18 November 2019

Kapiti Coast District Council
Private Bag 60 601
Paraparaumu 5254

Dear Amy

# Further Information request – 35 Kaitawa Street

With regard to your request for information please find below our responses.

1. **An amended plan with height in relation to boundary shown for:**

    a. **Water tanks and accessory buildings**

    b. **Location of the water tanks in relation to the boundaries.**

    The water tanks and sheds will be a maximum of 2.0m in height and will therefore comply with the 2.1m plus 45° recession plane requirements. As stated in the application and shown on the plans the water tanks will be located on the boundaries with a 1m yard encroachment which has been applied for as part of the application.

2. **Amend the plan for the outdoor living court.**

    The living court provisions are complied with. It will have direct access off the main living area of the dwelling in the form of the deck. Also more than sufficient outdoor space is provided.

3. **Amend the site plan showing the shape factor for both proposed lots.**

    Please see the attached plan – this does not comply as the original site is not 18m wide.

4. **Conformation as to whether the dwelling will be constructed prior to the subdivision.**

    The dwelling will more than likely be constructed prior to the completion of the subdivision which will result in a technical non-compliance until the subdivision has been completed. This will not result in any greater effect than has already been discussed in detail in the application in relation to residential character and amenity.

5. **Provision of a transport assessment.**

    Please see attached assessment.

6. **Provision of comment on compliance with the sight lines**

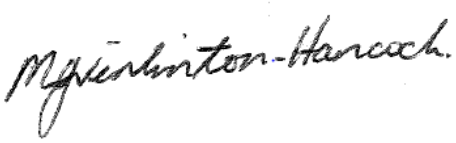
    Please see attached traffic assessment.

WSP
Wellington
L9 Majestic Centre
100 Willis Street
Wellington 6011, New Zealand
+64 4 471 7000
wsp.com/nz

7. **Provision of an updated services plan.**

   Please see the attached report.

Regards



Michelle Grinlinton-Hancock
Work Group Manager - Planning and Community Engagement

# Memorandum

| | |
|---|---|
| **To** | Michelle Grinlinton-Hancock |
| **Copy** | |
| **From** | Sam Thornton |
| **Office** | Wellington Civil |
| **Date** | 6 November 2019 |
| **File** | N-H0060.03 |
| **Subject** | Further Information Request – Resource Consent Application – 35 Kaitawa Crescent (190125) |

Dear Michelle,

As requested, please find below a traffic safety assessment addressing the comments in the Further Information Request for the proposed sub-division at 35 Kaitawa Crescent.

# My Qualifications

I am a Principal Transportation Engineer at WSP. I have 13 years of experience working in transportation engineering. I hold a bachelor's degree in civil engineering from the University of Canterbury and I am a Chartered Professional Engineer and Charted Member of Engineering New Zealand.

# Background

The proposed sub-division of 35 Kaitawa Crescent, Paraparaumu does not comply with the following rules and standards for a permitted activity regarding parking provision:

### 11P.1.2 Residential activities

1 A minimum of 2 carparks (including garages or carports) per household unit except for in Precincts A1 and A2 and C in the District Centre Zone and Raumati Beach Town Centre Zone. Minor flats are exempt from this standard.

A further information request (as detailed below) has been made following the initial application for sub-division.

In addition, the decision has been made to provide two car parks in a tandem arrangement (cars parking end to end with the front car unable to exit without the back car leaving first) for the rear dwelling. Tandem parking layouts are not identified in AS/NZS 2890.1:2004 which is referenced in the Kapiti Coast District Plan[1].

The proposed sub-division is shown in Figure 1 below and in summary is to:

- Subdivide one existing section (with an existing dwelling which is to be removed) into two new sections;
- The front section will have a 72m$^2$ floor area unit with two bedrooms;

[1] Section J.1.2.3

- The back section will have a 139m$^2$ total floor area (79m$^2$ ground floor area) unit with four bedrooms; and
- Provide a shared driveway with one off-street parks for the front section and a tandem off-street park for the rear-section.

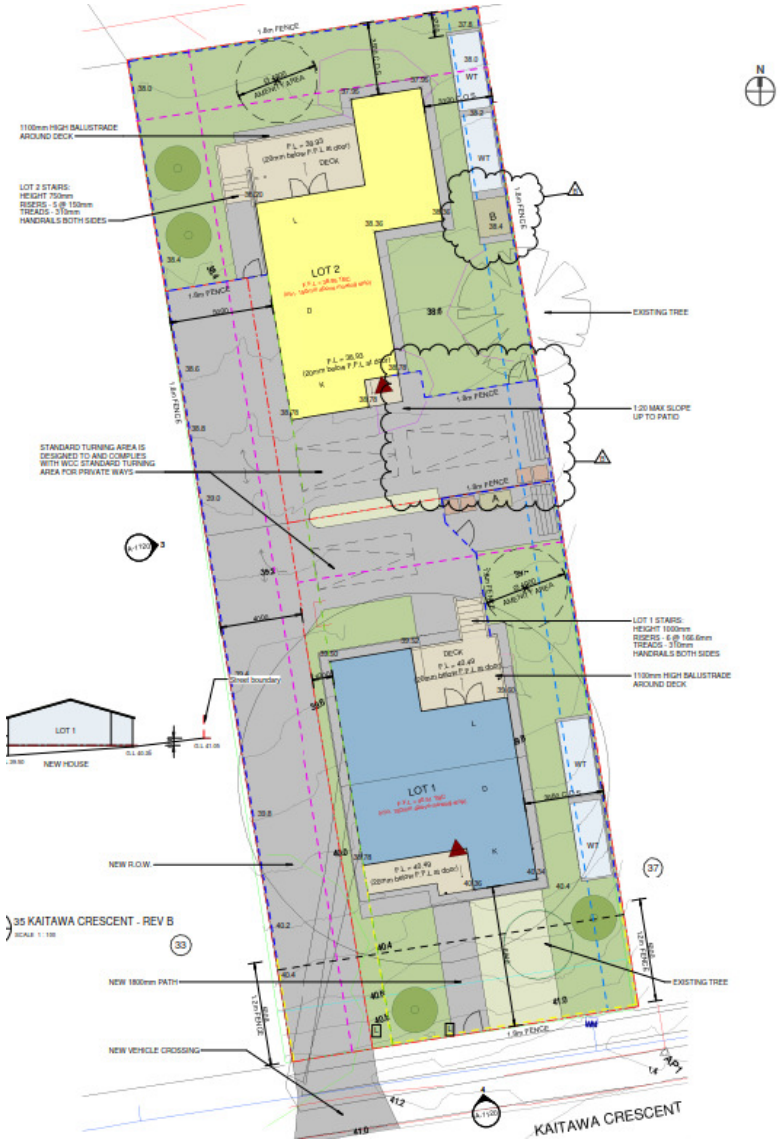



*Figure 1: Proposed subdivision*

# Requested Information

Supply a traffic safety assessment by a suitably qualified person assessing the relevant safety and transport policies and objectives of the Proposed District Plan relating to the non-compliance. Provide an amended Assessment of Environmental Effect assessing all of the relevant objectives and policies relating to the shortfall of parking spaces.

# Transport and Land-Use Context

This section provides some brief transport and land-use context.

## Transport Network

Figure 2 shows the adjacent transport network, features include:

- Bus route (shown with blue arrows) along Ruapehu Street (only operates Mondays and Wednesdays);

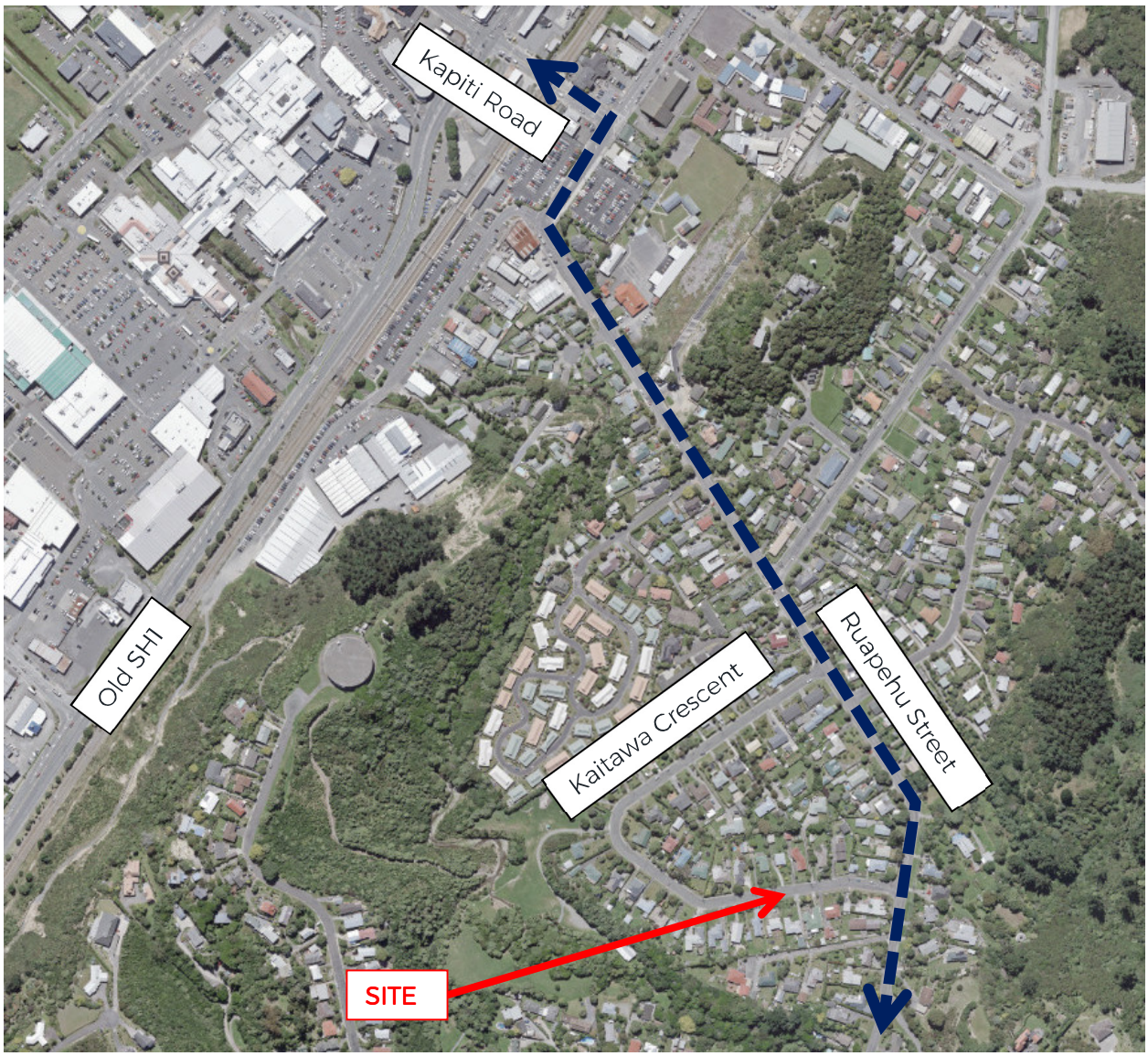



*Figure 2: Adjacent transport network*

## Transport Demands

The traffic demands on Kaitawa Crescent are estimated to be 87 average daily vehicles[2].

