HARRISON GRIERSON

22 April 2020

Auckland Council,
Level 2, 6 Henderson Valley Road
Henderson
AUCKLAND 0612

Attention: **Michael Treacy**
Michael.treacy@aucklandcouncil.govt.nz

Dear Michael

MARINE RECREATION CENTRE AND WATER ACCESS STRUCTURES AT THE END OF LAUNCH ROAD: REFERENCE – BUN60349817

HG REF: 1020-143449-01

This letter provides our response to the additional information you have requested in the letter dated 23 January 2020. For ease of reference we have ordered our response in the same format as your 23 January letter and for the most part our responses also flow from your requests.

1.0 VEGETATION REMOVAL

The proposal will include the removal of approximately ten trees that exceed 4m in height, which require resource consent for a **Restricted Discretionary** activity under Rule E16.4.1(A10).

Consent is also being sought under E15.4.1(A21) for removal of greater than 25m^2 of contiguous vegetation and tree removal of indigenous trees over 3m in height within 20m of the Mean High Water Springs.

The applicant has engaged Andrew Barrell from Tree Management Solutions to prepare an arboricultural report, which details and assesses the proposed tree removal works. A copy of the report is included as **Attachment 1** of this letter.

The report clearly identifies the trees to be removed, assesses the effects of the tree removal and recommends mitigation measures.

In summary, the vegetation removal will be undertaken in accordance with the recommendations made in the arboricultural report and will be appropriately mitigated by replacement planting in a location to be agreed with an Auckland Council Parks arborist.

We note that Tree Asset Owner Approval is also being sought from Auckland Council to remove these trees, which is separate from the resource consent process.

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2.0 CONTAMINATION

The applicant has engaged Pattle Delamore Partners Ltd (PDP) to undertake a preliminary site investigation (PSI) which identifies historical waste disposal to land (i.e. reclaimed land) and port activities (i.e. yacht maintenance facilities) are more than likely to have occurred on site. Both of these are categorised on the Hazardous Activities and Industries List (HAIL).

A detailed site investigation (DSI) has also been commissioned to assess the likelihood of human health and environmental risk associated with the proposed soil disturbance, change of land use, and to assess potential resource consent requirements under the National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (NESCS), as well as the Auckland Unitary Plan: Operative in Part (AUP:OP). A copy of the DSI is included as **Attachment 2** of this letter.

The DSI found that consent should be applied for under the NESCS as a controlled activity. The applicant therefore wishes to apply for consent under the NESCS Section 9(1) for a **Controlled** activity resource consent for the change in land use and the soil disturbance. We request that a Site Management Plan is required as a condition of the resource consent.

The DSI found that through appropriate soils handling and disposal measures required by a Site Management Plan, the soil disturbance is not considered to pose an unacceptable risk to human health nor the environment.

With regards to the AUP:OP Chapter E30, the DSI found that the proposed soil disturbance can be undertaken as a **Permitted** activity.

3.0 THE MARINE RECREATION CENTRE (MRC) BUILDING

SGA Architects have provided an updated plan set, included as **Attachment 3** which includes the following information as requested:

a) 1,009m^2 (enclosed building) + 139m^2 (covered deck). The total building coverage is approximately 1,148m^2

b) The GFA figures are contained on updated plans RC06-A and RC07-A. The total GFA is approximately 1,376m^2

c) The length of the building is shown on updated plan RC02-A. The length of the building is approximately 54m

d) The total occupation of the MRC building in the CMA is shown on RC11-A. The total occupation is approximately 895m^2 in the General Coastal Marine Zone.

e) Please refer to RC02-A for the preparation deck areas. The uncovered area is approximately 206m^2 and the covered deck area is approximately 139m^2. The total area of the preparation deck is approximately 345m^2.

f) There will be taps and hoses for the MRC users to use within the locked area of the building. These taps and hoses will not be available for the public to use.

g) The general public will be able to access the building when it's in use but there will not be someone on-site full time so public access will be limited to those hours. It is anticipated that there will be a 'sign in, sign out' system for any members of the public when they enter or exit the building.

h) The Trust will be seeking the ability to hire out the facility to the community. As Auckland Council did not want to own the building, the Trust has limited ability to create income to cover maintenance and running costs of the building. This is in keeping with typical sports club activities.

4.0 LANDSCAPE AND VISUAL EFFECTS

With respect to these requests:

a) Additional visual simulations have been provided in the Boffa Miskell Graphic Supplement included as **Attachment 4**. Boffa Miskell have also provided a supporting Memorandum included as **Attachment 5** which has assessed the visual effects of the proposal when viewed from the coastal walkway to the south of the site and from Boundary Road.

In respect of the view from the coastal walkway to the south, the assessment found that the proposal will have an effects rating of "very low adverse visual effects" when viewed from a distance.

When viewed from the coastal walkway in close proximity, the assessment found that the proposal will have a "low adverse visual amenity effect" which will be offset to an extent by the public recreational amenity of the building which requires a water edge location, noting that the quality and architectural design of the facility is a significant improvement on the series of garage / shed and lean-to structures which currently occupy a prime water edge location at the landing.

b) In respect of views from Harrier Park, no visual simulation has been prepared from within the park. This is because, as noted in the Boffa Miskell Memorandum, the parks elevation atop the escarpment and framing native vegetation along its eastern edge will mean the proposed low-lying structure will not be generally apparent in views from the park.

c) With regard to consideration of public access around the coastal edge of the proposed MRC with regard to Objective 4 and Policy 6 of the NZCPS and the AUP:OP Objectives F2.14.2(1), F2.14.2(3) and F2.14.2(5), and Policies F2.14.3(2), F2.14.3(3) and F2.14.3(4), we note the following:

Access needs to be maintained down Boundary Road for service vehicles to be able to get to Bomb Point. Setting the MRC back into the land would have required both significant earthworks and reclamation to ensure vehicle access could be provided on the coastal side of the building. When assessing the options for the proposal, we identified that it was important to avoid, to the greatest extent possible, encroachment of the development into the CMA and to avoid any reclamation into the CMA. Furthermore, any proposal that required encroachment or reclamation of the CMA in order to provide public access (which is already provided) around the seaward side of the MRC building would be contrary to the policy direction of the NZCPS and the AUP:OP.

- Providing continuing public access around the coastal edge of the MRC could also give rise to increased conflict between users of the MRC and the general public. The proposed layout has been designed to keep the operation of the MRC as separate as possible from general public activities (i.e. walking, cycling etc).

- The most direct route for the public walking along the coastal walkway is behind the building. Design measures have been incorporated to clearly delineate the coastal walkway behind the building and to the north towards the proposed wharf.
- Any adverse effects in relation to the public not being able to walk on the sea-ward side of the building are offset by the proposed jetty which can be enjoyed by the public. We also note that this section of coastal margin is currently inaccessible due to the vegetation along this section of the coastal edge.
- We consider the current layout to be the most efficient use of the land with minimal encroachment into the CMA and avoiding the need for any reclamation.

d) Please refer to the updated SGA drawings RC08-A & RC09-A. The North East & South West Elevations have been extended to include the relationship to the coastal walkway and vegetated bank to the west, dimensions and levels.

5.0 LOADING BAY / DROP OFF AREA

We respect to these requests, Russell Brandon from Flow Transportation Specialists (Flow) has provided the following responses:

a) As per the Transport Assessment submitted in the original application, there is no requirement for a loading bay under the AUP:OP. The loading bay proposed on the roundabout is for convenience to allow some drop offs/ pickups and for loading to occur close to the MRC.

We note that the provision of the loading bay on the roundabout is not yet finalised. To address the potential issue of the MRC being built and operational before the roundabout is built, we proposed that three parallel parking spaces on Launch Road are designed as the interim loading zone, highlighted in yellow below. These could then be removed once the roundabout is constructed. If the loading zone is for some reason not built on the roundabout, the Launch Road loading bay can remain as a permanent solution.

We note that a loading zone on a public road cannot be reserved for exclusive use by the MRC, but its use by other activities in the area is expected to be minimal. There is also another loading bay proposed within the Catalina Bay Precinct close to the nearby apartments, and other loading provisions for the commercial and retail premises. This means that the use of the proposed loading zone would largely be limited to recreational users.

With the boats kept on site, the majority of loading activities will be related to the drop off and pick up of people. Should the loading zone be occupied when people arrive to be dropped off/picked up, there is ample parking provided on the nearby streets (Launch Road/Bomb Point Drive etc). The effects of people using car parking spaces to drop people off, pick people up would be negligible beyond the effects of general use of the on-street parking.

b) As noted above, to address the potential issue of the MRC being built and operational before the roundabout is built, it is proposed that the first three parallel parking spaces on Launch Road are designated as the interim loading zone.

c) The construction of the roundabout needs to be timed with the construction of Boundary Road in Catalina Bay. Tying the construction of the roundabout to the MRC may create programming issues for the Catalina Bay development.

d) As noted above, we have proposed that the first three parallel parking spaces on Launch Road are designated as the interim loading zone. This would form an 18m long, 2.5m wide loading bay, capable of accommodating up to 3 cars.

The design and tracking of the potential loading bay on the roundabout will be confirmed during the EPA process, where it will be subject to Auckland Transport approval – although we have provided the most recent concept design (see **Attachment 6**) with tracking showing how vehicles can enter and exit the loading area on the roundabout. The loading bay will be 3.5m deep delineated with enough space for two cars, or one larger vehicle.

We note that there are no splitter islands proposed at the roundabout, and the central island will be flush or slightly raised but still trafficable. If someone was to park poorly in the roundabout loading zone, whereby their vehicle protrudes out onto the roundabout circulating lane, it will be simple for other drivers, including buses, to drive past them.

e) As above, tracking curves have been provided in **Attachment 6**.

6.0 MOVEMENT OF ROW BOATS

a) The details of the row boats and associated equipment to be housed by the facility are as follows (note these are only approximate numbers):

- 8 x Eight person skiffs
- 14 x Four person skiffs (coxed)
- 14 x Two person skiffs
- 10 x Single person skiffs
- 9 x Safety boats and trailers
- 100 x Oars

- 40 x Sets of sculls oars

b) The number of car trips estimated to be generated by the MRC is provided in Table 1 in the transport assessment. This anticipates that:

- Up to 65 drop offs in the morning before 5:30am, which can easily be accommodated in the interim loading zone and on-street parking on Launch Road. There will be very little other parking demand or traffic at this time in the morning
- Up to 25 drop offs/pick-ups at other times, spread over a short period before trainings are due to start (often 20 minutes before training sessions and in the order of 1 car par minute). This can easily be accommodated in the interim loading bay and surrounding on-street parking.
- Capacity functions at the MRC (up to 300 people) would be rare, and drop offs would be less prevalent. It is reasonable to assume that most people driving to the event would park where they find a vacant parking space and walk down.

c) It is unlikely that boats will be taken out of the storage area at other times than training or regattas. If they are to be taken out, these will be very infrequent occasions for maintenance reasons.

d) Not all of the gear will be taken to regattas from the MRC. Typically, 5 eights, 6 fours, 6 two people skiffs and 6 singles. The loading will be constant and occur in a timely and efficient manner to minimise any potential disruption to the coastal walkway.

e) It is not expected that the centre will be used for any other activities while loading is occurring.

f) The reversing manoeuvre will be undertaken very quickly and unlikely to be in excess of 30 seconds, noting that the driver who undertakes this manoeuvre is likely to be very experienced in manoeuvring the boat trailer around and is likely to have undertaken this same manoeuvre multiple limes before.

The boat trailer needing to be reversed into Boundary Road will be an infrequent event. During the summer months, this will typically only occur on some Thursday afternoons, and very early (around 5am) on Monday or Tuesday Mornings during the summer months.

The rare occasion that a bus arrives at the roundabout at the same time as this reverse manoeuvring is happening will have a negligible effect on the bus network. For example, this would be no different from a bus needing to wait briefly on any other road for a car to undertake a parallel car parking manoeuvre.

We also note that the Rowing Club has always loaded the boat trailers out of a much busier area of Catalina Bay than the proposed location. The proposed use of Boundary Road to load and unload the boat trailer will create significantly less nuisance to the general public than the existing operation.

g) The roundabout Island is required to be trafficable by buses to allow for tracking. If the island is raised when the design of the roundabout is finalised, this will only be minimal, primarily for visual effect. As such, it will be suitable for a car and boat trailer to track over when reversing into Boundary Road.

h) Boat loading and unloading of trailers will typically occur on a Friday/Monday (8 – 10 times per year) for the RPC. It is noted that the RPC load significantly less gear onto trailers than the Westlake Rowing club, so is anticipated to take

less than 30 minutes each time. Loading will typically occur on some Thursday mornings an unloading on late Sunday afternoon

i) Buses will generally arrive around 5 minutes before the students are supposed to be ready to leave (around 8am). Typically, this might take around 10 minutes for the rowers to board the bus. Depending on the size of the bus, it can pull into the proposed loading zones, or make use of the Launch Road on-street parking.

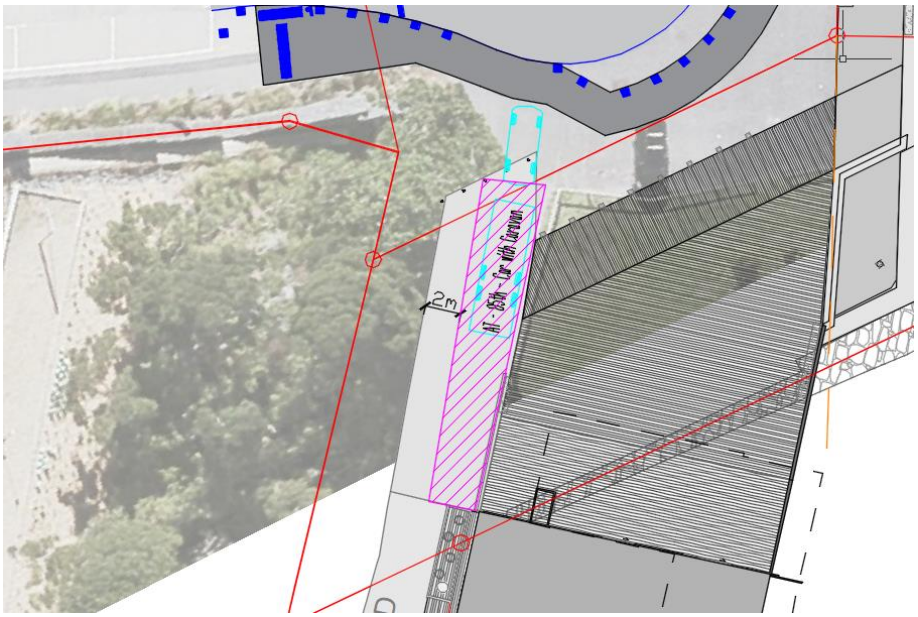
If a bus was to partially block a traffic lane while students board, this won't have any noticeable effects on the operation of Launch Road. As noted previously, other vehicles can drive over the central roundabout island to get past, and Launch Road is straight with clear sightlines.

j) Buses will be required to travel down Hudson Bay Road Extension into Catalina Bay, and follow Boundary Road around to Launch Road. This is the same route as the AT Metro scheduled bus services.

Boundary Road through Catalina Bay has been designed to accommodate AT Metro bus services, therefore the use of this route by a bus associated with the MRC will have no adverse effects beyond what has already been designed for.

k) There are no pseudo-tracking curves for movement of row boats and the AUP:OP does not require them to be provided. Row boats can be brought directly from the MRC building onto the boat preparation area. The boat preparation area has been designed in coordination with the proposed users to accommodate the required boat accommodation.

l) The approximate space required for row-boat loading is shown below:



Boats on the right side of the trailer can be loaded from the preparation deck. Boats in the centre and left side of the trailer will need to first be brought to the back of the trailer before being loaded parallel to the trailer. As per the loading and servicing management framework, this can be done while still allowing roughly 2m of clear space along Boundary Road. In this regard, we also note that signage will be proposed to alert the users of Boundary Road to this activity, that this will be infrequent activity (half the time likely occurring

around 5am in the morning), and if a boat was swung out over Boundary Road when loading, that this would be very brief and would not block the way for other people for any sustained period of time.

Disruption to the use of Boundary Road is anticipated to be very minor.

m) The bollard system will be a manual bollard system with bollards lifted out with key or alternatively will remain gated as it is now.

7.0 MOVEMENT OIF SAIL BOATS

a) Up to 30 boats will be stored in the MRC, including three safety boats around 4.2m in length. Usually, only the boats stored in the MRC will be launched at the MRC. All will be hand pushed with the sailboats on beach trailers.

b) There are no pseudo tracking curves that could be applied for moving sailing boats by hand. This is not an AUP:OP requirement and it they would be completely arbitrary if we were to create them. Boundary Road in the vicinity of the MRC is between 4m and 6m wide. While boats are pulled out of the MRC onto Boundary Road, they may need to swing out, but they will only occupy a couple metres of width while being pulled along the path to the preparation deck.

As per the loading management framework, temporary warning signage will be put out to warn people approaching on foot, bike, or scooter that there may be boats on the path. Additionally, Boundary Road is straight in this area with clear sightlines. People approaching this area will be able to clearly see that there are sail boats ahead of them.

While people may need to slow and give way to boats occasionally when this loading is happening, this will not be a safety issue. Shifting boats along boundary road will not be a constant occurrence and is just during a brief period before and after sailing trainings which may happen 4 times a week.

c) The boats will only arrive at or be removed from the site at their initial purchase or sale or should substantial maintenance be required to the boats. Assuming this is a very infrequent occurrence, it could also happen via Boundary Road. The loading zone could also be used.

d) There is no boat ramp provided for public use in the area. Providing trailer parking for the general public should therefore not be mitigation required by the MRC.

We have provided further commentary on the design of the loading zone in other responses. If larger vehicles use the loading zone and stick out onto the circulating lane, this will not block the route for general traffic or buses.

e) Once yachts are launched, their trailers will go back into the MRC building.

8.0 FURTHER OTHER CLARIFICATION AROUND EXTENT OF ACTIVITY AND EFFECTS

Russell Brandon from Flow Transportation Specialists has provided the following response to queries a-c. We have provided a response to query d:

a) As per the response regarding the school bus, this area is suitable for bus tracking, and the loading zone or on-street parking can accommodate a stopped bus depending on their size.

If the buses are required to park up/wait for the duration of the function they may need to leave the area to find somewhere suitable. This is common practice for other facilities around Auckland.

b) Rowing or sailing events in which boats would be taken to the site will be a very rare occurrence.

c) As noted previously, we have proposed an interim loading zone on Boundary Road. The potential loading zone on the roundabout will be assessed as part of the subsequent EPA application.

Drop offs and pick-ups on Launch Road using the on-street parking or loading zone are unlikely to cause any noticeable delay for bus services. If people park poorly, there are clear sightlines and enough width enabling buses to manoeuvre past.

d) We don't expect this will need to be managed unless it becomes clear that public demand for the facilities is sufficient enough that issues are occurring, in which case an update to the management plan or other measures may need to be adopted. But this is something that can occur if and when its needed.

9.0 BOUNDARY ROAD TREATMENT

a) The Boffa Miskell Memorandum included as **Attachment 5** addresses the concerns around whether the public walkway will appear public with the presence of the MRC.

The MRC will read as a public facility with the pathway / Te Ara Manawa clearly defined and legible to the west. We do not consider additional signage is necessary to reinforce the public nature of the walkway which is already popular and well used by local residents and visitors to Hobsonville.

b) It is proposed to install a series of 5w soffit mounted LED downlights to cast a soft glow down the lower half of the western façade of the building, lighting the planters below. The level of light will provide security to pedestrians, without creating light pollution to the greater area. Refer to updated SGA drawings RC06-A & RC08-A.

c) The planters were incorporated as a result of the Kāinga Ora Design Review Panel process, intended to allow a level of separation between building users and the public on the walkway. The planters demarcate the 2 allowing a threshold between walkway and building, while softening and mitigating the western façade. The series of planters are gapped to allow access at key points along the building.

The angled bicycle parking is located near the front entry of the building and the public deck, allowing both the public and building users to park bicycles in location that is both close to the jetty and the main access point to the building. The width of the walkway beyond parked bicycles is a minimum of 3.6m at the narrowest point.

Under point 6 of the recommendations (in the Section 92 request), it was noted that the doors shouldn't hinge outwards towards the Boundary Road walkway. The two doors to the bottom of the two stairwells (2 of 3) form part of fire escape routes and under the building code they must open outwards. The doors do not protrude beyond the adjacent planters, therefore will not create any hazard to public walking past the building.

d) With regards to the surface to Boundary Road public walkway – the existing tar-seal surface is proposed to remain.

e) With regards to wind tunnel effects – the addition of the proposed MRC building will in fact increase shelter to the public along the Boundary Road walkway, rather than increase exposure as suggested. Being tucked below the heavily vegetated bank to the west, the walkway is well sheltered from prevailing westerly winds, which will pass above the building.

We also note that the wind tunnel effects is not an AUP:OP consideration for buildings in this zone.

10.0 BICYCLE PARKING

Flow Transportation Specialists have noted that while parking is not provided on site, there is a significant amount of parking within walking distance of the site.

Westlake Boys Rowing Club and the RPC are unlikely to generate significant demand for cycle parking because the catchment of people is likely to extend well beyond typical cycle catchment areas.

The sailing activities of between 25 and 40 people is also unlikely to generate demand for more than 12 bicycle spaces, as that would be a mode share of between 25% and 50%, which is very high.

Overall, we consider that the proposed provision of bicycle parking is adequate, and there will be additional space for informal secure bicycle parking within the boat storage areas. We also note that there will be other public bicycle parking provided in nearby Catalina Bay.

11.0 EVENT TRAFFIC MANAGEMENT

We do not consider that specific traffic management will be required for any large functions held in the MRC because any such event would not be very common and is likely to occur outside of peak demand for parking along Launch Road.

12.0 CONSTRUCTION EFFECTS

a) It is premature to prepare a pre-construction plan because the applicant and the trust have yet to determine a timeline for construction or identify a likely construction partner. This would be more appropriate to require as a pre commencement condition.

b) Flow have confirmed that it is possible that during some phases of construction, Boundary Road may need to be closed to allow for efficient construction and ensure the safety of Boundary Road users. The duration of any possible closure will be confirmed in the construction management plan that we recommend would be appropriate to require as a pre-commencement condition.

If Boundary Road is closed adjacent to the MRC construction site, there are suitable diversions that can be used:

- Around 250m south of the site, the Boundary Road path links up to Bomb Point Drive via a path suitable for cyclists and scooters. Following Bomb Point Drive it connects to Launch Road.
- Immediately south of the construction site, there are stairs that lead up to Harrier Point Park, which then connects to Launch Road.

Any diversions can be clearly signed so Boundary Road users are aware of the diversion routes.

c) If Boundary Road remains open during construction, the details of public access can be agreed and approved as part of any Traffic Management Plans / Construction Management Plans.

d) The applicant does not have an anticipated build time for the MRC at this early stage of the project.

13.0 DREDGING

The applicant was well advanced with undertaking the required dredging within the existing capital dredging permit before the Level 4 lockdown commenced due to COVID-19. At this stage the applicant still remains optimistic that the dredging can occur under this permit.

14.0 EXISTING COASTAL PERMITS

Please find the updated Existing Coastal Permits Plan included as **Attachment 7.** We have also summarised the permits that have been given effect to within the Table 1 below:

TABLE 1: PERMITS THAT HAVE BEEN GIVEN EFFECT TO

PERMIT NUMBER	PERMIT	HAS IT BEEN IMPLEMENTED
37976	Mangrove vegetation removal	Yes, in part. To be implemented further with more mangrove vegetation removal required to enable the MRC construction
37977	Deposition of material to enhance Chenier Ridge	Yes
37469	Capital dredging	Yes, in part to enable the ferry wharf and wet edge. To be implemented further to enable all tide water access for the MRC
37470	Maintenance dredging	No maintenance dredging has been undertaken
37472	Temporary structures associated with construction	Yes
38179	Ferry Wharf	Yes
36489	Reconstruction of historic wharf and 400m long boardwalk	Yes
37457	Sea wall	Yes

The permits that are in the location of the proposed MRC and water access and need to be surrendered are summarised in **Table 2** below:

TABLE 2: PERMITS THAT NEED TO BE SURRENDERED

PERMIT NUMBER	PERMIT
37468	Artificial headland
37466	Recreational boat ramp and pontoon
37465	Superyacht launching facility
37467	Deposition of sand to create a 70m long beach

The permits listed in Table 2 above cover the area that the MRC and water access is proposed. All other permits in the area are not required to be surrendered to enable the construction of the MRC and water access.

15.0 UNDERWATER NOISE AND CONSTRUCTION METHODOLOGY

The piling activities will include pre auguring followed by use of an impact hammer to install the timber piles for the jetty. The construction methodology will be confirmed by the Contractor once appointed.

As impact piling may be required, the applicant therefore seeks resource consent under F2.19.8(114) as a **Restricted Discretionary** activity.

Styles Group Acoustic & Vibration Consultants have provided an updated Assessment of Construction Noise and Vibration Effects (contained as **Attachment 8**) which has assessed the effects of underwater noise in section 10.3 of the report. The proposed piling will be undertaken in accordance with the underwater noise management recommendations stated in 10.4 of the report. Styles considers the effects on marine fauna will be appropriately managed if the proposal is undertaken in accordance with these recommendations.

16.0 JETTY DESIGN

Tonkin and Taylor have prepared the following response in relation to this query:

The deck level of RL3.4m proposed for the jetty is considered an absolute minimum suitable deck level for a number of Health and Safety reasons as follows:

- Jetty structures should remain largely visible during storm events for the navigational safety of vessels in the harbour. As it is a deck level of RL3.4m is only 350mm above the level of a 1%AEP storm tide and 0.5m sea level rise allowance (for an estimated storm tide water level of RL3.05m). While the deck will not be submerged, the soffit of the deck beams are likely to be at or near the future storm tide level. Wave action on top of this storm tide will result in wave spray across the jetty from every wave, and the largest waves breaking across the jetty deck. While at times parts of the deck will go underwater as the larger waves break across the jetty deck, there should be a sufficient amount of the jetty still visible to alert mariners to the presents of the jetty.

- The jetty deck will not be dry during storm events together with an allowance for future predicted sea level rise.
- Access to the pontoon from the jetty via gangway may still be required during the storm tide event, as when extreme storm tides to occur they tend to coincide with strong north-easterly and easterly wind conditions. This part of the Harbour is protected from large wave action from this direction, so the local wave climate at the time of such a storm would not necessarily prevent navigation, and there is the possibility that the jetty and pontoon may be used in a storm to check vessels on nearby swing mooring. Therefore, the level of the jetty needs to keep the gangway above the storm tide level, so that a degree of access to the pontoon is still achievable during storms.

A more detailed discussion of water levels follows:

When setting the deck level, both extreme storm tide elevations and wave heights need to be considered, together with the likelihood of their joint occurrence. The extreme return period storm tides provided for the Waitemata Harbour in the report by NIWA (2013) are based on extreme north easterly and easterly wind conditions which historically occur when ex-tropical cyclones pass close to the east of the Hauraki Gulf. The project location is largely protected from wind generated waves from the north east, with exposure to a relatively small narrow fetch from this direction, with only small waves resulting at the site.

The site has much greater exposure to larger waves generated from the south, however these do not co-inside with historic extreme storm tide events in the Harbour. Therefore, various combinations of different return periods need to be considered for storm tide level and wave climate from the southerly direction.

Water level is an important factor to ensure the jetty does not go underwater, therefore it was decided to design to the 1% AEP storm tide, 50yr SLR and the 1yr southerly wave condition giving an estimated significant wave crest level of 3.3m AVD-46 (refer to section 3.2.1.3 of the Engineering Design report). Other combinations of extreme return period storm tide and wave conditions need to be assessed as well. If we consider a 50-year return period southerly wave climate together with a 10% AEP storm tide and 50 yr SLR, the estimated significant wave crest level is 3.22m AVD-46, compared. A 0.1m freeboard has been considered for the jetty above the wave crest level of a significant wave in this wave climate, to give the jetty a level of 3.4m AVD-46. These waves will however impact on the deck joists and other parts of the structure causing the jetty to be consistently wet with wave spray during a storm event. The wave crest levels considered have been assessed based on significant wave heights (average height of the highest third of wave heights), not the maximum wave height, which can be 1.5 times greater in this area. When waves larger than the significant wave occur the wave crest will briefly submerge part of the deck as well as causing an increased amount of spray.

This degree of spray and possible wave overtopping is considered acceptable for the various combinations of storm events considered, however a lower deck level would increase the future Health and Safety risk for accessing the structures and for navigational safety of Harbour users.

In relation to levels of similar structures in the area, we estimate that the level of the deck of the jetty deck of the Hobsonville ferry terminal jetty is approximately RL +3.3/+3.4m.

17.0 NOISE

a) The updated Assessment of Construction Noise and Vibration Effects prepared by Styles Group (contained as **Attachment 8**) has addressed construction noise and vibration effects on the Yacht Club Apartments. The updated assessment has found that construction works will comply with the permitted noise limits of the AUP:OP.

b) Styles Group have also provided an Assessment of Noise Effects relating to the operation of the facility included as **Attachment 9**. This confirmed that events being held at the MRC will meet the permitted standards for noise when measured from the nearby apartment buildings. Styles Group have provided criteria and requirements that will ensure compliance with the permitted standards in Table 3 below:

TABLE 3: EVENT NOISE REQUIREMENTS

OPERATING SCENARIO	NOISE CONTROL	
Monday to Saturday	**Before 10:00pm**	**After 10:00pm**
Up to 100 people in function area, inside and on the deck	No restrictions	All people must move inside. Doors can remain open. Windows on the western façade can remain open; all other windows must be closed
100 – 300 people in function area, inside and on the deck	No restrictions	Event must finish before 10:00pm, or be reduced to a maximum of 100 people on site. All remaining people must move inside and abide by requirement above.
Sundays	**Before 6:00pm**	**After 6:00pm**
Up to 100 people in function area, inside and on the deck	No restrictions	All people must move inside. Doors can remain open. Windows on western façade can remain open; all other windows must be closed.
100 – 300 people in function area, inside and on the deck	No restrictions	Event must finish before 6:00pm or be reduced to a maximum of 100 people on site. All remaining people must move inside. Doors can remain open. Windows on western facade can remain open; all other windows must be closed.

Abiding by the requirements of **Table 3** above will ensure the permitted standards for noise are met.

18.0 HOBSONVILLE POINT PRECINCT

Nearly the whole site is outside of the Hobsonville Point Precinct (the 'precinct'). The only works that are proposed within the precinct are the very corner of the preparation deck. The minimal works within the extent of the precinct do not trigger any reasons for consent under the Hobsonville Point Precinct.

With regard to the Hobsonville Point Precinct, the proposal is not inconsistent with the provisions of the precinct. Of relevance to this proposal, the precinct features plan identifies Boundary Road as an indicative coastal walkway and cycle route. This plan also identifies a Harrier Point Park, along with prime viewshafts that look out from the end of Launch Road to the north and across to the east.

The proposal is consistent with the precinct plan because:

- The pedestrian/cycle way along boundary road will be maintained;
- The proposed building and water access do not obstruct the identified prime viewshafts. The proposal even compliments this viewshaft given the water access will be open to public who may choose to walk to the end and be provided with viewshafts in excess of 180
- The identified open space (being Harrier Point) is further enhanced by the proposed preparation deck and water access which will be accessible by the public. Clubrooms are anticipated on or next to parks (especially if zoned informal recreation zone.

19.0 WASTEWATER INFRASTRUCTURE

Please refer to the calculations included as **Attachment 10** which confirm that downstream public lines have enough capacity for the proposed development.

20.0 STORMWATER INFRASTRUCTURE

Please refer to drawing DLH013-02-402 included as **Attachment 11** for clarification on public and private stormwater lines.

21.0 REQUIREMENTS OF THE MARINE AND COASTAL AREA (TAKUTAI MOANA ACT)

Since the application has been lodged, the applicant has sent details of the proposal out to the following contacts at iwi groups to seek their views on the 29th January 2020:

- Scott Lomas - Te Kawerau a Maki
- Jess Hiscox - Ngāti Whatua o Orakei
- Andrew Brown- Ngāti Whatua o Orakei
- Pani Gleeson - Ngāti Whatua o Kaipara
- Jeff Lee - Te Akitai o Waiohua
- Kathleen Wilson - Te Akitai o Waiohua
- Kaitiaki - Te Akitai o Waiohua
- Karl Flavell - Ngāti Te Ata

- Taiao - Ngāti Te Ata
- Lucie - Rutherfurd Ngāti Tamaoho
- Geoff Cook - Ngāti Maru
- Martin Te Moni - Ngāti Whanaunga
- Paulette Reidy - Te Patukirikiri
- Kaitiaki - Ngāti Paoa
- Zaelene Maxwell-Butler - Ngai Tai ki Tamaki

We note that no feedback has yet to be received from these groups.

22.0 EFFECTS ON FERRY OPERATIONS

Tonkin and Taylor have provided the following response to this query:

It is expected that there will be no impact on the existing ferry services as a result of the MRC and water access structure as all activities have co-existed at Hobsonville in the past with the previous launching facilities for the rowing and sailing activities being closer to the ferry wharf. Once boats are launched standard maritime rules will continue to apply, with no disruption to ferry services.

Hobsonville Point/Catalina Bay has been home to the sailing club since the 1930's and rowing club in more recent years. The activities are not new to the area, and the Waitemata Harbour consists of numerous boat ramps, mooring points, jetties and pontoon systems used by clubs and the public which co-exist with ferry operations (e.g. Half Moon Bay, Birkenhead wharf, Westpark Marina, among others).

The proposed water access will be moving away from the ferry terminal, into the shallower area to the south east of Hobsonville Point, at the end of Launch Road. The main channel where a ferry might operate would be at approximately the -5mCD (-6.74mAVD-46) contour, this is approximately over 100m away from the seaward edge of the proposed pontoon (refer to Figure 1). Based on this information, it is expected the ferries remain a minimum of 100m from the pontoon, and all vessels will be visible to each other.

The ferry servicing Hobsonville Point also stops at Beach Haven on the other side of the channel. The path of the ferry between these two wharves keeps it away from the project area as it heads to Beach Haven then across to Hobsonville Point and vice versa. Even if the ferry proceeded directly to Hobsonville Point on the western side of the channel its path is likely to remain in the channel more than 100m away from the new launching facility. near the project site would keep the ferry to the main channel.

