RTA STUDIO

Document Transfer

Project	THE GRAND MT EARNSLAW HOTEL		Project No.	19109
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Client: Douglas Rikard-Bell		**(RC)1/E**
Local Authority: Queenstown Lakes District Council		**(RC)1/E**
Planning: Ben Farrell - Cue Environmental		**(RC)1/E**
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Quantity Surveyor: Cuesko		
Traffic: Carriageway		
Landscape Architect: Boffa Miskell		
Interior Architect: Bureaux		
Archaeology and Heritage: Origin Consultants		

Issue Status Codes
(**A**) Approval (**BC**) Building Consent (**T**) Tender (**C**) For Construction
(**P**) Preliminary (**I**) Information Only (**CO**) Coordination (**RC**) Resource Consent
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ARCHITECTURAL DRAWINGS

Dwg No.	Description	Scale	Current Issue	.
RC-001	RC Cover Sheet	NTS	A	A
RC-010	RC Existing Site Survey	1:200	A	A
RC-020	RC Proposed Site Plan	1:200	A	A
RC-030	Site Sections	1:200	A	A
RC-031	Site Sections	1:200	A	A
RC-040	Site Elevations	1:200	A	A
RC-200	RC - Hotel - Floor Plan - Ground Floor	1:100	A	A
RC-201	RC - Hotel - Floor Plan - Level 1	1:100	A	A
RC-202	RC - Hotel - Floor Plan - Level 2	1:100	A	A
RC-203	RC - Hotel - Roof Plan	1:100	A	A
RC-204	RC - Hotel - Room Types Plans	1:50	A	A
RC-205	RC - Hotel - Room Types Plans	1:50	A	A
RC-210	RC - Hotel - Sections	1:100	A	A
RC-211	RC - Hotel - Sections	1:100	A	A
RC-221	RC - Hotel - Elevations	1:100	A	A
RC-222	RC - Hotel - Elevations	1:100	A	A
RC-300	RC - Mull St - Floor Plan	1:100	A	A
RC-301	RC - Mull St - Roof Plan	1:100	A	A
RC-310	RC - Mull St - Sections	1:100	A	A
RC-311	RC - Mull St - Sections	1:100	A	A
RC-321	RC - Mull St - Elevations	1:100	A	A
RC-400	RC - Islay St - Floor Plan	1:100	A	A
RC-401	RC - Islay St - Roof Plan	1:100	A	A
RC-402	RC - Islay St - Detail Floor Plans	1:50	A	A
RC-410	RC - Islay St - Sections	1:100	A	A
RC-411	RC - Islay St - Sections	1:100	A	A
RC-421	RC - Islay St - Elevations	1:100	A	A
		Total Drawings Issued		**27**

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10.2 *BOFFA MISKELL:* LANDSCAPE ARCHITECTURAL DRAWINGS

Boffa Miskell

GRAND MOUNT EARNSLAW HOTEL

GLENORCHY

LANDSCAPE PACKAGE

19 November 2019

Document Quality Assurance

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Cover photograph: Site location looking East, © Rachel de Lambert, 2019

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1. Urban Design - Introduction

This Urban Design Statement is intended to be read in conjunction with the Architectural Design Statement and drawing package prepared by RTA Studio, in addition, the Landscape Design Statement prepared by Boffa Miskell sets out the rationale and concept detail for proposed hard and soft landscape design.

Boffa Miskell has worked collaboratively with architects RTA Studio and Bureaux to develop the site masterplan including the placement of buildings on the site their bulk, form and the spatial qualities of the development. Urban design and landscape responses have informed the architecture and the architecture has informed the urban design and landscape.

The proposed development / design has also been informed by an understanding of the history of the site and its former use; engineering considerations, such as flood levels, wastewater treatment and management; and the statutory planning context. The project team has worked together collaboratively to evolve the proposal to fit the local context and to create a re-envisaged, contemporary hotel on the site of Glenorchy's earlier 'Earnslaw Hotel'. The proposed 'Grand Earnslaw Hotel' will establish a new amenity for the township and transform a large, vacant, strategically located, site which has long been envisaged as providing visitor accommodation in the heart of Glenorchy.

2. The Site

The site of the former Earnslaw Hotel occupies a strategic lakefront location in the township of Glenorchy. The large, 0.8079ha (8,079m2), site enjoys three street frontages, being Islay Street to the south, Benmore Place to the west and Mull Street to the north. The site's eastern boundary adjoins a vacant lot which then adjoins the site of Glenorchy Motors, a service station and garage. West of Benmore Place there is a public reserve on the lake frontage with Glenorchy wharf and the iconic Glenorchy wharf shed located on axis with Islay Street.

The lakefront reserve is grassed with a number of specimen trees, mainly willow, within the reserve and clustered along the lake edge. Small car parking areas are located to the north and south of the reserve accessed from Benmore Place to the south and the Mull / Benmore intersection to the north. With their dramatic lake and mountain backdrop, the lakefront, wharf and shed are a popular visitor destination and photograph opportunity in Glenorchy.

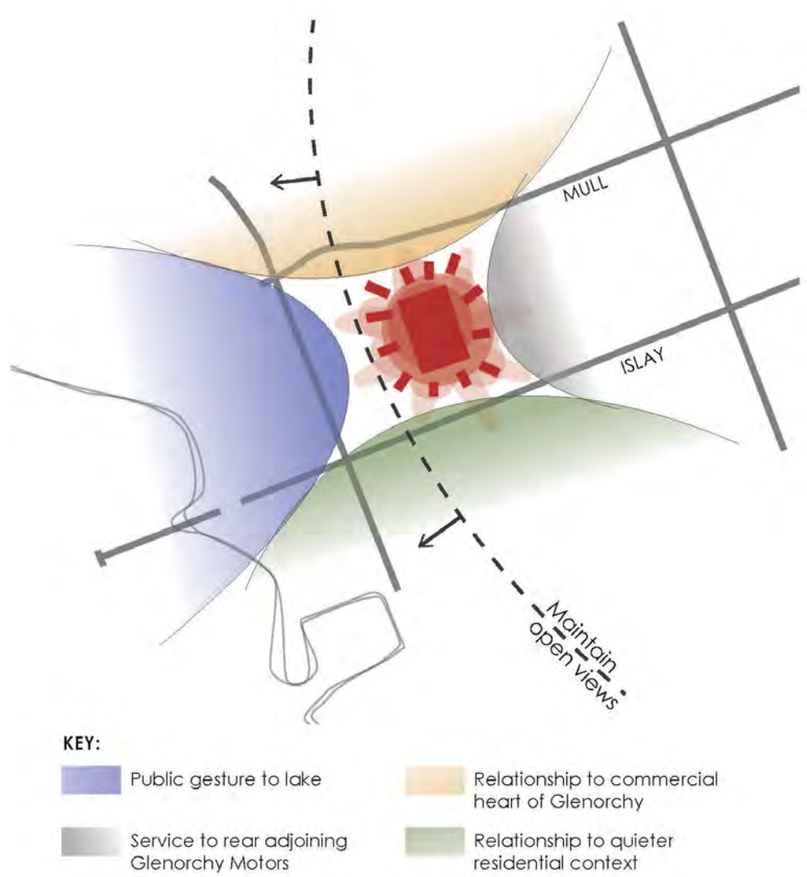
Project site location in Glenorchy, data source: Google Earth

Figure 1: *West Coast, New Zealand - See paragraph style 'Figure caption numbered' or 'Caption' for unnumbered*

The site occupies the western third of the block defined by Benmore Place, Mull, Argyle and Islay Streets. Mull Street is the main commercial 'heart' of Glenorchy with the majority of the township's cafes and retail outlets clustered along Mull and to a lesser extent Oban Streets. Oban being the main access into the settlement from Queenstown. Islay Street is more residential in character with some six residential properties occupying the block between Argyle Street and Benmore Place.

Glenorchy is framed by mountains which create a dramatic and enclosing landscape context. To the east the Richardson Mountains with Mts McIntosh, Alaska and Judah forming local peaks, whilst across Lake Wakatipu to the west The Humboldt and Ailsa Ranges provide the backdrop.

The site of the former Earnslaw Hotel has lain vacant in Glenorchy since the original hotel and villa burnt to the ground in 1959. The concrete footings of the hotel remain visible in the grass with a small number of clustered trees and shrubby vegetation peppering the site. There is an interpretive sign showing a historical photograph of the hotel and telling of its former ownership and colourful history. In times when the only access to Glenorchy was via the lake and the steam ferry 'Earnslaw', the Earnslaw Hotel sat pride of place at the end of the wharf on arrival into the settlement.



3. Proposal

The proposal is to re-develop the site to again establish a lakefront hotel in Glenorchy. The proposed design of the hotel draws strongly from the memory of the former hotel complex, with its two storey veranda hotel, whilst responding to the contemporary needs of a commercially viable hotel and associated hospitality offering for Glenorchy.

District Plan requirements in respect of providing habitable space floor levels above the 100 year flood RL's, require buildings on the site to be set at a raised ground level of RL 3.130 some 1.5m above the current ground level of the site (approx RL 3.115m – varies across the site). The proposal is to fill the central / rear, eastern portion of the site, where buildings are proposed to be located, leaving the Benmore Place / lake frontage western portion of the site at its existing level as a publicly accessible lawn.