No parking demand information is available. However, review of historic aerial imagery for the past 10 years from Google Earth indicates that demand is low (along the length of Kaitawa Crescent

## Crash History

Ten years (2009-2019[3])of crash history have been retrieved from the NZ Transport Agency Crash Analysis System (CAS) for the length of Kaitawa Crescent.

Two crashes were recorded in CAS:

- One non-injury crash occurred at the southern intersection of Kaitawa Crescent and Ruapehu Street with a southbound vehicle on Ruapehu Street doing a u-turn at the intersection being hit by a following car.
- One minor injury crash occurred on Kaitawa Crescent where a northbound vehicle lost control at excess speed in wet conditions and hit two concrete poles.

[2] https://mobileroad.org/desktop.html
[3] Retrieved on 11 October 2019

## Street Form

Aerial photography[4] indicates that the road carriageway is approximately 8.0m wide.

NZS 4404 (2010) notes[5] that a width of 7.2-7.5m provides for either two through movements and one parked car or two parked cars and one through movement.

## Census Data

The following information has been retrieved from the 2013 census and has been provided for the following areas:

- Kapiti Coast District;
- Paraparaumu Central Ward; and
- Meshblock 1997400 (the area within the Kaitawa Crescent loop).

### Vehicles per household

Figure 3 below shows that approximately 50% of households in the Kapiti Coast District have one vehicle or less and 90% have two vehicles or less. At a more local level, on Kaitawa Crescent, the ownership rates are slightly lower with around 60% having one vehicle or less and around 90% having two vehicles or less.

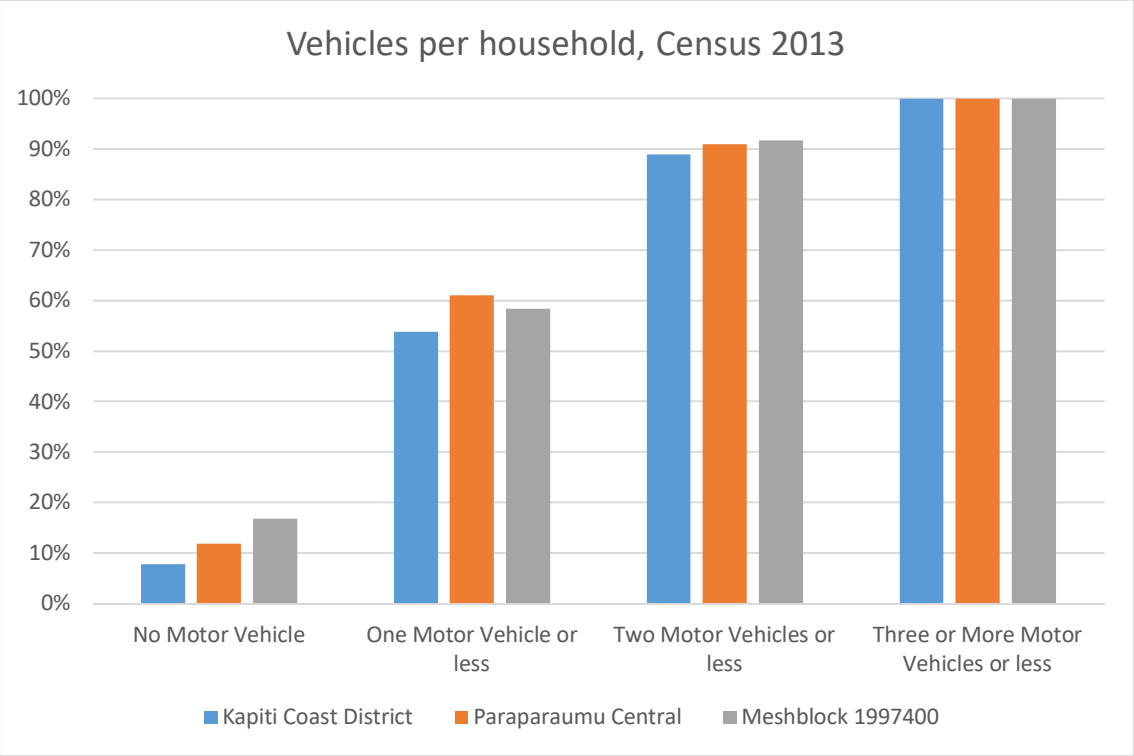



*Figure 3: Cumulative vehicles per household, Census 2013*

[4] https://publicgis.kcdc.govt.nz/LocalMaps/Viewer/
[5] Section 3.3.2 (b)

## Residents per household

Figure 4 shows that approximately 70% of households in the Kapiti Coast District have two residents or less. At a more local level, on Kaitawa Crescent, the occupancy rates are higher with around 55% having two residents or less

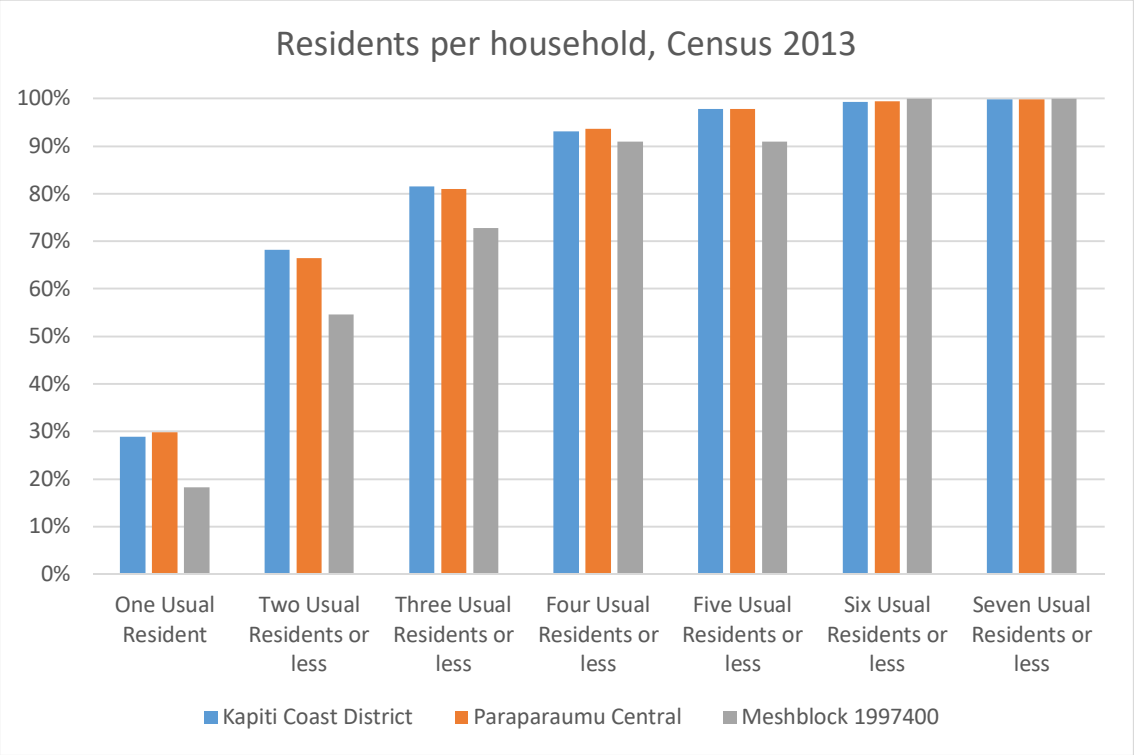



*Figure 4: Cumulative residents per household, Census 2013*

## Bedrooms per dwelling

Figure 5 shows that approximately 30% of dwellings in the Kapiti Coast District have two bedrooms or less with approximately 90% having four bedrooms or less. At a more local level, on Kaitawa Crescent, around 15% of dwellings have two bedrooms or less with around 90% having four bedrooms or less.

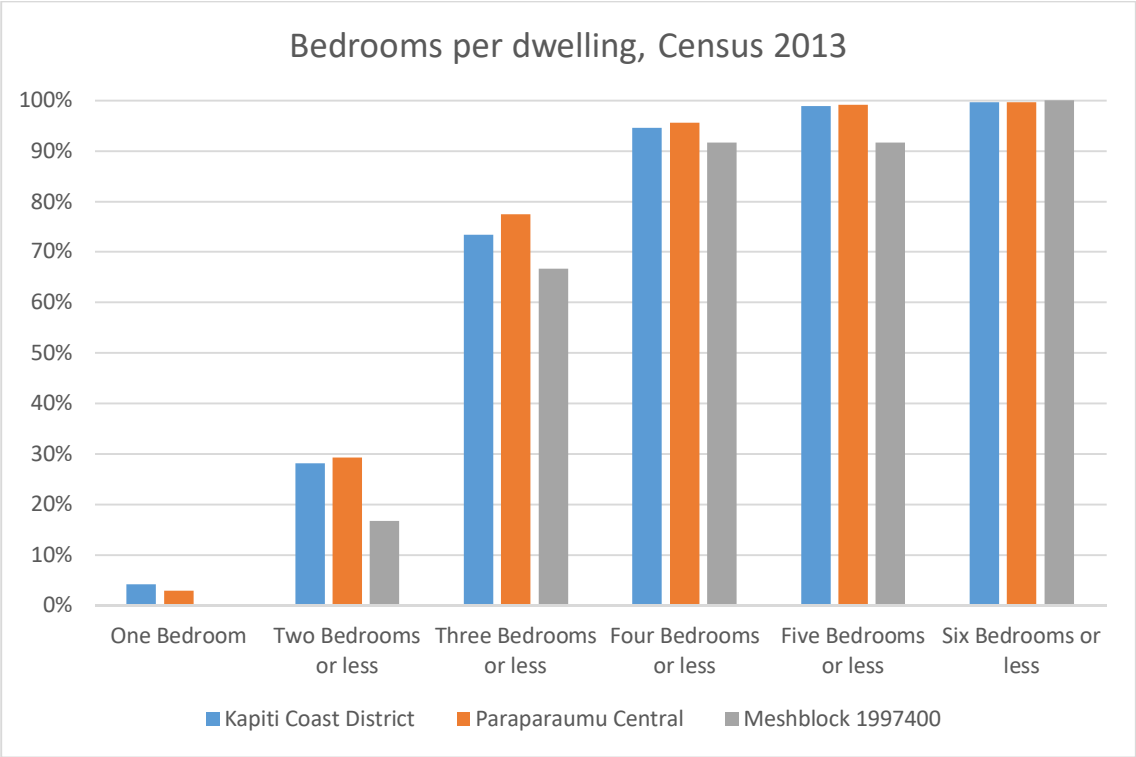



*Figure 5: Cumulative bedrooms per dwelling, Census 2013*

### Summary of Census data

The data above indicates that households / dwellings in and around Kaitawa Crescent have slightly fewer vehicles per household but more bedrooms per dwelling and residents per household when compared to the overall Kapiti Coast District.