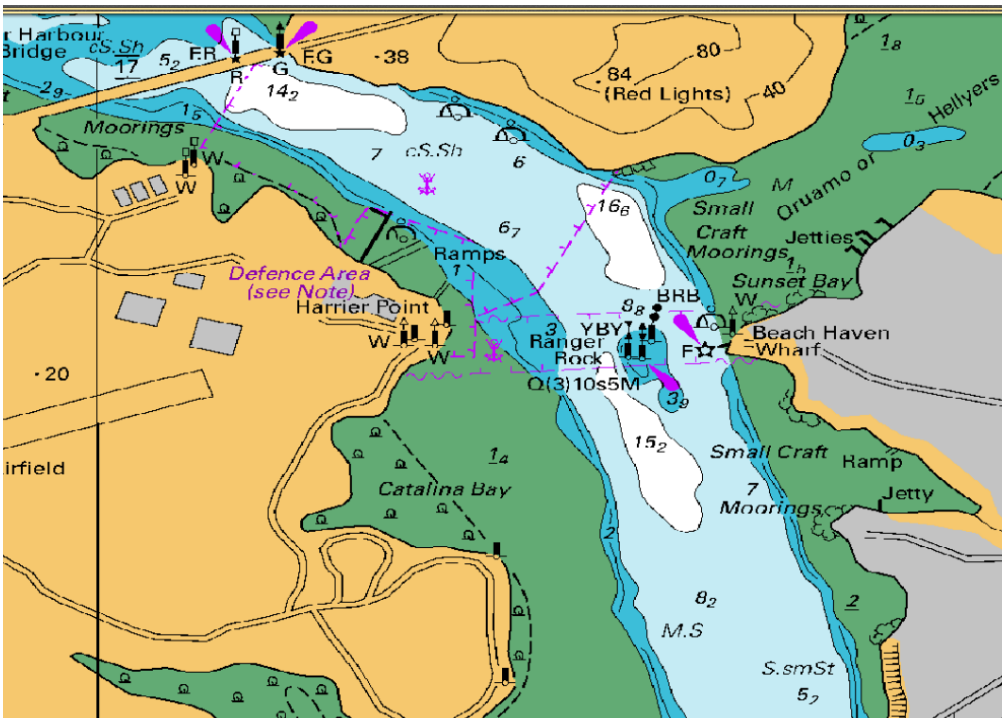


Figure 1 – Extract from Chart NZ 5232 (LINZ, 2020)

23.0 FURTHER INFORMATION REQUESTED AFTER FORMAL SECTION 92 REQUEST

Since the formal Section 92 request, Auckland Transport have requested that the following matters are considered:

- *Management of the effect on car parking as a result of the proposal needs to be considered, particularly at weekends and the growth of ferry service patronage on this route.*

With regard to the above, the parking on Launch Road is existing and would be used by the public regardless of the Marine Rec Centre being built. Use of this parking by people attending activities at the MRC would not generate any effects noticeably different from general use. It is possible that a bus may have to pause temporarily while a driver parks or leaves a parking space, failing to give way to a bus. This would be similar to any other bus route going through a town centre. As noted in the transport assessment letter, for the most part the activities will be low traffic/parking demand generating activities.

In terms of loading activities, the proposed roundabout will have a flush or slightly raised central island, and there will be no splitter islands. This will mean that if people park poorly in the proposed loading zone on the roundabout, buses can easily manoeuvre past them. The detail of loading zone layout and tracking will be shown in the EPA application for the roundabout.

In the interim, it is proposed that loading parking is provided in the existing parallel parking on Launch Road. Launch Road is straight with clear sight lines in this area, so bus drivers can safely and easily manoeuvre past any poorly parked cars in the loading zone if that occurs.

- *The bus route serving the ferry terminal is very important – even more so with the introduction of Ferry Fare Integration in late April. On a general note, if there is any disruption on the route through Hudson Bay Road to the ferry terminal then buses may have to do a U-turn at the roundabout. We need to preserve this as an option in future.*

A roundabout with enough space to accommodate bus U-turn tracking cannot be accommodated within the boundaries available. This has been discussed through the consenting process undertaken for the Catalina Bay developments, and the roundabout proposed can only accommodate up to 10.3m truck U turn tracking.

When Boundary Road is reconstructed as part of the Catalina Bay redevelopment, full closures of the road are likely to be very infrequent. However, if this was to occur, buses could be rerouted down Launch Road to a temporary stop at the top of the stairs that link down to Catalina Bay, then undertake a loop through Bomb Point Drive, Commander Avenue, and Wallace Road (already proposed as a bus route) back to Hobsonville Point Road (shown in yellow below). Alternatively, Waka Moana Drive could be used (shown in green), or any other combination of roads in this area.

These roads are narrow but we have shown some indicative tracking in the screen shots below that shows buses can get through these intersections. Potentially some traffic management could be required to manage potential conflict, but this should be acceptable in the rare occasions full closures of Boundary Road may be required.

While works are being undertaken in Catalina Bay, before the final Launch Road roundabout is constructed, it may also be possible to accommodate temporary U-turn bus tracking. This will be confirmed in the TMP provided as part of that work.

- *Some form of demarcation around water space management should be considered - to ensure that there is a clear, uninterrupted route for the passage of ferries to the Ferry Terminal.*

We do not consider this necessary as the rowing club and sailing club have operated out of the area in a safe manner much longer than the ferry route has been operating. The skiffs and yachts are currently launched on the seaplane ramp which is much closer to the ferry terminal than the proposed MRC location.

We trust the information provided in this letter, along with the enclosed drawings, provides adequate information to satisfy your requests and that the application can be taken 'off hold'. However, should anything require further clarification feel free to contact us.

Yours sincerely
Harrison Grierson

Sam Benson
Planner

Enc 1 - Arborist Assessment
2 – Detailed Site Investigation
3 – Architects Plan Set
4 – Graphic Supplement
5 – Boffa Miskell Memorandum
6 – Roundabout Design
7 – Existing Permits Plan with overlay
8 – Construction Noise and Vibration Assessment
9 – Operational Noise Assessment
10 – Wastewater calculations
11 – Infrastructure Plan

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Arboricultural report

To: Erin Taylor, Project Manager, Kainga Ora erin.taylor@kaingaora.govt.nz

From: Andrew Barrell, Consultant Arborist, Tree 3 Ltd andybarrell@xtra.co.nz

Date: 16 April 2020

Re: Catalina Bay, Hobsonville – tree works in *open space* zone

Asset Owner Approval application – supporting information

Introduction

1) I have been engaged to provide an arboricultural assessment of works at Catalina Bay, Hobsonville that will affect vegetation located within an area zoned as *open space* within the Auckland Council Unitary Plan (AUP).

2) The project involves construction of a new pontoon and jetty as shown in Figure 1 below. This will require removal of vegetation that stands within the *open space* zone and therefore require asset owner approval (AOA) from Auckland Council (AC).

3) I visited the site on 20 January 2020 to assess the proposed works and any vegetation that may be affected. Weather conditions were reasonable at the time of inspection and I had unrestricted access to the area of proposed works. Erin Taylor and Andrew Jefcoate, both from Kainga Ora, were present to explain and clarify the extent and nature of the proposed works.

4) This aim of this report is to provide assessments and recommendations to support an application to secure AOA from AC to carry out the proposed works on this site as detailed below:

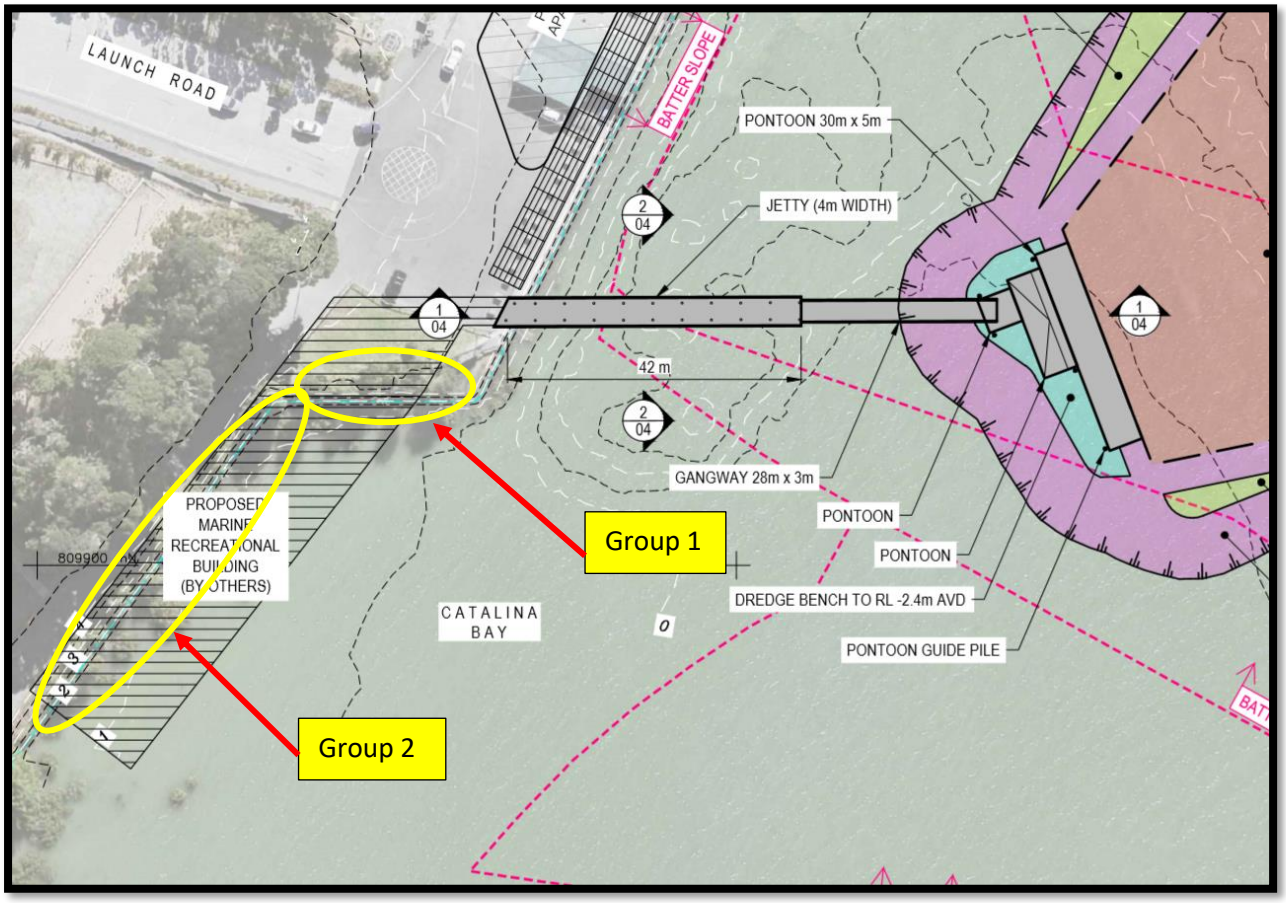
   a) *Provide an assessment of the proposal with regard to the Council vegetation that will need to be removed to accommodate the works at Catalina Bay as discussed on site on 20 Jan 2020 and in accordance with the relevant Auckland Council Unitary Plan Chapter;*
   b) *Provide recommendations to apply to any works in the vicinity of any other protected trees on Council land that may be affected, to include recommendations for suitable construction/site management procedures within root zone areas;*
   c) *Provide guidance for any tree protection measures, mitigation or remedial works that may be required during and post-works.*

5) I have arboricultural experience and qualifications, the details of which are summarised on my company website at the following address: **http://tree3.co.nz/about-us/andy-barrel-cv/**. I have based this report on the supplied information and the recommendations have been made in light of my observations and experience.

Proposal and vegetation implications

6) Figure 1 below is a screenshot of the site plan provided by the Project Manager showing the proposed layout of the development. For ease of reference I have divided the areas of affected vegetation into two sections, Group 1 and Group 2 as shown below.

***Figure 1** – Screenshot of most recent site plan, annotated to show location of relevant vegetation.*



7) The black hatched area shows the extent of the building works with regards to vegetation impacts. All vegetation (Groups 1 and 2) will need to be removed from within this footprint. It has been estimated that this amounts to about 180m^2 of vegetation.

8) There will be scope for adjacent vegetation to be affected by works if prudent site management procedures are not adopted. Such procedures will ensure any collateral and accidental damage to retained vegetation will be avoided, limiting any impacts to the vegetation proposed to be removed.

9) The vegetation consists of primarily native species with ten trees over 4m tall and a selection of lower-level species.

10) Tree protection rules relating to this site are contained in the AUP *Operative in part*. My understanding is that the relevant activities for this proposal are found in *Chapter E16 – Trees in open space zones*, specifically Activity Table E16.4.1, part of which is reproduced below in Table 1. Chapter E15 – *Vegetation management and biodiversity* is also relevant to this proposal – see Table 2.

Table 1 *– Activity table E16.4.1*

Activity		**Activity status**
(A9)	Tree removal of any tree less than 4m in height and less than 400mm in girth	P
(A10)	Tree removal of any tree greater than 4m in height or greater than 400mm in girth	RD

Table 2 *– Activity table E15.4.1*

Activity		**Activity status**
(A21)	Vegetation alteration or removal of greater than 25m^2 of contiguous vegetation or tree alteration or tree removal of any indigenous tree over 3m in height within 20m of mean high water springs in all zones other than in a Rural – Rural Production Zone, Rural – Mixed Rural Zone, Rural – Rural Coastal Zone, Rural – Rural Conservation Zone and Rural - Countryside Living Zone or Future Urban Zone	RD

11) Removal of the ten trees over 4m tall (A10) will have *restricted discretionary* (RD) status and removal of the lower level vegetation will have *permitted activity* status. The relevant assessment criteria from Chapter E16 are addressed below. The vegetation removal also triggers the RD activity status in Table 2 above. The relevant assessment criteria from Chapter E15 are also covered off in the following section.

Assessment of proposed works

12) Group 1 contains six kanuka (*Kunzea ericoides*) ranging in height from 4-7m and with diameter at breast height measurements (dbh) ranging from 50-200mm. There is also one matipo (*Myrsine australis*) and one pohutukawa (*Metrosideros excelsa*), both 4m tall. Group 2 contains one totara (*Podocarpus totara*) of 7m height with dbh of 200mm and one kanuka of 6m height and dbh of 200mm. The remaining understory within both groups includes kohuhu (*Pittosporum tenuifolium*), coprosma (*Coprosma* species), flax *(Phormium tenax*), cotoneaster (weed species) and mangroves further out into the water. Overall the vegetation was in reasonable condition with much of it estimated to be naturally regenerated growth.

13) Figure 2 below shows the vegetation in Group 1 and Figure 3 shows the vegetation in Group 2.

Figure 2 – *Photograph of vegetation referenced as Group 1.*

14) All the vegetation within both groups will have to be removed to accommodate the proposed works. The area is a rapidly-developing hub of Auckland and as such space is very limited and options to relocate projects such as this are significantly constrained by these spatial limitations. The existing rowing and sailing facilities are very close by but are being demolished to make way for other development and the new facilities will be available both to the public and club members. Consequently the loss of this native vegetation should be assessed in light of the wider benefits being provided by the proposal as well as the site constraints.

15) Mitigation to address the loss of this vegetation can be negotiated between the AC Parks Arborist and the applicant and suggestions have been made at the end of this report to guide the extent and nature of any such mitigation.

Figure 3 *– Photograph of vegetation referenced as Group 2.*

16) The relevant assessment criteria from section E16.8.2 of the AUP are addressed below. Any collateral damage to retained vegetation is expected to be avoided by implementation of robust site management procedures and this has been addressed in the recommendations at the end of this report.

(a) the specific values of the trees including any ecological values with respect to water and soil conservation, ecosystem services, stability, ecology, habitat for birds and amelioration of natural hazards;

Comments*:* The extent of the values above is considered to be limited by the average condition of the trees and limited ecological value arising from being located in such close proximity to human activity. It is anticipated the loss can be mitigated relatively easily by replacement planting and the presence of surrounding trees.

(b) the loss of amenity values that tree or trees provided;

Comments: The surrounding vegetation will serve to partially buffer any visual impacts. In addition, new planting will assist with replacing any amenity value loss arising from the tree and shrub removal.

(c) the risk of actual damage to people and property from the tree or trees including the extent to which adverse effects on the health and safety of people have been addressed as required under health and safety legislation;

Comments: Not applicable.

(d) any alternative methods that could result in retaining the tree or trees;

Comments: Alternative options have been rejected due to significant spatial constraints.

(e) the degree to which any proposed mitigation adequately compensates for the values that trees provide;

Comments: It is anticipated that replanting and retention of existing trees will serve to compensate for any perceived loss. The extent of any such mitigation will be agreed upon between the applicant and AC Parks Arborist to ensure it is fit for purpose and adequate.

(f) the degree to which the proposal is consistent with best practice guidelines for tree management;

Comments: Spatial constraints preclude any tree management in this situation; the only realistic option is to mitigate the loss of the trees by new planting.

(g) methods to contain and control plant pathogens and diseases including measures for preventing the spread of soil and the safe disposal of plant material;

Comments: Not applicable.

(h) the provision of a tree works plan to address the effects of the works on the tree or trees and outlining the proposed methods to be used, and where applicable:

(i) the provision of a landscape plan; or

(ii) consistency with any reserve management plan.

Comments: The recommendations at the end of this report provide information relating to the management of adjacent trees during this project and include methodologies for minimising adverse impacts on retained trees as well as recommendations for mitigation planting.

(i) the need for the direction and supervision of an on-site monitoring arborist while the works are being carried out;

Comments: This is detailed in the recommendations in this report.

17) The relevant assessment criteria from section E15.8.2 of the AUP are addressed below.

(a) Ecological values:

(i) the extent to which the vegetation alteration or removal is minimised and adverse effects on the ecological and indigenous biodiversity values of the vegetation are able to be avoided, remedied or mitigated;

(ii) whether vegetation removal will have an adverse effect on threatened species or ecosystems; and

(iii) the extent to which the proposal for vegetation alteration or removal has taken into account relevant objectives and policies in Chapter B7.2 Indigenous biodiversity, B4. Natural heritage, Chapter E18 Natural character of the coastal environment and E19 Natural features and natural landscapes in the coastal environment.

Comments*:* Item (iii) is beyond the scope of an arboricultural report however, I consider that natural features and indigenous biodiversity will not be affected significantly due to the isolated and fragmented location of vegetation being removed in relation to other vegetation which decreases habitat and biodiversity value.

(b) Hazard mitigation:

(i) the extent to which the vegetation serves to avoid or mitigate natural hazards and the amount of vegetation to be retained or enhanced;

(ii) the extent to which the vegetation alteration or removal will increase natural hazard risks; and

(iii) whether the vegetation alteration or removal is necessary to mitigate an identified bushfire risk.

Comments: Not applicable.

(c) Sediment, water quality and hydrology:

(i) the extent to which vegetation alteration or removal will adversely affect soil conservation, water quality and the hydrological function of the catchment and measures to avoid remedy or mitigate any adverse effects.

Comments: I anticipate that appropriate engineering and landscape treatment measures will ensure the proposed vegetation removal will have little or no effect upon the above functions.

(d) Landscape, natural features and natural character values:

(i) the extent to which vegetation alteration or removal will have adverse effects on the values identified for scheduled outstanding natural landscape, outstanding natural features, outstanding natural character and high natural character areas; and

(ii) the extent to which vegetation alteration or removal adversely affects landscape, natural features and natural character values particularly on adjacent public space including the coast, reserves and walkways and measures to avoid, remedy or mitigate any adverse effects.

Comments: Beyond the scope of an arboricultural assessment.

(e) Amenity values:

(i) the extent to which the vegetation alteration or removal will have adverse effects on the amenity values of any adjacent open space including the coast, parks, reserves and walkways and measures to avoid, remedy or mitigate any adverse effects.

Comments: Amenity is a very subjective issue; it essentially relates to what an individual person thinks looks nice and everybody is different to it would not be irrational to assume that everybody has their own opinion about what looks nice or not. It is not the place of an arboriculturalist, or anyone else for that matter, to presume to know the opinion of the wider viewing public and is therefore considered to be beyond the scope of an arboricultural report.

(f) Use:

(i) whether the vegetation alteration or removal is necessary to enable reasonable use of a site for a building platform and associated access, services and living areas, and existing activities on the site;

(ii) the extent to which the vegetation alteration removal is necessary taking into account the need for, or purpose of, the proposed building or structure;

(iii) the extent to which the vegetation alteration or removal is necessary to enable reasonable use of the site for farming purposes;

(iv) whether the vegetation alteration or removal will improve the reliance and security of the network utility, or road network;

(v) whether the vegetation alteration or removal is necessary for a structure that has a functional or operational need to be in the proposed location; and

(vi) the extent of the benefits derived from infrastructure and the road network.

Comments: Vegetation removal is necessary to enable the site to be developed and provide services suited to the specific location. The growing population places increasing pressure on space and other resources and inevitably there has to be some kind of compromise whereby negative attributes of a proposal are evaluated against the positive outcomes. In this situation there will be a loss of some vegetation however the surrounding area is well-vegetated and this will offset the loss of vegetation to a certain degree. The benefits provided to the population in this area who will use the intended facilities will most likely outweigh the loss of what is a relatively minor amount of unremarkable vegetation.

(g) Methods and location:

(i) whether there are practicable alternative locations and methods including consideration of an application to infringe development control where this would result in retention and enhancement of vegetation on the site; and

(ii) whether the effects from the alteration or removal of vegetation and land disturbance can be minimised through works being undertaken on an alternative location on the site, and/or method of undertaking the works.

Comments: Not applicable given the spatial and environmental constraints of the site.

(h) Mitigation measures:

(i) the extent to which revegetation can remedy or mitigate adverse effects, including eco-sourcing and the ongoing maintenance of revegetation measures.

Comments: The extent and nature of any mitigation can be agreed upon between the applicant and the asset owner.

(i) Bonds and covenants:

(i) whether conditions of consent can avoid, remedy or mitigate adverse effects including the imposition of bonds, covenants or similar instruments.

And

(j) Mana Whenua values:

(i) the extent to which any adverse effects on Mana Whenua values can be avoided, remedied or mitigated, and having regard to the objectives and policies in E20 Māori Land whether the proposed works are appropriate to provide for Mana Whenua, mātauranga and tikanga values.

Comments: Not applicable, both issues are beyond the scope of an arboricultural report.

18) The applicant is prepared to plant new vegetation where possible or necessary to assist with mitigating the loss of the vegetation referenced in this report as Groups 1 and 2. The extent and nature of any such planting can be agreed with the AC Parks Arborist and specified within the AOA.

19) These works will have the potential to adversely impact other protected vegetation within the *open space* zone if not managed appropriately. The recommendations in this report will ensure that any adverse impacts arising from tree removal or works in the vicinity of protected trees within this area are insignificant.

Recommendations

20) Prior to commencement of the works referenced in this report, a meeting shall be arranged by the consent holder between the consent holder's arborist ("*works arborist*", a suitably competent and professional arborist, engaged by the consent holder, who can effectively manage site works around protected trees) and the site/project manager. The consent holder is to give the AC Parks Arborist and monitoring officer a minimum notice of five working days prior to this meeting so that they may attend should they wish.

21) The aim of this meeting will be to explain the tree protection matters to the project manager and/or work site supervisory staff who are carrying out any works associated with the project at Catalina Bay, Hobsonville and described in this report. Tree protection will consist of a visible protective fence along the western side of Boundary Road to prevent any accidental encroachments into the root zones of retained trees adjacent to the area of works. This fence will remain in place for the duration of the project and will serve to prevent any access into adjacent root zone areas.

22) Construction-related materials and machinery will be stored away from the permeable root zone area of any trees or other vegetation adjacent to the area of works. Any machinery movements in the vicinity of retained trees may require deployment of a spotter to ensure no impact damage occurs to branches or stems of protected trees.

23) In addition to the tree protection requirements, the extent of vegetation removal will be confirmed at this meeting. No works are to commence on site until the vegetation removal has been completed.

24) Tree removal work is to be limited to removal of the vegetation referenced in this report as Groups 1 and 2. This removal may be carried out by the applicant's agents. Alternatively AC Parks contractors may carry out this removal work at the expense of the applicant. This can be specified in AOA conditions.

25) In summary, it is recommended that Asset Owner Approval be granted for the works described in this report subject to compliance with the recommendations made in this report.

Please feel free to contact me if you require further clarification of any of the above points.

Andrew Barrell

Consultant Arborist, Director, *Tree3 Ltd*

16 April 2020

Auckland Tauranga Wellington Christchurch

PATTLE DELAMORE PARTNERS LTD

Detailed Site Investigation – Marine Recreation Centre

Kāinga Ora – Homes and Communities

Detailed Site Investigation – Marine Recreation Centre

Prepared for

Kāinga Ora – Homes and Communities

April 2020

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Limitations:

This document has been prepared by Pattle Delamore Partners Limited (PDP) on the specific instructions of Kāinga Ora – Homes and Communities (Kāinga Ora) for the limited purposes described in the document. PDP accepts no liability if the document is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

This document has been prepared by PDP on the basis of information provided by Kāinga Ora and others (not directly contracted by PDP for the work), including Auckland Council and Strachan Group Architects. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the document. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This document has been prepared based on the collection and laboratory analysis of soil samples from six location for metals (arsenic, cadmium, chromium, copper, lead, nickel, tin and zinc), polycyclic aromatic hydrocarbons (PAH), tributyltin (TBT), and presence/absence asbestos; and the results from laboratory analyses. The site conditions as described in this document have been interpreted from, and are subject to, this information and its limitations and accordingly PDP does not represent that its interpretation accurately represents the full site conditions.

The information contained within this document applies to sampling undertaken on the dates stated in this document, or if none is stated, the date of this document. With time, the site conditions and environmental standards may change. Accordingly, the reported assessment and conclusions are not guaranteed to apply at a later date.

The advice and opinions expressed in this document are based on the observation and sampling of a series of boreholes at the site. The geological and associated environmental conditions interpolated between the boreholes are not guaranteed to be accurate.

The laboratory test results provide an approximation of the concentration of the tested analytes and are subject to the inherent limitations of the laboratory techniques used for the tests.

This assessment is limited to collection and analysis of soil samples from discrete sampling locations. Interpretations of subsurface conditions, including contaminant concentrations, are not guaranteed at distance away from the specific points of sampling.

If contaminants have been found at the site, it is possible that the contaminants could extend off-site, or that any contaminants existing on neighbouring sites might have contributed to the contamination that exists at the site. The presence or absence of contaminants off-site, and risks associated with any off-site contaminants, are not considered by this document.

Executive Summary

Kāinga Ora – Homes and Communities (Kāinga Ora) commissioned Pattle Delamore Partners Ltd (PDP) to undertake a detailed site investigation (DSI) to support the consenting of the proposed Marine Recreation Centre development at 9 Boundary Road, Hobsonville Point ('the site'). The objectives of this DSI were to assess the likelihood of human health and environmental risk associated with the proposed soil disturbance and change of land use, and assess the requirements for potential resource consents in relation to the *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011* (NESCS, 2012) and the Auckland Unitary Plan – Operative in Part (AUP:OP, 11 October 2019).

The scope of this DSI included sampling observations, collection and selective analysis of soil samples for metals (arsenic, cadmium, chromium, copper, lead, nickel, tin and zinc), polycyclic aromatic hydrocarbons (PAH), tributyltin (TBT), and presence/absence (P/A) asbestos from a target depth of 0.6 m below ground level (bgl) at six locations (SS01 – SS06) across the site. This scope of work has been conducted under the supervision of suitably qualified and experienced practitioners (SQEPs) in accordance with the NESCS.

The key findings of this DSI are as follows:

- Apart from a small amount of refuse encountered within the topsoil/fill material at sample location SS02 and a plastic bag within the topsoil/fill material at SS06, no visual or olfactory evidence of contamination was observed in any of the other collected soil samples. The quantity of this refuse material was minor and the materials were not hazardous nor putrescible.
- No groundwater was encountered in any of the hand augered bores down to the target depth.
- No fragments of asbestos containing material (ACM) were encountered.
- Asbestos was absent in all six shallow soil samples analysed for presence/absence asbestos.
- Samples were found to contain concentrations of metals, PAH or TBT above natural background levels, but none of the analysed soil samples have concentrations of contaminants that exceed the NESCS SCS/EGV for commercial/industrial land use. Therefore, a consent will be required under the NESCS as a controlled activity for the proposed soil disturbance and change in land use. A SMP will be required to support the consent application prior to undertaking any earthworks at the site.

- One surface soil sample (SS02_0.1) has a lead concentration above the AUP:OP permitted activity soil acceptance criteria and therefore, when excavated, the soil associated with this sample will require disposal at an appropriately licensed managed fill or landfill (unless it can be appropriately mixed with cleaner soils, which would allow reuse and / or disposal as managed fill). However, a consent will not be required under the AUP:OP for the proposed soil disturbance nor for an ongoing discharge as the likelihood of any discharge emanating from the small volume of lead-contaminated soils is low.
- Due to the presence of contaminants at concentrations above background values for non-volcanic soils in the Auckland region the soil at the site cannot be considered to be cleanfill and all excess soil not reused onsite will require disposal at an appropriately licensed managed fill or landfill.

Based on the findings of this investigation, the following conclusions have been made in relation to the DSI objectives:

- The soil disturbance associated with the proposed development at the site is not considered to pose an unacceptable risk to human health nor the environment.
- The proposed development:
  - Would be able to be carried out as a permitted activity if the soil disturbance volume is kept below the permitted activity volume limits of the NESCS (i.e. 25 m^3 of soil disturbance per 500 m^2 of site area and/or 5 m^3 of offsite disposal per 500 m^2 of site area in a year). Otherwise, a consent will be required for the soil disturbance and for the change in land use under the NESCS as a controlled activity;
  - Will require a Site Management Plan (SMP), in order to support the NESCS consent application, which will detail the appropriate soils handling and disposal measures that must be implemented, commensurate with the concentrations of contaminants observed at the site; and
  - Should be able to be carried out as a permitted activity under the AUP:OP as the likelihood of any discharge emanating from the small volume of lead-contaminated soil onsite is low.

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Appendices

1.0 Introduction

Pattle Delamore Partners Ltd (PDP) has been engaged by Kāinga Ora – Homes and Communities (Kāinga Ora) to undertake a contaminated site investigation to support the consenting of the proposed Marine Recreation Centre development at 9 Boundary Road, Hobsonville Point (herein referred to as 'the site'). For the purposes of this investigation, the site consists of a grassed open space area located to the south of the Launch Road roundabout and a portion of the esplanade reserve adjacent to Boundary Road to the southwest of the grassed open space area. Refer to Figure 1 for the site extent.

1.1 Background

PDP completed a preliminary site investigation (PSI) report for the site on 20 February 2020, which identified that historical waste disposal to land (i.e. reclaimed land) and port activities (i.e. yacht maintenance facilities) (Categories G5 and F5, respectively on the *Hazardous Activities and Industries List*[1] (HAIL) (Ministry for the Environment [MfE], 2011a)) are more than likely to have occurred historically on the site.

A detailed site investigation (DSI) was recommended to assess the concentration of contaminants of potential concern (COPC) associated with the identified waste disposal to land and port activities prior to undertaking any soil disturbance activities on the site.

1.2 Objectives

The objectives of the DSI were to:

- Assess the likelihood of human health and environmental risk associated with the proposed soil disturbance and change of land use through targeted soil sampling and comparison of analytical results against relevant guidelines/criteria; and
- Assess the requirements for potential consents in relation the *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011* (NESCS, 2012) and the Auckland Unitary Plan – Operative in Part (AUP:OP, 11 October 2019).

[1] The Hazardous Activities and Industries List (HAIL) is a compilation of activities and industries that are considered likely to cause land contamination resulting from hazardous substance use, storage or disposal. The HAIL is intended to identify most situations in New Zealand where hazardous substances could cause, and in many cases have caused, land contamination.

SOURCE:
1. AERIAL IMAGERY (FLOWN 2017), SERVICES AND CONTOUR DATA (VERTICAL DATUM AUCKLAND 1946) PROVIDED UNDER LICENCE FROM AUCKLAND COUNCIL WHO MAKES NO CLAIMS AS TO ITS RELIABILITY, ACCURACY OR ADEQUACY FOR ANY PARTICULAR PURPOSE.
2. CADASTRAL/TOPOGRAPHICAL INFORMATION AND INSET DERIVED FROM LINZ DATA.

SITE LOCATION

SCALE: 1:2,000 (A4)

0 12.5 25 50 75
METRES

1.3 Scope of Work

This report has been prepared in accordance with the requirements of the MfE's *Contaminated Land Management Guidelines (CLMG) No.1: Reporting on Contaminated Sites in New Zealand* (MfE, 2011b) and the NESCS under the supervision of suitably qualified and experienced practitioners (SQEPs). Field work carried out during this investigation was undertaken in accordance with the requirements of MfE's *CLMG No.5: Site Investigation and Analysis of Soils* (MfE, 2011c).

The scope of work has included:

- Collecting soils samples at varying depths to a maximum of depth of 0.6 metres below ground level (m bgl) from six locations (SS01 – SS06) to characterise contaminants (if any) in shallow soils across the site;
- Analysing targeted soil samples for metals (arsenic, cadmium, chromium, copper, lead, nickel, tin and zinc), polycyclic aromatic hydrocarbons (PAH), tributyltin (TBT), and presence/absence asbestos;
- Undertaking an initial assessment of the likelihood of human health or environmental risk associated with the COPC in relation to the proposed soil disturbance and change of land use activities, on the basis of the concentrations of contaminants detected;
- Undertaking an overall assessment of the applicability of the NESCS and the AUP:OP to the proposed soil disturbance works and change of land use; and
- Documenting the findings in this DSI letter report.

2.0 Site Description

2.1 Site Identification

The site is located within the residential suburb of Hobsonville, approximately 10 km northwest of Auckland's Central Business District (as shown in Figure 1). The details of the site are listed in Table 1 below.

Table 1: Site Information

Address	Legal Description	CT Number	Approximate Area (ha)
9 Boundary Road, Hobsonville Point	LOT 9 DP 511649	786143	0.08

2.2 Land Use – Current & Proposed

The site is currently a recreation reserve, is zoned as Open Space - Informal Recreation Zone under the AUP:OP, and is located on the foreshore of the Waitematā Harbour. For the purposes of this investigation, the site consists of the grassed open space area located to the south of the Launch Road roundabout, and a portion of the esplanade reserve adjacent to Boundary Road, to the southwest of the grassed open space area (as shown in Figure 1).

The site is proposed to be developed into a Marine Recreation Centre with water access structures (jetty and pontoon). The preliminary plan, showing the proposed concept drawings of the development, can be found in Appendix A. The development will include construction of a 'boat preparation deck' and the landward end of a timber jetty within the area of the site that is currently comprised of grassed open space; and the construction of a building to house the Marine Recreation Centre, which will extend along the Boundary Road esplanade, and out into the CMA.

The development plans anticipate that there will be excavation to an average depth of approximately 0.6 m bgl across the areas where construction will take place. In addition, there will be piling along the esplanade reserve to support the Marine Recreation Centre structure.

2.3 Site Condition and Surrounding Environment

Most of the site consists of a relatively flat grassed reserve area with shrubs/trees along the southern boundary. The areas along the northern and western boundaries are comprised of an existing asphalt-paved car park and road (Boundary Road), respectively. The Waitematā Harbour is adjacent to the east and south of the site's existing rock seawalls. The coastal marine habitat immediately south of the site's southern rock seawall consists of sparse mangroves.

Boundary Road (also known as the Hobsonville Point Coastal Walkway) extends further to the south from the southwest corner of the site. A grassed embankment slopes down to a rock seawall to the east of Boundary Road.

3.0 Geology and Hydrogeology

The Institute of Geological and Nuclear Sciences (GNS) 1:250,000 scale online geological map shows the regional geology consists of Neogene sedimentary rocks, which includes alternating sandstone and mudstone with variable volcanic content and interbedded volcaniclastic grits.

The nearest surface waterbody is the Waitematā Harbour immediately to the east and south of the site. Based on the general topography and geology surrounding the site, the local groundwater level is expected to be approximately

1-2 m below the site (at sea level) and the groundwater flow is expected to be towards the Waitematā Harbour.

Local geology, as identified during this investigation, generally consists of a layer of topsoil/fill from surface to 0.3 m bgl underlain by a silt material to the target depth of the hand augered bores (being 0.6 m bgl). The topsoil/fill material that was encountered consisted of gravelly/sandy silt. The underlying material consisted of sandy silt with some gravel, scattered shell fragments and increasing clay content with depth. A thin (approximately 5 cm) clay lens was encountered between the topsoil/fill and underlying material at two locations (SS02 and SS04). The embankment adjacent to Boundary Road consisted of gravelly/sandy silt and was underlain by silty clay with some gravels. Groundwater was not encountered in any of the hand augered bores down to the target depth.