The proposal replicates, in conceptual terms, the centrally located original two storey hotel with its associated Mull Street 'H' plan single storey villa. The two storey proposed hotel replaces the earlier two storey hotel with the architecture of the new drawing reference from the old. The proposed 64 room hotel will sit centrally atop the elevated terrace landform with the hotel's Food and Beverage / hospitality facilities located in a cluster of smaller scaled 'out-house' / villa buildings forming the Mull Street frontage. Along Islay Street a series of 'boat shed' accommodation units relate to the residential character of this street providing an interface between the hotel and the street.

The finer grain of the proposed Mull and Islay Street front buildings seeks to respond and generally replicate the scale and form of established development within the settlement providing a foreground foil to the larger footprint, two storey, hotel which is designed to 'front' toward the Lake signalling a clear point of arrival and destination. The existing informal layout and generally smaller scale of development in the settlement along with the proposed combination of structures to integrate the larger central building in illustrated in the two 'figure ground' Nolli maps below.

Both the Mull and Islay Street fronting buildings comprise some elements of their structure below the 100 year flood RL's with these components designed to accommodate potential flooding with the habitable spaces set above the required RL's. At the same time bringing these buildings down to the street is desirable in terms of pedestrian scale and amenity avoiding the whole development appearing to sit above the street on a flood protected pedestal.

The design of the Mull Street cluster of smaller scaled buildings is very much in response to the established informal retail character and amenity of the existing street. The buildings provide for multiple points of pedestrian entry via ramped and stepped surfaces. A small publicly accessible central courtyard is created with individual buildings providing hotel guests, other visitors and locals with café, delicatessen, bakery, bar and restaurant facilities to support the experience of the hotel and Glenorchy as a whole. The form and materiality of this cluster of complementary buildings reflects the heritage of the site and of Central Otago with a strong place-based vernacular and recognisable local identity.

In similar vein the Islay Street 'boat shed' accommodation units, day spa and hotel service / storage buildings reflect a lakeside character and draw reference to the Glenorchy wharf shed and similar Central Otago historical. The street fronting space is set below the 100 year flood RL with the habitable space and mezzanine set on the upper flood protected raised RLs. These simple gabled roof structures provide a diversification of the accommodation offering of the hotel and expand its amenities, providing day spa and steam room / sauna facilities. By creating a lesser scaled built frontage to Islay Street, they respond to the existing residential character of the street, noting at the same time that the 'front' third of the site is retained without any form of built development in lawn at the existing ground level and fully accessible to the public.

Vehicular access to the site and hotel entry is via a one way through access from Mull Street exiting onto Islay Street. The site's remnant lattice water tank structure and three metal tanks are relocated on the site brought forward to the Mull Street entry to signal the hotel and its arrival point. Parking for some 7 vehicles including mini-van / small coach pick-up and drop-off is provided on this through access. Additional parking is provided accessed from the Mull, Islay and Benmore road reserves. The 90˚ parking on the Benmore Place frontage is located partially within the site with the footpath set within the site (in front of the cars) defining the edge of the lawn. On Mull Street there is a widened road reserve and formed footpath, the proposal on this frontage is to provide 23 car parks at 90˚ to the street within the road reserve. These car parks would provide public parking, as occurs informally on this frontage already, for the commercial activities of the street and overnight parking associated with the hotel.

The proposed landscape design also draws on the history of the site with heritage fruit trees, Linden trees and Chaenomeles japonica (Flowering Quince) all related to vegetation found on the vacant wasteland site. The planting will provide scale through strategically located specimen trees and privacy for hotel guests through the use of hedging.

The landscape design (refer separate statement) is simple and restrained with seasonal variation and a framework of indigenous species complemented by productive, heritage and seasonally flowering / habitat enhancing exotic species. The grand scaled, terraced hotel lawn is seen as a community facility reflecting the lakeside reserve opposite and giving space and set back to the hotel as seen from the Lake and town.

4. Effects

The proposed development will introduce a significant change to the presently, and now long vacant, site. It will re-introduce a destination hotel to the heart of the established settlement and provide visitors with quality overnight accommodation to support Glenorchy's ability to host a quality experience of access to the outstanding natural, cultural and recreational environment of the locality.

The cluster of proposed buildings will address both the lakefront and the site's three street frontages with a carefully considered design that responds to and respects the established character and amenity of the site's context.

The proposed development is highly permeable to the public inviting locals and visitors alike into the Mull Street courtyard precinct and providing public access to and across the Benmore Place grand front lawn of the hotel.

From within the settlement approaching along Oban Street or in closer proximity on Argyle, Islay or Mull Streets the taller hotel building will be largely screened by closer houses, buildings and trees. Close up on Mull and Islay Streets the foreground finer grained and lesser scaled development will also largely screen and ameliorate the larger height and bulk of the hotel. In those views where the hotel is in clear view, such as from Benmore Place and Lakefront Reserve to the west, the prominent two storey building will provide a clear landmark in a logical location in the township. The scale of the open 'Grand Lawn' will ameliorate the grater scale of the hotel and maintain a sense of spacious openness for the public and to the Lake.

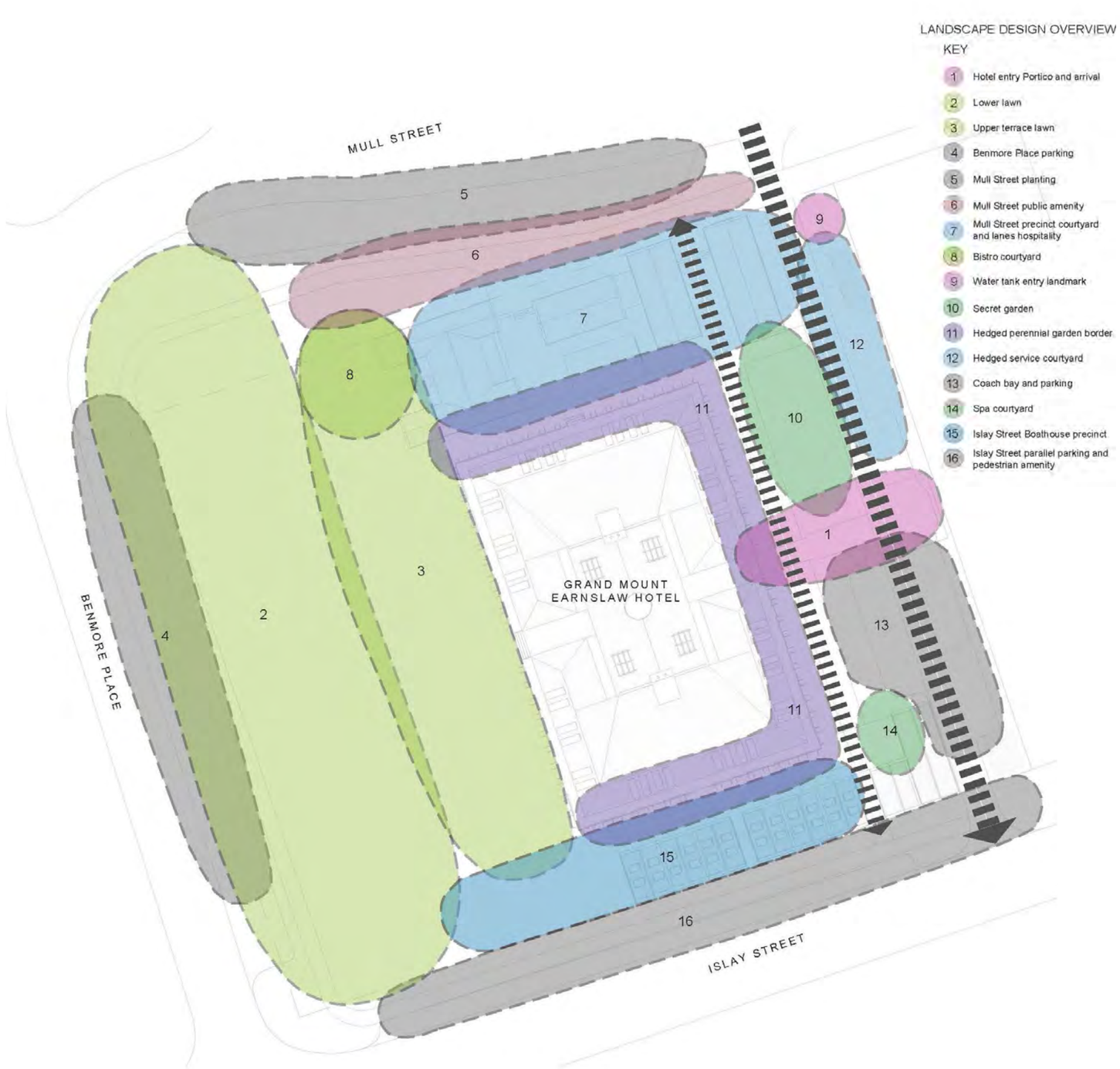
As illustrated in the series of three architectural renders the overall development has a clear vernacular that reflects but the former hotel and the Central Otago context.

Seen from the Lake / Reserve and township set against the dominant mountain backdrop of the Richardson Mountains the hotel and its associated buildings will set the scene for arrival into Glenorchy from the lake. The development will enhance the character and amenity of Glenorchy as a visitor destination providing quality accommodation to support the local and international tourism activities of the township. The development will return the substantial, long vacant, site to its historical roots and once again celebrate the hospitality of the Mt Earnslaw Hotel.

The existing tank stand, to be relocated as an entry marker.