The census data indicates that the majority of dwellings in the Kapiti District have more than two bedrooms but less than four bedrooms. Therefore, the proposed front unit is smaller than typical and the rear unit is typical for the district. In addition, the data suggests low car ownership in and around Kaitawa Crescent (60% of households have one vehicle or less) when compared to the overall Kapiti Coast District.

# Proposed District Plan

## Policies

The following transport policies are relevant to the proposed sub-division regarding the non-compliance associated with the amount of on-site parking provided:

- Policy 11.30 – Integrated Transport and Urban Form
- Policy 11.34 – Effects of Land use on Transport
- Policy 11.36 – Parking

The relevant sub-sections of the policies are expanded in the assessment section below.

## Referenced Information

The following information is referenced in the above policies.

### Transport Network Hierarchy in Schedule 11.2

Kaitawa Crescent is identified on the transport network hierarchy map as being a Neighbourhood Access Routes (which includes all other Local Roads). Neighbourhood Access Routes are defined as

"Roads providing direct access for residential and other areas of development in urban areas, with more than one intersection to other local or collector roads, and:

- provides access to: local residential neighbourhoods; schools; reserves.
- can include local walkways, beach access, residential lanes;
- will be low speed;
- will have low traffic volume".

### Subdivision and Development Principles and Requirements 2012

The following extracts from the Subdivision and Development Principles and Requirements 2012 are noted are relevant to the proposed sub-division regarding the non-compliance associated with the amount of on-site parking provided:

D (i) Sustainable Transport Strategy

- The Council wishes to encourage pleasant, walkable neighbourhoods, with a low speed environment, which provides increased amenity by, for example, enhancing connectivity, decreasing the area of sealed surfaces, differentiating parking bays and providing associated landscaping.

D (iii) Performance Criteria

- The layout and structure of a road network and its associated amenities shall provide for appropriate car parking, including that associated with reserves.

## Assessment of Traffic and Safety

Table 1 below provides an assessment of the proposed subdivision against the Proposed District Plan policies and objectives relating to the non-conformance of the proposed sub-division.

Overall the proposed sub-division is consistent with the Proposed District Plan policies and objectives relating to parking despite the non-conformance in the number of parks for the front unit and the rear units parks not being designed in accordance with AS/NZS 2890.1:2004.

*Table 1: Assessment of policies and objectives relating to the non-conformance of the proposed sub-division*

| Policy / objective | Assessment |
|---|---|
| **Policy 11.30 – Integrated Transport and Urban Form**<br><br>Development and subdivision will be integrated with and consistent with the transport network hierarchy in Schedule 11.2, and undertaken in a manner and at a rate to ensure:<br><br>• a) the transport network is capable of serving the projected demand safely and efficiently;<br>• d) development is consistent with Council's Subdivision and Development Principles and Requirements 2012; | Overall the proposed subdivision is consistent with Policy 11.30. Further information is provided below.<br><br>With regard to 11.30 (a):<br><br>• The transport network is more than capable of serving the minor increase in parking demand that may result from the subdivision (refer assessment of Policy 11.36 below).<br><br>With regard to 11.30(d):<br><br>• The Subdivision and Development Principles and Requirements 2012 are not directly relevant to the proposed subdivision with regard to parking provision off-street (other than the reference to AS/NZS 2890.1:2004).<br>• However, the subdivision is consistent with the following aspects of the requirements:<br><br>  • It is possible for vehicles parking-off-street to enter and exit the subdivision in a forward direction[6] which is an improvement on the existing situation as the current properties have no formal turning facilities. However, this arrangement can be quite time-consuming, and some users may choose instead to park on the street.<br>  • Any overflow parking that does occur and parks on the street will help to control vehicle speeds along Kaitawa Crescent. |

[6] For the tandem park this is based on the assumption that if the car in the front park wants to get out that the back car will reverse into the driveway towards the road and allow the front car to reverse into the driveway away from the road. The back car will then enter the car park area again and the front car can exit the driveway in a forward direction. It is acknowledged that in some circumstances the back car may reverse out to the road instead. There are no issues for the single park for the front unit

| Policy / objective | Assessment |
|---|---|
| **Policy 11.34 – Effects of Land use on Transport**<br><br>The potential adverse effects on the transport network from development and subdivision will be avoided, remedied or mitigated by identifying both the key existing transport routes and proposed transport routes likely to be required long term as part of the District's transport network and having regard to these when considering applications for subdivision or development. | Overall the proposed subdivision is consistent with Policy 11.34. Further information is provided below.<br><br>• The expected transport effects on the transport network associated with the minor increase in parking demand that may result from the subdivision are minor in effect (refer assessment of Policy 11.36 below). |
| **Policy 11.36 – Parking**<br><br>All new subdivision and development shall provide for safe vehicular and pedestrian access and appropriate vehicle parking areas by:<br><br>• a) providing parking numbers, layouts and dimensions consistent with parking standards;<br>• b) supplying adequate off street parking to meet the demand of the land use while having regard to the following factors:<br><br>  • i. the intensity, duration location and management of the activity.<br>  • ii. the adequacy of parking in the location and adjacent areas.<br>  • iii. the classification and use of the road (as per transport network hierarchy in Appendix 11.2), and the speed restrictions that apply.<br>  • iv. the nature of the site, in particular its capacity to accommodate parking.<br>  • v. the characteristics of the previous activity that utilised the site; | Overall the proposed subdivision is largely consistent with Policy 11.36. Further information is provided below.<br><br>With regard to 11.36 (a):<br><br>• For the rear unit, the parking layout of the tandem park is not consistent with parking standards.<br>• For the front unit, the number of off-street parks provided is not consistent with the rules of the District Plan.<br><br>With regard to 11.36 (b):<br><br>• Parking demand for the proposed subdivision is not expected to be two vehicles for the front dwelling (parking demand for two vehicles is expected for the rear unit). The two vehicles per dwelling standard applies to all dwellings regardless of size and number of bedrooms. Information from the 2013 census indicates that only 30% of dwellings in the Kapiti District have two or less bedrooms.<br>• The proposed front unit dwelling is relatively small by modern standards and only has two bedrooms and therefore is likely to have lower car ownership than might typically be expected in Kapiti. This is supported by the 2013 census data which suggests low car ownership in and around Kaitawa Crescent (60% of households have one vehicle or less) when compared to the overall Kapiti Coast District.<br>• The proposed subdivision provides three carparks which can be used by vehicles to enter and exit the subdivision in a forward direction[6].<br>• The road frontage of the proposed subdivision is approximately 17m of |

| Policy / objective | Assessment |
| --- | --- |
| | which 4m is used for the vehicle access. The remaining 13m provides sufficient width for two on-street parks (typical parallel parks are approximately 6m long).<br>• No parking demand data is available for Kaitawa Crescent, however, based on available information demands are very low, with plenty of capacity for on-street parking.<br>• Kaitawa Crescent is a Neighbourhood Access Routes / Local Road with low traffic demands and sufficient width for parking on one side and two traffic lanes or parking both sides with one traffic lane. Use of on-street parking should help to reduce vehicle speeds and improve safety.<br>• The proposed subdivision is residential which is consistent with its previous use. |

12 November 2019

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New Zealand

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www.wsp-opus.co.nz

Resource Consent Team
Kapiti Coast District Council
175 Rimu Road
Private Bag 60601
Paraparumu 5245

Ref: N-H0060.01

# 35 Kaitawa Crescent(Update): Water Storage and Hydraulic Neutrality

Dear Resource Consent Team

This letter describes minor updates to the stormwater system at 35 Kaitawa Crescent to accommodate an additional 8 $m^2$ of permeable paving surface. Tank sizes have been adjusted slightly but still remain within the original tank height and footprint sizes.

There are no changes to the rainwater capture, pumping or soakage systems proposed for these sites.

## 1.1 Updates to Pumping and Attenuation Sizing

Minor changes to the paving areas are present in Figure 1 and amended stormwater calculations are appended in Appendix A.

Results are summarised in Table 1.

Table 1. Summary of Attenuation Calculations

| | **Stormwater Results Lot 1** | **Stormwater Results Lot 2** |
|---|---|---|
| Pumped Depth | 0.30 m | 0.33 m |
| Pumped Volume | 2400 L | 2640 L |
| Pumped Capture | 24 mm of rainfall | 25 mm of rainfall |
| Pumped Discharge | 0.30 L/s | 0.30 L/s |
| Attenuation Depth | 0.43 m | 0.43 m |
| Attenuation Volume | 3230 Litres | 3450 Litres |
| Orifice Size | 20 mm | 20 mm |

Rainwater tank sizes have been updated slightly. Results are summarised in Table 2.

Table 2. Summary of Tank Selections

| | **Tank Selection Lot 1** | **Tank Selection Lot 2** |
|---|---|---|
| Proposed Tank Volume | 12800 Litres | 12800 Litres |
| Tank Height | 1.6 m | 1.6 m |
| Attenuation Height | 0.40 m | 0.43 m |

| | | |
|---|---|---|
| Pumped Height | 0.30 m | 0.33 m |
| Storage Height | 0.72 m | 0.67 m |
| Headspace | 180mm | 170 mm |
| Attenuation Volume | 3230 Litres | 3450 Litres |
| Pumped Volume | 2400 Litres | 2640 Litres |
| Storage Volume | 5730litres | 5350Litres |
| Approx. Base Level | 40.1 m | 38.1 m |
| Approx. Orifice Level | 40.8 m | 38.8 m |
| Minimum Attenuation Volume to achieve hydraulic neutrality (Note 1) | 1310 Litres | 1330 Litres |
| Note 1. The minimum attenuation volume is provided here to demonstrate that this design exceeds the hydraulic neutrality standard. Additional calculations to demonstrate the minimum requirement are included in Appendix D. | | |

There are no other changes to the proposed stormwater system. We trust that this information is sufficient to allow the resource consent to proceed, please don't hesitate to contact us if anything else is required.

