTek® Truss: T7

CARTERS Manufacturing

Qty: 7 of 7 Ply: 1 Bundle: None
Job UM11718
Description
Building Consent No.
MiTek 20/20 Engineering 4.6.6.210

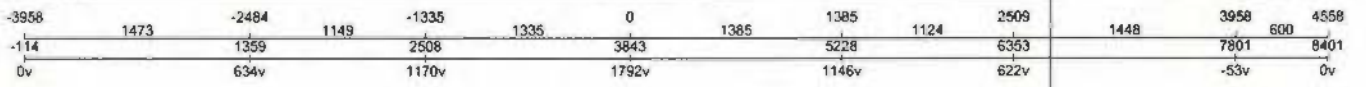
Client Homestead Concrete Homes
Phone

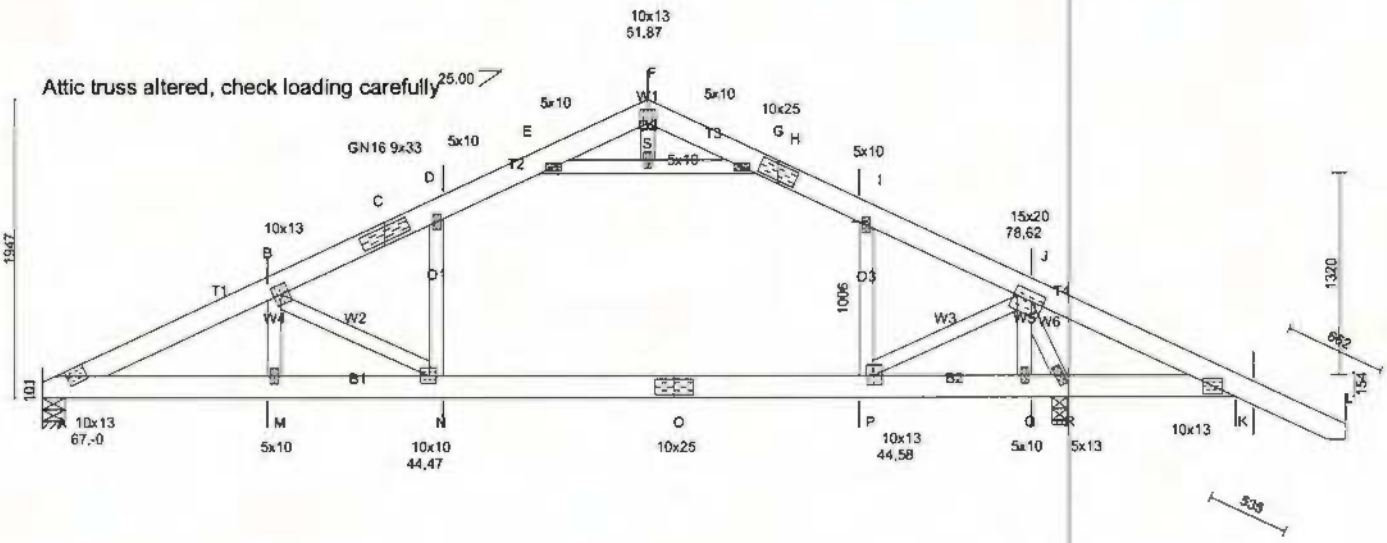
Site Lawry House
1097 Queen St
Levin

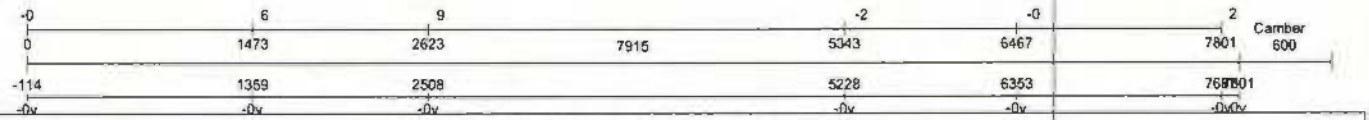
Phone

MiTek New Zealand Limited

Printed: 10.13.26 08 Jul 2014







*** Designed with warnings ***

All cambers shown on Elevation are factored by 1.00
Maximum camber of 9 mm exceeds maximum allowable Job Camber of 8 mm
All members at each joint must be touching for at least 50% of the possible contact area, with any gap being limited to a maximum of 2mm.
Overall Truss Height: 2226 mm

Plate Offsets (X,Y): [A:67,0], [F:51,87], [J:78,62], [N:44,47], [P:44,58]

CHORDS			**WEBS**		
All:		140x45 DDP MSG10 H1.2	**All:**		90x45 DDP MSG8 H1.2
Except:	T3, T1, T4	140x45 DDP MSG8 H1.2			
OTHER					
Wall:	O3, O1, O2	90x45 DDP MSG8 H1.2			

===<<<< CHORDS >>>>===(Sq.Cut=90)

Piece: T2 — 7 Off
140x45 MSG10 DDP -H1.2
65.0 | 65 | 65.0 | 65
OL:1960 TS:1895 BS:1895

Piece: T3 — 7 Off
140x45 MSG8 DDP -H1.2
65.0 | 65 | 65.0 | 65
OL:1007 TS:941 BS:941

Piece: T1 — 7 Off
140x45 MSG8 DDP -H1.2
25.0 | 300 | 65.0 | 65
OL:2380 TS:2380 BS:2014

Piece: T4 — 7 Off
140x45 MSG8 DDP -H1.2
65.0 | 65 | 65.0 | 43 | 92 | 104 | 48 | 25.0
OL:4130 TS:4087 BS:3961

Piece: B1 — 7 Off
140x45 MSG10 DDP -H1.2
90.0 | 83 | 39 | 25.0 | 101 | 90.0
OL:4130 TS:4047 BS:4130

Piece: B2 — 7 Off
140x45 MSG10 DDP -H1.2
90.0
25.0 | 300
OL:3671 TS:3671 BS:3371

PDF created with pdfFactory trial version www.pdffactory.com

MiTek® Truss: T7

CARTERS Manufacturing

Qty: 7 of 7 Ply: 1 Bundle: None
Job: UM11718
Description:
Building Consent No.
MiTek 20/20 Engineering 4.6.6.210

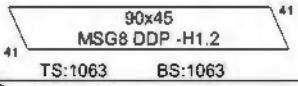
Client: Homestead Concrete Homes
Phone:

Site: Lawry House
1097 Queen St
Levin

Phone:

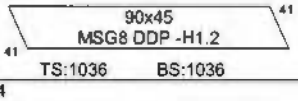
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Piece: W2 — 7 Off



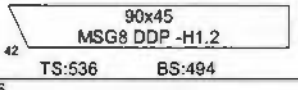
OL:1104 TS:1063 BS:1063

Piece: W3 — 7 Off



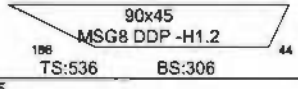
OL:1076 TS:1036 BS:1036

Piece: W4 — 7 Off



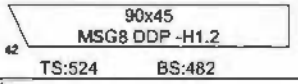
OL:536 TS:536 BS:494

Piece: W6 — 7 Off



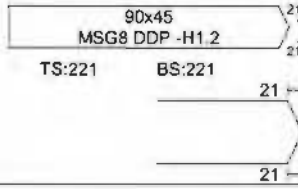
OL:536 TS:536 BS:306

Piece: W5 — 7 Off



OL:524 TS:524 BS:482

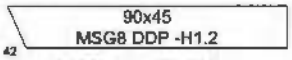
Piece: W1 — 7 Off



OL:242 TS:221 BS:221

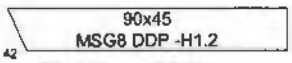
===<<<< OTHERS >>>>===(Sq.Cut=90)

Piece: O3 — 7 Off



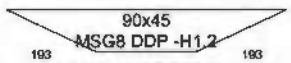
OL:1006 TS:1006 BS:964

Piece: O1 — 7 Off



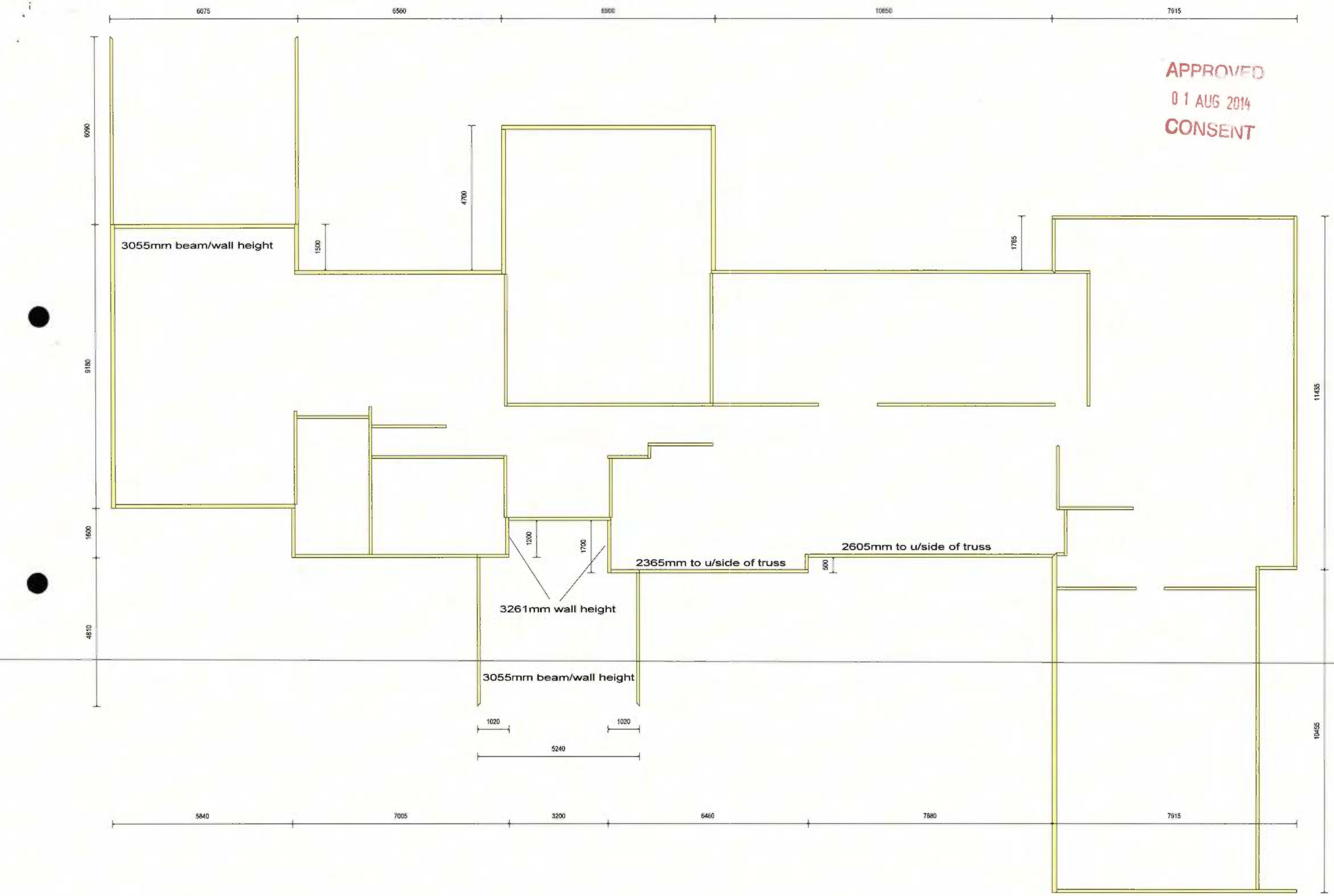
OL:1030 TS:1030 BS:988

Piece: O2 — 7 Off



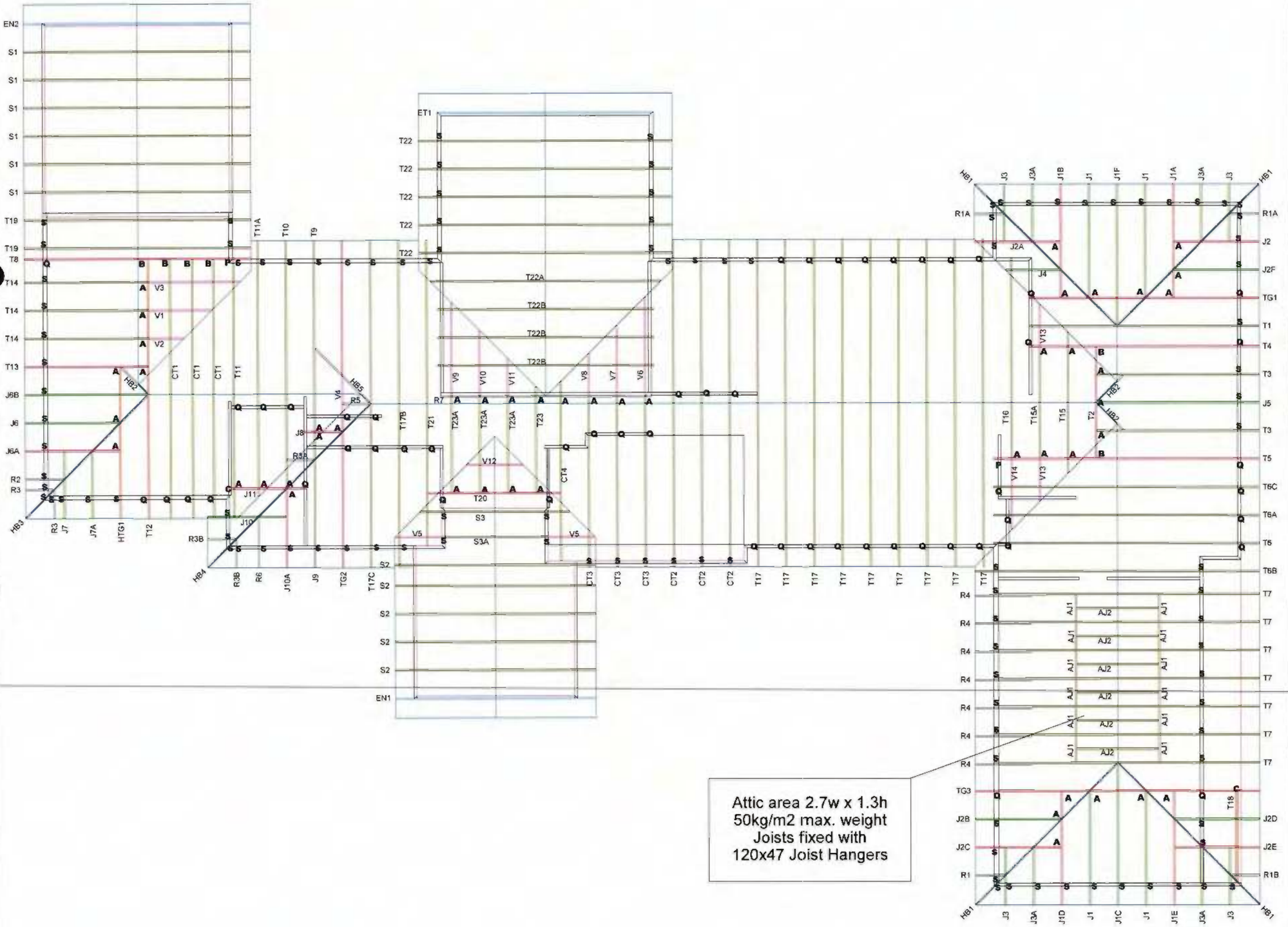
OL:1425 TS:1425 BS:1039

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PDF created with pdfFactory trial version www.pdffactory.com

BUILDING CONSENT LAYOUT



Attic area 2.7w x 1.3h
50kg/m2 max. weight
Joists fixed with
120x47 Joist Hangers

CARTERS
YourBuildingPartner

CARTERS Manufacturing
25 Peterkin Street Lower Hutt
Scheduling/Despatch (04) 567-0274

JOB No **UM11718**

Client: Homestead Concrete Homes
Job Name: Lawry House
Address: 1097 Queen St
Levin

Pitch: 25.0deg
Roof Material: Corona Shake
Soffit Overhang: 600mm
Wind Area: High
Snow Load(factored): 0.000kPa

Trusses and rafters at 900mm max centres unless stated otherwise.

This layout is to be read in conjunction with the Architectural plans.

DRAWN BY Geoff. S (06) 348-1755

DATE 7 Jul,2014

PAGE 1 of 2

FIXINGS

A= 47x90 JH
B= 47x120 JH
D= 47x190 JH
S= CPC40's'

C= CT200 (pair)
M= Multigrips (pair)
N= Nailon Plate
Q= 9kN Pack
P= 16kN Pack

All other truss fixings must have two wire dogs unless indicated as above

Joist Hanger
CT 200
Multi Grips
Nailon plate
CPC

NOTE

Please contact your local CARTERS Manufacturing Branch for any queries regarding this layout.

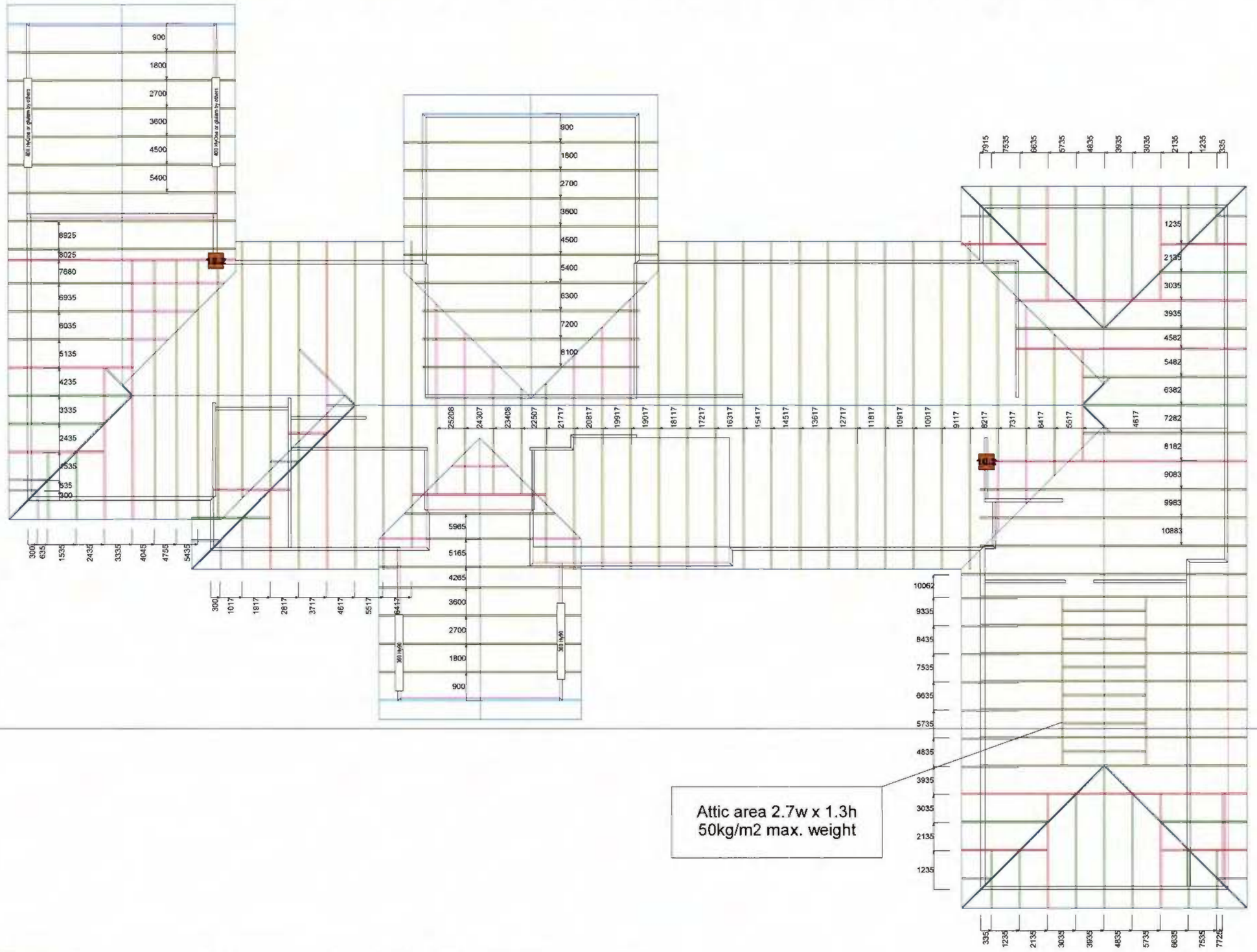
APPROVED
01 AUG 2014
CONSENT

QUALITY ASSURANCE F.T.M.A. NEW ZEALAND TIMBER & TRUSS MANUFACTURERS ASSOCIATION INC

See Page 2 for Dimensions, Lintel Statement & Point Load Notification

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BUILDING CONSENT LAYOUT



Attic area 2.7w x 1.3h
50kg/m2 max. weight

CARTERS
YourBuildingPartner

CARTERS Manufacturing
25 Peterkin Street Lower Hutt
Scheduling/Despatch (04) 567-0274

JOB No **UM11718**

Client: Homestead Concrete Homes
Job Name: Lawry House
Address: 1097 Queen St
Levin

Pitch: 25.0deg
Roof Material: Corona Shake
Soffit Overhang: 600mm
Wind Area: High
Snow Load(factored): 0.000kPa

Trusses and rafters at 900mm
max centres unless stated otherwise.

This layout is to be read in conjunction
with the Architectural plans.

DRAWN BY Geoff. S (06) 348-1755

DATE 7 Jul,2014

PAGE 2 of 2

These lintels have been sized using
one of the following :

The GANGLAM 04/2008 and
FLITCH BEAM 12/2007
selection manuals from MiTek NZ Ltd.

hy90 and hyONE lintels have been sized
using designIT v5 NZ software
(Incl. sub versions) or selection manuals,
hy90 Edition 1, and hyONE April 2008,
as provided by CHH Woodproducts.

Unless otherwise stated the timber grade
for all lintels is SG8. Lintels not shown
are to be selected as per NZS3604: 2011.

All walls shown on this layout are
considered to be load bearing.

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Lintels by others

QUALITY ASSURANCE F.T.M.A. NEW ZEALAND FRAME & TRUSS MANUFACTURERS ASSOCIATION (N.Z.)

See Page 1 for Truss
Layout and Fixings

_kN NOTIFICATION OF POINT LOADED LINTELS AND POINT LOADS ON INTERNAL OR EXTERNAL WALLS WHERE THE DOWNLOAD IS HIGHER THAN 10kN.
Note: If no point loads indicated, loading does not exceed 10kN.

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[redacted]

KOA

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HOMESTEAD GROUP

STRUCTURAL DESIGN FOR NEW RESIDENTIAL DWELLING 1097 QUEEN STREET EAST LEVIN

CALCULATIONS & DETAILS

CLIENT	LAWRY RESIDENCE				
SUBJECT	1097 QUEEN STREET EAST / LEVIN				
FILE No. 113573	DATE JULY 14	PAGE	OF	BY CLB	CKD

KOA

RESIDENTIAL

CONTENTS

A1 LOADS

B1 ERECTION FOOTING CHECK

C1 PC PANEL DESIGN CHECK + FOOTING
- 100 mm thick
- 125 mm thick
- 150 mm thick

D Design Lintel over garage

E LATERAL LOADS - CAPACITY SHEAR WALL

F ALFRESCO POST / FOUNDATION
PORTICO " / FOUNDATION

NOTE GENERAL

- IL2 / SOIL D ≥=
- ASSUME GOOD GROUND IAW NZS3604 TO BE CONFIRMED BY CONTRACTOR
- PC Panel - USE 50MPa Concrete strength
- FOUNDATION - USE 25MPa concrete strength Min 75 COVER
- UNLESS STATED Fy = 500 MPa
- SLAB 100 Thick

CLIENT	LAWRY RESIDENCE				
SUBJECT	1097 QUEEN ST EAST - LEVIN				
FILE No. 113573	DATE JULY 14	PAGE A1	OF	BY CLB	CKD

KOA

LOADINGS

G ROOF light weight timber framing say 0.5 kPa.

G PC PANEL

100 mm
0.1 x 24 = 2.4 kPa.
thick wall

125 mm
0.125 x 24 = 3.0 kPa

150 mm
0.150 x 24 = 3.6 kPa

G ROCKCOTE TEXT
say 10mm ⇒ 0.01 x 24 = 0.24 kPa

G INTERNAL LINING + Framing = 0.15 kPa

WINDS

Wu q = 1.03 kPa.

Ws q = 0.69 kPa.

1.87M

SEISMIC

- IL2 - residential
- $\mu = 1.25$
- Soil class D

ULS - Cd(T) = 0.97 SLS 0.24

PC PANEL PROP CANTILEVERED - ROOF RESISTING DIAPHRAGM
ACTION TOP PLATE BOLT - IAW NZS3604

GIB

A2

Earthquake Design Actions

1170 ACTIONS GNS SCIENCE

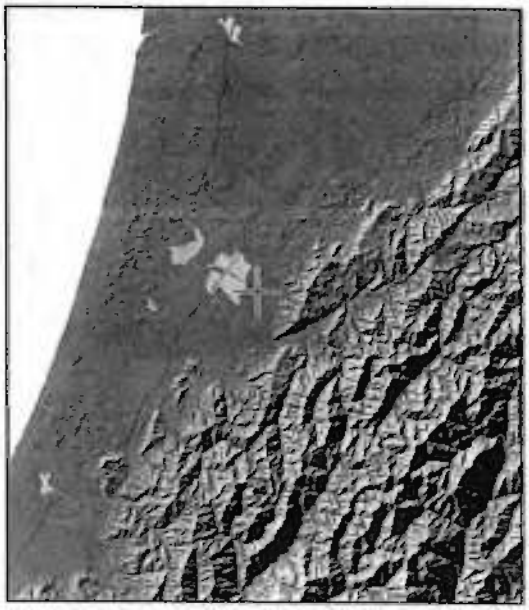
Report for

6061124N 2705585E

Compiled by

Chantelle Bailey of Kevin OConnor Associates

Site properties	
Location:	**6061124N 2705585E**
	175.31°E -40.63°S
Soil class:	**D: Deep or soft soil**
Hazard factor [Z]:	**0.40**
(derived from the national grid)	
Nearest fault:	**Wellington Fault**
Fault distance:	**19.1 km**



Structure properties	
Building importance class:	**2**
Design working life:	**50 yrs**
Dominant period X [T]:	**0.4 s**
Dominant period Y [T]:	**0.4 s**

Ultimate Limit State	X	Y
Structural ductility factor[μ]:	**1.25**	**1.25**
Probability of exceedence:	**1/500**	**1/500**
Spectral shape factor [$C_h(T)$]:	**3.00**	**3.00**
Return period factor [R_u]:	**1.00**	**1.00**
Near fault factor [N(T,D)]:	**1.00**	**1.00**
Elastic hazard spectrum [C(T)]:	**1.19**	**1.19**
Structural performance factor [S_p]:	**0.92**	**0.92**
Inelastic spectrum scale factor [k_μ]:	**1.14**	**1.14**
Minimum base shear	**0.04**	**0.04**
Design Action Coefficient [$C_d(T)$]:	**0.97**	**0.97**

pc Panels

Servicability Limit State (1)	X	Y
Structural ductility factor[μ]:	**1.00**	**1.00**
Probability of exceedence:	**1/25**	**1/25**
Spectral shape factor [$C_h(T)$]:	**3.00**	**3.00**
Return period factor [R_s]:	**0.25**	**0.25**
Near fault factor [N(T,D)]:	**1.00**	**1.00**
Elastic hazard spectrum [C(T)]:	**0.30**	**0.30**
Structural performance factor [S_p]:	**0.70**	**0.70**
Inelastic spectrum scale factor [k_μ]:	**1.00**	**1.00**
Design Action Coefficient [$C_d(T)$]:	**0.21**	**0.21**

A2a

Earthquake Design Actions

1170 ACTIONS GNS SCIENCE

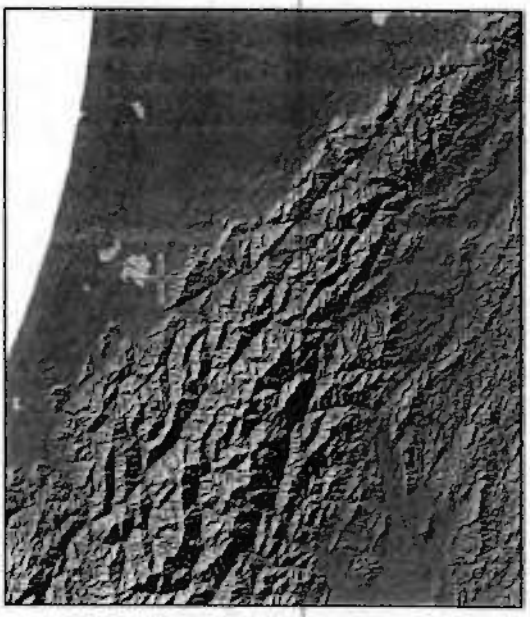
Report for

6061100N 2706320E

Compiled by

Chantelle Bailey of Kevin OConnor Associates

Site properties	
Location:	**6061100N 2706320E**
	175.32°E -40.63°S
Soil class:	**D: Deep or soft soil**
Hazard factor [Z]:	**0.40**
	(derived from the national grid)
Nearest fault:	**Wellington Fault**
Fault distance:	**18.4 km**



Structure properties	
Building importance class:	**2**
Design working life:	**50 yrs**
Dominant period X [T]:	**0.4 s**
Dominant period Y [T]:	**0.4 s**

Ultimate Limit State	X	Y
Structural ductility factor[μ]:	**2.00**	**2.00**
Probability of exceedence:	**1/500**	**1/500**
Spectral shape factor [$C_h(T)$]:	**3.00**	**3.00**
Return period factor [R_u]:	**1.00**	**1.00**
Near fault factor [N(T,D)]:	**1.00**	**1.00**
Elastic hazard spectrum [C(T)]:	**1.20**	**1.20**
Structural performance factor [S_p]:	**0.70**	**0.70**
Inelastic spectrum scale factor [k_μ]:	**1.57**	**1.57**
Minimum base shear	**0.04**	**0.04**
Design Action Coefficient [$C_d(T)$]:	**0.53**	**0.53**

Servicability Limit State (1)	X	Y
Structural ductility factor[μ]:	**1.00**	**1.00**
Probability of exceedence:	**1/25**	**1/25**
Spectral shape factor [$C_h(T)$]:	**3.00**	**3.00**
Return period factor [R_s]:	**0.25**	**0.25**
Near fault factor [N(T,D)]:	**1.00**	**1.00**
Elastic hazard spectrum [C(T)]:	**0.30**	**0.30**
Structural performance factor [S_p]:	**0.70**	**0.70**
Inelastic spectrum scale factor [k_μ]:	**1.00**	**1.00**
Design Action Coefficient [$C_d(T)$]:	**0.21**	**0.21**

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(A3)

Determination of Site Wind Speeds

Enter Return Period of Interest 500

Determination of Site Wind Speed $V_{sit,\beta} = V_R * M_d * M_{(z,cat)} * M_s * M_t$ m/sec

Enter Wind Region ID = A7

Wind Regime with this region is **Frontal**

Regional Wind Speed = V_R = 45 Ajustment Factor = 1 = **45** m/sec V1.5e

Directional (d) or Non-directional (n) wind speeds N

Elements being considered C *(C = Complete building & Primary Structure; O= Other elements)*

Wind Directional Multiplier, Md, for Region A7

1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1

Terrain/Height Multiplier

Enter Building Height Z= 5.5 m

Enter Reference height of interest 5.5 m *(can select several heights up the Building)*

Terrain Category Averaging Distance 1000 m *(As given in Table 4.2A)*

Enter the distance of each Terrain Category present over Averaging Distance Starting at base of building and Moving away in an upwind direction (Refer to Clause 4.2.3) — 1000 m of the site

TC	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
1	2/3000	2/3000	2/3000	2/3000	2/3000	2/3000	2/3000	2/3000
2								
3								
4								
5								
6								
7								
8								
Sum of averaging distances	1101	1101	1101	1101	1101	1101	1101	1101
check distance provided>Required	OK	OK	OK	OK	OK	OK	OK	OK
Weighted average terrain category	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
M(z,cat)=	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92

Non-Directional M(z,cat)= 0.92

Shielding Effects *(Note Shielding Zone is arc radius 20h &+/- 45 degree perp to wall)*

Effective shielding length has been assessed as 110 m *(20 * Building Height)*

Effective shielding buildings are required to have Ht> 5.5 m *(Shielding Bldgs Ht >= Bldg Ht)*

(Note if Upwind Slope >0.2 then no sheilding is present - Cl 4.3.1)

Enter

		1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
No. Bldgs in shielding zone of ht>h	No.	0	0	0	0	0	0	0	0
Avg. Height of shielding bldgs	m								
Avg. Breadth of shielding bldgs	m								
	Ls=	0	0	0	0	0	0	0	0
	s=	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Ms=	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Non-Directional M(z,cat)= 1.00

2/07/2014

Terrain Multiplier, Mt *(Max of Ml, Mc, Mh)*

(A4)

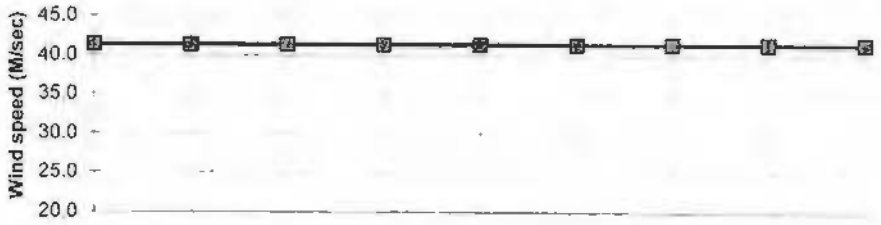
Hill Shape Multiplier		F	F	F	F	F	F	F	F
Enter Upwind Hill Shape (E,H,R,F)		H	H	H	H	H	H	H	H
(E=Escarpment, H=Hill, R=Ridge, F=Flat)									
Ridge Elevation	m								
Upwind Valley Elevation	m	0	5	5	5	5	5	5	5
H = Height of Terrain feature	m	0	-5	-5	-5	-5	-5	-5	-5
Contour at midheight of feature	m								
Enter Lu		1500							
Crest Slope	Rad								
Distance from Site to Crest	m								
Enter L if site is on Lee side of the slope									
Hill Shape Multiplier	Mh	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lee Zone Multiplier		1 st	2 nd	3 rd	N	5 th	6 th	7 th	N
Site is within a Lee Zone? (Y or N)					n				n
Distance Site to Leeward Crest	km				30				30
	Ml	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Elevation Multiplier (Eqn 4.4(1))	*{Note S*	50		
Enter approx. Elevation if >500 m	m	0	Then Me =	1
Topographic Multiplier	Mt	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Non-Directional Topo Multiplier		1.00							
Non-directional Multiplier =		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Directional Wind Speeds Are	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4

{Note Ultimate Wind Speed shall be greater than 30 m/sec for Ultimate conditions Cl 2.3}



Determine Design Wind Speeds				0	Dir 1	Dir 2	Dir 3	Dir 4
Enter the Bearing (1-180) of the normal to the longest wall				0	0	90	180	270
Design Wind speeds, Vd	at Ref ht	5.5 m	m/sec		41.4	41.4	41.4	41.4
Basic Design wind pressures, q	at Ref ht	5.5 m	kPa		1.03	1.03	1.03	1.03

(A5)

Kevin OConnor Associates		Page No.:	1
JOB NAME:	LAWRY RESIDENCE	Date	2/7/14
Job/File Number:	113573	Designer:	Chantelle Ba
Description:	1097 Queen Street East - Levin	Checker:	Check2

Determination of Site Wind Speeds

Enter Return Period of interest 25

Determination of Site Wind Speed $V_{sit,B} = V_R * M_d * M_{(z,cat)} * M_s * M_t$ m/sec

Enter Wind Region ID = A7

Wind Regime with this region is **Frontal**

Regional Wind Speed = V_R = 37 Ajustment Factor = 1 **= 37** m/sec V1.5e

Directional (d) or Non-directional (n) wind speeds N

Elements being considered C *(C = Complete building & Primary Structure; O= Other elements)*

Wind Directional Multiplier, Md, for Region A7

1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1

Terrain/Height Multiplier

Enter Building Height Z= 5.5 m

Enter Reference height of interest 5.5 m *(can select several heights up the Building)*

Terrain Category Averaging Distance 1000 m *(As given in Table 4.2A)*

Enter the distance of each 1000 m of the site

	TC	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
Terrain Category present over									
Averaging Distance	1	2/3000	2/3000	2/3000	2/3000	2/3000	2/3000	2/3000	2/3000
Starting at base of building and	2								
Moving away in an upwind direction	3								
	4								
(Refer to Clause 4.2.3)	5								
	6								
	7								
	8								
Sum of averaging distances		1101	1101	1101	1101	1101	1101	1101	1101
check distance provided>Required		OK	OK	OK	OK	OK	OK	OK	OK
Weighted average terrain category		2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
M(z,cat)=		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92

Non-Directional M(z,cat)= 0.92

Shielding Effects *(Note Shielding Zone is arc radius 20h &+/- 45 degree perp to wall)*

Effective shielding length has been assessed as 110 m *(20 * Building Height)*

Effective shielding buildings are required to have Ht> 5.5 m *(Shielding Bldgs Ht >= Bldg Ht)*

(Note if Upwind Slope >0.2 then no sheilding is present - Cl 4.3.1)

Enter		1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th
No. Bldgs in shielding zone of ht>h	No.	0	0	0	0	0	0	0	0
Avg. Height of shielding bldgs	m								
Avg. Breadth of shielding bldgs	m								
	Ls=	0	0	0	0	0	0	0	0
	s=	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Ms=	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Non-Directional M(z,cat)= 1.00

Kevin OConnor Associates		Page No.:	2
JOB NAME:	LAWRY RESIDENCE	Date	2/7/14
Job/File Number:	113573	Designer:	Chantelle Ba
Description:	1097 Queen Street East - Levin	Checker:	Check2

2/07/2014

Terrain Multiplier, Mt *(Max of Ml, Mc, Mh)*

(N4)

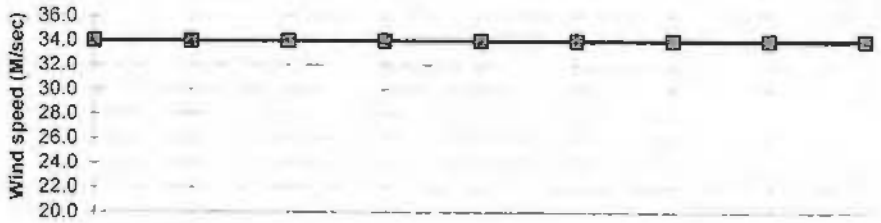
Hill Shape Multiplier		F	F	F	F	F	F	F	F	
Enter Upwind Hill Shape (E,H,R,F)		H	H	H	H	H	H	H	H	
(E=Escarpment, H=Hill, R=Ridge, F=Flat)										
Ridge Elevation	m									
Upwind Valley Elevation	m	0	5	5	5	5	5	5	5	
H = Height of Terrain feature	m	0	-5	-5	-5	-5	-5	-5		-5
Contour at midheight of feature	m									
Enter Lu		1500								
Crest Slope	Rad									
Distance from Site to Crest	m									
Enter L if site is on Lee side of the slope										
Hill Shape Multiplier	Mh	1.000	1.00	1.00	1.00	1.00	1.00	1.00		1.00

Lee Zone Multiplier		1 st	2 nd	3 rd	N	5 th	6 th	7 th	N	
Site is within a Lee Zone? (Y or N)					n				n	
Distance Site to Leeward Crest	km				30				30	
	Ml	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00

Elevation Multiplier (Eqn 4.4(1))	*{Note*	50			
Enter approx. Elevation if >500 m	m	0	Then Me =	1	
Topographic Multiplier	Mt	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00

Non-Directional Topo Multiplier		1.00								
Non-directionel Multiplier =		0.92	0.92	0.92	0.92	0.92	0.92	0.92		0.92
Directional Wind Speeds Are	34.0	34.0	34.0	34.0	34.0	34.0	34.0	34.0		34.0

{Note Ultimate Wind Speed shall be greater than 30 m/sec for Ultimate conditions Cl 2.3)



Determine Design Wind Speeds				0	Dir 1	Dir 2	Dir 3	Dir 4
Enter the Bearing (1~180) of the normal to the longest wall				0	0	90	180	270
Design Wind speeds, Vd	at Ref ht	5.5 m		m/sec	34.0	34.0	34.0	34.0
Basic Design wind pressures, q	at Ref ht	5.5 m		kPa	0.69	0.69	0.69	0.69

CLIENT	LAWRY RESIDENCE				
SUBJECT	1097 Queen St East - LEVIN				
FILE No. 113573	DATE July 14	PAGE B1	OF	BY CLB	CKD

KOA

DESIGN ERECTION FOOTING

TRY 300 WIDE x 250 DEEP.

Check — 150 mm PANEL (g) - 2.9m high max (ref P32)

150 PC Panel 3-W

$G_{150\ PC\ Panel} = 0.15 \times 24 \times 2.9 = 10.44$ kN/m length

Check - 125 mm Panel (g) 3.9 (ref P18)

125 PC Panel 3-W

$G_{125\ PC\ Panel} = 0.125 \times 24 \times 3.9 = 11.7$ kN/m length

$G_{Footing}$ $0.3 \times 0.25 \times 24 = 1.8$ kN/m length

13.5 kN/m

WORST LOAD CASE

$1.35G = 1.35 \times 13.5 = 18.3$ kN/m length.

$P_{max} = \frac{18.3}{0.3} = 61$ kPa OK

ASSUMED PROPOSED FOOTING ON GOOD GROUND TO NZS3604.

VERIFY SOIL CAPACITY DURING CONSTRUCTION

CLIENT LAWRY RESIDENCE

SUBJECT 1097 QUEEN ST EAST - LEVIN

FILE No. 113573 | DATE 10/14 | PAGE C1 OF | BY CLB | CKD

KOA

DESIGN Check: PC Panels - Prop Cantilevered roof provides diaphragm action.

100 mm thick @ average 2.9m high

USE 661 mesh. ϕ 7.5 mm @ 150 CTRS EW.

$A_s = 294.5$ mm²

check A_s min $= \frac{\sqrt{f'_c}}{4 f_y} b_w d = \frac{\sqrt{50}}{4 \times 485} \times 100 \times 1000 = 365$ mm²

check 1/3 moment de,

$f'_c = 50$ MPa

say $f_y = 485$

Check load cases

WIND $M^* = 1.03 \times (0.7 + 0.3) \times \frac{2.9^2}{8} = 1.1$ kNm/m length

SEISMIC $M^* = (0.15 + 0.4 + 2.4) \times 0.97 \times \frac{2.9^2}{8} = 2.8$ kNm/m length ⇐ design for Eq.

FIRE 0.5 kPa spray $V^* = 4.2$ kN

$M^* = 0.5 \times \frac{2 g^2}{8} = 0.6$ kNm/m length

$\phi M_n = 5.4$ kNm $> M^*$

$\therefore \phi M_n > 1.1/3 M^*$

(Check P25)

100 PC Panels @ 3.45 average $\Rightarrow M^* = 3.95$ kNm

check deflection

$E_c = 3320 \sqrt{f'_c} + 6900 = 30.3$ GPa

$\Delta_{Es} = \frac{5 q L^4}{384 EI} = \frac{5 \times (2.74 \times 0.21)^{SLS\ (dff)} \times 2900^4}{384 \times 30.3 \times 10^3 \times 833 \times 10^6} = < 1$mm OK.

Δ_{Ln} OK by inspection $\Rightarrow I_{eff} = I_g \times 0.33$.

- Roof diaphragm action provided.
- check wall minimum steel requirements A_s per NZS3101 Cl 11.3.11.3 (a) vertical reinforcement is more than one third greater than required thus a check $0.0014 A_g = 0.0014 \times 400 \times 1000 = 140$ mm² < A_s provided OK

C2

RC BEAM Moment Capacity

Beam	Depth H mm	100		0.100
	Width B mm	1000		1.000
	As (bottom face)	294.5	mm2	0.0002945 m2
	F'c	50	MPa	
	Fy	450	MPa	
	d mm	50	mm	
	Phi (Bending)	0.85		
	a = (As.Fy)/(0.85F'c.B) =	3.12	mm	
	jd =	48.44	mm	
	Phi M = phi.As.Fy.jd =	**5.46**	**kN.m**	
	phi T = phi.Fy.As =	112.6	kN/m	

$\phi M_n > M^*$ OK

I effective to NZS 3101:1982

	Ma (G & .7Qu)	**12**	**kN.m**
	I gross	**0.0001 m4**	**8.33E-05 m4**
	fr	4.24 MPa	
	M cr	**7.1 kN.m**	
Section	a	3 mm	0.003 m
	x top	4 mm	0.004 m
	x bot	46 mm	0.046 m
		2 mm	0.002 m
	A c'	2454 mm2	0.002 m2
	I cracked	**0.0000 m4**	**5.28E-06 m4**
	I e	**0.0000 m4**	**2.13E-05 m4**
		26% I gross	

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

UNITED STEEL

661 Standard

Sheet size	4560mm X 1970mm
Wire size	7.5mm
Wire mass	0.346802kg/m
Weight of sheet	43.32kg
Centre width	150mm centres
Cross section	294.66mm²/m width
Nett coverage	7.525m²
Minimum ultimate tensile	575MPa
Maximum ultimate tensile	775MPa
Minimum proof stress	485MPa

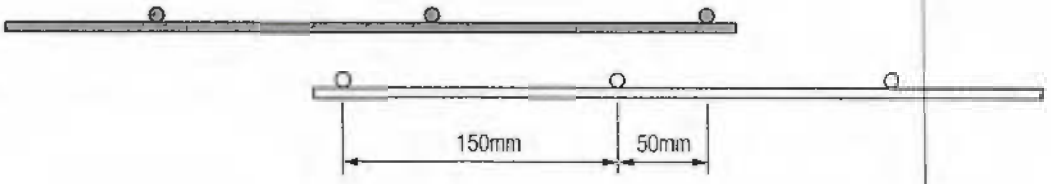


diagram not to scale

C4

LAPPAGES CONVERSIONS

MESH	COMMENTS	SIDE LAP	END
661 662 663 664 665 668	2 Wires plus 50mm for encasement plus overhangs	240	350
D84 D147 D188 D212 D264 D295	Overhangs to reach edge wire	300	300
84XP 147XP	2 Squares of double edge wires plus overhangs	190	225
NOTE: If sheets are cut and overhang or edge wire detail is lost, laps must revert to: 2 Wires plus 50mm in the lap zone			

- In some circumstances such as building slabs, reinforcing bar can be substituted with welded mesh.
- There are substantial savings in labour and time that can be gained by using welded mesh instead of tied re-bar.
- The quick reference conversion chart on page 10, makes allowance for the differences in design strengths of 500 grade and 300 grade re-bar and the 485 proof stress of hard drawn reinforcing wire.
- Eg: from the chart, H10 @ 300 = 662 = D264 Which means 10 diameter 500 grade bar at 300mm centres can be substituted with 662 mesh or D264 construction mesh.