Chaenomeles japonica, Flowering Quince, growing on site.

Looking down Mull Street to the Lake with the site on the left.



5. LANDSCAPE DESIGN

The landscape design concept for the Grand Mt Earnslaw Hotel development has been designed in collaboration with the wider project team to inform the spatial qualities of the overall development. The approach is to integrate the proposal into the site's Glenorchy township and wider landscape context, whilst also providing on site amenity for hotel guests and visitors, users of the site's facilities and the local community.

The terracing of the site to retain a publicly accessible lakeside lawn at existing ground levels, makes a clear gesture towards the public lakeside reserve and historical point of access from Lake Wakatipu via Glenorchy Wharf.

The broad lakefront lawn extends up the grassed batter slope to an upper grassed terrace adjacent to the built development. Buildings are set back on the site and raised up to meet the required 100 year flood levels.

All vehicular circulation is contained to the rear, eastern portion of the site adjacent to the boundary with Glenorchy Motors Ltd. There is a single, one way, vehicular through lane running from Mull Street south to Islay Street. The hotel main entry, with its portico, loading bay, coach bay and on site parallel parking are accessed from this driveway.

The existing historical remnant tank stand is relocated on the site to the Mull Street frontage adjacent to the vehicle entry to act as a signpost / landmark and heritage feature.

Within the site the landscape treatment is kept relatively simple with the generous lower and upper terrace lawns and grassed batter slope occupying the greatest proportion of the site. To the Mull and Islay Street frontages the slope to the raised ground level is planted with tussock tying to the site's wider natural landscape context.

The centrally located hotel building is set adjoining the lawn to the west, toward the Lake and Benmore Place and on its northern, eastern and southern perimeters is set within an ornamental perennial border planting contained by a hornbeam hedge. Hedges also define the eastern boundary to Glenorchy Motors and provide screening to the smaller scaled functional buildings along the eastern boundary as well as defining the main north-south pedestrian pathway along the east side of the hotel.

The cluster of domestic scaled hospitality buildings in the Mull Street Precinct – bistro / bar, butcher, baker, pizza house and deli – are softened by a large scale, fine leafed, central shade tree. Planting in and on the pizza glasshouse building and a range of up-cycled pots and urns with mixed native and exotic planting also break down the formality of the courtyard and lanes creating an intimate, human scaled cluster of buildings with a range of indoor and outdoor seating / gathering options to complement the experience of staying in the Hotel and to give locals and visitors a bespoke destination that reinforces and expands the established hospitality character of this part of Mull Street.

The schist flagstone paving in the Mull Street precinct, and elsewhere, is softened at its edges and in lower use areas by pea gravel and groundcover planting in the cracks creating an informal, naturalised garden character. Climbers, creepers and plants that soften the edges will be incorporated to age the buildings into their Glenorchy and Southland context.

A herb and small picking garden for the bistro is accommodated in the gardens along the northern edge of the hotel with some urn and glasshouse planting supplementing this 'garden to table' opportunity.

To the east of the hotel, adjacent to the main north / south path, a 'secret garden' with heritage fruit trees and lawn with seasonal bulbs – snow drop, blue bell, narcissus, lily of the valley and grape hyacinth - and wild flower edges provides hotel guests with a summer picnic, restful reading, or chill out space in the shade of the heritage orchard. A Japanese Quince, (Chaenomeles japonica) hedge separates this restful seasonal garden from the driveway to the east, this species has been selected as there is a remnant area of vegetation on the site – including blackberry and other weed species but also including a large bush of red flowering Japanese Quince, an old fashioned plant redolent of the era of the original hotel.

The proposed landscape concept design extends to include the adjoining road reserve berm on the site's three road frontages – Mull, Benmore and Islay streets. A pedestrian footpath is proposed along all street frontages (currently only provided on Mull Street). In the west along Benmore Place the proposed footpath is located within the site with proposed 90˚ parking (gravel surface) along the street edge. These twenty-seven car parks will be available to hotel guests as well as to the public generally.

Along Mull Street the existing informal angle parking on the wide berm is formalised with twenty-three 90˚ car parks adjoining the road carriageway. Two deciduous specimen trees and tussock underplanting are proposed here adjacent to the boundary and the northern elevation of the bistro / bar building which replicates the 'H' shape footprint of the earlier villa forming part of the original Glenorchy Hotel. On the widened footpath two smaller scaled deciduous specimen trees define the long elevation of the stone clad butcher building providing shade to a large public shared table and benches. Further public seating is provided within the site to accommodate people using the site's food and beverage outlets – the bistro, butcher, baker and deli.

Along the Islay Street frontage parallel parking is provided, twelve car parks, with proposed street trees and the gravel footpath accommodate alongside the trees.

In summary the proposed landscape design concept seeks to enhance the public and private amenity of the site, offering opportunities for local Glenorchy residents to use and occupy parts of the site, including the lakeside lawns and Mull Street precinct as well as creating a quality, high amenity and varied setting for the hotel and its visitors.

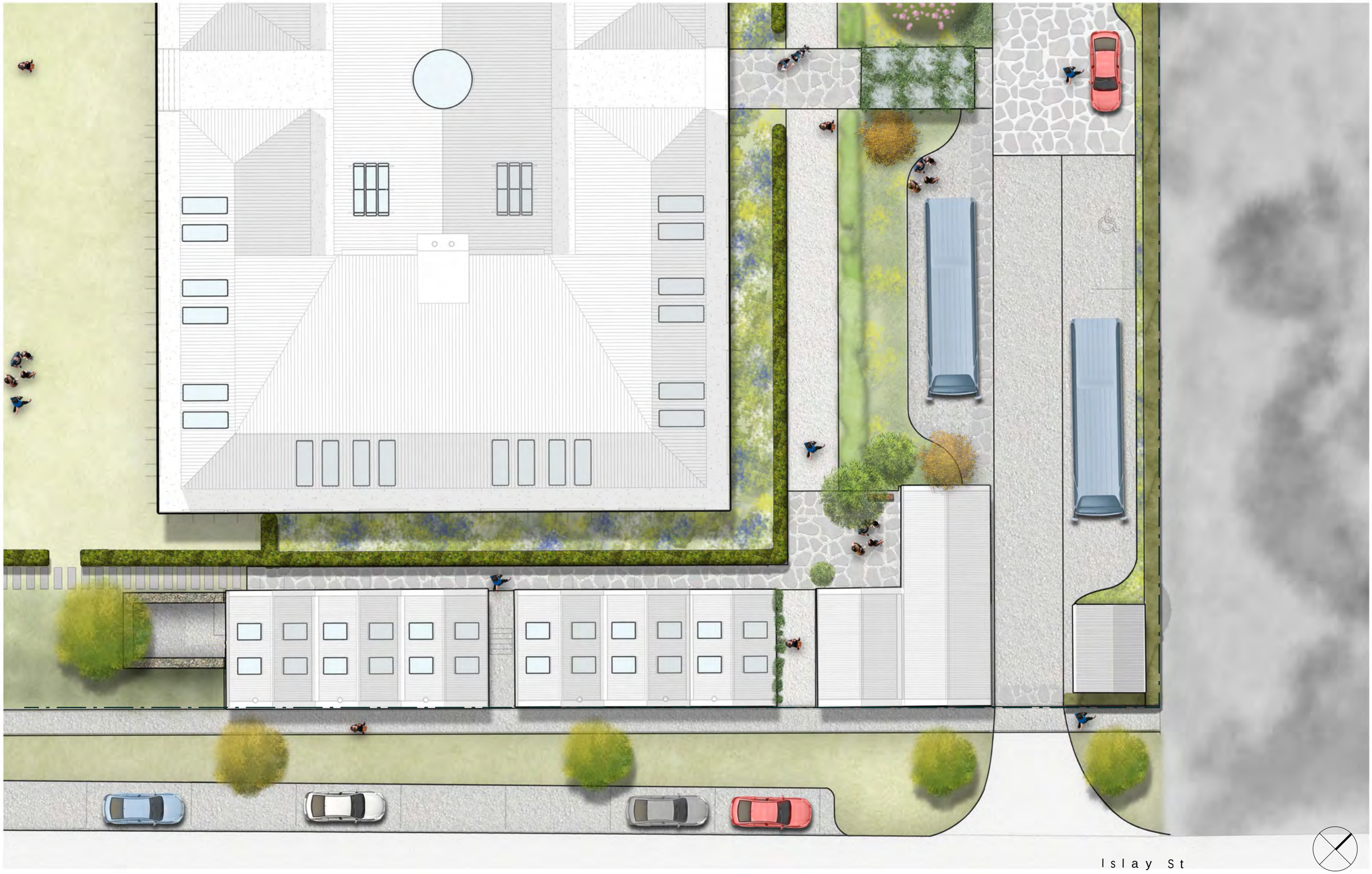
The planting pallet has been carefully selected to reflect the local Glenorchy vernacular, provide detailed seasonal interest and connect with remnant vegetation on the existing site including the use of Japanese Quince, Chaenomeles japonica, and heritage fruit trees.

The western lakefront portion of the site is intentionally kept open in lawn, to facilitate views and the public pedestrian 'desire line' access across the front of the site between Mull Street and the Lakefront Reserve / Glenorchy Wharf.