Kind Regards

Tim Strang
Principal Engineer Environmental

# 2 Appendix A. Attenuation Tank Calculations

**STORMWATER ON-SITE DETENTION TANK (OSD) DESIGN** 12-Nov-19

**100 YEAR ARI STORM with 2 YEAR ARI STORM OUTLET**

**442** $m^2$ Lot with **99** $m^2$ house plus **65** $m^2$ impervious

| | | | |
|---|---|---|---|
| **NAME** | Housing NZ | Calcs By | Tim Strang |
| **ADDRESS** | 35 Kaitawa Lot 1 | | |
| **PHONE** | 276088998 | Date | 12-Nov-19 |

**NOTE:**
**Only fill in the blue (unprotected) cells**

**DATA**

| | | |
|---|---|---|
| **Depth of Tank** | **0.4** | *m* |
| **2 Year Isoheyt Value** | **80** | *mm* |
| **100 Year Isoheyt Value** | **172** | *mm* |
| **Time of Concentration** | **10** | *min. (10,15,20,30,60)* |

| | Area ($m^2$) | `C' | CA ($m^2$) |
|---|---|---|---|
| **Site Area** | **442** | | |
| **1. EXISTING SITE COVERAGE** | | | |
| **Existing Roof** | **60** | 0.9 | 54.0 |
| **Existing Paved** | **94** | 0.85 | 79.9 |
| **Existing Permeable Paving** | **0** | 0.5 | 0.0 |
| **Existing Garden** | **288** | 0.35 | 100.8 |
| **TOTAL Existing Area** | **442** | | **234.7** |
| **2. PROPOSED DEVELOPMENT** | | | |
| **Additional/Reduced Roof** | **39** | 0.9 | 35.1 |
| **Additional/Reduced Paved** | **-29** | 0.85 | -24.7 |
| **Additional Permeable Paving** | **144** | 0.5 | 72.0 |
| **Additional/Reduced Lawn/Garden** | **-154** | 0.35 | -53.9 |
| **TOTAL Addition Area** (should be zero) | **0** | | **28.6** |
| **3. REMAINING UNDRAINED AREA** | (Not routed thru detention tank after development) | | |
| **Undrained Roof Area** (Normally Zero) | **0** | 0.9 | 0.0 |
| **Undrained Paved Area** (Normally Zero) | **65** | 0.85 | 55.3 |
| **Permeable Paving Area** | **144** | 0.5 | 72.0 |
| **Undrained Lawn/Garden Area** | **134** | 0.35 | 46.9 |
| **TOTAL Extg Not to Tank Area** | **343** | | **174.2** |

**NOTE** **A "#DIV/0!" message appearing in a cell means that data has been entered incorrectly**

**NOTE** **The sum of the existing areas must equal the `Site Area'**

*** NOTE If pre-development lawn areas are reduced a negative number is required to be entered.**

**CONTROL DATA**

| | | | |
|---|---|---|---|
| **Existing `C'** | 0.53 | | *(`CA'extg/Site Area)* |
| **Developed `CA' to OSD tank** | 89 | *($m^2$)* | *(`CA'extg+`CA'adds-`CA'undr)* |
| **Additional Area** | 0 | *($m^2$)* | *(`A'add)* |

| | | | |
|---|---|---|---|
| | 0.00 | 0 | 0 |

| RUNOFF DATA | for 2 year | | for 100 year | | |
|---|---|---|---|---|---|
| Intensity I | 52.80 | *mm/hr* | 113.5 | *mm/hr* | |
| Allowable Qmax whole site | 3.45 | | 7.41 | | |
| Lost Flows | 2.56 | | 5.50 | | |
| Reduced Flow (sump capacity) | 0.57 | | | | 0.57 |
| Allowable Qmax from tanks = | 0.3 | *l/s* | 1.91 | *l/s* | |
| Allowable Qave from tanks = | 0.2 | *l/s* | 1.2 | *l/s (Qmax * 0.65)* | |

**Orifice Calculation - PROTECTED DO NOT ENTER ANY FIGURES**

| | | | |
|---|---|---|---|
| d= | 19.9 | mm | |
| Q100 outflow= | 0.5444026 | for h= | 0.4 |
| Q100ave | 0.4 | | |
| Q= | 0.318840139 | for h in Q2 | 0.1372036 |
| Qave | 0.2 | Q2 | |

**Rainfall Intensities (mm)**

| MIN | Normalised Rainfall Depth($I/I_{24}$) | 2 Yr(mm/hr) | 100 Yr(mm/hr) |
|---|---|---|---|
| 10 | 0.11 | 52.8 | 113.5 |
| 15 | 0.14 | 44.8 | 96.3 |
| 20 | 0.16 | 38.4 | 82.6 |
| 30 | 0.19 | 30.4 | 65.4 |
| 60 | 0.26 | 20.8 | 44.7 |
| 120 | 0.35 | 14.0 | 30.1 |
| 180 | 0.46 | 12.3 | 26.4 |
| 240 | 0.51 | 10.2 | 21.9 |
| 300 | 0.56 | 9.0 | 19.3 |
| 360 | 0.60 | 8.0 | 17.2 |
| 420 | 0.64 | 7.3 | 15.7 |
| 480 | 0.68 | 6.8 | 14.6 |
| 540 | 0.71 | 6.3 | 13.6 |
| 600 | 0.75 | 6.0 | 12.9 |
| 660 | 0.78 | 5.7 | 12.2 |
| 720 | 0.81 | 5.4 | 11.6 |

**STORAGE (2 year)**

| time (min) | depth (mm) | inflow (l) | outflow (l) | storage (l) | |
|---|---|---|---|---|---|
| 10 | 8.8 | 784 | 124.34765 | 660 | *inflow=`CA'dev*depth* |
| 15 | 11.2 | 998 | 186.52148 | 811 | *outflow=Qave*time* |
| 20 | 12.8 | 1140 | 249 | 892 | *diff=inflow-outflow* |
| 30 | 15.2 | 1354 | 373 | 981 | |
| 60 | 20.8 | 1853 | 746 | 1107 | |
| 120 | 28.0 | 2495 | 1492 | 1003 | |
| 180 | 36.8 | 3279 | 2238 | 1041 | |
| 240 | 40.8 | 3635 | 2984 | 651 | |
| 300 | 44.8 | 3992 | 3730 | 261 | |
| 360 | 48.0 | 4277 | 4477 | 0 | |
| 420 | 51.2 | 4562 | 5223 | 0 | |
| 480 | 54.4 | 4847 | 5969 | 0 | |
| 540 | 56.8 | 5061 | 6715 | 0 | |
| 600 | 60.0 | 5346 | 7461 | 0 | |
| 660 | 62.4 | 5560 | 8207 | 0 | |
| 720 | 64.8 | 5774 | 8951 | 0 | |
| | | | Max= | 1107 | |

**STORAGE (100 year)**

| time (min) | depth (mm) | inflow (l) | 100 yr outflow (l) | Storage (100 yr) (l) |
|---|---|---|---|---|
| 10 | 18.9 | 1686 | 212.3170142 | 1473 |
| 15 | 24.1 | 2146 | 318 | 1827 |
| 20 | 27.5 | 2452 | 425 | 2027 |
| 30 | 32.7 | 2912 | 637 | 2275 |
| 60 | 44.7 | 3985 | 1274 | 2711 |
| 120 | 60.2 | 5364 | 2548 | 2816 |
| 180 | 79.1 | 7050 | 3822 | 3228 |
| 240 | 87.7 | 7816 | 5096 | 2720 |
| 300 | 96.3 | 8582 | 6370 | 2213 |
| 360 | 103.2 | 9195 | 7643 | 1552 |
| 420 | 110.1 | 9808 | 8917 | 891 |
| 480 | 117.0 | 10421 | 10191 | 230 |
| 540 | 122.1 | 10881 | 11465 | 0 |
| 600 | 129.0 | 11494 | 12739 | 0 |
| 660 | 134.2 | 11954 | 14013 | 0 |
| 720 | 139.3 | 12413 | 15287 | 0 |
| | | | Max= | 3228 |

## SUMMARY

| | | |
|---|---|---|
| **Tank Volume** | **3230.0** | **litres** |
| **100 Year Max Discharge** | **0.5** | **l/s** |
| **2 Year Max Discharge** | **0.3** | **l/s** |
| **Orifice Diameter** | **20** | **mm** |

**STORMWATER ON-SITE DETENTION TANK (OSD) DESIGN** 12-Nov-19

**100 YEAR ARI STORM with 2 YEAR ARI STORM OUTLET**

**400** $m^2$ **Lot with** **105** $m^2$ **house plus** **20** $m^2$ **impervious**

| | | | |
|---|---|---|---|
| **NAME** | Housing NZ | Calcs By | Tim Strang |
| **ADDRESS** | 35 Kaitawa Lot 2 | | |
| **PHONE** | 276088998 | Date | 12-Nov-19 |

**NOTE:**
**Only fill in the blue (unprotected) cells**

**DATA**

| | | |
|---|---|---|
| **Depth of Tank** | **0.43** | *m* |
| **2 Year Isoheyt Value** | **80** | *mm* |
| **100 Year Isoheyt Value** | **172** | *mm* |
| **Time of Concentration** | **10** | *min. (10,15,20,30,60)* |

| | Area ($m^2$) | `C' | CA ($m^2$) |
|---|---|---|---|
| **Site Area** | **400** | | |
| **1. EXISTING SITE COVERAGE** | | | |
| **Existing Roof** | **85** | 0.9 | 76.5 |
| **Existing Paved** | **20** | 0.85 | 17.0 |
| **Existing Permeable Paving** | **0** | 0.5 | 0.0 |
| **Existing Garden** | **295** | 0.35 | 103.3 |
| **TOTAL Existing Area** | **400** | | **196.8** |
| **2. PROPOSED DEVELOPMENT** | | | |
| **Additional/Reduced Roof** | **20** | 0.9 | 18.0 |
| **Additional/Reduced Paved** | **0** | 0.85 | 0.0 |
| **Additional Permeable Paving** | **109** | 0.5 | 54.5 |
| **Additional/Reduced Lawn/Garden** | **-129** | 0.35 | -45.2 |
| **TOTAL Addition Area** (should be zero) | **0** | | **27.4** |
| **3. REMAINING UNDRAINED AREA** | (Not routed thru detention tank after development) | | |
| **Undrained Roof Area** (Normally Zero) | **0** | 0.9 | 0.0 |
| **Undrained Paved Area** (Normally Zero) | **20** | 0.85 | 17.0 |
| **Permeable Paving Area** | **109** | 0.5 | 54.5 |
| **Undrained Lawn/Garden Area** | **166** | 0.35 | 58.1 |
| **TOTAL Extg Not to Tank Area** | **295** | | **129.6** |

**NOTE** **A "#DIV/0!" message appearing in a cell means that data has been entered incorrectly**

**NOTE** **The sum of the existing areas must equal the `Site Area'**

*** NOTE If pre-development lawn areas are reduced a negative number is required to be entered.**

**CONTROL DATA**

| | | | |
|---|---|---|---|
| **Existing `C'** | 0.49 | | *(`CA'extg/Site Area)* |
| **Developed `CA' to OSD tank** | 95 | *($m^2$)* | *(`CA'extg+`CA'adds-`CA'undr)* |
| **Additional Area** | 0 | *($m^2$)* | *(`A'add)* |

| | | | |
|---|---|---|---|
| | 0.00 | 0 | 0 |

| RUNOFF DATA | for 2 year | | for 100 year | | |
|---|---|---|---|---|---|
| Intensity I | 52.80 | *mm/hr* | 113.5 | *mm/hr* | |
| Allowable Qmax whole site | 2.89 | | 6.21 | | |
| Lost Flows | 1.90 | | 4.09 | | |
| Reduced Flow (poor soils) | 0.65 | | | | 0.65 |
| Allowable Qmax from tanks = | 0.3 | *l/s* | 2.12 | *l/s* | |
| Allowable Qave from tanks = | 0.2 | *l/s* | 1.4 | *l/s* | *(Qmax * 0.65)* |

| Orifice Calculation - PROTECTED DO NOT ENTER ANY FIGURES | | | |
|---|---|---|---|
| d= | 20.1 | mm | |
| Q100 outflow= | 0.573888573 | for h= | 0.43 |
| Q100ave | 0.4 | | |
| Q= | 0.335720916 | for h in Q2 | 0.1471533 |
| Qave | 0.2 | Q2 | |