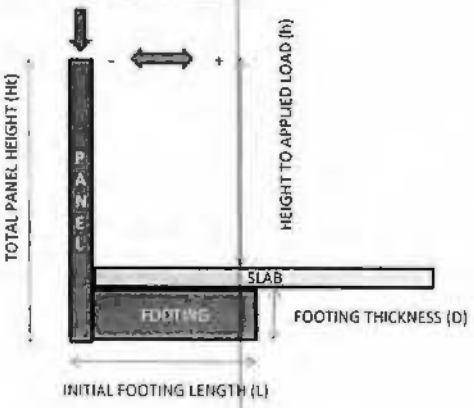


C5

Lawry Residence - 1097 Queen St East Levin

DESCRIPTION Wall/Panel 2.9m high JOB # 113573

INPUT
CALCULATION
LIST AVAILABLE



TOTAL PANEL HEIGHT (Ht) =	2.90	m	
PANEL THICKNESS =	100	mm	
INITIAL FOOTING LENGTH (L) =	900	mm	INCLUDES PANEL THICKNESS
FOOTING WIDTH (B) =	1000	mm	
SLAB THICKNESS OVER FOOTING =	100	mm	
FOOTING THICKNESS (D) =	200	mm	
SOIL/FILL THICKNESS OVER FOOTING (S) =	0.00	mm	
SOIL γ =	18	kN/m³	
DOMINANT CASE EQ/WIND/SOIL =	EQ		

APPLIED MOMENT TO FOOTING (M*) =	2.50	kNm/m width
APPLIED VERT LOADS TO PANEL (N*) =	0.00	kN/m
APPLIED HORIZ LOADS TO PANEL (P*) =		kN/m

WEIGHT OF SLAB =	4.32	kN
WEIGHT OF FOOTING =	4.32	kN
WEIGHT OF SOIL =	0.00	kN
WEIGHT OF PANEL =	6.96	kN/m
TOTAL R* =	15.60	kN

OVERTURNING MOMENT (M_O*) =	2.50	kNm	←M*
RIGHTING MOMENT (M_R*) =	4.20	kNm	
TOTAL MOMENT (M_T*) =	1.70	kNm	OK!
OVERTURNING MOMENT (M_O*) =	2.50	kNm	M*→
RIGHTING MOMENT (M_R*) =	8.43	kNm	
TOTAL MOMENT (M_T*) =	5.93	kNm	OK!
e =	0.3409	m	
L/6 =	0.13	mm	Outside Mid Third
D'=	0.18	m	
P_{ULT}* =	176	kPa	0.8
q_{ult} =	220	kPa	
q_{safe} =	73	kPa	

	la		
slab l=	0.800		0.5
footing l=	0.8		0.5
soil l=	0.8		0.5
wall l=	0.1		0.05
	la		
slab l=	0.8		0.4
footing l=	0.8		0.4
soil l=	0.8		0.4
wall l=	0.1		0.85

FOOTING SUMMARY USE 900 mm (L) FOOTING
200 mm (D)

THREADED INSERTS TO PANEL

INITIAL GUESS

REID BAR DIAMETER =	12	mm
CENTRES OF INSERTS =	100	mm
INSERTS DISTANCE FROM FOOTING BASE =	125	mm
EXTEND PANEL BELOW BASE OF FOOT =	100	mm
ϕ =	0.85	
CHARACTERISTIC YEILD STRENGTH =	56.50	kN
ϕN_{BASIC} =	48.02	
L_1 =	78.00	mm
BAR CENTRS IN TERMS OF L_1 =	1.28	
CENTRES REDUCTION FACTOR =	0.33	
EDGE DISTANCE IN TERMS OF L_1 =	2.88	
EDGE DISTANCE REDUCTION FACTOR =	0.93	
ϕN =	15.90	kN
FIXINGS @ 100 mm CRS =	159.01	kN/m
ϕN_{REQ} =	127.20	kN/m OK

APPLIED MOMENT FROM PANEL (M*) =	2.50	kNm/m width
FOOTING THICKNESS (D) =	200	mm
d =	73	mm
b =	1000	mm
f'c =	25	MPa
fy =	500	MPa
As REQUIRED =	300	mm²/m

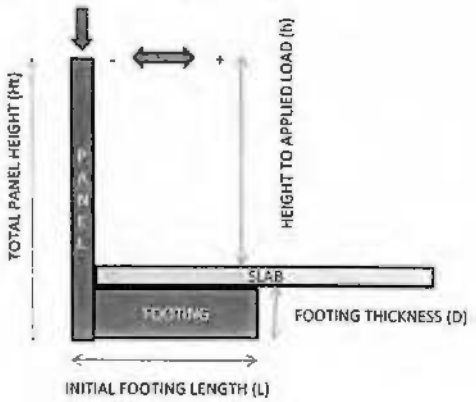
INSERTS SUMMARY USE RBTI 12
@ 100 mm CENTERS
@ 125 mm FROM BASE OF FOOTING
PANEL TO EXTEND BELOW FOOTING BASE BY 100 mm

C39

Lawry Residence - 1097 Queen St East Levin

DESCRIPTION Wall/Panel 3.32m high 100mm thick JOB # 113573

INPUT
CALCULATION
LIST AVAILABLE



TOTAL PANEL HEIGHT (Ht) =	3.32	m	
PANEL THICKNESS =	100	mm	
INITIAL FOOTING LENGTH (L) =	1100	mm	INCLUDES PANEL THICKNESS
FOOTING WIDTH (B) =	1000	mm	
SLAB THICKNESS OVER FOOTING =	100	mm	
FOOTING THICKNESS (D) =	200	mm	
SOIL/FILL THICKNESS OVER FOOTING (S) =	0.00	mm	
SOIL γ =	18	kN/m³	
DOMINANT CASE EQ/WIND/SOIL =	EQ		
APPLIED MOMENT TO FOOTING (M*) =	3.80	kNm/m width	
APPLIED VERT LOADS TO PANEL (N*) =	0.00	kN/m	
APPLIED HORIZ LOADS TO PANEL (P*) =		kN/m	
WEIGHT OF SLAB =	5.28	kN	
WEIGHT OF FOOTING =	5.28	kN	
WEIGHT OF SOIL =	0.00	kN	
WEIGHT OF PANEL =	7.97	kN/m	
TOTAL R* =	18.53	kN	
OVERTURNING MOMENT (M_O*) =	3.80	kNm	←M*
RIGHTING MOMENT (M_R*) =	6.06	kNm	
TOTAL MOMENT (M_T*) =	2.26	kNm	OK!
OVERTURNING MOMENT (M_O*) =	3.80	kNm	M*→
RIGHTING MOMENT (M_R*) =	12.28	kNm	
TOTAL MOMENT (M_T*) =	8.48	kNm	OK!
e =	0.1280	m	
L/6 =	0.17	mm	Outside Mid Third
D'=	0.22	m	
P_{ULT}* =	171	kPa	0.8
q_{SLS} =	214	kPa	
q_{safe} =	71	kPa	

	la	
slab l=	1.000	0.6
footing l=	1	0.6
soil l=	1	0.6
wall l=	0.1	0.05

	la	
slab l=	1	0.5
footing l=	1	0.5
soil l=	1	0.5
wall l=	0.1	1.05

FOOTING SUMMARY USE 1100 mm (L) FOOTING
200 mm (D)

THREADED INSERTS TO PANEL

INITIAL GUESS

REID BAR DIAMETER =	12	mm	
CENTRES OF INSERTS =	100	mm	
INSERTS DISTANCE FROM FOOTING BASE =	125	mm	
EXTEND PANEL BELOW BASE OF FOOT =	100	mm	
ϕ =	0.85		
CHARACTERISTIC YEILD STRENGTH =	56.50	kN	
ϕN_{BASIC} =	48.03		
L_1 =	75.00	mm	
BAR CENTRS IN TERMS OF L_1 =	1.28		
CENTRES REDUCTION FACTOR =	0.93		
EDGE DISTANCE IN TERMS OF L_1 =	2.80		
EDGE DISTANCE REDUCTION FACTOR =	0.99		
ϕN =	45.50	kN	
FIXINGS @ 100 mm CRS =	455.01	kN/m	
ϕN_{REQ} =	127.99	kN/m	OK

APPLIED MOMENT FROM PANEL (M*) =	3.80	kNm/m width
FOOTING THICKNESS (D) =	200	mm
d =	75	mm
b =	1000	mm
f'c =	25	MPa
fy =	500	MPa
As REQUIRED =	300	mm²/m

INSERTS SUMMARY USE RBTI 12
@ 100 mm CENTERS
@ 125 mm FROM BASE OF FOOTING
PANEL TO EXTEND BELOW FOOTING BASE BY 100 mm

C6

Project Name	Lawry Residence	**Grid reference**	
Address	1097 Queens Street - Levin	**Panel Reference**	100mm
Engineer	CLB	**Job ref:**	113573
Date	July/14	**Comments**	100mm thick Panel - 2.9m high

Materials

Concrete

Wall - MPa: 50

Base - MPa: 25

Ec - GPa: 23.5

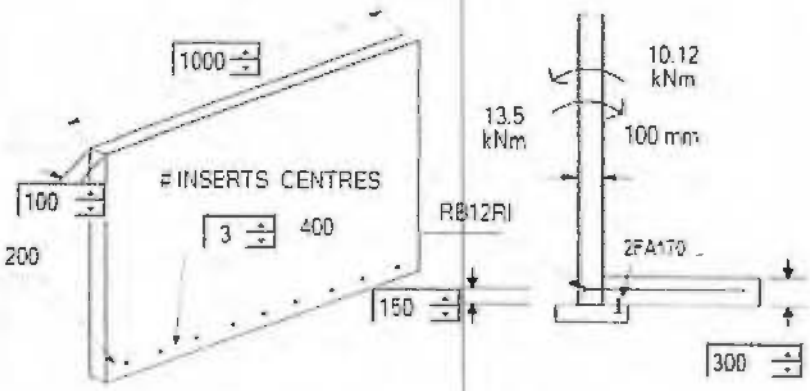
Reinforcement

Grade 500 - MPa

Es - GPa: 200.0

Insert Size

- (•) RB12RI
- ( ) RB12TI
- ( ) RBA16TI
- ( ) RB20TI
- ( ) RB25



Rows of Inserts in the base

- (•) one row
- ( ) two rows

Insert/Reo Info

	RB12RI	Starters
Effective depth - mm	83	38
Critical spacing - mm	249	114

[ ] Moment enhancement

Std starters

- (•) Central reo
- ( ) cover to reo

Results

CAPACITIES	RB12RI Inserts		Compare standard bent out starters	
Moments	Opening	Closing	Opening	Closing
Total Wall - kNm	10.12	13.5	3.14	4.18
Wall - kNm/m	10.12	13.5	3.14	4.18
Forces				
Insert/bar - kN	28.56	38.08	8.85	11.8

Calculate



Line check

$0.5 \times \frac{2.9^2}{2} = 2\text{kN}$ ok

DESIGN

Check PC Panel Continues

$W_M = 1.03$ kPa
$W_S = 0.69$ kPa
Fire = 0.5 kPa
$E_H = (0.15 + 0.24 + 3) \times 0.97 = 3.3$ kPa
$+ E_S = 3.3 \times \frac{0.21}{0.97} = 0.71$ kPa

125mm max height @ 3.37m

worst case SEISMIC ref Cl.

M* $E_H = (0.15 + 0.24 + 3) \times 0.97 \times \frac{3.37^2}{8} = 4.7$ kNm

$V^* = 5.5$ kN

Try HD10 @ 300 CTRS $\Rightarrow A_s = 261$ mm^2/met

Try HD 10 @ 250 $A_s = 314$ mm

$f'_c = 30$
$f_y = 500$

$A_{s\ min\ horizontal} = 0.7 / f_y \, bd = 175$ mm

$\phi M_n = 6.76$ kNm ref Pg C8

$A_{s\ min} > A_s$ however as per NZS 3101 clause 11.3.11.3 (c) vertical reinforcement is more than one third greater than required thus adopt

$0.0014 A_g = 0.0014 \times 125 \times 1000 = 175$ mm^2 125mm PC Panel

which is < As provided ok

PC checks $\phi < 1/4$ thickness ok Stability ok
spacing < 3 < thickness. - 375mm USE

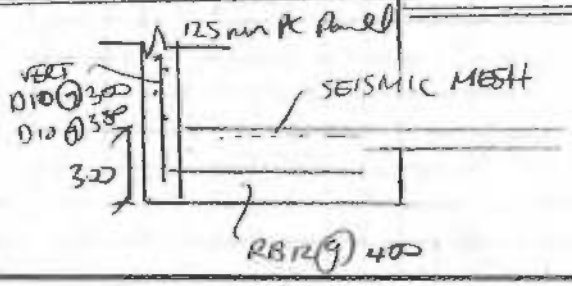
$\Delta_{E_S} = \frac{5 \times 0.71 \times 3370^4}{384 \times 30.3 \times 10^3 \times 1627 \times 10^4} = < 1$mm $\Delta_{W_S} = 1 \times \frac{0.67}{0.71} = \approx 1$mm ok HD 10 @ 250 VERT

By inspection Δ_{E_H} ok.

Check 125 panel @ 3.9 ok BY INSPECTION
OPENING BELOW.

USE HD10 @ 300 vert & horizontal + HD 10 @ 350 CTRS 125mm PC Panel

footing ref C9.



C8

RC BEAM Moment Capacity

Beam	Depth H mm	125		0.125
	Width B mm	1000		1.000
	As (bottom face)	314.0	mm2	0.000314 m2
	F'c	50	MPa	
	Fy	500	MPa	
	d mm	62.5	mm	
	Phi (Bending)	0.85		

TD 12 @ 250

a = (As.Fy)/(0.85F'c.B) =	3.69	mm
jd =	60.65	mm
Phi M = phi.As.Fy.jd =	**8.09**	**kN.m**
phi T = phi.Fy.As =	133.5	kN/m

M* = 4.7 < ϕMn

I effective to NZS 3101:1982

Ma (G & .7Qu)	**12**	**kN.m**	
I gross	**0.0002**	**m4**	**1.63E-04 m4**
fr	4.24	MPa	
M cr	**11.0**	**kN.m**	
Section a	4	mm	0.004 m
x top	4	mm	0.004 m
x bot	58	mm	0.058 m
	2	mm	0.002 m
A c'	2617	mm2	0.003 m2
I cracked	**0.0000**	**m4**	**8.88E-06 m4**
I e	**0.0001**	**m4**	**1.29E-04 m4**
	79%	I gross	

APPROVED
01 AUG 2014
CONSENT

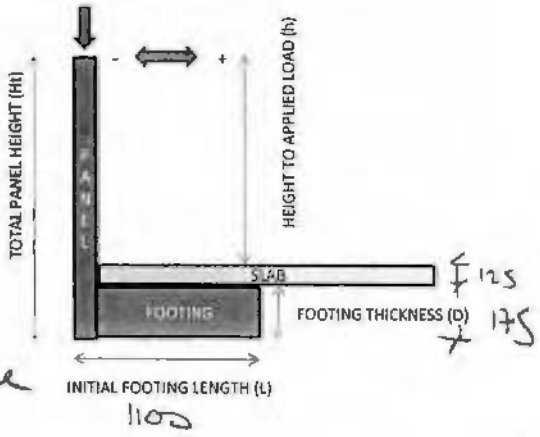
Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

C9

Lawry Residence - 1097 Queen St East Levin

DESCRIPTION Wall/Panel 3.37m high 125mm thick **JOB #** 113573

INPUT
CALCULATION
LIST AVAILABLE



TOTAL PANEL HEIGHT (Ht) =	3.37	m	
PANEL THICKNESS =	125	mm	
INITIAL FOOTING LENGTH (L) =	1100	mm	INCLUDES PANEL THICKNESS
FOOTING WIDTH (B) =	1000	mm	
SLAB THICKNESS OVER FOOTING =	~~125~~ 100	mm	
FOOTING THICKNESS (D) =	~~175~~ 200	mm	
SOIL/FILL THICKNESS OVER FOOTING (S) =	0.00	mm	
SOIL γ =	18	kN/m³	
DOMINANT CASE EQ/WIND/SOIL =	EQ		
APPLIED MOMENT TO FOOTING (M*) =	4.13	kNm/m width	
APPLIED VERT LOADS TO PANEL (N*) =	0.00	kN/m	Axial say 0 conservative check
APPLIED HORIZ LOADS TO PANEL (P*) =		kN/m	
WEIGHT OF SLAB =	6.50	kN	12ct 1.52.
WEIGHT OF FOOTING =	4.62	kN	Bearing capacity
WEIGHT OF SOIL =	0.00	kN	ref
WEIGHT OF PANEL =	10.11	kN/m	
TOTAL R* =	21.33	kN	
OVERTURNING MOMENT (M_O*) =	4.13	kNm	←M*
RIGHTING MOMENT (M_R*) =	6.75	kNm	
TOTAL MOMENT (M_T*) =	2.62	kNm	OK!
OVERTURNING MOMENT (M_O*) =	4.13	kNm	M*→
RIGHTING MOMENT (M_R*) =	14.36	kNm	
TOTAL MOMENT (M_T*) =	10.23	kNm	OK!
e =	0.4270	m	
L/6 =	0.18	mm	Outside Mid Third
D'=	0.18	m	
P_{ULT}* =	235	kPa	0.8
q_{ult} =	294	kPa	
q_{safe} =	98	kPa	

		la
slab l=	0.975	0.6125
footing l=	0.975	0.6125
soil l=	0.975	0.6125
wall l=	0.125	0.0625

		la
slab l=	0.975	0.4875
footing l=	0.975	0.4875
soil l=	0.975	0.4875
wall l=	0.125	1.0375

FOOTING SUMMARY USE 1100 mm (L) FOOTING
175 mm (D)

THREADED INSERTS TO PANEL

INITIAL GUESS

REID BAR DIAMETER =	12	mm	
CENTRES OF INSERTS =	300	mm	
INSERTS DISTANCE FROM FOOTING BASE =	125	mm	
EXTEND PANEL BELOW BASE OF FOOT =	100	mm	
ϕ =	0.85		
CHARACTERISTIC YEILD STRENGTH =	56.50	kN	
ϕN_{BASIC} =	48.03		
L_1 =	78.00	mm	
BAR CENTRS IN TERMS OF L_1 =	3.85		
CENTRES REDUCTION FACTOR =	0.84		
EDGE DISTANCE IN TERMS OF L_1 =	2.88		
EDGE DISTANCE REDUCTION FACTOR =	0.93		
ϕN =	38.81	kN	
FIXINGS @ 300 mm CRS =	132.70	kN/m	
ϕN_{REQ} =	127.50	kN/m	OK

APPLIED MOMENT FROM PANEL (M*) =	4.13	kNm/m width
FOOTING THICKNESS (D) =	175	mm
d =	50	mm
b =	1000	mm
Fc =	25	MPa
fy =	500	MPa
As REQUIRED =	300	mm²/m

ref reid C

INSERTS SUMMARY USE RBTI 12
@ 300 mm CENTERS
@ 125 mm FROM BASE OF FOOTING
PANEL TO EXTEND BELOW FOOTING BASE BY 100 mm

C10

Project Name	Lawry Residence	**Grid reference**	
Address	1097 Queens Street - Levin	**Panel Reference**	125mm
Engineer	CLB	**Job ref:**	113573
Date	July/14	**Comments**	125mm thick Panel - 2.9m high

– 3.4m high

Materials

Concrete

Wall - MPa 50

Base - MPa 25

Ec - GPa 23.5

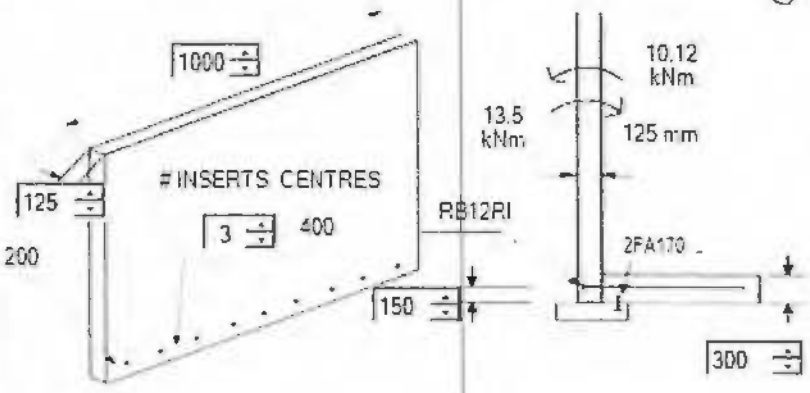
Reinforcement

Grade 500 - MPa

Es - GPa 200.0

Insert Size

- (•) RB12RI
- ( ) RB12TI
- ( ) RBA16TI
- ( ) RB20TI
- ( ) RB25



Rows of Inserts in the base

- (•) one row
- ( ) two rows

Insert/Reo Info

	RB12RI	Starters
Effective depth - mm	83	50.5
Critical spacing - mm	249	151.5

☐ Moment enhancement

Std starters

- (•) Central reo
- ( ) cover to reo

Calculate

Results

CAPACITIES	RB12RI Inserts		Compare standard bent out starters	
Moments	Opening	Closing	Opening	Closing
Total Wall - kNm	10.12	13.5	4.8	6.41
Wall - kNm/m	10.12	13.5	4.8	6.41
Forces				
Insert/bar - kN	28.56	38.08	13.55	18.07

Spot check $\frac{0.5 \times 3.4^2}{2} = 3\text{kNm}$ Ok

CLIENT	LAWRY RESIDENCE				
SUBJECT	1097 QUEEN ST EAST - LEVIN				
FILE No. 113573	DATE JULY 14	PAGE C11	OF	BY	CKD

KOA

DESIGN
Check PC Panel Continues

150 mm max height 2.9 m

worst case SEISMIC ref C1.

$W_R = 1.03\,kPa$
$W_S = 0.69\,kPa$
$E_H = (3.6 + 0.15 + 0.24) \times 0.97 = 3.9\ kN/m$ length.
$E_S = 3.9 \times \frac{0.24}{0.97} = 0.84\ kN/m$ length. (CLINING ROCK COTS)
$M^* = \frac{3.9 \times 2.9^2}{8} = 4.1\ kNm < \phi M_n = 8.8\ kNm$ OK
$V^* = 3.9 \times \frac{3}{2} = 6\ kN$

Try 10mm @ 400 $\Rightarrow A_s = 1.35\,kN$

$\frac{V^*}{4 \times f_y}$ A_s min $> A_s$ however as per NZS 3101 clause 11.3.11.3 (c) vertical reinforcement is more than one third greater than demand thus adopt

$0.0014\,A_g = 0.0014 \times 150 \times 1000 = 210\ mm^2$ OK $< A_s$ provided

PC checks $\phi < \frac{1}{4}$ thickness
stability checks OK
space max 450 OK

By inspection deflection OK.

TD 12
@ 400

TD 10
@ 400

C12

RC BEAM Moment Capacity

Beam	Depth H mm	150		0.150
	Width B mm	1000		1.000
	As (bottom face)	285.0	mm2	0.000285 m2
	F'c	50	MPa	
	Fy	500	MPa	
	d mm	75	mm	
	Phi (Bending)	0.85		

a = (As.Fy)/(0.85F'c.B) = 3.35 mm

jd = 73.32 mm

Phi M = phi.As.Fy.jd = 8.88 kN.m

phi T = phi.Fy.As = 121.1 kN/m

I effective to NZS 3101:1982

Ma (G & .7Qu) 12 kN.m

	I gross	**0.0003 m4**	**2.81E-04 m4**
	fr	4.24 MPa	
	M cr	**15.9 kN.m**	
Section	a	3 mm	0.003 m
	x top	4 mm	0.004 m
	x bot	71 mm	0.071 m
		2 mm	0.002 m
	A c'	2375 mm2	0.002 m2
	I cracked	**0.0000 m4**	**1.20E-05 m4**
	I e	**0.0003 m4**	**2.81E-04 m4**
		100% I gross	

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

CB

Project Name	Lawry Residence	**Grid reference**	
Address	1097 Queens Street - Levin	**Panel Reference**	150mm
Engineer	CLB	**Job ref:**	113573
Date	July/14	**Comments**	150mm thick Panel - 2.9m high

Materials

Concrete

Wall - MPa 50

Base - MPa 25

Ec - GPa 23.5

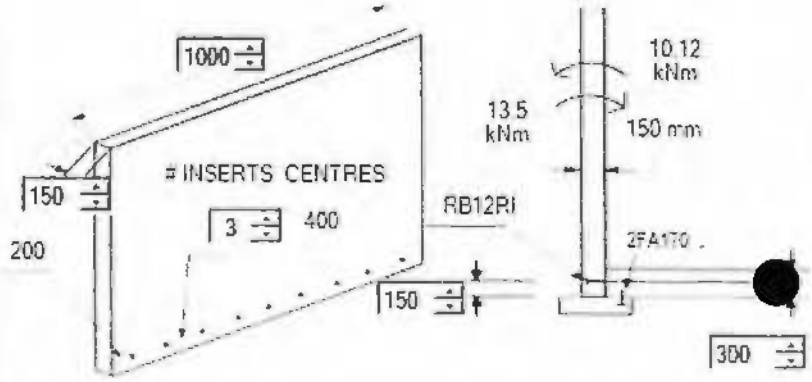
Reinforcement

Grade 500 - MPa

Es - GPa 200.0

Insert Size

- (•) RB12RI
- ( ) RB12TI
- ( ) RBA16TI
- ( ) RB20TI
- ( ) RB25



Rows of Inserts in the base

- (•) one row
- ( ) two rows

Insert/Reo Info

	RB12RI	Starters
Effective depth - mm	83	63
Critical spacing - mm	249	189

☐ Moment enhancement

Std starters

- (•) Central reo
- ( ) cover to reo

Results

CAPACITIES	RB12RI Inserts		Compare standard bent out starters	
Moments	Opening	Closing	Opening	Closing
Total Wall - kNm	10.12	13.5	6.69	8.93
Wall - kNm/m	10.12	13.5	6.69	8.93
Forces				
Insert/bar - kN	28.56	38.08	18.88	25.18

Calculate

Time check

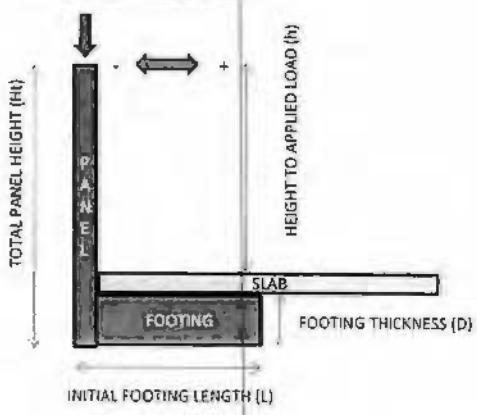
$0.5 \times \frac{3^2}{2} = 2.3\text{kNm}$ Ok

14

Lawry Residence - 1097 Queen St East Levin

DESCRIPTION Wall/Panel 2.9m high 150mm thick JOB # 113573

INPUT
CALCULATION
LIST AVAILABLE



TOTAL PANEL HEIGHT (Ht) =	2.90	m	
PANEL THICKNESS =	150	mm	
INITIAL FOOTING LENGTH (L) =	1100	mm	INCLUDES PANEL THICKNESS
FOOTING WIDTH (B) =	1000	mm	
SLAB THICKNESS OVER FOOTING =	100	mm	
FOOTING THICKNESS (D) =	200	mm	
SOIL/FILL THICKNESS OVER FOOTING (S) =	0.00	mm	
SOIL γ =	18	kN/m³	
DOMINANT CASE EQ/WIND/SOIL =	EQ		
APPLIED MOMENT TO FOOTING (M*) =	3.80	kNm/m width	
APPLIED VERT LOADS TO PANEL (N*) =	2.00	kN/m	
APPLIED HORIZ LOADS TO PANEL (P*) =		kN/m	
WEIGHT OF SLAB =	5.28	kN	
WEIGHT OF FOOTING =	5.28	kN	
WEIGHT OF SOIL =	0.00	kN	
WEIGHT OF PANEL =	10.44	kN/m	
TOTAL R* =	21.00	kN	
OVERTURNING MOMENT (M_O*) =	3.80	kNm	←M*
RIGHTING MOMENT (M_R*) =	6.64	kNm	
TOTAL MOMENT (M_T*) =	2.84	kNm	OK!
OVERTURNING MOMENT (M_O*) =	3.80	kNm	M*→
RIGHTING MOMENT (M_R*) =	14.15	kNm	
TOTAL MOMENT (M_T*) =	10.35	kNm	OK!
e =	0.4145	m	
L/6 =	0.16	mm	Outside Mid Third
O' =	0.18	m	
P_{ULT}* =	232	kPa	0.8
q_{ult} =	289	kPa	
q_{safe} =	96	kPa	

	la	
slab l=	0.950	0.625
footing l=	0.95	0.625
soil l=	0.95	0.625
wall l=	0.15	0.075

	la	
slab l=	0.95	0.475
footing l=	0.95	0.475
soil l=	0.95	0.475
wall l=	0.15	1.025

FOOTING SUMMARY USE 1100 mm (L) FOOTING
200 mm (D)

THREADED INSERTS TO PANEL

INITIAL GUESS

REID BAR DIAMETER =	12	mm
CENTRES OF INSERTS =	300	mm
INSERTS DISTANCE FROM FOOTING BASE =	125	mm
EXTEND PANEL BELOW BASE OF FOOT =	100	mm
ϕ =	0.85	
CHARACTERISTIC YEILD STRENGTH =	56.50	kN
ϕN_{Basic} =	48.02	
L_1 =	78.00	mm
BAR CENTRS IN TERMS OF L_1 =	3.85	
CENTRES REDUCTION FACTOR =	0.87	
EDGE DISTANCE IN TERMS OF L_1 =	2.88	
EDGE DISTANCE REDUCTION FACTOR =	0.99	
ϕN =	35.82	kN
FIXINGS @ 300 mm CRS =	132.70	kN/m
ϕN_{REQ} =	127.50	kN/m OK

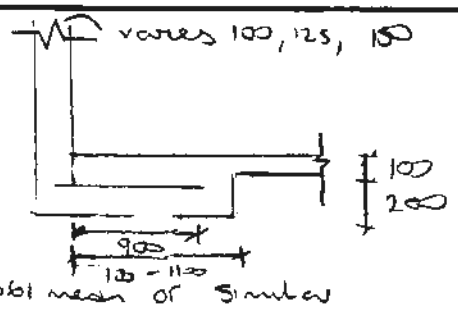
APPLIED MOMENT FROM PANEL (M*) =	3.80	kNm/m width
FOOTING THICKNESS (D) =	200	mm
d =	75	mm
b =	1000	mm
f'c =	25	MPa
fy =	500	MPa
As REQUIRED =	300	mm²/m

INSERTS SUMMARY USE RB12
@ 300 mm CENTERS
@ 125 mm FROM BASE OF FOOTING
PANEL TO EXTEND BELOW FOOTING BASE BY 100 mm

CLIENT	LAWRY RESIDENCE				
SUBJECT	1097 QUEEN STREET EAST - LEVIN				
FILE No. 113573	DATE July 14	PAGE C15 OF	BY CLB	CKD	

KO

PC Panel Summary



661 mesh or similar

100 PC Panel

upto 2.9m height

FOOTING -B12@400 CTRS, 900 Embed
(deep) 200 x 1000 (length)

upto 3.32m height

Say

661 mesh or similar

RB12@400 CTRS, 900 Embed

(deep 200 x 1100 (length)

125 PC Panel

upto 3.4m height

VERT YD10@250, HOR YD10@350 CTRS
FOOTING RB12@400 CTRS
200 Deep x 1100 Length

150 PC Panel

upto 2.9m height

vert YD12@300, hor YD10@400
FOOTING RB12@400, 600 Embed
200 d x 1100 length

RB12 Embedment length 900 mm.

NOTE

- 100 mm thick Slab with SEISMIC MESH - CROSS SECTION AREA 148 mm² /metre or similar with 35 mm top CVR
- FOUNDATION CONCRETE STRENGTH f'_c = 25 MPa.
- PC PANEL STRENGTH f'_c = 500 MPa
- f_y steel = 500 MPa, E = 200 MPa

CLIENT LAURY RESIDENCE

SUBJECT 1097 QUEEN STREET EAST / LEVIN

FILE No. 113573 | DATE July 14 | PAGE D1 OF | BY CWS | CKD

KOA

DESIGN LINTEL OVER OPENINGS - roof pitch say 10°

h/d = ≥1

150 mm PC Panel (ref P31)

- worst case span length say 5.1 m.
- lintel depth = 510 mm

Lintel is tributed to say 11 m/2 of roof load

Roof load

tan θ = 0.18

G = 0.5 kPa × 11/2 = 2.8 kN/m

Q = 0.25 kPa × 11/2 = 1.4 kN/m

W_u = 1.03 × (0.7 + 0.6) × 11/2 = 7.4 N/m

and CAN wind most permeable say door open

LINTEL S.W

G = (24 × 0.15 + 0.39) × 0.51 = 2.1 kN/m

ΣG = 2.8 + 2.1 = 5 N/m

LOAD COMBINATIONS

1.2G + 1.5Q = 1.2(5) + 1.5(1.4) = 8.1 kN/m.

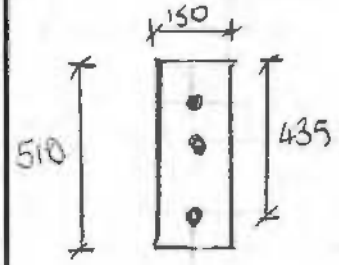
1.35G = 1.35(5) = 6.8 kN/m.

0.9G + W_u = 0.9(5) − 7.4 = 3 kN/m ↑ uplift

S.W panel either side footing > uplift OK

Design Bending moment

$M^* = 8.1 \times 5.1^2/8$ = 21 kNm



HD 16

b = 150 mm
d = 435 mm
f_y = 500 MPa
f_c' = 50 MPa

A_s = 201 mm²

⇒ ϕM_n = 39 kNm > M^* OK

USE HD 16 top + bottom to 150 mm thick Lintel.

CLIENT	LAWRY RESIDENCE			
SUBJECT	1097 QUEEN ST EAST LEVIN			
FILE No.	DATE JULY	PAGE 01 OF	BY CLS	CKD

KOA

Check Attic 150 PC Panel

$1.2G + 1.5Q = 8.1$ kN/m - pg D1.

G Attic Floor $= 0.5 \times \frac{6.6}{2} = 1.7$ kN/m

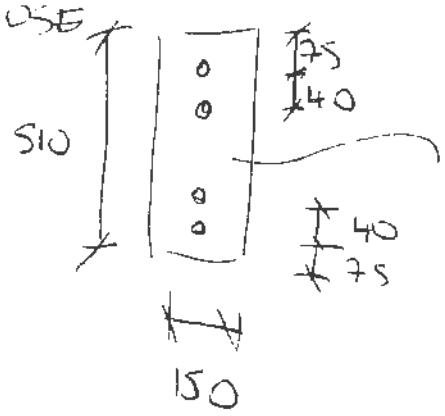
Q Attic Floor $= 0.5 \cdot \frac{6.6}{2} = 1.7$ kN/m

NZS 1170.1 A1 Table 3.1 non habitable roof space

$1.2G + 1.5Q = 12(1.7) + 1.5(1.7) + 8.1 = 12.7$ kN/m

$M^* = 12.7 \cdot \frac{5.1^2}{8} = 41.3$ kN < $\phi M_n = 39$ kN.m

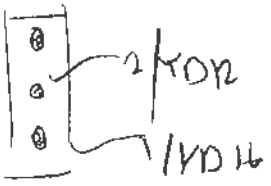
No Good



USE 4/HD 16 $\phi M_n > M^*$ OK

Check 100 mm lintel over garage 2.5m

$M^* = 12.7 \times \frac{2.5^2}{8} = 9.9$ kNm OK < ϕM_n.



OK $\phi M_n > M^*$

R1b

RC BEAM Moment Capacity

Beam	Depth H mm	150		0.150
	Width B mm	510		0.510
	As (bottom face)	402.0	mm2	0.000402 m2
	F'c	50	MPa	
	Fy	500	MPa	
	d mm	315	mm	
	Phi (Bending)	0.85		

a = (As.Fy)/(0.85F'c.B) = 9.27 mm

jd = 310.36 mm

Phi M = phi.As.Fy.jd = 53.03 kN.m

phi T = phi.Fy.As = 170.9 kN/m

I effective to NZS 3101:1982

Ma (G & .7Qu) 12 kN.m

	I gross	**0.0001 m4**	**1.43E-04 m4**
	fr	4.24 MPa	
	M cr	**8.1 kN.m**	
Section	a	9 mm	0.009 m
	x top	11 mm	0.011 m
	x bot	304 mm	0.304 m
		6 mm	0.006 m
	A c'	3350 mm2	0.003 m2
	I cracked	**0.0003 m4**	**3.10E-04 m4**
	I e	**0.0003 m4**	**2.59E-04 m4**

180% I gross

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

D2

150 PC Panel

LINTEL

RC BEAM Moment Capacity

Beam	Depth H mm	150		0.150
	Width B mm	510		0.510
	As (bottom face)	201.0	mm2	0.000201 m2
	F'c	50	MPa	
	Fy	500	MPa	
	d mm	435	mm	
	Phi (Bending)	0.85		

1 x Y016

a = (As.Fy)/(0.85F'c.B) =	4.64	mm
jd =	432.68	mm
Phi M = phi.As.Fy.jd =	**36.96**	**kN.m**
phi T = phi.Fy.As =	85.4	kN/m

$\phi M_n > M^*$ OK

I effective to NZS 3101:1982

Ma (G & .7Qu)	**12**	**kN.m**

	I gross	**0.0001 m4**	**1.43E-04 m4**
	fr	4.24 MPa	
	M cr	**8.1 kN.m**	
Section	a	5 mm	0.005 m
	x top	5 mm	0.005 m
	x bot	430 mm	0.430 m
		3 mm	0.003 m
	A c'	1675 mm2	0.002 m2
	I cracked	**0.0003 m4**	**3.09E-04 m4**
	I e	**0.0003 m4**	**2.58E-04 m4**

180% I gross

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

CLIENT	LAWRY RESIDENCE			
SUBJECT	1097 QUEEN ST EAST LEVIN			
FILE No. 113375	DATE JULY 14	PAGE 03 OF	BY CHS	CKD

KOA

DESIGN LINTEL OVER OPENING CONTINUOUS

roof pitch α say 20°

$L/d \geq 1$

125mm PC Panel

- worst case

say length = 3620 (P19 + P13, P15)

say 4m

Lintel depth = 660mm

Lintel is tributed to say $\frac{10.5}{2}$ of roof load

Roof load

$G = 0.5 \times \frac{10.5}{2}$ = 2.7 kN/m

$Q = 0.25 \times 5.3$ = 1.4 kN/m

$W_u = 1.03 \times (0.7 + 0.6) \times 5.3$ = 7.1 kN/m

(0.6 ↑ windward wall open)

LINTEL S.W

$G = (24 \times 0.125 + 0.39) \times 0.66 = 2.24$ kN/m

$\Sigma G = 2.7 + 2.24$ = 4.7 kN/m

APPROVED
01 AUG 2014
CONSENT

LOAD COMBINATIONS

$1.2G + 1.5Q = 1.2(.5) + 1.5(1.4) = 8.1$ kN/m

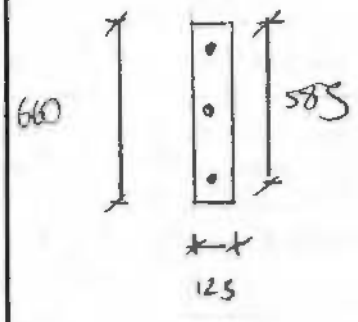
$1.35G = 1.35(.5) = 6.7$ kN/m

$0.9G + W_u = 0.9(5) - 7.1 = 2.6$ kN/m ↑ uplift

S.W Panel either side resist uplift OK

DESIGN BENDING MOMENT

$M^* = 8.1 \times \frac{4^2}{8} = 16.2$ kN m



b = 150 mm
d = 435 mm
f_y = 500 MPa
f'_c = 50 MPa

$A_s = 113 mm^2$

$\phi M_n = 29$ kN m > M^* OK

D4

RC BEAM Moment Capacity

Beam	Depth H mm	125		0.125
	Width B mm	660		0.660
	As (bottom face)	113.0	mm2	0.000113 m2
	F'c	50	MPa	
	Fy	500	MPa	
	d mm	585	mm	
	Phi (Bending)	0.85		
	a = (As.Fy)/(0.85F'c.B) =	2.01	mm	
	jd =	583.99	mm	
	Phi M = phi.As.Fy.jd =	**28.05**	**kN.m**	
	phi T = phi.Fy.As =	48.0	kN/m	

I effective to NZS 3101:1982

	Ma (G & .7Qu)	**12**	**kN.m**
	I gross	**0.0001 m4**	**1.07E-04 m4**
	fr	4.24 MPa	
	M cr	**7.3 kN.m**	
Section	a	2 mm	0.002 m
	x top	2 mm	0.002 m
	x bot	583 mm	0.583 m
		1 mm	0.001 m
	A c'	942 mm2	0.001 m2
	I cracked	**0.0003 m4**	**3.20E-04 m4**
	I e	**0.0003 m4**	**2.72E-04 m4**
		253% I gross	

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

RC BEAM Moment Capacity

Beam	Depth H mm	125		0.125
	Width B mm	660		0.660
	As (bottom face)	226.0	mm2	0.000226 m2
	F'c	50	MPa	
	Fy	500	MPa	
	d mm	510	mm	
	Phi (Bending)	0.85		

a = (As.Fy)/(0.85F'c.B) = 4.03 mm

jd = 507.99 mm

Phi M = phi.As.Fy.jd = 48.79 kN.m

phi T = phi.Fy.As = 96.1 kN/m

I effective to NZS 3101:1982

Ma (G & .7Qu) 12 kN.m

	I gross	**0.0001 m4**	**1.07E-04 m4**
	fr	4.24 MPa	
	M cr	**7.3 kN.m**	
Section	a	4 mm	0.004 m
	x top	5 mm	0.005 m
	x bot	505 mm	0.505 m
		3 mm	0.003 m
	A c'	1883 mm2	0.002 m2
	I cracked	**0.0005 m4**	**4.81E-04 m4**
	I e	**0.0004 m4**	**3.97E-04 m4**

370% I gross

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

06

RC BEAM Moment Capacity

Beam	Depth H mm	125		0.125
	Width B mm	192		0.192
	As (bottom face)	201.0	mm2	0.000201 m2
	F'c	50	MPa	
	Fy	500	MPa	
	d mm	142	mm	
	Phi (Bending)	0.85		

a = (As.Fy)/(0.85F'c.B) =	12.32	mm
jd =	135.84	mm
Phi M = phi.As.Fy.jd =	**11.60**	**kN.m**
phi T = phi.Fy.As =	85.4	kN/m

$\phi M_n > M^*$

OK

I effective to NZS 3101:1982

Ma (G & .7Qu)	**12**	**kN.m**

	I gross	**0.0000 m4**	**3.13E-05 m4**
	fr	4.24 MPa	
	M cr	**2.1 kN.m**	
Section	a	12 mm	0.012 m
	x top	14 mm	0.014 m
	x bot	128 mm	0.128 m
		8 mm	0.008 m
	A c'	1675 mm2	0.002 m2
	I cracked	**0.0000 m4**	**2.74E-05 m4**
	I e	**0.0000 m4**	**2.74E-05 m4**
		88% I gross	

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

069

RC BEAM Moment Capacity

Beam	Depth H mm	125		0.125
	Width B mm	192		0.192
	As (bottom face)	113.0	mm2	0.000113 m2
	F'c	50	MPa	
	Fy	500	MPa	
	d mm	142	mm	
	Phi (Bending)	0.85		

a = (As.Fy)/(0.85F'c.B) = 6.92 mm

jd = 138.54 mm

Phi M = phi.As.Fy.jd = 6.65 kN.m

phi T = phi.Fy.As = 48.0 kN/m

I effective to NZS 3101:1982

Ma (G & .7Qu) 12 kN.m

	I gross	**0.0000 m4**	**3.13E-05 m4**
	fr	4.24 MPa	
	M cr	**2.1 kN.m**	
Section	a	7 mm	0.007 m
	x top	8 mm	0.008 m
	x bot	134 mm	0.134 m
		5 mm	0.005 m
	A c'	942 mm2	0.001 m2
	I cracked	**0.0000 m4**	**1.69E-05 m4**
	I e	**0.0000 m4**	**1.70E-05 m4**

54% I gross

Note: Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

$\phi = 0.75$

Check Shear

$\phi V_n = V_c + V_s$

$V_c = v_c \times A_{cv} = k \times \sqrt{f'_c} \times A_c = 0.2 \times \sqrt{50} \times 192 \times 125 = 33.9 kN$

$V_s = A_v f_y (d/s) = A_s f_y = 2 \times \left(\frac{16}{2}\right)^2 \times \pi \times 500 = 201$

$\phi V_n = 0.75 (33.9 + 201) = 176 kN > V^*$ OK

CLIENT LAWRY RESIDENCE

SUBJECT 1097 QUEEN ST, EAST - LEVIN

FILE No. 113573 | DATE JULY 14 | PAGE 05 OF | BY CAS | CKD

KOA

Design lintel over opening continue

125 mm PC Panel continue

Check P 27

2.8 m length 192 deep say

tributary roof area $\frac{4.5\,m}{2}$

$G_{Roof} = 0.5 \times 2.3 = 1.15$ kN/m

$Q_{Roof} = 0.25 \times 2.3 = 0.6$ kN/m

$W_n = 1.03 \times (1.3) \times 23 = 3.1$ kN/m

G S.W lintel $= 24 \times 0.2 \times 0.15 = 0.6$ kN/m

$\Sigma G = 0.6 + 1.15 = 1.8$ kN/m.

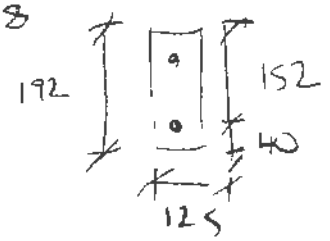
$\Rightarrow$ $1.2G + 1.5Q = 1.2(1.8) + 1.5(0.6) = 3.1$ kN/m

$1.35G = 1.35(1.8) = 2.43$ kN/m.

$0.9G + W_n = 0.9(1.8) - 3.1 = 1.5$ kN/m

Design Bending Moment

$M^*_{(1.2G+1.5Q)} = 3.1 \times \frac{2.9^2}{8} = 3.3$ kN m



$b = 125$ mm

$d = 152$ mm

$f_y = 500$ MPa

$f_c = 50$ MPa

$A_s = 113$ mm^2

$\phi M_n = 6.6$ kN m ✗

$A_s = 201$ mm^2

$\phi M_n = 11.6$ kN m ✓

USE 2 Y16

$\phi = 0.75$ $3.1 \times \frac{4}{2} = 6.2$ kN

$\phi V_n = \phi(V_c + V_s) = \phi\left[(k \sqrt{f'_c} \times A_c) + (A_s f_y)\right] = 17.6$ kN $> V^*_s$

CLIENT	LAWRY RESIDENCE				
SUBJECT	1097 QUEEN ST, EAST / LEVIN				
FILE No. 113573	DATE 5/4/14	PAGE 1	OF 6	BY CKS	CKD

KOA

DESIGN LINTEL OVER OPENINGS

100mm PC Panel (ref P4+P16) length say 4m.

$G_{roof} = 0.5 \times \frac{11}{5} = 2.8$ kN/m

$Q = 0.25$ kPa $\times 5.5 = 1.4$ kN/m

$W_u = 1.03(0.7+0.6) \times 5.5 = 7.4$ kN/m.

LINTEL S.W 610 deep.

$G = (24 \times 0.1 + 0.39) \times 0.61 = 1.7$

$\Sigma G = 2.8 + 1.7 = 4.5$ kN

LOAD COMBINATIONS

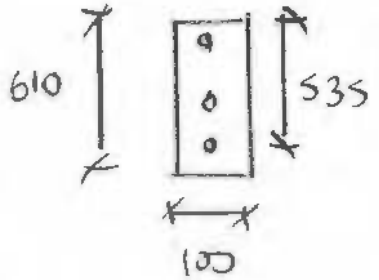
$1.2G + 1.5Q = 1.2(4.5) + 1.5(1.4) = 7.5$ kN/m

$1.35G = 1.35(4.5) = 6.1$ kN/m

$0.9(G) + W_u = 0.9(4.5) + -7.4 = 3.4$ kN/m

Design Bending Moment

$M^* = 7.4 \times \frac{4^2}{8} = 15$ kNm



Y D12

$b = 100$ mm $A_s = 113$ mm^2

$d = 535$ mm

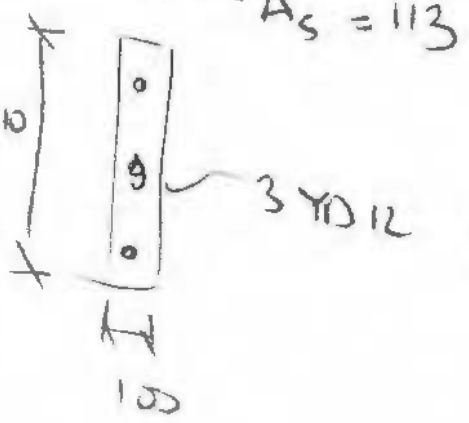
$f_y = 500$ MPa ϕM_n

$f'_c = 50$ MPa

07

RC BEAM Moment Capacity

Beam	Depth H mm	100		0.100
	Width B mm	610		0.610
	As (bottom face)	113.0	mm2	0.000113 m2
	F'c	50	MPa	
	Fy	500	MPa	
	d mm	535	mm	
	Phi (Bending)	0.85		
	a = (As.Fy)/(0.85F'c.B) =	2.18	mm	
	jd =	533.91	mm	
	Phi M = phi.As.Fy.jd =	**25.64**	**kN.m**	
	phi T = phi.Fy.As =	48.0	kN/m	



I effective to NZS 3101:1982

	Ma (G & .7Qu)	**12**	**kN.m**
	I gross	**0.0001 m4**	**5.08E-05 m4**
	fr	4.24 MPa	
	M cr	**4.3 kN.m**	
Section	a	2 mm	0.002 m
	x top	3 mm	0.003 m
	x bot	532 mm	0.532 m
		1 mm	0.001 m
	A c'	942 mm2	0.001 m2
	I cracked	**0.0003 m4**	**2.67E-04 m4**
	I e	**0.0003 m4**	**2.57E-04 m4**
		505% I gross	

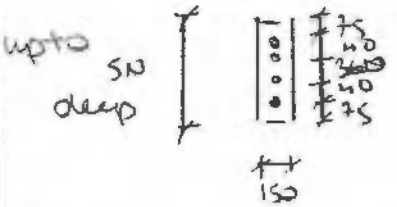
Note. Ignores top reinforcing in calculating I cr (conservative)
Assumes Ec = 24 GPa

KOA

SUMMARY LINTELS

LINTEL

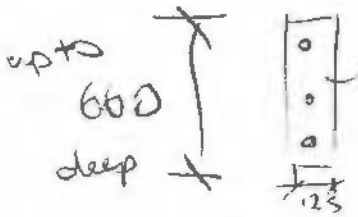
150 PC Panel max span 5.1m



2 TO 16

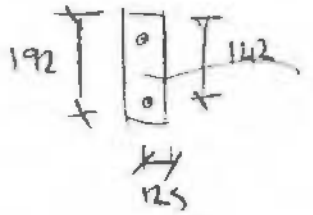
TIES
USE Vert PC Panel

125 PC Panel max span up to 4m



TIES
USE vert PC Panel

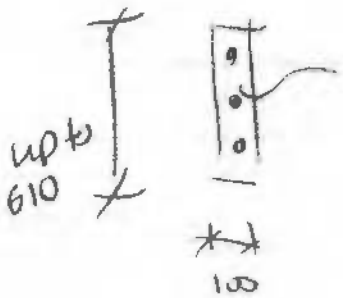
125 PC Panel span up 3m



USE 2 TO 16

ties R6 @ 150 CTRS

100 PC Panel



USE 3 TO 12

CLIENT	LAWRY RESIDENCE				
SUBJECT	1097 QUEEN STREET EAST /LEVIN				
FILE No.	113573	DATE JULY	PAGE E1 OF	BY CLB	CKD

KOA

Check wall strength to lateral loads

By inspection, Earthquake load governing

(1) Roof SEISMIC WEIGHT

Roof Area = 474 × 1.15 = 545 m^2

CANOPY etc = 76 × 1.15 = 87 m^2

632 m^2

W_{Roof} = 0.5 × 632 = 316

(2) WALL SEISMIC WEIGHT

PC Panels + GLAZING

Ref PayDirt W = 484 kN

conservative assuming 50% for concrete 30% glazing

(3) Internal Partitions

Based on floor area

W = 0.2 kPa × 474 = 95 kN

ΣW = 895 kN

(4) SEISMIC FORCE

SEISMIC WEIGHT = 895 kN

C d(T) = 0.97 kN

V_E = 0.97 × 895 = 868 kN < ϕV_c ok

E2

Project 113573 - 1097 Queens Street East Levin — Jul-14
Panel Analysis — CLB

Panel No	Width	Opening	Net Width	Along Length	Across Length
P1	6.54	2.13	4.41		4.41
P2	1.21	0.00	1.21		1.21
P3	4.69	0.86	3.83	3.83	
P4	5.64	2.41	3.23	3.23	
P5	1.32	0.86	0.46		0.46
P6	6.00	2.82	3.18	3.18	
P7	5.32	2.81	2.51	2.51	
P8	3.95	2.81	1.14		1.14
P9	3.74	1.21	2.53		2.53
P10	1.81	0.00	1.81	1.81	
P11	5.30	3.82	1.48		1.48
P12	5.52	2.82	2.70		2.70
P13	4.67	3.01	1.66	1.66	
P14	6.90	2.82	4.08		4.08
P15	4.56	3.01	1.55	1.55	
P16	6.68	4.01	2.67		2.67
P17	1.49	0.00	1.49	1.49	
P18	6.08	4.41	1.67		1.67
P19	4.50	3.61	0.89	0.89	
P20	4.40	1.41	2.99	2.99	
P21	5.94	2.82	3.12		3.12
P22	1.48	0.00	1.48	1.48	
P23	7.01	4.22	2.79		2.79
P24	1.08	0.00	1.08	1.08	
P25	3.40	2.36	1.04		1.04
P26	1.56	0.00	1.56	1.56	
P27	6.35	4.02	2.33		2.33
P28	0.60	0.00	0.60	0.60	
P29	2.61	1.21	1.40		1.40
P30	5.40	3.92	1.48		1.48
P31	7.28	5.00	2.28	2.28	
P32	3.60	2.40	1.20	1.20	
		Summary	**65.80**	**31.32**	**34.48**

Critical direction is the " Along Length" with less walls to resist lateral load.