3.1 Sensitive Aquifer Assessment

An assessment of the sensitivity of the aquifer with respect to groundwater use and potential effects on aquatic receptors has been undertaken in accordance with Module 5, Section 5.2.3 of the MfE's *Guidelines for Assessing and Managing Petroleum Hydrocarbon Sites in New Zealand* (Petroleum Hydrocarbon Guidelines) (1999). While the site is not anticipated to be a petroleum hydrocarbon contaminated site, the Petroleum Hydrocarbon Guidelines (MfE, 1999) are considered to provide a useful and widely applicable set of criteria for determining if potential groundwater contamination at a site poses a risk to groundwater users, or the receiving environment.

Based on the area in which the site is located, where extraction and use of groundwater is deemed unlikely, the shallow aquifer beneath the site is not considered sensitive with regards to use, as per Section 5.2.3 of Petroleum Hydrocarbon Guidelines (MfE, 1999).

Additionally, given the unlimited dilution potential of the Waitematā Harbour, it is not considered a sensitive surface waterbody based on Section 5.2.3 of the MfE's Petroleum Hydrocarbon Guidelines (1999).

4.0 Historical Site Contamination

A PSI was completed for the site by PDP in February 2020 (PDP, 2020). The sources of potential contamination from current or historical HAIL land uses identified though the PSI report was the historical land reclamation of the site (HAIL category G5: waste disposal to land) and historical use of the site for yacht maintenance facilities (HAIL category F5: vessel maintenance activities).

5.0 Site Investigation

The number of sample locations, depth ranges for sampling, and the COPC that the samples were analysed for were informed by the Conceptual Site Model (CSM) for the site; refer to PDP's PSI (2020), with reference to the proposed development plans for the site as communicated to PDP by Kāinga Ora (through emails on 23 January 2020 and 26 February 2020) prior to the DSI. A Sampling and Analysis Plan (SAP) was prepared which detailed the site investigation activities and rationale. The SAP is included with the report for reference, in Appendix B. In addition to the recommendations for sampling made in the SAP, soil samples were collected from a total of six locations (as shown in Figure 2) on 28 February 2020 as described below.

5.1 Soil Sampling Methodology

Soil sampling was undertaken in general accordance with the *CLMG No.5: Site Investigation and Analysis of Soils* (revised 2011) (MfE, 2011c).

The soil sampling works comprised:

- Collection of soil samples (0.0-0.6 m bgl) from a total of six test pits/boreholes, hand-excavated in locations across the site (SS01 – SS06) using a stainless-steel spade and hand auger;
- The soil samples were placed in new laboratory supplied glass and/or plastic jars and couriered to RJ Hill Laboratories (Hills) in Hamilton, with Chain of Custody documentation; and

As noted in the SAP the test pit/boreholes were extended to a depth of 0.6 m bgl as this is the average excavation depth across the site as recorded on the site development plans (refer to Appendix A). Samples were collected at various depths within each test pit/borehole. As a minimum, samples were collected from the topsoil layer at the ground surface (0-0.1 m bgl), and from within the underlying fill material at a depth of 0.3 m bgl.

Based on the potential HAIL activities that were initially identified at the site, the shallow soil samples were selectively analysed for metals, PAH, TBT and presence/absence (P/A) asbestos as per the analytical schedule in Table 2. The selection of analysis for individual samples was based on obtaining information on the contaminant conditions in soils across the site, and across the target depth range.

SITE LOCATION

SOURCE:
1. AERIAL IMAGERY (FLOWN 2017), SERVICES AND CONTOUR DATA (VERTICAL DATUM AUCKLAND 1946) PROVIDED UNDER LICENCE FROM AUCKLAND COUNCIL WHO MAKES NO CLAIMS AS TO ITS RELIABILITY, ACCURACY OR ADEQUACY FOR ANY PARTICULAR PURPOSE.
2. CADASTRAL/TOPOGRAPHICAL INFORMATION AND INSET DERIVED FROM LINZ DATA.

SAMPLING LOCATION PLAN

SCALE: 1:500 (A4)

0 5 10 20

METRES

Table 2: Summary of Sample ID and Laboratory Analytical Schedule			
Sample ID	**Depth (m bgl)**	**Soil Type**	**Laboratory Analysis**
SS01_0.1	0.1	Sandy gravelly SILT	Metals, PAH, TBT and P/A asbestos
SS01_0.3	0.3	Sandy SILT	Metals, PAH and TBT
SS02_0.1	0.1	Sandy gravelly SILT	Metals, PAH and TBT
SS02_0.3	0.3	Sandy SILT	Metals, PAH, TBT and P/A asbestos
SS03_0.1	0.1	Sandy gravelly SILT	Metals, PAH, TBT and P/A asbestos
SS03_0.4	0.4	Sandy SILT	Metals, PAH and TBT
SS03_0.6	0.6	Silty CLAY	Hold Cold
SS04_0.1	0.1	Sandy gravelly SILT	Metals, PAH and TBT
SS04_0.4	0.4	Sandy SILT	Metals, PAH, TBT and P/A asbestos
SS05_0.1	0.1	Sandy gravelly SILT	Metals, PAH, TBT and P/A asbestos
SS05_0.3	0.3	Silty CLAY	Metals, PAH and TBT
SS06_0.1	0.1	Sandy gravelly SILT	Metals, PAH and TBT
SS06_0.3	0.3	Silty CLAY	Metals, PAH, TBT and P/A asbestos

6.0 Assessment Criteria

The following assessment criteria were used to screen the soil sample results.

6.1 Background Concentrations

According to Regulation 5(9) of the NESCS, if a DSI can demonstrate that any contaminants on a HAIL site are at, or below, background concentrations, then the NESCS regulations do not apply. To assess heavy metal results, Auckland Council Background Concentrations for metals are taken from the Non-volcanic Range Soils of Table E30.6.1.4.2 in the AUP:OP. Small amounts of hydrocarbon compounds (including PAH) may be present naturally due to natural bush fires, volcanic eruptions and decaying organic matter but, as these are extremely variable, background data is not presented for these compounds. Relevant background concentrations are summarised in Table 3 in Section 7.2.

Note that for anthropogenic contaminants such as TBT, there is no concentration above the laboratory limit of detection which can be considered to be 'background'. A detection of these contaminants in a sample equates to an exceedance of background concentrations.

6.2 Soil Contaminant Standards (NESCS)

The NESCS provides soil contamination standards (SCSs) for seven inorganic substances and five organic compounds (or groups of compounds). SCSs are available for these substances and compounds when present in soil, for five land use scenarios. The contaminants analysed at this site for which SCSs are available are arsenic, cadmium, chromium, copper, lead and benzo(a)pyrene (equivalent). For this site, a commercial/industrial land use scenario was adopted, which includes the following source-pathway-receptor assumptions:

- The selected commercial/industrial SCSs assume that intended future land use will be a commercial/industrial site with varying degrees of exposed soil.
- Potential receptors include site workers during the proposed development work, and site maintenance personnel and general public following the development.
- The NESCS adopted standards for commercial/industrial land use have been used to assess risks to both site workers and end users of the site.
- It has been assumed that the soil pH is 5, and that all lead is present in inorganic form.

Relevant SCSs are summarised in Table 3 below in Section 7.2.

6.3 Other Applicable Human Health Standards

For contaminants of concern that are not priority contaminants, the NESCS references the hierarchy defined in the MfE's *CLMG No.2 – Hierarchy and Application in New Zealand of Environmental Guideline Values* (MfE, 2011d).

In accordance with this hierarchy, the Australian National Environment Protection Council (NEPC) (1999 rev: 2013) National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM) *Guidelines on investigation levels for soil and groundwater* (NEPC, 2013) has been used for two metals (nickel and zinc). Health-based investigation levels for 'Commercial/Industrial D' land use have been selected in accordance with the proposed end use of the site and to protect site workers during the development work. 'Commercial/Industrial D' investigation levels are described in the ASC NEPM to include "premises such as shops, offices, factories and industrial sites" (NEPC, 2013).

The Regional Screening Levels for Chemical Contaminants at Superfund Sites (US EPA regions 3, 6 and 9 (accessed Oct 2012)) has been used for tin and TBT.

In addition, the MfE's Petroleum Hydrocarbon Guidelines (MfE, 1999) has been used for two PAH compounds (naphthalene and pyrene). The Tier 1 soil acceptance criteria for Commercial/Industrial use, All Pathways, sandy silt, surface (<1 m) depth has been selected.

Relevant Environmental Guideline Values (EGV) are summarised in Table 3 in Section 7.2.

6.4 Auckland Council Criteria

Rule E30.6.1.4 of the AUP:OP sets out the soil acceptance criteria for the discharge of contaminants to comply with the permitted activity standards. The permitted activity soil acceptance criteria referenced in this report have been selected from Table E30.6.1.4.1 and are summarised in Table 3 in Section 7.2.

7.0 Results

Results from field observations and soil sampling are outlined below.

7.1 Sampling Observations

The following observations were made during the collection of soil samples:

- A small amount of refuse consisting of a cobble-sized cement fragment, woven rope and plastic bag was encountered within the topsoil/fill material at SS02. A plastic bag was also encountered within the topsoil/fill material at SS06. It is noted that the quantity of this refuse material was minor and that it was not hazardous nor putrescible.
- With the exception of the above, no visual or olfactory evidence of contamination was observed in any of the other collected soil samples.
- No groundwater was encountered in any of the hand augered bores down to the target depth of 0.6 m bgl.
- No fragments of asbestos containing material (ACM) were encountered.

7.2 Soil Sample Results

Laboratory analytical results of the analysed soil samples are summarised in the Table 3 below. The laboratory analytical reports are provided in Appendix C.

Table 3: Summary Laboratory Results of Analysed Soil Samples [1]

Sample Name	MRC_SS01_0.1	MRC_SS01_0.3	MRC_SS02_0.1	MRC_SS02_0.3	MRC_SS03_0.1	MRC_SS03_0.4	MRC_SS04_0.1	MRC_SS04_0.4	MRC_SS05_0.1	MRC_SS05_0.3	MRC_SS06_0.1	MRC_SS06_0.3	Background Ranges of Trace Elements in Auckland Soils Non-Volcanic [2]	AUP:OP Permitted Activity Criteria [3]	NES-CS SCS & EGV Commerical/Industrial outdoor worker (unpaved) [4]	Tier 1 Soil Acceptance Criteria [9,10] ALL PATHWAYS Sandy SILT / Silty CLAY Surface (<1 m)
Laboratory Reference	2332399.1	2332399.2	2332399.3	2332399.4	2332399.5	2332399.6	2332399.8	2332399.9	2332399.10	2332399.11	2332399.12	2332399.13				
Date	28-Feb-20															
Soil Type - Field	Sandy gravelly SILT	Sandy SILT	Sandy gravelly SILT	Sandy SILT	Sandy gravelly SILT	Sandy SILT	Sandy gravelly SILT	Sandy SILT	Sandy gravelly SILT	Silty CLAY	Sandy gravelly SILT	Silty CLAY				
Soil Type - MfE (2011)	Sandy SILT	Sandy SILT	Sandy SILT	Sandy SILT	Sandy SILT	Sandy SILT	Sandy SILT	Sandy SILT	Sandy SILT	Silty CLAY	Sandy SILT	Silty CLAY				
Sample depth (m bgl)	0.1	0.3	0.1	0.3	0.1	0.4	0.1	0.4	0.1	0.3	0.1	0.3				
Metals																
Arsenic	3	7	**14**	7	< 2	7	7	7	4	4	5	4	0.4 - 12	100	70	-
Cadmium	0.14	< 0.10	**0.82**	0.14	< 0.10	< 0.10	0.43	0.2	< 0.10	< 0.10	0.17	< 0.10	<0.1 - 0.65	7.5	1,300	-
Chromium	18	13	46	16	7	12	17	14	24	10	23	9	2 - 55	400	6,300 [5]	-
Copper	21	10	**196**	32	**50**	9	**64**	45	**85**	13	42	13	1 - 45	325	>10,000	-
Lead	**67**	20	**290**	50	14.4	17.8	**172**	60	**118**	28	**100**	25	<5 - 65	250	3,300 [6]	-
Nickel	14	8	**52**	14	11	9	18	13	**87**	12	**36**	6	0.9 - 35	105	6,000 [7]	-
Tin	1.8	2	**5.6**	2	< 1.0	1.6	1.6	1	1.1	2.2	1.5	1.7	<0.7 - 4	-	610,000 [8]	-
Zinc	35	33	**260**	52	60	30	71	41	60	17	74	14	9 - 180	400	400,000 [7]	-
Polycyclic Aromatic Hydrocarbons																
Naphthalene	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.07	< 0.06	< 0.07	-	-	-	(210) / (230) [11,12v]
Non-carc. (Pyrene)	1	10.7	3.2	0.78	0.16	3.1	1.04	1.23	10.6	3.3	11.2	0.89	-	-	-	NA [13]
Benzo(a)pyrene eq. [14]	0.57	8	2.7	0.75	0.18	4.2	0.98	0.84	8.7	2.5	11.5	0.79	-	20	35	-
Total PAH	5.7	66	21	5.4	1.2	26	7.2	7.4	71	22	82	5.9	-	-	-	-
Tributyl Tin																
Dibutyltin (as Sn)	< 0.005	< 0.005	0.053	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	-	-	-	-
Monobutyltin (as Sn)	< 0.007	< 0.007	0.009	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	-	-	-	-
Tributyltin (as Sn)	< 0.004	< 0.004	0.118	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004	-	-	180 [8]	-
Triphenyltin (as Sn)	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003	-	-	-	-
Asbestos In Soil																
P/A Asbestos	Absent	NA	NA	Absent	Absent	NA	NA	Absent	NA	Absent	NA	Absent	-	-	-	-

14	Concentration exceeds natural background concentrations in Auckaland Non-Volcanic Soils
290	Concentration exceeds AUP:OP Permitted Activity Criteria
NA	Not analysed
-	No guideline value available

Notes.
1. Results in mg/kg.
2. Criteria from Table E30.6.1.4.2 of the Auckland Unitary Plan Operative in Part (from Table 3 of TP153: Background Concentrations of Inorganic Elements in Soils from the Auckland Region (ARC, 2001) - Non-Volcanic).
3. Criteria from Table E30.6.1.4.1 of the Auckland Unitary Plan Operative in Part (AC, 2019).
4. Human Health Criteria values come from Table B2 and B3, Appendix B of the Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations (NESCS, 2011): Commercial/Industrial.
5. Guideline value (from NESCS, 2011) is for Chromium VI.
6. Lead is inorganic lead
7. Criteria from Schedule B(1) Guideline on Investigation Levels for Soils and Groundwater National Environment Protection Measure (NEPM, 2013). Table 1-A Health Investigation Levels for soil contaminants (mg/kg) - Commercial/Industrial Landuse (HIL D).
8. Criteria from the Regional Screening Levels for Chemical Contaminants at Superfund Sites (US EPA regions 3, 6 and 9 (accessed Oct 2012)).
9. Criteria from Guidelines for Assessing and Managing Petroleum Hydrocarbon Contaminated Sites in New Zealand, Revised 2011 (MfE 2011).
10. Criteria assume commercial/industrial land use, 'sandy silt' and 'silty clay' soil type and contamination depths of <1 m below ground level.
11. Brackets denote values exceed threshold likely to correspond to formation of residual separate phase hydrocarbons.
12. The following notes indicate the limiting pathway for each criterion: m - maintenance/excavation, v - volatilisation, x - PAH surrogate.
13. NA indicates contaminant is not limiting as health based criterion is significantly higher than may be encountered on site.
14. Risk associated with mixture of carcinogenic PAH assessed by comparison with the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011. Where a laboratory result for an individual PAH compound is below the laboratory detection limit the concentration is taken to be half the detection limit.

Laboratory analytical results of the 12 analysed soil samples indicates that:

- The concentrations of arsenic (in soil sample SS02_0.1), cadmium (in soil sample SS02_0.1), copper (in four soil samples), lead (in five soil samples), nickel (in three soil samples), tin (in soil sample SS02_0.1) and zinc (in soil sample SS02_0.1) are above background values for non-volcanic soils in the Auckland region. All these soil samples were collected from the surface topsoil layer;
- The concentration of lead in soil sample SS02_0.1 (290 mg/kg) exceeds the AUP:OP permitted activity criteria (250 mg/kg);
- Apart from the above, the concentrations of metals in the analysed soil samples are below their respective background ranges for non-volcanic soils in the Auckland region, the AUP:OP permitted activity soil acceptance criteria and the NESCS SCS/EGV for commercial/industrial land use;
- PAH were detected in all 12 soil samples but:
  - The concentrations of benzo(a)pyrene (equivalent) are below the AUP:OP permitted activity soil acceptance criteria (20 mg/kg) and the NESCS SCS for commercial/industrial land use (35 mg/kg);
  - As pyrene is not limiting (the estimated health-based criterion is significantly higher than that likely to be encountered onsite) the detected concentrations are not expected to be a risk to human health; and
  - The concentrations of naphthalene are below the laboratory's detection limit and are therefore below the NESCS EGV for commercial/industrial land use (210 mg/kg);
- TBT was not detected in any of the soil samples analysed except for soil sample SS02_0.1 with a concentration of 0.118 mg/kg, which is below the NESCS EGV for commercial/industrial land use (180 mg/kg); and
- Asbestos was absent in all six shallow soil samples analysed for presence/absence asbestos.

8.0 Conceptual Site Model and Risk Assessment

A conceptual site model (CSM) was developed as part of the PSI completed by PDP in February 2020. The CSM has been updated to reflect the findings of this DSI, as summarised below in Table 4.

As asbestos was absent in the analysed soil samples and none of the analysed soil samples have concentrations of metals, PAH or TBT that are above the NESCS SCS/EGV for commercial/industrial land use, the soil at the site is not considered to pose an unacceptable risk to human health for the proposed development.

While the lead concentration of one surface soil sample exceeds the AUP:OP permitted activity soil acceptance criteria, due to its small volume (i.e. the area immediately surrounding sample SS02 and to a depth of <0.3 m bgl, at which depth the concentration of lead was found to be below background level for non-volcanic soils in the Auckland region) onsite, the likelihood of any discharges emanating from this soil is low and therefore is not considered to pose an unacceptable risk to the environment.

Table 4: Conceptual Site Model

Potential source of contamination	Reclaimed land	Yacht maintenance facilities
HAIL Category	G5: Waste disposal to land (including filling of land with potentially contaminated soils)	F5: Port activities including dry docks or marine vessel maintenance facilities (including yacht maintenance)
Contaminants of potential concern	Metals, PAH and fragments of ACM	Metals, paint scrapings (tin and lead) and antifoulant (TBT)
Potential exposure pathways	Dermal contact and soil ingestion (site workers and future site users), surface runoff (towards the Waitematā Harbour) during soil disturbance activities	
Receptors	Site workers, future site users (should soil remain onsite), Waitematā Harbour	
Complete / Incomplete Pathways	All pathways incomplete: concentrations of contaminants are below applicable human health and environmental guideline values	

9.0 Regulatory Assessment (Contaminated Land)

9.1 NESCS

The NESCS regulation applies to the activities of soil disturbance and change of land use on a piece of land where HAIL activity is being / has been / is more likely than not to have been undertaken. The results of the historical review identified waste disposal to land (i.e. reclaimed land) and port activities (i.e. yacht maintenance facilities) are more likely than not to have occurred historically on the site.

The volume of soil that may be disturbed during the proposed Marine Recreation Centre development is currently estimated to be approximately 233 m^3 (SGA, 2019), which exceeds the permitted activity volume limits set out in Regulations 8(3)(c) and 8(3)(d)(ii) of the NESCS (i.e. 25 m^3 of soil disturbance per 500 m^2 of site area and/or 5 m^3 of offsite disposal per 500 m^2 of site area in a year). Therefore, as concentrations of metals in excess of background values for non-volcanic soils in the Auckland region but below the NESCS SCS/EGV for commercial/industrial land use were detected in all of the collected surface soil samples, the requirements of regulation 9(1) for soil disturbance apply.

With respect to the change in land use that is occurring, the DSI has found that the soil contamination does not exceed the applicable NESCS SCSs/EGVs.

As such, it is considered that the soil disturbance and change in land use associated with the proposed development will require application for consent as a controlled activity under regulation 9 of the NESCS. This will require a Site Management Plan (SMP) be prepared prior to undertaking any earthworks at the site.

9.2 AUP:OP

Discharges of contaminants into air, or into water, or onto or into land from disturbing soil on land containing elevated levels of contaminants as a permitted activity are regulated by AUP:OP rules E30.6.1.2 and E30.6.1.4.

Rule E30.6.1.2 requires that:

- The volume of cumulative soil disturbance at a site is less than 200 m^3;
- The discharge must not contain separate phase liquid contaminants; and
- The duration of soil disturbance must not exceed two months.

Rule E30.6.1.4 requires that:

- Contaminant concentrations, or the 95% upper confidence limit of the mean concentration, must not exceed:
  - The AUP:OP permitted activity soil acceptance criteria;
  - For contaminants not included in the AUP:OP permitted activity soil acceptance criteria, a number of additional specified guidelines; or
  - The natural background levels for that soil or fill material or the relevant background levels specified in Table E30.6.1.4.2; and
- Any discharge from land containing elevated levels of contaminants must not contain separate phase liquid contaminants.

While the lead concentration of one surface soil sample exceeds the AUP:OP permitted activity soil acceptance criteria, the volume of this lead-contaminated soil is estimated to be below 200 m^3 (the area immediately surrounding the sample location, and to a depth of <0.3 m bgl). Therefore, it is considered that a consent under the AUP:OP is not required for the soil disturbance associated with the proposed development. Further, a discharge consent is not considered to be required as the quantity of soils containing lead at concentrations above the PA criteria is small and the soils are located above the groundwater table. On this basis, the potential for a discharge to occur which could result in adverse impacts on the nearby environmental receptor (i.e. the Waitemata Harbour) is low.

10.0 Conclusions and Recommendations

PDP has been engaged by Kāinga Ora to undertake a DSI to support the consenting of the proposed Marine Recreation Centre development at 9 Boundary Road, Hobsonville Point. The objectives of this DSI were to assess the likelihood of human health and environmental risk associated with the proposed soil disturbance and change of land use, and assess the requirements for potential resource consents in relation to the NESCS and the AUP:OP.

This investigation included sampling observations, collection and selective analysis of soil samples for metals, PAH, TBT, and P/A asbestos from a target depth of 0.6 m bgl at six locations (SS01 – SS06) across the site.

The key findings of this DSI are as follows:

- Apart from a small amount of refuse encountered within the topsoil/fill material at sample location SS02 and a plastic bag within the topsoil/fill material at SS06, no visual or olfactory evidence of contamination was observed in any of the other collected soil samples. The quantity of this refuse material was minor and it was not hazardous nor putrescible.
- No groundwater was encountered in any of the hand augered bores down to the target depth.
- No fragments of ACM were encountered.
- Asbestos was absent in all six shallow soil samples analysed for presence/absence asbestos.
- Samples were found to contain concentrations of metals, PAH or TBT above natural background levels, but none of the analysed soil samples have concentrations of contaminants that exceed the NESCS SCS/EGV for commercial/industrial land use. Therefore, a consent will be required under the NESCS as a controlled activity for the proposed soil disturbance and change in land use. A SMP will be required to support the consent application prior to undertaking any earthworks at the site.

- One surface soil sample (SS02_0.1) has a lead concentration above the AUP:OP permitted activity soil acceptance criteria and therefore, when excavated, the soil associated with this sample will require disposal at an appropriately licensed managed fill or landfill (unless it can be appropriately mixed with cleaner soils, which would allow reuse and / or disposal as managed fill). However, a consent will not be required under the AUP:OP for the proposed soil disturbance nor for an ongoing discharge as the likelihood of any discharge emanating from the small volume of lead-contaminated soils is low.
- Due to the presence of contaminants at concentrations above background values for non-volcanic soils in the Auckland region the soil at the site cannot be considered to be cleanfill and all excess soil not reused onsite will require disposal at an appropriately licensed managed fill or landfill.

Based on the findings of this investigation, the following conclusions have been made in relation to the DSI objectives:

- The soil disturbance associated with the proposed development at the site is not considered to pose an unacceptable risk to human health nor the environment.
- The proposed development:
  - Would be able to be carried out as a permitted activity if the soil disturbance volume is kept below the permitted activity volume limits of the NESCS (i.e. 25 m^3 of soil disturbance per 500 m^2 of site area and/or 5 m^3 of offsite disposal per 500 m^2 of site area in a year). Otherwise, a consent will be required for the soil disturbance and for the change in land use under the NESCS as a controlled activity;
  - Will require a SMP, in order to support the NESCS consent application, which will detail the appropriate soils handling and disposal measures that must be implemented, commensurate with the concentrations of contaminants observed at the site; and
  - Should be able to be carried out as a permitted activity under the AUP:OP as the likelihood of any discharge emanating from the small volume of lead-contaminated soil onsite is low.

11.0 References

AC, 2019. *Auckland Unitary Plan Operative in Part.* Auckland Council (Updated 11 October 2019).

MfE, 1999 (revised 2011). *Guidelines for Assessing and Managing Petroleum Hydrocarbon Sites in New Zealand*. Ministry for the Environment.

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SGA, 2019. *Architectural Drawings*. Strachan Group Architects.

Appendix A

Proposed Development Concept Plan

No.	Rev	Sheet Name
Set RC Resource Consent Set		
RC01		Title Page
RC02		Site Plan
RC03		Forecourt Plan
RC04		Foundation and Earthworks Plan
RC05		Jetty Foundation Plan
RC06		Ground Floor Plan
RC07		Upper Floor Plan
RC08		Building Elevations
RC09		Building Elevations II
RC10		Jetty
RC11		Site - AUP Zoning Plan

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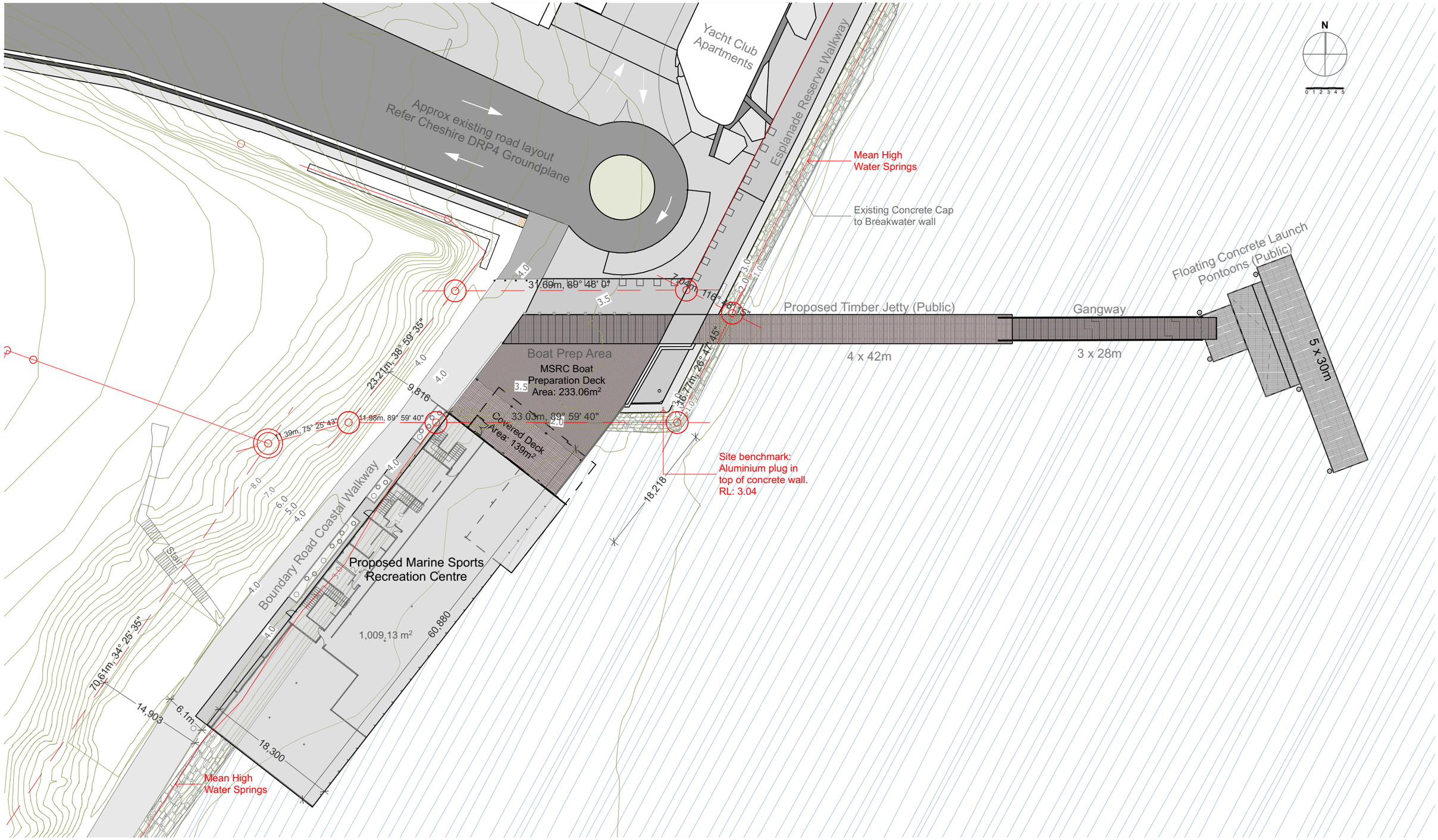
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Title Page	2/09/19	Resource Consent Application	RC01
Project No. 1852							**Page** 1 of 11	**Scale** at A3	**Revision Number**



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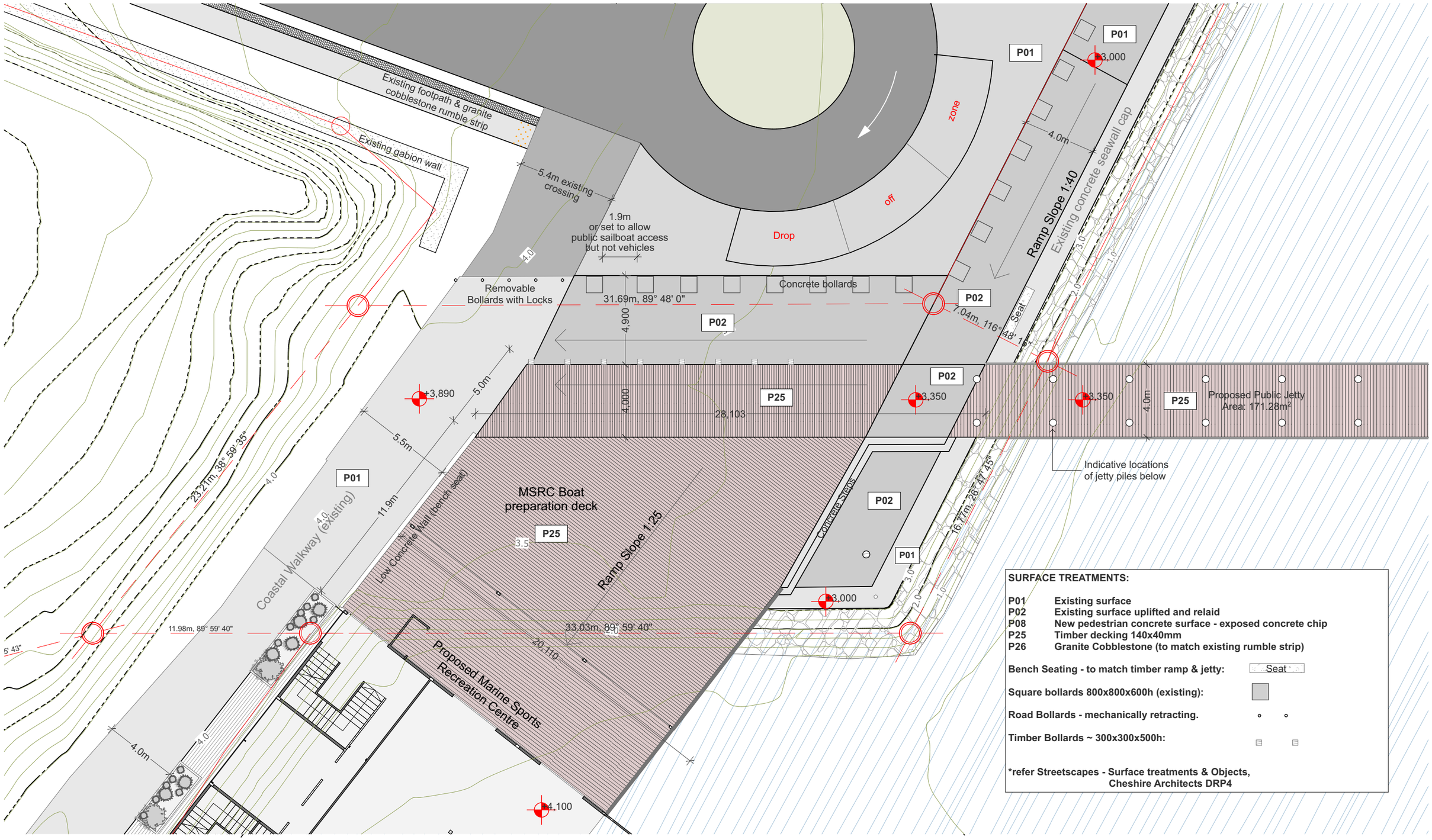
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Site Plan	2/09/19	Resource Consent Application	RC02
Project No. 1852							**Page** 2 of 11	**Scale** 1:500 at A3	**Revision Number**



SURFACE TREATMENTS:

P01	Existing surface
P02	Existing surface uplifted and relaid
P08	New pedestrian concrete surface - exposed concrete chip
P25	Timber decking 140x40mm
P26	Granite Cobblestone (to match existing rumble strip)

Bench Seating - to match timber ramp & jetty: Seat

Square bollards 800x800x600h (existing):

Road Bollards - mechanically retracting.