6. Location Plan

7. Concept Landscape Plan, 1:500@A3

8. Concept Landscape Plan: Mull St frontage, 1:500@A3



9. Concept Landscape Plan: Islay St frontage, 1:500@A3

10. Plant Palette

KEY: Proposed trees

- *Tilia cordata* — Linden Lime
- *Liquidambar styraciflua 'Worplesdon'* — Sweet Gum
- *Sophora microphylla* — South Island Kowhai
- *Fraxinus angustifolia 'Raywoodii'* — Claret Ash
- *Malus ssp* — Heritage Apple trees
- *Citrus x meyerii* — Lemon Meyer
- *Ulmus procera 'Louis van Houtte'* — Golden Elm
- *Malus floribunda* — Japanese flowering crabapple
- *Quercus palustris* — Pin Oak
- *Magnolia grandiflora 'Little Gem'* — Evergreen Magnolia

KEY: Shrubs & Groundcovers

- Espalier: A1: Crabapple, A2: Japanese Quince
- Hedges: B1: Hornbeam, B2:Camelia, B3: Pittosporum
- Climbers: C1: Wisteria, C2: Boston Ivy, C3: Climbing Rose
- Shrub Shade Mix
- Herb Garden
- Slope Planting

Proposed tree species

Tilia X europea

Liquidambar styraciflua 'Worplesdon'

Sophora microphylla

Fraxinus angustifolia 'Raywoodii'

Malus sp

Citrus x meyeri

Ulmus procera 'Louis van Houtte'

Malus floribunda

Taxus baccata

Magnolia grandiflora 'Little Gem'

LOCATION PLAN

Espalier

Malus floribunda

Chaenomeles japonica

Camellia 'Sweet Jane'

Hedges

Pittosporum tenuifolium

Carpinus betulus

Rosemarinus officinalis

Climbers

Wisteria sinensis

Parthenocissus tricuspidata

Climbing Rose

Shrub Shade Mix

Daphne odora

Viburnum tinus 'Gwenllian'

Viburnum davidii

Herb Garden

Lavandula angustifolia

Salvia officinalis

Thymus serpyllum

Santolina chamaecyparissus

Salvia officinalis '"Purpurascens'

Spring bulbs

Slope Planting

Chionochloa rigida

Single shrubs (Pots)

Buxus 'Graham Blandy'

Hebe topiara

11. Material Palette

KEY:

Vehicle Access & Parking

1. Main Access: Chip seal where slopes require otherwise gravel
2. Carpark: Gravel
3. Carpark: Reinforced grass
4. Car Drop-off/ entry schist flagstones on concrete base
5. Bus Drop-off gravel

Pedestrian Realm & Access

6. Entrance
7. Foothpath: Exposed aggregate concrete to match gravel
8. Schist Flagstones and gravel/ planting at edges
9. Exposed aggregate concrete to match gravel
10. Schist stepping stones
11. Concrete beam step/ seats on batter slope
12. Steps between upper and lower terrace lawns

Various

13. Existing watertank relocated as entry marker
14. Upcycled various containers and planters
15. Local schist retaining walls/ walls

LOCATION PLAN

Vehicle Access & Parking

Chip Seal
(Internal access)

Schist flagstones, as seen in Glenorchy - (Access)

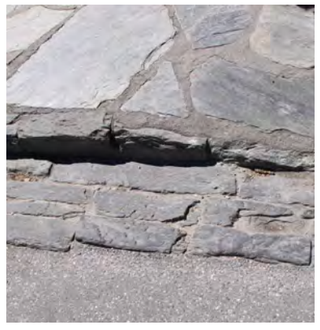
Gravel
(Parking)

Reinforced grass
(Parking)

Pedestrian Access

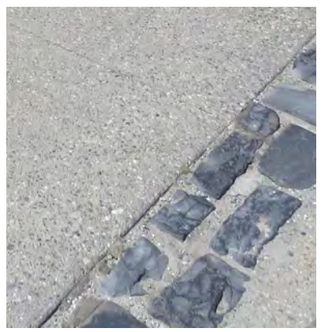
Schist flagstones
(Informal paths)

Concrete steps
(Seating on batter slope)



Schist flagstones and pavers
(Paths, kerb and channel)

Schist flagstone
(Paths)



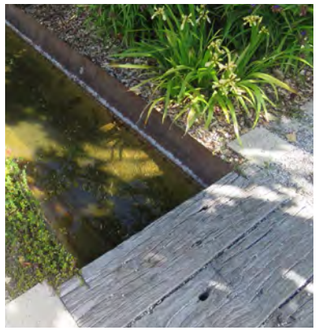
Schist flagstones
(Edges)

Various

Existing watertank
(Landmark and signage)

Corten steel
(Planters)

Upcycled Industrial Components on schist - (Planters)



Upcycled old irrigation pipe and timber

Old rural building

Dry stack schist wall and Hornbeam hedge

About Boffa Miskell

Bo a Miskell is a leading New Zealand professional services consultancy with offices in Auckland, Hamilton, Tauranga, Wellington, Christchurch, Dunedin and Queenstown. We work with a wide range of local and international private and public sector clients in the areas of planning, urban design, landscape architecture, landscape planning, ecology, biosecurity, cultural heritage, graphics and mapping. Over the past four decades we have built a reputation for professionalism, innovation and excellence. During this time we have been associated with a signi cant number of projects that have shaped New Zealand's environment.

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www.boffamiskell.co.nz

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10.3 *GWE CONSULTING ENGINEERS:* INFRASTRUCTURE & CIVILS

THE GRAND MT EARNSLAW HOTEL

INFRASTRUCTURE ASSESSMENT REPORT

BLACKTHORN LTD

NOVEMBER 2019 | DRAFT V1




GWE
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DOCUMENT CONTROL RECORD

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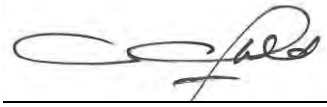
Prepared by:	 Colin Cranfield, Technical Director
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Approved by:	 Gareth Williams, Director
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PO Box 32 311 Devonport Auckland 0624

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1. INTRODUCTION

Blackthorn Limited has engaged GWE Consulting Engineers to provide an Infrastructure Assessment Report for the proposed development of a 64 room hotel, hospitality and retail buildings and accommodation units on 1 Benmore Place (Lot1, DP12016, CFR OT3D/76, 0.8079 ha) in the commercial block bounded by Mull Street, Benmore Place and Islay Street, Glenorchy.

This Assessment considers the nature of the proposed development, the site conditions and the existing Council owned infrastructure in providing the necessary infrastructure to support the proposed development. This assessment report covers:

- Geotechnical and Potential for Liquefaction
- Earthworks
- Water Supply
- Wastewater Collection, Treatment and Disposal
- Stormwater Management

This Infrastructure Assessment Report is intended to support designs prepared by the wider consultant team and planning submissions made by Ben Farrell, Cue Environmental for land use consent.

2. DESCRIPTION OF THE PROPOSED DEVELOPMENT

The site of the former Earnslaw Hotel occupies a strategic lakefront location in the township of Glenorchy. The large 8,079 m^2 site enjoys three street frontages, being Islay Street to the south, Benmore Place to the west and Mull Street to the north. The site's eastern boundary adjoins a vacant lot which then adjoins the site of Glenorchy Motors, a service station and garage. West of Benmore Place there is a public reserve on the lake frontage with Glenorchy wharf and the iconic Glenorchy wharf shed located on axis with Islay Street.

The proposal is to re-develop the site to re-establish a lakefront hotel. The proposed design of the hotel draws strongly from the history of the former hotel complex, with its two-storey veranda hotel, whilst responding to the contemporary needs of a commercially viable hotel and associated hospitality offering for Glenorchy.

The proposed 64 room hotel will sit centrally atop the elevated terraced landform with the hotel's food and beverage/hospitality facilities located in a cluster of smaller scaled "out-house"/villa buildings forming the Mull Street frontage. Along Islay Street a series of "boat shed" accommodation units relate to the residential character of this street providing an interface between the hotel and the street.

3. GEOTECHNICAL

The following narrative provides a preliminary assessment of the potential geotechnical (especially liquefaction) constraints at the site of the proposed Hotel.

3.1 Potential for Liquefaction

Queensland Lakes District Council (QLDC) has undertaken work to analyse and map (at a high level) the potential for liquefaction in the Glenorchy area (and others) in 2012. This developed four zones for potential liquefaction susceptibility: LIC 1, LIC 1(P), LIC 2 (P) and LIC 3 (P). Most of the township (and the subject site) is within Zone LIC 2 (P), which is described as follows:

> *LIC 2(P) covers areas assessed to have a possibly moderate liquefaction risk (i.e. minor to moderate land damage). LIC 2 (P) areas typically occur where there are young normally consolidated sediments (silts and sands), and the water table is close to the ground surface. The limited CPT and SPT data from similar sites and geological materials suggest a possible moderate liquefaction risk is present. Deep subsurface investigations are required in accordance with the guidelines provided by the Department of Building and Housing (DBH).*

Figure 1: Site Plan

A recent liquefaction assessment has been undertaken for a proposed subdivision in Sheil Street which provides an indication of liquefaction potential (although this is remote from the site and can't be directly applied). Boreholes were drilled at two locations (as indicated in the following plan) to depths of 15 to 22 m with SPT testing carried out at about 1.5 m intervals.

The liquefaction assessment carried out indicated settlements of around 150 mm for 0.51g PGA (consistent with a 1/1000 year earthquake). Investigations at that site indicated a 9m non-liquefiable crust at the surface, but this was due to groundwater at 9m depth.