Shear Capacity of concrete walls

fc= 50 Mpa
vc= 0.57
ϕ= 0.75
thickness= 100 mm min panel thickness
0.80

ϕVc=ϕvcAcv= 10629 kN > 868 kN OK.

Thus PC Panels Have sufficient capacity to resist lateral loads.

$\phi V_n = \phi (V_c + V_s)$ ⇒ V_s by inspection OK greater capacity

E3

Project 113573 - 1097 Queens Street East Levin — Jul-14
Panel Analysis — CLB

Concrete weight	PC thickness	Height	Mass excluding Opening	Opening PC Mass70%	Glazing 30% Opening	
24	0.1	2.90	30.7	10.4	0.19	
24	0.1	2.90	8.4	0.0	0.00	
24	0.1	2.90	26.6	4.2	0.08	
24	0.1	2.90	22.5	11.7	0.22	
24	0.1	2.90	3.2	4.2	0.08	
24	0.1	2.90	22.1	13.7	0.25	
24	0.1	2.90	17.4	13.7	0.25	
24	0.1	2.90	7.9	13.7	0.25	
24	0.1	2.90	17.6	5.9	0.11	
24	0.1	2.90	12.6	0.0	0.00	
24	0.1	2.90	10.3	18.6	0.34	
24	0.1	2.90	18.8	13.7	0.25	
24	0.125	3.40	16.9	21.5	0.27	
24	0.125	3.40	41.6	20.1	0.25	
24	0.125	3.40	15.8	21.5	0.27	
24	0.1	2.90	18.5	19.5	0.36	
24	0.125	3.40	15.2	0.0	0.00	
24	0.125	3.40	17.0	31.5	0.40	
24	0.125	3.40	9.1	25.8	0.32	
24	0.125	3.40	30.5	10.1	0.13	
24	0.125	3.40	31.8	20.1	0.25	
24	0.1	2.90	10.3	0.0	0.00	
24	0.1	2.90	19.4	20.6	0.38	
24	0.1	3.50	9.1	0.0	0.00	
24	0.1	3.50	8.7	13.9	0.21	
24	0.1	3.50	13.1	0.0	0.00	
24	0.125	3.40	23.8	28.7	0.36	
24	0.1	2.90	4.2	0.0	0.00	
24	0.1	2.90	9.7	5.9	0.11	
24	0.1	2.90	10.3	19.1	0.35	
24	0.15	2.90	23.8	36.5	0.45	
24	0.15	2.90	12.5	17.5	0.22	
		Total	**539.37**	**422.19**	**6.37**	

PC Wall Weight say half to foundation **484.0**

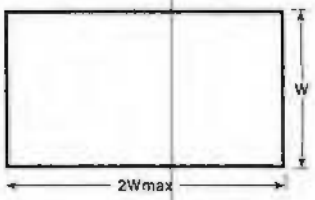
Glazing 0.3

E4

Ceiling Diaphragms

MARCH 2006

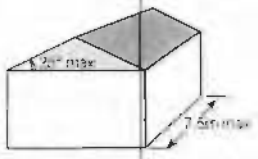
GIB® ceiling diaphragms are strong and stiff horizontal bracing elements which effectively transfer loads over large distances. They are used to space bracing lines further apart than 5 metres (single top plate), or 6 metres (double top plate).
A ceiling diaphragm shall be square or rectangular. Its length shall not exceed twice its width. The width being measured horizontally between supporting walls. Ceiling diaphragms under light and heavy roofs are required to comply with NZS3604: 1999.



Limitations for 10mm or 13mm GIB® Standard Plasterboard Ceiling Diaphragms

- Diaphragms not steeper than 25 degrees to the horizontal shall not exceed 7.5 metres in length.
- 10mm or 13mm GIB® Standard Plasterboard is fastened at 150mm centres to the boundary members around the entire perimeter of the diaphragm.

  Fasteners – 32mm x 6g GIB® Grabber® Drywall Screws or 30mm x 2.8mm GIB® Nails.

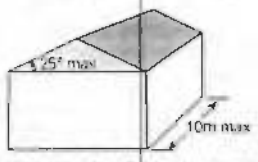


GIB® Standard Plasterboard Diaphragms

Limitations for GIB Ultraline® Ceiling Diaphragms

- Diaphragms not steeper than 25 degrees to the horizontal shall not exceed 10 metres in length.
- GIB Ultraline® is fastened at 150mm centres to the boundary members around the entire perimeter of the diaphragm.

  Fasteners – 32mm x 6g GIB® Grabber® Drywall Screws or 30mm x 2.8mm GIB® Nails.

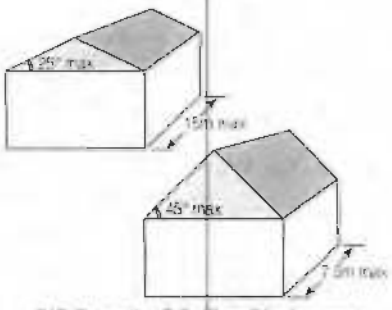


GIB Ultraline® Diaphragms

GIB Braceline® Ceiling Diaphragms

- Diaphragms not steeper than 25 degrees to the horizontal shall not exceed 15 metres in length.
- Diaphragms not steeper than 45 degrees to the horizontal shall not exceed 7.5 metres in length.
- GIB Braceline® is fastened at 150mm centres to the boundary members around the entire perimeter of the diaphragm.

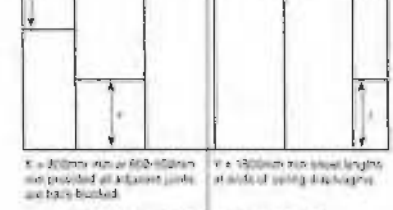
  Fasteners – 32mm x 7g GIB Braceline® Drywall Screws or 35mm GIB Braceline® Nails.



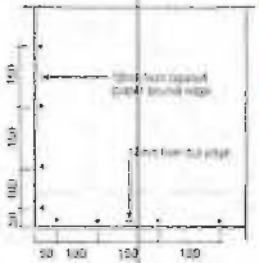
GIB Braceline® Ceiling Diaphragms

General Fixing Requirements for GIB® Ceiling Diaphragms

- Linings shall be installed over the entire area of the diaphragm.
- Fastening shall be no less than 12mm from sheet edges.
- Sheets shall be supported by framing members (e.g. ceiling battens) spaced at no more than 450mm centres for 10mm GIB® plasterboard and at no more than 600mm centres for 13mm GIB® plasterboard.
- Sheets within the diaphragm area may be fastened and finished conventionally in accordance with the publication entitled "GIB® Site Guide". All joints shall be paper tape reinforced and stopped. It is recommended that sheet butt joints are formed off framing and back-blocked (see "GIB® Site Guide").
- Use full width sheets where possible. At least 900mm wide sheets with a length not less than 1800mm shall be used. Sheets less than 900mm wide but no less than 600mm may be used provided all joints with adjacent sheets are back-blocked (see "GIB® Site Guide").
- Openings are allowed within the middle third of the diaphragm's length and width. Fixing of sheet material to opening trimmers shall be at 150mm centres. Neither opening dimension shall exceed a third of the diaphragm width. Larger openings, or openings in other locations, require specific engineering design. Refer "Openings in Bracing Elements" page 27.
- Fasteners are placed at 150mm centres around the ceiling diaphragm starting at 50mm and 150mm from the sheet corners.



Sheet Widths and Lengths in Ceiling Diaphragms



Fastening pattern for ceiling diaphragms

APPROVED
01 AUG 2014
CONSENT

In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow system specifications.

CLIENT	LAWRY RESIDENCE				
SUBJECT	1097 QUEEN STREET - EAST / LEVIN				
FILE No. 113573	DATE JULY 14	PAGE F1	OF	BY CJB	CKD

KOA

DESIGN CHECK OF ALFRESCO POST

ALFRESCO ROOF AREA

$A = (7.1 \times 6.5) \times 11 = 50.7\ m^2$

POST IS TRIBUTED TO $\frac{50.7}{4} = 12.7\ m^2$ OF ROOF LOAD.

ROOF LOAD

$G = 0.5\ kPa \times 12.7 = 6.3\ kN$

$Q = 0.25\ kPa \times 12.7 = 3.2\ kN$

$W_u = 1.03\ kPa \times 1.5 \times 12.7 = 19.6\ kN$

$C_{p,n}$

$4_a = 0.3 + \frac{3}{\sqrt{A}} = 1$

POST S.W

$G = 24 \times 0.3^2 \times 4.2 = 9\ kN$

$G_{\text{ROUGHCOAT TEXTURED FINISH}} = 0.01 \times 24 \times 42 = 1\ kN$

PILE S.W

$G = 24 \times 0.5^2 \times 0.9 = 5.4\ kN$

$\Sigma G = 6 + 9 + 1 + 5.4 = 21.4\ kN$

LOAD COMBINATION

$1.2G + 1.5Q = 31.4\ kN$

$0.9G + W_u = 0.3\ kN \uparrow$

Check Ground bearing

$P_{max} = \frac{30.5}{0.5^2} = 121\ kPa < 100\ kPa \times \frac{3}{2}$ OK

$G + Q = \frac{24.6}{0.5^2} = 98 < 100\ kPa$ Ok

ASSUME GOOD GROUND

CLIENT LAWRY RESIDENCE

SUBJECT 1097 QUEEN STREET EAST / LEVIN

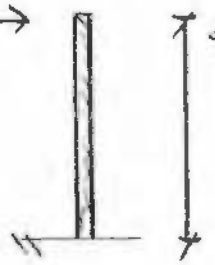
FILE No. 113573 | DATE JULY 14 | PAGE F2 OF | BY CMB | CKD

KOA

ALFRESCO POST CHECK CONTINUE

Check Post for lateral loads

V_E = 11.1 kN →



SEISMIC WEIGHT

W_{ROOF} = 6.3 kN

$W_{POST/COLUMN}$ $\frac{9.1+1}{2}$ = 5.1 kN

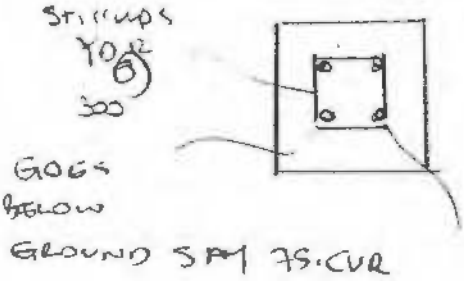
half to foundation

ΣW = 11.4 kN

SEISMIC FORCE $V_E = 11.4 \times 0.97 = 11.1$ kN
$C_d(T)$

DESIGN CHECK BENDING MOMENT

$M^* = 11 \times 3.2 = 35$ kNm $< \phi M_n$ OK



b = 300 mm
d = 222 mm
f_y = 500 MPa
f'_c = 40 MPa

$A_s > A_{s\,min}$ OK $\quad \phi M_n = 44$ kNm $> M^*$ OK
refer PD F3

USE 2 - YD 16 top + bottom @ post / column

F3

Job number (or name): 113573
Column number: Alfresco Post

User name : chantelle.bailey

Concrete properties:

Rectangular stress block as defined by NZS 3101:1995.
Concrete cylindrical compressive strength = 40.0 MPa
Concrete compression stress coefficient, a1 = 0.85
Compression zone depth coefficient, B1 = 0.77
Concrete maximum strain = 0.0030

Steel properties:

Steel modulus of elasticity = 200 000 MPa
Steel yield strength = 500.0 MPa

Dimensions of the column section:

Rectangular section.
Height of the column section = 300.0 mm
Width of the column section = 300.0 mm
Clear cover to ties parallel to the y-axis = 75.0 mm
Clear cover to ties parallel to the x-axis = 75.0 mm

Results:

Load combination number 1 :-
Axial load = 0.0 kN, Mx = 44.5 kNm, My = 0.0 kNm
Strength reduction factor, Phi = 0.85
Required reinforcement ratio = 0.00893, Required reinforcement area = 803.7 mm2
Initial reinforcement ratio = 0.00893, Initial reinforcement area = 803.7 mm2
Initial reinforcement ratio scaled by = 1.0000
Moment ratio = 0.00000, Target moment ratio = N/A
Skew angle = 0.0 degrees, NA depth = 51.2 mm
Force (unfactored) carried by concrete = 402.1 kN
Force (unfactored) carried by reinforcement = -402.1 kN

Load combination number 2 :-
Axial load = 1.0 kN, Mx = 44.6 kNm, My = 0.0 kNm
Strength reduction factor, Phi = 0.85
Required reinforcement ratio = 0.00893, Required reinforcement area = 803.7 mm2
Initial reinforcement ratio = 0.00893, Initial reinforcement area = 803.7 mm2
Initial reinforcement ratio scaled by = 1.0000
Moment ratio = 0.00000, Target moment ratio = N/A
Skew angle = 0.0 degrees, NA depth = 51.4 mm
Force (unfactored) carried by concrete = 403.3 kN
Force (unfactored) carried by reinforcement = -402.1 kN
Axial load eccentricity: ex = 0.0 mm, ey = 44600.0 mm

The analysis for all load combinations have been finished.

KOA

Check Post FOUNDATION

ALFESCO POST

USE 500 mm^2 x 1200 mm deep OK

ref page F5

ENTRANCE / PORTICO POST

By ratio of area

$V_E = 11.4 \times \frac{31.2}{37.2} \times 0.97 = 9.6$

$M^* = 9.6 \times 3.2 = 30.5$ kNm

USE 500 mm^2 x 900 mm deep OK

ref page F6

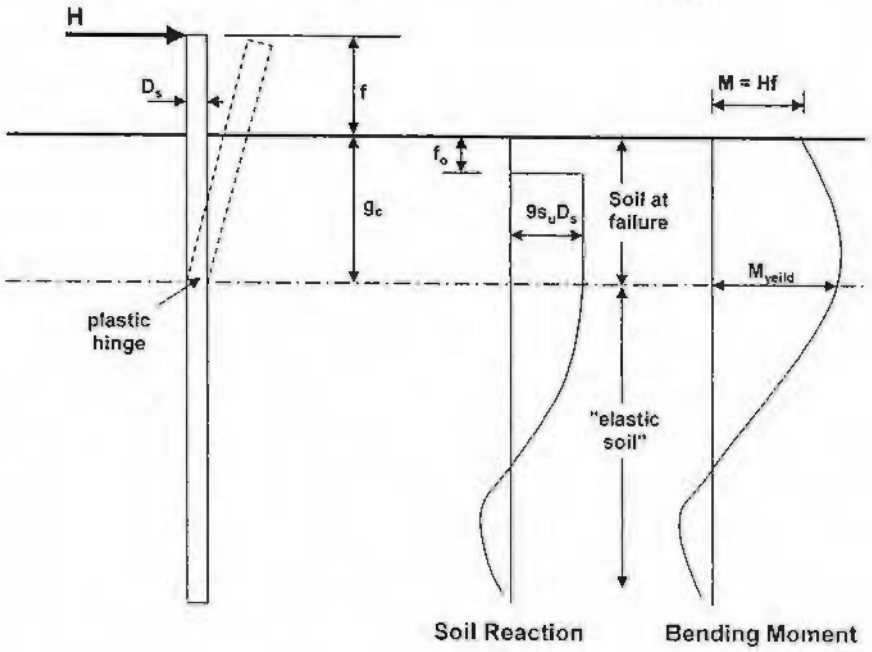
Job Number : 113573
Job Title : Lawry Residence - 1097 Queens St East - Levin
Alfresco Post

ES

Page Number :
Calcs by :
Date :
Checked by :

Undrained lateral capacity of piles in overconsolidated clay (constant undrained shear strength with depth)

Verification Method
B1/VM4



Pile Information

Length of Pile (L) =	1.2	m
Pile Diameter (D_s) =	0.5	m
Ult Moment capacity (M_{ull}) =	44	kNm
Horizontal load (H) =	11.1	kN
Height to load (f) =	0.1	m

Soil Information

Constant undrained shear strength (s_u) = 150 kN/m^2

Assumed length of pile (f_o) = 0.3 m
unsupported in soil

Ultimate lateral capacity of a short free head pile

$$H_{u\ capacity} = 9\, s_u\, D_s\, [\,(\,2(L+f)^2 + (f+f_o)^2\,)^{0.5} - (\,L + 2f + f_o\,)\,]$$

$H_{u\ capacity}$ = 150.9 kN ***DO NOT USE***

$$g_c = \frac{H_u}{9\, s_u\, D_s} + f_o$$

g_c = 0.52 m ***DO NOT USE***

$$M_{max} = H_u \times \left(f + f_o + \frac{H_u}{18\, s_u\, Ds} \right)$$

M_{max} = 77.2 kNm ***DO NOT USE***

Greater then Ult Moment Capacity - use long free head pile equation

Ultimate lateral capacity of a long free head pile

$$H_{u\ capacity} = 3\, s_u\, D_s\, [\,(9(f+f_o)^2 + \frac{2\, M_{ult}}{s_u\, D_s})^{0.5} - 3(f+f_o)\,]$$

$H_{u\ capacity}$ = 94 kN ***Use This Result***

M_{max} = 44.0 kNm ***Use This Result***

g_c = 0.44 m ***Use This Result***

$\phi H_n > H^*$ OK.

$\phi M_n = 352 kN > M^*$ OK

$\phi = 0.8$ → SDSMIC

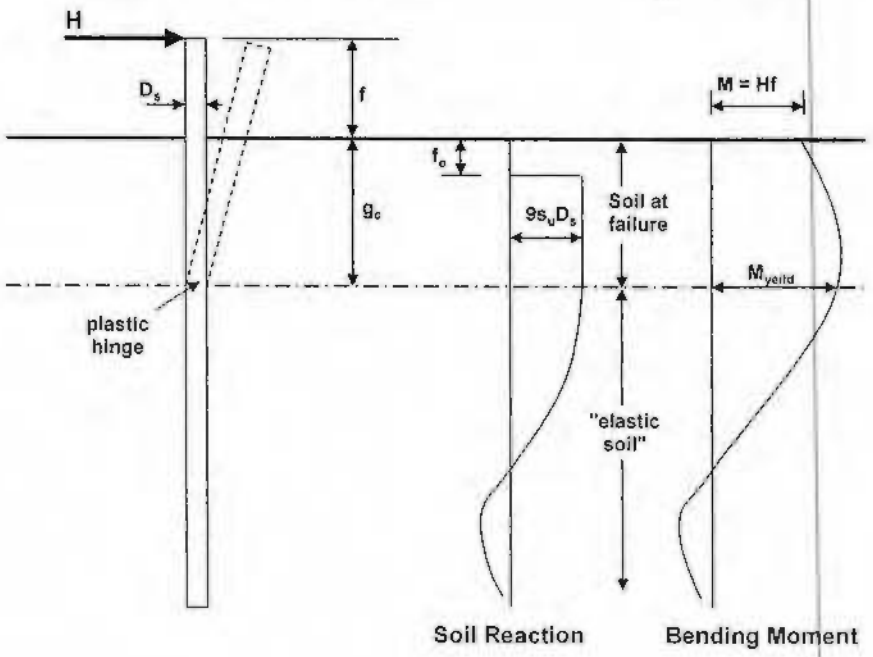
Job Number : 113573
Job Title : Lawry Residence - 1097 Queens St East - Levin
Portico Post

F6

Page Number :
Calcs by :
Date :
Checked by :

Undrained lateral capacity of piles in overconsolidated clay (constant undrained shear strength with depth)

Verification Method B1/VM4



Pile Information

Length of Pile (L) =	0.9	m
Pile Diameter (D_s) =	0.5	m
Ult Moment capacity (M_{ult}) =	44	kNm
Horizontal load (H) =	11.1	kN
Height to load (f) =	0.1	m

Soil Information

Constant undrained shear strength (s_u) = 150 kN/m²

Assumed length of pile (f_o) = 0.3 m
unsupported in soil

Ultimate lateral capacity of a short free head pile

$$H_{u\ capacity} = 9\ s_u\ D_s\ [\ (\ 2(L + f)^2 + (f + f_o)^2\ )^{0.5} - (\ L + 2\ f + f_o\ )\ ]$$

$H_{u\ capacity}$ = 83.1 kN ***Use This Result***

$\phi H_u > H$ OK

$$g_c = \frac{H_u}{9\ s_u\ D_s} + f_o$$

g_c = 0.42 m ***Use This Result***

$$M_{max} = H_u \times \left(f + f_o + \frac{H_u}{18\ s_u\ Ds} \right)$$

M_{max} = 38.4 kNm ***Use This Result***

$\phi M = 0.8 \times 38.4 = 30.7 > M^*$ OK

less than Ult Moment Capacity - use short free head pile equation

Ultimate lateral capacity of a long free head pile

$$H_{u\ capacity} = 3\ s_u\ D_s\ \left[\left(9(f + f_o)^2 + \frac{2\ M_{ult}}{s_u\ D_s} \right)^{0.5} - 3(f + f_o) \right]$$

$H_{u\ capacity}$ = 94 kN ***DO NOT USE***

M_{max} = 44.0 kNm ***DO NOT USE***

g_c = 0.44 m ***DO NOT USE***

Client: Homestead Concrete Homes

Job#: H1408

Vstor= (Rc - Vsoak)	**32.27**		
Vsoak= (Asp x Sr/1000)	8.112		Volume disposed of by soakage in 1hr (m^2)
Asp=	13.52	m^2	plan size of soak pit (width x depth)
Sr=	600	mm/hr	Soakage rate
Rc= (10x (C x I x A))	40.38		Runoff discharged from catchment into soakpit
C=	0.9		Run-off co-efficent (roof is 0.90)
I=	70	mm/hr	Rainfall intensity - Appendix A E1/AS1
A=	0.0641	Ha	catchment area in hectares (roof area)

Soakpit design	w	d	h
Soakpit=	5.2	2.6	1.6

Soak pits required:

(Vstor / (Soakpit size/0.38)) **3.9258 soakpits reqd**

0.38= factor from E1/AS1 for rockfilled soakpits

APPROVED
01 AUG 2014
CONSENT

NEW HOUSE FOR:

Homestead Homes Ltd

at:

1097 Queen Street
Levin 5571

HOROWHENUA DISTRICT COUNCIL
APPROVED
SUBJECT TO COMPLIANCE WITH THE BUILDING CONSENT DOCUMENTATION



HOMESTEAD
CONCRETE HOMES

LICENSED BUILDING PRACTITIONER
www.dbh.govt.nz
BUILDING CONFIDENCE

Layout Page Table		
Page#	Sheet #	Page Title
1		Title Page
2	PI1	Project Information
3	L1	Site Plan
4	A1	Layout Plan
5	A2	Dimension Plan
6	A3	Dimension Framing Plan
7	A4	Dimension Framing Plan
8	A5	Elevations
9	A6	Cross Sections
10	A7	Slab Plan
11	A8	Plumbing & Drainage Plan
12	A9	Roof Plan
13	C1	Roof Details
14	C2	Roof Details
15	C3	Internal Wet Area Details
16	C4	Foundation Details
17	C5	Pre-Cast Wall Joint Details
18	C6	Joinery Details - Rockcote over Precast Panel
19	C7	Construction Details
20	C8	Construction Details

General Notes:

- A copy of the consented building consent plans are to be kept onsite at all times. The main contractor is responsible for this. Contact Homestead Concrete Homes to obtain consent information if this is not available on site.
- These documents may have been scanned, copied or digitally reproduced. The plans may not be to scale. Contact the architect/technician to confirm measurements that are unclear.
- Reference in this document and supporting documentation shall be taken as refering to the latest version of and standard or rule.
- Barriers, scaffolding and handrails are to comply with NZBCF5 & OSH requirements.
- All variations to the consented plans must be consented by the territorial authority.
- Slip resistance of walking/traffic surfaces shall be in compliance with Table 2 on this Sheet. (refered to as part of NZBC D1/AS1)
- Established fences on site are not to be taken as boundary lines, confirm all boundaries.
- Before commencement, and during the construction, the head contractor (main contractor in charge of the site) is to carry out a hazard evaluation report. Site fencing in compliance with Section F5 of the New Zealand Building Code.

Site Notes:

- This is a **HIGH** wind zone. All fixings, connectors, flashings, tie downs, glazing etc are required to be to the correct level for this wind zone.

Foundation Notes:

- Unless specified in architectural drawings, all foundations are to specific engineer design carried out by:
  Kevin O'Conner & Associates.
  Refer documentation #113573
- Architectural specified foundations are to NZS3604:2011
- Foundation setout and construction will allow for the protection of all waste pipes and drainage pipes that are to pass through or under the foundation.

Wall Notes:

- Timber treatment to comply with NZS3602
- Bottom plates to be fixed in accordance with requirements of NZS3604.
- Lintel sizing to be in accordance with NZS3604, or other approved manufacturer. Documentation of approved lintel size to be clearly indicated on plans and supplied in supporting documentation.
- Lintel fixing to be to Lumberlok Lintel Fixing Schedule, unless specified.
- All fixings to be to requirements of NZS3604 section 4 - Durability. Table 22 of NZBC D1/AS1 should also be consideration fo all fixings.

Cladding Notes:

- All flashings to be fitted to manufacturers requirements and details.
- Air seals to be fitted where specified on plans or by manufacturers documentation.
- Rockcote systems cladding to be installed by licensed & approved applicators. A copy of the product warranty must be supplied to the territorial authority prior to final approval of CCC.

Roofing Notes:

- Timber treatment to comply with NZS3602
- All roof fixings are to comply with NZS3604:2011, section 10.
- Trusses shall be designed and supplied by a licensed manufacturer. A copy of the design report and Producer Statement (PS1) shall be supplied to the Territorial Authority at lodgement for approval of Building Consent.
- Support for internal truss loads are to be as indicated on the Truss Manufacturers layout design, and shown on the Foundation Plan
- Internal Load-bearing walls to be indicated on Truss Manufacturers layout design, and shown on the Foundation Plan.
- Foundation support for Internal Load-bearing walls shall be as per NZS3604:2011 Section 7 Clause 7.5.11. Refer to Truss Manufacturer for further specific detailing.
- All fixings to be to requirements of NZS3604 section 4 - Durability. Table 22 of NZBC D1/AS1 should also be consideration fo all fixings.

Window Joinery/Glazing Notes:

- Aluminium joinery to be in accordance with NZS4211
- Glazing to comply with NZS4223 (part 1, 2, 3)
- Window manufacturer to confirm all window openings on site before production.
- Window manufacturer to confirm all windows requiring safety glazing.
- Window manufacturer to supply all flashings and WANZ supports where required.
- All habitable and service spaces are required meet the minimum standard of NZBC G4/AS1. The minimum requirement is 5% of the floor area. Other means of compliance must be shown if this is not achieved.
- All windows with openings that project over an accessible route must have protection to users. Refer NZBC D1/AS1 clause 1.5.4 for methods of protection.
- Compliance with NZBC F4/AS1 paragraph 2.0 to be observed where safety from falling is required.

Fire Safety Notes:

- Residential buildings to be fitted with *Type 1* domestic smoke alarms in accordance with C/AS1 (SH Risk Group)
- Domestic smoke alarms to comply with requirements of NZBC F7/AS1
- Smoke alarms to be located on each level of the building
- Smoke alarms to be located within 3.0m of every sleeping space door.

Plumbing & Drainage Notes:

- All plumbing & drainage to be constructed in accordance with ~~NZS/AS3500.2~~
- All frost prone pipes to be lagged with suitable type of insulation
- Pipes passing under foundation to be protected.
- Tempering Valve to be fitted to Hot Water Delivery device to limit temperature to 55°C
- All underslab pipes to be tested & inspected before slab is poured.
- All drainage pipework to be tested & inspected before backfilled.
- Ensure all plumbing in external & internal wall cavities does not compromise the structural stability of the member.
- Certifying Plumber & Drainlayer to supply producer statement forms and as-built drawings to Territorial Authority upon completion of work (prior to CCC being issued)

Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION

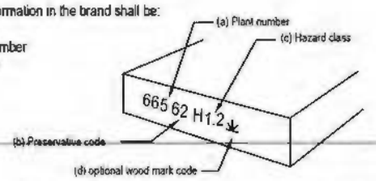
Table 2: Acceptable Slip Resistance for Walking Surfaces
Paragraphs 2.1.2, 3.1.4 and 4.1.4 c)

Walking surface[1][2]	Level surface[1]		Sloping surface[2] or stairs[3]		Typical values for coefficient of friction (wet)
	Acceptable dry slip resistance	Acceptable wet slip resistance	Acceptable dry slip resistance	Acceptable wet slip resistance	
Portland cement concrete					
Smooth trowelled finish (Class U3)[6]	Yes	No	Yes	No	0.30 – 0.45
Broomed (Class 5 or 6)[6] or wood float finish (Class U2)	Yes	Yes	Yes	Yes	0.65 – 0.85
Coated (paint, polyurethane, etc)	Yes	No	No	No	0.20 – 0.30
Coated and sand/grit impregnated[5]	Yes	Yes	Yes	Yes	0.55 – 0.90
Exposed aggregate finish					
– rounded aggregate	Yes	Test	Yes	Test	0.40 – 0.70
– crushed aggregate	Yes	Yes	Yes	Yes	0.60 – 0.90

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Timber Preservatives and Identifying Timber:

The sequence of the information in the brand shall be:
(a) plant number
(b) preservative code number
(c) hazard class number



Timber Preservatives Note: Where H3.1, H3.2, H4 or H5 timber treatment is required, CCA (copper chromium arsenic) preservative code 01 must only be used. Galvanised fixings can be used with CCA treated timber.

If alternative preservatives such as ACQ (Alkaline Copper Quaternary) preservative code 90 or CA (Copper Azole) preservative code 58 are instead used, Stainless Steel 304 or 316 fixings must always be used to timbers with these alternative preservatives **and NOT galvanised steel fixings.**

TIMBER TREATMENT SCHEDULE	
COMPONENT	**TREATMENT**
▪ Jackstuds, subfloor braces, wall plates, floor joists to the subfloor, blocking, walings and battens, noigs and diagonal boards ▪ Interior solid wood flooring to ground floors	H1.2
▪ Roof framing, trusses & ceiling joists, eaves framing, purlin & battens ▪ Enclosed flat & skillion roof framing and associated members ▪ Sarking and framing not protected from solar driven moisture through absorbent cladding materials ▪ Valley board and boards supporting flashings for box gutters, roof penetrations and upstands to roof decks	
▪ Enclosed wall framing protected from the weather and other members within or beneath a parapet ▪ Framing and other members within enclosed decks or balconies ▪ Framing and other members supporting enclosed decks or balconies ▪ Exterior wall framing and all other members including exterior and boundary joists ▪ Internal walls ▪ Midfloor framing including boundary joists, ceiling framing and ceiling battens and double top plates ▪ Internal flooring	
▪ Wall cladding cavity battens. (treatement can be either solvent-based or boron)	H3.1
▪ Framing exposed to the weather and above ground	H3.2
▪ Fence posts & landscape timbers that are exposed to the weather and in contact with the ground	H4
▪ House piles & all other members that are exposed to the weather and in contact with the ground	H5

a All timber to comply with NZS 3602
b All timber species to be Radiata Pine, unless specifically stated
c Steel fixing & fasteners in contact with timber treated with copper -based timber preservatives (H3.2 or higher) shall be Type 304 stainless steel in exposed or sheltered locations, and Hot-dipped galvanised for all other locations

CONTRACTOR TO VERIFY ALL ALL DIMENSIONS ON SITE PRIOR TO COMMENCEMENT WORK

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www.homesteadconcretehomes.co.nz
sales@homesteadgroup.co.nz
76 Main Road South, Levin 5510
Ph: 06 3681357
Fax: 06 3681359

DATE: 09-07-14
CONSENT: PRELIM ENGINEERING BUILDING CONSENT & CONSTRUCTION
DRAWN BY: Hall Stirling
REVISION#: -
CHECKED BY: Walter Simmons (LBP# 121902)
REV. DATE: -

Project Information

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

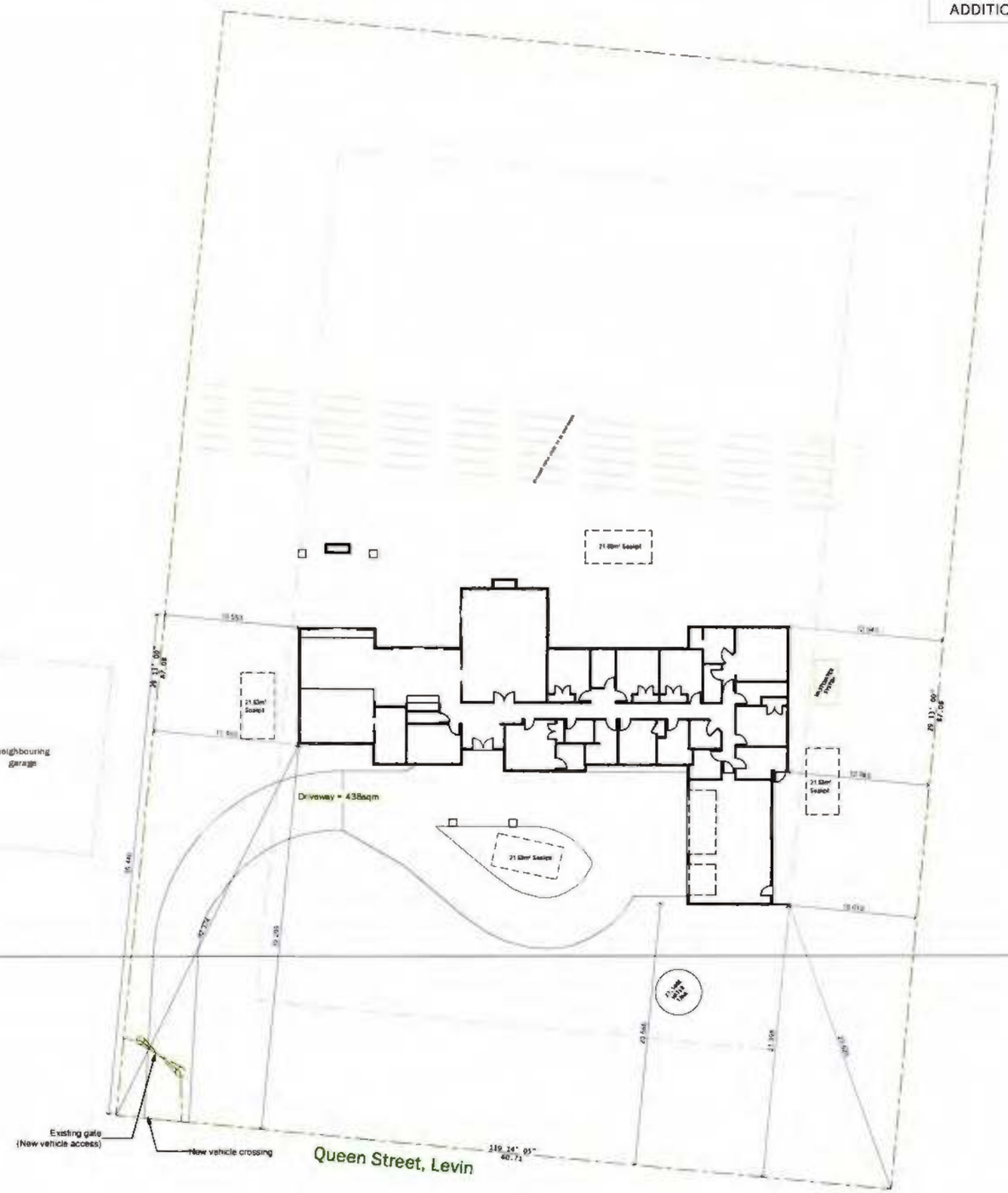
SCALE: 1:100 ISO A3 (297 mm x 420 mm)
PROJECT# H1408
SHEET# PI1 OF 20



Location Plan
Scale 1:2000

Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION



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01 AUG 2014
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SITE DETAILS

LOT: 1
DP: 468677

1097 Queen Street
Levin, 5571

COUNCIL ZONING DETAILS

Building Consent Authority:	Horowhenua District Council
Wind Zone:	High
Earthquake Zone:	3
Exposure Zone:	C
Snow Loading:	N1
Planning Zone:	Rural

SITE COVERAGE

Site:	5288sqm
Building Footprint:	475sqm
Other covered areas:	65.9sqm (entry & Alfresco)
Total coverage:	540.98sqm (10.23%)

Revision Table

Rev.	Desc.	Author	Date
1	Dwelling moved back (north) 8.0m	NJS	16-07-14

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www.homesteadconcretehomes.co.nz
sales@homesteadgroup.co.nz
76 Main Road South, Levin 5510
Ph: 06 3681357
Fax: 06 3681359

DATE: 09-07-14
DRAWN BY: Neil Stirling
CHECKED BY: Walter Smetsers (LBP# 121932)
CONCEPT FINAL IS BUILDING CONSENT & CONSTRUCTION
REVISION# A
REV. DATE: 16-07-14

Site Plan

PROPOSED NEW HOUSE

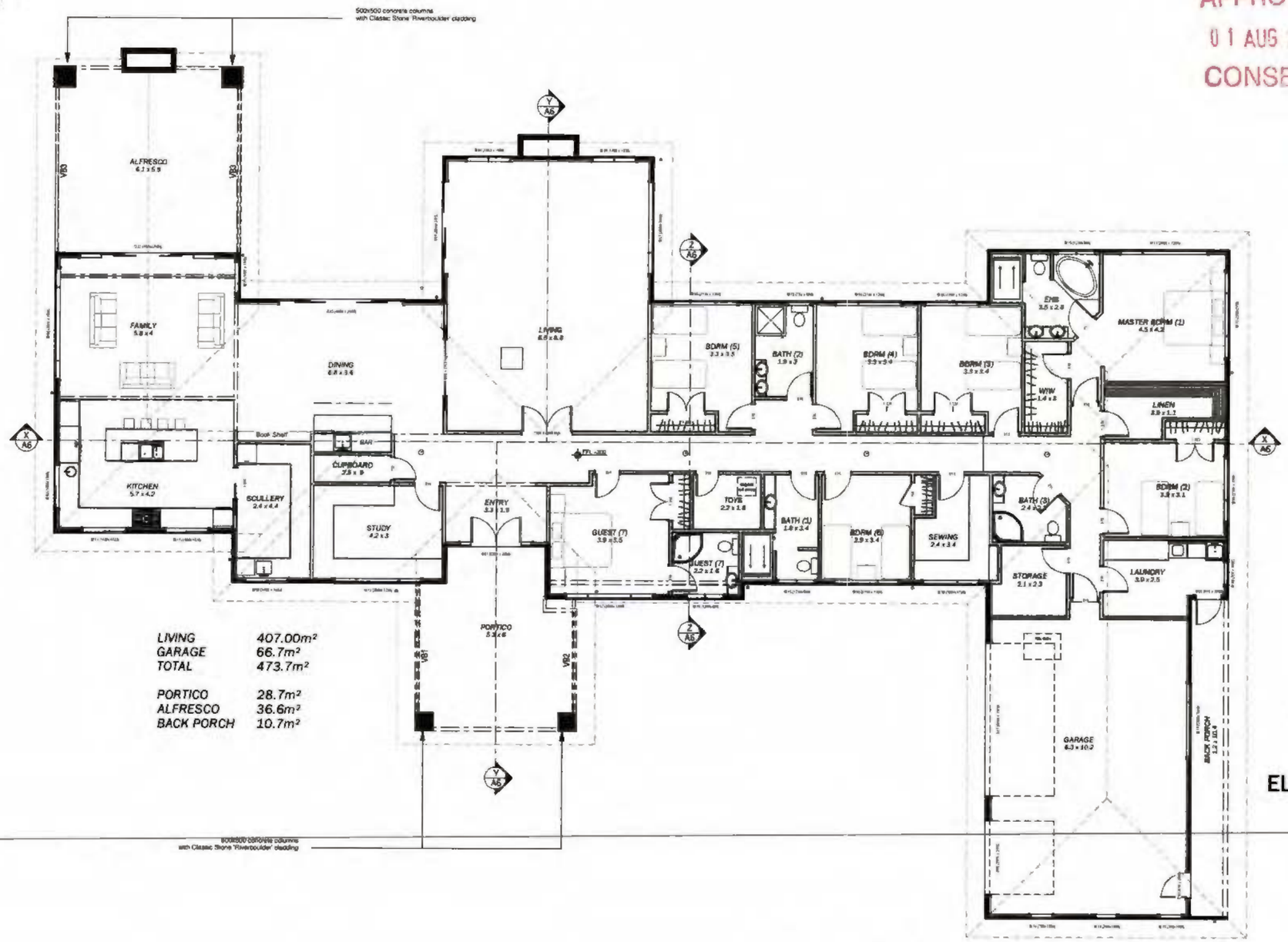
SITE ADDRESS:
1097 Queen Street
Levin

CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

SCALE: 1:400 ISO A3 (297 mm x 420 mm)
PROJECT# H1408
SHEET# L1 of 21

CONTRACTOR TO VERIFY ALL DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.



LIVING	*407.00m²*
GARAGE	*66.7m²*
TOTAL	*473.7m²*
PORTICO	*28.7m²*
ALFRESCO	*36.6m²*
BACK PORCH	*10.7m²*

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01 AUG 2014
CONSENT

Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION

NOTES:

Wind Zone:	High
Earthquake Zone:	3
Exposure Zone:	C
Snow Loading:	N1
Building Footprint:	473.7sqm
Stud Height:	2.55m 3.0m (Living, Kitchen, Family & Alfresco)
Panel thickness:	100mm & 125mm - Except Garage panel (150mm)
Panel strapping (internal):	Merch grade 40x40 battens
Timber framing (internal):	H1.2 90x45 SG8 @ 600crs
Bottom plate:	H1.2 90x45 SG8 Fix with M12 Trubolts @ 150mm crs from end of every plate, & at 900crs. Use bolt with 50x50x3mm washers. DPC under bottom plate.
Wall linings:	10mm Gib Standard
-Bathrooms:	10mm Gib Aqualine
Finish (internal):	Gib to be stopped & with F4 finish
Finish (exterior):	Rockcote texture system James Hardie Linea over 20mm cavity
Gable Ends:	Rockcote EPS40 cavity system
Building wraps:	Thermakraft Watergate (Gables)

Window sizes shown are indicative size only - not trim size. refer to joinery manufacturer and Precast panel plans for trim sizes. Sizes are given in height by width (h x w)

Roof access is through a 600x600mm access hatch located in the toy room & Attic stairs in Garage (access to attic trusses)

Roof plan:
Refer sheet A9 for Roof layout & CHH DesginIT documentation
Roof truss framing:
Refer to PS1, calculation & layout plan supplied by truss manufacturer for location of all internal load bearing walls & framing fixing requirements.

Precast wall design:
Refer to design calculations & layout plans supplied by engineer for all panel and foundation fixing requirements.

NZBC C/AS1 & F7 - Fire protection:
Type 1 - Domestic Smoke Alarms to be installed within 3.0m of every sleeping space door. Alarms must be located before the escape route from any bedroom becomes blocked by smoke.
Type 1 smoke detectors are indicated on the plan by the 'SD' markers

Wet areas:
Impervious floor surfaces to bathrooms/laundry/kitchen

ELEVATIONS

Light & Ventilation Schedule

Room Name	Room Area	10% light req	Light achieved	5% Ventilation req	Ventilation achieved
Master Bedroom	19.0m²	1.9	4.76	0.85	1.54
Bedroom 2	12.12m²	1.21	2.52	0.60	0.84
Bedroom 3	12.04m²	1.20	2.04	0.60	0.84
Bedroom 4	12.11m²	1.21	2.52	0.61	0.84
Bedroom 5	12.07m²	1.21	2.52	0.60	0.84
Bedroom 6	9.88m²	0.98	2.52	0.45	0.84
Guest Bedroom 7	13.18m²	1.32	3.36	0.66	1.68
Study	12.70m²	1.27	3.36	0.64	0 .84
Bathroom 1	6.39m²	N/A	N/A	0.44	0.46
Bathroom 2	5.63m²	N/A	N/A	0.28	0.56
Bathroom 3	4.82m²	N/A	N/A	0.37	m.vent
Master Ensuite	7.8m²	N/A	N/A	0.39	m.vent
Guest Ensuite	3.57m²	N/A	N/A	0.18	0.46
Sewing	7.72m²	0.77	2.16	0.38	0.72
Laundry	9.91m²	N/A	N/A	0.45	2.30
Kitchen	25.31m²	2.53	5.84	1.27	2.10
Scullery	10.50m²	1.05	1.40	0.51	0.70
Living	57.62m²	5.76	17.64	2.88	5.85
Dining	29.12m²	2.91	8.00	1.45	4.00
Family	25.25m²	2.52	17.04	1.26	7.54

Lighting requirements to comply with NZBC G7/AS1 (Feb 2014 Amdt 2)
Ventilation requirements to comply with NZBC G4/AS1 (Oct 2010 Amdt 2)
note: natural light is only required for *Habitable Spaces* and excludes any bathroom, laundry, water closet, pantry, scullery, walk in robe, corridor, hallway, lobby, clothes drying room, or other space of a specialised nature occupied neither frequently or for extended periods
Where 'M.Vent' is noted -Mechanical ventilation system shall be supplied to meet minimum standards.