**Rainfall Intensities (mm)**

| MIN | Normalised Rainfall Depth($I/I_{24}$) | 2 Yr(mm/hr) | 100 Yr(mm/hr) |
|---|---|---|---|
| 10 | 0.11 | 52.8 | 113.5 |
| 15 | 0.14 | 44.8 | 96.3 |
| 20 | 0.16 | 38.4 | 82.6 |
| 30 | 0.19 | 30.4 | 65.4 |
| 60 | 0.26 | 20.8 | 44.7 |
| 120 | 0.35 | 14.0 | 30.1 |
| 180 | 0.46 | 12.3 | 26.4 |
| 240 | 0.51 | 10.2 | 21.9 |
| 300 | 0.56 | 9.0 | 19.3 |
| 360 | 0.60 | 8.0 | 17.2 |
| 420 | 0.64 | 7.3 | 15.7 |
| 480 | 0.68 | 6.8 | 14.6 |
| 540 | 0.71 | 6.3 | 13.6 |
| 600 | 0.75 | 6.0 | 12.9 |
| 660 | 0.78 | 5.7 | 12.2 |
| 720 | 0.81 | 5.4 | 11.6 |

**STORAGE (2 year)**

| time (min) | depth (mm) | inflow (l) | outflow (l) | storage (l) | |
|---|---|---|---|---|---|
| 10 | 8.8 | 832 | 130.93116 | 701 | *inflow=`CA'dev*depth* |
| 15 | 11.2 | 1058 | 196.39674 | 862 | *outflow=Qave*time* |
| 20 | 12.8 | 1210 | 262 | 948 | *diff=inflow-outflow* |
| 30 | 15.2 | 1436 | 393 | 1044 | |
| 60 | 20.8 | 1966 | 786 | 1180 | |
| 120 | 28.0 | 2646 | 1571 | 1075 | |
| 180 | 36.8 | 3478 | 2357 | 1121 | |
| 240 | 40.8 | 3856 | 3142 | 713 | |
| 300 | 44.8 | 4234 | 3928 | 306 | |
| 360 | 48.0 | 4536 | 4714 | 0 | |
| 420 | 51.2 | 4838 | 5499 | 0 | |
| 480 | 54.4 | 5141 | 6285 | 0 | |
| 540 | 56.8 | 5368 | 7070 | 0 | |
| 600 | 60.0 | 5670 | 7856 | 0 | |
| 660 | 62.4 | 5897 | 8641 | 0 | |
| 720 | 64.8 | 6124 | 9425 | 0 | |
| | | | Max= | 1180 | |

**STORAGE (100 year)**

| time (min) | depth (mm) | inflow (l) | 100 yr outflow (l) | Storage (100 yr) (l) |
|---|---|---|---|---|
| 10 | 18.9 | 1788 | 223.8165436 | 1564 |
| 15 | 24.1 | 2276 | 336 | 1940 |
| 20 | 27.5 | 2601 | 448 | 2153 |
| 30 | 32.7 | 3088 | 671 | 2417 |
| 60 | 44.7 | 4226 | 1343 | 2883 |
| 120 | 60.2 | 5689 | 2686 | 3003 |
| 180 | 79.1 | 7477 | 4029 | 3448 |
| 240 | 87.7 | 8290 | 5372 | 2918 |
| 300 | 96.3 | 9102 | 6714 | 2388 |
| 360 | 103.2 | 9752 | 8057 | 1695 |
| 420 | 110.1 | 10403 | 9400 | 1002 |
| 480 | 117.0 | 11053 | 10743 | 310 |
| 540 | 122.1 | 11540 | 12086 | 0 |
| 600 | 129.0 | 12191 | 13429 | 0 |
| 660 | 134.2 | 12678 | 14772 | 0 |
| 720 | 139.3 | 13166 | 16115 | 0 |
| | | | Max= | 3448 |

## SUMMARY

| | | |
|---|---|---|
| **Tank Volume** | **3450.0** | **litres** |
| **100 Year Max Discharge** | **0.6** | **l/s** |
| **2 Year Max Discharge** | **0.3** | **l/s** |
| **Orifice Diameter** | **20** | **mm** |

**STORMWATER ON-SITE DETENTION TANK (OSD) DESIGN** 12-Nov-19

**100 YEAR ARI STORM with 2 YEAR ARI STORM OUTLET**

**442** $m^2$ **Lot with** **99** $m^2$ **house plus** **65** $m^2$ **impervious**

## Minimum Volume for Hydraulic Neutrality

| | | | |
|---|---|---|---|
| **NAME** | Housing NZ | Calcs By | Tim Strang |
| **ADDRESS** | 35 Kaitawa Lot 1 | | |
| **PHONE** | 276088998 | Date | 12-Nov-19 |

**NOTE:**
**Only fill in the blue (unprotected) cells**

**NOTE** **A "#DIV/0!" message appearing in a cell means that data has been entered incorrectly**

| **DATA** | | |
|---|---|---|
| **Depth of Tank** | **0.4** | *m* |
| **2 Year Isoheyt Value** | **80** | *mm* |
| **100 Year Isoheyt Value** | **172** | *mm* |
| **Time of Concentration** | **10** | *min. (10,15,20,30,60)* |

| | **Area (m²)** | **`C'** | **CA (m²)** |
|---|---|---|---|
| **Site Area** | **442** | | |
| **1. EXISTING SITE COVERAGE** | | | |
| **Existing Roof** | **60** | 0.9 | 54.0 |
| **Existing Paved** | **94** | 0.85 | 79.9 |
| **Existing Permeable Paving** | **0** | 0.5 | 0.0 |
| **Existing Garden** | **288** | 0.35 | 100.8 |
| **TOTAL Existing Area** | **442** | | **234.7** |
| **2. PROPOSED DEVELOPMENT** | | | |
| **Additional/Reduced Roof** | **39** | 0.9 | 35.1 |
| **Additional/Reduced Paved** | **-29** | 0.85 | -24.7 |
| **Additional Permeable Paving** | **144** | 0.5 | 72.0 |
| **Additional/Reduced Lawn/Garden** | **-154** | 0.35 | -53.9 |
| **TOTAL Addition Area** (should be zero) | **0** | | **28.6** |
| **3. REMAINING UNDRAINED AREA** | (Not routed thru detention tank after development) | | |
| **Undrained Roof Area** (Normally Zero) | **0** | 0.9 | 0.0 |
| **Undrained Paved Area** (Normally Zero) | **65** | 0.85 | 55.3 |
| **Permeable Paving Area** | **144** | 0.5 | 72.0 |
| **Undrained Lawn/Garden Area** | **134** | 0.35 | 46.9 |
| **TOTAL Extg Not to Tank Area** | **343** | | **174.2** |

**NOTE** **The sum of the existing areas must equal the `Site Area'**

*** NOTE If pre-development lawn areas are reduced a negative number is required to be entered.**

| **CONTROL DATA** | | | |
|---|---|---|---|
| **Existing `C'** | 0.53 | | *(`CA'extg/Site Area)* |
| **Developed `CA' to OSD tank** | 89 | *(m²)* | *(`CA'extg+`CA'adds-`CA'undr)* |
| **Additional Area** | 0 | *(m²)* | *(`A'add)* |

| | | | |
|---|---|---|---|
| | 0.00 | 0 | 0 |

| RUNOFF DATA | for 2 year | | for 100 year | | |
|---|---|---|---|---|---|
| Intensity I | 52.80 | *mm/hr* | 113.5 | *mm/hr* | |
| Allowable Qmax whole site | 3.45 | | 7.41 | | |
| Lost Flows | 2.56 | | 5.50 | | |
| Reduced Flow (sump capacity) | 0.00 | | | | 0.57 |
| Allowable Qmax from tanks = | 0.9 | *l/s* | 1.91 | *l/s* | |
| Allowable Qave from tanks = | 0.6 | *l/s* | 1.2 | *l/s* | *(Qmax * 0.65)* |

**Orifice Calculation - PROTECTED DO NOT ENTER ANY FIGURES**

| | | | |
|---|---|---|---|
| d= | 32.7 | mm | |
| Q100 outflow= | 1.469477673 | for h= | 0.4 |
| Q100ave | 1.0 | | |
| Q= | 0.888952823 | for h in Q2 | 0.1463833 |
| Qave | 0.6 | Q2 | |

**Rainfall Intensities (mm)**

| MIN | Normalised Rainfall Depth($I/I_{24}$) | 2 Yr(mm/hr) | 100 Yr(mm/hr) |
|---|---|---|---|
| 10 | 0.11 | 52.8 | 113.5 |
| 15 | 0.14 | 44.8 | 96.3 |
| 20 | 0.16 | 38.4 | 82.6 |
| 30 | 0.19 | 30.4 | 65.4 |
| 60 | 0.26 | 20.8 | 44.7 |
| 120 | 0.35 | 14.0 | 30.1 |
| 180 | 0.46 | 12.3 | 26.4 |
| 240 | 0.51 | 10.2 | 21.9 |
| 300 | 0.56 | 9.0 | 19.3 |
| 360 | 0.60 | 8.0 | 17.2 |
| 420 | 0.64 | 7.3 | 15.7 |
| 480 | 0.68 | 6.8 | 14.6 |
| 540 | 0.71 | 6.3 | 13.6 |
| 600 | 0.75 | 6.0 | 12.9 |
| 660 | 0.78 | 5.7 | 12.2 |
| 720 | 0.81 | 5.4 | 11.6 |

**STORAGE (2 year)**

| time (min) | depth (mm) | inflow (l) | outflow (l) | storage (l) | |
|---|---|---|---|---|---|
| 10 | 8.8 | 784 | 346.6916 | 437 | *inflow=`CA'dev*depth* |
| 15 | 11.2 | 998 | 520.0374 | 478 | *outflow=Qave*time* |
| 20 | 12.8 | 1140 | 693 | 447 | *diff=inflow-outflow* |
| 30 | 15.2 | 1354 | 1040 | 314 | |
| 60 | 20.8 | 1853 | 2080 | 0 | |
| 120 | 28.0 | 2495 | 4160 | 0 | |
| 180 | 36.8 | 3279 | 6240 | 0 | |
| 240 | 40.8 | 3635 | 8321 | 0 | |
| 300 | 44.8 | 3992 | 10401 | 0 | |
| 360 | 48.0 | 4277 | 12481 | 0 | |
| 420 | 51.2 | 4562 | 14561 | 0 | |
| 480 | 54.4 | 4847 | 16641 | 0 | |
| 540 | 56.8 | 5061 | 18721 | 0 | |
| 600 | 60.0 | 5346 | 20801 | 0 | |
| 660 | 62.4 | 5560 | 22882 | 0 | |
| 720 | 64.8 | 5774 | 24957 | 0 | |
| | | | Max= | 478 | |