3.2 Implications for the Subject Site

The subject site is at a lower elevation than the proposed subdivision on Sheil Street and near to the lake front. These factors (notwithstanding the need to undertake geotechnical investigations) lead to a potentially higher risk of liquefaction. The groundwater level is likely to be within a few metres of ground surface (meaning liquefaction could occur closer to the ground surface), and the presence of the lake frontage means that lateral spread could occur during liquefaction.

MBIE (2012) has categorised foundation types when dealing with liquefiable soils. TC2 foundations are required for settlements of 0-100 mm, and TC3 foundations are required for settlement 100 mm. TC2 foundations can include a ribbed or reinforced raft capable of spanning over limited distances. TC3 foundations require specific design and can include piling to a founding stratum, or ground improvement to create a reinforced surface crust underneath a slab to assist in holding the structure together.

It is possible that this site may be required to adopt a TC3 foundation system. At this stage a possible solution would be:

- Sub-excavation of foundation (depth uncertain, perhaps 1.5 - 2 m).
- Re-compaction of foundation materials with reinforcing geogrid and/or cementing agents.
- Import clean, granular fill material and compact
- Raft type foundation with horizontal reinforcement included to manage potential for lateral stretch.

3.2.1 Recommendation

It is recommended that deep geotechnical investigations and reporting in accordance with the requirements of NZS 3604 and DBH guidelines be undertaken to allow the for the analysis and detailed design of earthworks and building foundations at the site. A geotechnical report and a QLDC Statement of Professional Opinion on the Suitability of Land for Development/Subdivision form will need to be supplied to support the application for consent.

4. EARTHWORKS

4.1 Overview

Given the existing site topography and the levels of the proposed platforms for the development it will be necessary to undertake bulk earthworks across most of the site. The proposed cut and imported fill earthworks will allow the existing catchments and hydrology of the area to remain largely the same as the predevelopment scenario. The only change will be the movement of the flood contours to the west as a result of the construction of the building platform at the eastern end of the site. The effect of this amendment to the flood contour is considered less than minor.

The design of the earthworks has been undertaken to provide suitable gradients and profiles to building platforms, accessways and service areas.

The proposed earthworks cover an area of approximately 8,079 m^2 and is primarily for the formation of building platforms, an accessway and carparking spaces. The earthworks will be retained along Mull and Islay Streets where buildings are proposed and sloped at the western end of the fill area to create a tiered, grand front lawn.

Earthworks plan showing the overall proposal is attached as Appendix A – Cut/Fill Earthworks Contour Plan. The proposed earthworks include:

- Area of exposed bare earth: 8,079 m^2
- Cut Volume: 40 m^3
- Fill Volume: 8,636 m^3 (excludes bulking factor)
- Maximum cut height: 0.5 m
- Maximum fill height: 2.50 m

4.2 Methodology

4.2.1 General Requirements

The proposed earthworks are anticipated to be undertaken in a single operation, completed within one earthworks season and be expected to comply with the following general requirements:

- All earthworks areas will be fenced off and signage will be erected to warn the public of potential hazards. Only personnel directly involved in the development works will be allowed on site.
- All work shall be undertaken in accordance with Council requirements.
- All earthworks and the construction of erosion and sediment control measures shall be undertaken in accordance with QLDC's, "A Guide to Earthworks Brochure".
- A site manager will be appointed who will be responsible for all onsite earthwork's activities.
- The work shall be conducted in strict accordance with relevant hours of work and noise limits as set out in the District Plan and conditions of consent, whichever is the more conservative.

- Truck movements to and from the site will be minimised, supported by an approved Traffic Management Plan and an approved earthwork methodology.
- Nuisance from the creation and emissions of dust will be mitigated through best practice measures where and when necessary, including water carts and rapid stabilisation.
- Site procedures and health and safety inductions will be conducted for all workers by the site manager. This will include the provision of an approved site-specific safety plan by all sub-contractor personnel working on the site.

4.2.2 Staging and Sequence of Works

On acquisition of all necessary consents and permits for the work, including but not limited to earthworks, the bulk earthworks work should generally be carried out following the sequence outlined below.

- Clear site of debris and vegetation in areas where earthworks and associated construction activities are proposed to take place.
- Construct stabilised entrance to the site and contractor lay down areas.
- Construct erosion and sediment controls within the earthworks area, including sediment retention pond (SRP), clean and dirty water diversion bunds, silt fences and stabilised outlets.
- Commence bulk earthworks within the earthworks area by stripping topsoil and placing in approved stockpile area(s). Excavate, place and recompact material in areas identified by the detailed geotechnical investigation. Import fill material place and compact in accordance with the earthwork's specification.
- Progressively stabilise completed earthworks areas. Stabilisation to be achieved by topsoiling, seeding and covering with mulch or by placing the first layer of pavement aggregate, as appropriate.
- On completion of bulk earthworks, and once the stabilisation measures have become effective, accumulated sediment within control devices may be removed and disposed in an approved location, and the erosion and sediment controls can be decommissioned and removed.

5. WATER SUPPLY

5.1 General

The existing public water reticulation in Glenorchy is supplied from Council reservoirs located at the top end of Bible Terrace, at the southern end of Glenorchy. The elevation of these reservoirs is approximately 354 m above sea level. Two falling mains (200 mm and 100 mm diameter) are laid in an easement between the reservoirs and Oban Street and then north along Oban Street, on either side of the street. The 200 mm diameter main on the eastern side of Oban Street reduces at a 200/100/100 mm diameter tee close to Invincible Drive. One of the 100 mm diameter branches services the eastern part of Glenorchy and the other connects with the 100 mm diameter main on the western side of Oban Street. A 100 mm branch from this main is laid along Invincible

Drive and the two 100 mm diameter mains service the north and north west areas of Glenorchy.

Figure 2: Water Supply Reticulation, Glenorchy

The western and north western areas of Glenorchy are also serviced from the south by a 100 mm diameter main laid from the road crossing of Oban Street close to the Council reservoirs, in the undeveloped land to the south of Glenorchy and then along Benmore Place. The watermain reduces to a 40 mm diameter main for a short section before connecting with the 100 mm diameter watermain at the northern end of Benmore Place, to complete the ring main.

The subject site is located in the north west of Glenorchy, at the western end of the commercial block bounded by Mull Street, Benmore Place, Islay Street and Argyle Street in the north western area of Glenorchy. The subject site is serviced on three sides by a Council 100mm diameter ring main and a 50 mm diameter rider main laid on the northern side of Islay Street.

It is proposed to obtain a potable water supply connection from the 100 mm diameter main on Mull Street.

Discussions have been held between Doug Rickard-Bell and Ulrich Glasner of QLDC to confirm if sufficient supply capacity is available. At present, the Glenorchy water reticulation network is currently under review by QLDC by way of a better Business Case, however, assurances have been given that the existing water supply and any proposed upgrades will provide an adequate supply for the needs of the proposed development

5.2 Water Demand Assessment

Water demand at the proposed development has been significantly influenced by the need to treat and disperse treated wastewater on site. Ultimate design figures have been determined from TP58. The figures take into account the use of the following water saving devices:

- Low volume, dual flush toilet cisterns;
- Aerated faucets;
- Restricted flow showerheads;
- No baths, except in 4 luxury suites;
- No garbage grinders;
- Offsite laundry services;
- No onsite vehicle washing.

Irrigation of landscaped areas will be undertaken using the subsoil irrigation of treated effluent. The specific design requirements of the irrigation scheme will be determined during the detailed design phase of the project.

Given the above water supply demand, the anticipated peak flow required from the development based on a peak hour factor of 6.6 in accordance with QLDC, Land Development and Subdivision Code of Practice 2018, 6.3.5.6 (b) is likely to be 3 to 3.5L/sec.

5.3 Firefighting Water

Firefighting water demand has been calculated using SNZ PAS4509:2008. The structures that comprise the proposed development are catergorised, according to Table 1, as “sprinklered” and not a “single family home” and therefore require a water supply classification of that meets FW2.

The firefighting water supply required from a FW2 classification is 12.5L/s from fire hydrants within a distance of 135 m from the site and an additional 12.5L/s within a distance of 270 m from the site, both at a minimum residual pressure of 1 bar.

There are 3 fire hydrants located close to the development and these are at 26 Mull Street, on the south eastern side of the intersection of Mull and Argyle Streets and on the north western side of the intersection of Argyle and Islay Streets.

6. WASTEWATER DISPOSAL

6.1 General

The community of Glenorchy is not currently served by a sewerage scheme. It is understood that a Council owned, and operated community scheme will be developed in the near future, however timing and certainty of these proposed works still remain unknown.

It is therefore proposed that all wastewater generated within the development will be treated to an advanced secondary standard and discharged via ground soakage onsite.

6.2 Design Flows

The wastewater from the development will be generated from a combination of the Grand Mt. Earnslaw Hotel, the Mull Street Retail Precinct and the Islay Street Boatsheds.

Wastewater from the hotel will be primarily generated by hotel guests, staff and the bar. It is assumed that full water saving devices will be installed on all faucets within the hotel rooms, bathrooms and kitchens. It is understood that linen will be laundered off site.

On this basis a conservative flow allowance of 160 litres/person/day has been allocated for guests to the hotel. A conservative peak occupancy has been assumed at 2 persons per bedroom.