Shower linings:	
Bathroom 1:	tiled shower
Bathroom 2:	Acrylic liner
Bathroom 3:	Acrylic liner
Ensuite:	Tiled shower
Guest Ensuite:	Acrylic liner

Wall Key
- 100/125/150mm precast concrete wall
- 90mm timber frame
- 90mm timber framing (1.2m high)
- 90mm timber framing (2.0m high)

Revision Table			
Rev	Description	Author	Date
1	Shower linings table added	NJS	30-07-14

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Ph: 06 3681357
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DATE: 09-07-14
CONCEPT / PRELIM / ENG/METRING / BUILDING CONSENT / & CONSTRUCTION
DRAWN BY: Nev Stirling
REVISION#: A
CHECKED BY: Walter Steenaars (LBP# 131622)
REV. DATE: 30-07-14

Layout Plan

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

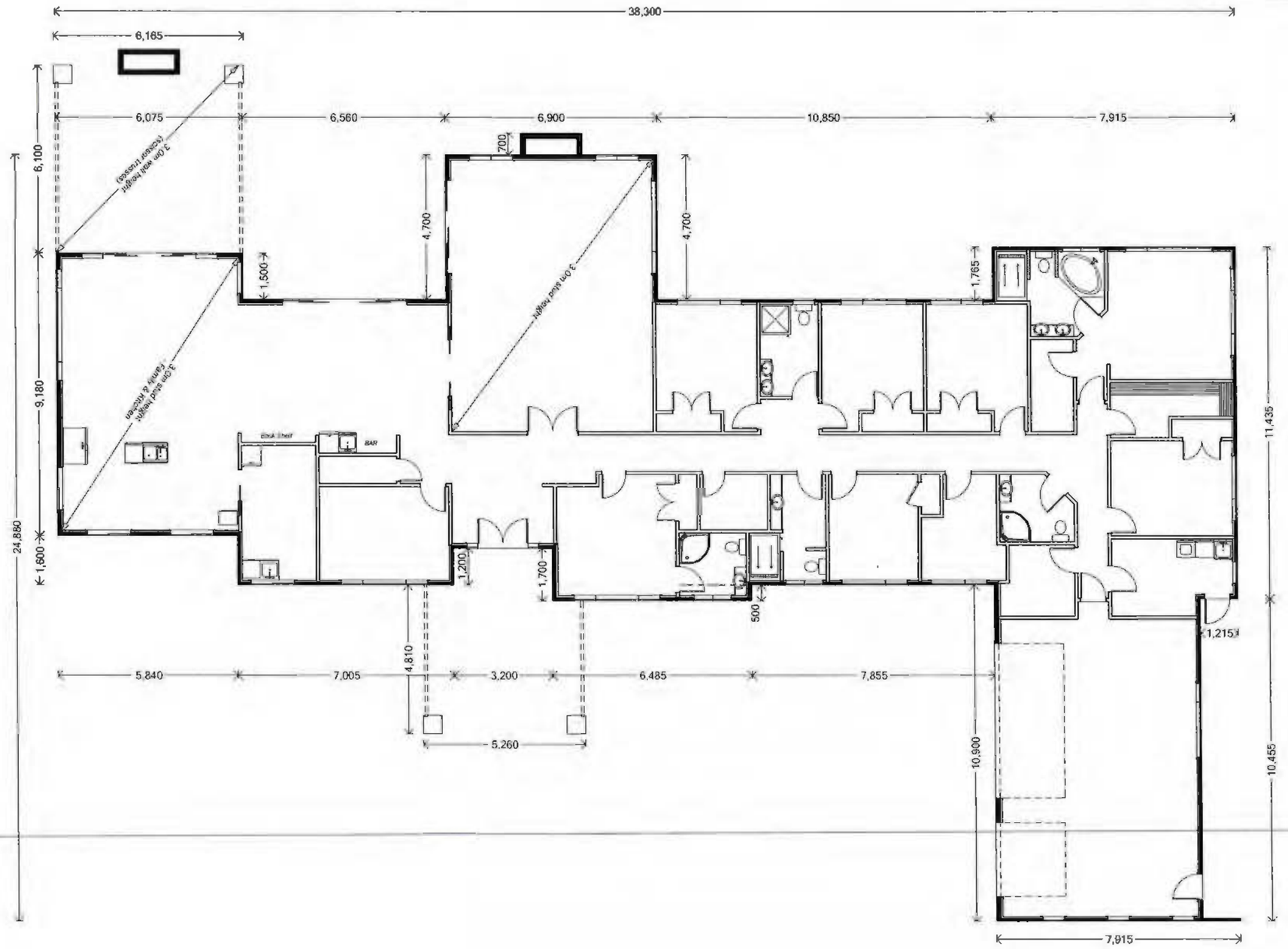
SCALE: 1:100 @ A3 (297 mm x 420 mm)
PROJECT#: H1408
SHEET#: A1 of 20

CONTRACTOR TO VERIFY ALL ALL DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.

Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION

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Ph: 06 3681357
Fax: 06 3681359

DATE: 09-07-14
DRAWN BY: Ned Stirling
CHECKED BY: Walter Simmons (LBP# 121932)
CONSENT PRICING ENGINEERING BUILDING CONSENT & CONSTRUCTION
REVISION#: -
REV. DATE: -

Dimension Plan

PROPOSED NEW HOUSE

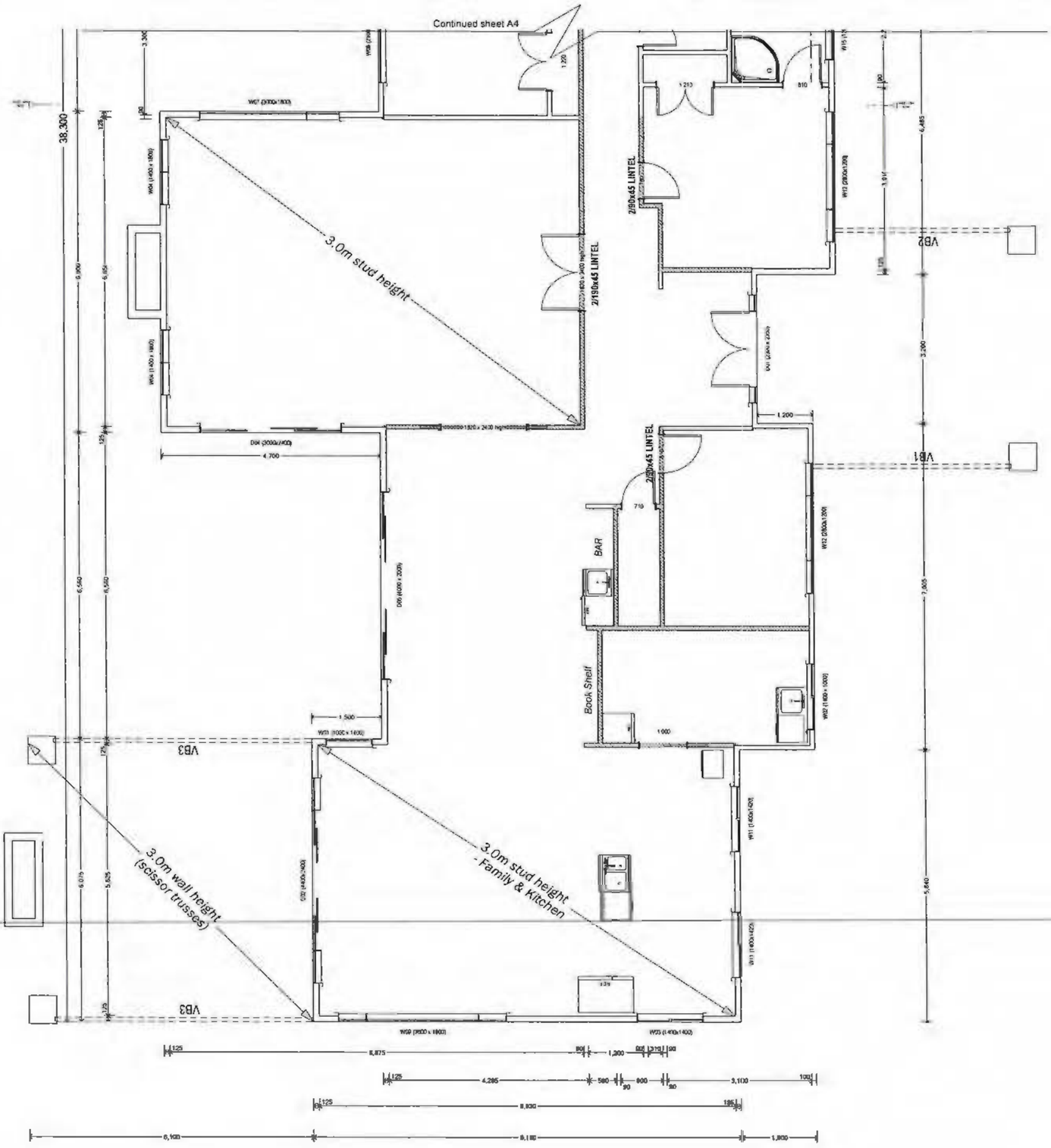
SITE ADDRESS:
1097 Queen Street
Levin

CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

SCALE: 1:100 ISO A1 (297 mm x 420 mm)
PROJECT#: H1408
SHEET#: A2 OF 20

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01 AUG 2014
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Wall Key:

- 100/125/150mm precast concrete wall
- 90mm timber frame
- 90mm timber frame - Internal load bearing (less than 10kN loading)

Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION

NOTES:

Wind Zone:	High
Earthquake Zone:	3
Exposure Zone:	C
Snow Loading:	N1

Building Footprint:	473.7sqm
Stud Height:	2.55m 3.0m (Living, Kitchen, Family & Alfresco)
Panel thickness:	100mm & 125mm - Except Garage panel (150mm)
Panel strapping (internal):	Merch grade 40x40 battens
Timber framing (internal):	H1.2 90x45 SG8 @ 600crs
Bottom plate:	H1.2 90x45 SG8 Fix with M12 Trubolts @ 150mm crs from end of every plate, & at 900crs. Use bolt with 50x50x3mm washers. DPC under bottom plate.
Wall linings:	10mm Gib Standard
-Bathrooms:	10mm Gib Aqualine
Finish (internal):	Gib to be stopped & with F4 finish
Finish (exterior):	Rockcote texture system James Hardie Linea over 20mm cavity
Gable Ends:	Rockcote EPS40 cavity system
Building wraps:	Thermakraft Watergate (Gables)

Window sizes shown are indicative size only - not trim size. refer to joinery manufacturer and Precast panel plans for trim sizes. Sizes are given in height by width (h x w)

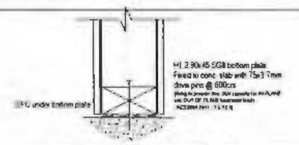
Door sizes shown on this plan are door leaf sizes only.

Window sizes shown are indicative size only - not trim size. refer to joinery manufacturer and Precast panel plans for trim sizes. Sizes are given in height by width (h x w)

Roof access is through a 600x600mm access hatch located in the toy room & Attic stairs in Garage (access to attic trusses)

Roof truss framing:
Refer to PS1, calculation & layout plan supplied by truss manufacturer for location of all internal load bearing walls & framing fixing requirements. Refer to DesginIT design certificate for verandah beams VB1, VB2 & VB3.

Precast wall design:
Refer to design calculations & layout plans supplied by engineer for all panel and foundation fixing requirements.



Bottom Plate Detail
Scale 1:5

Door Schedule				
Ref	Qty	Width	Height	Area (sq m)
D01	1	2320	2350	5.45
D02	1	4400	2400	10.56
D03	2	810	2000	1.62
D04	1	3000	2400	7.2
D05	1	4000	2000	8.0
D07	1	5000	2100	10.5
D08	1	2400	2100	5.04
Totals:				49.99

Window Schedule				
Number	Qty	Width	Height	Area (sq m)
W01	1	1000	1400	1.4
W02	1	1400	1000	1.4
W03	1	1400	1400	1.96
W04	2	1400	1800	2.52
W05	1	1700	1200	2.04
W06	4	2100	1200	2.52
W07	1	3000	1800	5.4
W08	1	1800	1200	2.16
W09	1	3600	1800	6.48
W10	1	700	1000	0.7
W11	2	1400	1420	1.99
W12	3	2800	1200	3.36
W13	1	2800	500	1.4
W14	1	2400	1000	2.4
W15	3	1200	800	0.96
W16	1	700	800	0.56
W18	3	700	1600	1.12
Totals:				61.32

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DATE: 09-07-14	CONCEPT / PRICING / ENGINEERING / BUILDING CONSENT / CONSTRUCTION
DRAWN BY: Neil Stirling	REVISIONS -
CHECKED BY: Walter Simmons (LBP# 121933)	REV. DATE: -

Dimension Framing Plan

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

SCALE:	1:100 (SQ A3 297 mm x 420 mm)
PROJECT#	H1408
SHEET#	A3 of 20

Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION

NOTES:

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01 AUG 2014
CONSENT

Wind Zone:	High
Earthquake Zone:	3
Exposure Zone:	C
Snow Loading:	N1

Building Footprint:	473.7sqm
Stud Height:	2.55m 3.0m (Living, Kitchen, Family & Alfresco)
Panel thickness:	100mm & 125mm - Except Garage panel (150mm)
Panel strapping (internal):	Merch grade 40x40 battens
Timber framing (internal):	H1.2 90x45 SG8 @ 600crs
Bottom plate:	H1.2 90x45 SG8 Fix with M12 Trubolts @ 150mm crs from end of every plate, & at 900crs. Use bolt with 50x50x3mm washers. DPC under bottom plate.
Wall linings:	10mm Gib Standard
-Bathrooms:	10mm Gib Aqualine
Finish (internal):	Gib to be stopped & with F4 finish
Finish (exterior):	Rockcote texture system James Hardie Linea over 20mm cavity
Gable Ends:	Rockcote EPS40 cavity system
Building wraps:	Thermakraft Watergate (Gables)

Window sizes shown are indicative size only - not trim size. refer to joinery manufacturer and Precast panel plans for trim sizes. Sizes are given in width by height (w x h)

Door sizes shown on this plan are door leaf sizes only.

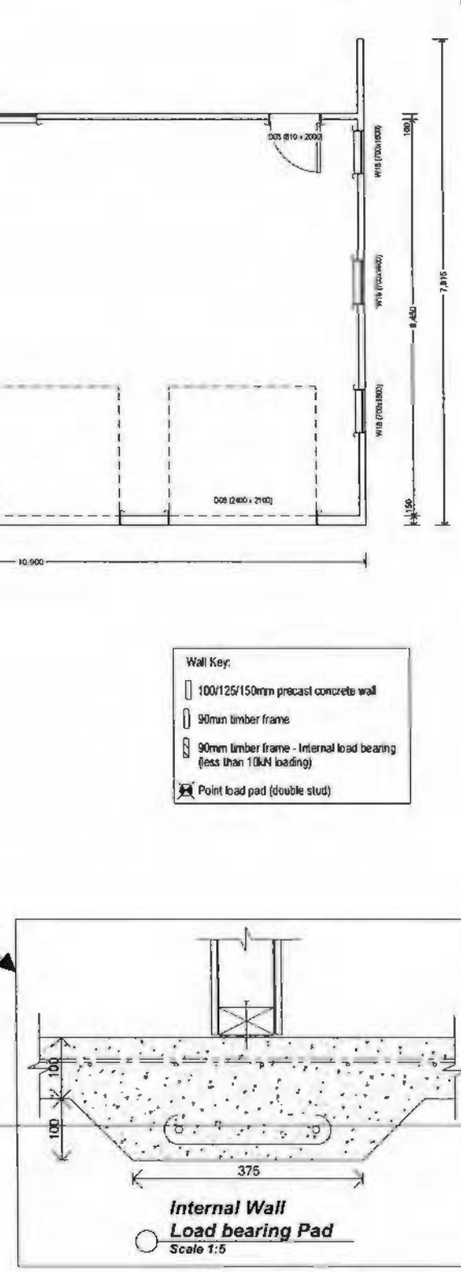
Window sizes shown are indicative size only - not trim size. refer to joinery manufacturer and Precast panel plans for trim sizes. Sizes are given in height by width (h x w)

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Roof truss framing:
Refer to PS1, calculation & layout plan supplied by truss manufacturer for location of all internal load bearing walls & framing fixing requirements. Refer to DesginIT design certificate for verandah beams VB1, VB2 & VB3.

Precast wall design:
Refer to design calculations & layout plans supplied by engineer for all panel and foundation fixing requirements.

Wall Key:
- 100/125/150mm precast concrete wall
- 90mm timber frame
- 90mm timber frame - Internal load bearing (less than 10kN loading)
- Point load pad (double stud)


W14 (2400x1000)
D03 (810 x 2000)
D02 (5000 x 2100)
D08 (2400 x 2100)
10,900
W06 (2100 x 1200)
W18 (700 x 1600)
W12 (2800 x 1200)
W15 (1200x800)
W16 (700x1600)
W18 (700x1600)
W18 (700x1600)
W15 (1200x800)
W15 (1200x800)
W15 (1200x800

Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION

BUILDING RISK MATRIX	
RISK FACTOR	SCORE
WIND ZONE	2
NO. OF STOREYS	0
ROOF/WALL INTERSECTION DESIGN	0
EAVES WIDTH	0
ENVELOPE COMPLEXITY	0
DECK DESIGN	0
TOTAL	2

Key:

CGL - Clear ground level
FPL - Finished paved level
FFL - Finished floor level (slab)
(S) - Denotes safety glazing to NZS 4223 compliance

A

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01 AUG 2014
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Elevation 1



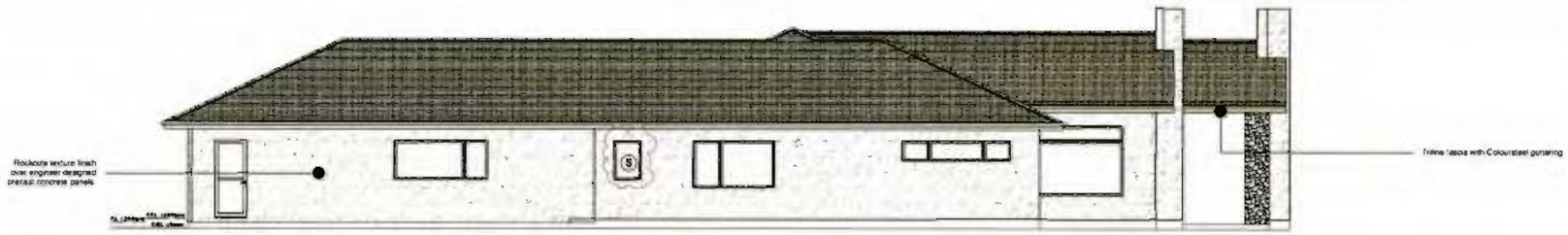
Elevation 2



Elevation 3



Elevation 4



Revision Table			
Rev.	Description	Author	Date
1	Safety glazing noted	NJS	30-07-14

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DATE: 09-07-14
DRAWN BY: Neil Sterling
CHECKED BY: Walter Simmons (LBP# 121932)
BUILDING CONSENT & CONSTRUCTION
REVISION# A
REV. DATE: 30-07-14

Elevations

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

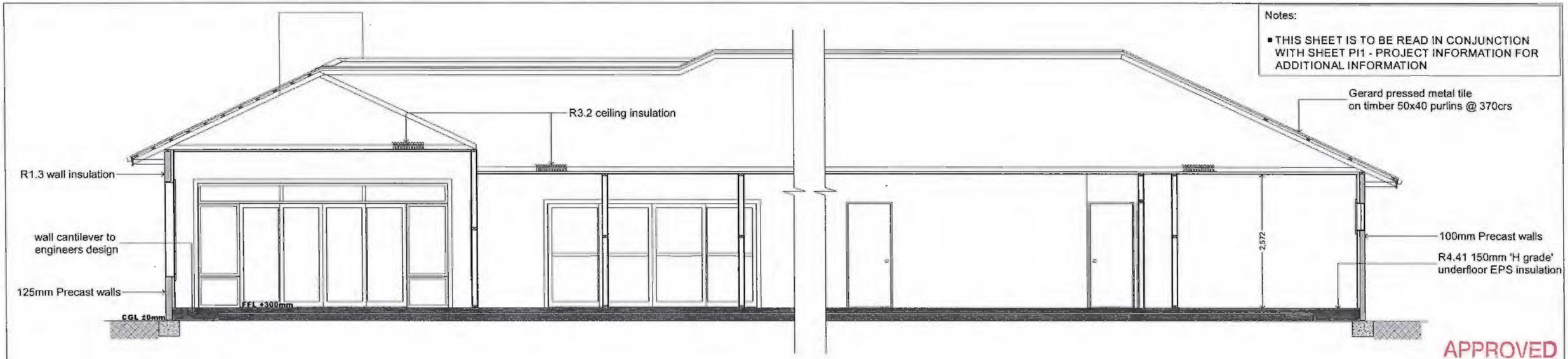
CLIENT NAME:
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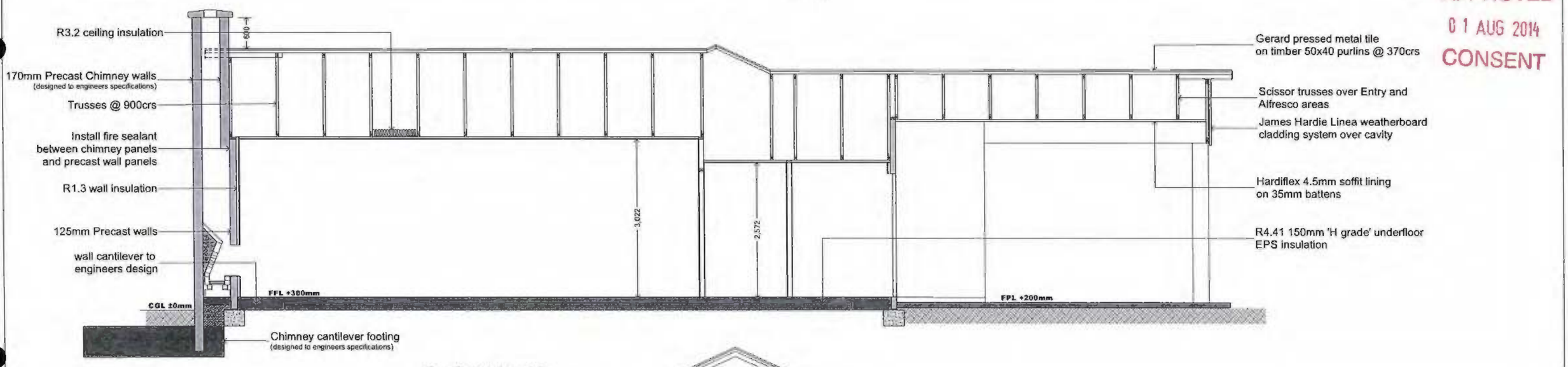
SCALE: ISO A3 1:150 (297 mm x 420 mm)
PROJECT# H1408
SHEET# A5 of 21

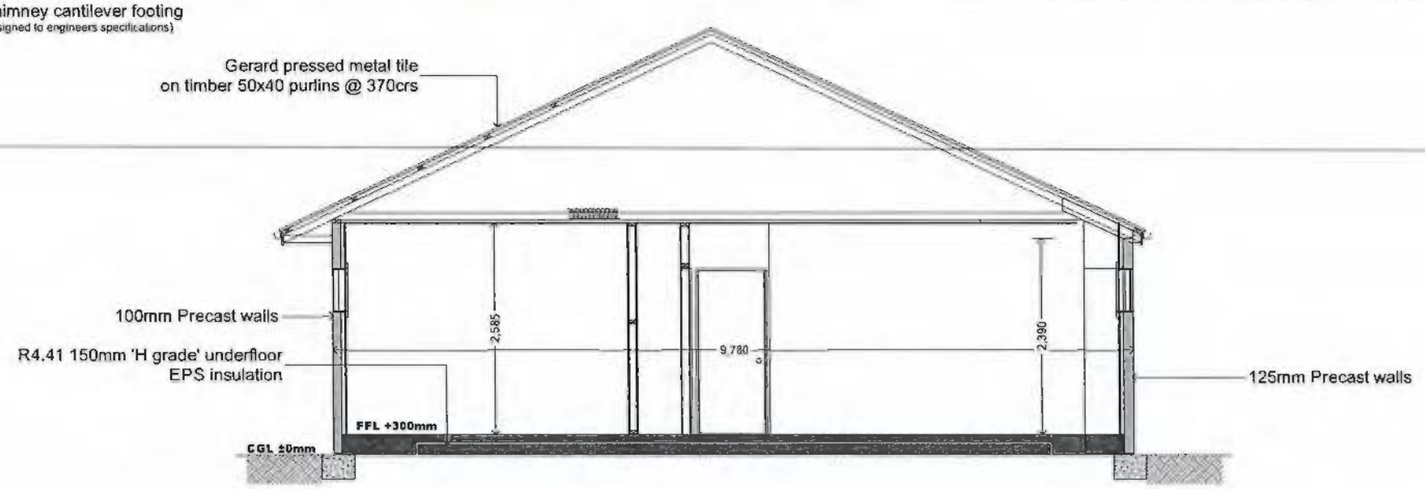
Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION



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01 AUG 2014
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DATE: 09-07-14
DRAWN BY: Neil Dicing
CHECKED BY: Walter Simmons (LBP# 121403)
REVISIONS: -
REV. DATE: -

Cross Sections

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

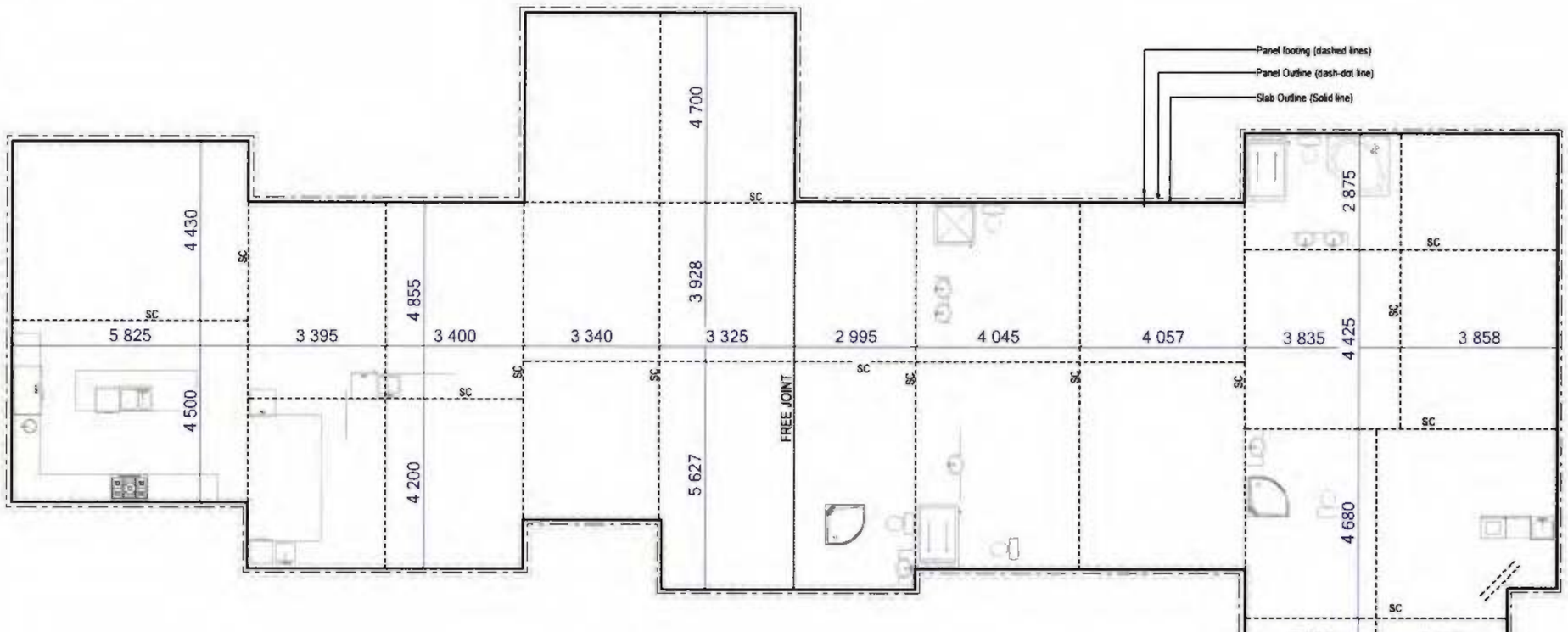
CLIENT NAME:
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HOMESTEAD CONCRETE HOMES

SCALE: ISO A3 1:100 (297 mm x 420 mm)
PROJECT# H1408
SHEET# A6 OF 20

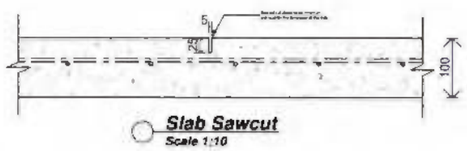
Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION





Slab Free Joint
Scale 1:10



Slab Sawcut
Scale 1:10

APPROVED
01 AUG 2014
CONSENT

Revision Table			
Rev.	Description	Author	Date
1	Concrete strength changed to 25MPa	NJS	30-07-14

NOTES:

Slab Area:	458sqm
Slab perimeter:	135.3m
Slab thickness:	100mm
Exposure Zone:	C
Slab strength:	25MPa (@ 28 days)

A

Slab construction:
- 100mm thick concrete slab.
- SE83 reinforcing mesh with 35mm cover to top of slab.
- 150mm EPS underslab insulation (R4.17)
- 0.25mm black polythene DPM with tape sealed 150mm lap joints.
- 25mm sand blinding layer

Saw Cuts:
- Saw cuts to be a minimum of one quarter of the depth of the slab (25mm).
- Saw cuts are to take place no later than 24 hours after initial set for average ambient temperatures above 20°C, and 48 hours for average ambient temperature below 20°C.
- Bay sizes shall not exceed 6m in any direction and not exceed a length to width ratio of 2:1.
- Saw cuts are to be placed to coincide with major changes in plan perimeter.
- Supplementary reinforcing bars are to be placed as shown on the plan. Bars are to be 2/ D10 reinforcing bars, 1200mm long.

Free Joint:
- Free joint shall be more than half the slab thickness and a minimum of 5mm thick.
- Free joint cut is to take place no later than 24 hours after initial set for average ambient temperatures above 20°C, and 48 hours for average ambient temperature below 20°C.

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Ph: 06 3681357
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DATE: 09-07-14
BUILDING CONSENT & CONSTRUCTION
DRAWN BY: Neil Stirling
REVISION# A
CHECKED BY: Walter Simmons (LBP# 121932)
REV. DATE: 30-07-14

Slab Plan

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

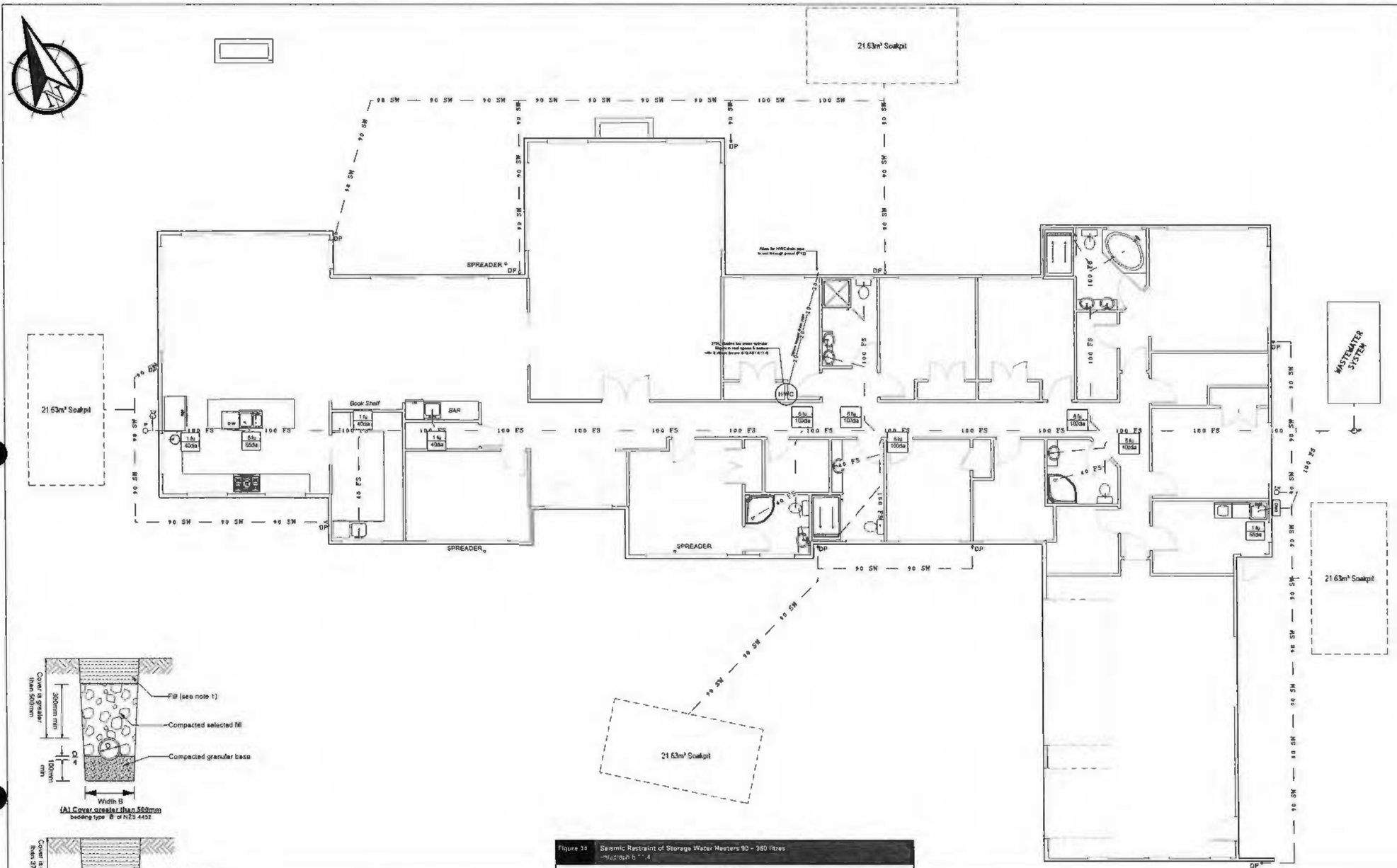
CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

SCALE: 1:100 @ A2 (297 mm x 420 mm)
PROJECT# H1408
SHEET# A7 of 21

Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION



NOTES:

ALL PLUMBING TO NZs:3500 part 2

PIPE SIZES AND GRADIENTS:

All pipes to be PVC unless stated.

40mm pipes - 1:40 min. gradient
65mm pipes - 1:40 min. gradient
100mm pipes - 1:60 min. gradient (mains sewer line)

Toilet fixtures to be 110mm with 1:40 gradient

Downpipes: 80mm round PVC

Stormwater: (internal diameter)
85mm pipe - 1.90 min. gradient
100mm pipe - 1:120 min. gradient

Terminal Vents:
80mm

Water supply pipes are to be insulated.

Hot water supply temperature to sanitary fixtures not to exceed 55°C

270L mains pressure hot water cylinder installed in ceiling space. Cylinder to be fixed & braced in accordance with NZBC G12/AS1 6.11.4 (see detail on this page)

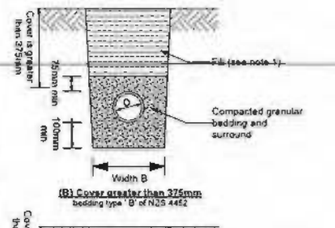
LEGEND.

ORG -	Overflow Relief Gulley
IP -	Inspection Point
T.V -	Terminal Vent
A.A.V -	Air Admittance Valve
S.W.S -	Surface Water Sump

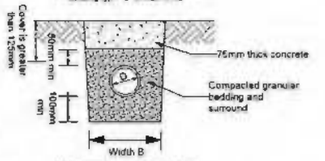
1 hi / 65dia — Fixture unit rating total / Discharge pipe size

APPROVED
0 1 AUG 2014
CONSENT

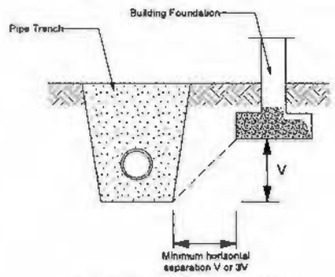
(A) Cover greater than 500mm
bedding type 'B' of NZS 4452



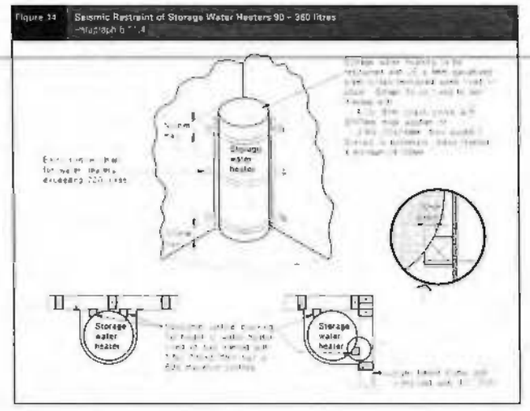
(B) Cover greater than 375mm
bedding type 'B' of NZS 4452

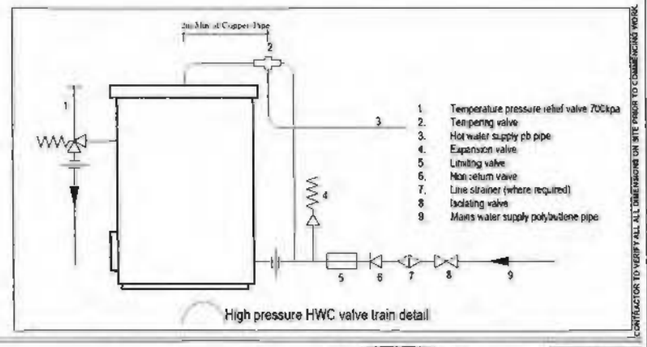


(C) Cover greater than 125mm



Pipe Trench to Foundation
NZBC E1 AS1 fig 14





High pressure HWC valve train detail

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Ph: 06 3681357
Fax: 06 3681359

DATE: 09-07-14
CONSENT: PRELIM. & CONSTRUCTION BUILDING CONSENT & CONSTRUCTION
DRAWN BY: Neil Stirling
CHECKED BY: Walter Simmons (LBP# 121953)
REVISION: -
REV. DATE: -

Plumbing & Drainage Plan

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

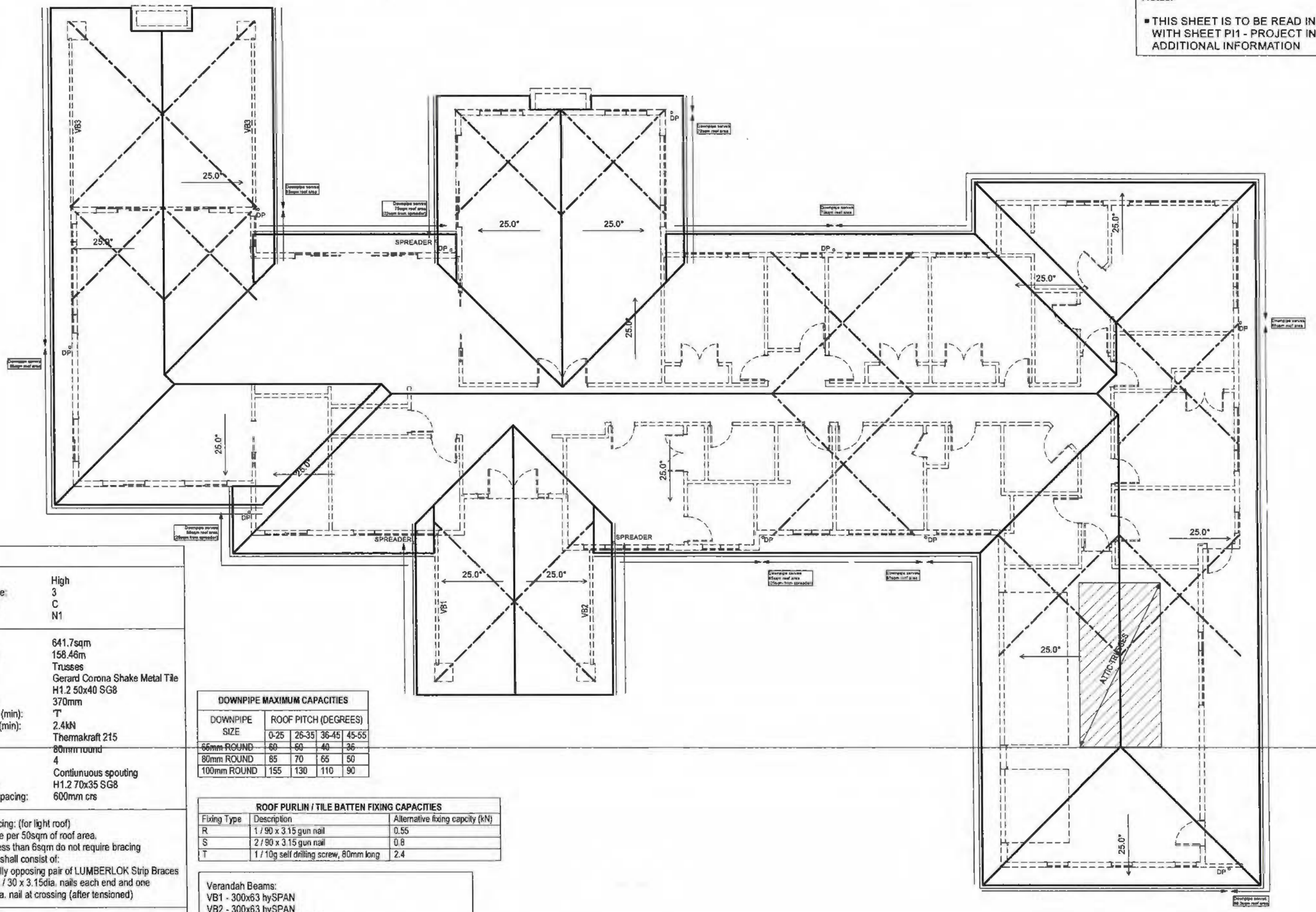
CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

SCALE: ISO A3 1:150 (297 mm x 420 mm)
PROJECT# H1408
SHEET# A8 of 20

Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION



NOTES:

Wind Zone:	High
Earthquake Zone:	3
Exposure Zone:	C
Snow Loading:	N1
Roof Area:	641.7sqm
Roof perimeter:	158.46m
Roof framing:	Trusses
Cladding type:	Gerard Corona Shake Metal Tile
Tile Battens:	H1.2 50x40 SG8
Batten spacing:	370mm
Fixing type reqt (min):	T
Fixing capacity (min):	2.4kN
Roof underlay:	Thermakraft 215
Downpipes:	80mm round
Downpipe qty:	4
Guttering:	Contiunuous spouting
Ceiling battens:	H1.2 70x35 SG8
Ceiling batten spacing:	600mm crs

Roof Strap Bracing: (for light roof)
- One roof brace per 50sqm of roof area.
- Roof planes less than 6sqm do not require bracing
- Strap bracing shall consist of:
  - a diagonally opposing pair of LUMBERLOK Strip Braces fixed with 5 / 30 x 3.15dia. nails each end and one 30 x3.15 dia. nail at crossing (after tensioned)

Roof Truss Plan:
Refer to truss plan prepared by Carters manufacturing.
Job reference #UM11718.
Plan will show location of point loads and load-bearing walls

DOWNPIPE MAXIMUM CAPACITIES

DOWNPIPE SIZE	ROOF PITCH (DEGREES)			
	0-25	26-35	36-45	45-55
~~65mm ROUND~~	~~68~~	~~50~~	~~40~~	~~36~~
80mm ROUND	85	70	65	50
100mm ROUND	155	130	110	90

ROOF PURLIN / TILE BATTEN FIXING CAPACITIES

Fixing Type	Description	Alternative fixing capcity (kN)
R	1 / 90 x 3.15 gun nail	0.55
S	2 / 90 x 3.15 gun nail	0.8
T	1 / 10g self drilling screw, 80mm long	2.4

Verandah Beams:
VB1 - 300x63 hySPAN
VB2 - 300x63 hySPAN
VB3 - 360x63 HySPAN (qty 2)

Refer to DesginIT design certificqte for verandah beams VB1, VB2 & VB3.