Timber Bollards ~ 300x300x500h:

*refer Streetscapes - Surface treatments & Objects, Cheshire Architects DRP4

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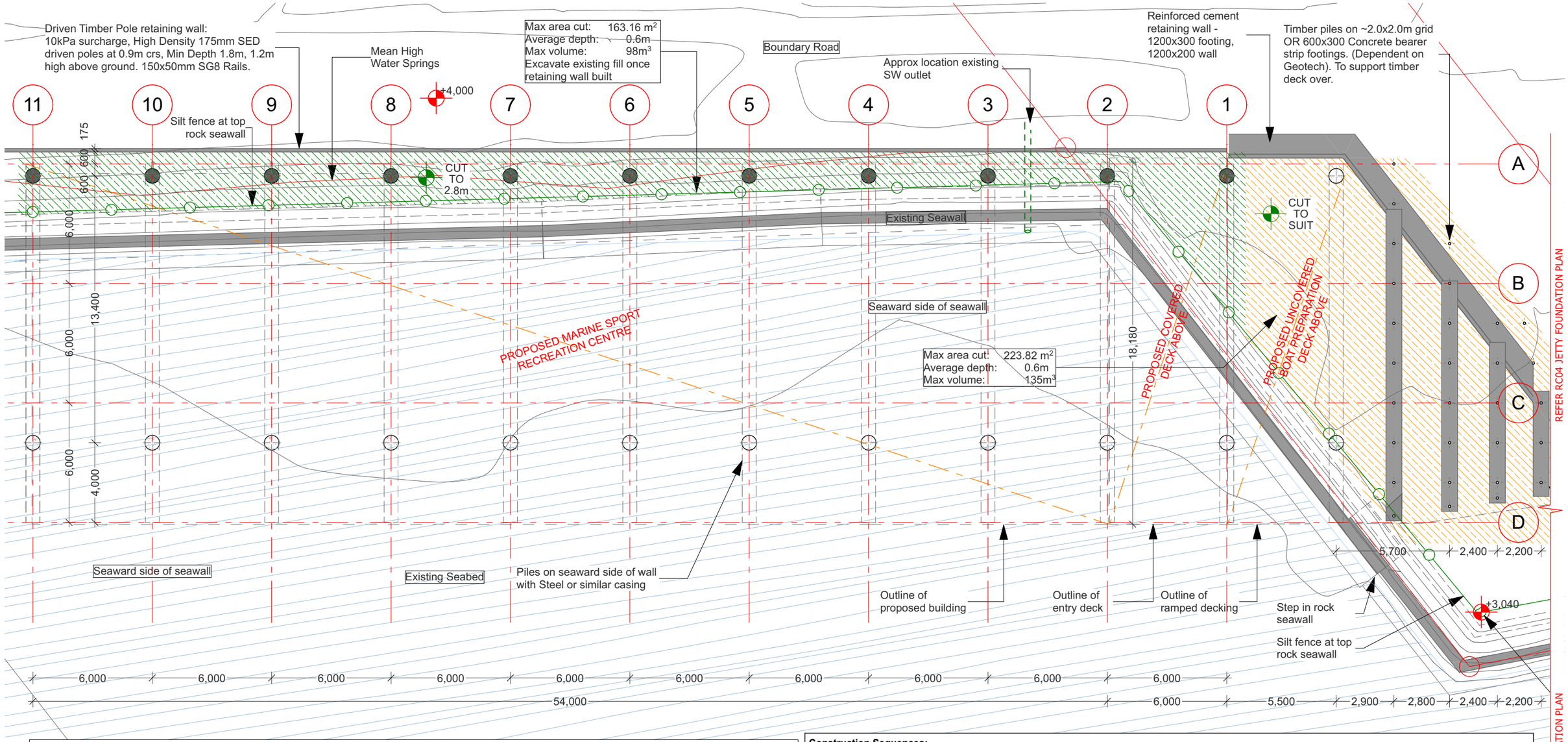
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Forecourt Plan	2/09/19	Resource Consent Application	RC03
Project No. 1852							**Page** 3 of 11	**Scale** 1:200 at A3	**Revision Number**



Key:

- 750mm ⌀ Bored reinforced concrete pile into bank (land side of sea wall)
- 750mm ⌀ Bored reinforced concrete pile with Steel or similar casing for sea-side installations.
- Timber piles on ~2.0x2.0m grid to support timber deck over
- 1000x400mm (excl corbel) Precast Concrete Beam
- Driven Timber Pole retaining wall: 10kPa surcharge, High Density 175mm SED driven poles at 0.9m crs, Min Depth 1.8m, 1.2m high above ground. 150x50mm SG8 Rails.
- Jetty Piles 300⌀ at 4200 Crs
- Temporary Silt Fence to ARC TP90 Erosion and Sediment control guidelines

Construction Sequences:

Marine Sport Recreation Centre Construction Sequence:

- Install bored reinforced concrete piles (casing or sheet pile caisson to seaward side)

Geotech guidance for the building platform:

- Bored piles for the building platform: either permanent or temporary casing would be adopted to prevent the collapse of the bored holes during drilling. Auger will be used to construct piles in ECBF rock with the minimum embedment depth of 3 x pile diameter. A tremie method should be chosen to pour the concrete.

- Land primary PB1 precast concrete beams
- Land secondary PB2 precast concrete beams
- Install timber floor / decking units
- Carry on with timber construction above in a traditional manner

Jetty Construction Sequence:

- Timber jetty piles – auger a hole approx. 90% of pile diameter, sharpen end of pile and impact hammer in.
- It is likely that land and marine (barge) rigs will be used, this will be up to the contractor, both should be considered.

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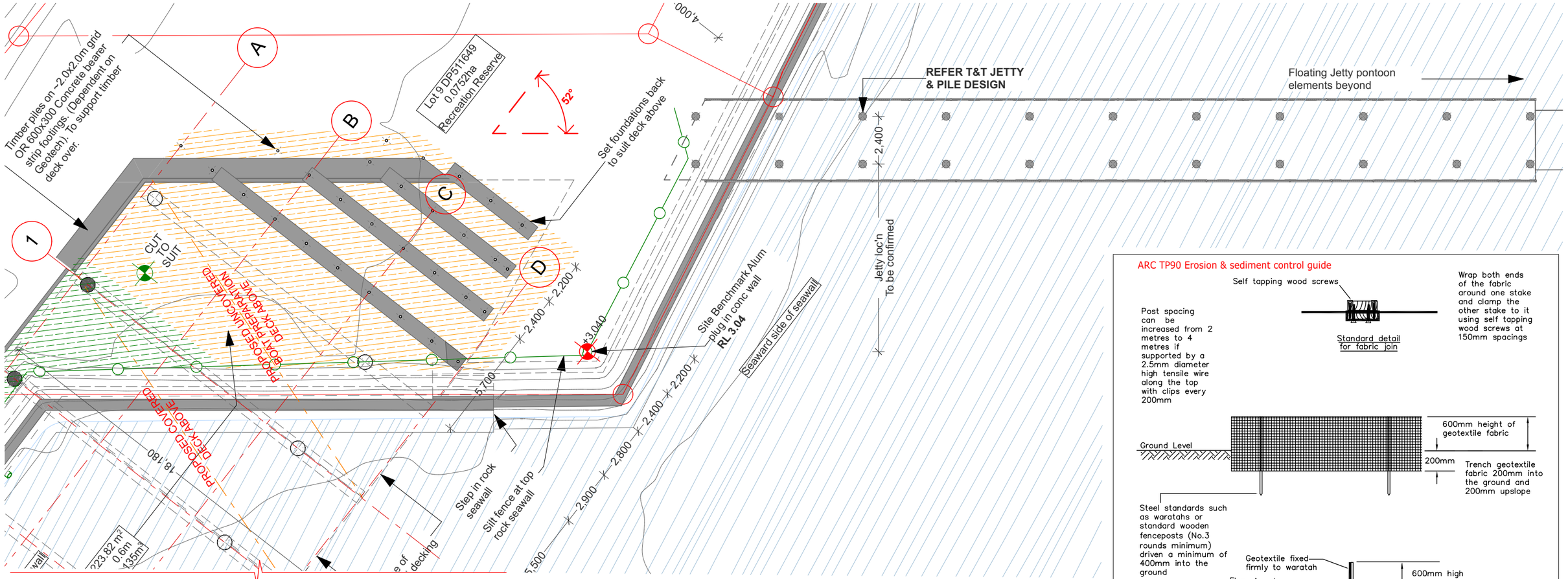
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Foundation and Earthworks Plan	2/09/19	Resource Consent Application	RC04
Project No. 1852							**Page** 4 of 11	**Scale** 1:200 at A3	**Revision Number**



Key:

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- Jetty Piles 300⌀ at 4200 Crs
- Temporary Silt Fence to ARC TP90 Erosion and Sediment control guidelines

Construction Sequences:

Marine Sport Recreation Centre Construction Sequence:

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- *Geotech guidance for the building platform:*
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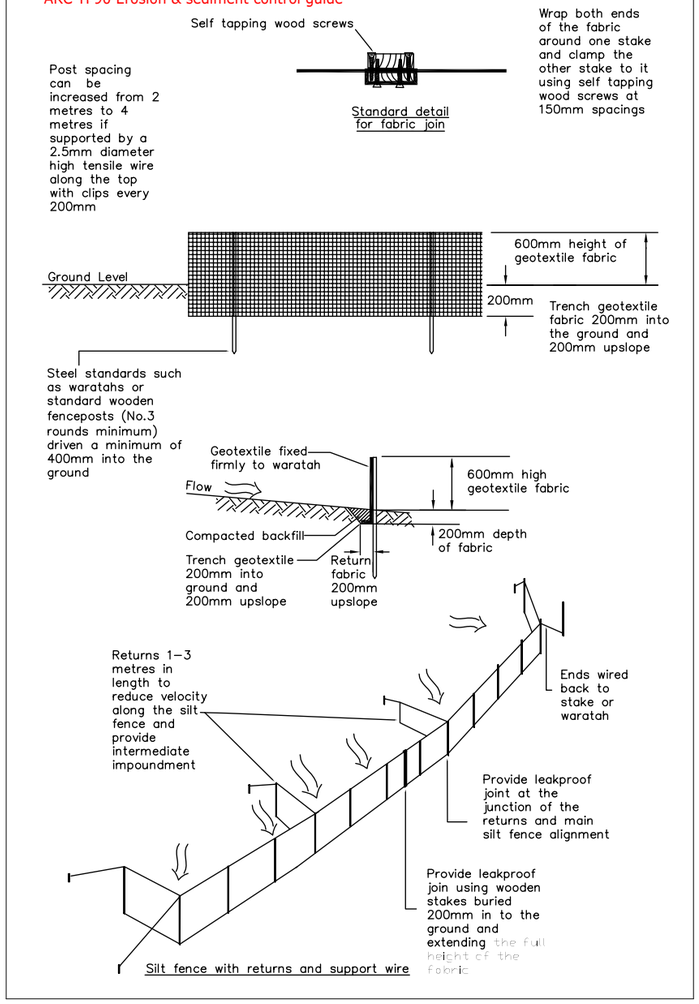
ARC TP90 Erosion & sediment control guide



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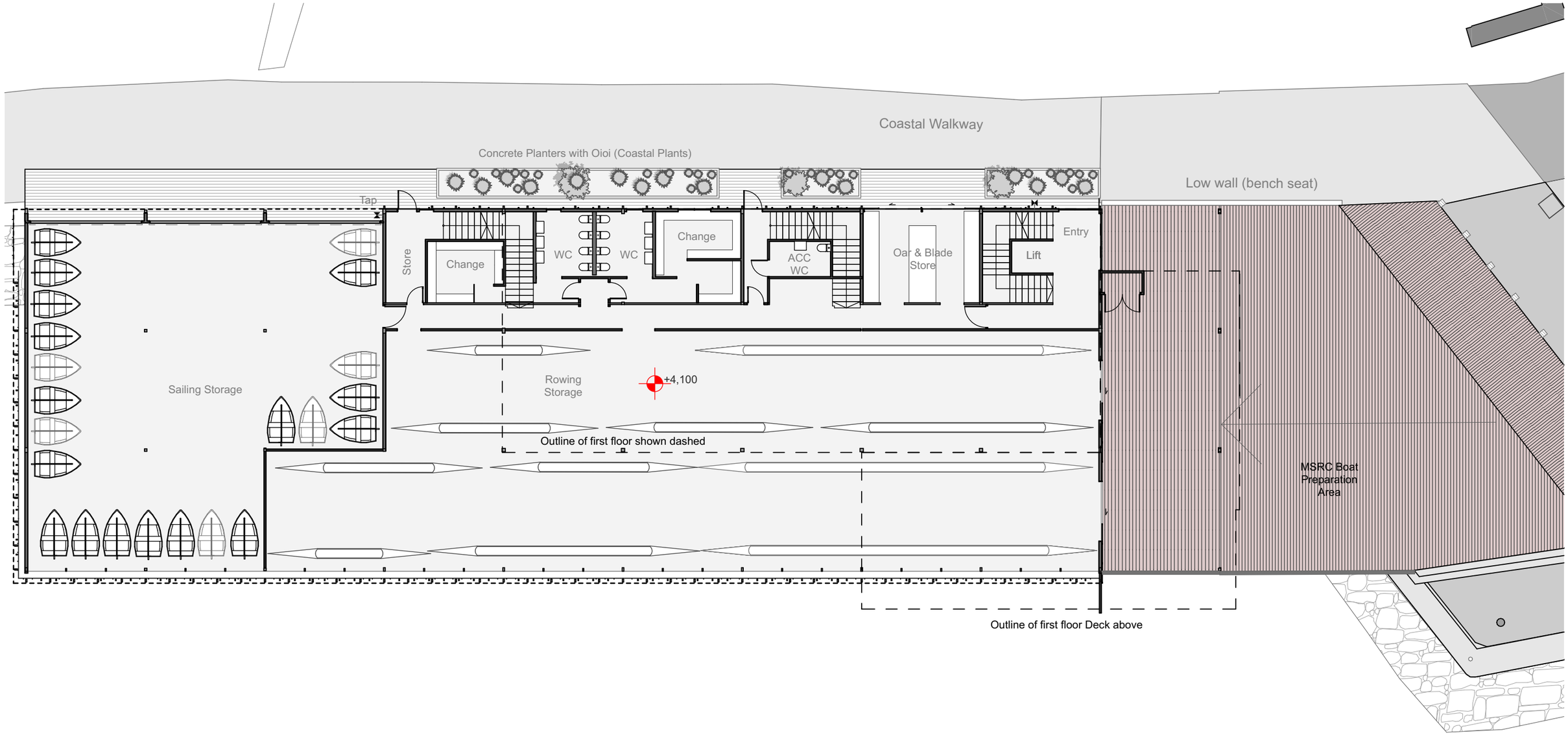
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Jetty Foundation Plan	2/09/19	Resource Consent Application	RC05
Project No. 1852							**Page** 5 of 11	**Scale** 1:200 at A3	**Revision Number**



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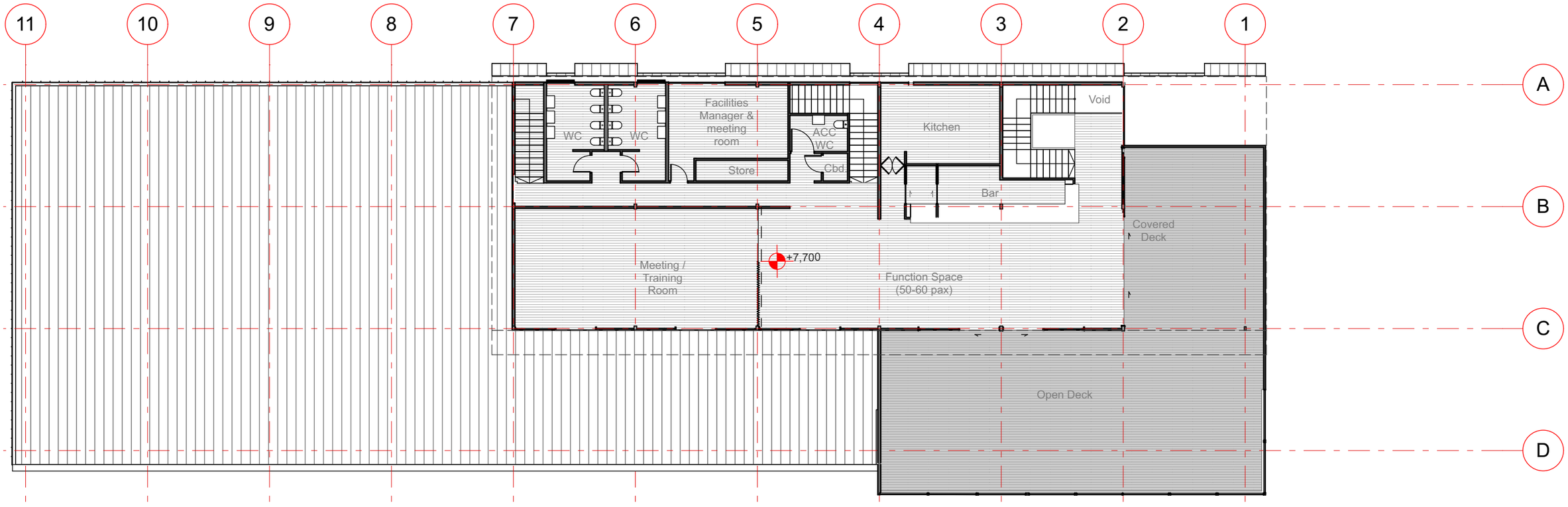
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Ground Floor Plan	2/09/19	Resource Consent Application	RC06
Project No. 1852							**Page** 6 of 11	**Scale** 1:200 at A3	**Revision Number**



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Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Upper Floor Plan	2/09/19	Resource Consent Application	RC07
Project No. 1852							**Page** 7 of 11	**Scale** 1:200 at A3	**Revision Number**

4.10.03 Fibre Cement
Sheet - Painted

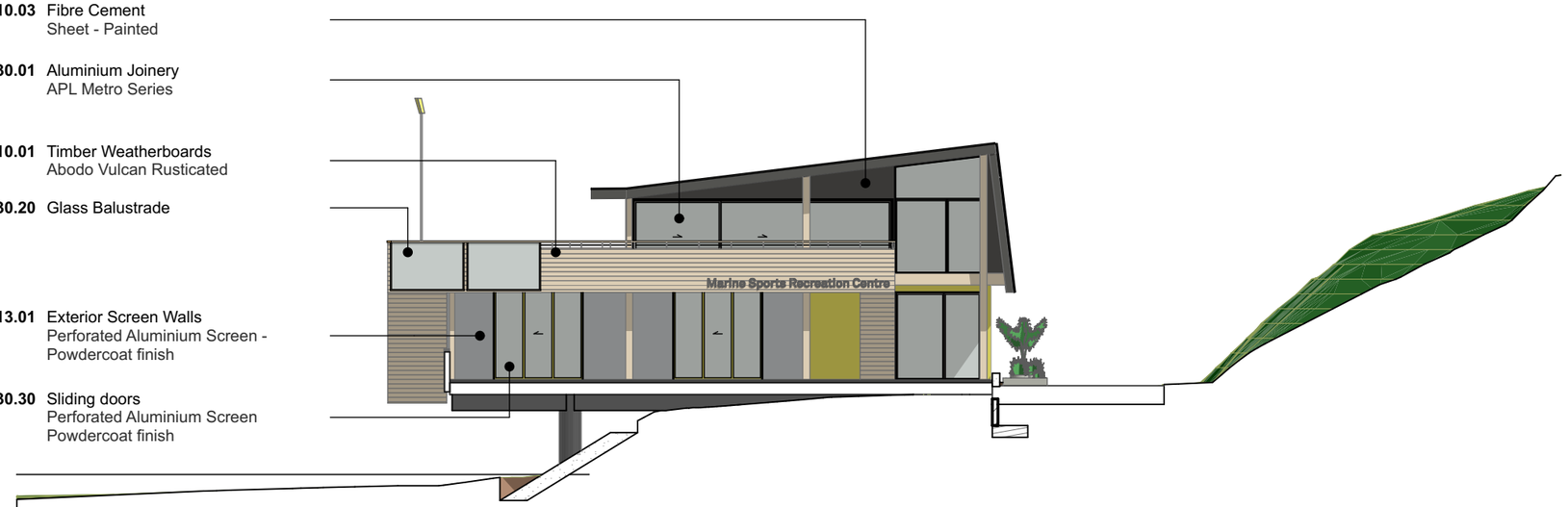
4.30.01 Aluminium Joinery
APL Metro Series

4.10.01 Timber Weatherboards
Abodo Vulcan Rusticated

4.30.20 Glass Balustrade

4.13.01 Exterior Screen Walls
Perforated Aluminium Screen -
Powdercoat finish

4.30.30 Sliding doors
Perforated Aluminium Screen
Powdercoat finish



North East Elevation

4.10.05 Profiled Metal
Wall Cladding
Epan Colorsteel
Bounce

4.10.04 Polycarbonate
Cladding
Translucent

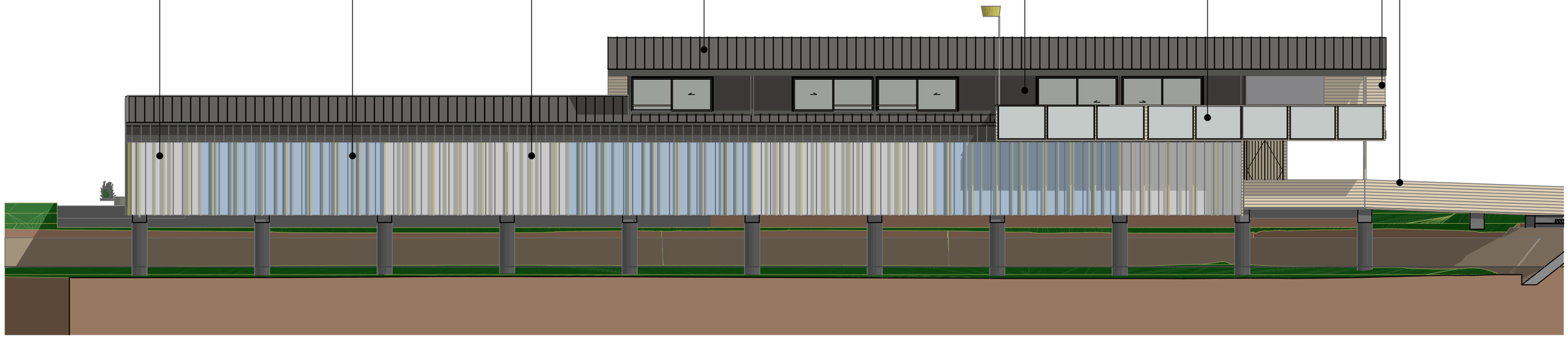
4.10.05 Polycarbonate
Cladding
Opaque

4.20.01 Profiled Roofing
E-span

4.10.03 Fibre Cement
Sheet - Painted

4.30.20 Glass Balustrade

4.10.01 Timber
Weatherboards
Abodo Vulcan
Rusticated



South East Elevation

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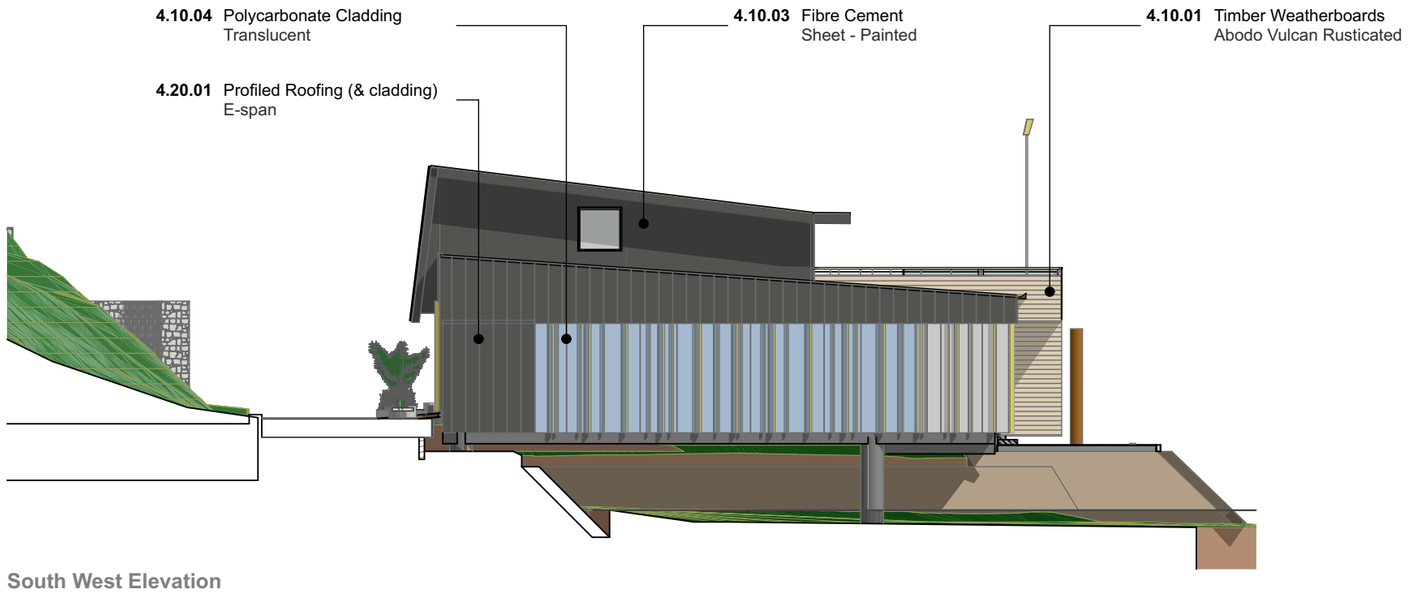
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Building Elevations	2/09/19	Resource Consent Application	RC08
Project No. 1852							**Page** 8 of 11	**Scale** 1:200 at A3	**Revision Number**



South West Elevation

North West Elevation

SGA Strachan Group Architects

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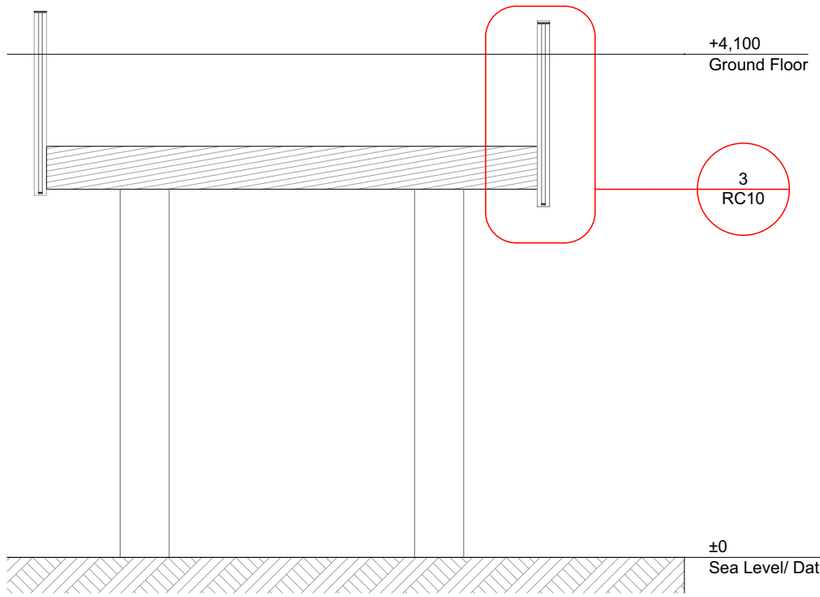
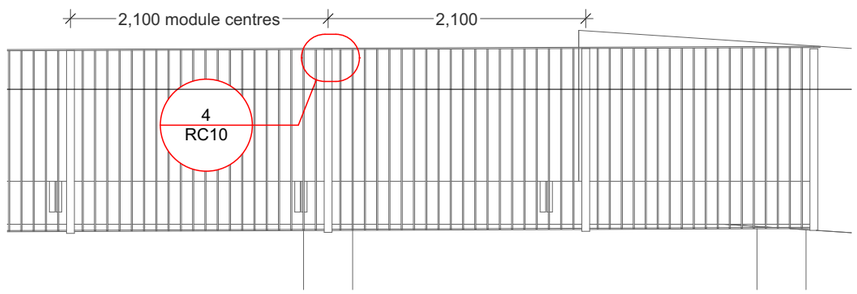
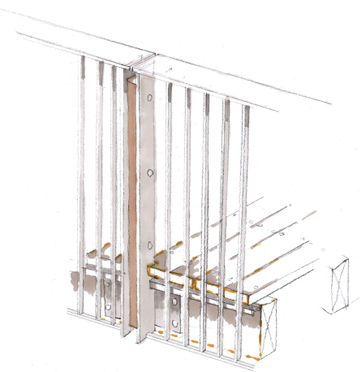
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Building Elevations II	2/09/19	Resource Consent Application	RC09
Project No. 1852							**Page** 9 of 11	**Scale** 1:200 at A3	**Revision Number**



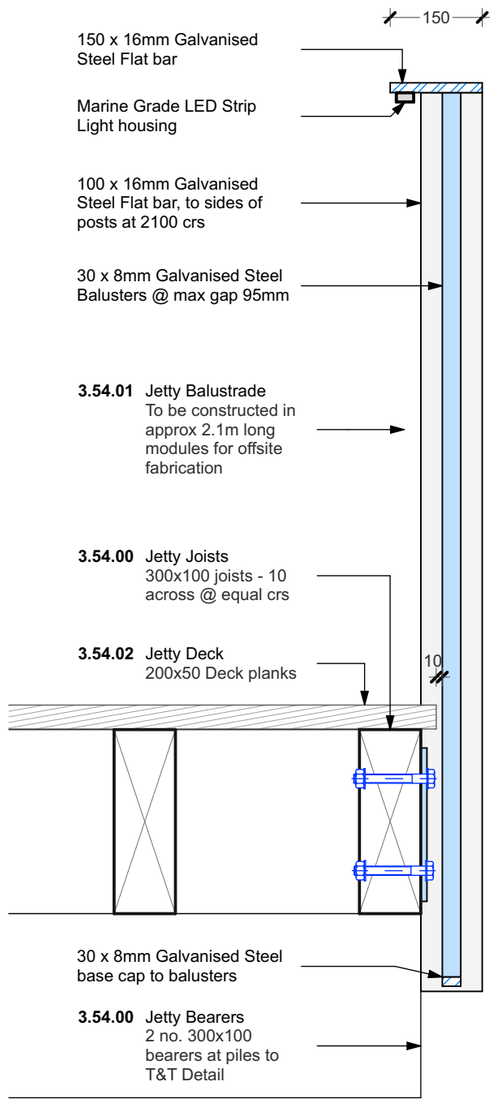
1 Jetty Section 1:50



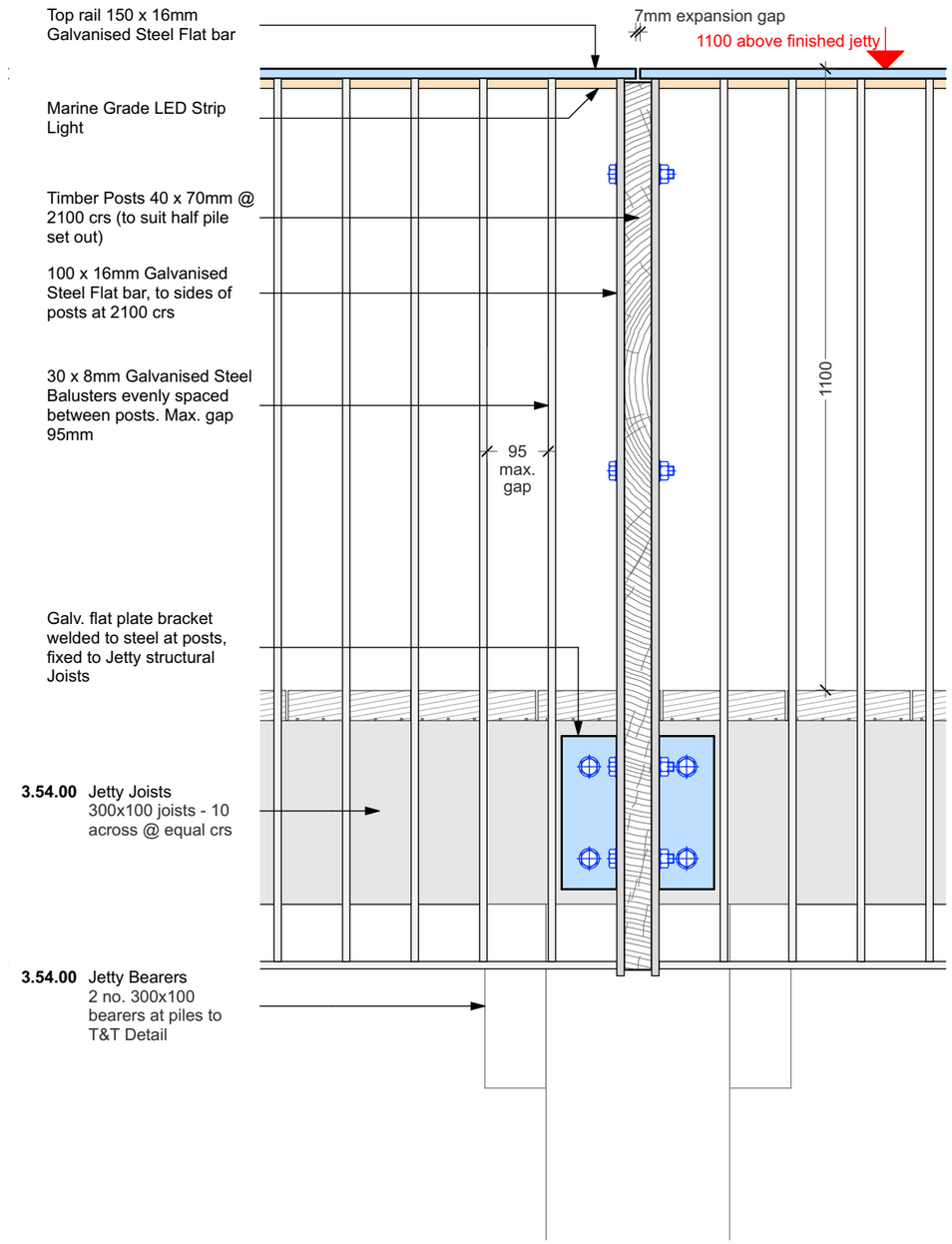
2 Jetty Elevation 1:50



Concept Sketch



3 Handrail Section Detail 1:10



4 Handrail Elevation Detail 1:10

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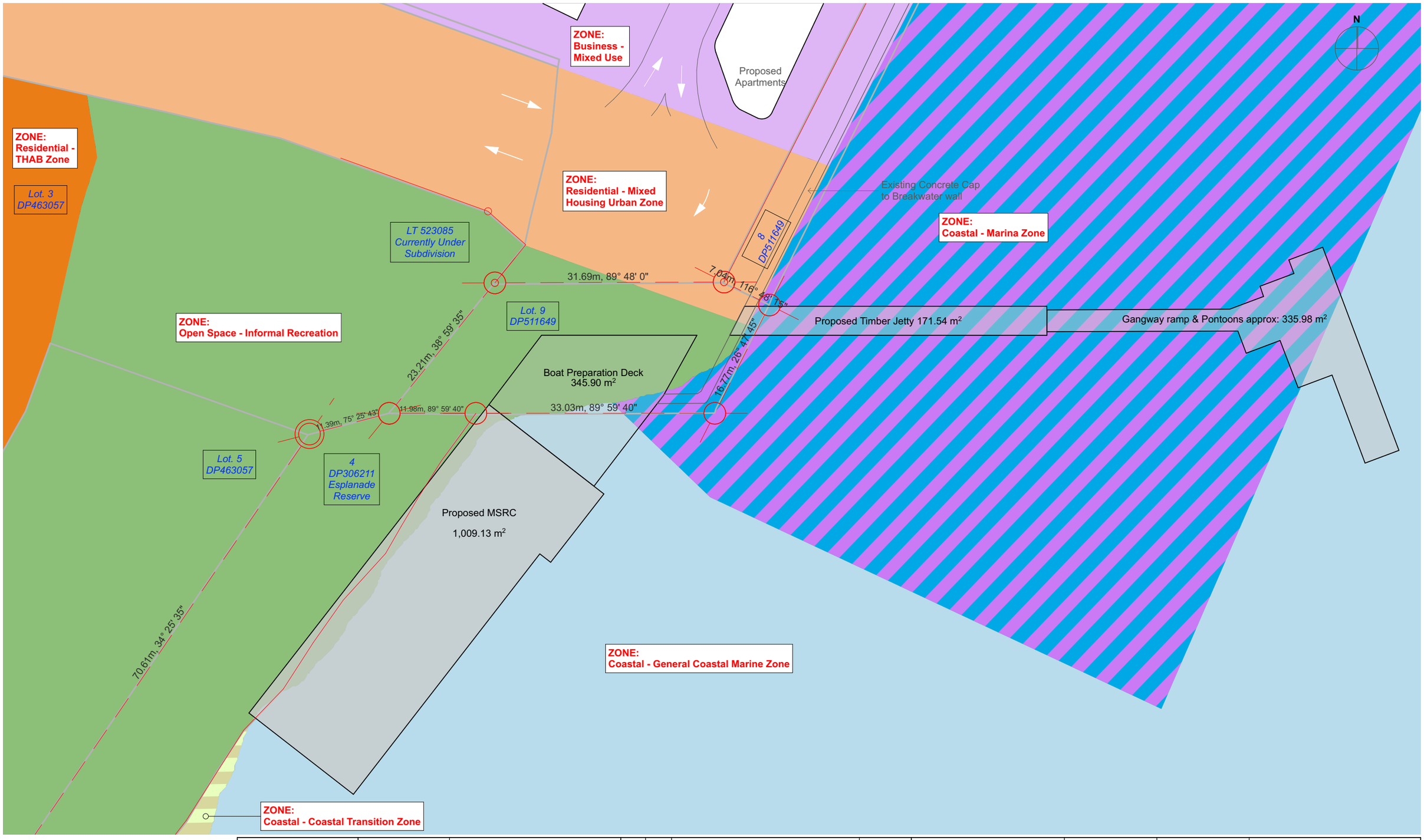
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point			NOT FOR CONSTRUCTION THIS DESIGN IS SUBJECT TO ENGINEERS REVIEW		Jetty	2/09/19	Resource Consent Application	RC10
Project No. 1852							**Page** 10 of 11	**Scale** 1:50, 1:10 at A3	**Revision Number**



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Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Site - AUP Zoning Plan	2/09/19	Resource Consent Application	RC11
Project No. 1852							**Page** 11 of 11	**Scale** 1:500 at A3	**Revision Number**

Appendix B

Sampling and Analysis Plan

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PO Box 9528, Auckland 1149, New Zealand

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Auckland Tauranga Wellington Christchurch

solutions for your environment

21 February 2020

Erin Taylor
Assistant Development Manager
Kāinga Ora – Homes and Communities
PO Box 84143
Westgate
AUCKLAND 0614

Dear Erin,

SAMPLING AND ANALYSIS PLAN FOR THE MARINE RECREATION CENTRE, HOBSONVILLE POINT

1.0 Introduction

Kāinga Ora – Homes and Communities (Kāinga Ora, 'the Client') has engaged Pattle Delamore Partners Ltd (PDP) to undertake a contaminated site investigation to support the consenting of the proposed Marine Recreation Centre development at 9 Boundary Road, Hobsonville Point (herein referred to as 'the site'). PDP completed a preliminary site investigation (PSI) report for the site on 20 February 2020, which identified that port activities (i.e. yacht maintenance facilities) and waste disposal to land (i.e. reclaimed land) (Categories F5 and G5, respectively on the *Hazardous Activities and Industries List* (HAIL) (Ministry for the Environment [MfE], 2011)) are more than likely to have occurred historically on the site.