Staff has been estimated using standard guidelines for a 58-room hotel – allowing for front of house, porters, maintenance, housekeeping and bar/shop staff an estimate of 20 people has been used.

Table 1: Summary of Wastewater Generation from Grand Mt Earnslaw Hotel

No. of Bedrooms	58
Occupancy Allowance	116 people
Guest Per Capita Flow Rate	160 litres/person/day
Staff Allowance	20 people
Staff Per Capita Flow Rate	30 litres/person/day
Water Reduction Fixtures and Assumptions	• Dual Flush WC – 6/3L • Shower flow restrictors 9L/minute flow rate • Wash hand basin faucets 9L/minute • No baths in hotel rooms • All laundry cleaned off site
Daily Flow Allowance	Guests – 19,160 litres/day Staff – 600 litres/ day
Total Daily Flow Allowance	**Total: 19,760 L/day**

Wastewater from the Mull Street Retail Precinct will be generated by the bar/restaurant, butcher shop, café and bakery. An occupancy allowance of 0.7 covers/day/m^2 has been used for the café and restaurant using a flow rate of 40 litres for the bar/restaurant and 30 litres for the café respectively.

Wastewater from the butcher shop will be based on staff within the property and water used for cleaning of the premises. It has been assumed that up to 4 staff will be on the premises each day and 480 litres of water has been allocated for washdown of surfaces and cleaning of equipment.

It has been assumed that the bakery will generate wastewater from staff, food preparation and cleaning, and takeaway customers.

Table 2: Summary of Wastewater Generation from Mull Street Retail Precinct

No. of Hospitality Tenancies	5
Bar/Restaurant	Assume 0.7 covers per m^2 for 220 m^2 Total Covers per day = 154 Per Capita Flow Rate = 40 litres Total daily flow = 6,160 litres/day (covers) Bar only patrons Daily use – 100 people 10 litres/person Total Bar Patrons Only – 1,000 litres/day (Bar Only) **Total = 7,160 litres/day (Combined Bar and Dining Patrons)**
Café	Assume 0.7 covers per m^2 for 71.4 m^2 Total Covers per day = 50 Per Capita Flow Rate = 30 litres Total daily flow = 1,500 litres/day Additional allowance for takeaway coffees 100 people/day 5 litres/person = 500 litres/day **Total Daily Flow = 2,000 litres/day**
Bakery	2 staff using 40 litres/person/day = 80 litres/day Cleaning water = 480 litres/day **Total Daily Flow = 560 litres/day**
Butchers	2 staff using 40 litres/person/day = 80 litres/day Cleaning water = 480 litres/day **Total Daily Flow = 560 litres/day**
Water Reduction Fixtures and Assumptions	Best available water reducing fixtures including: • Waterless Urinals; • Dual Flush WC 6/3Litres/flush; • Wash hand basin faucets 4.5L/minute; • Sinks (commercial use) 6L/minute; • Push-button wash hand basins faucets in toilets; • No public toilet access in the bakery or butcher shop.
Total Daily Flow Allowance	**Total: 10,280L/day**
Flow Meter	A water meter is required.
Other Notes	All chemical cleaners/disinfections shall be suitable for discharge to septic tanks/onsite treatment systems.

The wastewater from the development will be generated from a combination of the Grand Mt. Earnslaw Hotel, the Mull Street Retail Precinct and the Islay Street Boatsheds.

Wastewater from the Islay Street Boatsheds will be primarily generated by guest with 2 staff for housekeeping. It is assumed that full water saving devices will be installed on all faucets within the hotel rooms, bathrooms and kitchens. It is understood that linen will be laundered off site.

On this basis a conservative flow allowance of 160 litres/person/day has been allocated for guests to the hotel. Peak occupancy has been assumed at 2 persons per unit.

Table 3: Summary of Wastewater Generation from Islay Street Boathouses and Day Spa

No. of Bedrooms/Rooms	7
Occupancy Allowance	14 people
Guest Per Capita Flow Rate	160 litres/person/day
Staff Allowance	2 people
Staff Per Capita Flow Rate	30 litres/person/day
Water Reduction Fixtures and Assumptions	• Dual Flush WC – 6/3L • Shower flow restrictors 9L/minute flow rate • Wash hand basin faucets 9L/minute • No baths in hotel rooms • All laundry cleaned off site
Daily Flow Allowance	Guests – 2,240 litres/day Staff – 40 litres/ day
Total Daily Flow Allowance	**Total: 2,280 litres /day**

The total combined peak daily wastewater generated from The Grand Mt Earsnlaw Hotel, the Mull Street Retail Precinct and the Islay Street Boatsheds will be **32,320 litres/day**.

6.3 Wastewater Characteristics

Wastewater from the development will be considered to have an elevated average BOD_5 of 600 mg/litre based on domestic quality effluent from the Grand Mt Earnslaw Hotel and restaurant effluent from the Mull Street Retail Precinct.

The characteristics of the wastewater from the proposed development have been adopted from Auckland Council GD-06 and are:

Table 4: Typical Black Water Chemical Constituents

Parameter	Unit	Blackwater Range
Suspended Solids	mg/L	300 to 500
BOD_5	mg/L	400 to 600
Total Nitrogen	mg/L	Up to 100
E.coli.		10^6 - 10^8

6.4 Wastewater Treatment System

For safe land disposal of effluent, a high level of treatment is required that relies on biological treatment.

There are several options for onsite treatment available in New Zealand that have proven track records.

These are:

- Recirculating Textile Packed Bed Reactor
- Submerged Aerated Fixed Film (SAFF)
- Sequencing Batch Reactor (SBR)

The collection and treatment systems must be designed to allow any noxious/explosive gases e.g. carbon dioxide, hydrogen sulphide, to be collected and vented to atmosphere.

In all cases grease/oils are removed from the system using grease traps and screening/primary treatment is used to "pre-treat" the effluent to facilitate biological treatment.

Typically, biological treatment involves the conversion of soluble organic (and insoluble) material to biomass in the presence of micro-organisms and oxygen. By controlling the tank sizing and the process dynamics, a high-level treatment can be expected. The treatment system would be controlled via a SCADA and telemetry system, thereby reducing the requirement for ongoing operation and monitoring.

Clean, odourless and suspended solids free effluent is stored within a treated effluent tank prior to land disposal. As this stage the effluent can be treated further via disinfection e.g., Ozone treatment, UV disinfection.

The design of the proposed wastewater treatment system is based on:

- An Advanced Secondary Treatment System with Nitrogen Removal which is available from a number of suppliers, including Hynds Environmental, Innoflow Technologies and Graf Technologies Ltd. The unit to be installed will be confirmed at the time of Building Consent application and be certified for a minimum of 32,800 litres/day.
- Tertiary disinfection of the effluent will be carried out using a UV disinfection unit which will remove the pathogens being discharged to land.
- The selected system will be installed by a trained technician and a maintenance contract will be signed with an experienced service provider to ensure correct operation of the system.
- Ongoing monitoring of the system will be required by as part of the resource consent to ensure the system is performing and the potential for impact on the environment is managed.

Table 5: Treated Effluent Quality

Parameter	Unit	Blackwater Range
Suspended solids	mg/L	15
BOD_5	mg/L	15
Total Nitrogen	mg/L	25
Faecal Coliforms	-	200 CFU/100ml

6.5 Effluent Dispersal System

Investigations into soil conditions have been undertaken by GWE Consulting Engineers at 12 separate locations where hand augurs were carried out. These investigations indicate that soils in the area are mostly Gravels and Sands (Category 1 soils). This categorisation has been used to size the wastewater dispersal system.

The soil category shall be checked at time of construction of the areas (including reserve area) designated for dispersing the treated effluent. Final areas will be confirmed following completion of the earthwork's operation.

It is proposed that a combination of irrigation trenches and sub surface drip irrigation is used to apply the treated wastewater to the lawn and landscaped areas around the site.

6.5.1 Conventional Trench/Bed

Table 5.2 in AS/NZS 1547:2012 states that the Design Loading Rate (DLR) for trenches/beds with secondary treated effluent on Category 1 (Structureless/Massive) soils is 50 mm/day.

Based on this design criteria an area of 646 m^2 has been specified for land disposal of effluent. In addition to this a 50% reserve area has been allocated covering 323 m^2. A wastewater plan showing the overall concept is attached as Appendix B – Wastewater Concept Plan

6.5.2 Drip Irrigation

Table 5.2 in AS/NZS 1547:2012 states that the Design Loading Rate (DLR) for drip irrigated secondary treated effluent on Category 1 soils is 50 mm/day. The area set aside for drip irrigation will form part of the minimum area required for wastewater disposal and will be determined during the detailed design phase.

Due to the location of the site and the number of frost and snow days during winter, it is proposed that drip irrigation pipes are buried at least 250 mm deep.

7. FLOOD HAZARD

7.1 General

Glenorchy is located at the northern end of Lake Whakatipu. The Lake has a catchment of 3,067 km^2, fed in the main by the Rees and Dart Rivers, with a combined catchment

of 1,044 km^2. Other tributaries include the Buckler Burn, Horne Creek, and the Lochy, Von and Greenstone Rivers. The lake has a single outlet – the Kawarau River, located at the southern end of the Lake.

7.2 Lake Whakatipu – Hydrological Setting

The main cause of high lake levels in Lake Wakatipu is the natural imbalance between the capacity of the lake outlet (Kawarau River) and the magnitude of inflows during heavy rainfall events. For example, rainfall and snowmelt associated with the November 1999 flood produced a peak inflow of approximately 4,000 cubic metres per second compared to a peak outflow of approximately 800 cubic metres per second.