APPROVED
01 AUG 2014
CONSENT

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76 Main Road South, Levin 5510
Ph: 06 3681357
Fax: 06 3681359

DATE: 09-07-14
CONCEPT/ PRELIM/ ENGINEERING/ BUILDING CONSENT & CONSTRUCTION
DRAWN BY: Neil Stirling
REVISION#: -
CHECKED BY: Walter Simmons (LBP# 121932)
REV. DATE: -

LICENSED BUILDING PRACTITIONER – BUILDING CONFIDENCE

Roof Plan

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

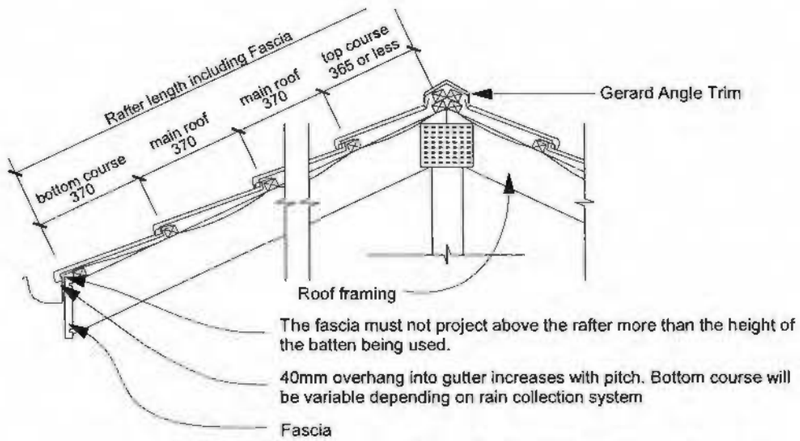
CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

SCALE: 1:125 ISO A3 (297 mm x 420 mm)
PROJECT# H1408
SHEET# A9 OF 20

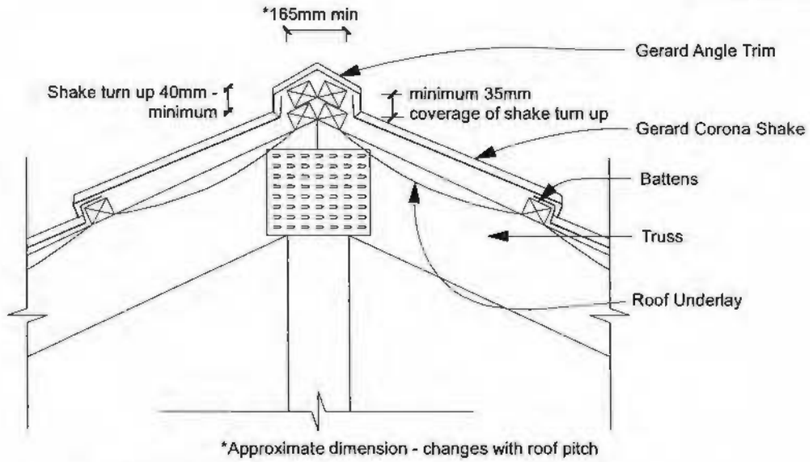
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- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION



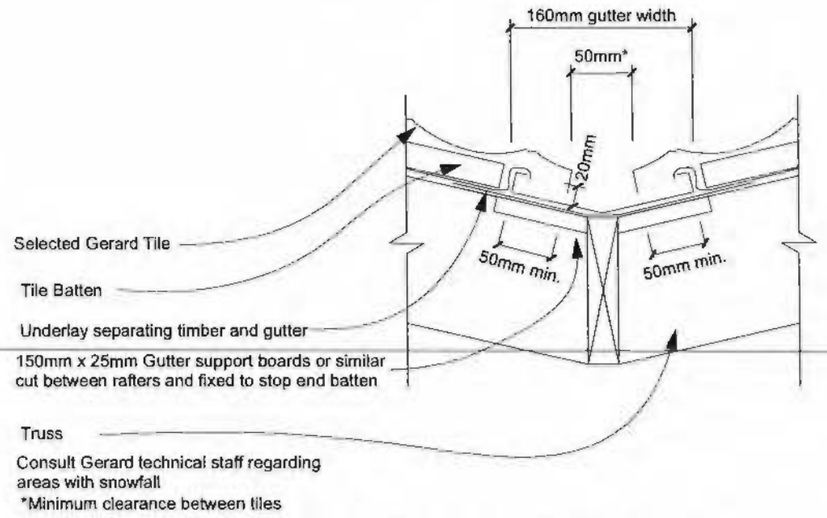
Corona Shake Installation Detail

Scale 1:20



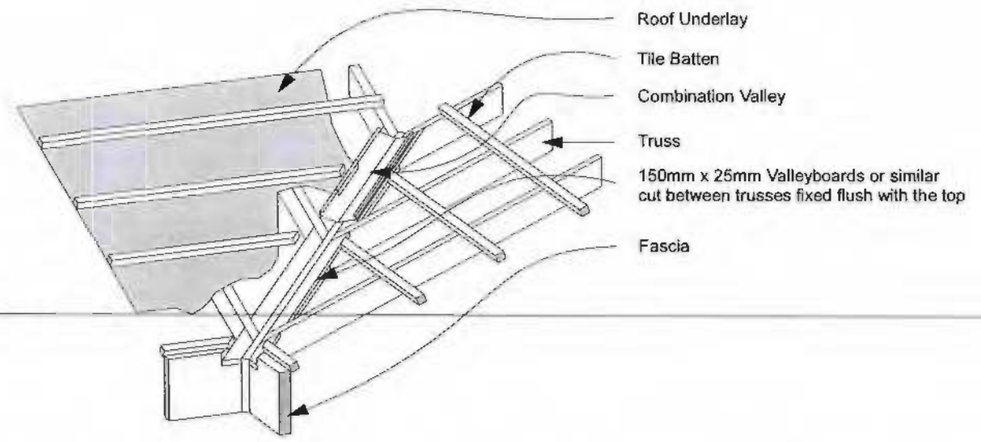
Corona Shake Ridge Detail

Scale 1:20



Corona Shake Valley Detail

Scale 1:10



Corona Shake Valley Isometric Detail

Scale 1:10

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Fax: 06 3681359

DATE:	CONCEPT / PRELIM / ENGINEERING / BUILDING CONSENT & CONSTRUCTION
09-07-14	
DRAWN BY: Neil Stirling	REVISION# -
CHECKED BY: Walter Simmons (LBP# 121553)	REV. DATE: -

Roof Details

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

CLIENT NAME:
Homestead Homes Ltd

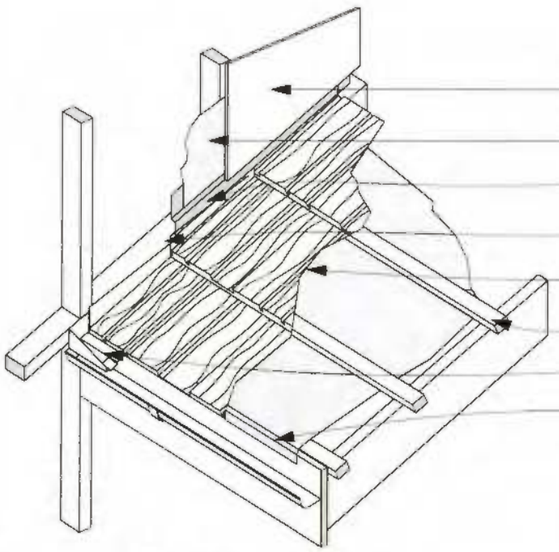
HOMESTEAD CONCRETE HOMES

SCALE:	ISO A3 (297 mm x 420 mm)
1:10 1:20	
PROJECT#	H1408
SHEET#	C1 OF 20

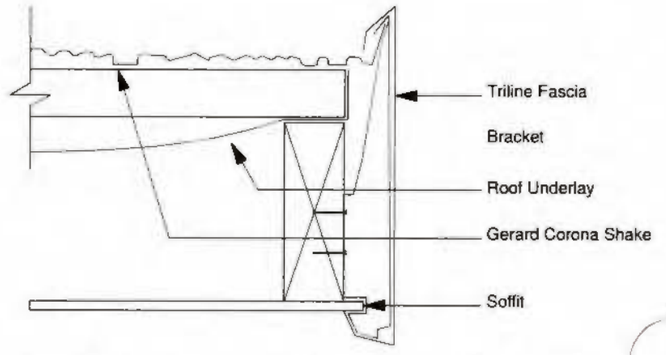
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- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION

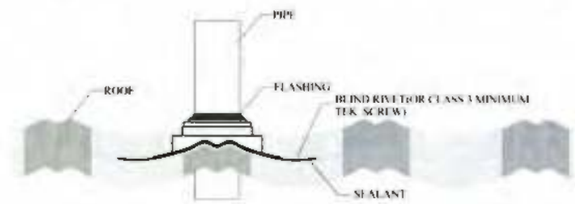
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01 AUG 2014
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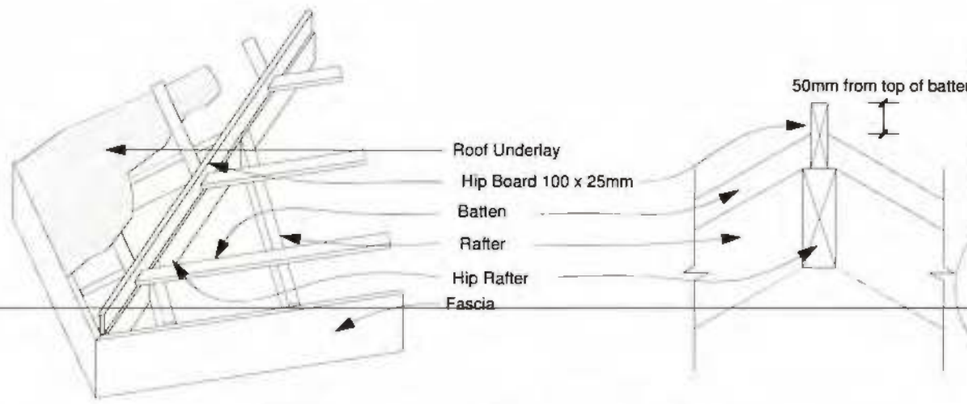


Corona Shake
Stop-End Flashing Isometric Detail
Scale 1:10

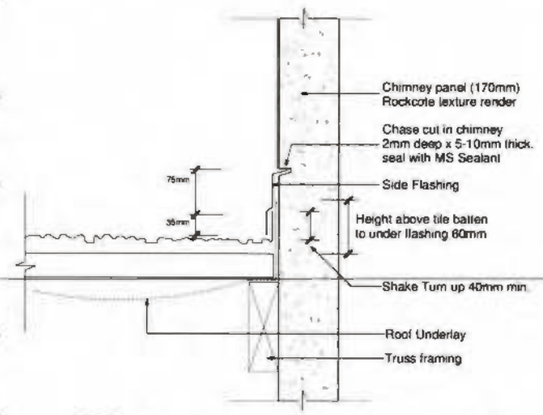


Corona Shake Barge Detail
Scale 1:5





Corona Shake Hip Detail
Scale 1:10



ROOF CLADDING TO CHIMNEY DETAIL
Scale 1:10



Penetration Detail
Not to Scale

A

Revision Table			
Rev.	Description	Author	Date
1	Roof junction & Penetration details added	NJS	30-07-14

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Ph: 06 3681357
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DATE: 09-07-14
CONSENT: BUILDING CONSENT & CONSTRUCTION
DRAWN BY: Neil Stirling
REVISION#: A
CHECKED BY: Walter Simmons (LBP# 121888)
REV. DATE: 30-07-14

Roof Details

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

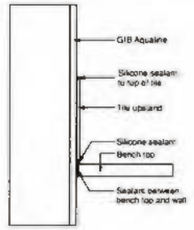
CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

SCALE: ISO A3 1:5 (297 mm x 420 mm) 1:10
PROJECT#: H1408
SHEET#: C2 of 21

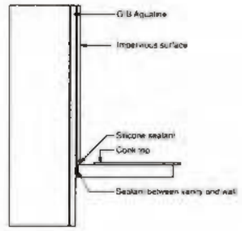
Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION



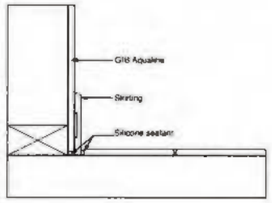
Bench Top/Wall Detail

Kitchen and Laundry GAW-D031



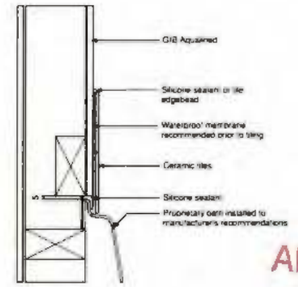
Cook Top/Wall Detail

Kitchen and Laundry GAW-D032



Wall/Floor Detail

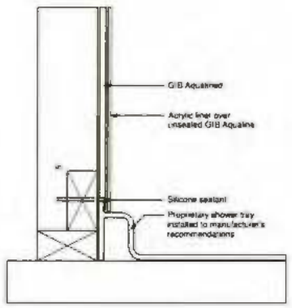
Kitchen and Laundry GAW-D033



Bath/Wall Detail

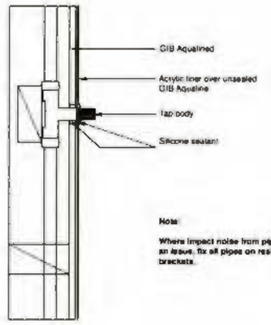
Bath - Tiled Upstand

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01 AUG 2014
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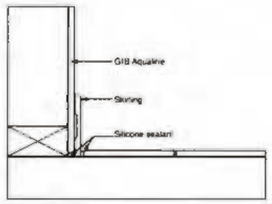
Shower Wall/Tray Detail

Shower - Acrylic Liner and Base



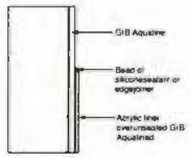
Penetration Detail

Shower - Acrylic Liner and Base



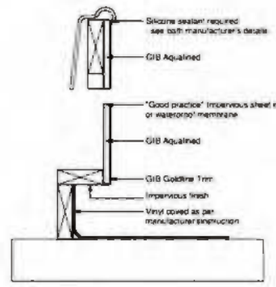
Wall/Floor Detail

Shower - Acrylic Liner and Base



Liner Top Detail

Shower - Acrylic Liner and Base



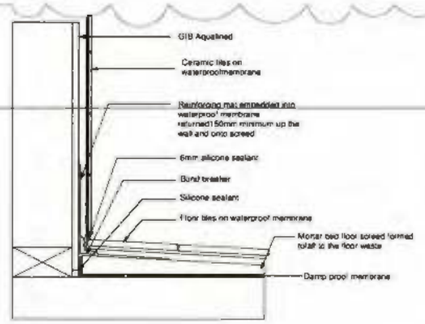
Bath Plinth Detail

Bath - Tiled Upstand

Rev.	Description	Author	Date
1	Note box added for waterproofing membrane applicator	KJS	30-07-14

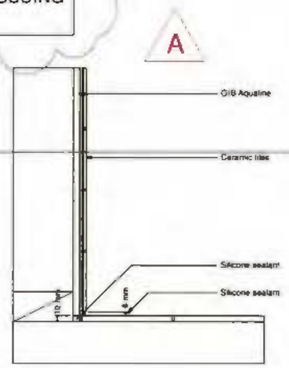
Revision Table

APPROVED INSTALLER TO PROVIDE COUNCIL WITH PS3 (Producer statement) FOR THE INSTALLATION OF THE WATER PROOFING MEMBRANE, PRIOR TO THE ISSUING OF CODE OF COMPLIANCE



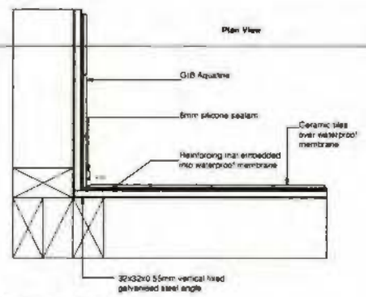
Shower Wall/Floor Detail

Shower - Tiled Walls and Base GAW-D018



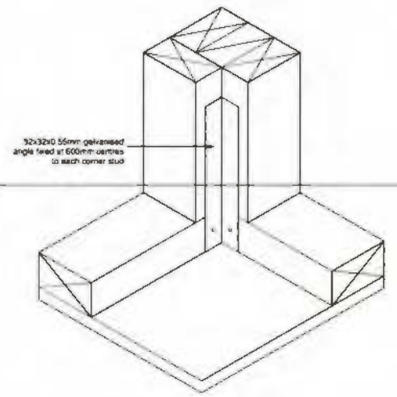
Wall/Floor Detail

Shower - Tiled Walls and Base GAW-D019



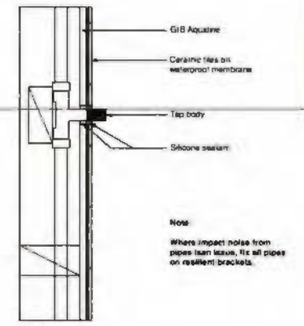
Shower Corner Detail

Shower - Tiled Walls and Base GAW-D020



Shower Corner Angle Detail

Shower - Tiled Walls and Base GAW-D021



Penetration Detail

Shower - Tiled Walls and Base GAW-D0

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76 Main Road South, Levin 5510
Ph: 06 3681357
Fax: 06 3681359

DATE: 09-07-14
DRAWN BY: Neil Stirling
CHECKED BY: Walter Simmons (LBP# 121822)
REVISION#: A
REV. DATE: 30-07-14

Internal Wet Area Details

PROPOSED NEW HOUSE

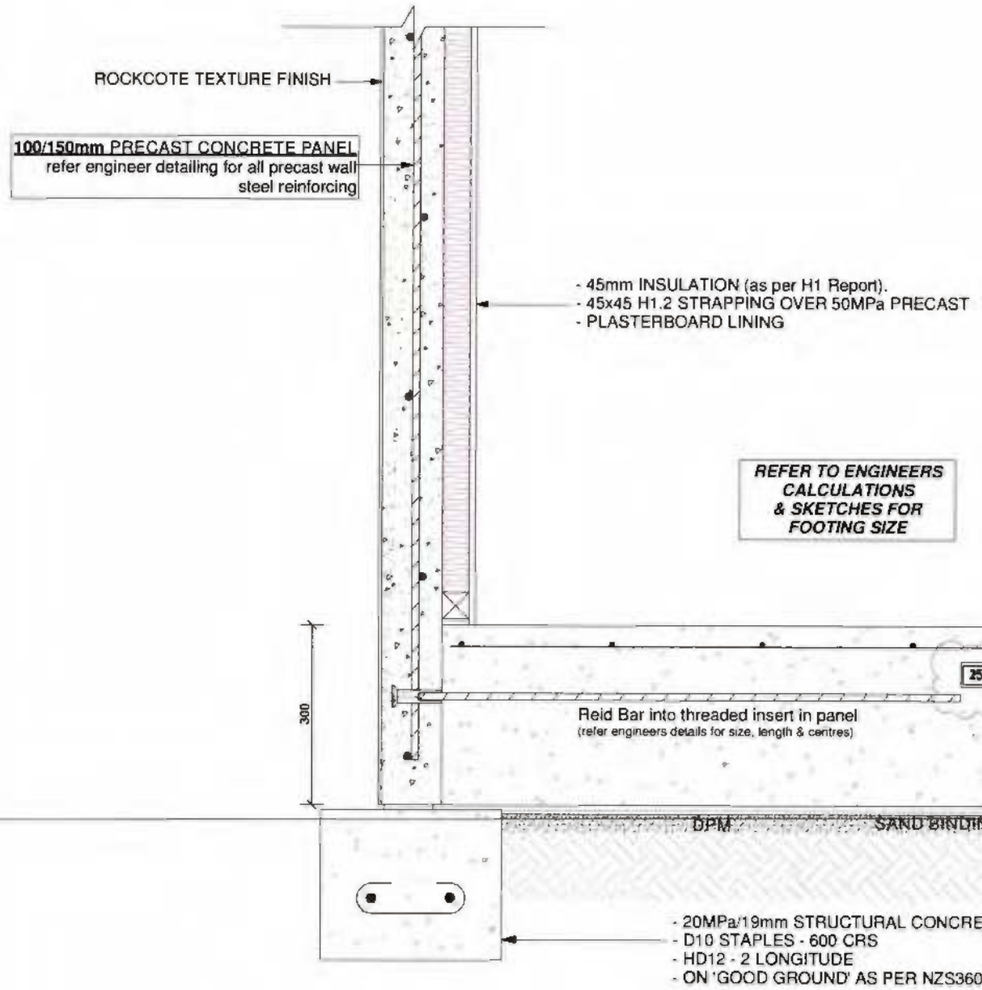
SITE ADDRESS:
1097 Queen Street
Levin

CLIENT NAME:
Homestead Homes Ltd

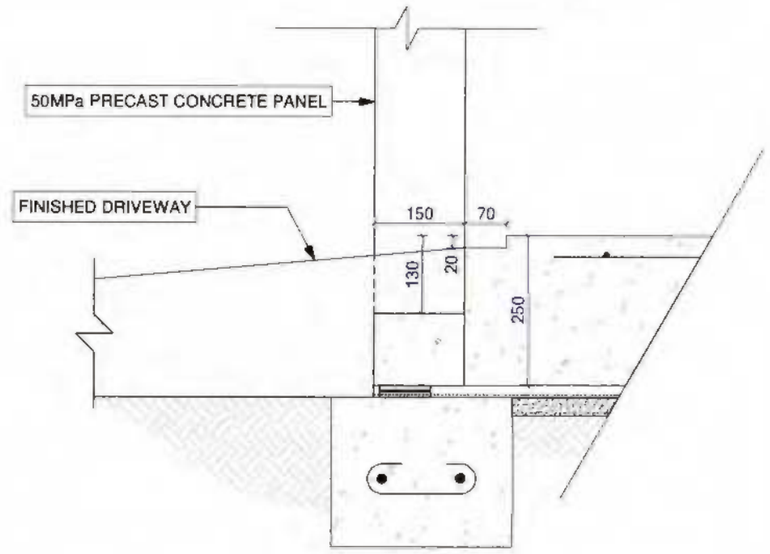
SCALE: ISO A3 1:2 (297 mm x 420 mm)
PROJECT#: H1408
SHEET#: C3 of 20

Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION



F100/150 - FOUNDATION DETAIL
SCALE 1:10



F100 - GARAGE DOOR DETAIL
SCALE 1:20

APPROVED
01 AUG 2014
CONSENT

Revision Table			
Rev.	Description	Author	Date
1	Slab strength changed to 25MPa	NJS	30-07-14

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DATE: 09-07-14
DRAWN BY: Reid Storing
CHECKED BY: Walter Simmons (LBP# 121932)
BUILDING CONSENT & CONSTRUCTION
REVISION# A
REV. DATE: 30-07-14

Foundation Details

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

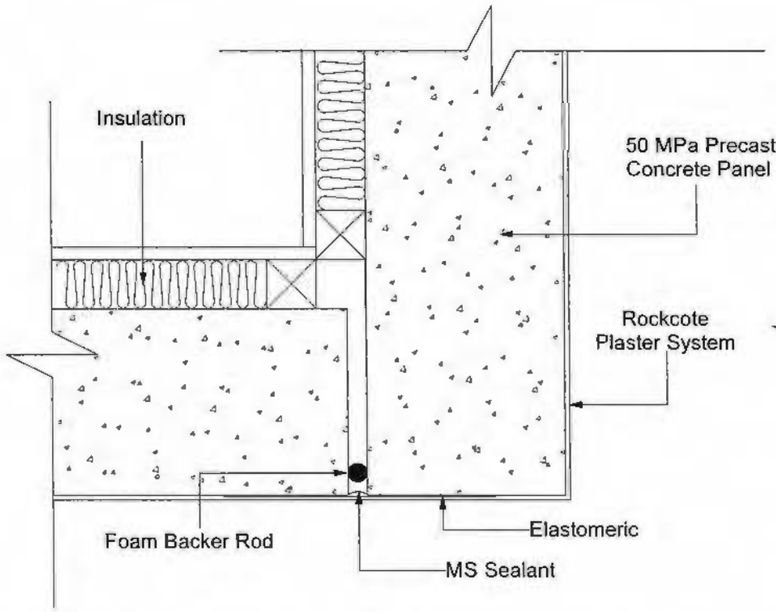
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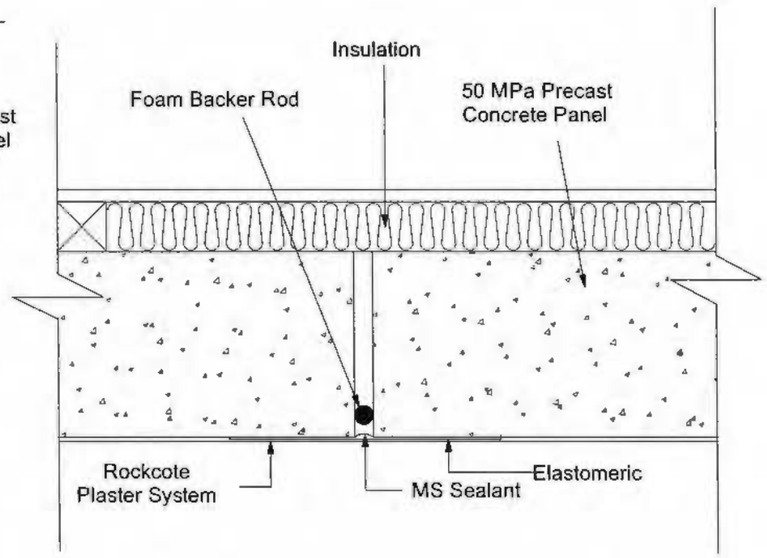
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PROJECT# H1408
SHEET# C4 OF 21

Notes:

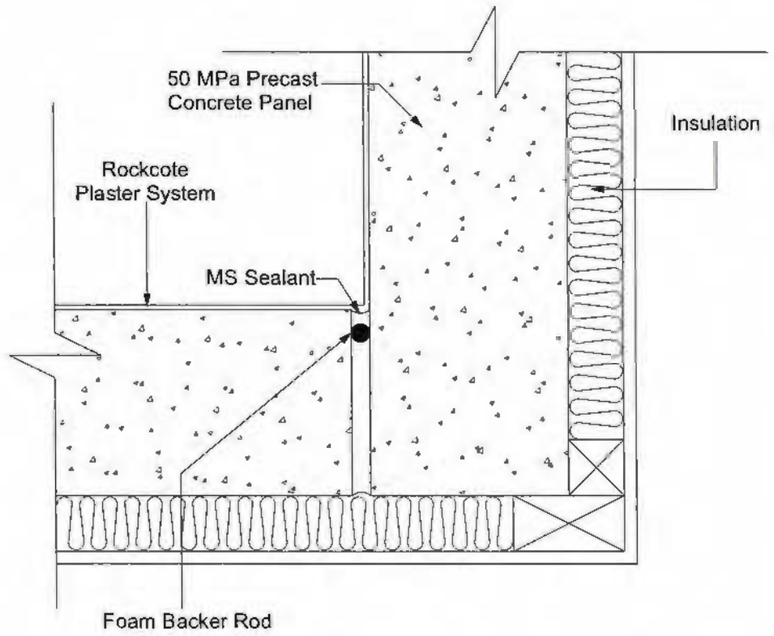
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Typical Precast Ext. Corner Joint Sealing Detail
Scale 1:5



Typical Precast Joint and Sealing Detail
Scale 1:5



Typical Precast Int. Corner Joint Sealing Detail
Scale 1:5

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01 AUG 2014
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DATE:	CONSENT/ PRELIM/ ENGINEERING/ BUILDING CONSENT/ CONSTRUCTION
09-07-14	
DRAWN BY: Nat Stirling	REVISION# -
CHECKED BY: Walter Simmons (LBP# 121932)	REV. DATE: -

Pre-Cast Wall Joint Details

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

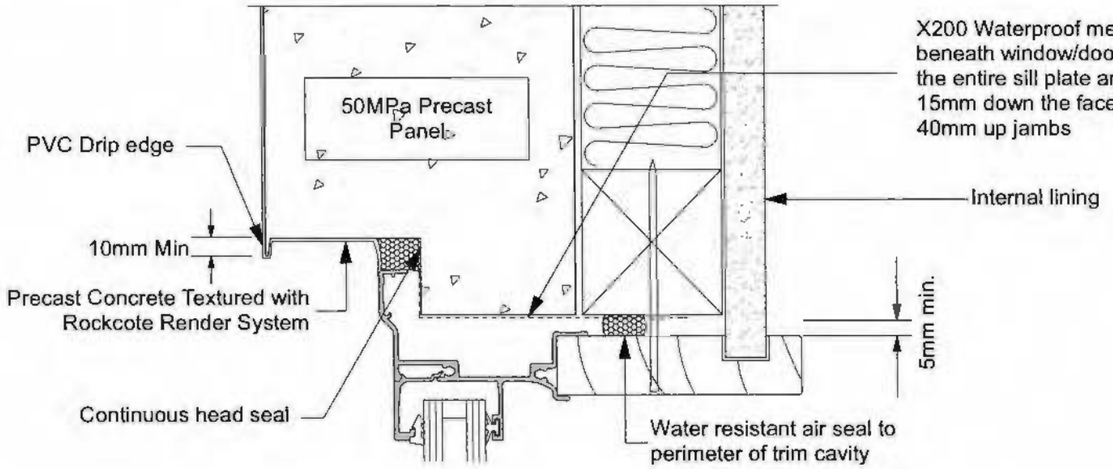
CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

SCALE:	ISO A3 (297 mm x 420 mm)
1:5	
PROJECT#	H1408
SHEET#	C5 of 20

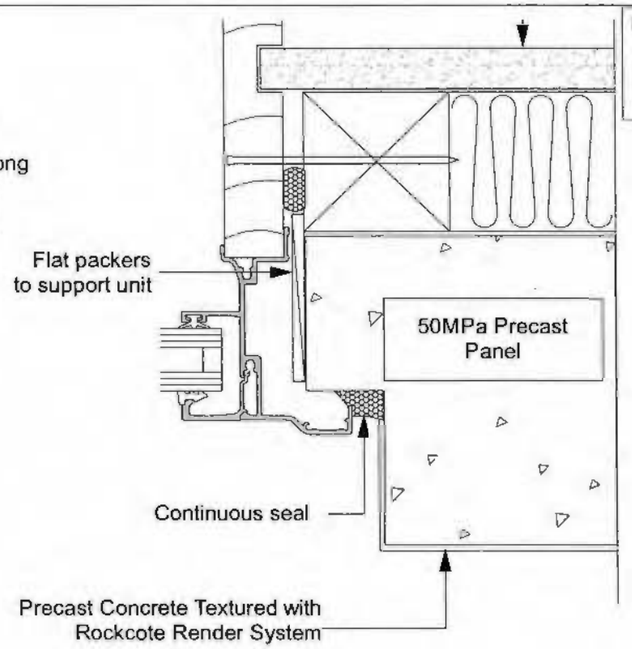
Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION



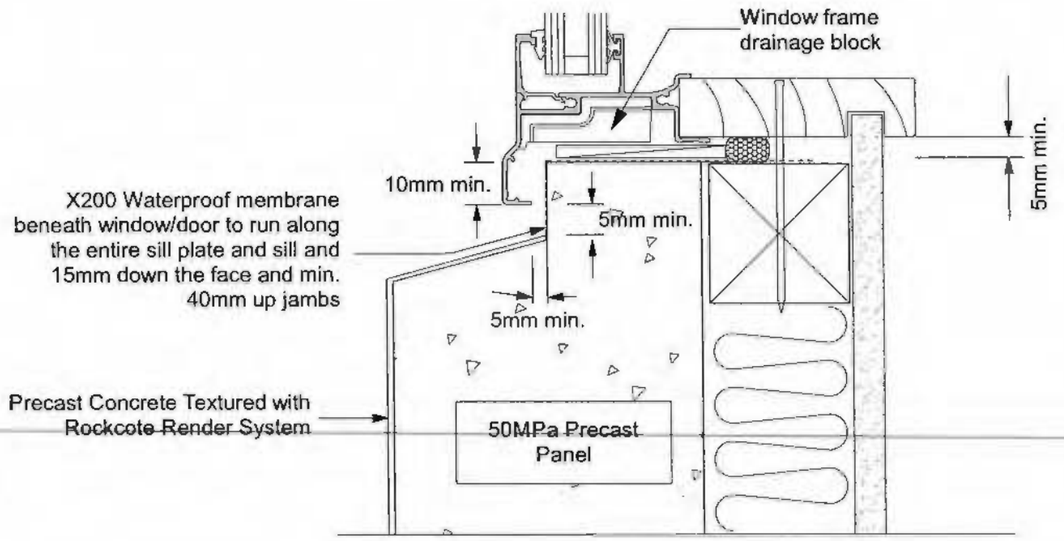
W100 - REBATED WINDOW HEAD DETAIL

Scale 1:2



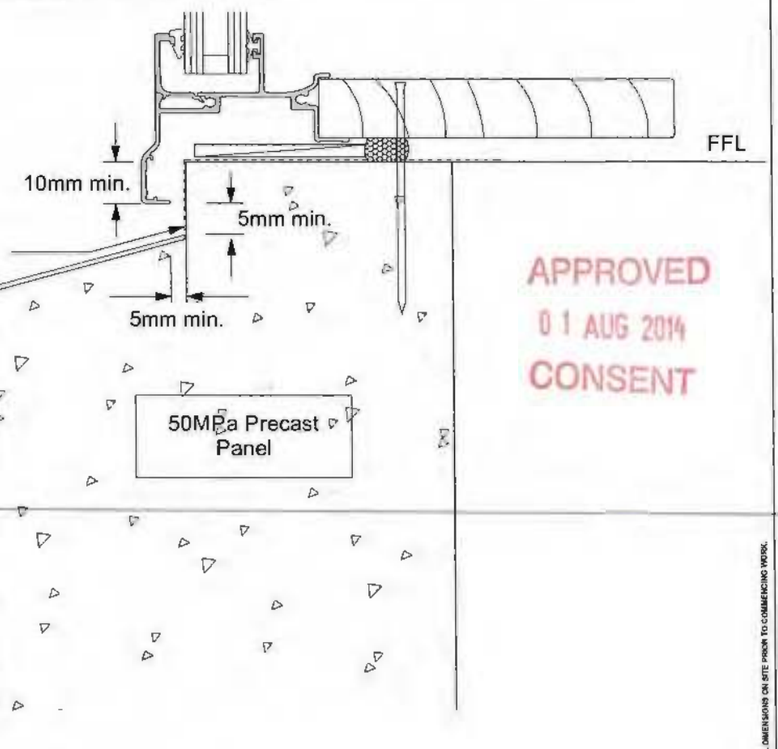
W100 - REBATED WINDOW JAMB DETAIL

Scale 1:2



W100 - REBATED WINDOW/DOOR SILL DETAIL

Scale 1:2



W100 - DOOR SILL DETAIL

Scale 1:2

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0 1 AUG 2014
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76 Main Road South, Levin 5510
Ph: 06 3681357
Fax: 06 3681359

DATE: 09-07-14
CONCEPT: PRELIM ENGINEERING BUILDING CONSENT & CONSTRUCTION
DRAWN BY: Neil Stirling
REVISIONS: -
CHECKED BY: Walter Simmons (LBP# 121922)
REV. DATE: -

Joinery Details - Rockcote over Precast Panel

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

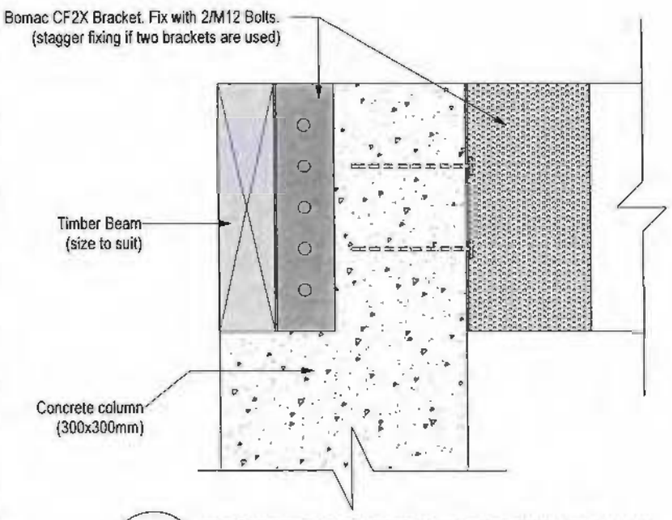
CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

SCALE: ISO A3 (297mm x 420 mm) 1:2
PROJECT# H1408
SHEET# C6 of 20

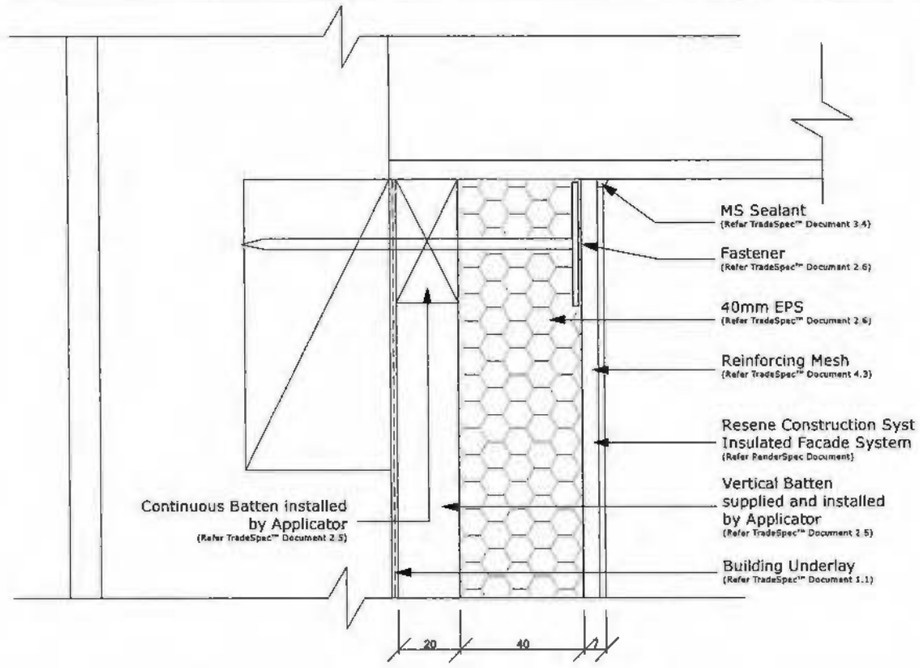
Notes:

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COLUMN TO BEAM CONNECTION DETAIL

Scale 1:5

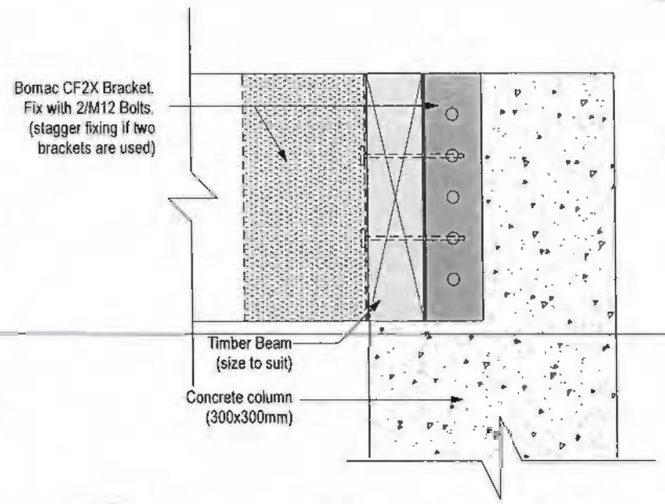


GABLE END CLADDING SOFFIT DETAIL

ROCKCOTE EPS40 OVER CAVITY

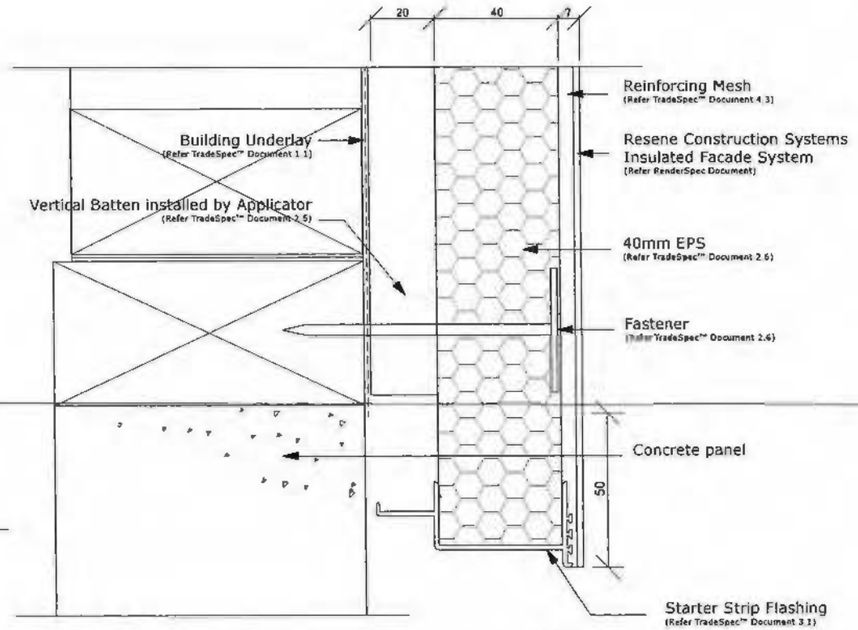
Scale 1:2

APPROVED
01 AUG 2014
CONSENT



COLUMN TO BEAM CONNECTION DETAIL

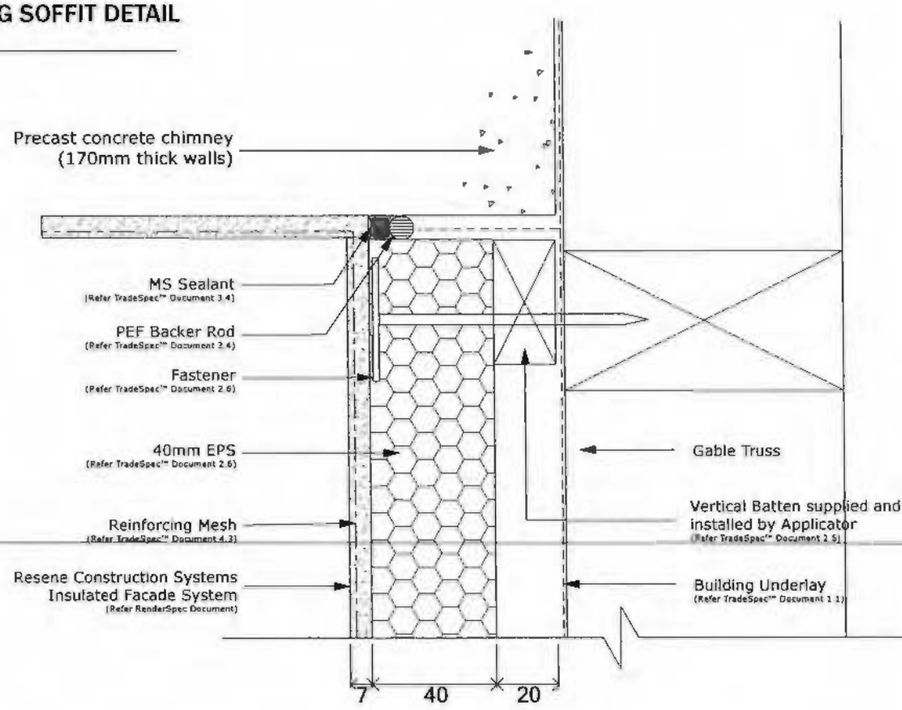
Scale 1:5



GABLE END CLADDING BASE DETAIL

ROCKCOTE EPS40 OVER CAVITY

Scale 1:2



GABLE END CLADDING JUNCTION DETAIL

ROCKCOTE EPS40 OVER CAVITY

Scale 1:2

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76 Main Road South, Levin 5510
Ph: 06 3681357
Fax: 06 3681359

DATE: 09-07-14

DRAWN BY: Matt Stirling

CHECKED BY: Walter Simmons (LBP# 121932)

CONCEPTI PRELIM. ENGINEERING BUILDING CONSENT & CONSTRUCTION

REVISION# -

REV. DATE: -

Construction Details

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

SCALE: ISO A3 1:5 (297 mm x 420 mm)

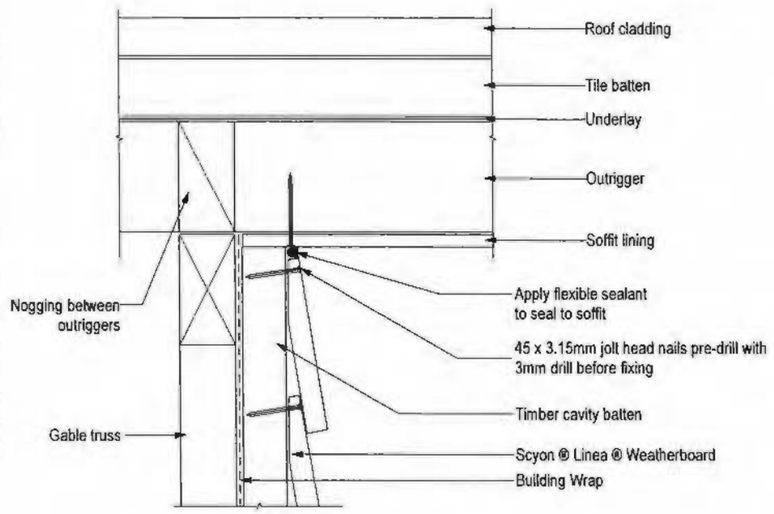
PROJECT# H1408

SHEET# C7 OF 20

Notes:

- THIS SHEET IS TO BE READ IN CONJUNCTION WITH SHEET PI1 - PROJECT INFORMATION FOR ADDITIONAL INFORMATION

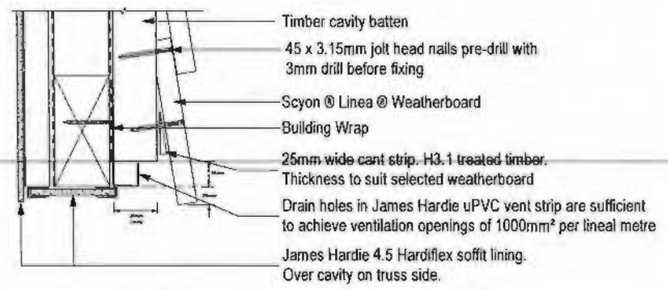
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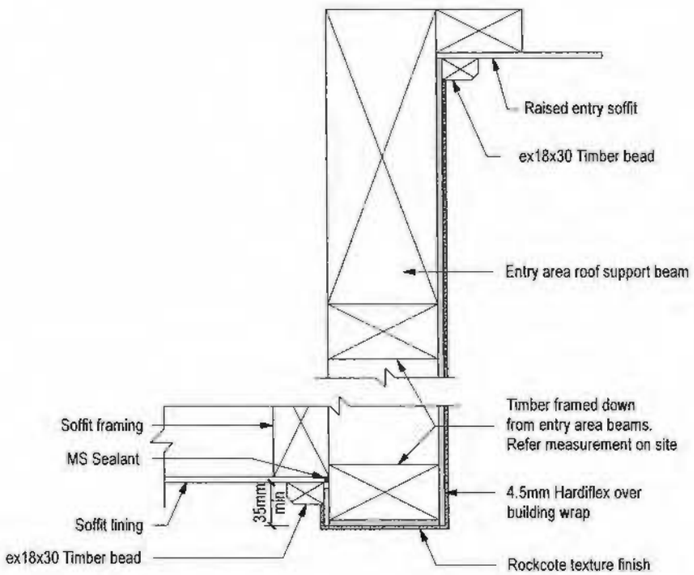
The Scyon ® Linea ® Weatherboard must be neat cut and silicone sealed to angle of soffit

Alternatively a scotia can be scribed and sealed to Scyon ®/ Linea ®/ Weatherboard and the soffit lining

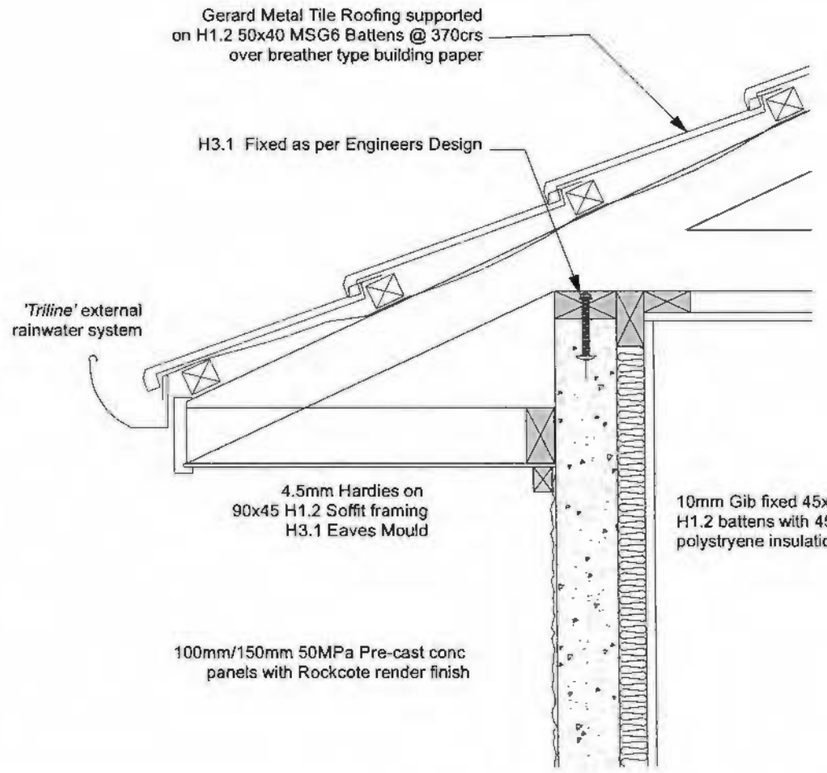
GABLE END RAKING SOFFIT DETAIL
LINEA WEATHERBOARD OVER CAVITY
Scale 1:5



GABLE END CLADDING BASE DETAIL
LINEA WEATHERBOARD OVER CAVITY
Scale 1:5



RAISED ENTRY EAVES/SOFFIT DETAIL
Scale 1:5



Soffit and Truss Connection Detail
Scale 1:10

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DATE: 09-07-14
CONCEPT/PRELIM/ENGINEERING/BUILDING CONSENT/CONSTRUCTION
DRAWN BY: Neil Stirling
REVISION#: -
CHECKED BY: Walter Simmons (LBP# 121932)
REV. DATE: -

Construction Details

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street
Levin

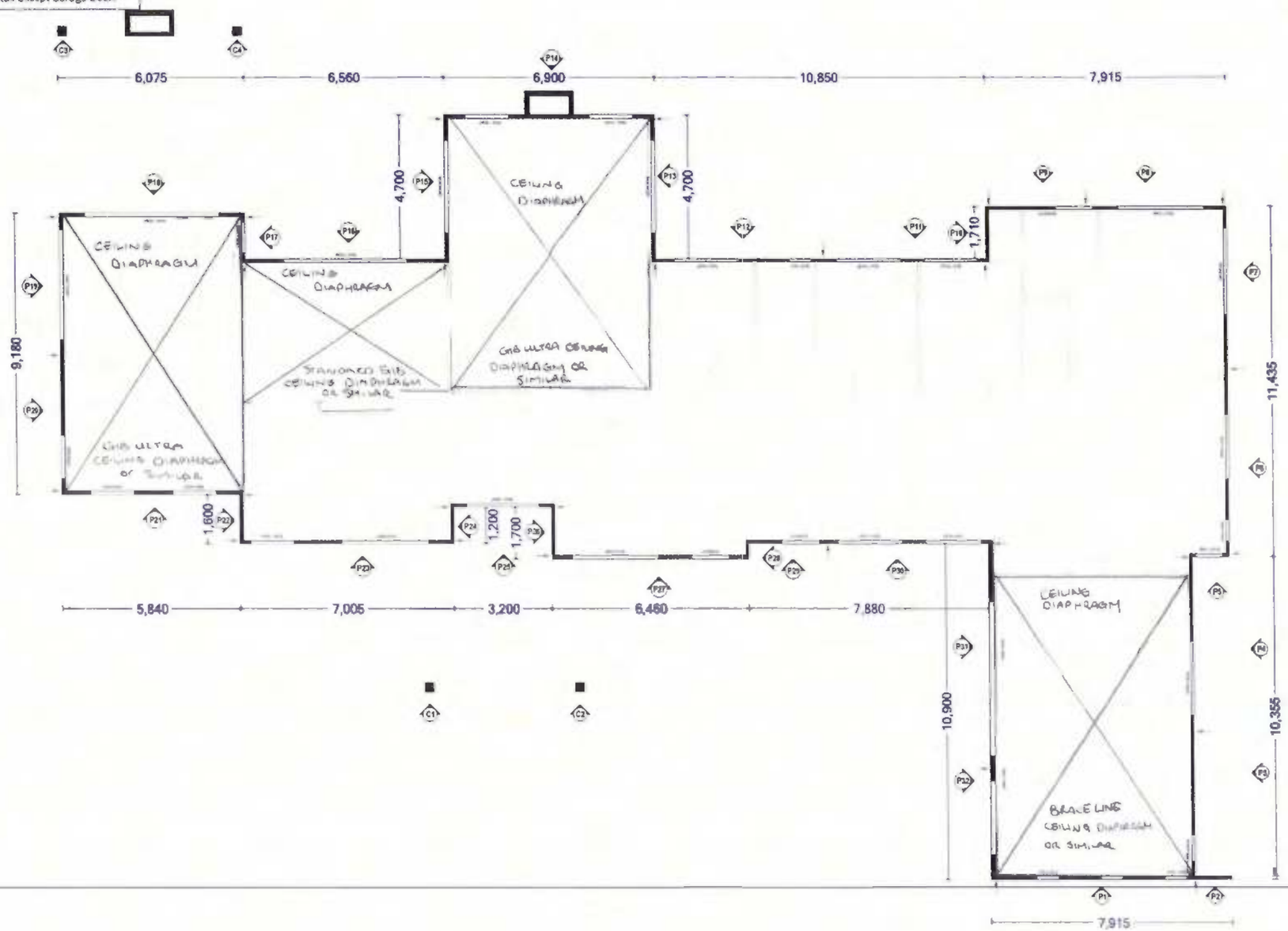
CLIENT NAME:
Homestead Homes Ltd

HOMESTEAD CONCRETE HOMES

SCALE: 1:5 1:10 (ISO A3 297 mm x 420 mm)
PROJECT# H1408
SHEET# C8 OF 20

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary, default is 100mm
All Windows and Doors have rebated detail Except Garage Door.

OPENING SIZES SHOWN ON LAYOUT PLAN INDICATE SIZE OF OPENING IN PANEL, NOT THE ACTUAL WINDOW SIZE.
GARAGE OPENING SIZE ALLOWS FOR 120mm RECESS BELOW SLAB LEVEL.