A detailed site investigation (DSI) was recommended to assess the concentration of contaminants of potential concern (COPC) associated with the identified waste disposal to land and port activities prior to undertaking any soil disturbance activities on the site. PDP has prepared this sampling and analysis plan (SAP) to formalise the DSI's scope of work.

2.0 DSI Objectives

The objectives of the DSI are to:

- Assess the likelihood of human health and environmental risk associated with the proposed soil disturbance through targeted soil sampling and comparison of analytical results against relevant guidelines/criteria; and
- Assess the requirements for potential consents in relation the *Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011* (NESCS) and the Auckland Unitary Plan – Operative in Part (AUP:OP, 11 October 2019).

3.0 DSI Scope of Work

The MfE's Contaminated Land Management Guidelines (CLMG, revised 2011) promote a nationally consistent approach to the investigation and assessment of contaminated land. The NESCS incorporates by reference the MfE CLMG No.'s 1, 2 and 5. The proposed DSI has been scoped to generally accord with the requirements of the MfE CLMGs and the NESCS.

The investigation will be overseen by and the report certified by Suitably Qualified and Experienced Practitioners (SQEPs) as required by the NESCS.

The proposed scope of work (SOW) is set out below and includes undertaking targeted soil sampling to characterise COPC (if any) in shallow soils across the site and documenting the findings in a DSI report.

3.1 Stage 1 – Fieldwork

The following SOW is proposed in general accordance with the requirements set out in the MfE's CLMG No.5 (revised 2011):

- Based on the total area of the site to be developed (assumed, from the information provided, to be approximately 224 m^2), the MfE sampling guidelines recommend a minimum of five sampling locations. From our experience and understanding of the project, the following targeted soil sampling and analysis programme is proposed:
  - Collection of soil samples from four sampling locations as shown in the proposed sampling location plan (Figure 1).
  - Soil samples will be collected:
    - From ground surface (0-0.1 m below ground level (bgl));
    - At changes of lithology (currently assumed to comprise of topsoil and fill material) to approximately 0.4 m below the maximum depth to which construction excavations will occur (assumed, from the information provided, to be approximately 0.6 m bgl); and/or
    - At any horizons with stains and/or odours.
- All soil samples will be couriered (with Chain of Custody documentation) to RJ Hill Laboratories (Hills) in Hamilton for the following analyses:
  - For the purpose of cost estimating, it is assumed that two soil samples (one each from the topsoil and fill material horizon) from each sampling location will be analysed for:
    - Metals (arsenic, cadmium, chromium, copper, lead, nickel, tin and zinc);
    - Polycyclic aromatic hydrocarbons (PAH); and
    - Tributyltin (TBT).

If unforeseen issues arise (e.g. additional sampling and/or analyses is required) based on field observations, and more time is likely to be required, we will discuss these with you and agree on an approach and costs prior to proceeding.

3.2 Stage 2 – Reporting

Our findings will be documented as a DSI report in general accordance with the MfE's CLMG No.1 and will include an updated conceptual site model to ensure that all potential pathways and receptors are considered.

The report will assess the likelihood of human health and environmental risk associated with the proposed soil disturbance by assessing the soil results against relevant guidelines/criteria. The tabulated results (included in the DSI report) will inform conclusions regarding whether there are any specialist soils handling and disposal requirements for the project – for example:

- Are measures required to protect the health of site workers, site neighbours and/or environmental receptors during the works?
- Should excess excavated soils be disposed of to a managed or licenced landfill, or is reuse of soils onsite a possibility?

The report will also provide recommendations relating to:

- The requirement for consents (under the NESCS and the AUP:OP); and
- Whether any further investigation work is necessary to inform site management and/or consenting and/or construction requirements (which will be scoped and costed for separately).

The DSI report will be provided electronically as a PDF document. Allowance has been made for addressing one set of comments from the client on the draft DSI report prior to issuing a final report.

4.0 Timing

PDP can commence work within one week upon receipt of written direction to proceed with our proposal. Laboratory analysis of soil samples will take approximately 10 working days and we aim to present our draft report within two weeks of receiving the final analytical results from the laboratory.

5.0 Limitations

This document has been prepared by Pattle Delamore Partners Limited (PDP) on the basis of information provided by Kāinga Ora – Homes and Communities (Kāinga Ora) and others (not directly contracted by PDP for the work), including Auckland Council, Harrison Grierson, Strachan Group Architects and Tonkin & Taylor. PDP has not independently verified the provided information and has relied upon it being accurate and sufficient for use by PDP in preparing the document. PDP accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the provided information.

This document has been prepared by PDP on the specific instructions of Kāinga Ora for the limited purposes described in the document. PDP accepts no liability if the document is used for a different purpose or if it is used or relied on by any other person. Any such use or reliance will be solely at their own risk.

Yours faithfully,

PATTLE DELAMORE PARTNERS LIMITED

Prepared by

Stefan Yap

Service Leader - Contaminated Land

Reviewed & Approved by

Natalie Webster

Technical Director - Contaminated Land

Figure 1: Proposed Sampling Location Plan

0 1.5 3 4.5
Meters

Scale @ A4
= 1:250

Date Printed:
20/02/2020

Auckland Council
Te Kaunihera o Tāmaki Makaurau

Appendix C

Laboratory Analytical Report

Hill Laboratories
TRIED, TESTED AND TRUSTED

R J Hill Laboratories Limited
28 Duke Street Frankton 3204
Private Bag 3205
Hamilton 3240 New Zealand

T 0508 HILL LAB (44 555 22)
T +64 7 858 2000
E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	Pattle Delamore Partners Limited	**Lab No:**	2332399 SPv1
Contact:	Stefan Yap	**Date Received:**	29-Feb-2020
	C/- Pattle Delamore Partners Limited	**Date Reported:**	06-Mar-2020
	PO Box 9528	**Quote No:**	93309
	Newmarket	**Order No:**	A01964178
	Auckland 1149	**Client Reference:**	Marine Rec Centre
		Submitted By:	Liam Green

Sample Type: Soil

Sample Name:		MRC_SS01_0.1 28-Feb-2020	MRC_SS01_0.3 28-Feb-2020	MRC_SS02_0.1 28-Feb-2020	MRC_SS02_0.3 28-Feb-2020	MRC_SS03_0.1 28-Feb-2020
Lab Number:		2332399.1	2332399.2	2332399.3	2332399.4	2332399.5
Individual Tests						
Dry Matter	g/100g as rcvd	81	88	87	82	90
Total Recoverable Tin	mg/kg dry wt	1.8	2.0	5.6	2.0	< 1.0
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	3	7	14	7	< 2
Total Recoverable Cadmium	mg/kg dry wt	0.14	< 0.10	0.82	0.14	< 0.10
Total Recoverable Chromium	mg/kg dry wt	18	13	46	16	7
Total Recoverable Copper	mg/kg dry wt	21	10	196	32	50
Total Recoverable Lead	mg/kg dry wt	67	20	290	50	14.4
Total Recoverable Nickel	mg/kg dry wt	14	8	52	14	11
Total Recoverable Zinc	mg/kg dry wt	35	33	260	52	60
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Total of Reported PAHs in Soil	mg/kg dry wt	5.7	66	21	5.4	1.2
1-Methylnaphthalene	mg/kg dry wt	0.024	0.052	0.023	< 0.012	< 0.011
2-Methylnaphthalene	mg/kg dry wt	0.017	< 0.012	0.014	< 0.012	< 0.011
Acenaphthylene	mg/kg dry wt	0.025	0.35	0.127	0.047	0.012
Acenaphthene	mg/kg dry wt	0.049	0.42	0.076	0.014	< 0.011
Anthracene	mg/kg dry wt	0.124	2.1	0.22	0.070	0.013
Benzo[a]anthracene	mg/kg dry wt	0.35	5.2	1.47	0.40	0.081
Benzo[a]pyrene (BAP)	mg/kg dry wt	0.39	5.5	1.76	0.50	0.127
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	mg/kg dry wt	0.57	8.0	2.7	0.75	0.18
Benzo[a]pyrene Toxic Equivalence (TEF)	mg/kg dry wt	0.56	7.9	2.7	0.74	0.18
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	0.42	5.6	2.3	0.56	0.130
Benzo[e]pyrene	mg/kg dry wt	0.22	3.1	1.12	0.29	0.075
Benzo[g,h,i]perylene	mg/kg dry wt	0.21	3.4	1.35	0.35	0.096
Benzo[k]fluoranthene	mg/kg dry wt	0.181	2.2	0.84	0.21	0.055
Chrysene	mg/kg dry wt	0.41	4.5	1.68	0.39	0.092
Dibenzo[a,h]anthracene	mg/kg dry wt	0.041	0.74	0.28	0.076	0.017
Fluoranthene	mg/kg dry wt	1.03	9.9	3.1	0.83	0.154
Fluorene	mg/kg dry wt	0.058	0.38	0.071	0.013	< 0.011
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	0.26	3.5	1.56	0.41	0.094
Naphthalene	mg/kg dry wt	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06
Perylene	mg/kg dry wt	0.085	1.14	0.36	0.107	0.031
Phenanthrene	mg/kg dry wt	0.81	7.4	1.68	0.30	0.039
Pyrene	mg/kg dry wt	1.00	10.7	3.2	0.78	0.160

Sample Type: Soil						
Sample Name:		MRC_SS01_0.1 28-Feb-2020	MRC_SS01_0.3 28-Feb-2020	MRC_SS02_0.1 28-Feb-2020	MRC_SS02_0.3 28-Feb-2020	MRC_SS03_0.1 28-Feb-2020
Lab Number:		2332399.1	2332399.2	2332399.3	2332399.4	2332399.5
Tributyl Tin Trace in Soil samples by GCMS						
Dibutyltin (as Sn)	mg/kg dry wt	< 0.005	< 0.005	0.053	< 0.005	< 0.005
Monobutyltin (as Sn)	mg/kg dry wt	< 0.007	< 0.007	0.009	< 0.007	< 0.007
Tributyltin (as Sn)	mg/kg dry wt	< 0.004	< 0.004	0.118	< 0.004	< 0.004
Triphenyltin (as Sn)	mg/kg dry wt	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003

Sample Name:		MRC_SS03_0.4 28-Feb-2020	MRC_SS04_0.1 28-Feb-2020	MRC_SS04_0.4 28-Feb-2020	MRC_SS05_0.1 28-Feb-2020	MRC_SS05_0.3 28-Feb-2020
Lab Number:		2332399.6	2332399.8	2332399.9	2332399.10	2332399.11
Individual Tests						
Dry Matter	g/100g as rcvd	87	86	86	96	80
Total Recoverable Tin	mg/kg dry wt	1.6	1.6	1.0	1.1	2.2
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	7	7	7	4	4
Total Recoverable Cadmium	mg/kg dry wt	< 0.10	0.43	0.20	< 0.10	< 0.10
Total Recoverable Chromium	mg/kg dry wt	12	17	14	24	10
Total Recoverable Copper	mg/kg dry wt	9	64	45	85	13
Total Recoverable Lead	mg/kg dry wt	17.8	172	60	118	28
Total Recoverable Nickel	mg/kg dry wt	9	18	13	87	12
Total Recoverable Zinc	mg/kg dry wt	30	71	41	60	17
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Total of Reported PAHs in Soil	mg/kg dry wt	26	7.2	7.4	71	22
1-Methylnaphthalene	mg/kg dry wt	< 0.011	< 0.012	< 0.012	0.011	0.014
2-Methylnaphthalene	mg/kg dry wt	0.011	< 0.012	< 0.012	< 0.011	< 0.013
Acenaphthylene	mg/kg dry wt	0.47	0.038	0.017	0.28	0.102
Acenaphthene	mg/kg dry wt	0.065	0.028	0.048	0.165	0.141
Anthracene	mg/kg dry wt	0.39	0.120	0.142	1.02	0.62
Benzo[a]anthracene	mg/kg dry wt	1.81	0.53	0.50	6.0	1.81
Benzo[a]pyrene (BAP)	mg/kg dry wt	3.0	0.65	0.56	5.5	1.62
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	mg/kg dry wt	4.2	0.98	0.84	8.7	2.5
Benzo[a]pyrene Toxic Equivalence (TEF)	mg/kg dry wt	4.2	0.97	0.82	8.6	2.5
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	3.0	0.76	0.63	7.7	2.1
Benzo[e]pyrene	mg/kg dry wt	1.74	0.39	0.33	3.1	0.83
Benzo[g,h,i]perylene	mg/kg dry wt	2.0	0.48	0.38	3.2	0.94
Benzo[k]fluoranthene	mg/kg dry wt	1.18	0.27	0.24	3.2	0.80
Chrysene	mg/kg dry wt	1.86	0.50	0.50	5.8	1.60
Dibenzo[a,h]anthracene	mg/kg dry wt	0.34	0.107	0.080	0.84	0.25
Fluoranthene	mg/kg dry wt	2.9	1.08	1.33	13.5	4.4
Fluorene	mg/kg dry wt	0.093	0.023	0.038	0.114	0.131
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	2.2	0.56	0.43	4.6	1.37
Naphthalene	mg/kg dry wt	< 0.06	< 0.06	< 0.06	< 0.06	< 0.07
Perylene	mg/kg dry wt	0.71	0.142	0.139	1.52	0.43
Phenanthrene	mg/kg dry wt	1.14	0.45	0.83	3.7	1.80
Pyrene	mg/kg dry wt	3.1	1.04	1.23	10.6	3.3
Tributyl Tin Trace in Soil samples by GCMS						
Dibutyltin (as Sn)	mg/kg dry wt	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Monobutyltin (as Sn)	mg/kg dry wt	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007
Tributyltin (as Sn)	mg/kg dry wt	< 0.004	< 0.004	< 0.004	< 0.004	< 0.004
Triphenyltin (as Sn)	mg/kg dry wt	< 0.003	< 0.003	< 0.003	< 0.003	< 0.003

Sample Name:		MRC_SS06_0.1 28-Feb-2020	MRC_SS06_0.3 28-Feb-2020			
Lab Number:		2332399.12	2332399.13			
Individual Tests						
Dry Matter	g/100g as rcvd	84	74	-	-	-

Sample Type: Soil						
Sample Name:		MRC_SS06_0.1 28-Feb-2020	MRC_SS06_0.3 28-Feb-2020			
Lab Number:		2332399.12	2332399.13			
Individual Tests						
Total Recoverable Tin	mg/kg dry wt	1.5	1.7	-	-	-
Heavy Metals, Screen Level						
Total Recoverable Arsenic	mg/kg dry wt	5	4	-	-	-
Total Recoverable Cadmium	mg/kg dry wt	0.17	< 0.10	-	-	-
Total Recoverable Chromium	mg/kg dry wt	23	9	-	-	-
Total Recoverable Copper	mg/kg dry wt	42	13	-	-	-
Total Recoverable Lead	mg/kg dry wt	100	25	-	-	-
Total Recoverable Nickel	mg/kg dry wt	36	6	-	-	-
Total Recoverable Zinc	mg/kg dry wt	74	14	-	-	-
Polycyclic Aromatic Hydrocarbons Screening in Soil						
Total of Reported PAHs in Soil	mg/kg dry wt	82	5.9	-	-	-
1-Methylnaphthalene	mg/kg dry wt	0.028	< 0.014	-	-	-
2-Methylnaphthalene	mg/kg dry wt	0.028	< 0.014	-	-	-
Acenaphthylene	mg/kg dry wt	0.71	0.048	-	-	-
Acenaphthene	mg/kg dry wt	0.198	0.025	-	-	-
Anthracene	mg/kg dry wt	1.08	0.091	-	-	-
Benzo[a]anthracene	mg/kg dry wt	6.5	0.42	-	-	-
Benzo[a]pyrene (BAP)	mg/kg dry wt	7.7	0.54	-	-	-
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	mg/kg dry wt	11.5	0.79	-	-	-
Benzo[a]pyrene Toxic Equivalence (TEF)	mg/kg dry wt	11.4	0.78	-	-	-
Benzo[b]fluoranthene + Benzo[j] fluoranthene	mg/kg dry wt	9.6	0.59	-	-	-
Benzo[e]pyrene	mg/kg dry wt	4.8	0.31	-	-	-
Benzo[g,h,i]perylene	mg/kg dry wt	5.8	0.36	-	-	-
Benzo[k]fluoranthene	mg/kg dry wt	3.4	0.24	-	-	-
Chrysene	mg/kg dry wt	6.1	0.44	-	-	-
Dibenzo[a,h]anthracene	mg/kg dry wt	0.98	0.066	-	-	-
Fluoranthene	mg/kg dry wt	11.8	0.90	-	-	-
Fluorene	mg/kg dry wt	0.154	0.020	-	-	-
Indeno(1,2,3-c,d)pyrene	mg/kg dry wt	6.8	0.42	-	-	-
Naphthalene	mg/kg dry wt	< 0.06	< 0.07	-	-	-
Perylene	mg/kg dry wt	1.91	0.124	-	-	-
Phenanthrene	mg/kg dry wt	2.8	0.41	-	-	-
Pyrene	mg/kg dry wt	11.2	0.89	-	-	-
Tributyl Tin Trace in Soil samples by GCMS						
Dibutyltin (as Sn)	mg/kg dry wt	< 0.005	< 0.005	-	-	-
Monobutyltin (as Sn)	mg/kg dry wt	< 0.007	< 0.007	-	-	-
Tributyltin (as Sn)	mg/kg dry wt	< 0.004	< 0.004	-	-	-
Triphenyltin (as Sn)	mg/kg dry wt	< 0.003	< 0.003	-	-	-

Analyst's Comments

2332399/1 was spiked with target compounds as part of the in-house QC procedure for PAH analysis. It showed lower than expected recoveries for the majority of compounds with spike recoveries ranging from 69%-96%. The corresponding sample result was accepted because the Laboratory Control Sample (LCS) spike recovery was within the expected ranges (with recoveries ranging from 89-106%). This indicates that the low sample spike recovery was due to the matrix of the sample that was spiked.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request. Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**

Sample Type: Soil			
Test	**Method Description**	**Default Detection Limit**	**Sample No**
Environmental Solids Sample Drying*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-6, 8-13
Soil Prep Dry for Organics,Trace*	Air dried at 35°C Used for sample preparation. May contain a residual moisture content of 2-5%.	-	1-6, 8-13
Total of Reported PAHs in Soil	Sonication extraction, SPE cleanup, GC-MS SIM analysis.	0.3 mg/kg dry wt	1-6, 8-13
Heavy Metals, Screen Level	Dried sample, < 2mm fraction. Nitric/Hydrochloric acid digestion US EPA 200.2. Complies with NES Regulations. ICP-MS screen level, interference removal by Kinetic Energy Discrimination if required.	0.10 - 4 mg/kg dry wt	1-6, 8-13
Polycyclic Aromatic Hydrocarbons Screening in Soil	Sonication extraction, Dilution or SPE cleanup (if required), GC-MS SIM analysis (modified US EPA 8270). Tested on as received sample. [KBIs:5786,2805,2695].	0.002 - 0.3 mg/kg dry wt	1-6, 8-13
Tributyl Tin Trace in Soil samples by GCMS	Solvent extraction, ethylation, SPE cleanup, GC-MS SIM analysis. Tested on dried sample.	0.003 - 0.007 mg/kg dry wt	1-6, 8-13
Dry Matter (Env)	Dried at 103°C for 4-22hr (removes 3-5% more water than air dry) , gravimetry. (Free water removed before analysis, non-soil objects such as sticks, leaves, grass and stones also removed). US EPA 3550.	0.10 g/100g as rcvd	1-6, 8-13
Total Recoverable Tin	Dried sample, sieved as specified (if required). Nitric/Hydrochloric acid digestion, ICP-MS, screen level. US EPA 200.2.	1.0 mg/kg dry wt	1-6, 8-13
Benzo[a]pyrene Potency Equivalency Factor (PEF) NES	BaP Potency Equivalence calculated from; Benzo(a)anthracene x 0.1 + Benzo(b)fluoranthene x 0.1 + Benzo(j)fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Benzo(a)pyrene x 1.0 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Fluoranthene x 0.01 + Indeno(1,2,3-c,d)pyrene x 0.1. Ministry for the Environment. 2011. Methodology for Deriving Standards for Contaminants in Soil to Protect Human Health. Wellington: Ministry for the Environment.	0.002 mg/kg dry wt	1-6, 8-13
Benzo[a]pyrene Toxic Equivalence (TEF)	Benzo[a]pyrene Toxic Equivalence (TEF) calculated from; Benzo[a]pyrene x 1.0 + Benzo(a)anthracene x 0.1 + Benzo(b) fluoranthene x 0.1 + Benzo(k)fluoranthene x 0.1 + Chrysene x 0.01 + Dibenzo(a,h)anthracene x 1.0 + Indeno(1,2,3-c,d)pyrene x 0.1. Guidelines for assessing and managing contaminated gasworks sites in New Zealand (GMG) (MfE, 1997).	0.002 mg/kg dry wt	1-6, 8-13

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

Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.

Ara Heron BSc (Tech)
Client Services Manager - Environmental

Hill Laboratories
TRIED, TESTED AND TRUSTED

R J Hill Laboratories Limited
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Christchurch 8042 New Zealand

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E mail@hill-labs.co.nz
W www.hill-laboratories.com

Certificate of Analysis

Client:	Pattle Delamore Partners Limited	**Lab No:**	2333152	A2Pv1
Contact:	Stefan Yap	**Date Received:**	02-Mar-2020	
	C/- Pattle Delamore Partners Limited	**Date Reported:**	04-Mar-2020	
	PO Box 9528	**Quote No:**	93309	
	Newmarket	**Order No:**	A01964178	
	Auckland 1149	**Client Reference:**	Marine Rec Centre	
		Submitted By:	Liam Green	

Sample Type: Soil

Sample Name	Lab Number	As Received Weight (g)	Dry Weight (g)	<2mm Subsample Weight (g dry wt)	Asbestos Presence / Absence	Description of Asbestos Form
MRC_SS01_0.1	2333152.1	300.5	252.8	52.9	Asbestos NOT detected.	-
MRC_SS02_0.3	2333152.2	311.9	260.7	51.0	Asbestos NOT detected.	-
MRC_SS03_0.1	2333152.3	381.8	339.8	56.1	Asbestos NOT detected.	-
MRC_SS04_0.4	2333152.4	316.7	268.2	56.4	Asbestos NOT detected.	-
MRC_SS05_0.1	2333152.5	398.1	384.3	58.5	Asbestos NOT detected.	-
MRC_SS06_0.3	2333152.6	277.0	206.6	53.4	Asbestos NOT detected.	-

Glossary of Terms

- Loose fibres (Minor) - One or two fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- Loose fibres (Major) - Three or more fibres/fibre bundles identified during analysis by stereo microscope/PLM.
- ACM Debris (Minor) - One or two small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- ACM Debris (Major) - Large (>2mm) piece, or more than three small (<2mm) pieces of material attached to fibres identified during analysis by stereo microscope/PLM.
- Unknown Mineral Fibres - Mineral fibres of unknown type detected by polarised light microscopy including dispersion staining. The fibres detected may or may not be asbestos fibres. To confirm the identities, another independent analytical technique may be required.
- Trace - Trace levels of asbestos, as defined by AS4964-2004.

For further details, please contact the Asbestos Team.

Summary of Methods

The following table(s) gives a brief description of the methods used to conduct the analyses for this job. The detection limits given below are those attainable in a relatively simple matrix. Detection limits may be higher for individual samples should insufficient sample be available, or if the matrix requires that dilutions be performed during analysis. A detection limit range indicates the lowest and highest detection limits in the associated suite of analytes. A full listing of compounds and detection limits are available from the laboratory upon request.
Unless otherwise indicated, analyses were performed at Hill Laboratories, 28 Duke Street, Frankton, Hamilton 3204.

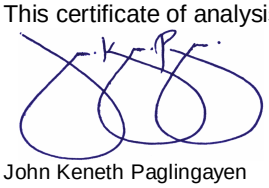
Sample Type: Soil

Test	Method Description	Default Detection Limit	Sample No
Asbestos in Soil			
As Received Weight	Measurement on analytical balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-6
Dry Weight	Sample dried at 100 to 105°C, measurement on balance. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	0.1 g	1-6
<2mm Subsample Weight	Sample dried at 100 to 105°C, weight of <2mm sample fraction taken for asbestos identification if less than entire fraction. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch.	-	1-6
Asbestos Presence / Absence	Examination using Low Powered Stereomicroscopy followed by 'Polarised Light Microscopy' including 'Dispersion Staining Techniques'. Analysed at Hill Laboratories - Asbestos; 101c Waterloo Road, Christchurch. AS 4964 (2004) - Method for the Qualitative Identification of Asbestos in Bulk Samples.	0.01%	1-6
Description of Asbestos Form	Description of asbestos form and/or shape if present.	-	1-6

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

Dates of testing are available on request. Please contact the laboratory for more information.

Samples are held at the laboratory after reporting for a length of time based on the stability of the samples and analytes being tested (considering any preservation used), and the storage space available. Once the storage period is completed, the samples are discarded unless otherwise agreed with the customer. Extended storage times may incur additional charges.



John Keneth Paglingayen
Bachelor of Applied Science
Laboratory Technician - Asbestos

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Client
HLC

Project No.
1852

Project Name / Location
Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point

		Date
RC01	Title Page	
RC02-A	Site Plan	
RC03-A	Forecourt Plan	
RC04	Foundation and Earthworks Plan	
RC05	Jetty Foundation Plan	
RC06-A	Ground Floor Plan	
RC07-A	Upper Floor Plan	
RC08-A	Building Elevations	
RC09-A	Building Elevations II	
RC10	Jetty	
RC11-A	Site - AUP Zoning Plan	

Drawing Title
Title Page

Created
14/02/20

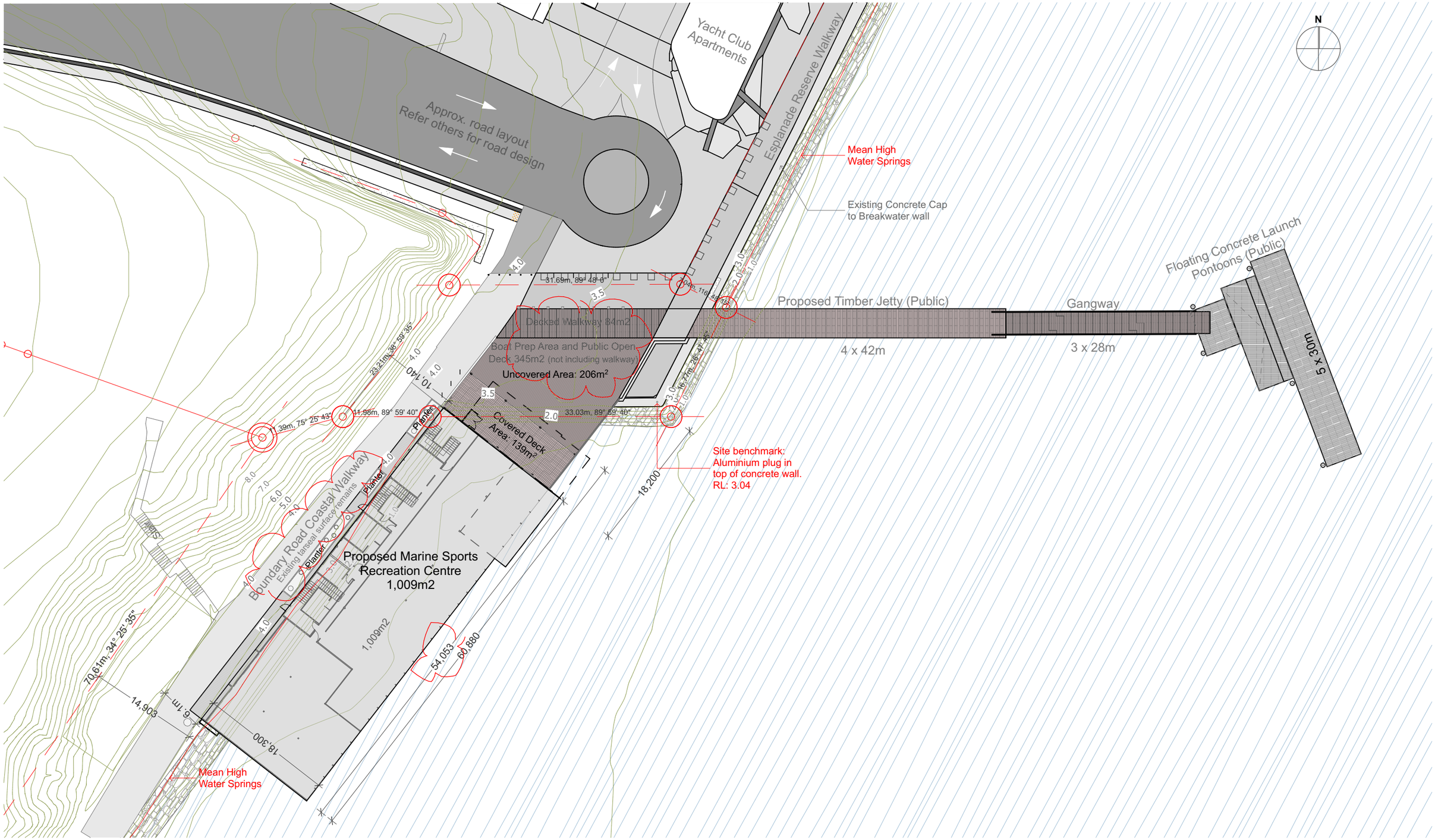
Stage
Resource Consent Application

Drawing Number
RC01

Page
1 of 11

Scale

Revision Number



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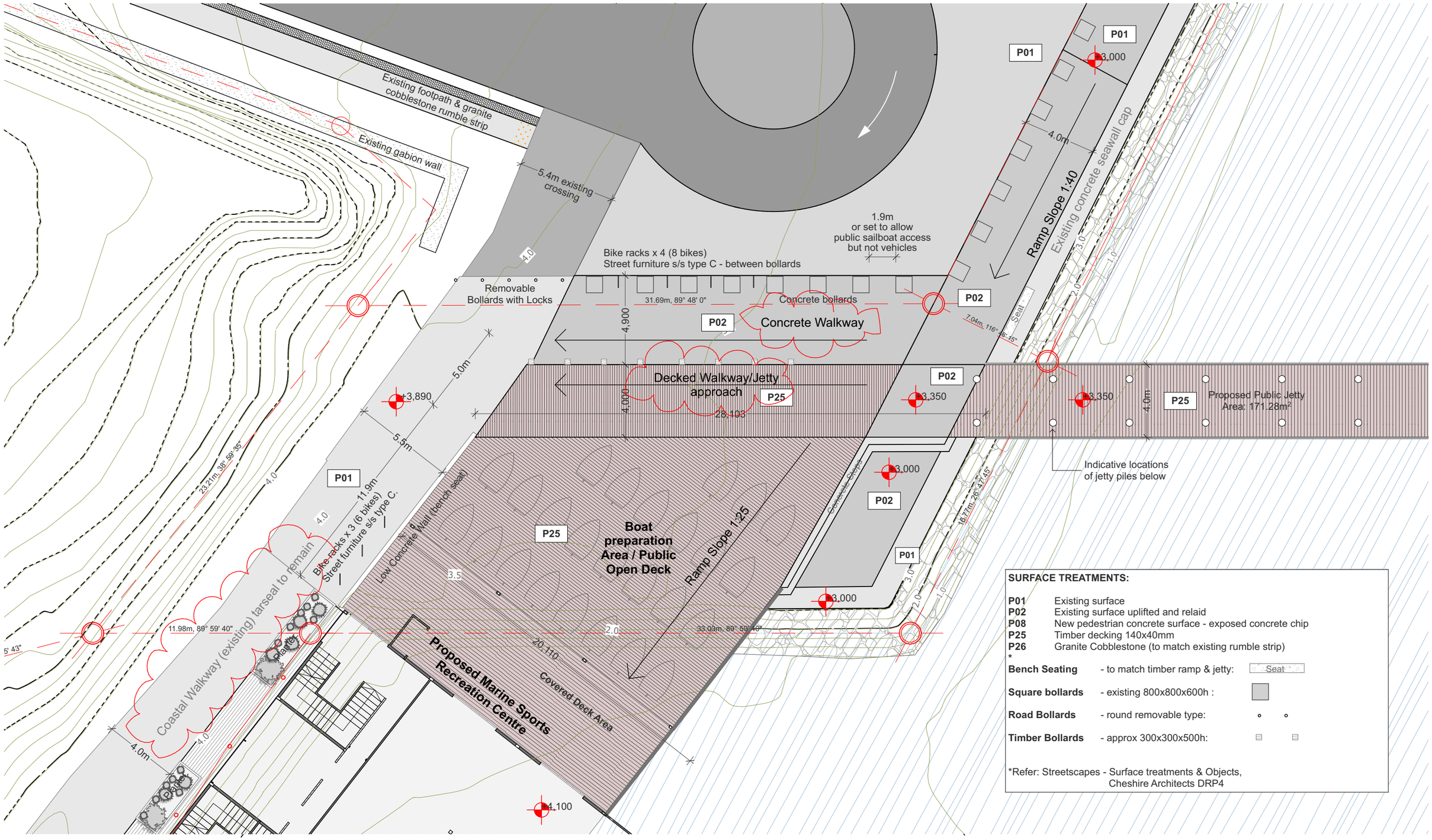
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point	A		Text & Dimensions Added. Areas added/updated	14.02.20	Site Plan	14/02/20	Resource Consent Application	RC02-A
Project No. 1852							**Page** 2 of 11	**Scale** 1:500 at A3	**Revision Number** A