Despite having a large catchment, Lake Wakatipu rises relatively slowly, even when inflows to the lake are high, due its large surface area. This characteristic means that the development of a flood event can be reliably monitored, and the Glenorchy community afforded a long-lead time; typically, several days, in which to prepare for inundation.

7.3 Flood Risk Management

The approach to flood risk management for the site has been a combination of local earthworks within the site boundaries to raise the eastern end of the site where the proposed hotel is located, above the flood level of RL312.8. For the balance of the site the principles of flood sensitive design have been applied to buildings and open spaces.

Figure 3: Showing Flood Contours (150, 100, 75 and 50 year return period events) and Extent of Flooding (blue hatched area)

The design of the earthworks and the earthworks batters that will be subject to rising flood waters will take into account and mitigate the effect of wave action and the impact of debris accumulation.

Floor levels in the hotel have been set at RL313.80 and in the associated hospitality and retail buildings have been set at RL313.10.

For habitable buildings with non-habitable spaces located below the flood level and for the lower levels of non-habitable buildings the design will incorporate flood proofing and durable materials able to withstand inundation by flood waters for extended periods (e.g. hard flooring, moveable fit-outs and all electrical works above the flood level). Once flood waters recede these spaces will be able to be rapidly returned to service.

7.4 Utilities - Wastewater

The hotel and associated hospitality and retail services should be able to recover quickly following a flood event. The wastewater treatment plant and dispersal field has been designed and will be constructed in a manner that allows its continued operation in all except the most extreme flood events. The treatment system will achieve advanced secondary level, a much higher standard than most of the septic tank systems currently in operation in Glenorchy.

The treatment plant will be located at the eastern end of the site where the proposed finished ground level is RL313.00 and will be unaffected by floods. The dispersal field is located in the middle of the site where the proposed finished ground level is RL313.00. The base of the individual disposal trenches is proposed to be RL312.50 and will be unaffected by surface flooding and mostly from rising ground water tables, in all but extreme floods.

8. STORMWATER

8.1 The Proposed Development

The proposed development of the site will alter the current stormwater run-off patterns however this is expected to be less than minor as the proposed stormwater management devices are intended to mimic the existing hydrology and pre-development scenario.

8.2 Stormwater Design Objectives

In line with QLDC's LDSCOP, the primary objective of the stormwater management plan for the site is to manage stormwater runoff and avoid exacerbating downstream flooding problems and adverse effects on the receiving environment.

It is proposed that this will be achieved through the application of the principles of water sensitive design and the selection of appropriate stormwater management devices for the detention and retention of run-off, e.g. rain gardens and infiltration trenches. Run-off equivalent to pre-development levels will be managed in roadside swales that will flow via road culverts under Benmore Place to open swales that eventually reach Lake Whakatipu.

Figure 4: Stormwater Infrastructure and Overland Flow Path to Lake Whakatipu

8.3 QLDC Land Development and Subdivision Code of Practice

The design of the development will follow the QLDC Land Development and Subdivision Code of Practice. This document generally references requirements of New Zealand Standard NZS 4404:2010 Land Development and Subdivision Infrastructure, with a number of amendments.

Provided below is a summary of requirements in the Code of Practice that are relevant to stormwater engineering design for the Hotel development

The QLDC Code of Practice specifies the following design storm standard for development:

4.3.5 Design Criteria

Discharge to an existing network from a primary system shall be at a rate (litres per second) no greater than would have occurred for the undeveloped catchment during a 60 minute 5-year storm.

4.3.5.1 Design Storms

All Primary Systems shall, as a minimum, cater for the worst case 1 in 20-year return period (5% AEP) storm with no surface flooding.

Where no secondary flow path is available the worst case 1 in 100year return period (1% AEP) storm shall be catered for with no surface flooding.

8.4 Site Design Criteria

The concept stormwater design for the Hotel development is based on the principles of water sensitive design and where appropriate the following design criteria:

- Engineering Design Standards – QLDC LDSCOP (2015), NZS4404:2010 and the New Zealand Building Code.
- Level of Service (LOS) – 20 year ARI storm flows to be contained within primary conveyance systems, and 100 year ARI storm flows on site to be contained within overland flow areas.
- Freeboards – minimum 500 mm on habitable floors and 300 mm on hospitality and retail (non-habitable) spaces.
- Hydrology – Hydrological design parameters adopted include HIRDS (Version 3) to obtain rainfall data, and nested storm hyetographs with allowance for climate change in accordance with MfE -Guidance Document for Climate Change (MfE, 2008).

8.5 Stormwater Management Philosophy

Stormwater from the roofs of the hotel, hospitality buildings and accommodation units will be disposed of to-ground using rain gardens, infiltration trenches and retention/detention tanks or similar system.

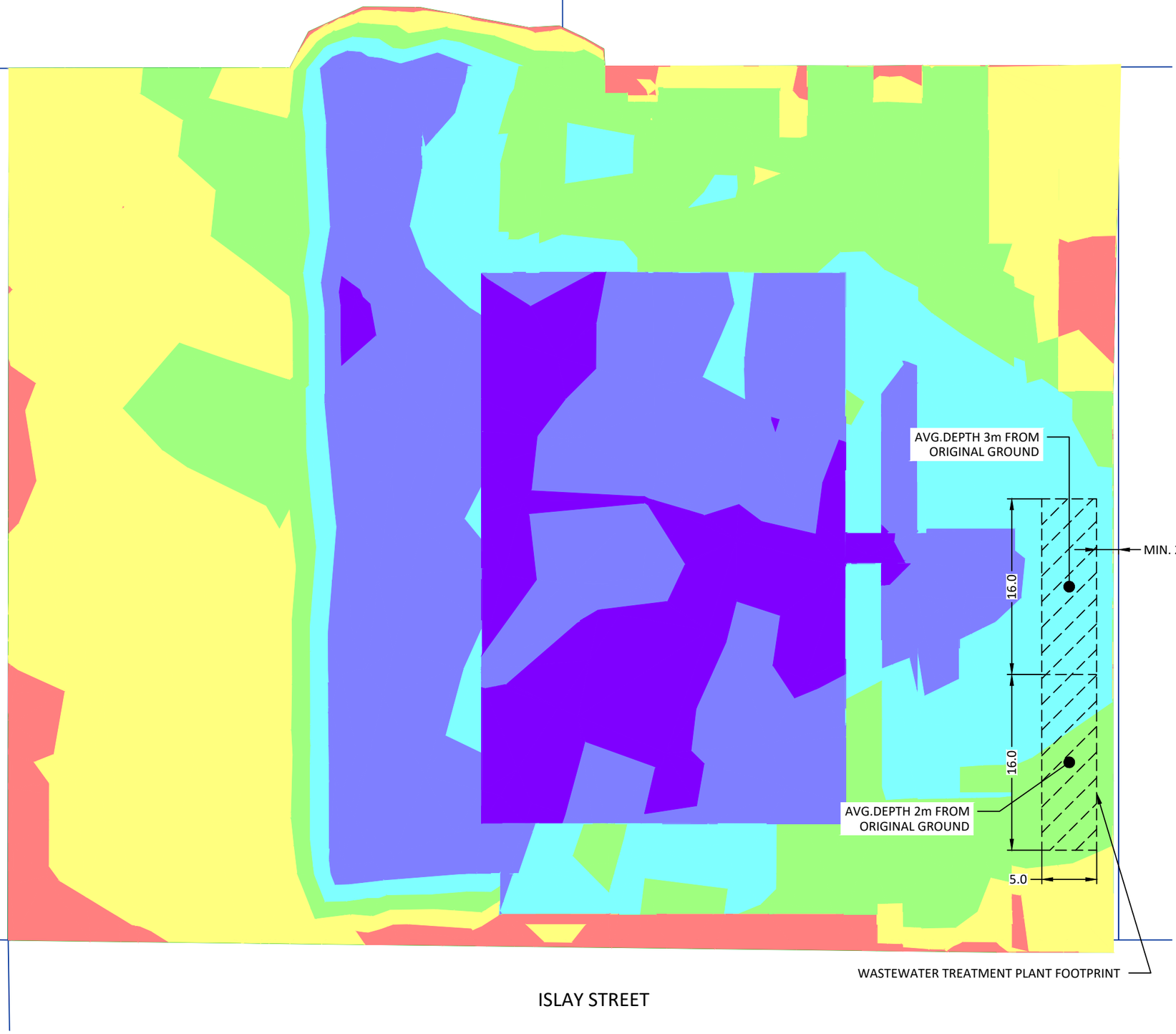
The increase in stormwater run-off as a result of the post development scenario will be disposed of on-site and the difference between the predevelopment and post development run-off will be attenuated through stormwater management devices and discharged off site to road side swales on the perimeter of the development, these are on the southern side of Mull Street, the eastern side of Benmore Place and the northern side of Islay Street.

The lower terrace of the Grand Lawn will be used for stormwater infiltration from the development.

Runoff from the accessway to the Hotel will be directed to the roadside swales.

APPENDIX A CUT/FILL EARTHWORKS CONTOUR PLAN.