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CONTENTS

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Job: 113573
Page title: PANEL PLAN + CEILING DIAPHRAGM
Sheet# SK01

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Fax: 06 3681359

DATE: 26-06-14
PRELIM ENGINEERING
DRAWN BY: Nat Stirling
REVISION: A
CHECKED BY:
REV. DATE: 25-07-14

Panel Layout Plan

PROPOSED NEW HOUSE

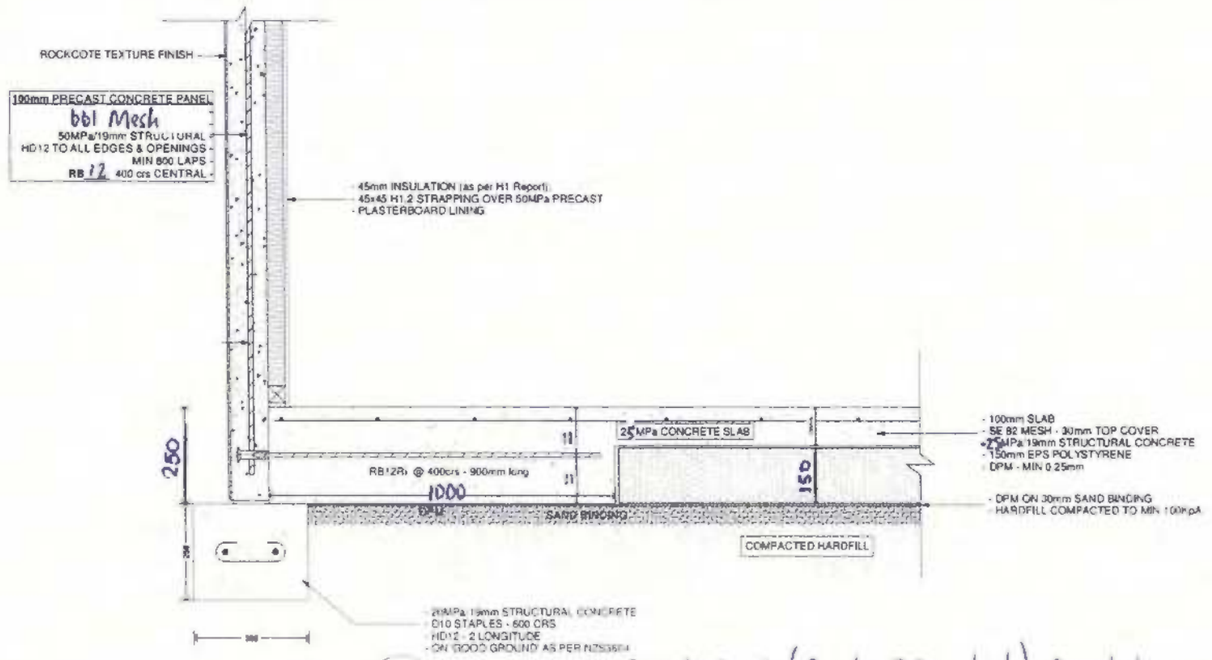
SITE ADDRESS
1097 Queen Street East
Levin 5510

CLIENT NAME
D & J Lawry

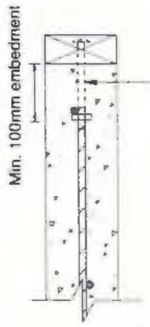
HOMESTEAD CONCRETE HOMES

SCALE: 1:100 @ A3 (297mm x 420mm)
PROJECT# H1408
SHEET# 1 of 26

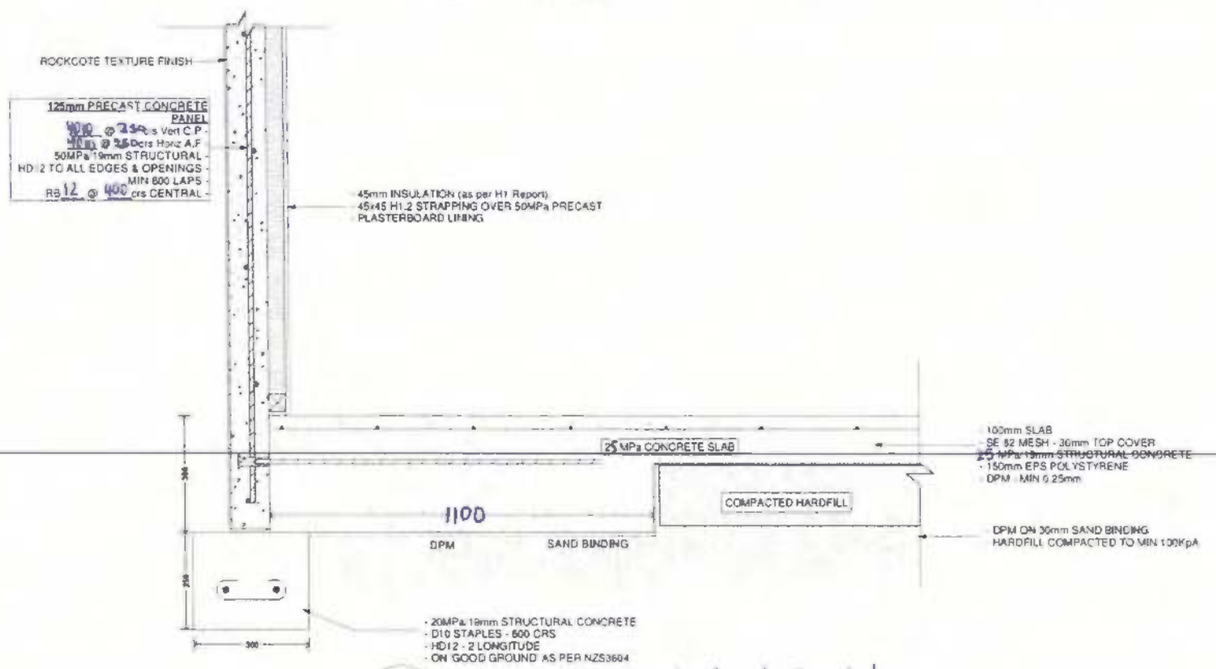
All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



100mm Thick Precast Panel (Panels 2.9m high) Foundation
SCALE 1:15



TOP PLATE DETAIL
SCALE 1:10



125 Thick Precast Panel Foundation
SCALE 1:15

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Job: 113573
Page title: Foundation Detail Sheet# SK02

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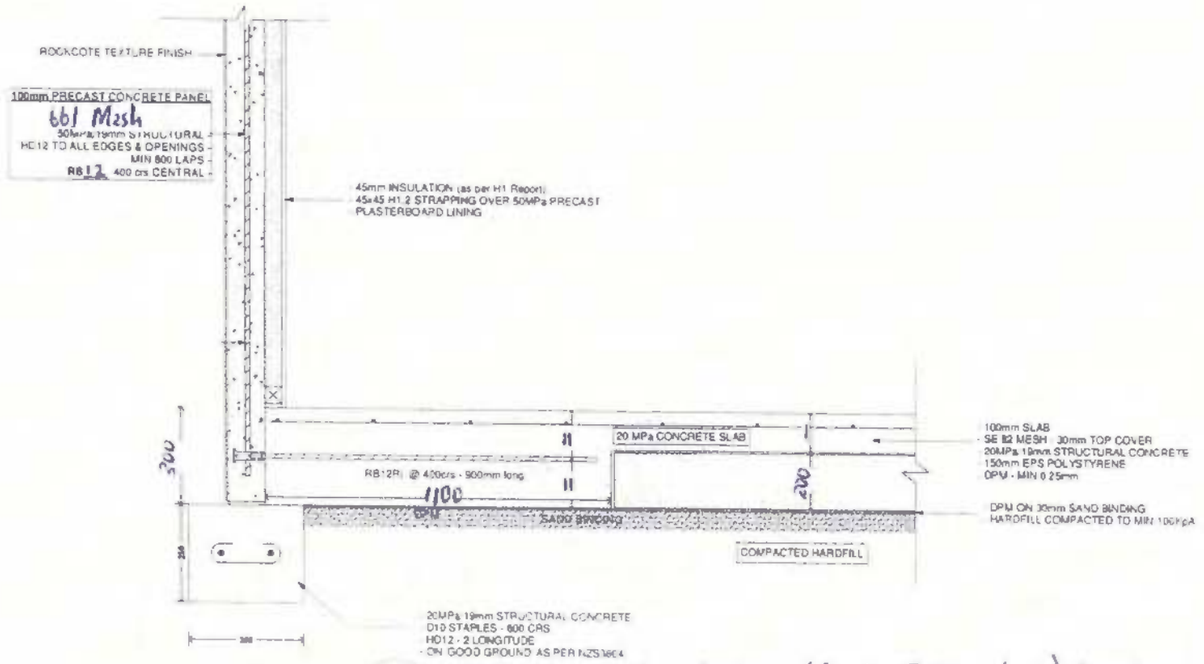
Foundation Detail
PROPOSED NEW HOUSE

SITE ADDRESS
1097 Queen Street East
Levin 5510
CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: A3
PROJECT# H1408
SHEET# 2 of 26

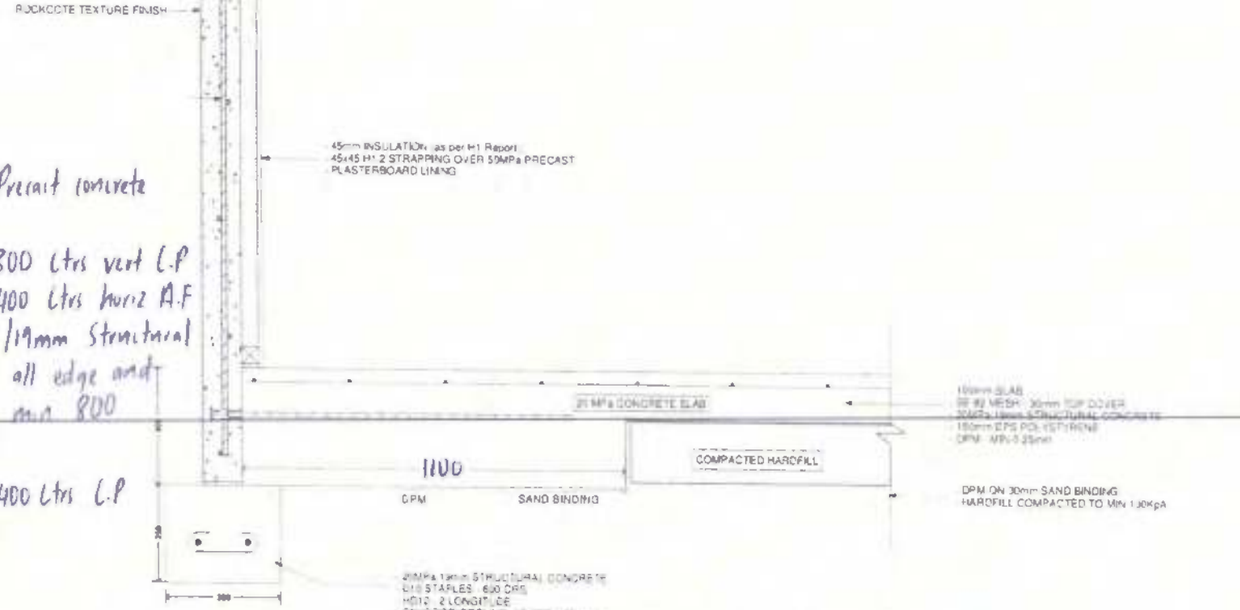
All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary, default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



100mm Thick Precast Panel (Panels 3.32m high) Foundation
SCALE 1:15



TOP PLATE DETAIL
SCALE 1:10



150mm Precast concrete
Panel
4D12 @ 300 Ctrs vert C.P
4D10 @ 400 Ctrs horiz A.F
50 MPa /19mm Structural
HD12 to all edge and
openings, min 800
lap
RB12 @ 400 Ctrs C.P

150mm Thick Precast Panel Foundation
SCALE 1:15

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DATE: 26-06-14 PRELIM ENGINEERING
DRAWN BY:
REVISION# A
CHECKED BY:
REV. DATE 25-07-14

Foundation Detail

PROPOSED NEW HOUSE

SITE ADDRESS
1097 Queen Street East
Levin 5510
CLIENT NAME
D & J Lawry

Job 113573
KOA
Page title: Foundation Detail Sheet# SK03

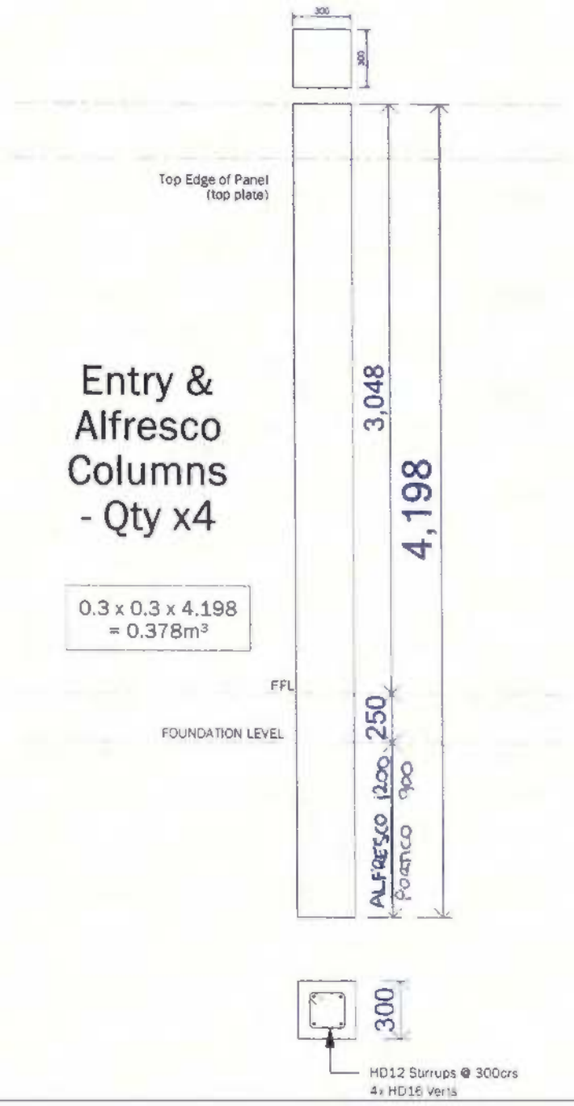
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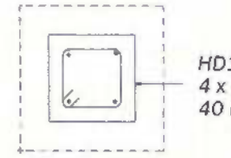
SCALE:
PROJECT# H1408
SHEET# 2 of 26

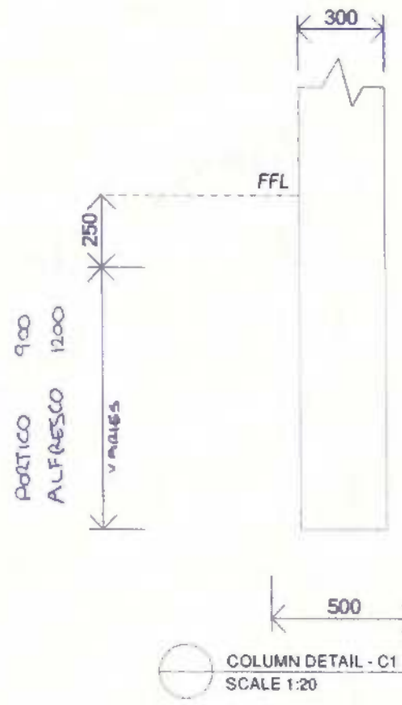
All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



Entry & Alfresco Columns - Qty x4

0.3 x 0.3 x 4.198
= 0.378m³





COLUMN DETAIL - C1 to C4
SCALE 1:20

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C1 - 4

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DRAWN BY:
REVISIONS A
CHECKED BY:
REV. DATE: 26-07-14

COLUMNS C1 - C4

PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street East
Levin 5510
CLIENT NAME:
D & J Lawry

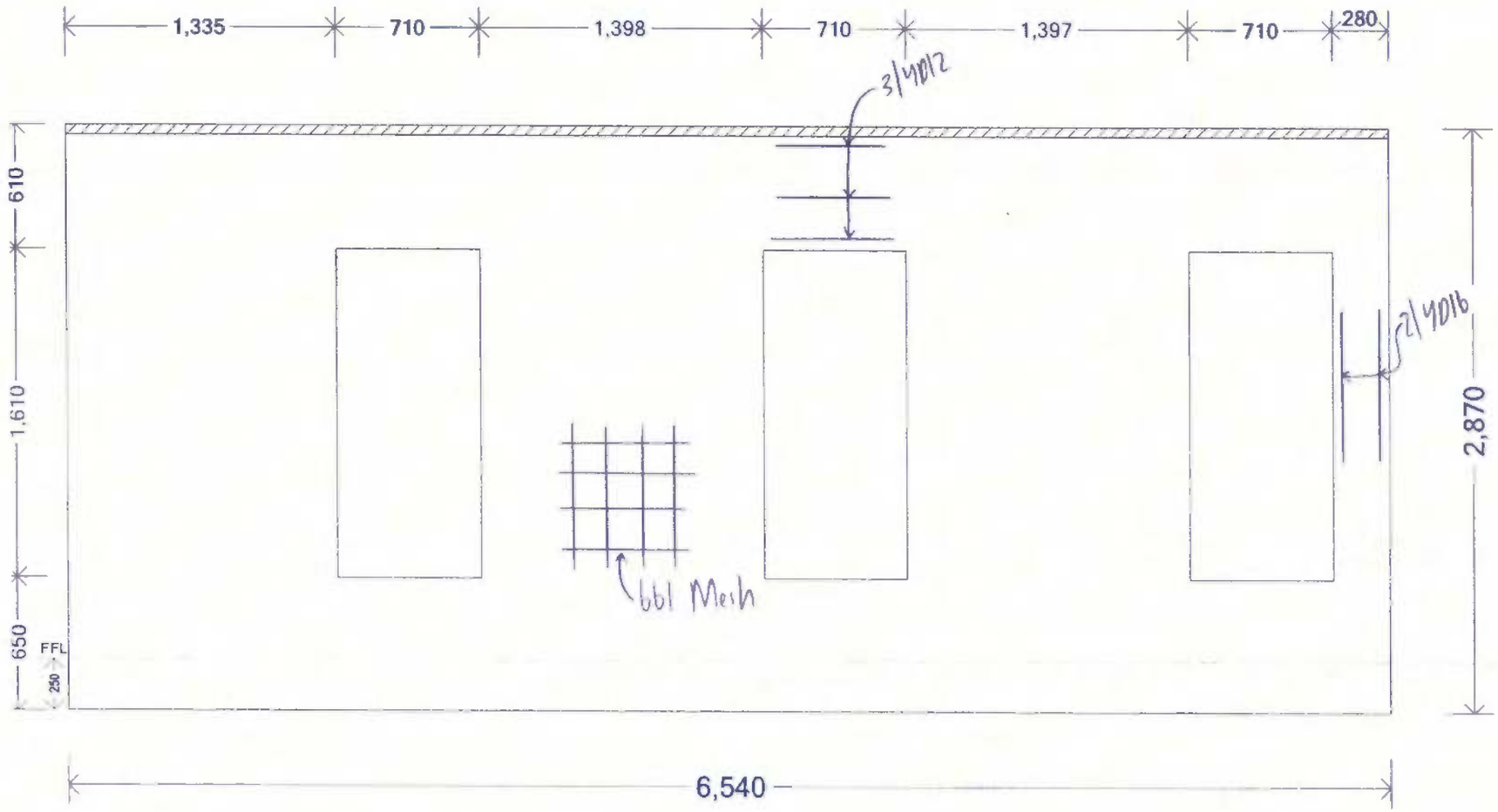
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PROJECT# H1408
SHEET# 3 OF 26

Job: 113573
Page title: Column Detail Sheet# SK04

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All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
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P1

Job: 113573
Page title: Panel Design
Sheet# SK05

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CHECKED BY:
PRELIM ENGINEERING
REVISION# A
REV. DATE 26-07-14

Panel # 1

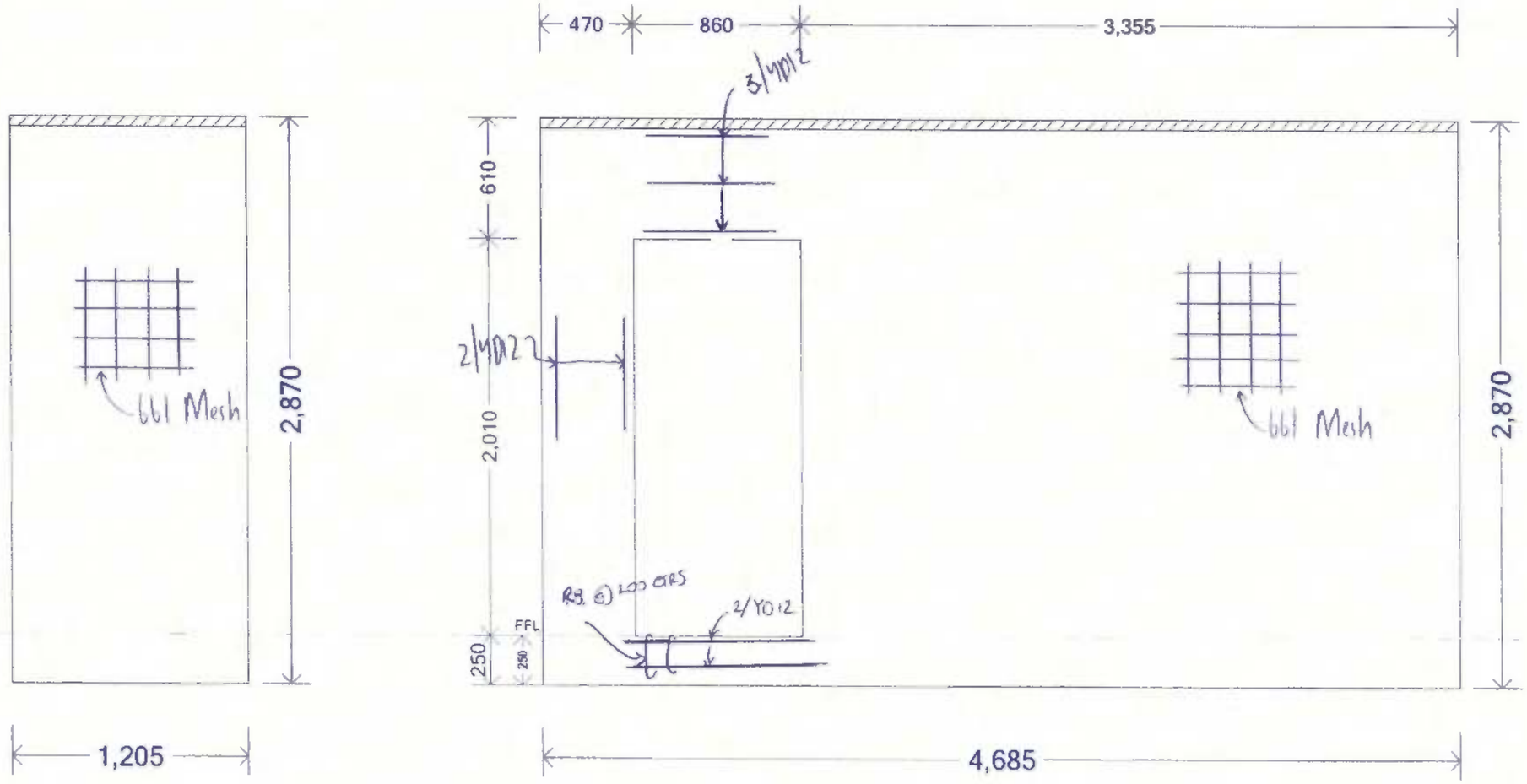
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SITE ADDRESS:
1097 Queen Street East
Levin 5510
CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE:
PROJECT# H1408
SHEET# 4 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



P2

P3

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Page title: Panel Design
Sheet# SK06

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DATE: 26-06-14 PRELIM ENGINEERING
DRAWN BY: Neil Sterling REVISION# A
CHECKED BY: REV. DATE 26-07-14

Panel # 2, 3

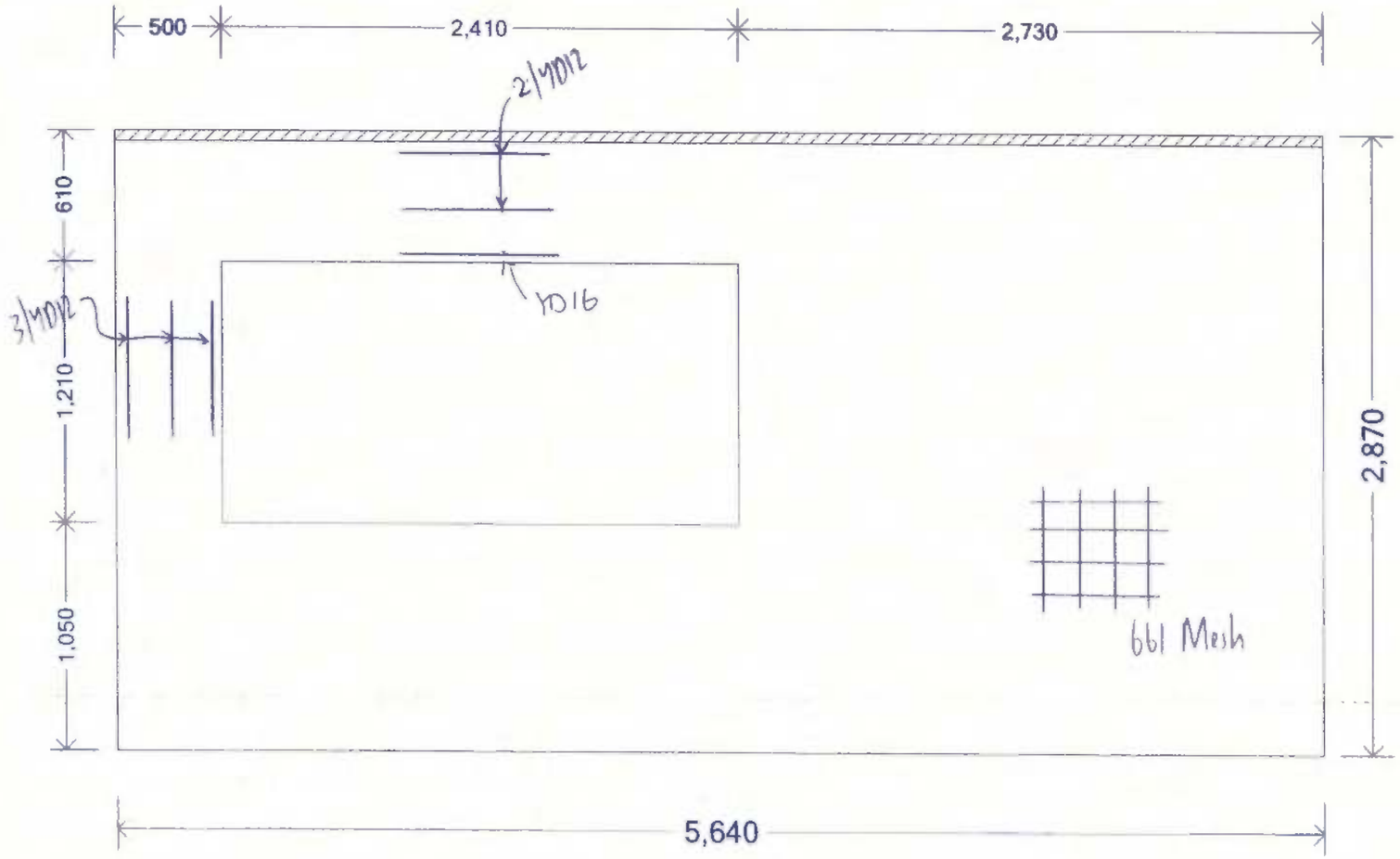
PROPOSED NEW HOUSE

SITE ADDRESS
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Levin 5510
CLIENT NAME
D & J Lawry

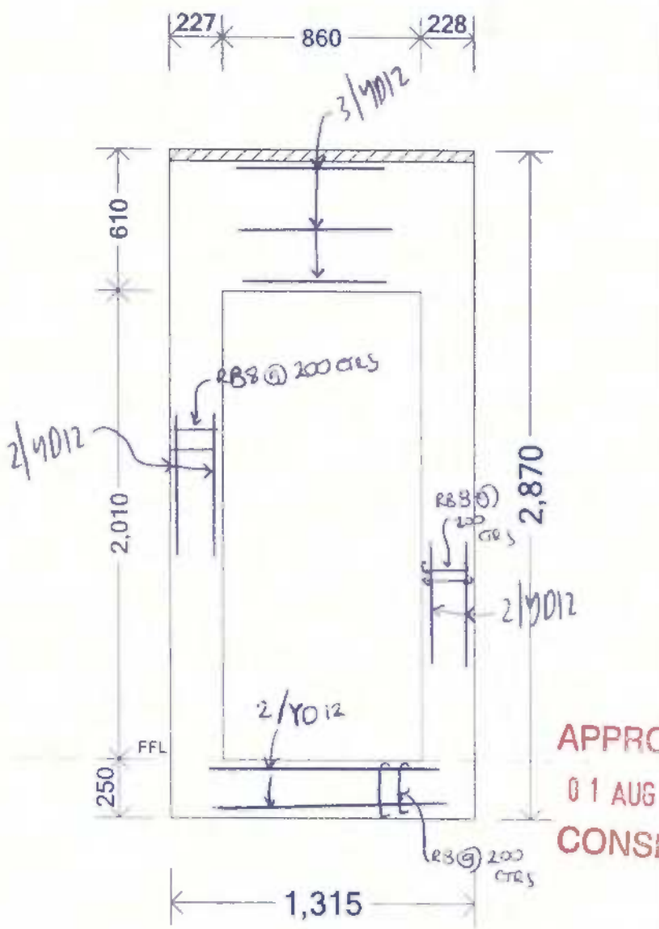
HOMESTEAD CONCRETE HOMES

SCALE: 1:20 @ A3 (297 mm x 420 mm)
PROJECT# H1408
SHEET# 5 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



P4



P5

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Job: 113573
Page title: Panel Design Sheet# SK07

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Panel #4, 5

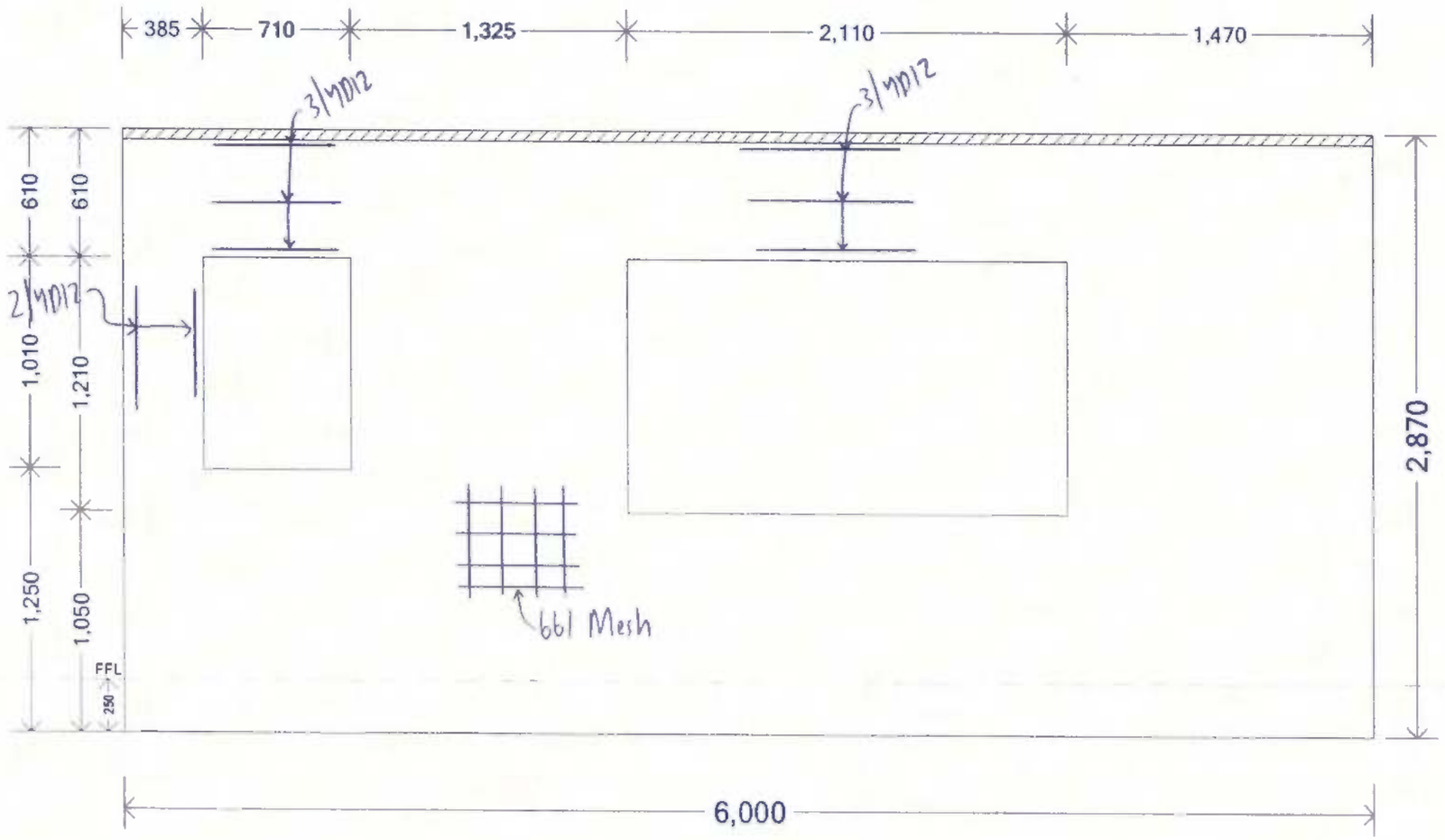
PROPOSED NEW HOUSE

SITE ADDRESS
1097 Queen Street East
Levin 5510
CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE:
PROJECT# H1408
SHEET# 6 OF 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



P6

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Job: 113.573
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Sheet# SK08

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A	RFC AS PER KOA	N/A	26-07-14

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DATE: 26-06-14 — PRELIM ENGINEERING
DRAWN BY: Neil Stirling
REVISION# A
CHECKED BY: Ezra Ross
REV. DATE 26-07-14

LICENSED BUILDING PRACTITIONER

Panel # 6

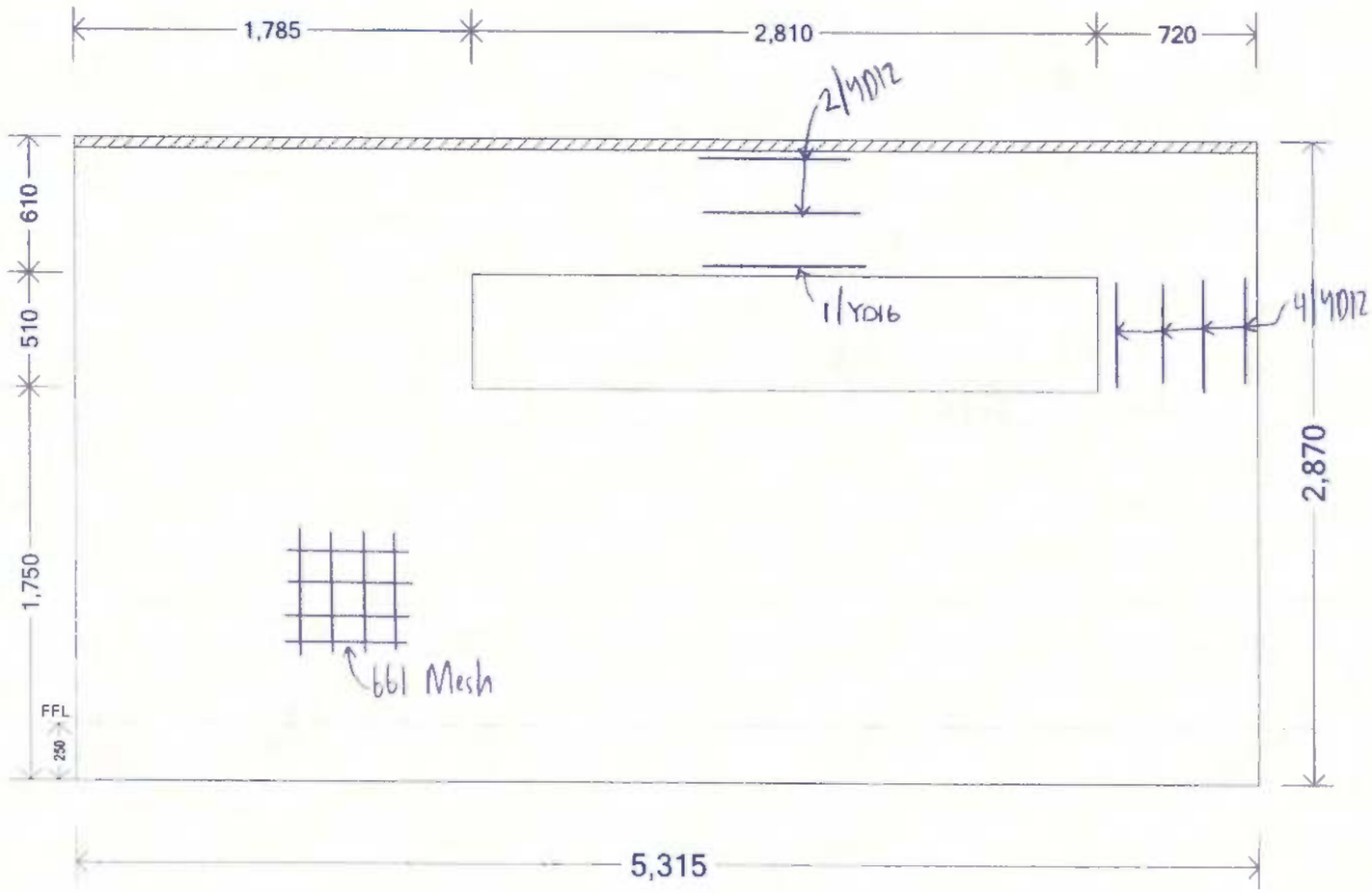
PROPOSED NEW HOUSE

SITE ADDRESS:
1097 Queen Street East
Levin 5510
CLIENT NAME:
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: 1:25 (@ A3) (@ A1)
PROJECT# H1408
SHEET# 7 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
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All Windows and Doors have rebated detail Except Garage Door.



P7

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Job: 11 3573
Page title: Panel Design
Sheet# SK09

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PRELIM ENGINEERING
DRAWN BY:
REVISION# A
CHECKED BY:
REV. DATE: 26-07-14

Panel # 7

PROPOSED NEW HOUSE

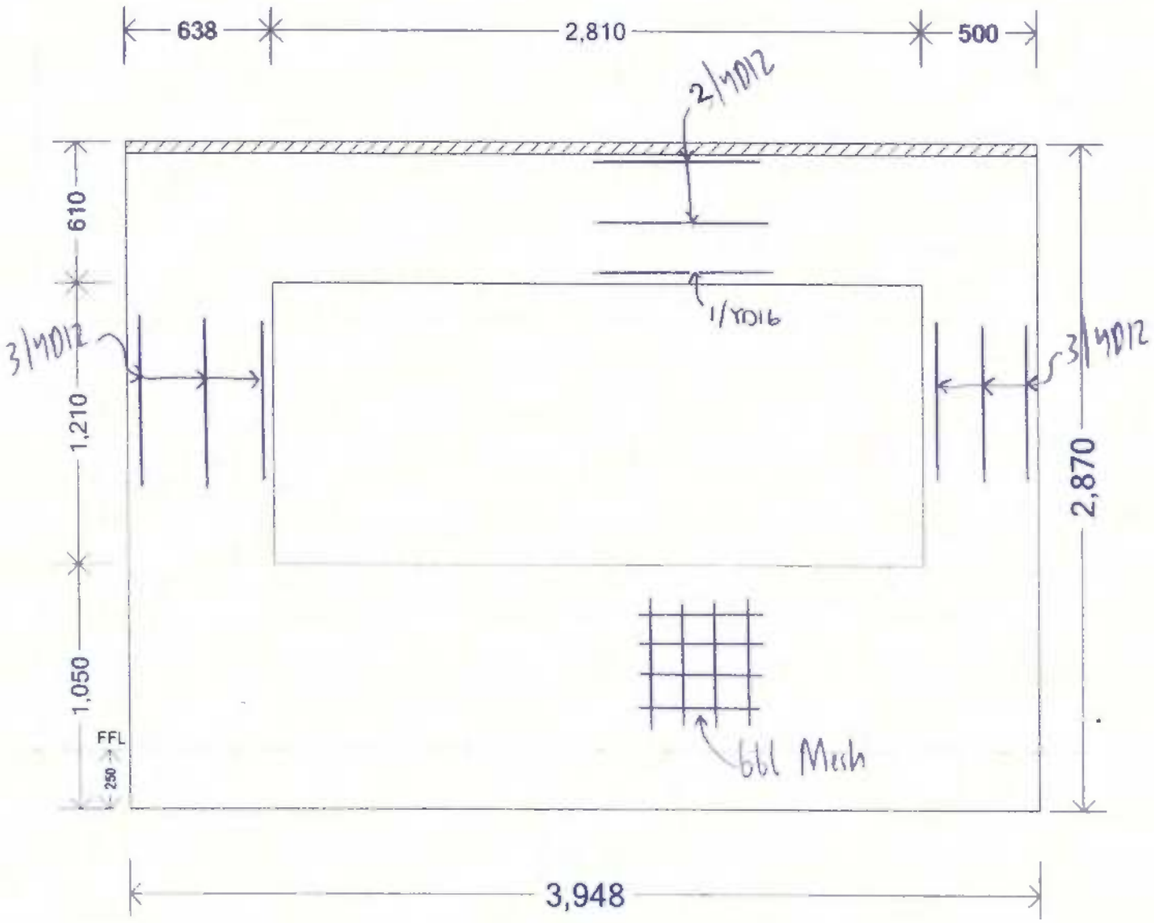
SITE ADDRESS:
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Levin 5510

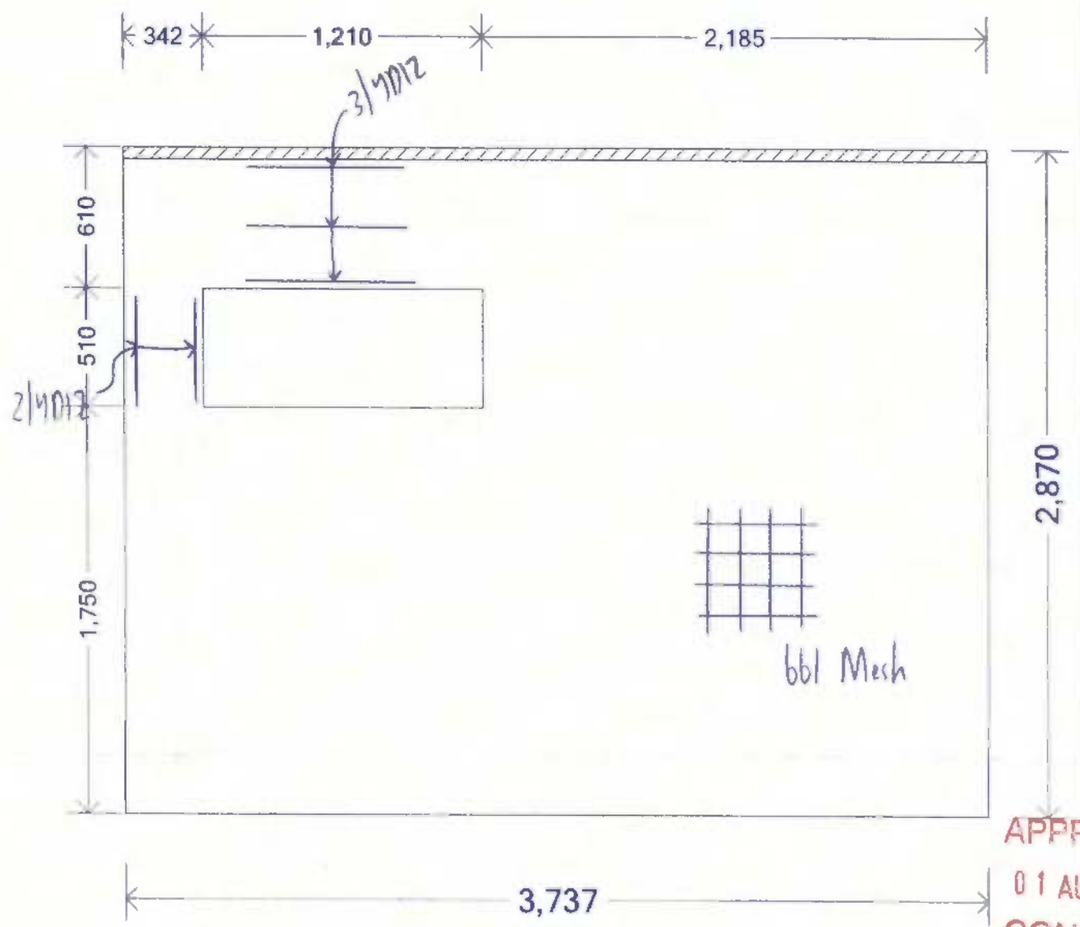
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SCALE: 1:20 @ A3, 1:10 @ A1, 1:5 @ A0
PROJECT# H1408
SHEET# 8 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary, default is 100mm
All Windows and Doors have rebated detail Except Garage Door.