SURFACE TREATMENTS:

P01	Existing surface
P02	Existing surface uplifted and relaid
P08	New pedestrian concrete surface - exposed concrete chip
P25	Timber decking 140x40mm
P26	Granite Cobblestone (to match existing rumble strip)
*	
Bench Seating	- to match timber ramp & jetty: Seat
Square bollards	- existing 800x800x600h :
Road Bollards	- round removable type:
Timber Bollards	- approx 300x300x500h:

*Refer: Streetscapes - Surface treatments & Objects, Cheshire Architects DRP4

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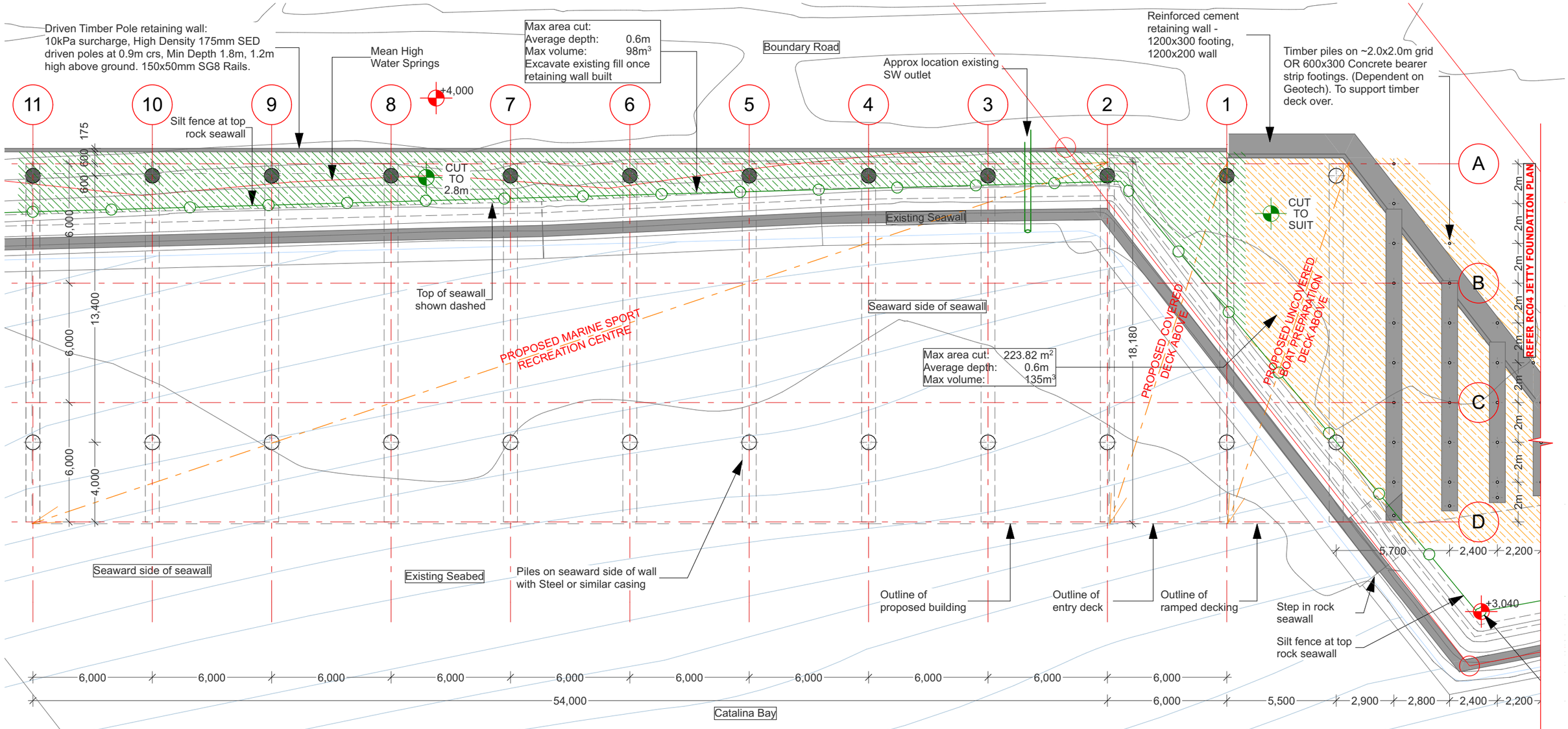
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point	A		Text added.	14.02.20	Forecourt Plan	14/02/20	Resource Consent Application	RC03-A
Project No. 1852							**Page** 3 of 11	**Scale** 1:200 at A3	**Revision Number** A



Key:

- 750mm ⌀ Bored reinforced concrete pile into bank (land side of sea wall)
- 750mm ⌀ Bored reinforced concrete pile with Steel or similar casing for sea-side installations.
- Timber piles on ~2.0x2.0m grid to support timber deck over
- 1000x400mm (excl corbel) Precast Concrete Beam
- Driven Timber Pole retaining wall: 10kPa surcharge, High Density 175mm SED driven poles at 0.9m crs, Min Depth 1.8m, 1.2m high above ground. 150x50mm SG8 Rails.
- Jetty Piles 300⌀ at 4200 Crs
- Temporary Silt Fence to ARC TP90 Erosion and Sediment control guidelines

Construction Sequences:

Marine Sport Recreation Centre Construction Sequence:

- Install bored reinforced concrete piles (casing or sheet pile caisson to seaward side)
  - *Geotech guidance for the building platform:*
  - *Bored piles for the building platform: either permanent or temporary casing would be adopted to prevent the collapse of the bored holes during drilling. Auger will be used to construct piles in ECBF rock with the minimum embedment depth of 3 x pile diameter. A tremie method should be chosen to pour the concrete.*
- Land primary PB1 precast concrete beams
- Land secondary PB2 precast concrete beams
- Install timber floor / decking units
- Carry on with timber construction above in a traditional manner

Jetty Construction Sequence:

- Timber jetty piles – auger a hole approx. 90% of pile diameter, sharpen end of pile and impact hammer in.
- It is likely that land and marine (barge) rigs will be used, this will be up to the contractor, both should be considered.

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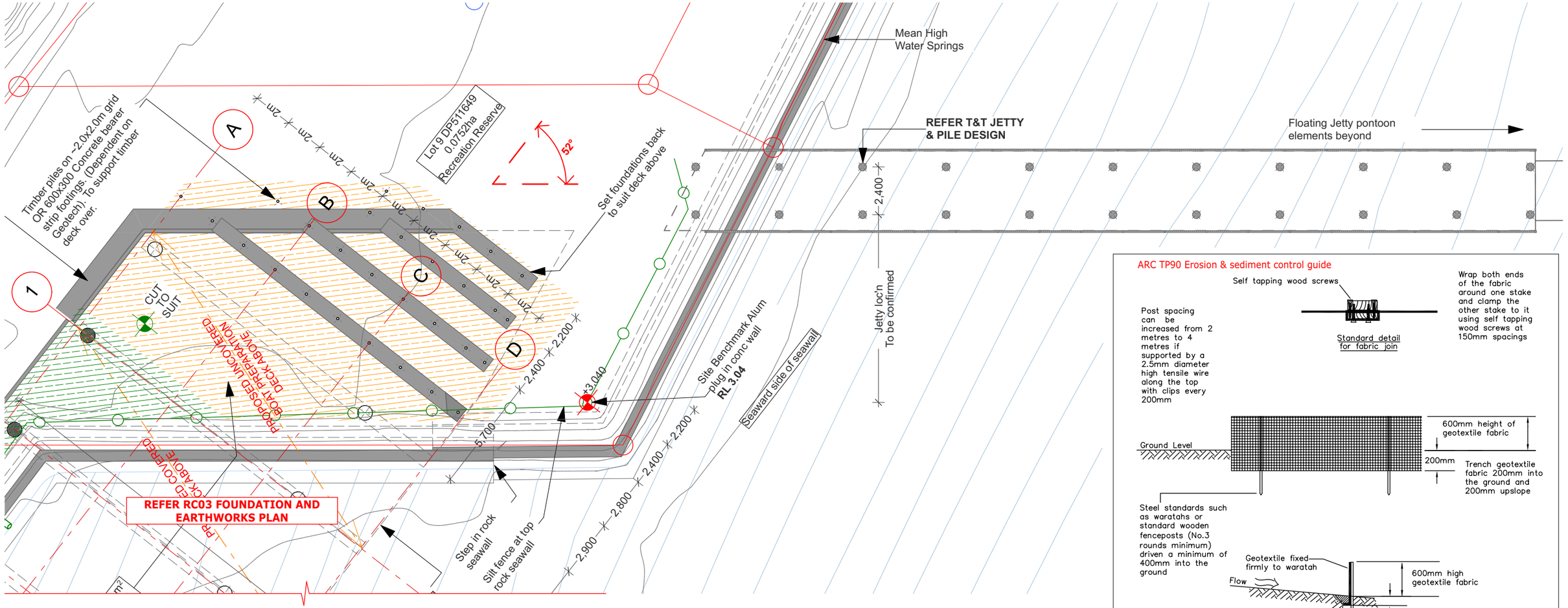
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Foundation and Earthworks Plan	14/02/20	Resource Consent Application	RC04
Project No. 1852							**Page** 4 of 11	**Scale** 1:200 at A3	**Revision Number**



Key:

- 750mm ⌀ Bored reinforced concrete pile into bank (land side of sea wall)
- 750mm ⌀ Bored reinforced concrete pile with Steel or similar casing for sea-side installations.
- Timber piles on ~2.0x2.0m grid to support timber deck over
- 1000x400mm (excl corbel) Precast Concrete Beam
- Driven Timber Pole retaining wall: 10kPa surcharge, High Density 175mm SED driven poles at 0.9m crs, Min Depth 1.8m, 1.2m high above ground. 150x50mm SG8 Rails.
- Jetty Piles 300⌀ at 4200 Crs
- Temporary Silt Fence to ARC TP90 Erosion and Sediment control guidelines

Construction Sequences:

Marine Sport Recreation Centre Construction Sequence:

- Install bored reinforced concrete piles (casing or sheet pile caisson to seaward side)
- *Geotech guidance for the building platform:*
- *Bored piles for the building platform: either permanent or temporary casing would be adopted to prevent the collapse of the bored holes during drilling. Auger will be used to construct piles in ECBF rock with the minimum embedment depth of 3 x pile diameter. A tremie method should be chosen to pour the concrete.*
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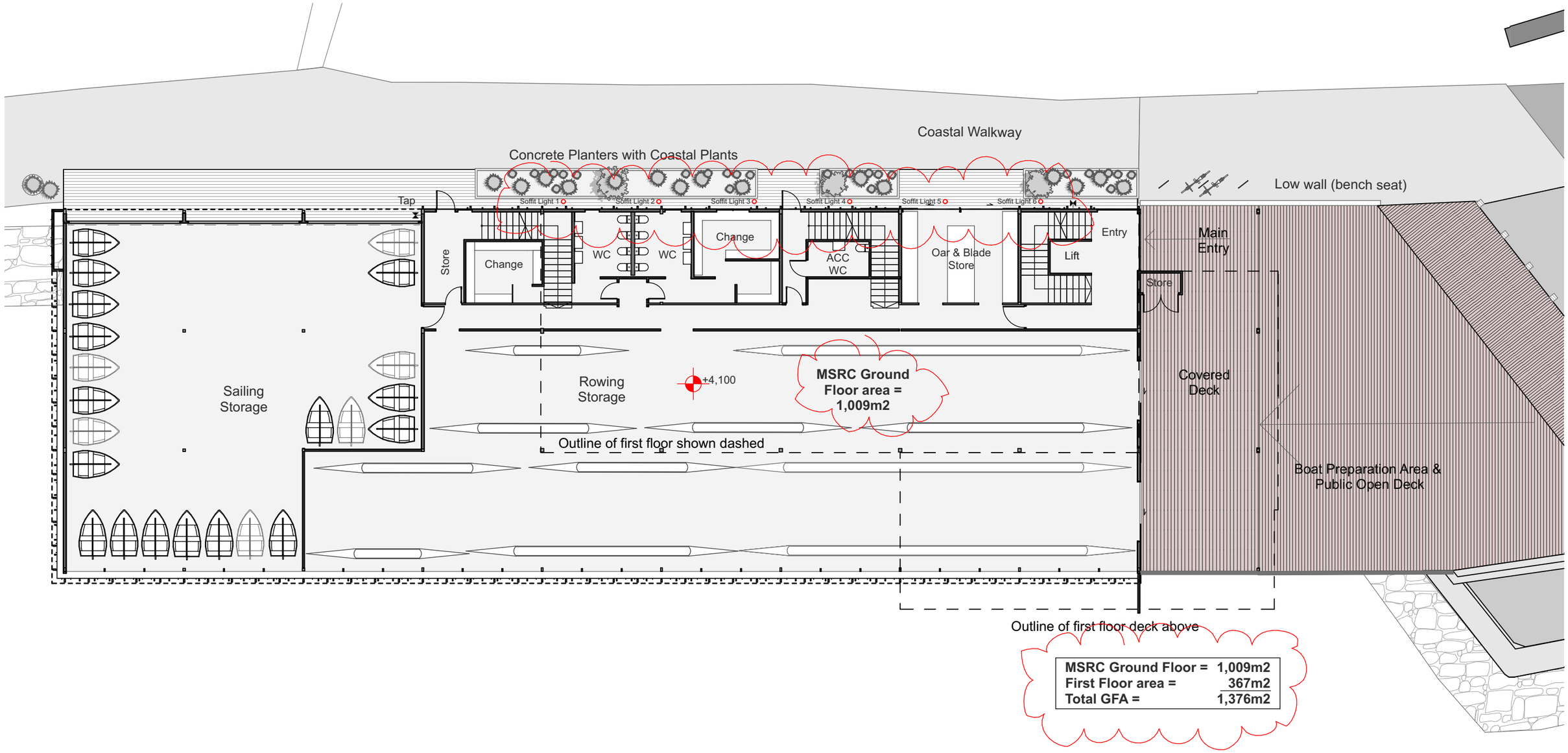
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point					Jetty Foundation Plan	14/02/20	Resource Consent Application	RC05
Project No. 1852							**Page** 5 of 11	**Scale** 1:200 at A3	**Revision Number**



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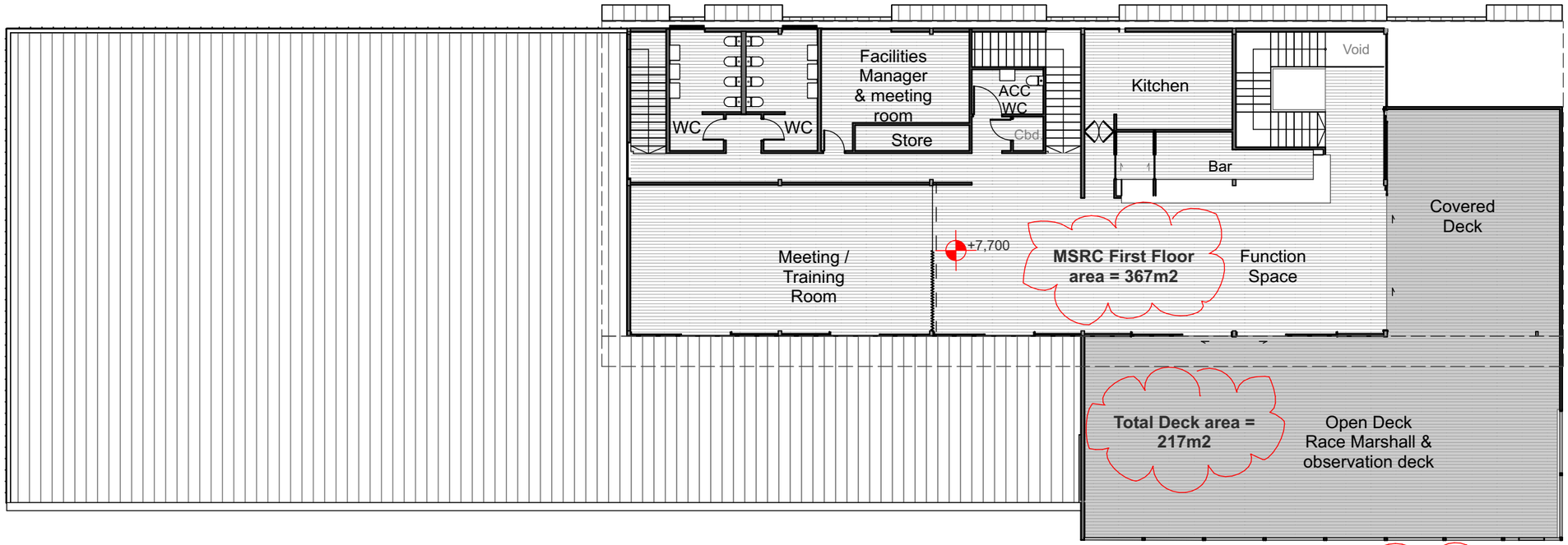
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point	A		Areas added. Soffit lights indicated	14.02.20	Ground Floor Plan	14/02/20	Resource Consent Application	RC06-A
Project No. 1852							**Page** 6 of 11	**Scale** 1:200 at A3	**Revision Number** A



MSRC Ground Floor = 1,009m2
First Floor area = 367m2
Total GFA = 1,376m2

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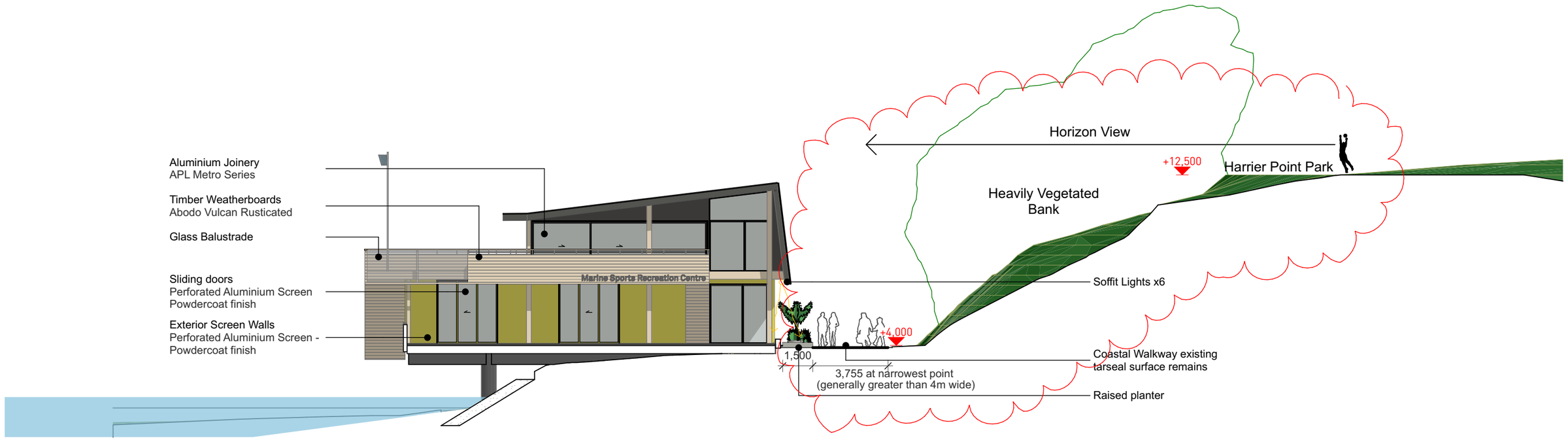
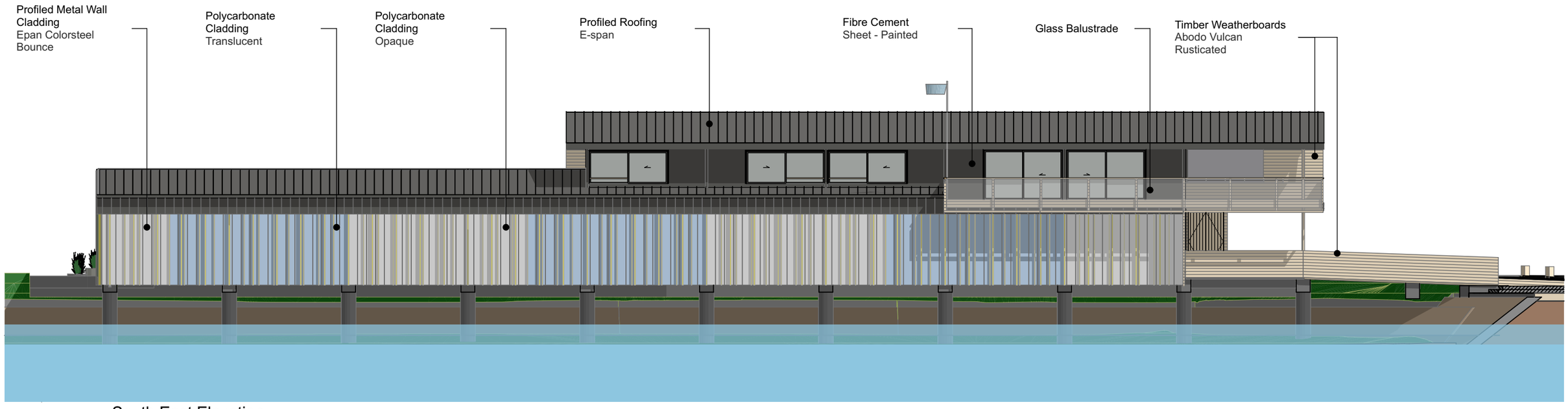
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point	A		Areas added	14.02.20	Upper Floor Plan	14/02/20	Resource Consent Application	RC07-A
Project No. 1852							**Page** 7 of 11	**Scale** 1:200 at A3	**Revision Number** A



North East Elevation



South East Elevation

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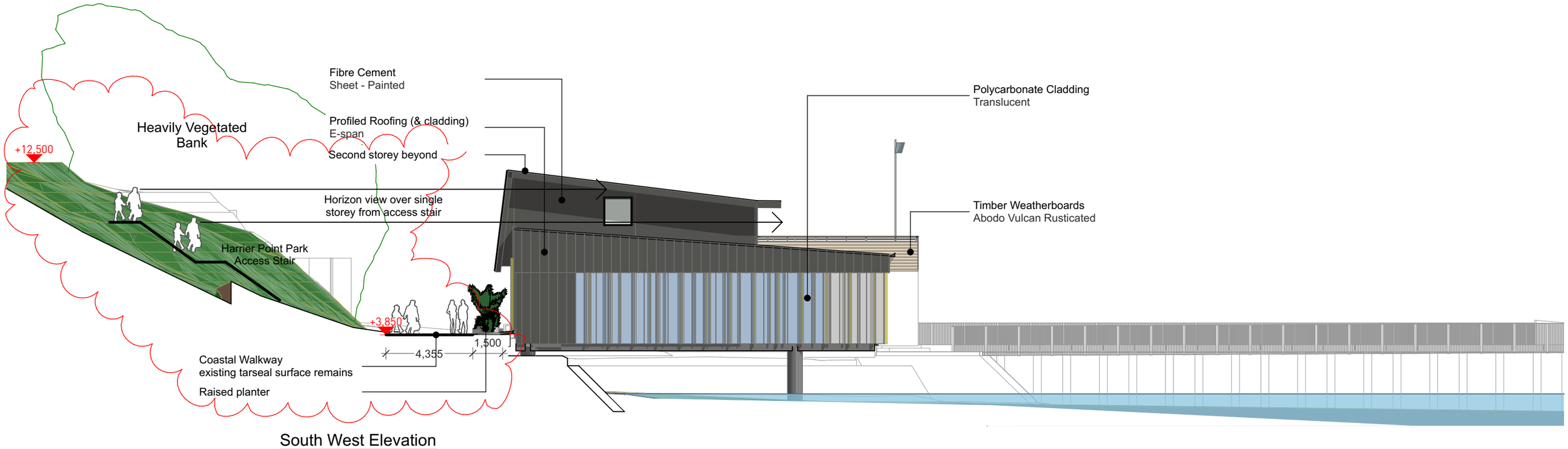
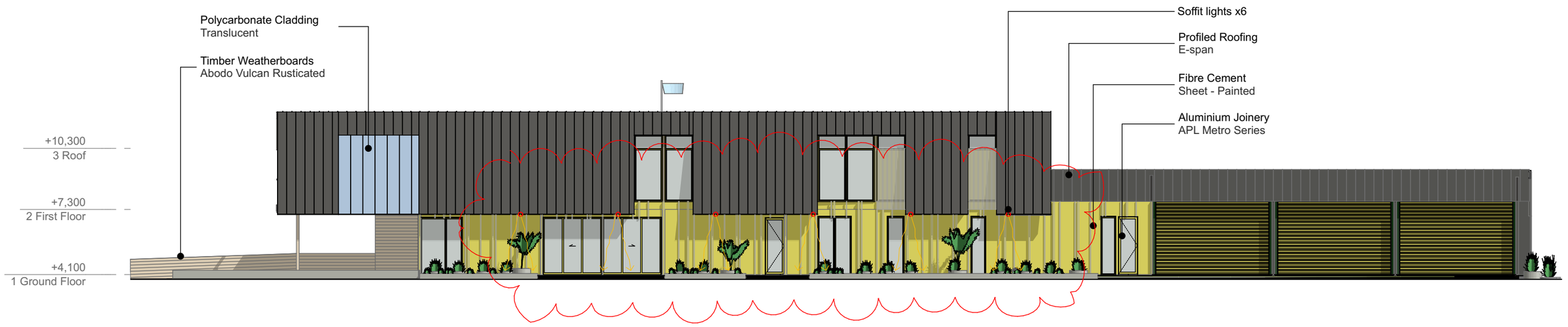
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point	A		Coastal walkway & bank added to North East Elevation. Soffit lights indicated.	14.02.20	Building Elevations	14/02/20	Resource Consent Application	RC08-A
Project No. 1852							**Page** 8 of 11	**Scale** 1:200 at A3	**Revision Number**



South West Elevation



North West Elevation

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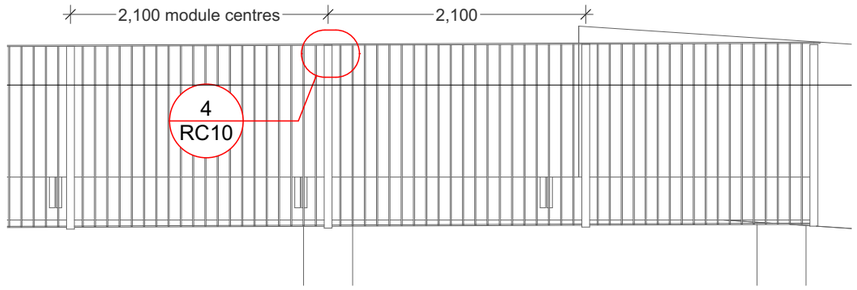
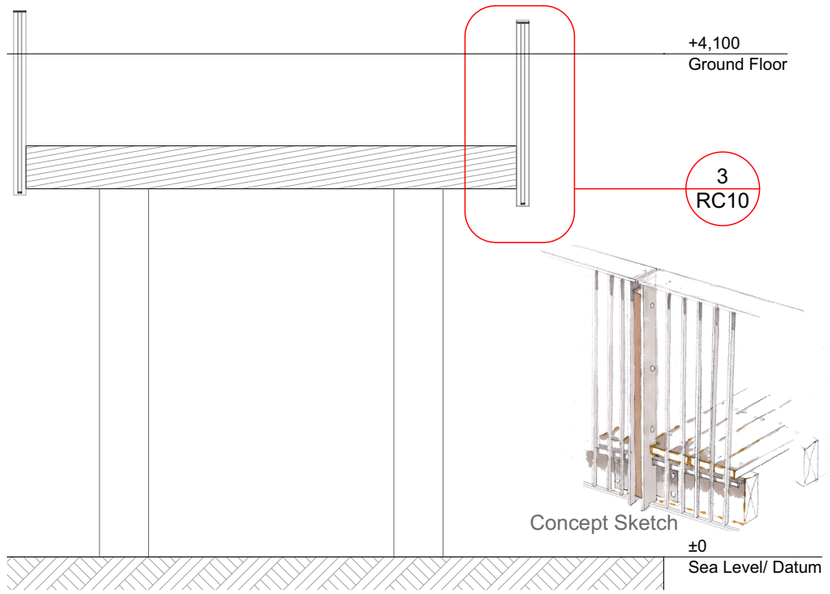
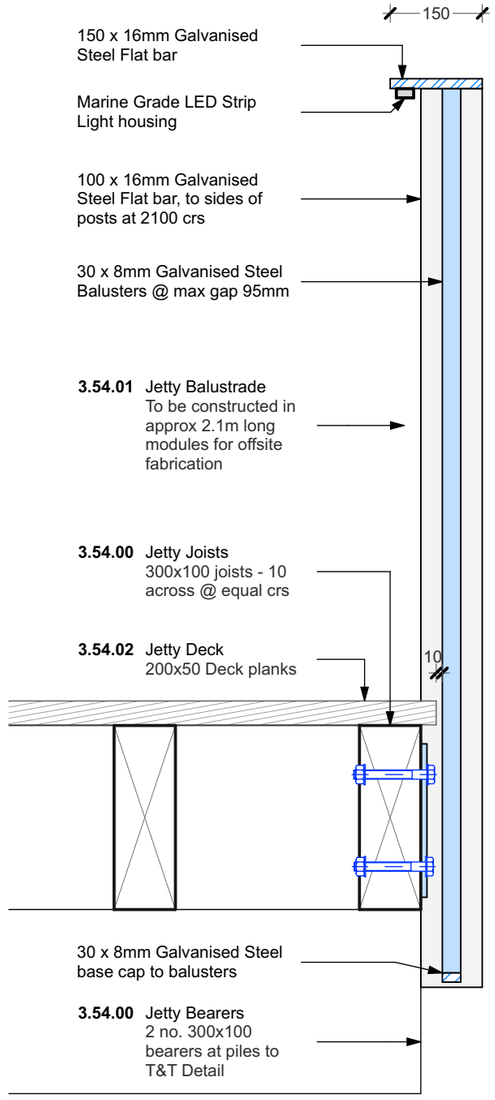
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point	A		Coastal walkway & bank added to South West Elevation. Soffit lights indicated	14.02.20	Building Elevations II	14/02/20	Resource Consent Application	RC09-A
Project No. 1852							**Page** 9 of 11	**Scale** 1:200 at A3	**Revision Number** A