**STORAGE (100 year)**

| time (min) | depth (mm) | (l) | inflow | 100 yr outflow (l) | Storage (100 yr) (l) |
|---|---|---|---|---|---|
| 10 | 18.9 | | 1686 | 573.0962926 | 1113 |
| 15 | 24.1 | | 2146 | 860 | 1286 |
| 20 | 27.5 | | 2452 | 1146 | 1306 |
| 30 | 32.7 | | 2912 | 1719 | 1192 |
| 60 | 44.7 | | 3985 | 3439 | 546 |
| 120 | 60.2 | | 5364 | 6877 | 0 |
| 180 | 79.1 | | 7050 | 10316 | 0 |
| 240 | 87.7 | | 7816 | 13754 | 0 |
| 300 | 96.3 | | 8582 | 17193 | 0 |
| 360 | 103.2 | | 9195 | 20631 | 0 |
| 420 | 110.1 | | 9808 | 24070 | 0 |
| 480 | 117.0 | | 10421 | 27509 | 0 |
| 540 | 122.1 | | 10881 | 30947 | 0 |
| 600 | 129.0 | | 11494 | 34386 | 0 |
| 660 | 134.2 | | 11954 | 37824 | 0 |
| 720 | 139.3 | | 12413 | 41263 | 0 |
| | | | | Max= | 1306 |

## SUMMARY

| | | |
|---|---|---|
| **Tank Volume** | **1310.0** | **litres** |
| **100 Year Max Discharge** | **1.5** | **l/s** |
| **2 Year Max Discharge** | **0.9** | **l/s** |
| **Orifice Diameter** | **33** | **mm** |

**Minimum Volume for Hydraulic Neutrality**

**STORMWATER ON-SITE DETENTION TANK (OSD) DESIGN** 12-Nov-19

**100 YEAR ARI STORM with 2 YEAR ARI STORM OUTLET**

**400** $m^2$ **Lot with** **105** $m^2$ **house plus** **20** $m^2$ **impervious**

**Minimum Volume for Hydraulic Neutrality**

| | | | |
|---|---|---|---|
| **NAME** | Housing NZ | Calcs By | Tim Strang |
| **ADDRESS** | 35 Kaitawa Lot 2 | | |
| **PHONE** | 276088998 | Date | 12-Nov-19 |

**NOTE:**
**Only fill in the blue (unprotected) cells**

| **DATA** | | |
|---|---|---|
| **Depth of Tank** | **0.43** | *m* |
| **2 Year Isoheyt Value** | **80** | *mm* |
| **100 Year Isoheyt Value** | **172** | *mm* |
| **Time of Concentration** | **10** | *min. (10,15,20,30,60)* |

| | **Area (m²)** | **`C'** | **CA (m²)** |
|---|---|---|---|
| **Site Area** | **400** | | |
| **1. EXISTING SITE COVERAGE** | | | |
| **Existing Roof** | **85** | 0.9 | 76.5 |
| **Existing Paved** | **20** | 0.85 | 17.0 |
| **Existing Permeable Paving** | **0** | 0.5 | 0.0 |
| **Existing Garden** | **295** | 0.35 | 103.3 |
| **TOTAL Existing Area** | **400** | | **196.8** |
| **2. PROPOSED DEVELOPMENT** | | | |
| **Additional/Reduced Roof** | **20** | 0.9 | 18.0 |
| **Additional/Reduced Paved** | **0** | 0.85 | 0.0 |
| **Additional Permeable Paving** | **109** | 0.5 | 54.5 |
| **Additional/Reduced Lawn/Garden** | **-129** | 0.35 | -45.2 |
| **TOTAL Addition Area** (should be zero) | **0** | | **27.4** |
| **3. REMAINING UNDRAINED AREA** | (Not routed thru detention tank after development) | | |
| **Undrained Roof Area** (Normally Zero) | **0** | 0.9 | 0.0 |
| **Undrained Paved Area** (Normally Zero) | **20** | 0.85 | 17.0 |
| **Permeable Paving Area** | **109** | 0.5 | 54.5 |
| **Undrained Lawn/Garden Area** | **166** | 0.35 | 58.1 |
| **TOTAL Extg Not to Tank Area** | **295** | | **129.6** |

**NOTE** **A "#DIV/0!" message appearing in a cell means that data has been entered incorrectly**

**NOTE** **The sum of the existing areas must equal the `Site Area'**

*** NOTE If pre-development lawn areas are reduced a negative number is required to be entered.**

| **CONTROL DATA** | | | |
|---|---|---|---|
| **Existing `C'** | 0.49 | | *(`CA'extg/Site Area)* |
| **Developed `CA' to OSD tank** | 95 | *(m²)* | *(`CA'extg+`CA'adds-`CA'undr)* |
| **Additional Area** | 0 | *(m²)* | *(`A'add)* |

| | | | |
|---|---|---|---|
| | 0.00 | 0 | 0 |

| RUNOFF DATA | for 2 year | | for 100 year | | |
|---|---|---|---|---|---|
| Intensity I | 52.80 | *mm/hr* | 113.5 | *mm/hr* | |
| Allowable Qmax whole site | 2.89 | | 6.21 | | |
| Lost Flows | 1.90 | | 4.09 | | |
| Reduced Flow (poor soils) | 0.00 | | | | 0.65 |
| Allowable Qmax from tanks = | 1.0 | *l/s* | 2.12 | *l/s* | |
| Allowable Qave from tanks = | 0.6 | *l/s* | 1.4 | *l/s* | *(Qmax * 0.65)* |

**Orifice Calculation - PROTECTED DO NOT ENTER ANY FIGURES**

| | | | |
|---|---|---|---|
| d= | 33.9 | mm | |
| Q100 outflow= | 1.635198347 | for h= | 0.43 |
| Q100ave | 1.1 | | |
| Q= | 0.985849415 | for h in Q2 | 0.1562963 |
| Qave | 0.6 | Q2 | |

**Rainfall Intensities (mm)**

| MIN | Normalised Rainfall Depth($I/I_{24}$) | 2 Yr(mm/hr) | 100 Yr(mm/hr) |
|---|---|---|---|
| 10 | 0.11 | 52.8 | 113.5 |
| 15 | 0.14 | 44.8 | 96.3 |
| 20 | 0.16 | 38.4 | 82.6 |
| 30 | 0.19 | 30.4 | 65.4 |
| 60 | 0.26 | 20.8 | 44.7 |
| 120 | 0.35 | 14.0 | 30.1 |
| 180 | 0.46 | 12.3 | 26.4 |
| 240 | 0.51 | 10.2 | 21.9 |
| 300 | 0.56 | 9.0 | 19.3 |
| 360 | 0.60 | 8.0 | 17.2 |
| 420 | 0.64 | 7.3 | 15.7 |
| 480 | 0.68 | 6.8 | 14.6 |
| 540 | 0.71 | 6.3 | 13.6 |
| 600 | 0.75 | 6.0 | 12.9 |
| 660 | 0.78 | 5.7 | 12.2 |
| 720 | 0.81 | 5.4 | 11.6 |

**STORAGE (2 year)**

| time (min) | depth (mm) | inflow (l) | outflow (l) | storage (l) | |
|---|---|---|---|---|---|
| 10 | 8.8 | 832 | 384.48127 | 447 | *inflow=`CA'dev*depth* |
| 15 | 11.2 | 1058 | 576.72191 | 482 | *outflow=Qave*time* |
| 20 | 12.8 | 1210 | 769 | 441 | *diff=inflow-outflow* |
| 30 | 15.2 | 1436 | 1153 | 283 | |
| 60 | 20.8 | 1966 | 2307 | 0 | |
| 120 | 28.0 | 2646 | 4614 | 0 | |
| 180 | 36.8 | 3478 | 6921 | 0 | |
| 240 | 40.8 | 3856 | 9228 | 0 | |
| 300 | 44.8 | 4234 | 11534 | 0 | |
| 360 | 48.0 | 4536 | 13841 | 0 | |
| 420 | 51.2 | 4838 | 16148 | 0 | |
| 480 | 54.4 | 5141 | 18455 | 0 | |
| 540 | 56.8 | 5368 | 20762 | 0 | |
| 600 | 60.0 | 5670 | 23069 | 0 | |
| 660 | 62.4 | 5897 | 25376 | 0 | |
| 720 | 64.8 | 6124 | 27677 | 0 | |
| | | | Max= | 482 | |

**STORAGE (100 year)**

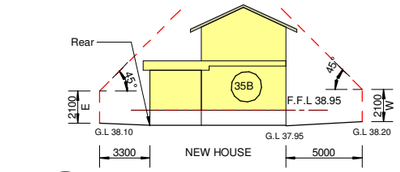
| time (min) | depth (mm) | (l) | inflow | 100 yr outflow (l) | Storage (100 yr) (l) |
|---|---|---|---|---|---|
| 10 | 18.9 | | 1788 | 637.7273552 | 1150 |
| 15 | 24.1 | | 2276 | 957 | 1319 |
| 20 | 27.5 | | 2601 | 1275 | 1325 |
| 30 | 32.7 | | 3088 | 1913 | 1175 |
| 60 | 44.7 | | 4226 | 3826 | 400 |
| 120 | 60.2 | | 5689 | 7653 | 0 |
| 180 | 79.1 | | 7477 | 11479 | 0 |
| 240 | 87.7 | | 8290 | 15305 | 0 |
| 300 | 96.3 | | 9102 | 19132 | 0 |
| 360 | 103.2 | | 9752 | 22958 | 0 |
| 420 | 110.1 | | 10403 | 26785 | 0 |
| 480 | 117.0 | | 11053 | 30611 | 0 |
| 540 | 122.1 | | 11540 | 34437 | 0 |
| 600 | 129.0 | | 12191 | 38264 | 0 |
| 660 | 134.2 | | 12678 | 42090 | 0 |
| 720 | 139.3 | | 13166 | 45916 | 0 |
| | | | | Max= | 1325 |

## SUMMARY

| | | |
|---|---|---|
| **Tank Volume** | **1330.0** | **litres** |
| **100 Year Max Discharge** | **1.6** | **l/s** |
| **2 Year Max Discharge** | **1.0** | **l/s** |
| **Orifice Diameter** | **34** | **mm** |