BENMORE PLACE



ISLAY STREET

CUT/FILL SUMMARY	
CUT	40.4m^3
FILL	8635.7m^3
NET	8595.3m^3(FILL)

Surface Analysis: Elevation Ranges

Number	Color	Minimum Elevation (m)	Maximum Elevation (m)	Area (m²)	Volume (m³)
1		-0.500	0.000	403.4	40.41
2		0.000	0.500	2053.9	3462.46
3		0.500	1.000	1660.0	2474.94
4		1.000	1.500	1294.2	1688.16
5		1.500	2.000	2031.9	918.30
6		2.000	2.500	749.6	91.89

NOTES:

1. ALL VOLUMES ARE IN-SITU SOLID MEASURE. NO BULKING OR COMPACTION FACTORS ARE CONSIDERED
2. CALCULATION BASED ON EXISTING GROUND LEVEL LESS 100mm AND PROPOSED SUBGRADE LEVEL.
3. CUT MATERIAL TO BE REUSED ON SITE WHERE SUITABLE
4. APPROVED CLEAN FILL TO BE USED ON SITE
5. ALL WORKS TO BE COMPLETED AS PER THE APPROVED CONSTRUCTION METHODOLOGY AND IN ACCORDANCE WITH THE QUEENSTOWN LAKES DISTRICT COUNCIL LAND DEVELOPMENT AND SUBDIVISION CODE OF PRACTICE.
6. CONTRACTOR TO OBTAIN ALL NECESSARY APPROVAL PRIOR TO EXCAVATION, INCLUDING WORKING NEAR OVERHEAD POWER LINES AND OTHER UTILITY SERVICES
7. CONTRACTOR TO OBTAIN, MARKOUT AND LOCATE EXISTING PUBLIC SERVICES PRIOR TO EXCAVATION
8. CONTRACTOR MUST TAKE ALL CARE TO PROTECT EXISTING PUBLIC AND PRIVATE SERVICES
9. THE CONTRACTOR IS RESPONSIBLE TO REPAIR ALL DAMAGES CAUSED BY THE CONTRACT WORKS AND ASSOCIATED COSTS
10. CONTRACTOR TO REINSTATE ALL OTHER GROUND TO MATCH EXISTING

0 10 20
Scale 1:400 (m)

PLOT STATUS: CONSENT

REV	AMENDMENT	CAD	ENG	APPD	DATE
0	FOR RESOURCE CONSENT	JQ	CC	CC	05/11/19

GWE CONSULTING ENGINEERS
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PROJECT:
THE GRAND MT. EARNSLAW HOTEL
1 BENMORE PLACE, GLENORCHY

TITLE:
CUT/FILL EARTHWORKS PLAN

CLIENT: BLACKTHORN LTD

SCALE: 1:400 A3

PROJECT No : J1538

DRAWING No : EW-01

REV 0

BENMORE PLACE

EL: 312.06
EL: 312.80
EL: 312.30
EL: 312.80
EL: 313.60
EL: 313.30
EL: 313.15
EL: 312.85
EL: 313.60
EL: 312.80
EL: 312.80
EL: 312.00

312.00
312.20
312.40
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313.00
312.80
312.80
312.60
312.40

311.00
312.00

ISLAY STREET

LEGEND

PROPOSED SUBGRADE LEVEL — EL: 313.60

0 10 20
Scale 1:400 (m)

PLOT STATUS: CONSENT

REV	AMENDMENT	CAD	ENG	APPD	DATE
0	FOR RESOURCE CONSENT	JQ	CC	CC	05/11/19

GWE CONSULTING ENGINEERS
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PROJECT:
THE GRAND MT. EARNSLAW HOTEL
1 BENMORE PLACE, GLENORCHY

TITLE:
PROPOSED SUBGRADE CONTOUR PLAN

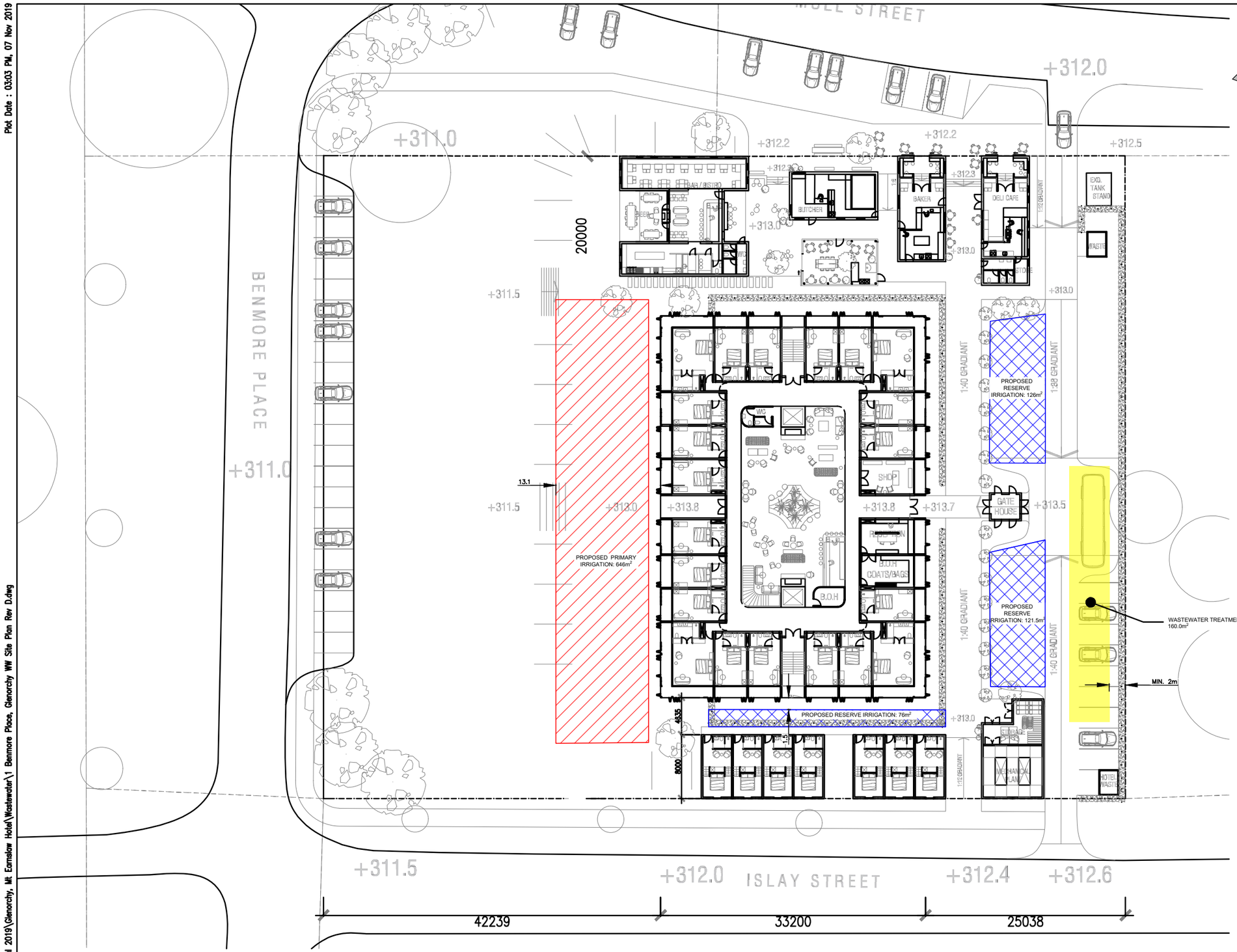
CLIENT: BLACKTHORN LTD

SCALE: 1:400 | A3

PROJECT No : J1538 | DRAWING No : EW-02 | REV 0

APPENDIX B WASTEWATER CONCEPT PLAN

Plot Date : 03:03 PM, 07 Nov 2019



NOTES

1. WASTEWATER CONCEPT PLAN IS BASED ON SITE PLAN PREPARED BY RTA STUDIO
2. PEAK DESIGN FLOW: 32,320 litres/day
3. IRRIGATION SYSTEM: TO BE CONFIRMED
4. CATEGORY 1 SOILS, PEAK LOADING RATE 50 mm/day
5. PROPOSED PRIMARY DISPOSAL FIELD = 646 m^2
6. PROPOSED RESERVE DISPOSAL FIELD = 323 m^2 (50%)

LEGEND

- PROPOSED PRIMARY DISPOSAL FIELDS
- PROPOSED RESERVE DISPOSAL FIELDS
- PROPOSED AREA FOR WASTEWATER TREATMENT PLANT

0m 10m 15m 20m 25m

A3 SCALE = 1 : 500

PLOT STATUS: CONSENT

REV	DESCRIPTION	CAD	ENG	APPD	DATE
D	UPDATED SITE PLAN	JQ	CC	CC	07/11/19
C	REVISED TO CHANGE TREATMENT PLANT LOCATION	JQ	CC	CC	11/10/19
B	SITE PLAN	JT	CC	CC	08/19
A	WASTEWATER – PRELIMINARY	JT	CC	CC	05/19

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TITLE:
WASTEWATER CONCEPT PLAN

CLIENT: BLACKTHORN LTD

SCALE: 1:500 | A3

PROJECT No : J1538 | DRAWING No : WW-01 | REV D

File Name : W:\Projects\Commercial\Commercial 2019\Glenorchy, Mt. Earnslaw Hotel\Wastewater\1 Benmore Place, Glenorchy WW Site Plan Rev D.dwg

10.4 *ORIGIN CONSULTANTS:* ARCHAEOLOGICAL ASSESSMENT