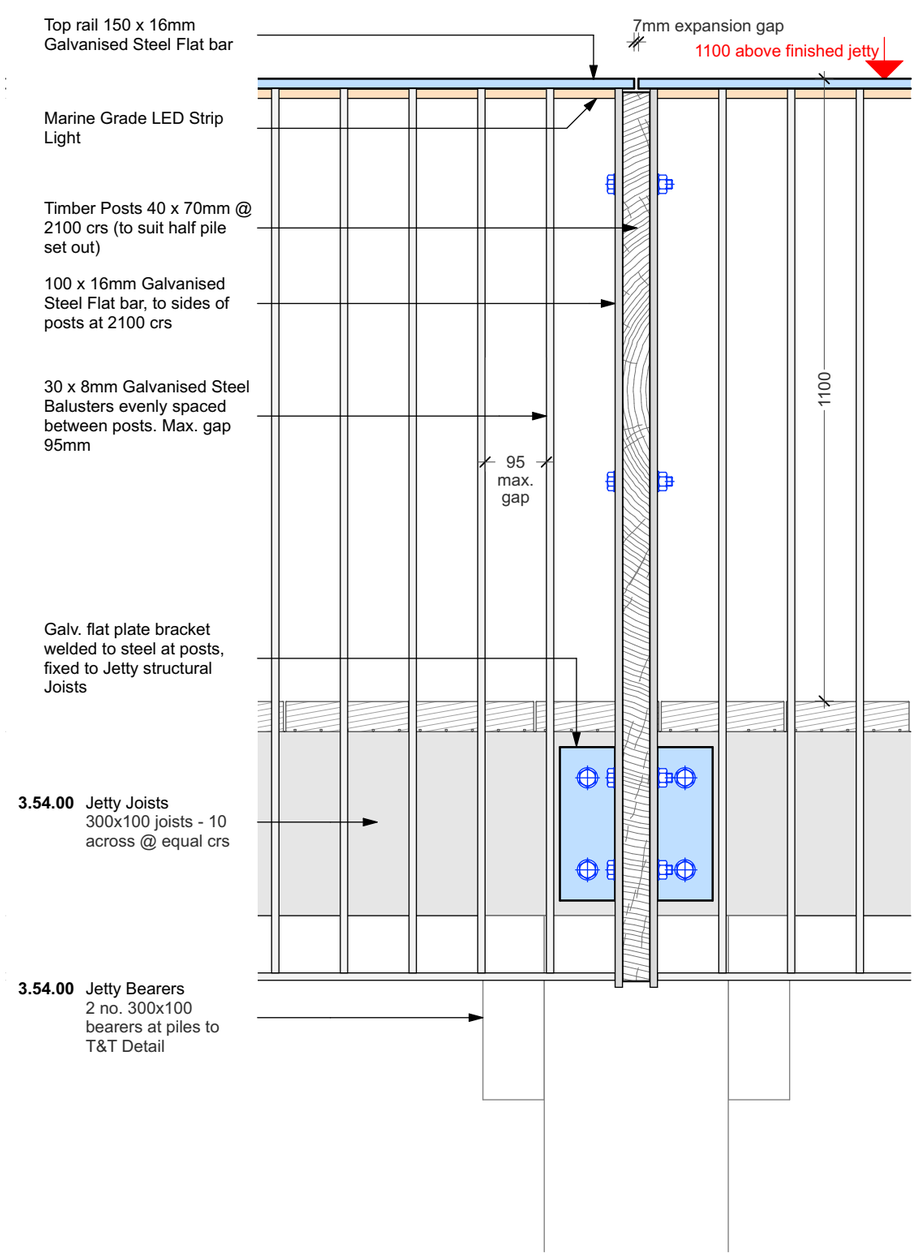
2 Jetty Elevation 1:50



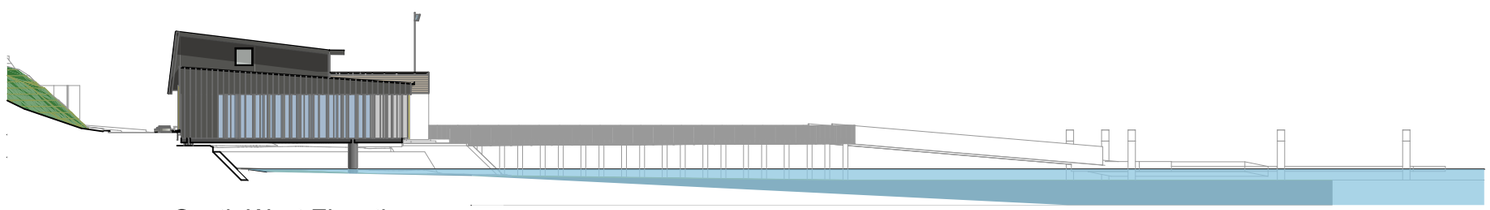
1 Jetty Section 1:50



3 Handrail Section Detail 1:10



4 Handrail Elevation Detail 1:10



South West Elevation

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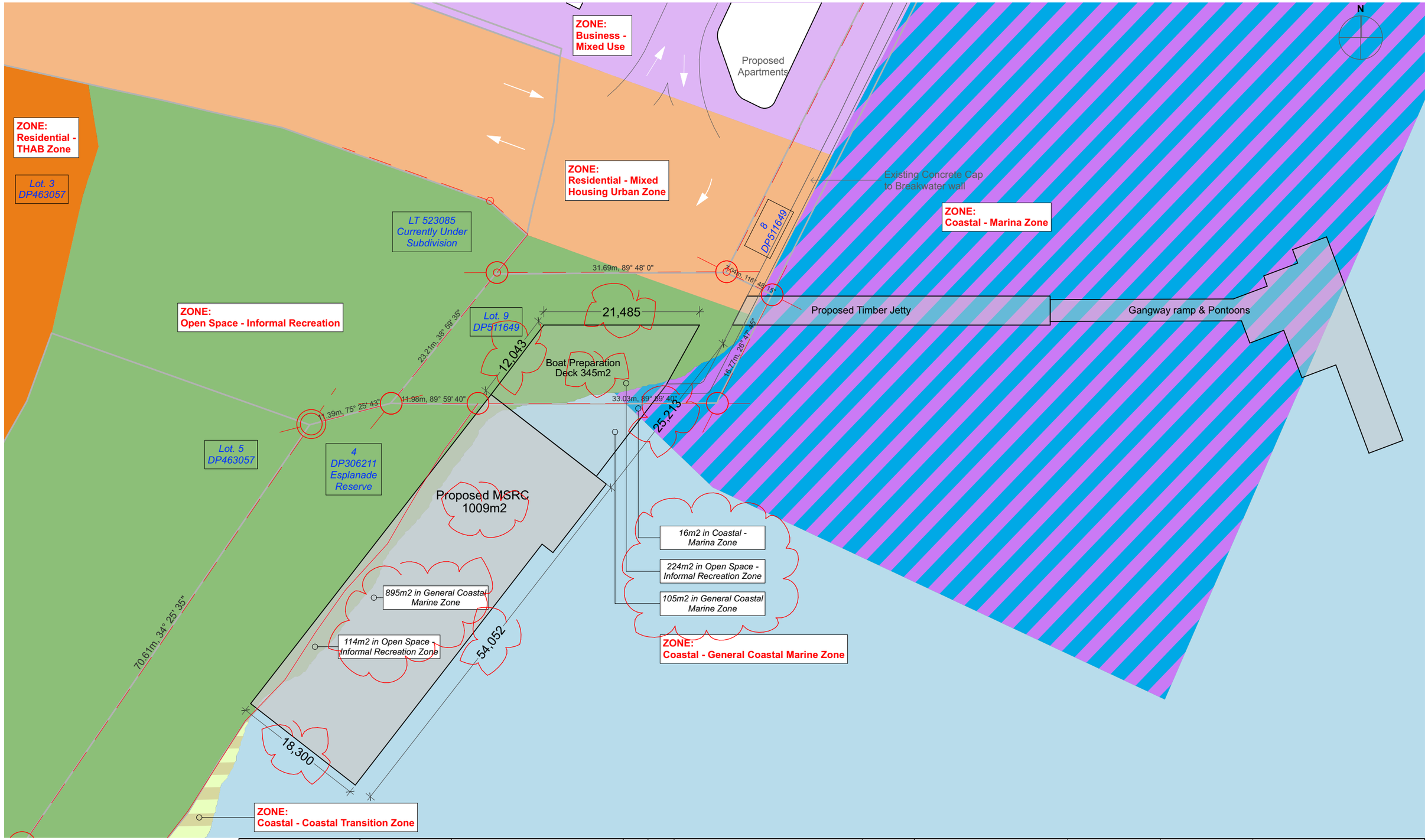
Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point			NOT FOR CONSTRUCTION THIS DESIGN IS SUBJECT TO ENGINEERS REVIEW PONTOON AND GANGWAY BY OTHERS		Jetty	14/02/20	Resource Consent Application	RC10
Project No. 1852							**Page** 10 of 11	**Scale** 1:50, 1:10, 1:500 at A3	**Revision Number**



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Client	Project Name / Location	Rev	ID	Description	Date	Drawing Title	Created	Stage	Drawing Number
HLC	Marine Sports Recreation Centre, Boundary Road, Catalina Bay, Hobsonville Point	A		Areas & Dimensions Added	14.02.20	Site - AUP Zoning Plan	14/02/20	Resource Consent Application	RC11-A
Project No. 1852							**Page** 11 of 11	**Scale** 1:500 at A3	**Revision Number** A

Marine Sports & Recreation Facility: Hobsonville Point

Graphic Supplement

March 2020

Boffa Miskell

Marine Sports & Recreation Facility: Hobsonville Point

Contents

File Ref: BM19249_002_A3L_Visual_Simulation_Viewpoint_Locations.mxd

Boffa Miskell

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0 100 200 m

1:5,000 @ A3

Data Sources: LINZ (Cadastre, Aerials), Auckland Council, Boffa Miskell

Projection: NZGD 2000 New Zealand Transverse Mercator

Legend

- Visual Simulation Viewpoint Locations
- Proposed Development Footprint
- AUP High Natural Character of Greenhithe

BM19249 HOBSONVILLE POINT RECREATION CENTRE

Visual Simulation Viewpoint Locations

Date: 3 March 2020 | Revision: A

Plan prepared by Boffa Miskell Limited

Project Manager: Rachel.deLambert@boffamiskell.co.nz | *Drawn:* SGa | *Checked:* RDl

VISUAL SIMULATIONS - METHODOLOGY

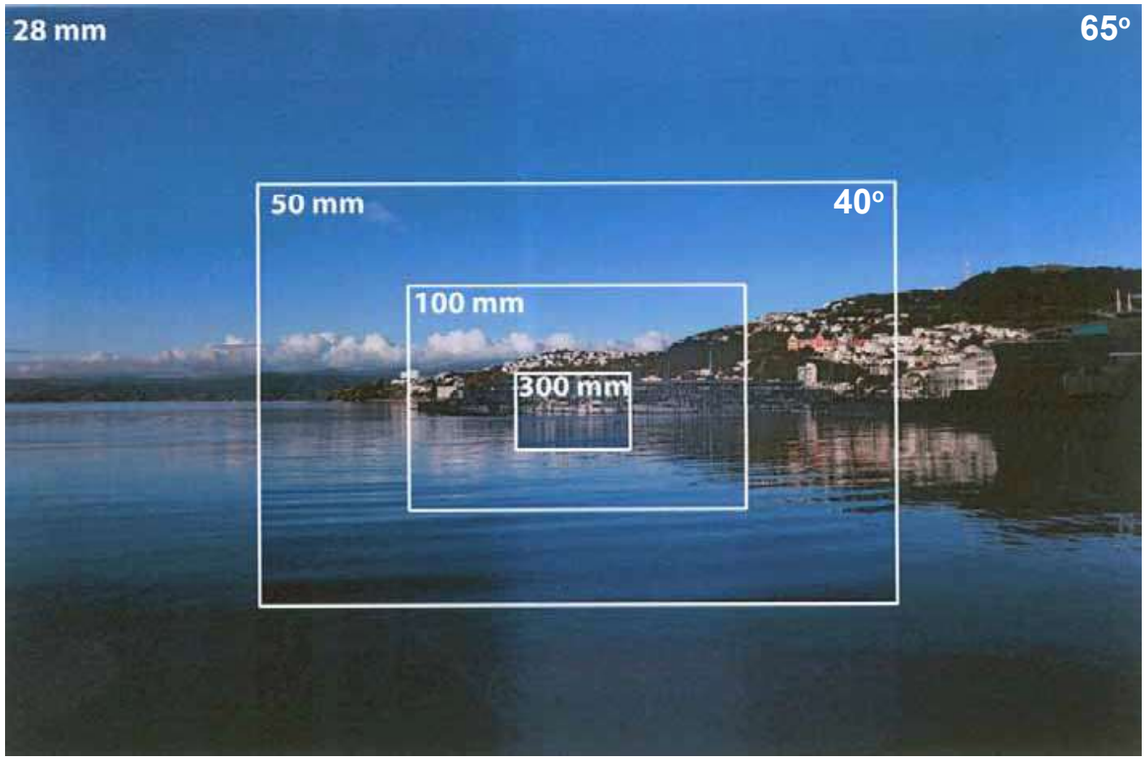
SITE VISIT & PHOTOGRAPHY

Site photographs were taken with a Canon digital SLR camera fitted with a 50mm focal length lens, mounted on a tripod and panoramic head. A series of photos were taken at predetermined viewpoints, situated on public land. The locations of each viewpoint were fixed by either hand held GPS or GPS units built in to the cameras.

NZILA GUIDELINES & PANORAMA PREPARATION

The visualisations have been produced in accordance with the NZILA Best Practice Guidelines for Visual Simulations (BPG 10.2) and also adhere to Boffa Miskell's internal Visualisation Guidelines.

As can be seen below (derived from Figure 9 of the NZILA BPG), a photo taken with a 28mm lens will provide a horizontal field of view of 65°. Using a 50mm lens will provide a "cropped" (40°) version of the same view. The same effect can also be achieved by taking multiple 50mm photos in portrait mode, and using digital stitching software to merge and crop to 90°, 65° or 40°.



COMPOSITING

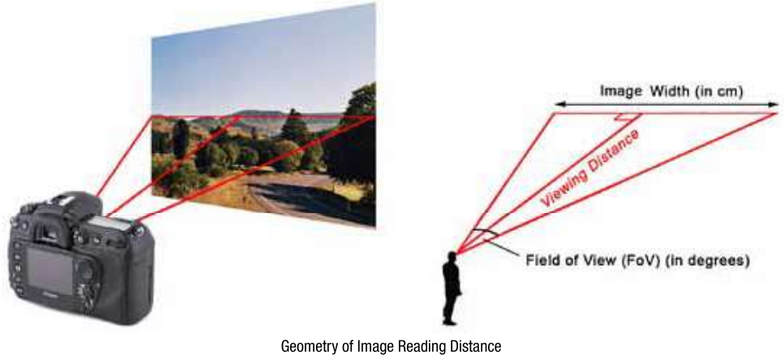
Virtual camera views were then created in 3D modelling software, and a combination of 3D contour data and 3D engineering drawings turned on in each of these views. These were then matched to the corresponding photographic panorama, using identifiable features in the landscape and the characteristics of the camera to match the two together. The visualisations were then assembled using graphic design software.

VIEWING (IMAGE READING DISTANCE)

Views which have a field of view of 40° should be viewed from a distance of 55 cm when printed at A3.
Views which have a field of view of 65° should be viewed from a distance of 31.5cm when printed at A3.
Views which have a field of view of 90° should be viewed from a distance of 20 cm when printed at A3.

This will ensure that each simulation is viewed as if standing on-site at the actual camera location, and is in accordance with Section 7.11 of the NZILA BPG (reproduced below). Users are encouraged to print these pages on A3 transparency, go to the viewpoint and hold at the specified reading distance, in order to verify the methodology.

LENS	HORIZ FoV [1]	PAPER SIZE	ACTUAL IMAGE SIZE [2]	READING DISTANCE [3]
28mm	65°	A4	277mm W x 185mm H	215mm
		A3	400mm W x 267mm H	315mm
		A2	574mm W x 383mm H	450mm
50mm	40°	A4	277mm W x 185mm H	380mm
		A3	400mm W x 267mm H	550mm
		A2	574mm W x 383mm H	790mm



Geometry of Image Reading Distance

Boffa Miskell

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BM19249 HOBSONVILLE POINT RECREATION CENTRE

Visual Simulations - Methodology

| Date: 20 August 2019 | Revision: 0 |

Prepared for HLC by Boffa Miskell Ltd

Project Manager: **rachel.delambert@boffamiskell.co.nz** | Drawn: RGo | Checked: KOt

Existing View

Proposed View

Boffa Miskell

www.boffamiskell.co.nz

Viewpoint Details

NZTM Easting	: 1749250.1 mE	Horizontal Field of View	: 90°
NZTM Northing	: 5927132.0 mN	Vertical Field of View	: 30°
Elevation	: 6.10m Approx	Projection	: Rectilinear
Date of Photography	: 11:55am, 14 June 2019	Image Reading Distance @ A3 is	20 cm

Data sources: BML - Photography; ACC - 2016 LiDAR, 2015/16 Aerials; Survey - B N Walker Surveyors; Models - SGA MSRC, BuildMedia (Winton), Cheshire Architects, Architectus

BM19249 HOBSONVILLE POINT RECREATION CENTRE

Viewpoint 1 - Launch Road Roundabout

| Date: 27 August 2019 | Revision: 0 |

Plan prepared for HLC by Boffa Miskell Limited

Project Manager: **rachel.delambert@boffamiskell.co.nz** | *Drawn:* RGo | *Checked:* KOt

VS 1

Existing View

Proposed View

Boffa Miskell

www.boffamiskell.co.nz

Viewpoint Details

NZTM Easting	: 1749439.3 mE	Horizontal Field of View	: 90°
NZTM Northing	: 5927049.9 mN	Vertical Field of View	: 30°
Elevation	: 2.39m Approx	Projection	: Rectilinear
Date of Photography	: 11:02am, 10 April 2019	Image Reading Distance @	A3 is 20 cm

Data sources: BML - Photography; ACC - 2016 LiDAR, 2015/16 Aerials; Survey - B N Walker Surveyors; Models - SGA MSRC, BuildMedia (Winton), Cheshire Architects, Architectus, LINZ

BM19249 HOBSONVILLE POINT RECREATION CENTRE

Viewpoint 2 - Boat View to Launch Road from Catalina Bay

| Date: 27 August 2019 | Revision: 0 |

Plan prepared for HLC by Boffa Miskell Limited

Project Manager: **rachel.delambert@boffamiskell.co.nz** | *Drawn:* RGo | *Checked:* KOt

VS 2

Existing View

View Showing Consented But as of Yet Un-built Development View

Boffa Miskell

www.boffamiskell.co.nz

Viewpoint Details

NZTM Easting	: 1749439.3 mE	Horizontal Field of View	: 90°
NZTM Northing	: 5927049.9 mN	Vertical Field of View	: 30°
Elevation	: 2.39m Approx	Projection	: Rectilinear
Date of Photography	: 11:02am, 10 April 2019	Image Reading Distance @ A3 is	20 cm

Data sources: BML - Photography; ACC - 2016 LiDAR, 2015/16 Aerials; Survey - B N Walker Surveyors; Models - BuildMedia (Winton), Cheshire Architects, Architectus, LINZ

BM19249 HOBSONVILLE POINT RECREATION CENTRE

Viewpoint 2 - Boat View to Launch Road from Catalina Bay

| Date: 4 March 2020 | Revision: 0 |

Plan prepared for HLC by Boffa Miskell Limited

Project Manager: **rachel.delambert@boffamiskell.co.nz** | *Drawn:* RGo | *Checked:* KOt

VS 2a

Existing View

Proposed View

Note: Representing 4 a) i in respect of council's S92 request

Boffa Miskell

www.boffamiskell.co.nz

Viewpoint Details

NZTM Easting	: 1749144.4 mE	Horizontal Field of View	: 90°
NZTM Northing	: 5926737.7 mN	Vertical Field of View	: 30°
Elevation	: 7.4m Approx	Projection	: Rectilinear
Date of Photography	: 4:02pm, 11 February 2020	Image Reading Distance @ A3 is 20 cm	

Data sources: BML - Photography; ACC - 2016 LiDAR, 2015/16 Aerials; Survey - B N Walker Surveyors; Models - SGA MSRC, BuildMedia (Winton), Cheshire Architects, Architectus, LINZ

BM19249 HOBSONVILLE POINT RECREATION CENTRE

Viewpoint 3 - Onekiritea Park Pathway (south of the proposal)

| Date: 25 February 2020 | Revision: 0 |

Plan prepared for HLC by Boffa Miskell Limited

Project Manager: **rachel.delambert@boffamiskell.co.nz** | *Drawn:* RGo | *Checked:* RdL

VS 3

Existing View

View Showing Consented But as of Yet Un-built Development View

Boffa Miskell

www.boffamiskell.co.nz

Viewpoint Details

NZTM Easting	: 1749144.4 mE	Horizontal Field of View	: 90°
NZTM Northing	: 5926737.7 mN	Vertical Field of View	: 30°
Elevation	: 7.4m Approx	Projection	: Rectilinear
Date of Photography	: 4:02pm, 11 February 2020	Image Reading Distance @ A3 is 20 cm	

Data sources: BML - Photography; ACC - 2016 LiDAR, 2015/16 Aerials; Survey - B N Walker Surveyors; Models - BuildMedia (Winton), Cheshire Architects, Architectus, LINZ

BM19249 HOBSONVILLE POINT RECREATION CENTRE

Viewpoint 3 - Onekiritea Park Pathway (south of the proposal)

| Date: 4 March 2020 | Revision: 0 |

Plan prepared for HLC by Boffa Miskell Limited

Project Manager: **rachel.delambert@boffamiskell.co.nz** | *Drawn:* RGo | *Checked:* RdL

VS 3a

Existing View

Proposed View

Note: Representing 4 a) ii in respect of council's S92 request

Boffa Miskell

www.boffamiskell.co.nz

Viewpoint Details

NZTM Easting	: 1749193.9 mE	Horizontal Field of View	: 90°
NZTM Northing	: 5927042.7 mN	Vertical Field of View	: 30°
Elevation	: 5.7m Approx	Projection	: Rectilinear
Date of Photography	: 3:46pm, 11 February 2020	Image Reading Distance @ A3 is	20 cm

Data sources: BML - Photography; ACC - 2016 LiDAR, 2015/16 Aerials; Survey - B N Walker Surveyors; Models - SGA MSRC, BuildMedia (Winton), Cheshire Architects, Architectus, LINZ

BM19249 HOBSONVILLE POINT RECREATION CENTRE

Viewpoint 4 - Boundary Rd (immediately southwest of the proposal)

| Date: 25 February 2020 | Revision: 0 |

Plan prepared for HLC by Boffa Miskell Limited

Project Manager: **rachel.delambert@boffamiskell.co.nz** | *Drawn:* RGo | *Checked:* RdL

VS 4

Existing View

View Showing Consented But as of Yet Un-built Development View

Boffa Miskell

www.boffamiskell.co.nz

Viewpoint Details

NZTM Easting	: 1749193.9 mE	Horizontal Field of View	: 90°
NZTM Northing	: 5927042.7 mN	Vertical Field of View	: 30°
Elevation	: 5.7m Approx	Projection	: Rectilinear
Date of Photography	: 3:46pm, 11 February 2020	Image Reading Distance @ A3 is 20 cm	

Data sources: BML - Photography; ACC - 2016 LiDAR, 2015/16 Aerials; Survey - B N Walker Surveyors; Models - BuildMedia (Winton), Cheshire Architects, Architectus, LINZ

BM19249 HOBSONVILLE POINT RECREATION CENTRE

Viewpoint 4 - Boundary Rd (immediately southwest of the proposal)

| Date: 4 March 2020 | Revision: 0 |

Plan prepared for HLC by Boffa Miskell Limited

Project Manager: **rachel.delambert@boffamiskell.co.nz** | *Drawn:* RGo | *Checked:* RdL

VS 4a

Boffa Miskell

Memorandum

☑ **Auckland**
Level 3, IBM Centre
82 Wyndham Street
PO Box 91250, 1142
+64 9 358 2526

☐ **Hamilton**
PO Box 1094, 3240
+64 7 960 0006

☐ **Tauranga**
PO Box 13373, 3141
+64 7 571 5511

☐ **Wellington**
PO Box 11340, 6142
+64 4 385 9315

☐ **Christchurch**
PO Box 110, 8140
+64 3 366 8891

☐ **Queenstown**
PO Box 1028, 9348
+64 3 441 1670

☐ **Dunedin**
PO Box 657, 9054
+64 3 470 0460

Attention:	Erin Taylor
Company:	Kāinga Ora
Date:	2 March 2020
From:	Rachel de Lambert
Message Ref:	s92 Request Marine Recreation Centre, Launch Road, Hobsonville Landscape Matters
Project No:	BM19249

4. Landscape and Visual Effects:

Auckland Council's s92 request at 4. Landscape and Visual Effects, sets out a number of matters which we have addressed as attached and below.

4. a) Two additional visual simulations have been prepared from viewpoint locations identified by Council as a) i and a) ii these are now included in the Graphic Supplement document attached as:

VS3 - Viewpoint 3 – Onekiritea Park Pathway (south of the proposal); and

VS4 – Viewpoint 4 – Boundary Road (immediately south west of the proposal).

No visual simulation has been prepared from Harrier Point Park as discussed below.

VS3 – the view in respect of the coastal walkway to the south:

Te Ara Manawa, the coastal walkway connecting The Landing at Hobsonville Point with Onekiritea Park (Bomb Point) passes adjacent to the proposed MRC and then generally heads inland on the alignment of Boundary Road. Further south on the coastal pathway there are locations where glimpse views north toward the subject section of coastline and MRC are available. These views are more generally available when walking north toward The Landing given the natural orientation of the walkway and pedestrians on it.

The visual simulation VS3 illustrates this view. As can be seen the proposed MRC has a simple, low, horizontal profile set at the shoreline, seen against and well below the vegetated escarpment behind. The visually light jetty and pontoon structure extends out into the water which also accommodates moored boats. By contrast taller consented urban residential buildings at The Landing and further west on Launch Road define the skyline and signal the approach toward the urban heart of Hobsonville.

The proposed colours of the MRC also set the building into the landscape avoiding noticeable contrast. In terms of potential adverse visual effects, these more distant views from Te Ara Manawa, as illustrated by VS3, are not considered to be adversely affected by the proposal with an effects rating of 'very low adverse visual effects' attributed to the proposal. It is also recognised that locations where a clear view, such as that illustrated in the viewpoint, are limited and unlikely to form a significant component of the walkway experience. In these views the more prominent presence of the taller skyline residential towers are more likely to draw the viewer's attention and, in that respect, signal a likely destination for many users of the walkway.

VS4 – The view in respect of the immediate experience of the MRC from Te Ara Manawa, the coastal walkway:

The existing edge of the walkway, former Boundary Road, in this location is generally vegetated with native shrub species including manuka / kanuka, karamu (coprosma robusta) and Harakeke (flax). This planting restricts clear views toward the tidal bay adjacent with glimpse views available at times. This part of the walkway is strongly defined by the landward escarpment atop which sits Harrier Point Park.

As illustrated in VS4 the proposed MRC facility will define a new seaward edge to a short section of the walkway just south of Launch Road and The Landing. The introduction of a building in this location will change the nature of the walkway environment from one that is dominated by natural elements to one with a more urban, built character. The location, just south of The Landing, will extend the urban node slightly south but with a community oriented recreational facility that requires water access in contrast to the more private residential / commercial / hospitality and PT activities at The Landing.

The MRC building has been designed to meet its functional purpose whilst at the same time having a quality, considered architectural design including a range of features to break up the scale of the building and make it of interest to the adjacent public. These include the varied roof profile, inclusion of windows and vertical fins, colour and planters / vegetation along the edge of the pathway. Proposed planting will replicate the coastal species already present.

Whilst the building will be experienced in close proximity in these views, the western elevation adjacent to the walkway is broken up into a series of elements to relieve the length of the façade creating visual interest. When the facility is in use, generally early in the morning, in the evenings and at weekends, the activity and increased visibility into the structure, with its boats, boating equipment and people, will add further interest and a human dimension to the community recreation nature of the facility. Whilst an aspect of proximity to the tidal water's edge will be removed this portion of the walkway does not currently benefit from extensive open views.

Walking north toward The Landing the building reinforces an approach to the urban heart of Hobsonville Point with the consented Willis Bond 'Cheshire Building', comprising residential apartments, visually terminating the view with a low rise residential tower. Cumulatively these structures will alter the urban qualities of the locality, but they are not unattractive or out of context in respect of the wider Hobsonville location. In particular the MRC replaces facilities, including buildings to support marine recreation, that have long been accommodated at The Landing and are therefore not unexpected by people already familiar with the locality and its water based activities.

In terms of visual effects and the recreational amenity of Te Ara Manawa in this location a 'low adverse visual amenity effect' will be generated due to the building's physical enclosure of the walkway and proximity to its users. This effect is offset to an extent by the public recreational amenity of the building which requires a water edge location. The quality and architectural design of the facility is a significant improvement on the series of garage / shed and lean-to structures which currently occupy a prime water edge location at The Landing.

4. b) Harrier Point Park

In respect of views from Harrier Point Park no visual simulation has been prepared from within the Park. The park's elevation atop the escarpment and framing native vegetation along its eastern edge adjacent to Te Ara Manawa and the subject site mean that the proposed low lying structure will not be generally apparent in views from the park.

Views out from this public park are oriented north and north east with a protected viewshaft extending to the north from the park toward the bush clad escarpment and trig on the far side of the Harbour. Attractive views across the water / channel to Hellyer's Creek from the park are oriented north east with the proposed development set further south along the coastline out of view. The proposal will not therefore impact on the character or visual amenity for park users or the nature / attractiveness of its wider landscape views.

The one location where users of the park will experience the proposed development is on the pathway and set of steps that connect Harrier Point Park with Te Ara Manawa adjacent to the MRC development. For people descending from the park to the walkway there will be initial views out and over the MRC which will become blocked by the building as one descends the stairs to join the walkway. This transient visual impact is not considered to generate an adverse visual effect.

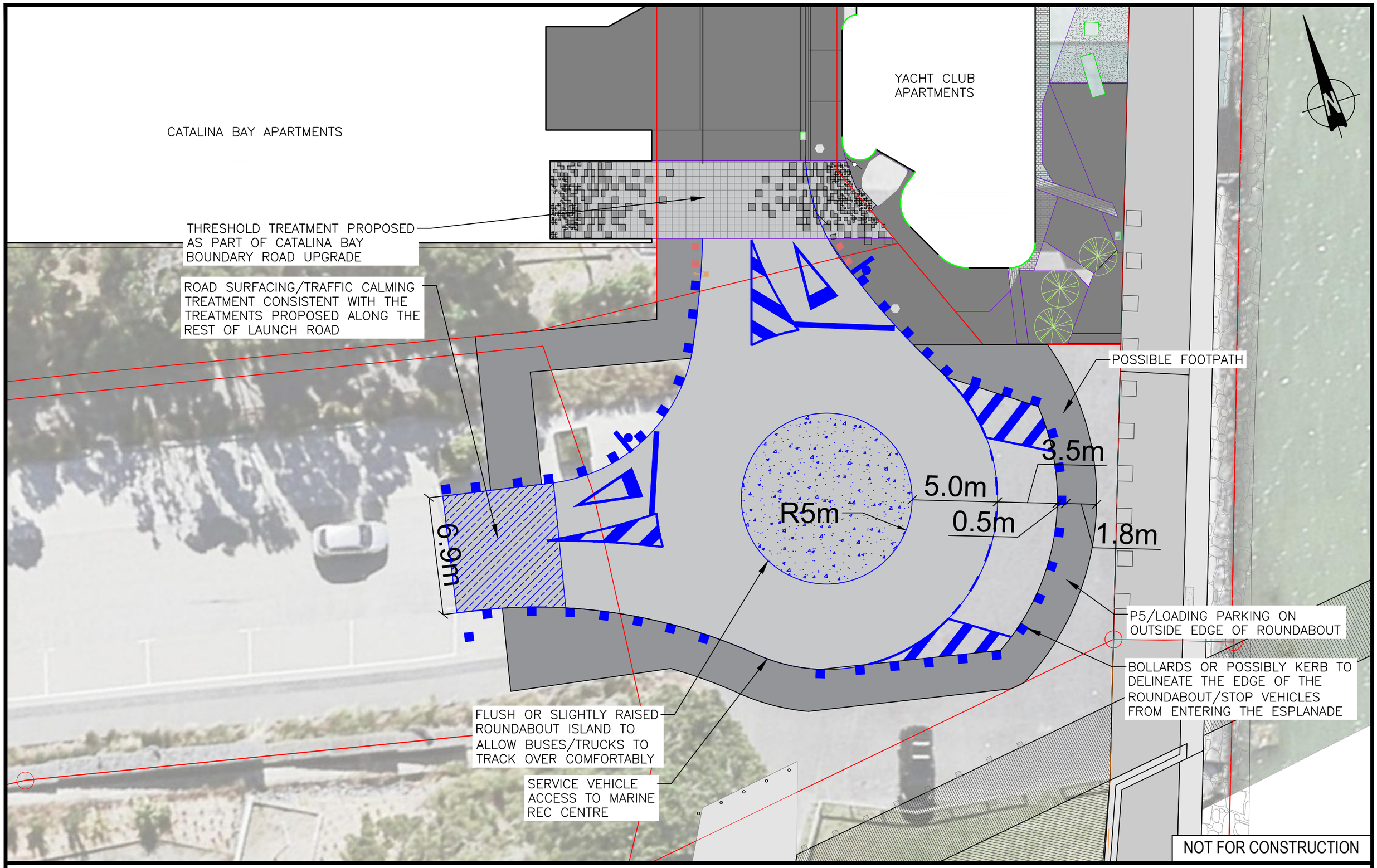
9. Boundary Road Treatment

9. a) Council has questioned whether the public walkway will appear public with the presence of the MRC.

In my opinion the MRC will read as a public facility with the pathway / Te Ara Manawa clearly defined and legible to the west. I do not consider additional signage is necessary to reinforce the public nature of the walkway which is already popular and well used by local residents and visitors to Hobsonville.