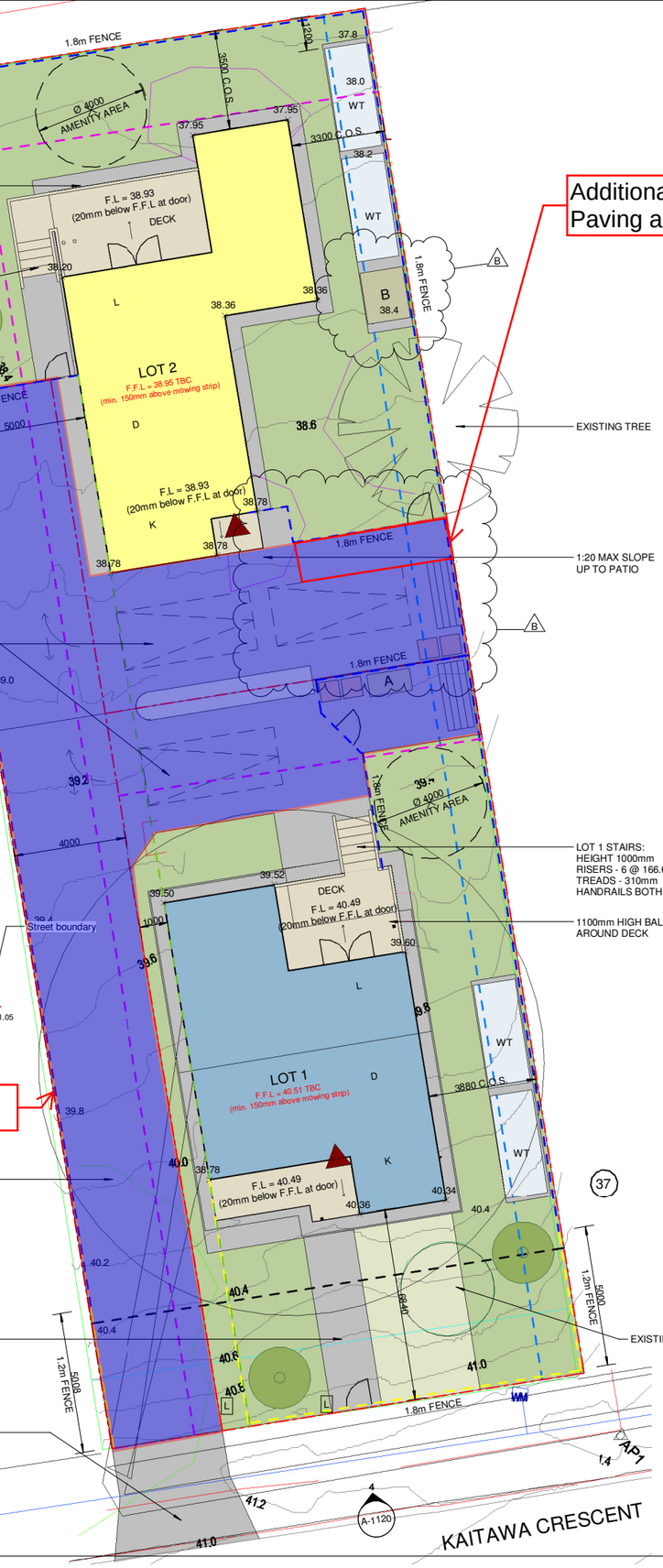
**Minimum Volume for Hydraulic Neutrality**

# 3 Appendix B. Figure

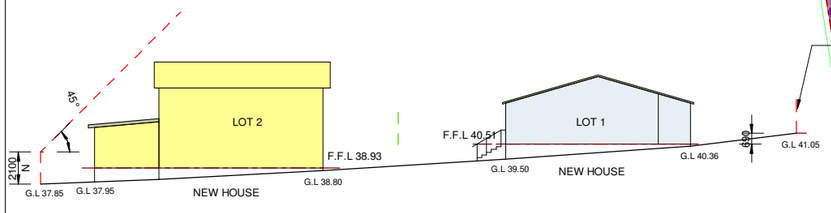



2 A-1120 35 KAITAWA A N ELEVATION.
SCALE 1 : 200

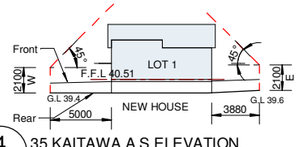
## Previous Design


1 35 KAITAWA CRESCENT - REV B
SCALE 1 : 100




3 A-1120 35 KAITAWA A W ELEVATION.
SCALE 1 : 200




4 A-1120 35 KAITAWA A S ELEVATION.
SCALE 1 : 250

**CONSTRUCTION MANAGEMENT ZONE**

CONSTRUCTION MANAGEMENT ZONE IS INDICATED BY THE COLOURED AREA ON THE PLAN.

**HAZARD MANAGEMENT TEMPORARY FENCING**

WHERE THE WORK SITE IS NOT COMPLETELY ENCLOSED AND UNAUTHORISED ENTRY BY CHILDREN IS LIKELY IT IS REQUIRED FOR SPECIFIC HAZARDS TO BE FENCED WHEN WORKERS ARE ABSENT FROM THE IMMEDIATE VICINITY.
WHERE A POTENTIAL HAZARD AT A WORK SITE MAKES A SAFETY BARRIER NECESSARY A BARRIER COMPLYING WITH TABLE 1, NZBC F5/AS1 IS AN ACCEPTABLE SOLUTION.

**GEOTECHNICAL NOTES**

REFER TO THE GEOTECHNICAL ASSESSMENT REPORT AND THE EARTHWORK TECHNICAL SPECIFICATION FOR THE EARTHWORKS REQUIRED FOR FOUNDATION CONSTRUCTION TO THIS SITE.

**GENERAL NOTES**

1, BUILDING CONTRACTOR TO CHECK ALL DIMENSIONS PRIOR TO COMMENCING CONSTUCTION

2, WHERE ITEMS ARE TO BE REMOVED AND/OR DEMOLISHED ALLOW TO MAKE GOOD OR ALLOW PREPARATION FOR NEW WORK

3, CONTRACTOR TO CHECK CONDITION AND HEIGHTS OF EXISTING FENCING, CONFIRM WITH PROJECT MANAGER ON REUSE OF EXISTING FENCE, MAKING GOOD OR NEW FENCE.

4, THIS DRAWING TO BE READ INCONJUNCTION WITH THE CIVIL AND STRUCTURAL DOCUMENTATION

5, BUILDER IS TO CONFIRM THE LOCATION OF ALL EXISTING IN GROUND SERVICES PRIOR TO THE COMMENCEMENT OF BUILDING WORKS.

6, CONTRACTOR IS TO CONFIRM STAIRS BEFORE CONSTRUCTION

7, INSTALL DPM UNDER HOUSE AND DECK

8, PROVIDE LOCAKABLE ACCESS HATCH/DOOR UNDER ALL DECKS

**LEGEND**

- (1) SITE NUMBER
- SITE BOUNDARY
- 1.2M TIMBER BATTEN FENCE
- 1.8M TIMBER BATTEN FENCE
- 2 BEDROOM ACCESSIBLE HOUSE
- 3 BEDROOM + 1 ACCESSIBLE HOUSE
- A NEW SHED 1530x785x1830
- B NEW SHED 1830x1530x1980
- VERANDAH / PATIO
- FENCED OUTDOOR LIVING (LAWN)
- UNFENCED OUTDOOR FRONTAGE / SIDE YARDS (MIX OF LAWN AND PLANTING)
- 4.0M WIDE DRIVEWAY (PERMEABLE SURFACE)
- NEW FRUIT TREE
- FRONT DOOR
- BESPOKE FRENCH DOORS
- GLAZED SLIDING DOOR
- CARPARK
- CLOTHES LINE
- RUBBISH BINS
- WT WATER TANK ON CONCRETE PAD (REFER CIVIL DRAWINGS)
- L LETTERBOX

**PLANNING**

- 3.0m REAR/ 3.0m SIDE BOUNDARY OFFSET (DRIVEWAY)
- 4.5m ROAD FRONTAGE BOUNDARY OFFSET
- 1.5m SIDE BOUNDARY
- 1.0m SIDE BOUNDARY OFF DRIVEWAY
- HEIGHT IN RELATION TO BOUNDARY (HIRB)
- 4.0 M DIAMETER OUTDOOR LIVING COURT

# NOTES:

**SITE NOTES**

| | | |
|---|---|---|
| ADDRESS: | | 35 KAITAWA CRESCENT, PARAPARAUMU |
| LEGAL DESCRIPTION: | LOT: | 62 |
| | DP: | 23300 |
| | CT: | B1/1459 |
| TERRITORIAL AUTHORITY: | | KAPITI COAST DISTRICT COUNCIL |
| PLANNING ZONE: | | RESIDENTIAL ZONE |
| WIND ZONE: | | HIGH |
| EARTHQUAKE ZONE: | | ZONE 3 |
| CORROSION ZONE: | | ZONE C (MEDIUM) |
| SNOW LOADING: | | N1 |
| RAINFALL INTENSITY: | | 60-70 |
| TOTAL SITE AREA: | | 842m2 |
| LOT 1 SITE AREA: | | 442m2 |
| LOT 1 NET SITE AREA: | | 336m2 |
| LOT 1 FLOOR AREA: | | 72m2 |
| SITE COVERAGE: | | 21.5% |
| LOT 2 SITE AREA: | | 400m2 |
| LOT 2 NET SITE AREA: | | 384m2 |
| LOT 2 FLOOR AREA: | | 79m2 |
| SITE COVERAGE: | | 20.6% |

NOTE: ALL SITES ARE SUBJECT TO SUBDIVISION

**BUILDING TYPOLOGY SETS**

FOR HOUSE DOCUMENTATION REFER TO THE FOLLOWING SETS LISTED BELOW:

LOT 1: C1
HOUSE BUILDING SET
CONTEXT ARCHITECTS

LOT 2: 3+1 HOUSE TYPOLOGY
HOUSE BUILDING SET
WSP OPUS

| REVISION | AMENDMENT | APP | DATE |
|---|---|---|---|
| P A | TENDER | | 08.07.2019 |
| P B | SITE AMENDMENTS FOR LOT 2 | | 01.11.2019 |

DETAILED DESIGN

Housing New Zealand
Housing New Zealand Corporation


WSP | OPUS
Wellington Office
PO Box 12 003
Wellington 6144
New Zealand
+64 4 471 7000


| SCALE | | ORIGINAL SIZE |
|---|---|---|
| As indicated @ A1 | | A1 |
| DRAWN | DESIGNED | APPROVED |
| CSC | CSC | SM |
| DRAWING VERIFIED | DESIGN VERIFIED | APPROVED DATE |
| SM | HNZ | 01.11.2019 |