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01 AUG 2014
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P8

P9

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Job: 113573
Page title: Panel Design Sheet# SK10

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Fax: 06 3681359

DATE: 26-06-14 PRELIM ENGINEERING
DRAWN BY:
CHECKED BY:
REVISION# A
REV. DATE 26-07-14

Panel # 8, 9

PROPOSED NEW HOUSE

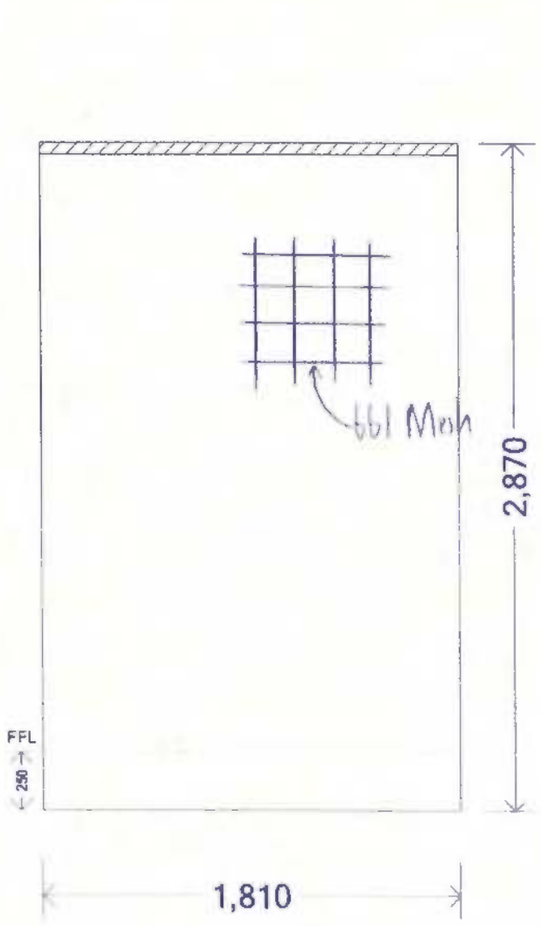
SITE ADDRESS
1097 Queen Street East
Levin 5510

CLIENT NAME
D & J Lawry

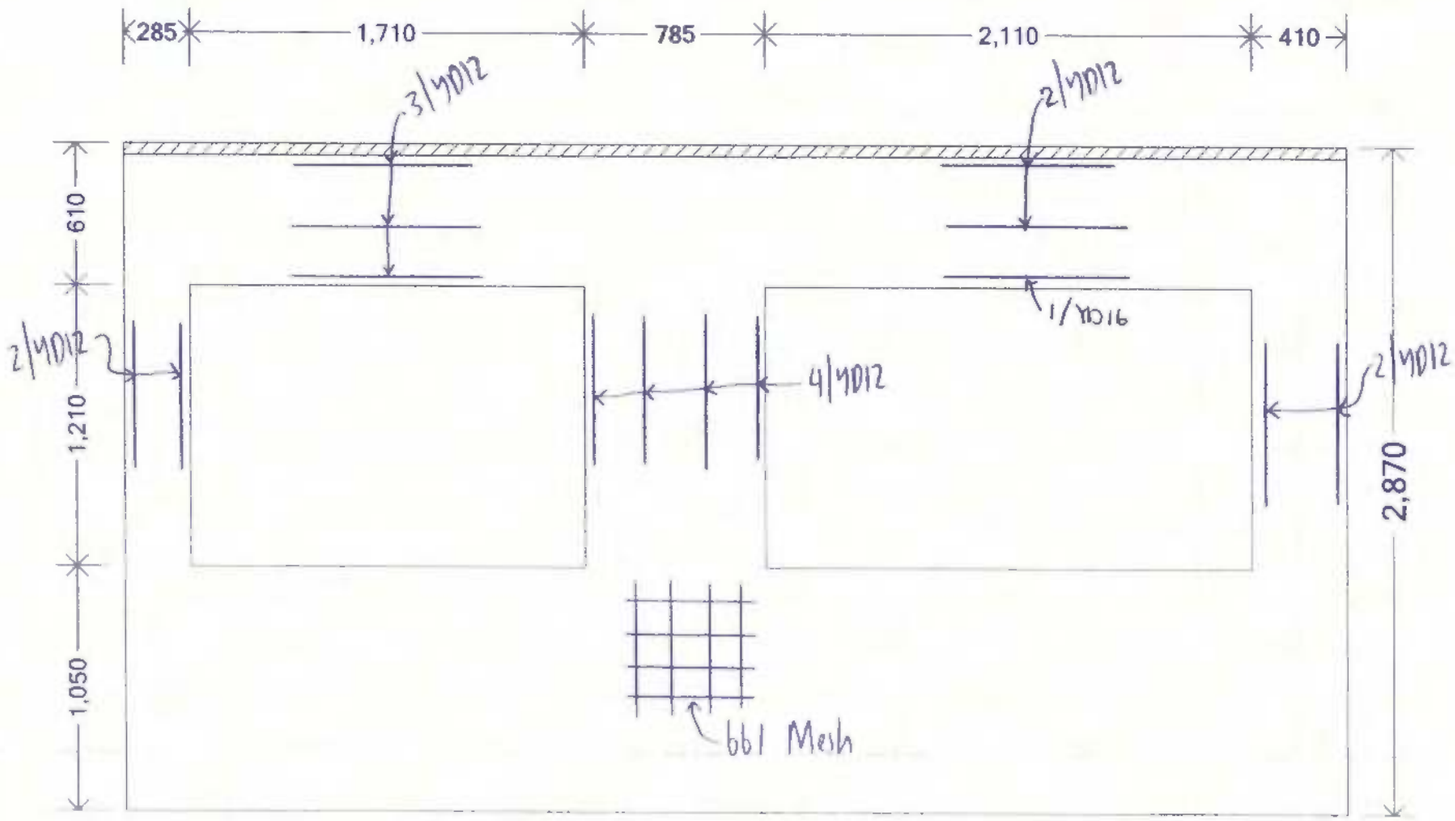
HOMESTEAD CONCRETE HOMES

SCALE:
PROJECT# H1408
SHEET# 9 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
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P10



P11

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DATE: 26-06-14 PRELIM ENGINEERING
DRAWN BY: Neil Barling
CHECKED BY: Tom Xia
REVISION# A
REV. DATE 26-07-14

Panel # 10, 11

PROPOSED NEW HOUSE

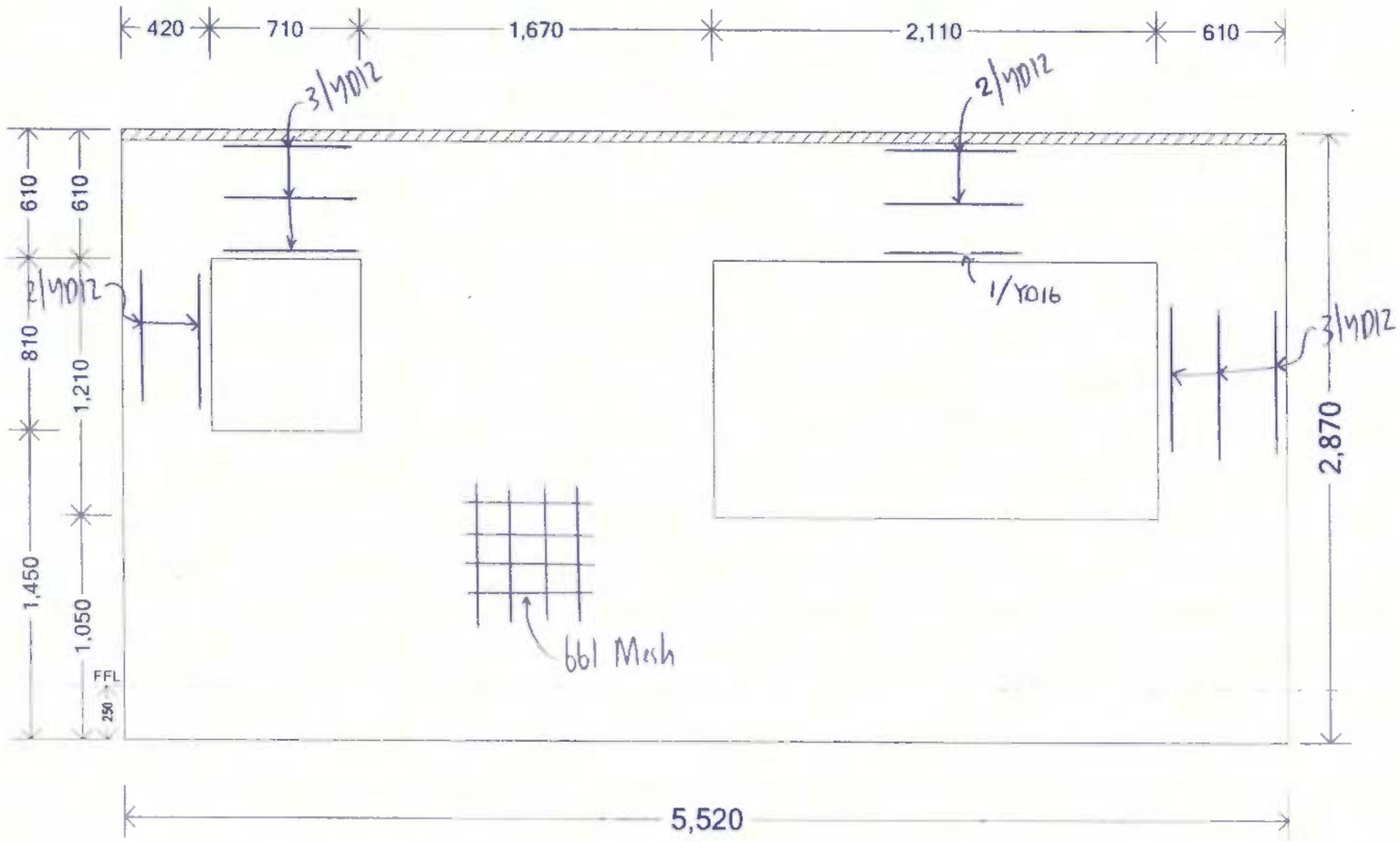
SITE ADDRESS
1097 Queen Street East
Levin 5510

CLIENT NAME:
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE:
PROJECT# H1408
SHEET# 10 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



P12

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DATE: 26-06-14
PRELIM ENGINEERING
DRAWN BY:
REVISION# A
CHECKED BY:
REV. DATE 26-07-14

Panel # 12

PROPOSED NEW HOUSE

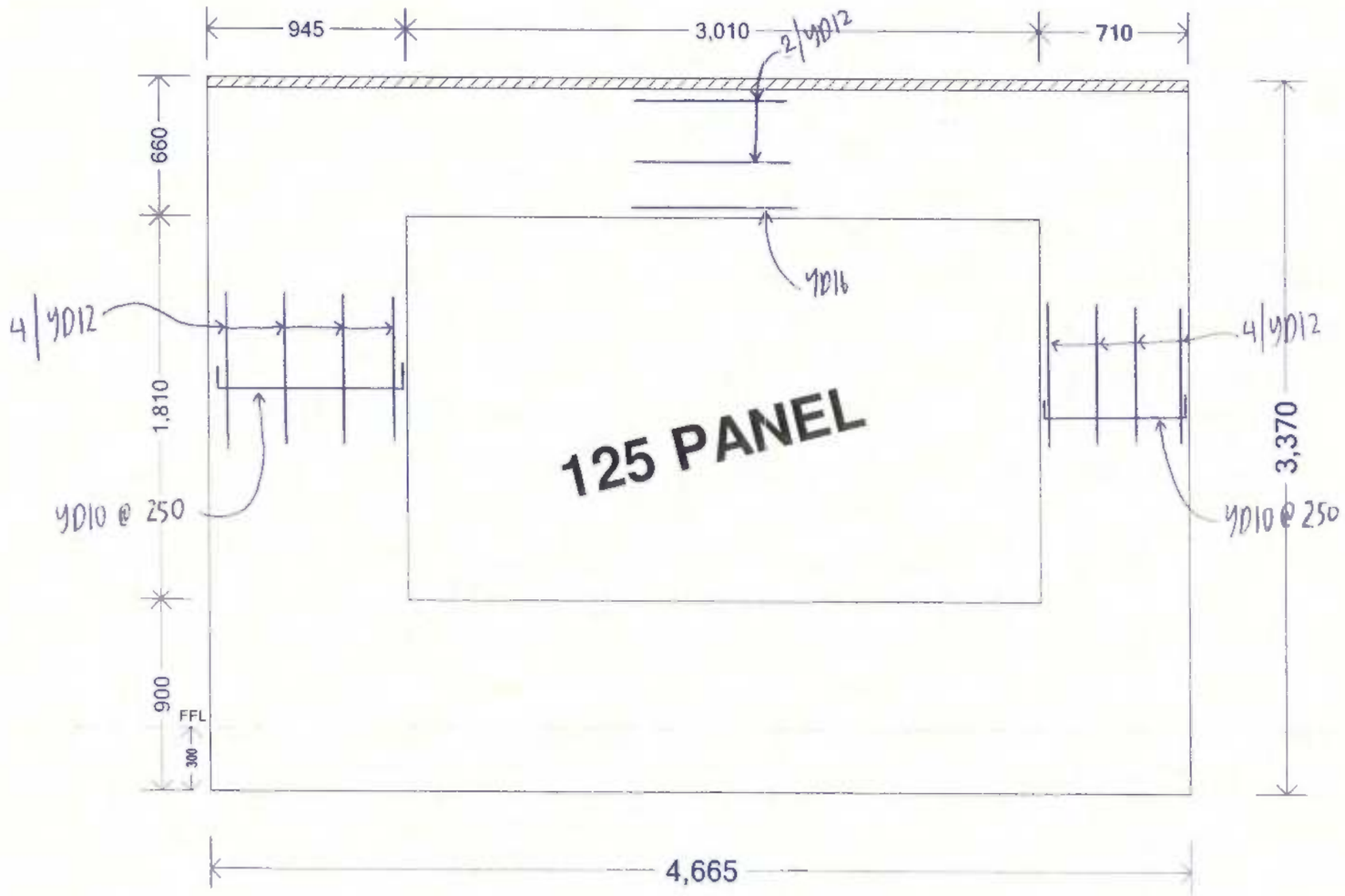
SITE ADDRESS
1097 Queen Street East
Levin 5510

CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE:
PROJECT# H1408
SHEET# 11 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



P13

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DATE 26-06-14 PRELIM ENGINEERING
DRAWN BY
CHECKED BY
REVISION# A
REV. DATE 25-07-14

Panel # 13

PROPOSED NEW HOUSE

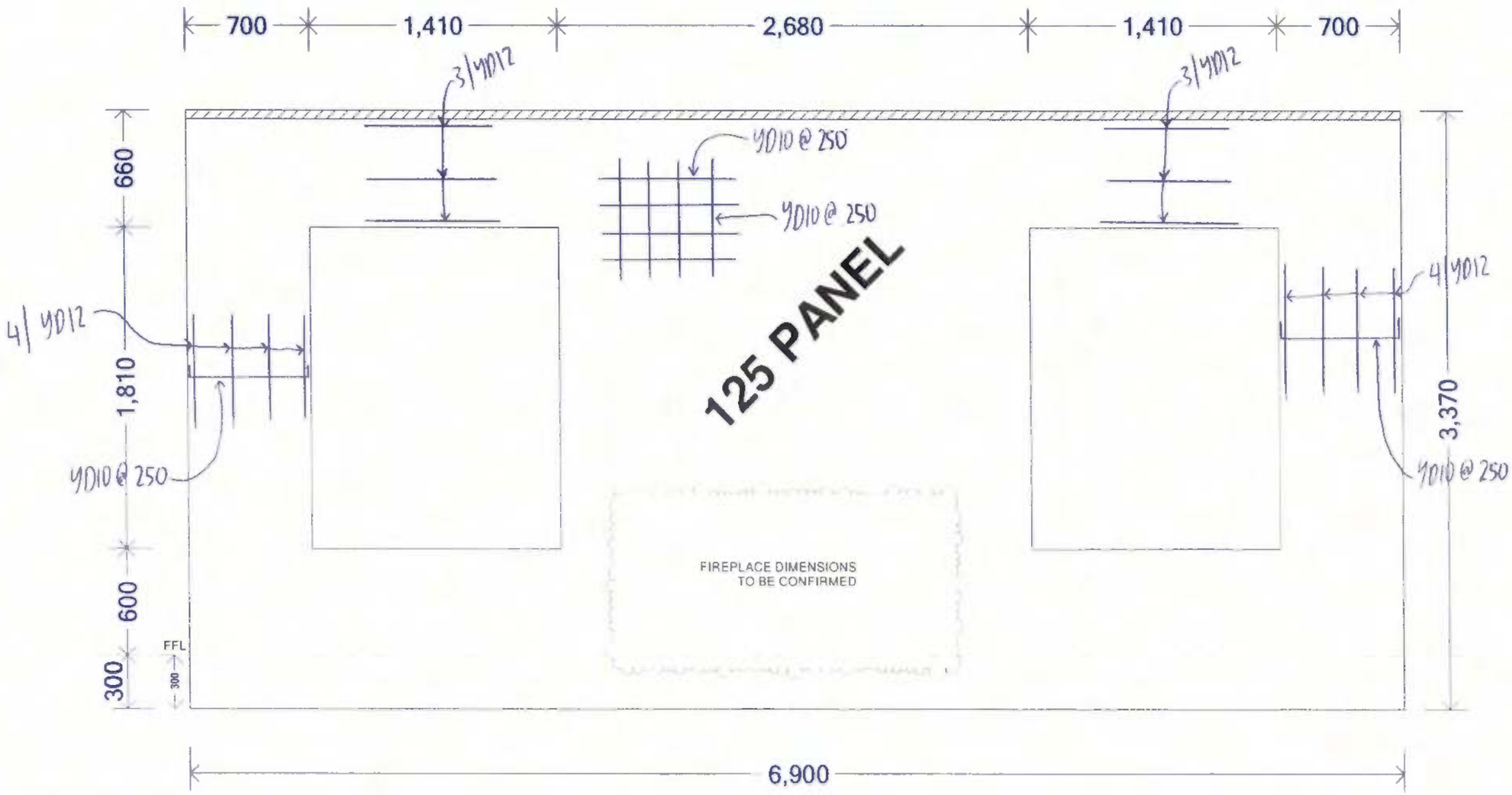
SITE ADDRESS
1097 Queen Street East
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CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: 1:25 @A3 (297 mm x 420 mm)
PROJECT# H1408
SHEET# 12 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
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P14

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DATE: 26-06-14
DRAWN BY: Nat Stirling
CHECKED BY: Kevin Rose
PRELIM ENGINEERING
REVISION# A
REV. DATE 26-07-14

LICENSED BUILDING PRACTITIONER

Panel # 14

PROPOSED NEW HOUSE

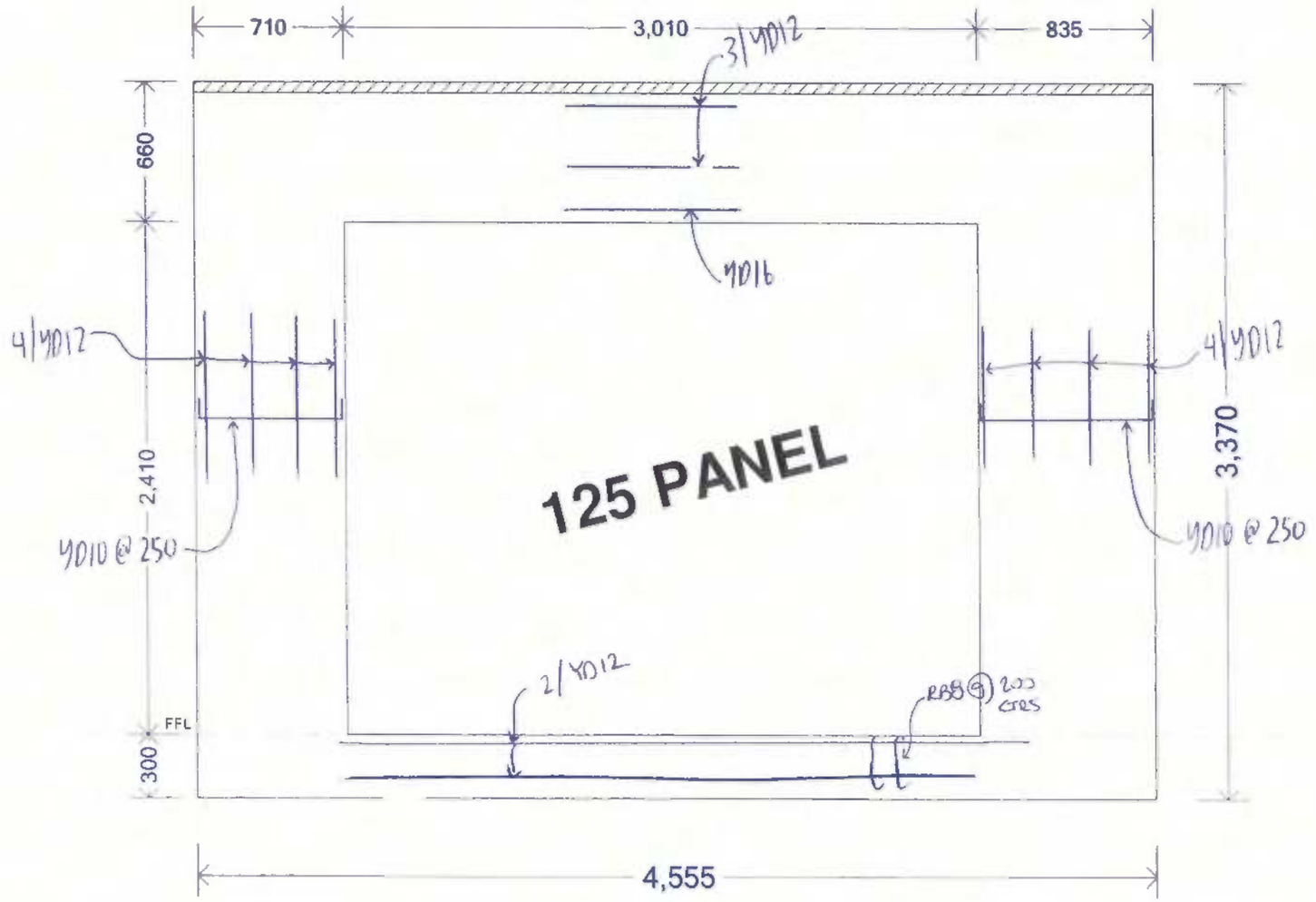
SITE ADDRESS:
1097 Queen Street East
Levin 5510

CLIENT NAME:
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: 1:25 (@ A1 297 mm x 420 mm)
PROJECT# H1408
SHEET# 13 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
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CHECKED BY:
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REV DATE 26-07-14

Panel # 15

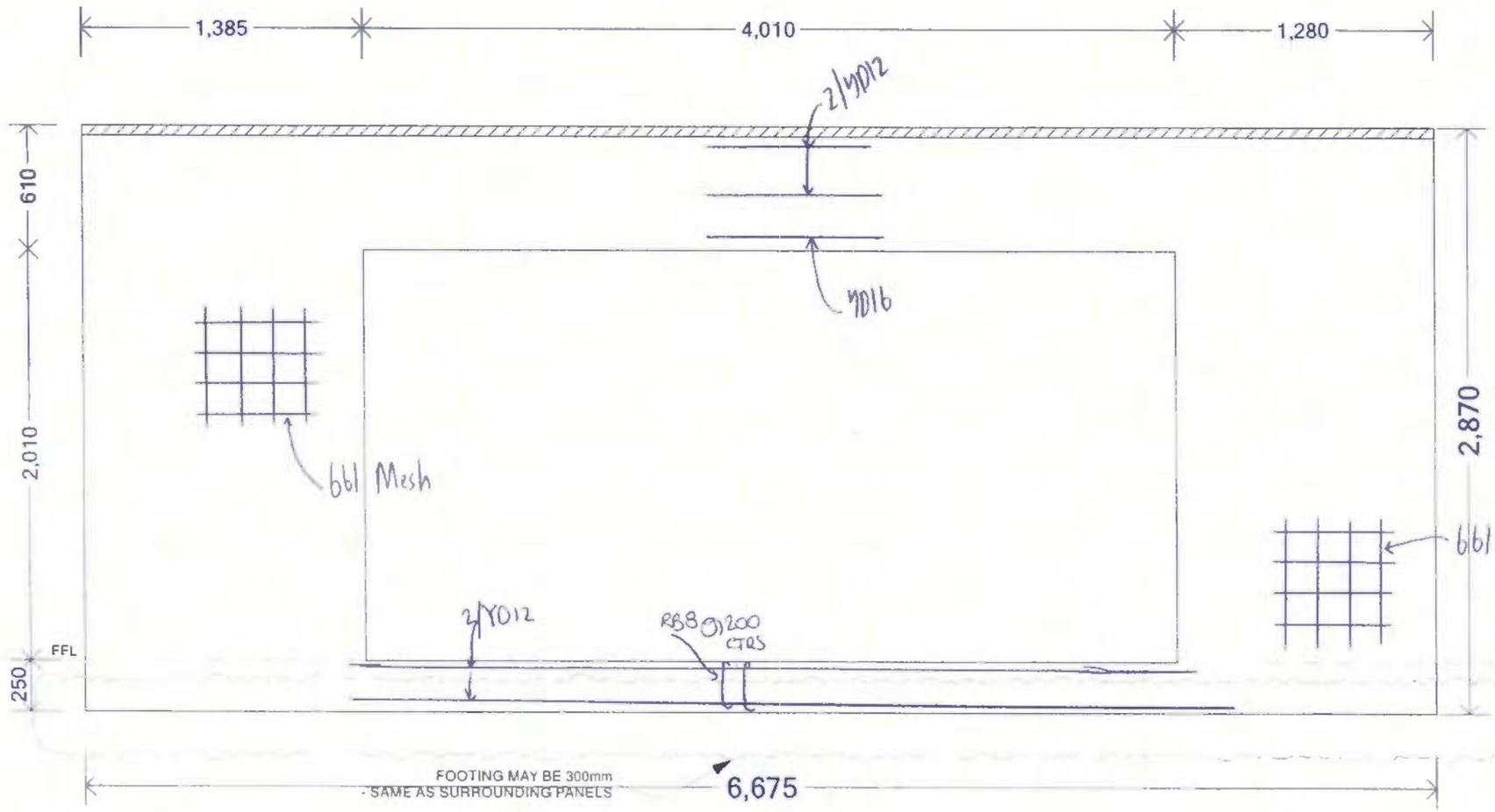
PROPOSED NEW HOUSE

SITE ADDRESS
1097 Queen Street East
Levin 5510
CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE:
PROJECT# H1408
SHEET# 14 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



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Job: 113573
Page title: Panel Design Sheet# SK16

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PRELIM ENGINEERING
DRAWN BY: Neil Stirling
REVISION# A
CHECKED BY: John Kerr
REV. DATE: 26-07-14

Panel # 16

PROPOSED NEW HOUSE

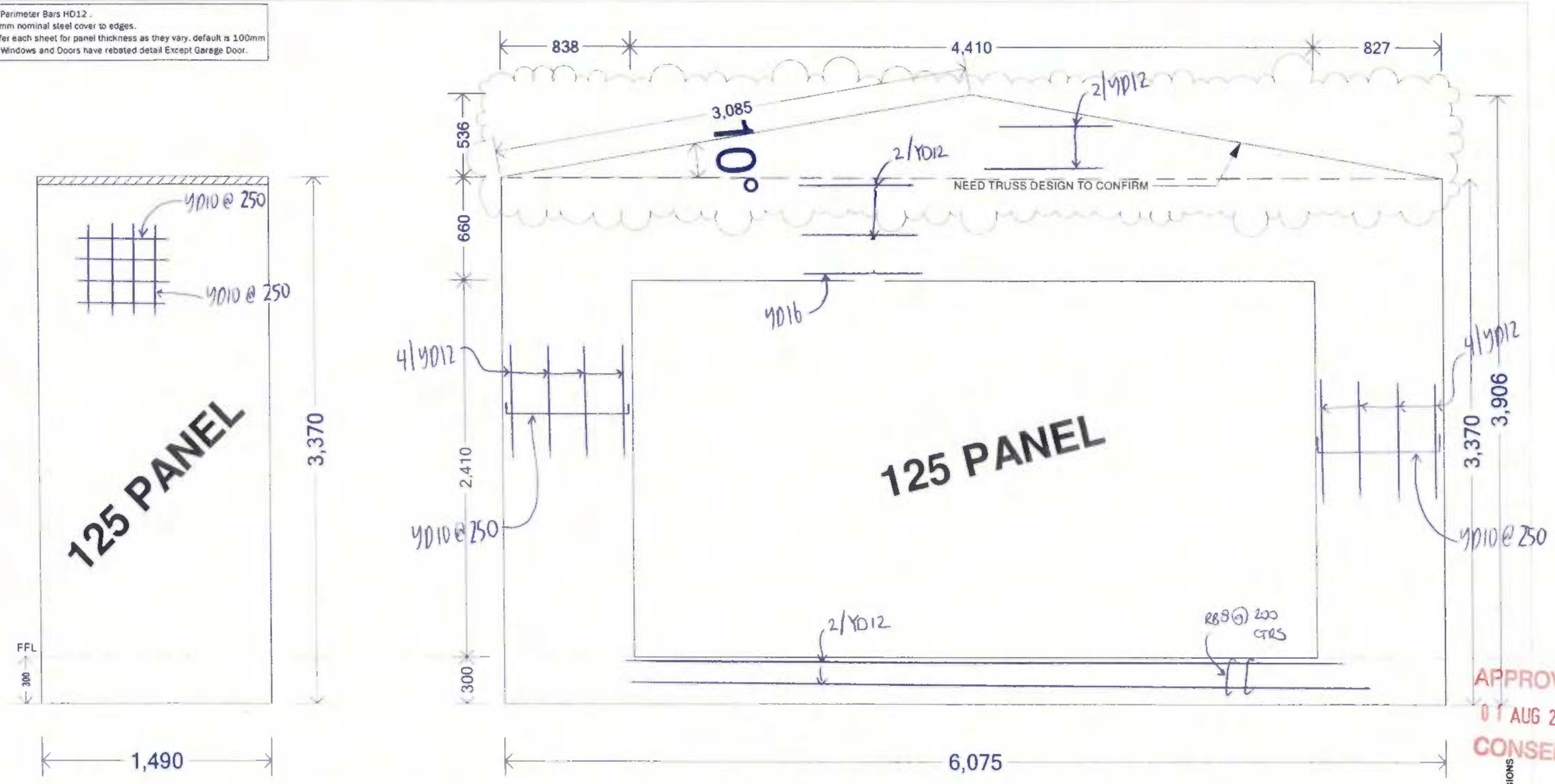
SITE ADDRESS:
1097 Queen Street East
Levin 5510

CLIENT NAME:
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE:
PROJECT# H1408
SHEET# 15 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



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P17

P18

Job: 113523
Page title: Panel Design
Sheet# SK17

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PRELIM ENGINEERING
DRAWN BY: Rod Stirling
REVISION# A
CHECKED BY:
REV. DATE: 26-07-14

LICENSED BUILDING PRACTITIONER www.dbh.govt.nz

Panel # 17, 18

PROPOSED NEW HOUSE

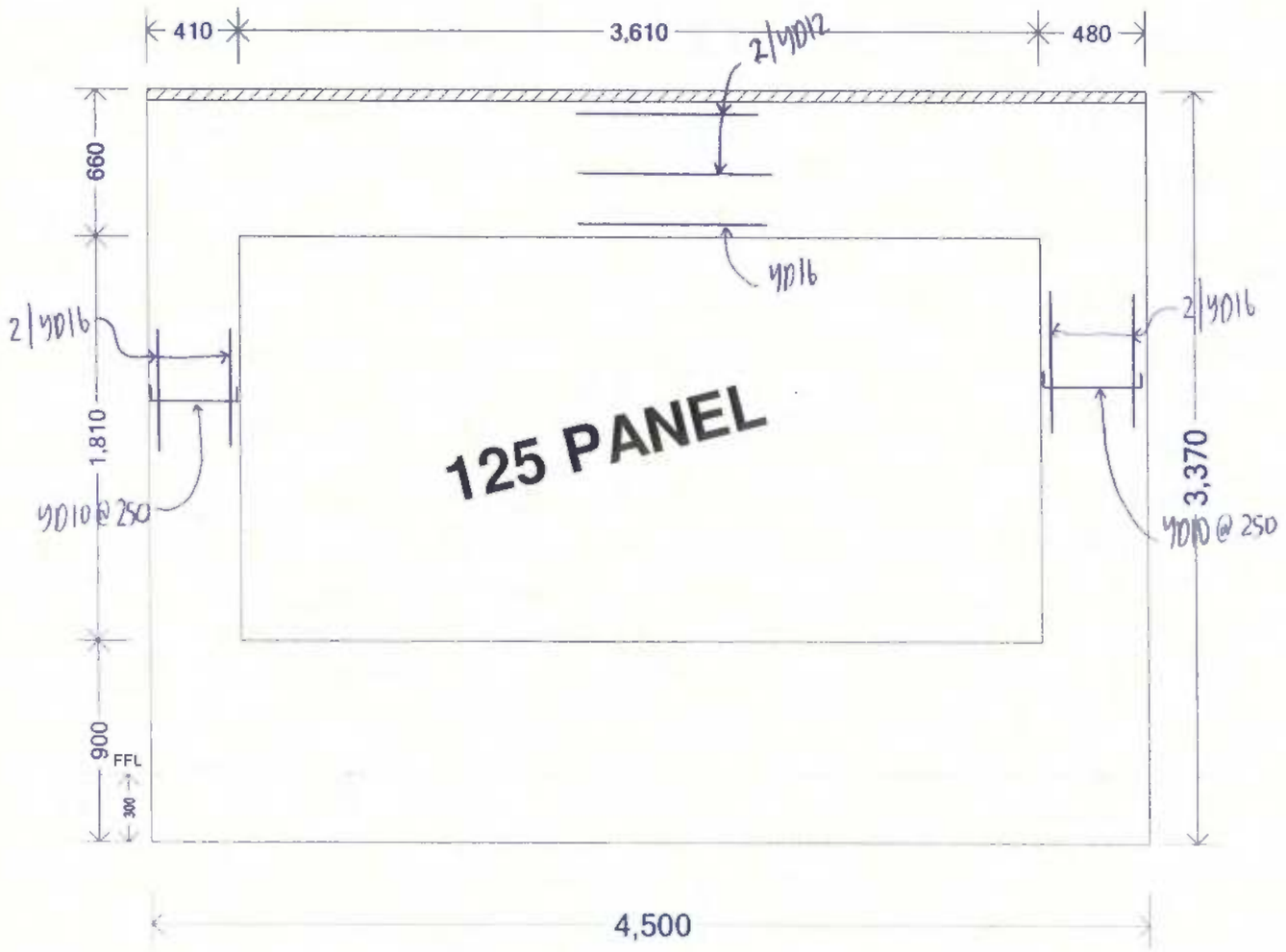
SITE ADDRESS
1097 Queen Street East
Levin 5510

CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: ISO A3 1:20 (297 mm x 420 mm)
PROJECT# H1408
SHEET# 16 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



P19

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Job: 113573
Page title: Panel Design
Sheet# SK18

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DATE: 26-06-14 — PRELIM ENGINEERING
DRAWN BY: Nell Stirling
CHECKED BY:
REVISION# A
REV. DATE: 26-07-14

Panel # 19

PROPOSED NEW HOUSE

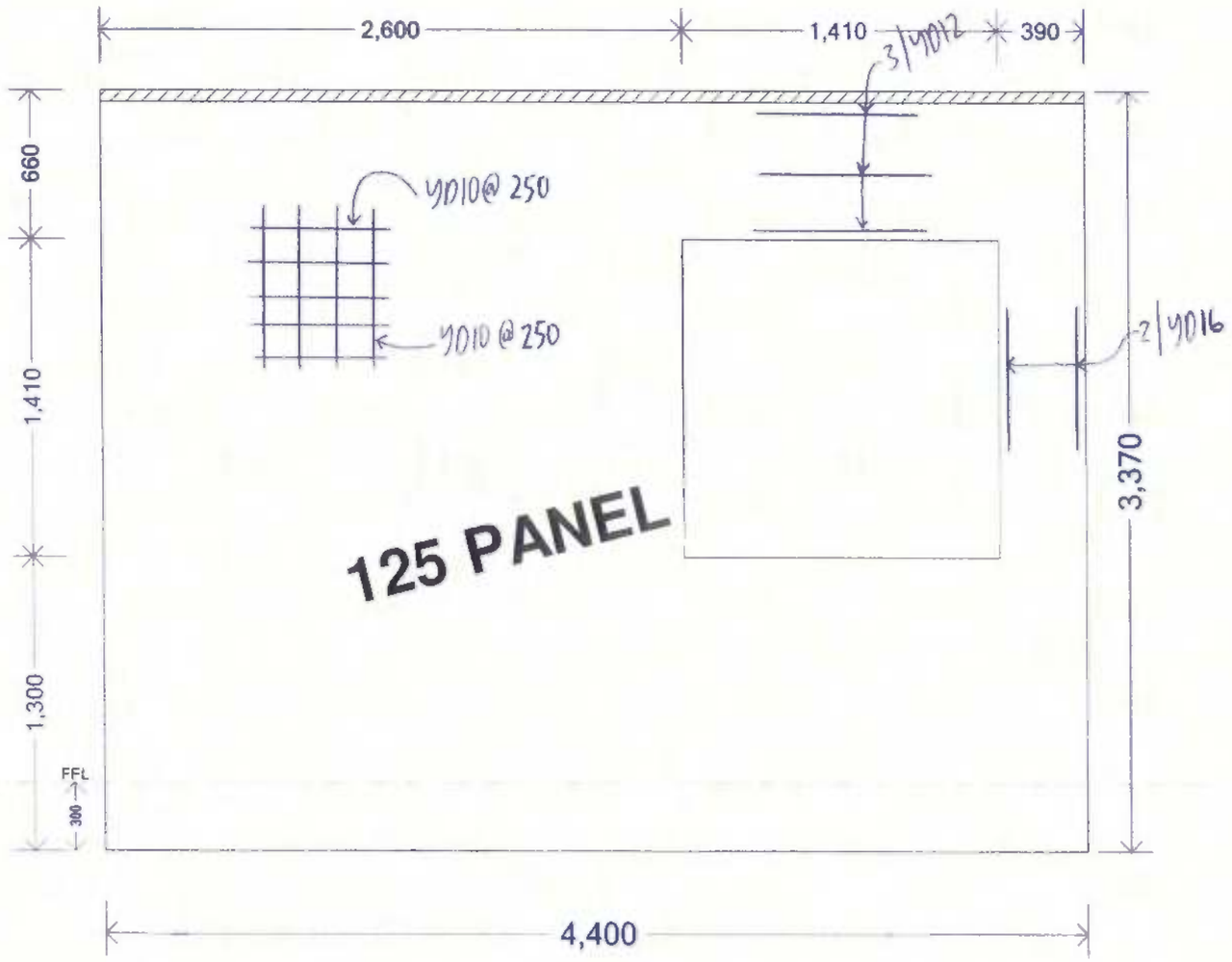
SITE ADDRESS:
1097 Queen Street East
Levin 5510

CLIENT NAME:
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: 1:36 (297mm x 420mm)
PROJECT# H1408
SHEET# 17 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
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CHECKED BY:
PRELIM ENGINEERING
REVISION# A
REV. DATE: 26-07-14

Panel # 20

PROPOSED NEW HOUSE

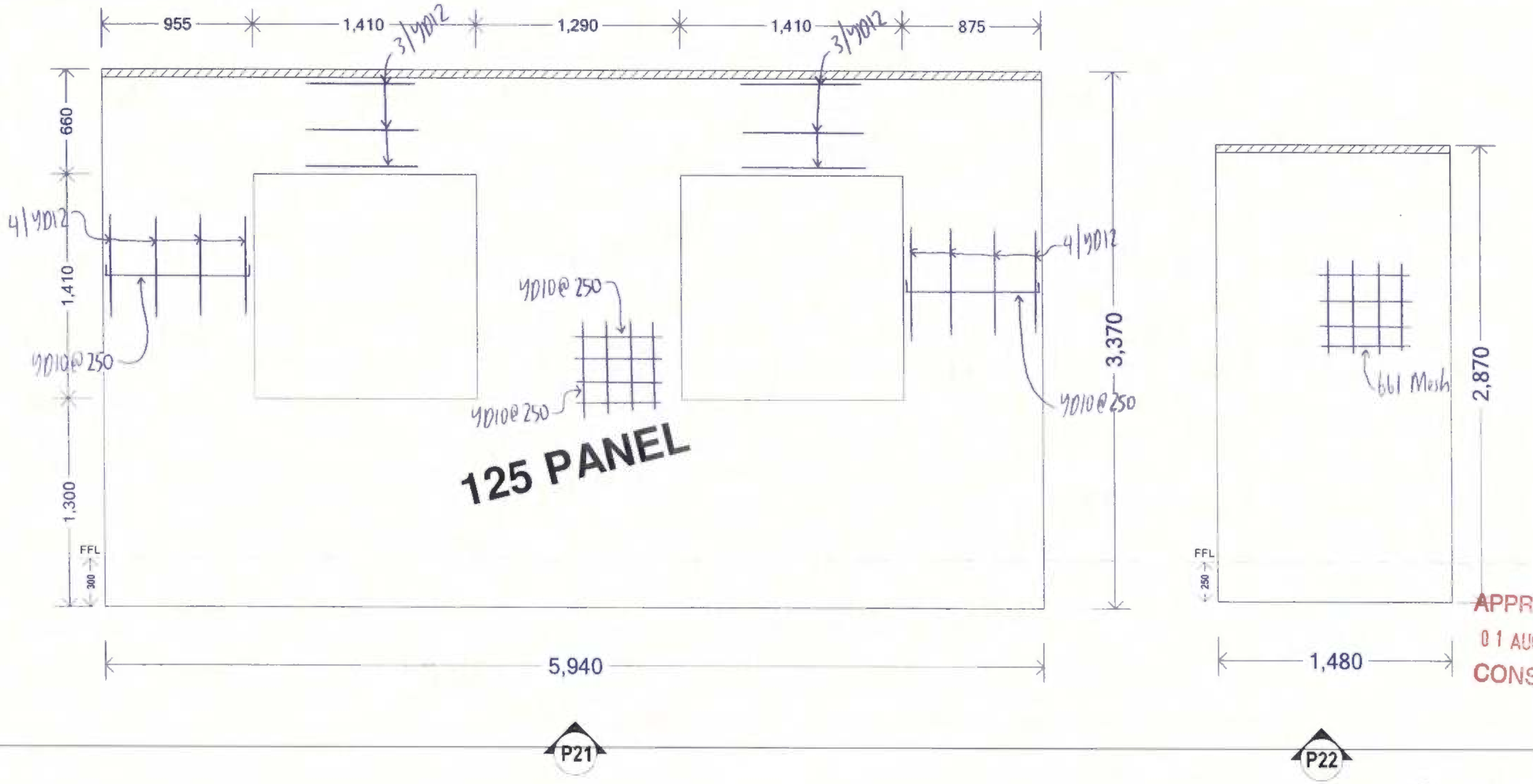
SITE ADDRESS
1097 Queen Street East
Levin 5510

CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE:
PROJECT# H1408
SHEET# 18 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



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PRELIM ENGINEERING
DRAWN BY: [illegible]
REVISION# A
CHECKED BY: [illegible]
REV DATE 26-07-14

Panel # 21, 22

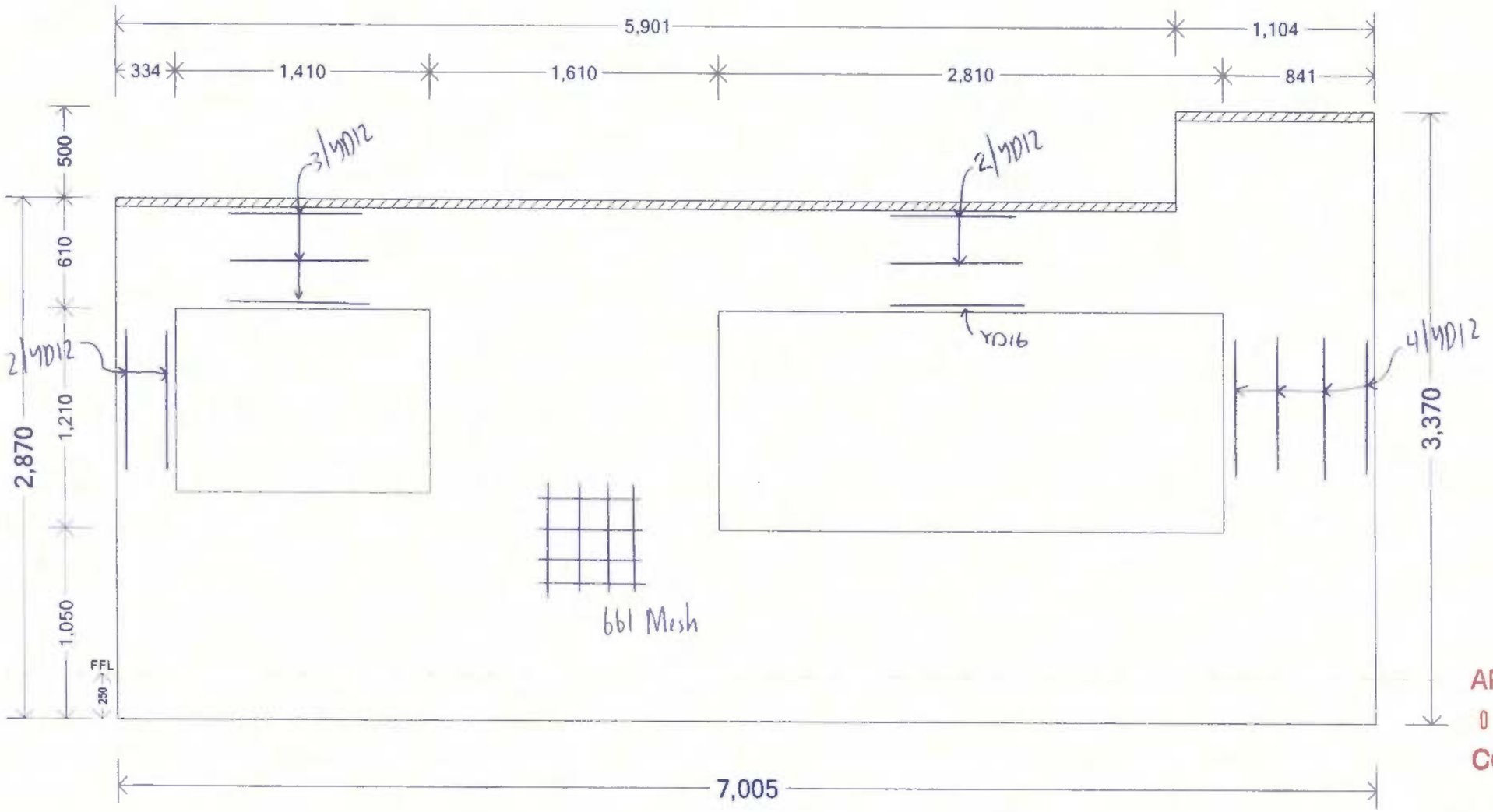
PROPOSED NEW HOUSE

SITE ADDRESS
1097 Queen Street East
Levin 5510
CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: 1:30
PROJECT# H1408
SHEET# 19 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



P23

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Job: 113573
Page title: Panel Design
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Revision / Issue			
REV.	DESCRIPTION	AUTHOR	DATE
A	PRELIM / CONSENT REVISION	KOA	26.07.14

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DATE: 26-06-14
PRELIM ENGINEERING
DRAWN BY: Neil Sterling
REVISION# A
CHECKED BY:
REV. DATE: 26-07-14

LICENSED BUILDING PRACTITIONER

Panel # 23

PROPOSED NEW HOUSE

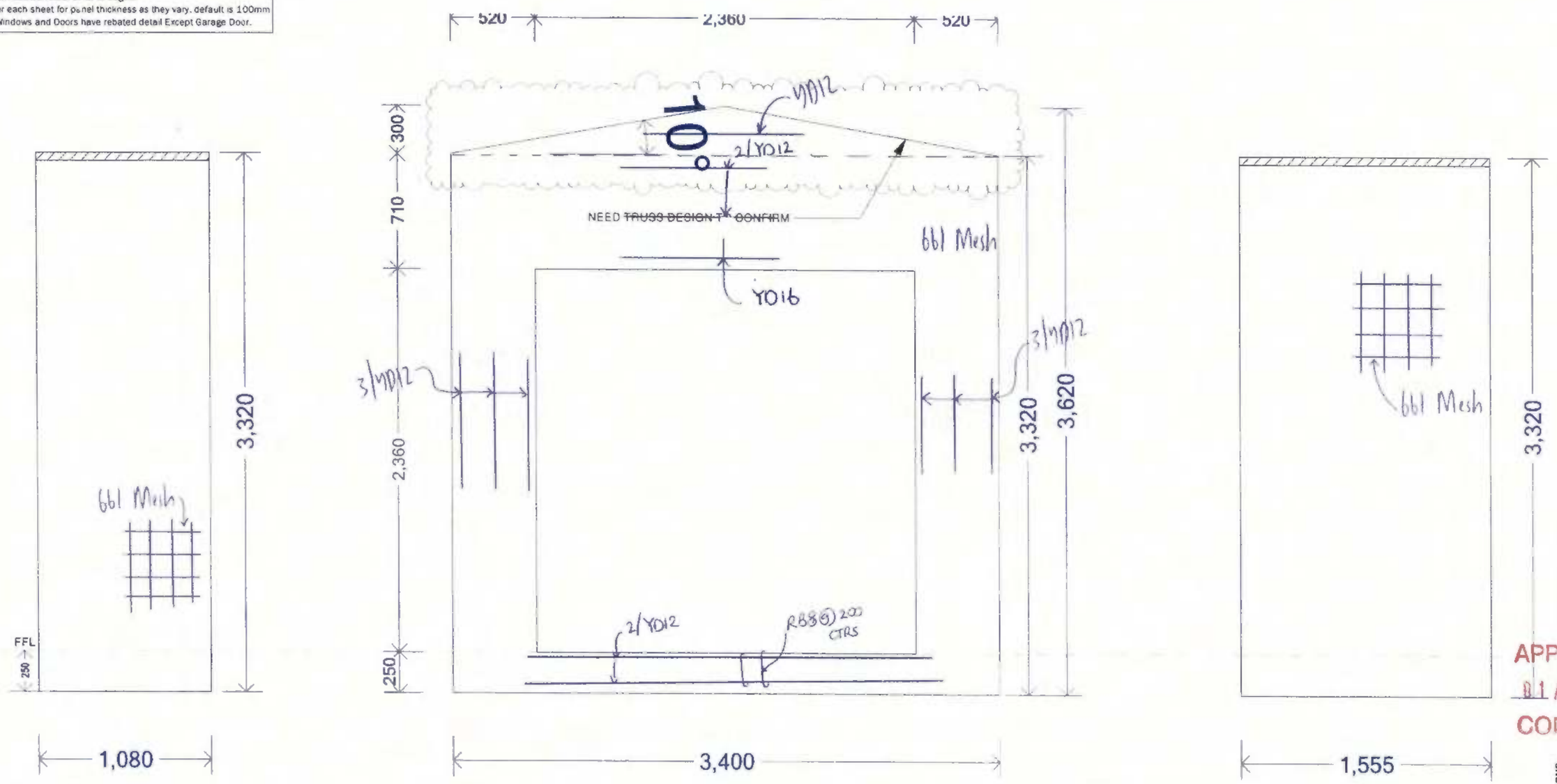
SITE ADDRESS
1097 Queen Street East
Levin 5510

CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: 1:20 @ A3
PROJECT# H1408
SHEET# 20 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
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P24 P25 P26

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Job: 113523 Page title: Panel Design Sheet# SK22

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DATE 26-06-14 PRELIM ENGINEERING
DRAWN BY: Rod Stirling
CHECKED BY: Tom Kerr
REVISION# A
REV. DATE 26-07-14

Panel # 24, 25, 26

PROPOSED NEW HOUSE

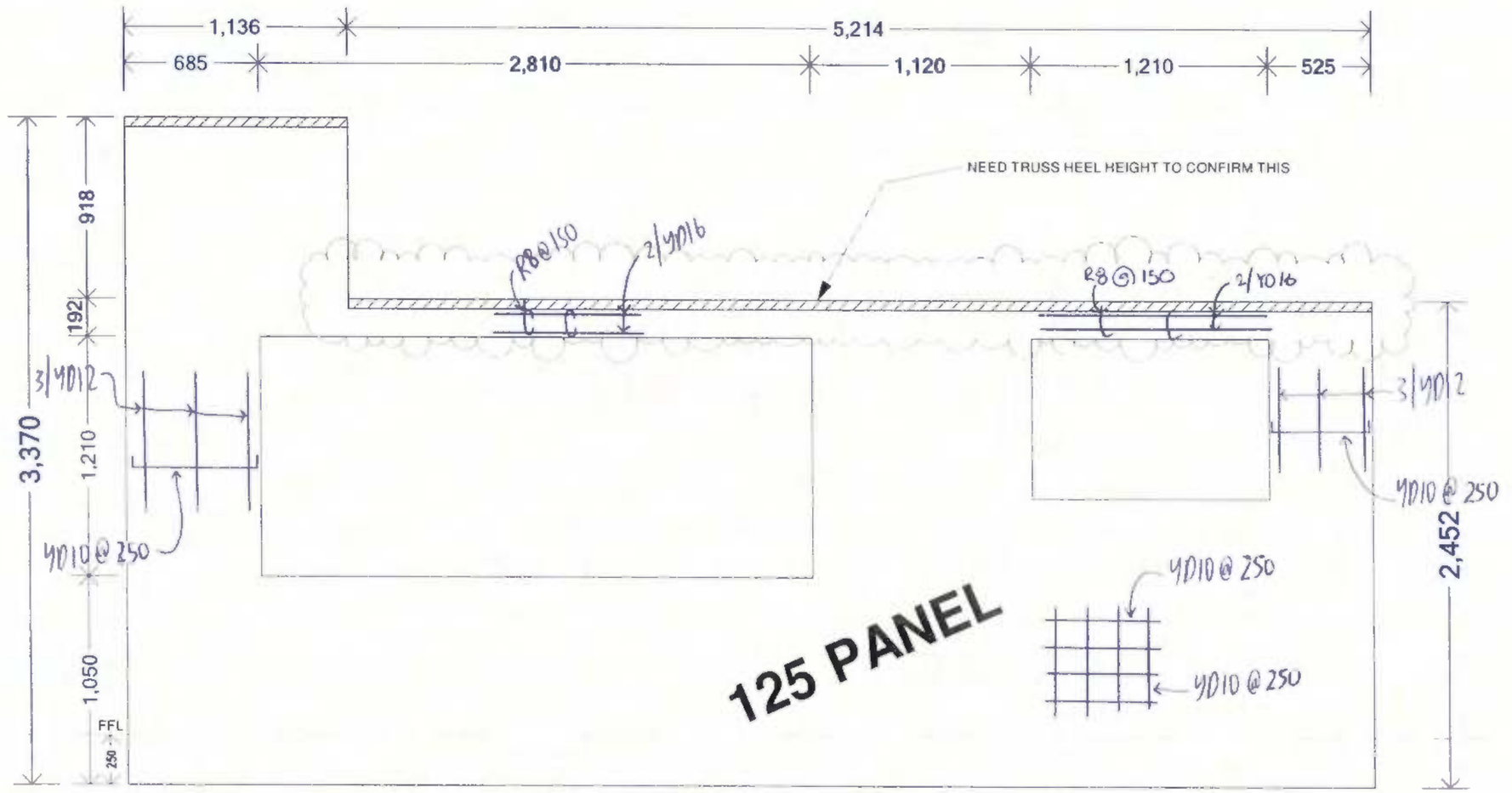
SITE ADDRESS
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Levin 5510

CLIENT NAME
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HOMESTEAD CONCRETE HOMES

SCALE: ISO A3
PROJECT# H1408
SHEET# 21 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
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All Windows and Doors have rebated detail Except Garage Door.



6,350

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DATE: 26-06-14 PRELIM ENGINEERING
DRAWN BY:
REVISION# A
CHECKED BY:
REV. DATE 26-07-14

Panel # 27

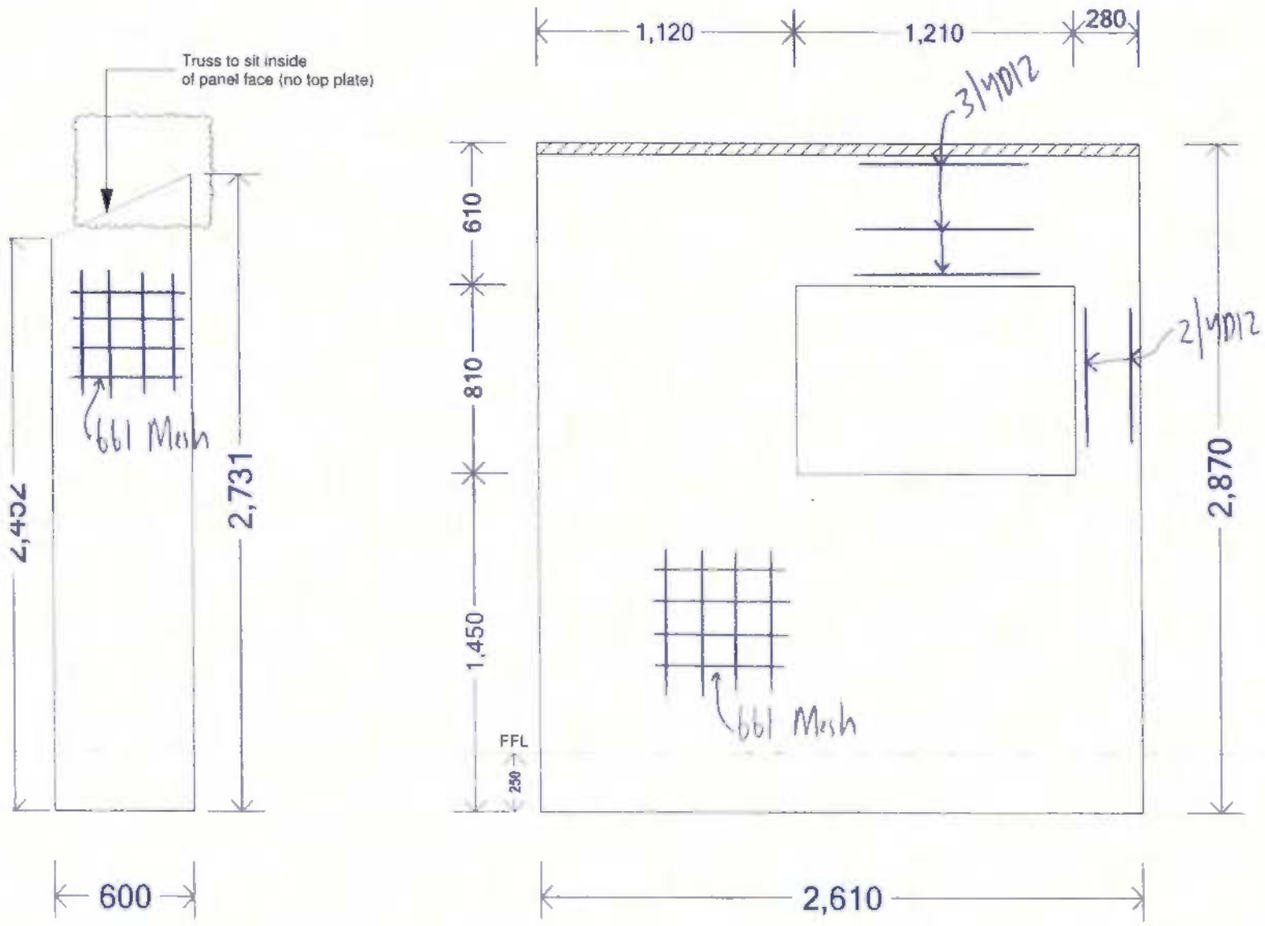
PROPOSED NEW HOUSE

SITE ADDRESS
1097 Queen Street East
Levin 5510
CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: ISO A3
PROJECT# H1408
SHEET# 22 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary, default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



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P28

P29

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Page title: Panel Design
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sales@homesteadgroup.co.nz
76 Main Road South, Levin 5510
Ph: 06 3681357
Fax: 06 3681359

DATE: 26-06-14
PRELIM ENGINEERING
DRAWN BY:
REVISION# A
CHECKED BY:
REV. DATE 26-07-14

Panel # 28 & 29

PROPOSED NEW HOUSE

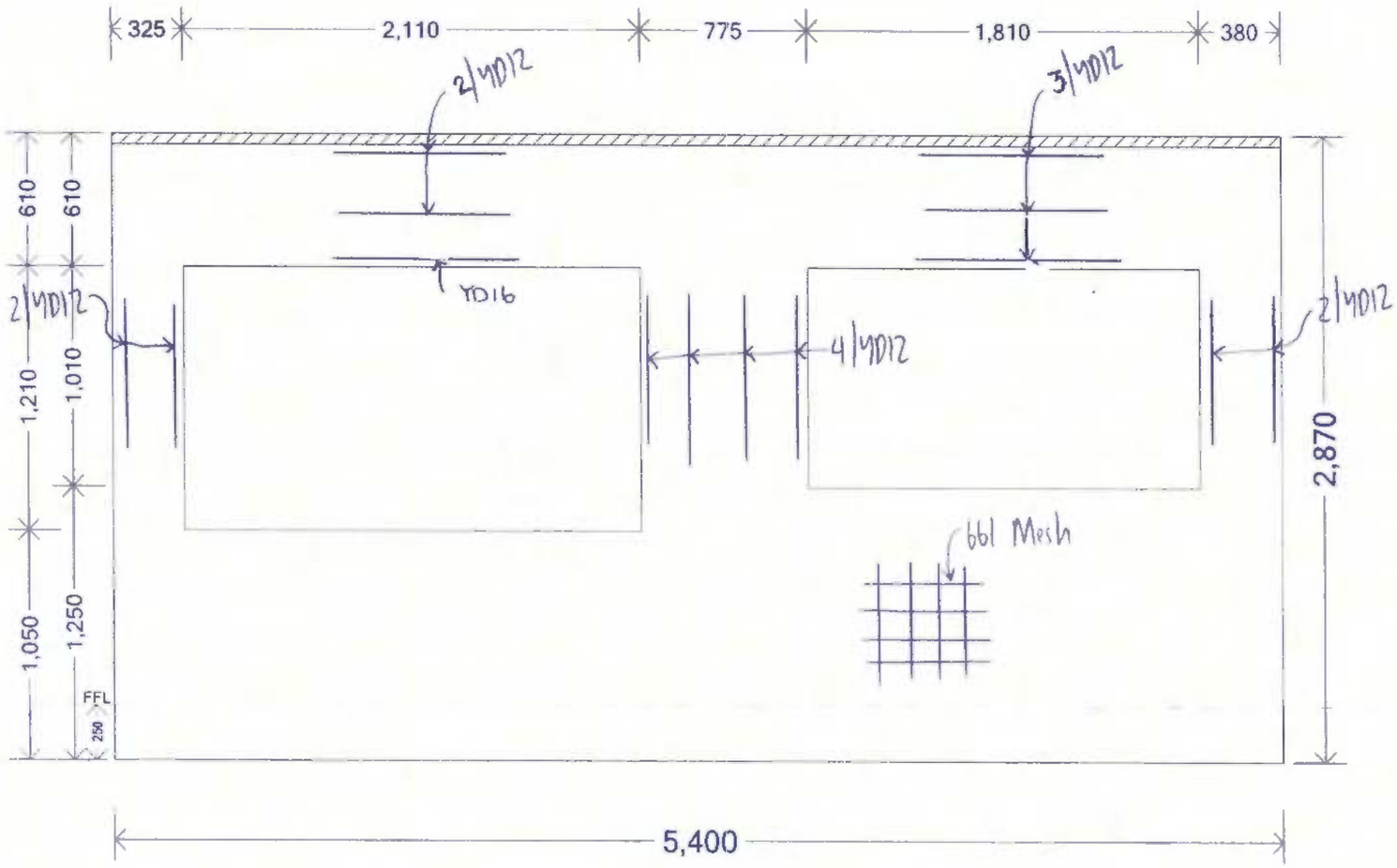
SITE ADDRESS
1097 Queen Street East
Levin 5510

CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: ISO A3 (297 mm x 420 mm)
PROJECT# H1408
SHEET# 23 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



P30

APPROVED
0 1 AUG 2014
CONSENT

CONTRACTOR TO VERIFY ALL ALL DIMENSIONS ON SITE PRIOR TO COMMENCING WORK

Job: 113573
Page title: Panel Design
Sheet# SK25

KOA

P 06 356 7000 E info@koa.co.nz W www.koa.co.nz

Kevin O'Conner & Associates Ltd
71 Pitt Street, PO Box 600, Palmerston North 4440

Revision Table			
No.	Description	Author	Date
A	PRELIM ENGINEERING	NA	26-07-14

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76 Main Road South, Levin 5510
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DATE: 26-06-14 PRELIM ENGINEERING
DRAWN BY: Neil Watling
REVISIONS: A
CHECKED BY: Kevin Toms
REV. DATE: 26-07-14

LICENSED BUILDING PRACTITIONER www.lbp.govt.nz

Panel # 30

PROPOSED NEW HOUSE

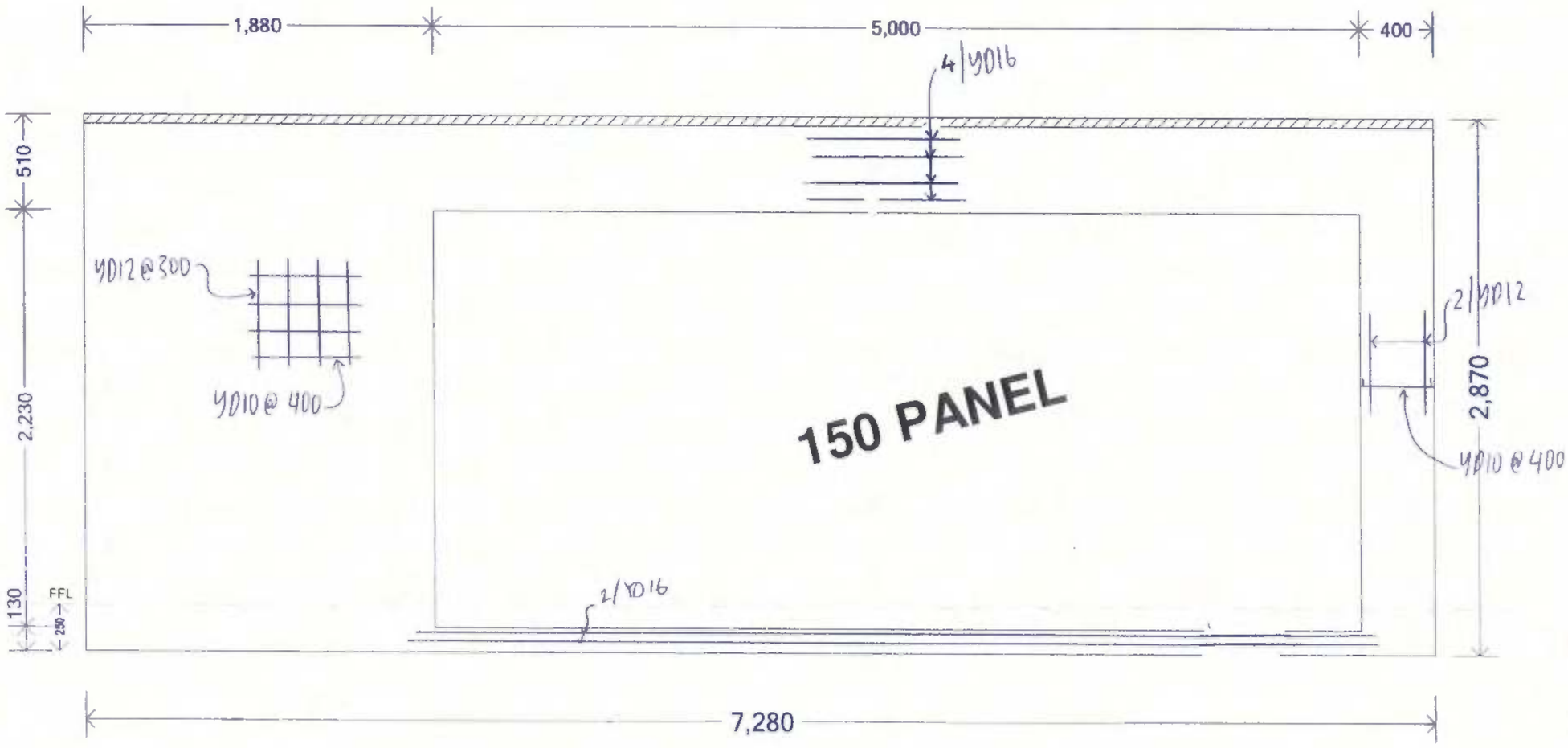
SITE ADDRESS
1097 Queen Street East
Levin 5510

CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: @ A3 1:20 (297 mm x 420 mm)
PROJECT# H1408
SHEET# 24 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



P31

APPROVED
01 AUG 2014
CONSENT

CONTRACTOR TO VERIFY ALL ALL DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.

Job: 113573
Page title: Panel Design
Sheet# SK26

KOA

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Ph: 06 3681357
Fax: 06 3681359

DATE 26-06-14
PRELIM ENGINEERING
DRAWN BY
REVISIONS A
CHECKED BY
REV DATE 26-07-14

Panel # 31

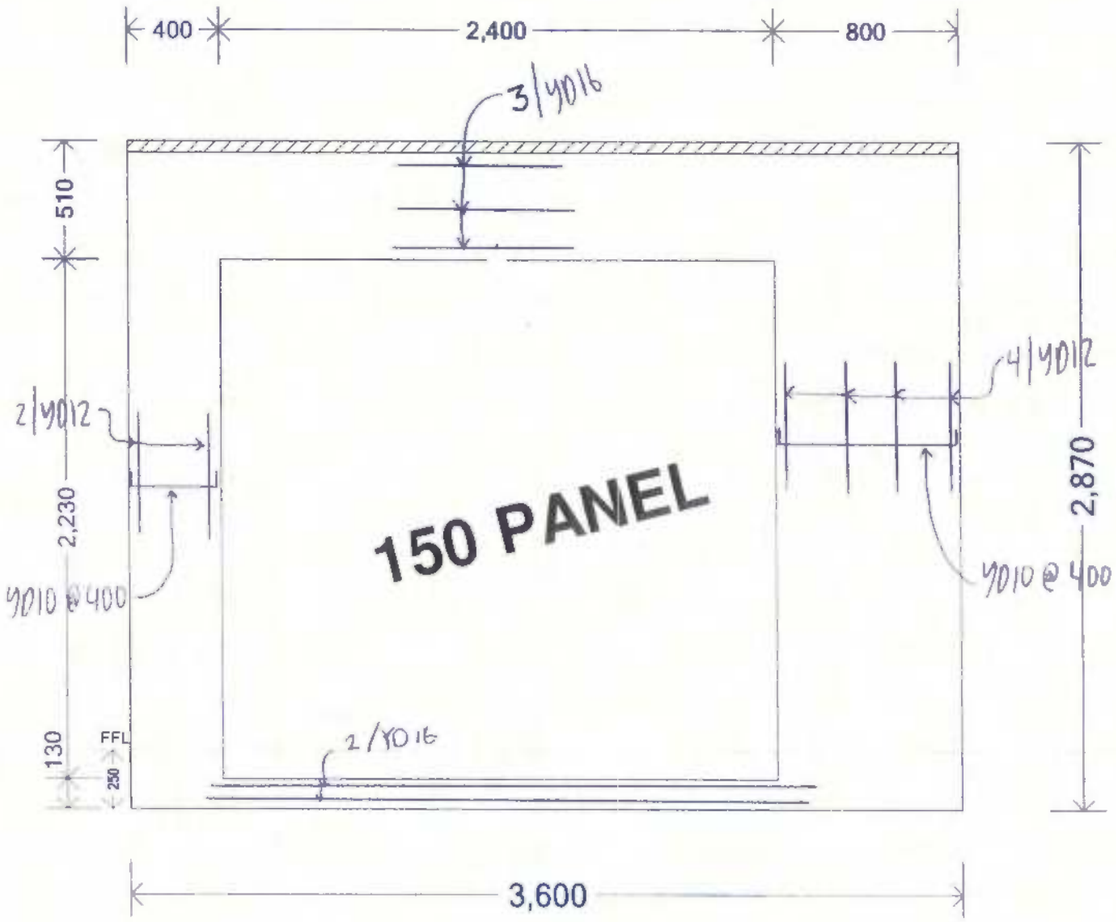
PROPOSED NEW HOUSE

SITE ADDRESS
1097 Queen Street East
Levin 5510
CLIENT NAME
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE:
PROJECT# H1408
SHEET# 25 of 26

All Perimeter Bars HD12 .
70mm nominal steel cover to edges.
Refer each sheet for panel thickness as they vary. default is 100mm
All Windows and Doors have rebated detail Except Garage Door.



P32

APPROVED
01 AUG 2014
CONSENT

CONTRACTOR TO VERIFY ALL ALL DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.

Job. 113573
Page title: Panel Design
Sheet# SK27

KOA

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REVISION HISTORY			
REV	DESCRIPTION	AUTHOR	DATE
A	PRELIM ENGINEERING	KOA	26-06-14

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Ph: 06 3681357
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DATE: 26-06-14
PRELIM ENGINEERING
DRAWN BY: Rod Stirling
REVISION# A
CHECKED BY:
REV. DATE 26-07-14

Panel # 32

PROPOSED NEW HOUSE

SITE ADDRESS
1097 Queen Street East
Levin 5510
CLIENT NAME:
D & J Lawry

HOMESTEAD CONCRETE HOMES

SCALE: 1:25 @ A3 (297 mm x 420 mm)
PROJECT# H1408
SHEET# 26 OF 26



LAND INFORMATION MEMORANDUM

Cadastre Map

Nearmap Urban Aerial Imagery February 2025
Rural Imagery 2021

Date: 7/09/2026

Cadastral Base derived from Digital Cadastral Database - Crown Copyright Reserved - Land Information New Zealand



Legend

NZ - Imagery

New Zealand Imagery

N

Scale: 1:1,000

0 10 20 40 Metres

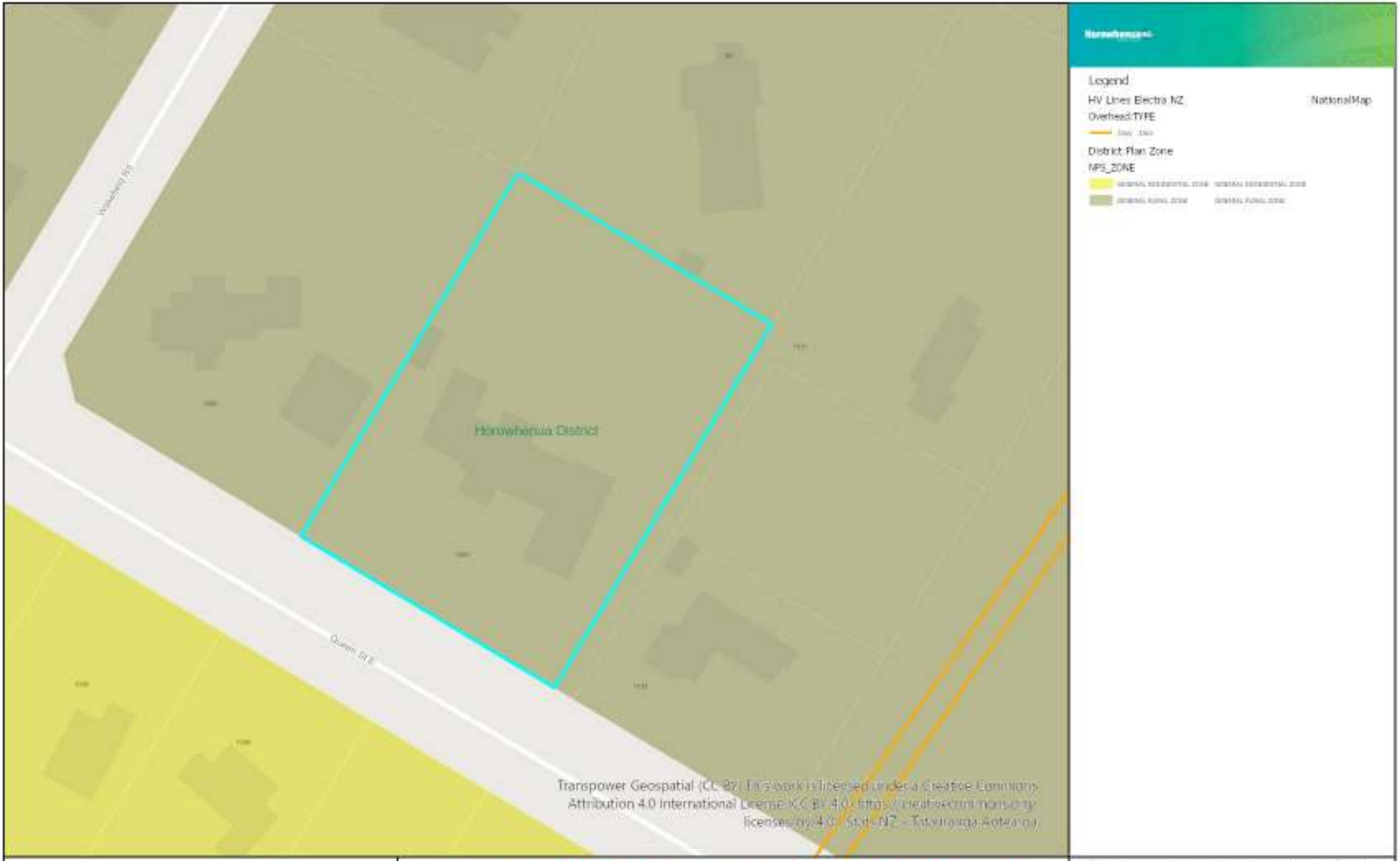
LAND INFORMATION MEMORANDUM

Aerial Imagery

Nearmap Urban Aerial Imagery February 2025
Rural Imagery 2021

Date: 7/09/2026

Cadastral Base derived from Digital Cadastral Database - Crown Copyright Reserved - Land Information New Zealand



N

Scale: 1:1,000

0 10 20 40 Metres

LAND INFORMATION MEMORANDUM

District Plan

Nearmap Urban Aerial Imagery February 2025
Rural Imagery 2021

Date: 7/09/2026

Cadastral Base derived from Digital Cadastral Database - Crown Copyright Reserved - Land Information New Zealand



Legend

District Plan Landscape Domain

LEVIN KOPUTAROA LEVIN KOPUTAROA

N

Scale: 1:1,000

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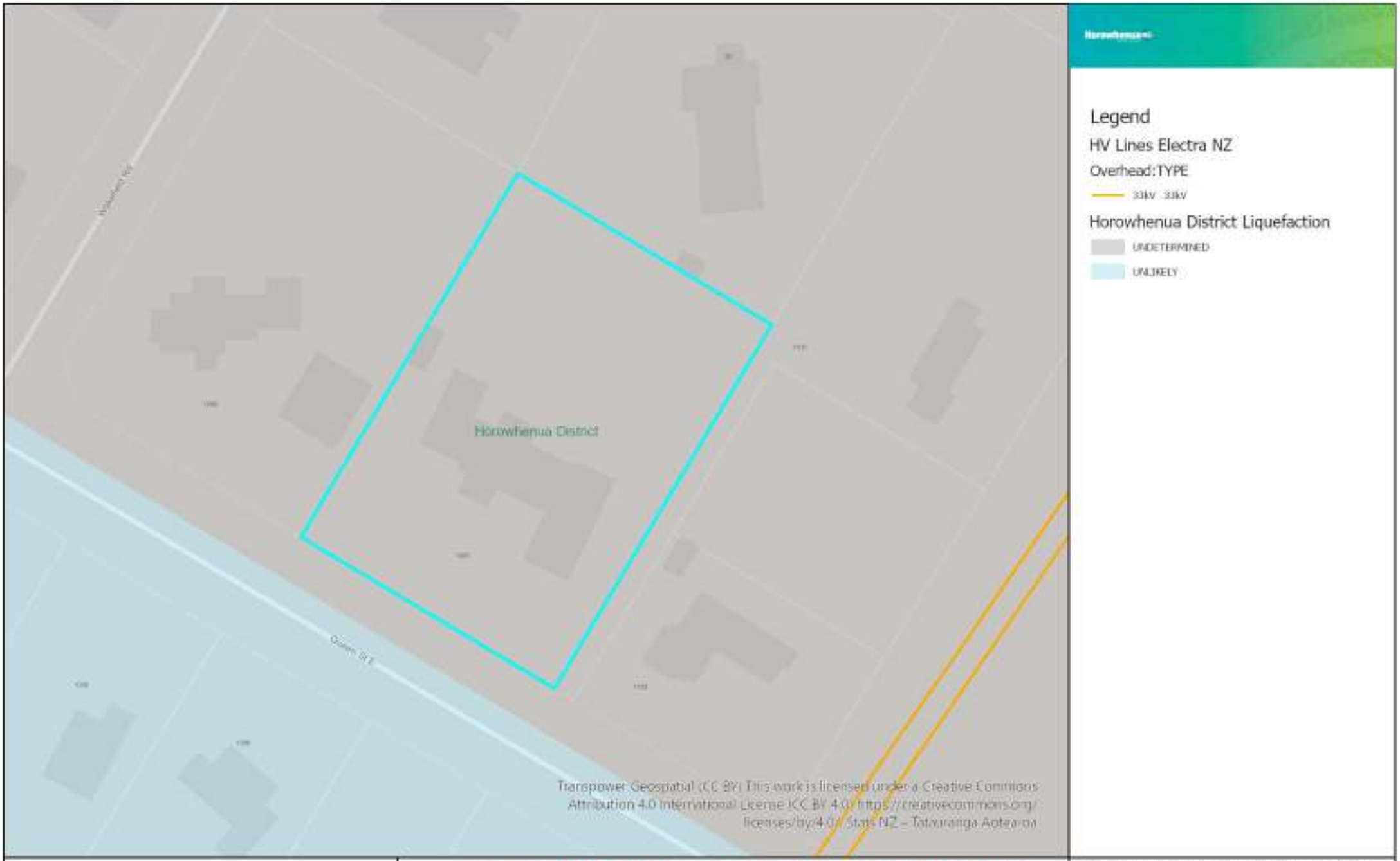
LAND INFORMATION MEMORANDUM

Landscape Domain

Nearmap Urban Aerial Imagery February 2025
Rural Imagery 2021

Date: 7/09/2026

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Legend

HV Lines Electra NZ

Overhead:TYPE

33kV 33kV

Horowhenua District Liquefaction

UNDETERMINED

UNLIKELY

N

Scale: 1:1,000

0 10 20 40 Metres

LAND INFORMATION MEMORANDUM

Hazards

Nearmap Urban Aerial Imagery February 2025
Rural Imagery 2021

Date: 7/09/2026

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Legend

Solid Waste Collection Area and Days

National Map WMS

N

Scale: 1:1,000

0 10 20 40 Metres

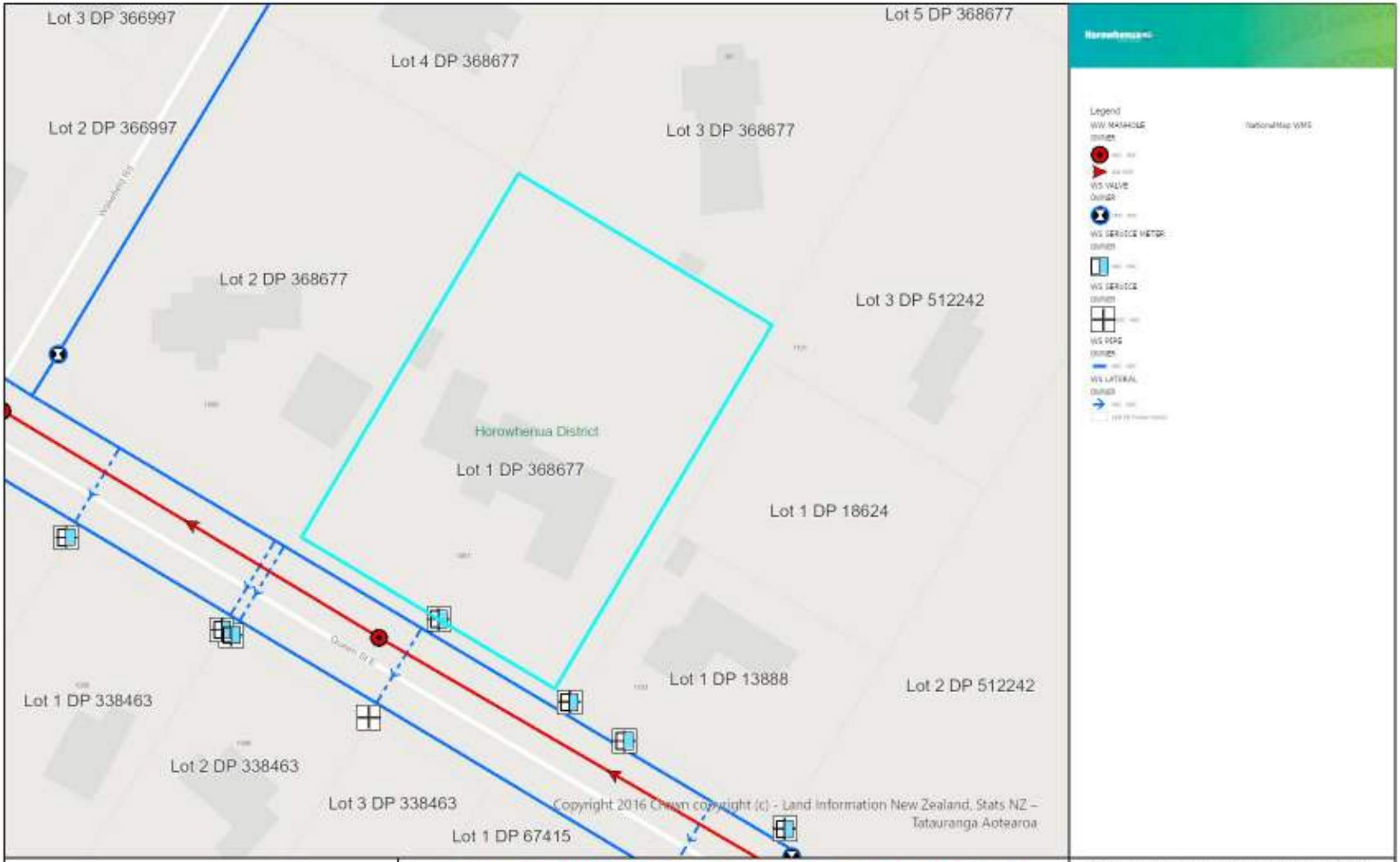
LAND INFORMATION MEMORANDUM

Solid Waste

Nearmap Urban Aerial Imagery February 2025
Rural Imagery 2021

Date: 7/09/2026

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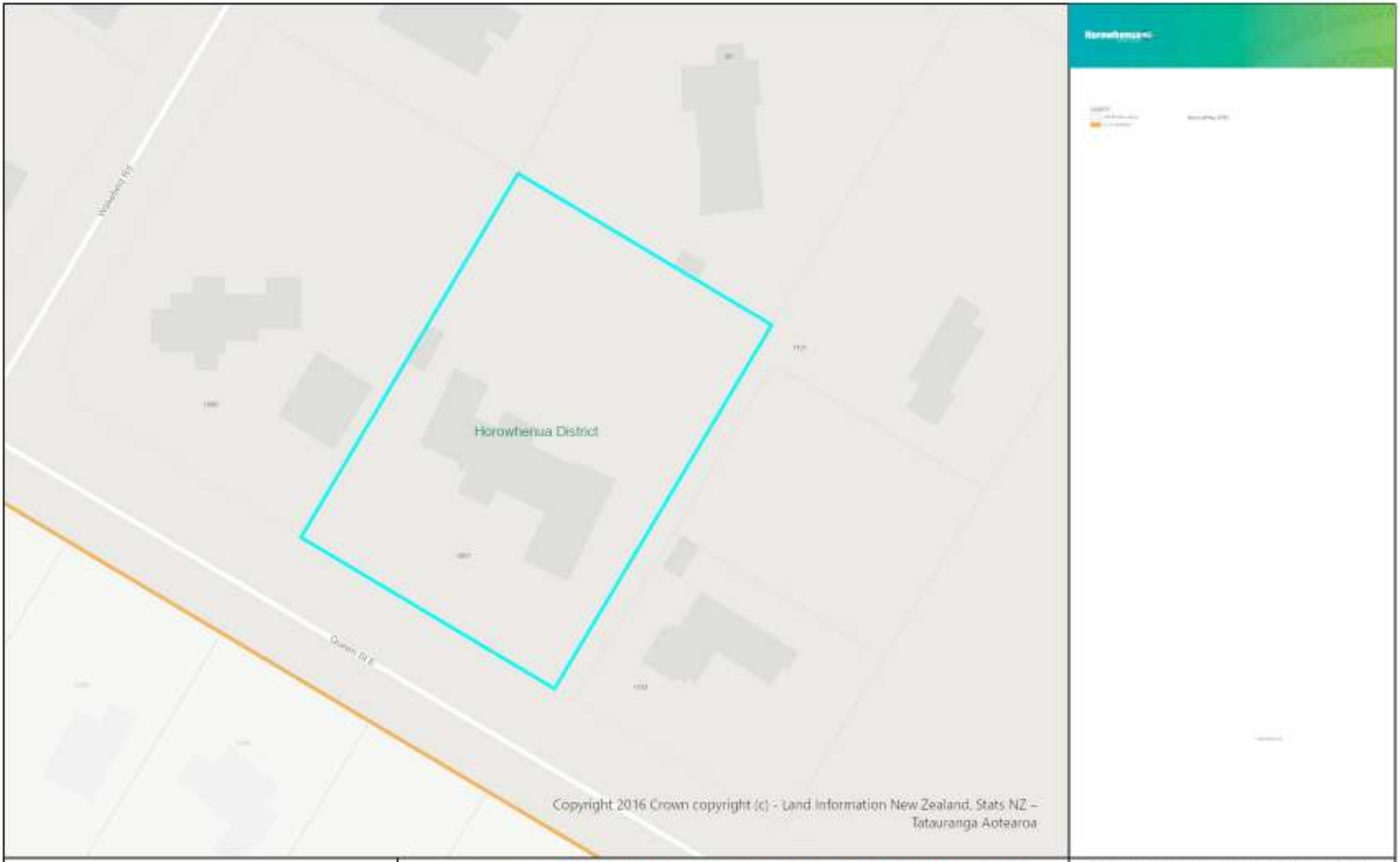
LAND INFORMATION MEMORANDUM

3 Waters Infrastructure

Nearmap Urban Aerial Imagery February 2025
Rural Imagery 2021

Date: 7/09/2026

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N

Scale: 1:1,000

0 10 20 40 Metres

LAND INFORMATION MEMORANDUM

Structure Plans

Nearmap Urban Aerial Imagery February 2025
Rural Imagery 2021

Date: 7/09/2026

Cadastral Base derived from Digital Cadastral Database - Crown Copyright Reserved - Land Information New Zealand



Otaki to North Levin Corridor
Shown for information purposes only, current as of October 2020. Location subject to change.

Commercial Zone

Education Overlay

Arapaepae Rd Special Treatment Overlay

Medium Density Residential Overlay

Residential Zone

Low Density Residential Overlay

Greenbelt Residential Zone

Open Space Zone

Culturally Significant Species - assessment required under 15A.8.2.2(a)(xii)

Primary Features

Arterial road connections

Collector road connections

Strategic Cycleways

Central Open Space

Maunu Wahine

Secondary Features

Local roads and laneways

Secondary Reserves

LAND INFORMATION MEMORANDUM GLOSSARY OF TERMS

Abatement Notice

This is a notice to stop/start doing something relating to a property. This requires compliance with the Resource Management Act within the time specified in the notice. Only councils can issue these to get someone to stop or to start doing something.

Accessory Building

Any detached building which is an accessory to the principal activity on the site. They can include a garage housing vehicles (used in association with a residential activity), a garden/ implement shed, studio or sleep out. An accessory building excludes a family flat.

Annual Rates

The total amount of rates payable over the period of one year (01 July to 30 June). Council invoices rates in quarterly instalments.

Building Warrant of Fitness

A **Building Warrant of Fitness** (BWoF) is a statement, supplied by a building owner, to the territorial authority, confirming that the systems (specified in the compliance schedule for the building), have been maintained and checked(in accordance with the compliance schedule for the previous 12 months) and will continue to perform as required. It applies to commercial or industrial buildings, or those that are for public occupations.

Certificate of Title

A **Certificate of Title** is a document that indicates ownership of a parcel/s of land. It usually shows Ownership, a survey plan of the parcel/s and any consents notices or easements attached to it.

Cadastre

This is a term that describes the extent/boundary of property in a given area. Council receives updated data monthly from Land Information New Zealand. The **Cadastre** is digitised by Land Information New Zealand from Survey Plans.

Capital Value

This is the total combination of the Improvements Value of a property + the Land Value of the property. Valuation figures are determined by QV New Zealand. www.qv.co.nz

Certificate of Acceptance

Certificates of Acceptance were introduced by the Building Act 2004. The certificate confirms that, to the extent an inspection was able to be carried out, the building work complies with the Building Code. A Certificate of Acceptance therefore has similarities to a Code of Compliance Certificate, in that it will provide some verification for a building owner, or future building owner, that all or part of the work is compliant.

Coastal Hazards

Coastal Hazards are physical phenomena that expose a coastal area to risk of property damage, loss of life and/or environmental degradation. Rapid-onset hazards last over periods of minutes to several days and examples include major cyclones accompanied by high winds, waves, surges or tsunamis created by submarine earthquakes and landslides. Slow-onset hazards develop incrementally over longer time periods and examples include erosion and gradual inundation.

Code of Compliance

A **Code of Compliance Certificate** (CCC) is a formal statement, issued under section 95 of the Building Act 2004, which states that building work, carried out under a building consent application, complies with that building consent. A CCC provides assurance to the owner and subsequent property owners that the approved plans and specifications have been followed.

Compliance Schedule

A **Compliance Schedule** lists specified systems within a building. The Compliance Schedule for a building must identify which specified systems are present, the performance standards for those systems, and how those systems will be inspected and maintained to ensure they continue to function.

Consents

Consents are approvals, issued by the council, to carry out something with regard to land and/or buildings.

Different types include:

- Land Use – Consent to use land for a specific purpose.
- Subdivision – Consent to subdivide the land in a certain way.
- Building Consents – Consent to build/install something.

Contaminated Land

Means land has been identified as having a hazardous substance in or on it that:

a) has significant adverse effects on the environment, or
b) is reasonably likely to have significant adverse effects on the environment.

Council Underground Services

Services owned by a council that crosses a parcel boundary which may require access by council from time to time e.g. water, storm water and wastewater pipes and associated assets such as manholes.

Current Rates Instalment Amount

The current amount of rates owed per quarter of the year.

Daylight Setback Envelope

A **Daylight Setback Envelope** indicates a shape, measured at ground level at each site boundary, which is imposed to control the distance of buildings from boundaries so as to maximise daylight to adjoining properties.

Deferred Zone

Deferred Zone means the Residential and Greenbelt Residential Areas, identified in Council's Planning Maps, as future growth areas. For the Deferred Zoning area, the Rural Zone provisions apply until such time as the deferred zoning status is uplifted; at which point, the rules change to the new zoning status.

Deposited Plan

Sometimes also known as a 'Title Plan'. These are plans recording land transfer subdivisions that have been deposited by the Registrar General of Lands. They are identified by a number and a DP prefix such as 'DP 12345'. Most modern land transfers are identified by their position on a specific deposited plan, e.g. Lot 123 DP 4567.

This is the plan deposited when the title was created. This could be a simple plan of the property's boundaries, area and dimensions, a detailed survey plan or a combination of both.

Designations Applying to the Property

Designations are provisions in council's district plan, which provide notice to the community, of an intention by the council (or a requiring authority) to use land in the future for a particular work or project. Examples include provision for future roading or educational facilities.

District Plan

The main purpose of the **District Plan** is to ensure that land use and subdivision in the Horowhenua district are sustainably maintained. Horowhenua District Council is required to have a district plan under the Resource Management Act 1991. The District Plan identifies zones (e.g. Residential, Commercial, Industrial and Rural) for different land uses in the Horowhenua District. Each zone has different objectives, policies and rules associated with it which are tailored to the land use and activities typical to that particular zone. There are also provisions in the District Plan that apply to all properties in spite of the zoning such as Hazardous Substances and Utilities and Energy.

Easements over the Property

An **Easement** is a right, agreed between a landowner and another party, to use a property for a particular purpose. It can be registered against the property title. Easements are often granted over land for pipelines, electricity, supply transmission lines, or to establish right of way. An easement does not confer ownership of the land – simply the right to use part of the land.

Enforcement Order

An Enforcement order is another way of getting someone to comply with the Resource Management Act. It differs from an abatement notice in that anybody (not just the council) can apply for an enforcement order against somebody else. These are issued by the Environment Court rather than the council.

Fencing of Swimming Pools Act 1987 Certificate

If your pool has the capability of water depth greater than 400mm (16 inches) then it is required to be fenced in accordance with the **Fencing of Swimming Pools Act**.

Anyone intending to install a new pool, spa or hot tub or new pool fence, must apply for and uplift a Building Consent prior to commencing the work.

Hazardous Contaminants

Activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal.

Hazardous Substance

Hazardous Substance means (unless expressly provided otherwise by regulations) any substance - with one or more of the following intrinsic properties:

- An explosive nature
- Flammability
- An oxidising nature
- A corrosive nature
- Acute or chronic toxicity
- Eco-toxicity, with or without bioaccumulation

Historic Heritage Site(s)

An **Historic Heritage Site** is a site contained in the Historic Heritage Schedule, that has important archaeological and/or Māori cultural heritage values (Only applicable to the heritage provisions of the District Plan). Unless specifically identified in the Historic Heritage Schedule, historic heritage sites exclude existing buildings or structures located within the site. Information on heritage sites can be researched at http://www.heritage.org.nz/the-list.

Improvements Value

Estimated value added to a parcel of land through the addition of buildings and/or service connections such as water and sewer connections. This figure is provided by QV New Zealand.

Land Value

The most likely selling price of the bare land at the time of valuation. This figure is supplied by QV New Zealand.

Legal Description (a.k.a. Appellation/Deposited Plan)

This is the legal description for a specific piece of land. Land has been numbered and named differently in each Land District over time. Thus, locating land by its historical legal description depends on its Land District and the type of land being dealt with. Some examples include:

- 'Section 1 Block VII Mata Survey District' for Crown land
- 'Kaiti 313A6B2' for Māori Land
- 'Section 1019-1022 Town of Christchurch' for land in a town.

Each of these depends on the way the land was historically recorded and described.

The commonly used terms to describe the land are by describing parcels e.g. lots and plan types (e.g. Deposited Plan, Survey Office plan, etc). So currently land is described as 'Lot 123 on DP 456'. Historical legal descriptions vary by Land District and include 'Hundreds', 'Parishes', and 'Blocks'.

Under the current land transfer system, each parcel of land is described as a Lot on a DP (Deposited Plan), e.g. Lot 123 DP4567 (the 123rd lot on Deposited Plan 4567).

You can find legal descriptions on rating valuation notices or rates demands. You can also search maps on some local council websites. Historic rating rolls, held by some city and district councils, also list the history of legal descriptions for properties.

Liquor Licence

A **Liquor Licence** is a licence to sell alcohol. The reason for the Act is to establish a reasonable system of control over the sale and supply of alcohol to the public with the aim of contributing to the reduction of alcohol abuse, so far as that can be achieved by legislative means.

Outstanding Natural Features and Landscapes (ONFL)

These are areas of the district (identified on the district plan) seen to be of special significance.

Permits

A **Permit** is a document giving someone authorisation to do something. In context with a LIM Report, it usually refers to consent notices issued prior to 1991.

Potential Alluvion (Silting of Land)

The action of the sea, or a river, in adding to the area of land by depositing material such and silt, sand etc.

Potential Avulsion (Flood Erosion)

This term describes the potential for sudden separation of land from a property, and its attachment to another, especially by flooding or a change in the course of a river.

Potential Erosion

The term describes potential for land to be reduced, by the removal of material (soil, sand, etc.) due to wind, water or other natural agents.

Potential Inundation (flooding/ponding)

The term describes the potential for a parcel of land to flood during certain events.

Potential Slippage

The term describes the falling (or sliding) of a mass of soil, detritus, or rock on or from a steep slope.

Potential Subsidence (sinking of land)

Subsidence is the motion of a surface (usually, the Earth's surface) as it shifts downward relative to a datum such as sea-level.

Protected Tree

These are tree/s that are protected because of historical significance, age, the ability to preserve the ecosystem around them, or their cultural value.

Rate Arrears

The amount of rates behind the owner is in payment (including penalties).

Seismically Assessed Buildings

Seismically Assessed Buildings are buildings which have had an independent report done on them and have been given a rating based on that report.

Structure Plan

A **Structure Plan** is a framework to guide the subdivision, development or redevelopment, of a particular area, by defining the broad future form, areas of open space, layout and nature of infrastructure (including links), and other key features for managing the effects of development.

Valuation Number

A unique number, issued by Quotable Valuation, to denote a parcel, or parcels of land, that have a value or combined value. Council uses these numbers to determine its rating assessments.

Versatile Land

Versatile Land is rurally zoned land identified on a planning map as containing Land Use Class I or II soil types. These soil types are regarded as high quality, suitable for crop and market garden production.

Zoning

Categorising of land based on land use characteristics. Examples include Rural, Residential, and Industrial etc.