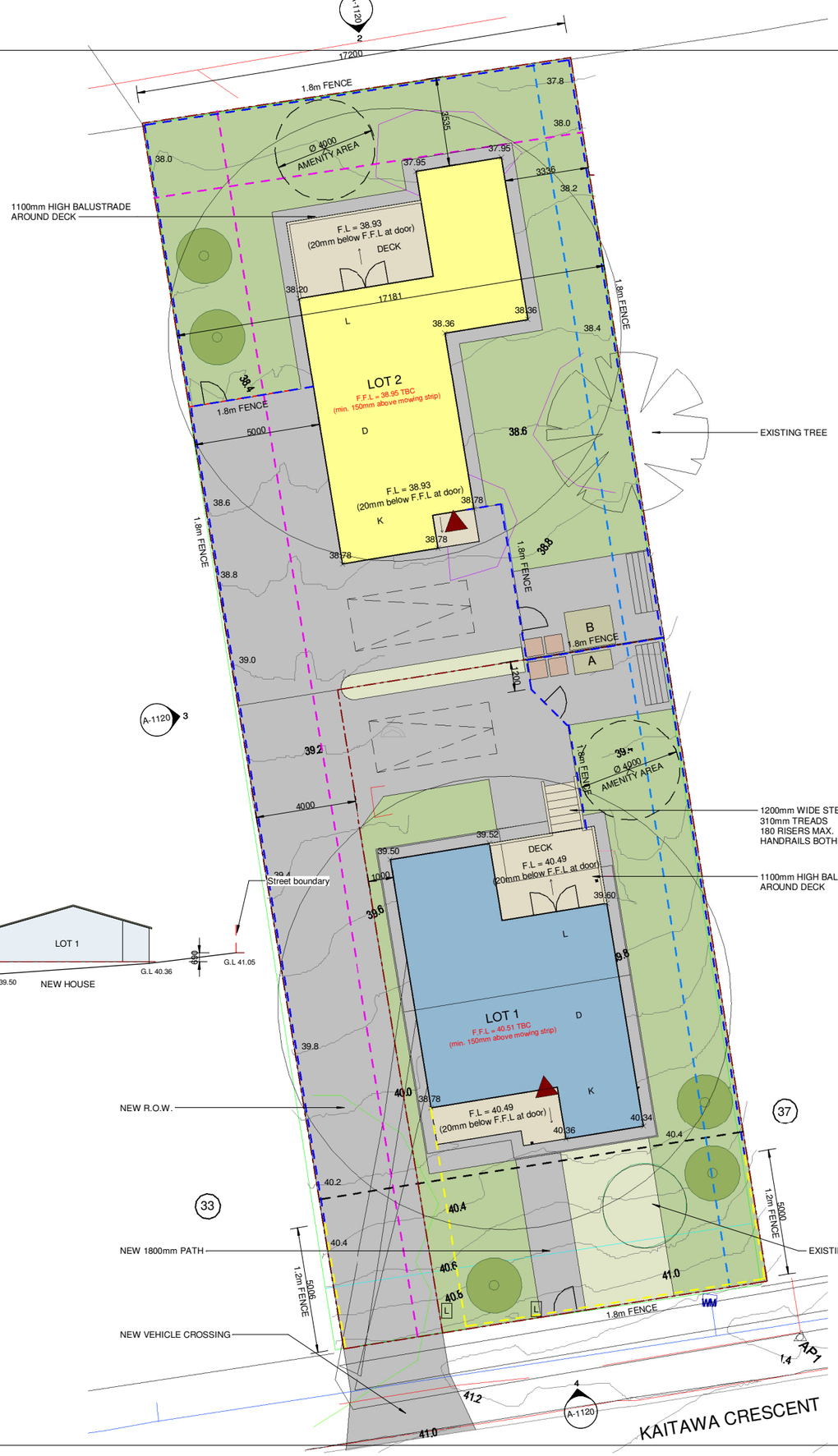
PROJECT
HOUSING NEW ZEALAND
35 KAITAWA CRESCENT, PARAPARAUMU

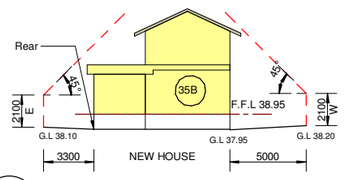
BUILDING CONSENT

TITLE
SITE PLAN - PROPOSED

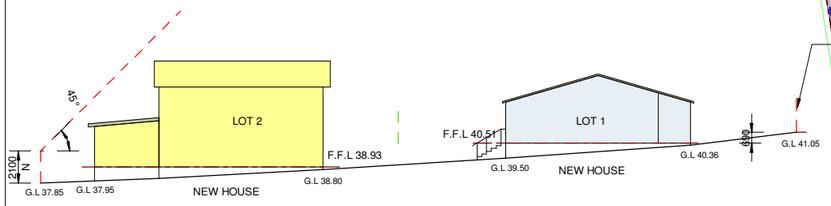
| OPUS PROJECT NO. | | SUITABILITY |
|---|---|---|
| N-H0060.03 | | |
| PROJ-ORIG-VOL-LVL-TYPE | SHEET NO. | REVISION |
| NH0060-OIC-03-XX-DR | A-1120 | RB |

ARCHITECTURE

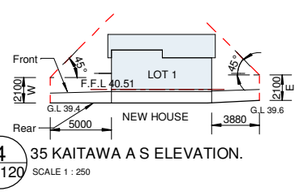



2 A-1120 35 KAITAWA A N ELEVATION.
SCALE 1 : 200




3 A-1120 35 KAITAWA A W ELEVATION.
SCALE 1 : 200




4 A-1120 35 KAITAWA A S ELEVATION.
SCALE 1 : 250

1 35 KAITAWA CRESCENT - REV B
SCALE 1 : 100

**CONSTRUCTION MANAGEMENT ZONE**

CONSTRUCTION MANAGEMENT ZONE IS INDICATED BY THE COLOURED AREA ON THE PLAN.

**HAZARD MANAGEMENT TEMPORARY FENCING**

WHERE THE WORK SITE IS NOT COMPLETELY ENCLOSED AND UNAUTHORISED ENTRY BY CHILDREN IS LIKELY IT IS REQUIRED FOR SPECIFIC HAZARDS TO BE FENCED WHEN WORKERS ARE ABSENT FROM THE IMMEDIATE VICINITY.
WHERE A POTENTIAL HAZARD AT A WORK SITE MAKES A SAFETY BARRIER NECESSARY A BARRIER COMPLYING WITH TABLE 1, NZBC F5/AS1 IS AN ACCEPTABLE SOLUTION.

**LEGEND**

- 1 — SITE NUMBER
- SITE BOUNDARY
- 1.2M TIMBER BATTEN FENCE
- 1.8M TIMBER BATTEN FENCE
- 2 BEDROOM ACCESSIBLE HOUSE
- 3 BEDROOM + 1 ACCESSIBLE HOUSE
- A — NEW SHED 1530x785x1830
- B — NEW SHED 1830x1530x1980
- VERANDAH / PATIO
- FENCED OUTDOOR LIVING (LAWN)
- UNFENCED OUTDOOR FRONTAGE / SIDE YARDS (MIX OF LAWN AND PLANTING)
- 4.0M WIDE DRIVEWAY (PERMEABLE SURFACE)
- NEW FRUIT TREE
- FRONT DOOR
- BESPOKE FRENCH DOORS
- GLAZED SLIDING DOOR
- CARPARK
- CLOTHES LINE
- RUBBISH BINS
- L — LETTERBOX

**PLANNING (Indicative only TBC)**

- 3.0 M REAR/ 3.0M SIDE BOUNDARY OFFSET (DRIVEWAY)
- 6.0 M ROAD FRONTAGE BOUNDARY OFFSET
- 1.5M SIDE BOUNDARY
- HEIGHT IN RELATION TO BOUNDARY (HIRB)
- 4.0 M DIAMETER OUTDOOR LIVING COURT

# NOTES:

**SITE NOTES**

| | | |
|---|---|---|
| ADDRESS: | | 35 KAITAWA CRESCENT, PARAPARAUMU |
| LEGAL DESCRIPTION: | LOT: | 62 |
| | DP: | 23300 |
| | CT: | B1/1459 |
| TERRITORIAL AUTHORITY: | | KAPITI COAST DISTRICT COUNCIL |
| PLANNING ZONE: | | RESIDENTIAL ZONE |
| WIND ZONE: | | HIGH |
| EARTHQUAKE ZONE: | | ZONE 3 |
| CORROSION ZONE: | | ZONE C (MEDIUM) |
| SNOW LOADING: | | N1 |
| RAINFALL INTENSITY: | | 60-70 |
| TOTAL SITE AREA: | | 842m2 |
| LOT 1 SITE AREA: | | 336m2 |
| LOT 1 FLOOR AREA: | | 72m2 |
| SITE COVERAGE: | | 21.5% |
| LOT 2 SITE AREA: | | 350m2 |
| LOT 2 FLOOR AREA: | | 72m2 |
| SITE COVERAGE: | | 20.6% |
| DRIVEWAY ALLOTMENT AREA: R.O.W. | | 156m2 |

**BUILDING TYPOLOGY SETS**

FOR HOUSE DOCUMENTATION REFER TO CONTEXT ARCHITECTS DRAWINGS. TYPOLOGY SETS ARE LISTED BELOW:

LOT 1: C1 HOUSE BUILDING SET

LOT 2: TBC INFO FROM HNZ REQD HOUSE BUILDING SET

**GENERAL NOTES**

1, BUILDING CONTRACTOR TO CHECK ALL DIMENSIONS PRIOR TO COMMENCING CONSTUCTION

2, WHERE ITEMS ARE TO BE REMOVED AND/OR DEMOLISHED ALLOW TO MAKE GOOD OR ALLOW PREPARATION FOR NEW WORK

3, CONTRACTOR TO CHECK CONDITION AND HEIGHTS OF EXISTING FENCING. CONFIRM WITH PROJECT MANAGER ON REUSE OF EXISTING FENCE, MAKING GOOD OR NEW FENCE.

4, THIS DRAWING TO BE READ INCONJUNCTION WITH THE CIVIL DOCUMENTATION

| REVISION | AMENDMENT | APP | DATE |
|---|---|---|---|
| | | | |

DETAILED DESIGN

Housing New Zealand
Housing New Zealand Corporation


WSP | OPUS
Wellington Office
PO Box 12 003
Wellington 6144
New Zealand
+64 4 471 7000


| | | |
|---|---|---|
| SCALE: As indicated @ A1 | | ORIGINAL SIZE: A1 |
| DRAWN: CSC | DESIGNED: CSC | APPROVED: Approver |
| DRAWING VERIFIED: Checker | DESIGN VERIFIED | APPROVED DATE: . |

PROJECT
HOUSING NEW ZEALAND
35 KAITAWA CRESCENT, PARAPARAUMU

BUILDING CONSENT

TITLE
SITE PLAN - PROPOSED

| | | |
|---|---|---|
| OPUS PROJECT NO.: N-H0060.03 | | SUITABILITY: S0 |
| PROJ-ORIG-VOL-LVL-TYPE: NH0060-OIC-03-XX-DR | SHEET NO.: A-1120 | REVISION |

ARCHITECTURE

DRAWING IN PROGRESS
DRAWING EDITED SINCE LAST ISSUE