Rachel de Lambert
Boffa Miskell

P:\hlco\052 Catalina Bay Marine Rec Centre and Launch Road Roundabout\Drawings\D1C200214 - Launch Rd Roundabout Concept.dwg vj 19/02/2020 3:00 pm



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1 of 6 sheets

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date:	17/07/2019	drawn:	rb
ref:	hlco 052	checked:	lb

status	issued
a	17/07/2019
b	20/08/2019
c	19/02/2020

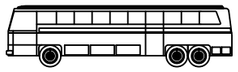
Launch Road Roundabout - Catalina Bay Concept Layout

flow
TRANSPORTATION SPECIALISTS
Level 1, 11 Blake Street, Ponsonby, Auckland | PO Box 47497 Ponsonby
p 09 970 3820 | f 09 970 3890 | www.flownz.com

vehicle tracking key:

- vehicle chassis outline (forwards)
- vehicle chassis outline (reverse)
- overhang of vehicle (forwards)
- overhang of vehicle (reverse)
- 500mm clearance (forwards)
- 500mm clearance (reverse)

vehicle specs:



AT Bus - Rear Steer

vehicle width: 2.50m
lock to lock time: 6.00s
track width: 2.50m
max steering angle: 47 degrees
vehicle speed: 5-15kmph

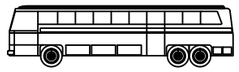
Not to Scale

NOT FOR CONSTRUCTION

vehicle tracking key:

- vehicle chassis outline (forwards)
- vehicle chassis outline (reverse)
- overhang of vehicle (forwards)
- overhang of vehicle (reverse)
- 500mm clearance (forwards)
- 500mm clearance (reverse)

vehicle specs:



Tour Coach

vehicle width: 2.50m
lock to lock time: 6.00s
track width: 2.50m
turning radius: 12.5m
vehicle speed: 5-15kmph

Not to Scale

NOT FOR CONSTRUCTION

0 8m

2 of 6 sheets

scale:	1:200 A3	design:	rb
date:	17/07/2019	drawn:	rb
ref:	hlco 052	checked:	lb

status	issued
a	17/07/2019
b	20/08/2019
c	19/02/2020

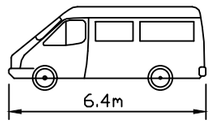
Launch Road Roundabout - Catalina Bay
Bus Tracking

flow
TRANSPORTATION SPECIALISTS
Level 1, 11 Blake Street, Ponsonby, Auckland | PO Box 47497 Ponsonby
p 09 970 3820 | f 09 970 3890 | www.flownz.com

vehicle tracking key:

- vehicle chassis outline (forwards)
- vehicle chassis outline (reverse)
- overhang of vehicle (forwards)
- overhang of vehicle (reverse)
- 500mm clearance (forwards)
- 500mm clearance (reverse)

vehicle specs:



6.4m Van

vehicle width: 2.05m
lock to lock time: 4.00s
track width: 1.81m
turning radius: 7.2m
vehicle speed: 5-10kmph

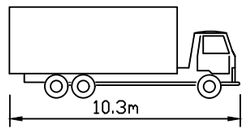
Not to Scale

NOT FOR CONSTRUCTION

vehicle tracking key:

- vehicle chassis outline (forwards)
- vehicle chassis outline (reverse)
- overhang of vehicle (forwards)
- overhang of vehicle (reverse)
- 500mm clearance (forwards)
- 500mm clearance (reverse)

vehicle specs:



10.3m Truck

vehicle width: 2.50m
lock to lock time: 6.00s
track width: 2.50m
turning radius: 47 degrees
vehicle speed: 5-10kmph

Not to Scale

NOT FOR CONSTRUCTION

0 8m

3 of 6 sheets

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date:	17/07/2019	drawn:	rb
ref:	hlco 052	checked:	lb

status	issued
a	17/07/2019
b	20/08/2019
c	19/02/2020

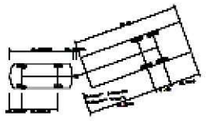
Launch Road Roundabout - Catalina Bay
U-Turn Tracking

flow
TRANSPORTATION SPECIALISTS
Level 1, 11 Blake Street, Ponsonby, Auckland | PO Box 47497 Ponsonby
p 09 970 3820 | f 09 970 3890 | www.flownz.com

vehicle tracking key:

- vehicle chassis outline (forwards)
- vehicle chassis outline (reverse)
- overhang of vehicle (forwards)
- overhang of vehicle (reverse)
- 500mm clearance (forwards)
- 500mm clearance (reverse)

vehicle specs:



14.2m Car with Trailer

vehicle width: 2.50m
lock to lock time: 4.00s
track width: 2.40m
turning radius: 5.95m
vehicle speed: 5-10kmph

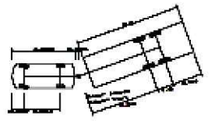
Not to Scale

NOT FOR CONSTRUCTION

vehicle tracking key:

- vehicle chassis outline (forwards)
- vehicle chassis outline (reverse)
- overhang of vehicle (forwards)
- overhang of vehicle (reverse)
- 500mm clearance (forwards)
- 500mm clearance (reverse)

vehicle specs:



14.2m Car with Trailer

vehicle width: 2.50m
lock to lock time: 4.00s
track width: 2.40m
turning radius: 5.95m
vehicle speed: 5-10kmph

Not to Scale

NOT FOR CONSTRUCTION

0 8m

4 of 6 sheets

scale:	1:200 A3	design:	rb
date:	17/07/2019	drawn:	rb
ref:	hlco 052	checked:	lb

status	issued
a	17/07/2019
b	20/08/2019
c	19/02/2020

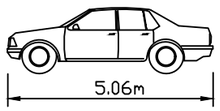
Launch Road Roundabout - Catalina Bay
Row Boat Trailer Tracking

flow
TRANSPORTATION SPECIALISTS
Level 1, 11 Blake Street, Ponsonby, Auckland | PO Box 47497 Ponsonby
p 09 970 3820 | f 09 970 3890 | www.flownz.com

vehicle tracking key:

- vehicle chassis outline (forwards)
- vehicle chassis outline (reverse)
- overhang of vehicle (forwards)
- overhang of vehicle (reverse)
- 500mm clearance (forwards)
- 500mm clearance (reverse)

vehicle specs:



95th Percentile Car

vehicle width: 1.92m
lock to lock time: 4.00s
track width: 1.89m
turning radius: 6.45m
vehicle speed: 5-10kmph

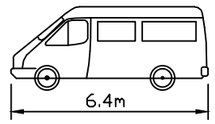
Not to Scale

NOT FOR CONSTRUCTION

vehicle tracking key:

- vehicle chassis outline (forwards)
- vehicle chassis outline (reverse)
- overhang of vehicle (forwards)
- overhang of vehicle (reverse)
- 500mm clearance (forwards)
- 500mm clearance (reverse)

vehicle specs:



6.4m Van

vehicle width: 2.05m
lock to lock time: 4.00s
track width: 1.81m
turning radius: 7.2m
vehicle speed: 5-10kmph

Not to Scale

NOT FOR CONSTRUCTION

0 8m

5 of 6 sheets

scale:	1:200 A3	design:	rb
date:	17/07/2019	drawn:	rb
ref:	hlco 052	checked:	lb

status	issued
a	17/07/2019
b	20/08/2019
c	19/02/2020

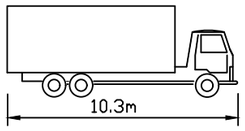
Launch Road Roundabout - Catalina Bay Loading Zone Tracking

flow
TRANSPORTATION SPECIALISTS
Level 1, 11 Blake Street, Ponsonby, Auckland | PO Box 47497 Ponsonby
p 09 970 3820 | f 09 970 3890 | www.flownz.com

vehicle tracking key:

- vehicle chassis outline (forwards)
- vehicle chassis outline (reverse)
- overhang of vehicle (forwards)
- overhang of vehicle (reverse)
- 500mm clearance (forwards)
- 500mm clearance (reverse)

vehicle specs:



10.3m Truck

vehicle width: 2.50m
lock to lock time: 6.00s
track width: 2.50m
turning radius: 47 degrees
vehicle speed: 5-10kmph

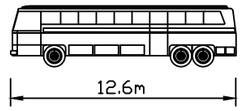
Not to Scale

NOT FOR CONSTRUCTION

vehicle tracking key:

- vehicle chassis outline (forwards)
- vehicle chassis outline (reverse)
- overhang of vehicle (forwards)
- overhang of vehicle (reverse)
- 500mm clearance (forwards)
- 500mm clearance (reverse)

vehicle specs:



Tour Coach

vehicle width: 2.50m
lock to lock time: 6.00s
track width: 2.50m
turning radius: 12.5m
vehicle speed: 5-15kmph

Not to Scale

NOT FOR CONSTRUCTION

0 8m

6 of 6 sheets

scale:	1:200 A3	design:	rb
date:	17/07/2019	drawn:	rb
ref:	hlco 052	checked:	lb

status	issued
a	17/07/2019
b	20/08/2019
c	19/02/2020

Launch Road Roundabout - Catalina Bay
Loading Zone Bus and Truck Tracking

flow
TRANSPORTATION SPECIALISTS
Level 1, 11 Blake Street, Ponsonby, Auckland | PO Box 47497 Ponsonby
p 09 970 3820 | f 09 970 3890 | www.flownz.com

Drawing Plotted: 09 Jul 2010 09:25

TIDE LEVELS (m) (HSD)	
HAT	3.82
MHWS	3.42
MHWN	2.85
MSL	1.90
L & S DATUM	1.83
MLWN	0.98
MLWS	0.38
HSD	0.00

NOTE:

1. ALL LEVELS SHOWN ARE IN TERMS OF HOBSONVILLE SOUNDING DATUM.

JIMMY'S POINT
TIMBER BOARDWALK REFER DWG C-117
NEW FERRY WHARF REFER DWG C-112,
VISITOR BERTHS
NEW TIDAL STAIRS
EXISTING SEABED CONTOUR
TOP OF BANK
BOTTOM OF BANK
DECK
VEGETATION
MARLBOROUGH CRESCENT
MARLBOROUGH CRESCENT
BOARDWALK REFER DWG C-113
MARINA
FLOATING BREAKWATER, PILED
5No. MOORING PILES
SUPERYACHT MOORING AREA
CATALINA CHANNEL
SEAPLANE RAMP
BUS STOP
SUNDERLAND HANGAR
TOP OF SEA WALL
HUDSON BAY EXTENSION
HUDSON BAY ROAD
SOVEREIGN YACHTS
5No. MOORING PILES
PONTOON 40m x 5m
JETTY (4m WIDTH)
MAIN FINISHING BERTH AND WHARF REFER DWG C-114
TRAVEL LIFT
SHIP LIFT/TRAVEL LIFT
GANGWAY 28m x 3m
PONTOON
PONTOON
PONTOON GUIDE PILE
BASE COMMANDER'S HOUSE
COASTAL ROAD
PROPOSED MARINE RECREATIONAL BUILDING (BY OTHERS)
BEACH
RECREATIONAL BOAT RAMP REFER DWG C-116
EXTENT OF DREDGING REFER DWG C-122
BREAKWATER / HEADLAND STRUCTURE REFER DWG C-116
CATALINA BAY

No.	Revision	By	Chk	Appd	Date
C	UPDATED FOR CONSENT HEARING	AJS		RAF	06-07-10
B	FOR RESOURCE CONSENT	VDLT			
A	FOR INFORMATION	AJS			

Drawing Originator: Beca

Original Scale (A3): 1: 2000

Design	RAF	APR '09
Drawn	AJS /VDLT	APR 09
Dsg Verifier	RAF	07-10
Dwg Check		

Approved for Construction* Date

* Refer to Revision 1 for Original Signature

Client: HOBSONVILLE LAND COMPANY

Project: THE LANDING COASTAL CONSENT

Title: PROPOSED COASTAL STRUCTURES AND WORKS OVERALL LAYOUT

Discipline: CIVIL

Drawing No: 3121410-C-110

Rev: C

DO NOT SCALE

IF IN DOUBT ASK.

Styles Group
Acoustics & Vibration Consultants

ASSESSMENT OF CONSTRUCTION NOISE AND VIBRATION EFFECTS

MARINE SPORTS RECREATION CENTRE CATALINA BAY, HOBSONVILLE POINT

PREPARED FOR

HLC (2017) Ltd

DATE

25 February 2020

Assessment prepared by Styles Group for HLC .

REVISION HISTORY

Rev:	Date:	Comment:	Version:	Prepared by:	Reviewed by:
1	5/09/19		Draft	Kelly Leemeyer, MASNZ Consultant Styles Group Dr. Matthew Pine Principal Styles Group	Jon Styles, MASNZ Director and Principal Styles Group
2	24/10/19		Final	Kelly Leemeyer, MASNZ Consultant Styles Group Dr. Matthew Pine Principal Styles Group	Jon Styles, MASNZ Director and Principal Styles Group
3	25/02/20	Updates following s92 request from Auckland Council	Final	Kelly Leemeyer, MASNZ Consultant Styles Group Dr. Matthew Pine Principal Styles Group	Jon Styles, MASNZ Director and Principal Styles Group

Table of Contents

Appendices

1.0 Introduction

HLC has engaged Styles Group to assess the noise effects of the proposed construction of a Marine Sports Recreation Centre at Catalina Bay, Hobsonville Point.

This report includes an assessment of the proposed construction works from an acoustics perspective, including:

- Noise level predictions prepared using Brüel & Kjær Predictor computer noise modelling software
- Recommended noise mitigation, noise management measures and conditions of consent for the project
- An assessment of the construction noise and vibration emissions in terms of the Auckland Unitary Plan (AUP) and the Resource Management Act (the Act).

To preface this report, the proposed construction works will comply with the AUP permitted construction noise and vibration limits at all times.

This report must be read in conjunction with the Assessment of Environmental Effects (AEE) and application site plans. A glossary of acoustical terms used within this document is attached as Appendix A.

2.0 The proposed construction works

HLC are managing the development of the former Hobsonville Air Force base into a new township at Catalina Bay, Hobsonville Point. The project involves several stages and will include the removal of the existing sailing facilities, construction of residential apartments where the sailing facilities have been removed and adjacent to the Hangar, and the construction of a marine sports recreation centre. This assessment is only for the stage of works involving the construction of the recreation centre.

The existing area is currently undeveloped coastal and coastal transition land adjacent to the Hobsonville Point Coastal Walkway. It is proposed to construct a new marine sports recreation facility that will provide water access for the rowing and sailing clubs using the existing facilities, and for the public.

The works will involve the construction of the two-level recreation centre building. It will include a deck at the northern end of the building on the lower level and a balcony at the northern end of the building on the second level. North of the decked area a timber jetty extending 42 m east towards the main harbour channel, an aluminium gangway 28 m long and a floating concrete launch pontoon will be constructed. The works will also involve dredging to allow access for small keeled yachts and other vessels (we understand that this is authorised by separate consent).

3.0 Surrounding site and noise receivers

The Site for the proposed marine recreation centre is partly on land and partly in the sea and crosses a number of zones, including the *Coastal – Marina Zone, Coastal – General Coastal Transition Zone, Coastal – Coastal Transition Zone* and *Open Space – Informal Recreation Zone.*

The surrounding sites are zoned *Business – Mixed Use Zone, Residential – Mixed Housing Urban Zone* and *Residential – Terrace Housing and Apartment Buildings Zone.*

A construction noise or vibration receiver (receiver), as referred to in this report, is any surrounding building that may be occupied during the proposed works. The site and surrounding receivers are illustrated in Figure 1 below.

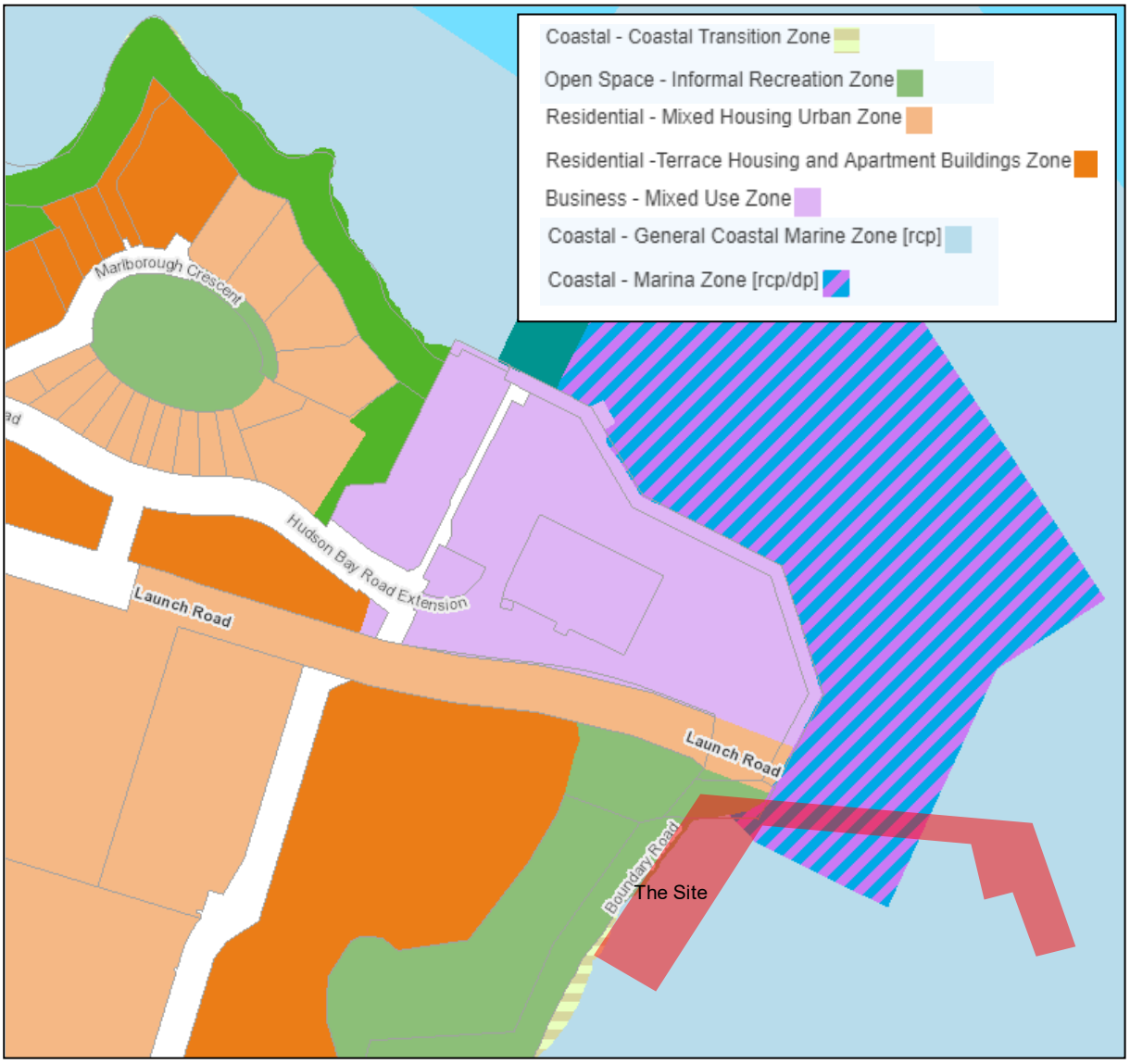


Figure 1: The Site and surrounding receivers

Resource consent for the construction of the Catalina Bay Apartments and Yacht Club Apartments on the adjacent part of the site has recently been approved. These apartments will be 45 m and 40 m from the Marine Recreation Centre, respectively. We understand that it is unlikely that these apartments will be completed and occupied when the Marine Recreation Centre is being constructed. However, to assume a worst case scenario, we have assumed they will be occupied and have assessed the potential effects on them.

4.0 Construction methodology

The proposed construction of the jetty and pontoon will involve the installation of timber piles into the foreshore / seabed area. The construction methodology is outlined below:

- Demolition of existing concrete blocks and wall from jetty entrance
- Pre-drilling of pile holes, either from land based piling rig or drilling rig on barge
- Removal of spoil offsite using trucks
- Installation of timber piles (driven using impact hammer)
- Construction of the jetty and pontoon deck
- Pontoon will be constructed offsite and floated to the site to be secured to the pontoon guide piles
- Gangway will be constructed offsite and brought to site by barge. It will be lifted into position by a crane of the barge and secured to the jetty

The proposed construction of the recreation centre building and decked areas will involve the installation of concrete piles into the foreshore / seabed area. The construction methodology is outlined below:

- Installation of temporary H-beams piles and beams
- Installation of bored reinforced concrete piles. Pile holes will be bored and may required permanent or temporary steel casings to be installed to prevent collapse of the bored holes.
- Precast concrete beams lifted into position by crane (on land)
- Removal of temporary beams and piles
- Construction of building and deck

A site plan showing the location of the recreation centre, jetty and pontoon is shown in Figure 2 overleaf. The works for the construction of the marine sports recreation centre are expected to take over two years to complete.

Dredging work is not covered in this assessment as there is existing consent for this activity.

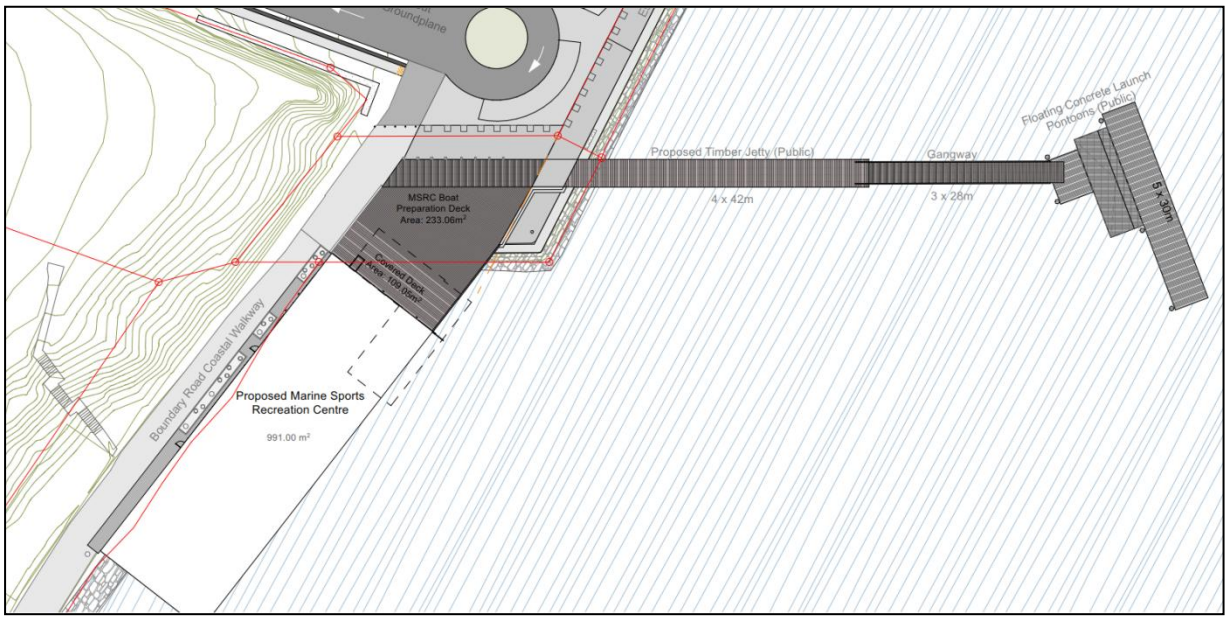


Figure 2: Site plan for marine sports recreation centre

5.0 Construction noise and vibration criteria for the proposed construction works

This section sets out the framework for the management of noise effects under the Auckland Unitary Plan and the Act, and the relevant construction noise and vibration standards.

5.1 Construction noise criteria

The AUP permitted limits for construction noise are set out in E25.6.27:

> E25.6.27. Construction noise levels in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone
>
> 1) Noise from construction activities in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone must not exceed the levels in Table E25.6.27.1 Construction noise levels for activities sensitive to noise in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone when measured 1m from the façade of any building that contains an activity sensitive to noise that is occupied during the works.

Table E25.6.27.1 Construction noise levels for activities sensitive to noise in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone

Time of week	Time Period	Maximum noise level (dBA)	
		L_{eq}	L_{max}
Weekdays	6:30am – 7:30am	60	75

	7:30am – 6:00pm	75	90
	6:00pm - 8:00pm	70	85
	8:00pm - 6:30am	45	75
Saturdays	6:30am – 7:30am	45	75
	7:30am – 6:00pm	75	90
	6:00pm - 8:00pm	45	75
	8:00pm - 6:30am	45	75
Sundays and public holidays	6:30am – 7:30am	45	75
	7:30am – 6:00pm	55	85
	6:00pm - 8:00pm	45	75
	8:00pm - 6:30am	45	75

2) Noise from construction activities in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone must not exceed the levels in Table E25.6.27.2 Construction noise levels for noise affecting any other activity when measured 1m from the façade of any other building that is occupied during the works.

Table E25.6.27.2 Construction noise levels for noise affecting any other activity

Time Period	Maximum noise levels L_{eq} (dBA)
7:30am – 6:00pm	70
6:00pm – 7:30am	75

3) For a project involving a total duration of construction work that is less than 15 calendar days, the noise levels in Table E25.6.27.1 Construction noise levels for activities sensitive to noise in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone and Table E25.6.27.2 Construction noise levels for noise affecting any other activity above may be increased by 5dB in all cases.

4) For a project involving a total duration of construction work that is more than 20 weeks the noise limits in Table E25.6.27.1 Construction noise levels for activities sensitive to noise in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone and Table E25.6.27.2 Construction noise levels for noise affecting any other activity above may be decreased by 5dB in all cases.

The AUP also states in Chapter E25 that any construction noise shall be measured and assessed in accordance with *NZS 6803: 1999 Acoustics – Construction Noise*.

The construction works will generally be undertaken between 07:30 and 18:00, Monday to Saturday and will take more than 20 weeks to complete. The relevant permitted construction noise limits are therefore 5 dB lower than those stated in Table E25.6.27.1 of the AUP.

The permitted noise limits for the earthworks can be summarised as 70 dB L_{Aeq} and 85 dB L_{Amax} between 07:30 and 18:00 at 1 m from the most exposed façade of any occupied dwelling. Where a building is known to be unoccupied during the works, the noise limits do not apply.

5.2 Construction vibration criteria

The AUP permitted limits for construction vibration are set out in E25.6.30 as follows:

E25.6.30. Vibration

1) Construction and demolition activities must be controlled to ensure any resulting vibration does not exceed:

   a. the limits set out in German Industrial Standard DIN 4150-3 (1999): Structural vibration – Part 3 Effects of vibration on structures when measured in accordance with that Standard on any structure not on the same site; and

   b. the limits in Table E25.6.30.1 Vibration limits in buildings in any axis when measured in the corner of the floor of the storey of interest for multi-storey buildings, or within 500mm of ground level at the foundation of a single storey building.

Table E25.6.30.1 Vibration limits in buildings

Receiver	Period	Peak Particle Velocity Limit millimetres/second
Occupied activity sensitive to noise	Night time 10pm to 7am	0.3 mm/s
	Daytime 7am to 10pm	2 mm/s
Other occupied buildings	At all times	2 mm/s

Works generating vibration for three days or less between the hours of 7am to 6pm may exceed the limits in Table E25.6.30.1 Vibration limits in buildings above, but must comply with a limit of 5mm/s peak particle velocity in any axis when measured in the corner of the floor of the storey of interest for multi-storey buildings, or within 500mm of ground level at the foundation of a single storey building, where:

i. all occupied buildings within 50m of the extent of the works generating vibration are advised in writing no less than three days prior to the vibration-generating works commencing; and

ii. the written advice must include details of the location of the works, the duration of the works, a phone number for complaints and the name of the site manager

E25.6.30.1 (a) of the AUP refers to the DIN Standard for permitted construction vibration limits to avoid building damage. This Standard uses a three-tiered classification system for buildings according to their susceptibility to vibration damage, as follows:

- Line 1: Buildings used for commercial purposes, industrial buildings and buildings of similar design;
- Line 2: Dwellings and buildings of similar design and/or occupancy; and
- Line 3: Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value (e.g. listed buildings under preservation order).

Line 2 of the DIN criteria is typically applied to residential dwellings unless the receiving structure is particularly sensitive to vibration. A suitably qualified structural expert should be consulted where there are concerns about a building's susceptibility to vibration or where the appropriate assessment classification under DIN 4150–3:1999 requires confirmation.

The DIN Standard is specifically concerned with the structure of the building, not the effects on the people within the building. Assessment is in terms of a reduction in *serviceability* which includes minor cosmetic damage such as cracked plaster. The DIN Standard guideline values for short-term vibration are illustrated in the graph overleaf (Figure 3) for reference. The DIN Standard includes many other recommendations including more stringent values for long-term vibration (which may cause structural fatigue or produce resonance in the structure). The Standard must therefore be referred to in full when being applied.

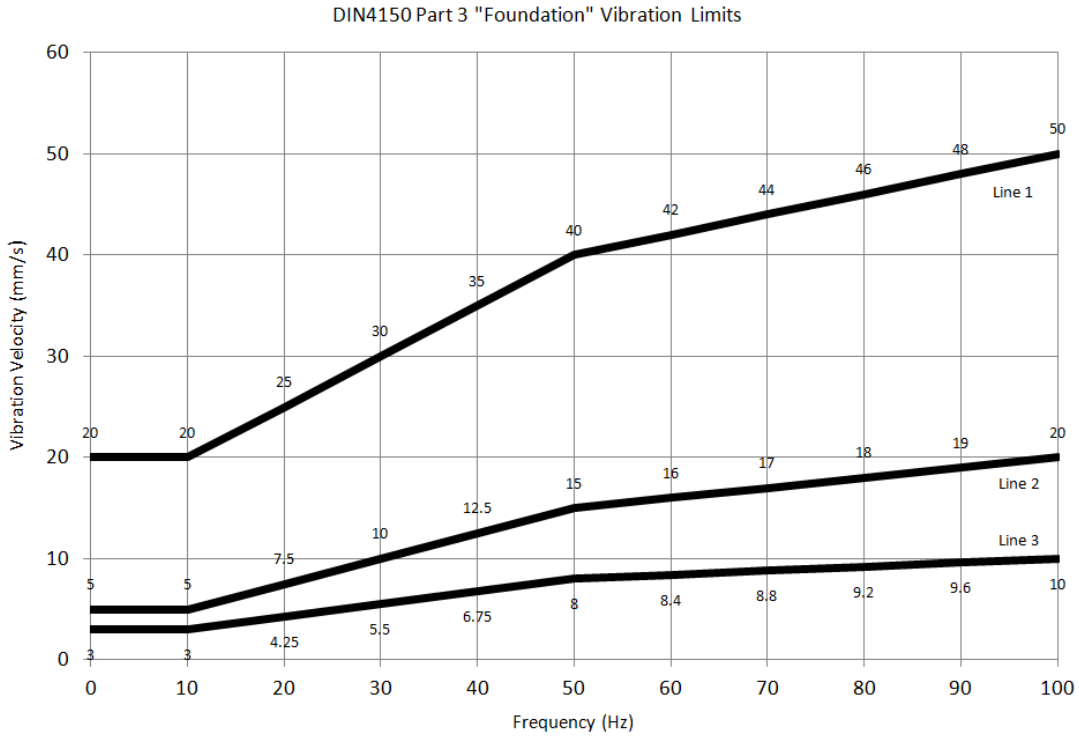


Figure 3: DIN 4150–3: 1999 guideline values for short-term vibration

5.3 Underwater construction noise criteria

The AUP sets out the following with respect to underwater noise:

F2.18.1. Background

Underwater noise can have an adverse effect on a range of marine animals that rely on sound to communicate, navigate, hunt and mate. Noise can cause threshold shifts in sensitivity to sound, and higher levels of sound can permanently damage or even kill some species.

Underwater noise has largely been overlooked in the past as a potential source of adverse effect to marine fauna, as well as to people working or undertaking recreational activities underwater. While limits on underwater noise generated by ships and vessels needs to be regulated at a national level, significant noise from certain underwater activities, such as blasting, impact and vibratory piling, marine seismic surveys, can be managed to address effects on marine fauna and people.

The Department of Conservation 2013 Code of Conduct for Minimising Acoustic Disturbance to Marine Mammals from Seismic Survey Operations focuses on controlling peak level noise effects and the Unitary Plan addresses the need to control noise levels.

F2.18.2. Objective [rcp]

(1) Underwater noise from identified activities is managed to maintain the health and well-being of marine fauna and users of the coastal environment.

F2.18.3. Policies [rcp]

(1) Require underwater blasting, impact and vibratory piling, and marine seismic surveys in the coastal marine area to adopt the best practicable option to manage noise so that it does not exceed a reasonable level.

(2) Assess the following matters for underwater blasting, impact and vibratory piling, and marine seismic surveys:

   a. the health and well-being of marine fauna (including threatened and at-risk species) and people from the noise associated with the proposal;

   b. the practicability of being able to control the noise effects;

   c. the social and economic benefits to the community of the proposal; and

   d. the extent to which the adverse effects of the noise will be mitigated.

(3) Enable the generation of underwater noise where that noise is associated with the following activities:

   a. the operational requirements of vessels;

   b. construction or operation of marine and port activities, marine and port facilities, marina activities, marine and port accessory structures and services, maritime passenger facilities and dredging, that do not involve underwater blasting, impact and vibratory piling, or marine seismic surveys; and

   c. sonar not including marine seismic surveys.

F2.19.8 Activity table – use and activities

Activity		Activity status						
		GCM Zone	SEA-M1, ONC	ONL	SEA -M2, HNC	ONF-Type A1 and A	ONF– Type V1, V2, B, C, D, E, F	HH
(A114)	Underwater blasting, impact and vibratory piling, marine seismic surveys	RD	RD	RD	RD	RD	RD	RD

The broad principle of the underwater noise assessment is to analyse the proposed activity to determine the extent and nature of underwater noise effects, taking into account the species that may be found in the area, the local physical environment and the level and character of noise that will be generate by the proposed activity.

5.4 Objectives and policies of the AUP

E25.2 *Objectives* of the AUP sets out the following regarding construction noise and vibration:

> 4) Construction activities that cannot meet noise and vibration standards are enabled while controlling duration, frequency and timing to manage adverse effects.

E25.3 *Policies* of the AUP sets out the following regarding construction noise and vibration:

> 10) Avoid remedy or mitigate the adverse effects of noise and vibration from construction, maintenance and demolition activities while having regard to:
>
> a) The sensitivity of the receiving environment; and
>
> b) The proposed duration and hours of the operation of the activity; and
>
> c) The practicability of complying with permitted noise and vibration standards.

5.5 Resource Management Act

The overarching requirement for noise from the proposed activity is compliance with Section 16 (1) of the Act, which states:

> Every occupier of land (including any premises and any costal marine area), and every person carrying out an activity in, on, or under a water body or the costal marine area, shall adopt the best practicable option to ensure that the emission of noise from that land or water does not exceed a reasonable level.

The Act defines noise as “includes vibration”.

6.0 Reference noise levels and minimum separation distances

The reference sound power levels used in our calculations are displayed in Table 1 overleaf. These are derived from:

- Measurements undertaken by Styles Group on similar projects
- NZS 6803:1999 Appendix C *Guide to Sound Level Data on Site Equipment and Site Activities*
- The DEFRA *Noise Database for Prediction of Noise on Construction Sites and Open Sites*.

Our reference sound power levels are based on typical plant and operations. Good plant selection, regular maintenance, and experienced operators can further reduce noise emissions.

Table 1 also displays the minimum separation distance for each activity to comply with the noise limit of 70 dB L_{Aeq} from 07:30 to 18:00, based on the following assumptions. Where the 70 dB L_{Aeq} noise limit is complied with, the 85 dB L_{AFmax} noise limit will also be complied with.

- The minimum distance stated is that from the noise generating plant to the occupied building (taking into account that the assessment position is at 1 m from the most exposed façade)
- The calculation includes an adjustment of +3 dB for reflections from the façade, in accordance with NZS 6803:1999. The assumed ground type is a mix of hard and porous
- Unmitigated means there is a direct line of sight from the noise generating plant to the façade of the dwelling

Table 1: Reference noise levels and minimum compliance distances

Construction Activity	Reference sound power level	Minimum distance for compliance with 70 dB L_{Aeq}
Excavation with 30 t excavator	105 dB L_{WA}	30 m
Idling dump truck	92 dB L_{WA}	7 m
Bored piles	107 dB L_{WA}	38 m
Driven timber piles	110 dB L_{WA}	54 m
Crane	103 dB L_{WA}	24 m

Construction Activity	Reference sound power level	Minimum distance for compliance with 70 dB L_{Aeq}
Piling rig (driven steel casings)	115 dB L_{WA}	95 m
Concrete pump and truck discharging	103 dB L_{WA}	24 m

7.0 Construction noise modelling

This section sets out the methodology and results of our construction noise modelling.

7.1 Methodology

We have used Brüel & Kjær Predictor computer noise modelling software to calculate the noise emissions from the proposed earthworks. This software is globally recognised and has been used on many projects throughout New Zealand. The calculations are based on the Standards ISO 9613-1/2 and NZS 6803:1999. The noise level predictions assume meteorological conditions that slightly increase propagation in all directions.

Topographical contours, land parcels and building footprints for the noise model were obtained from the Auckland Council GIS service and by observation during our site visit. We have ensured the integrity of model by careful scrutiny of the final three-dimensional model.

The noise experienced outside any occupied dwelling between 07:30 and 18:00 may be from a number of construction activities taking place. We have modelled the following activities in the noise model as a separate point source and reported the maximum noise level from the one of these activities that generates the most noise:

i. Excavation of cut face with a 30 t excavator and an idling dump truck
ii. Bored piling
iii. Driven timber piling
iv. Driven steel casings (vibratory piling)

The calculation grid spacing for the noise level contours is 1 m x 1 m. The software interprets the noise level contours between these points. For the purpose of determining the noise level at any particular receiving building, and for the purpose of calibrating the model, we have used point receivers; these are independent of the contour grid and provide precise predictions.

Other input parameters for the noise model are displayed in Table 2.

Table 2: Brüel & Kjær Predictor input parameters

Calculation settings	Details

Calculation settings	Details
Calculation grid height	1.5 m
Meteorological parameters	Single value, C0 = 0
Ground attenuation	General method, ground factor 0.5 (mixture of hard and porous ground)
Air temperature	293.15 K
Atmospheric pressure	101.33 kPa
Air humidity	60 %
Receiver heights (relative)	Ground level: 1.5 m Upper level facade: 4.5 m

7.2 Results

The results of our noise modelling demonstrate that the works can comply with the permitted noise limits at all receivers, with the proposed mitigation.

The calculated construction noise levels at 1 m from the façade of the closest buildings are displayed in Table 3. These dwellings will be exposed to the highest levels of noise during the earthworks.

The noise levels outside all other dwellings will be lower (and therefore compliant by a greater margin).

Table 3: Calculated construction noise levels

Address	Receiver height	Highest predicted noise level (L_{Aeq})
The Hangar	1.5 m	48 dB
	4.5 m	50 dB
23 Launch Road - Yachting Developments	1.5 m	39 dB
	4.5 m	40 dB
Yacht Club Apartments	1.5 m	68 dB
	4.5 m	69 dB
	7.0 m	70 dB
	1.5 m	65 dB

Address	Receiver height	Highest predicted noise level (L_{Aeq})
Catalina Bay Apartments	4.5 m	66 dB
	7.0 m	67 dB

It is important to note that the noise levels discussed in this section will not be typical during the works for any receiver. These higher levels of construction noise for any one receiver will only be experienced when piling works are in the closest part of the site. The noise will be lower for that receiver when works progress to another area of the site.

Resource consent for the construction of the Catalina Bay Apartments and Yacht Club Apartments on the adjacent part of the site has recently been approved. We understand that it is unlikely that these apartments will be completed and occupied when the Marine Recreation Centre is being constructed. If these apartments have not been constructed or are not occupied then no acoustic screening will be required.

If these apartments are occupied then the AUP permitted noise limits can be complied with by installing 2 m high acoustic screening.

8.0 Construction noise mitigation measures

The following mitigation measures are proposed to reduce noise emissions from the site by as far as practicable and avoid any unnecessary effects on the surrounding receivers.

1. When any plant must be used within the minimum unmitigated separation distance (from an occupied dwelling) displayed in Table 1 of this report, a temporary acoustic barrier will be used to reduce the noise levels. This will only be required if the Catalina Bay Apartments or the Yacht Club apartments have been constructed and are occupied at the time of construction works.
2. Any acoustic barriers used will be no less than 2.0 m in height and constructed with no gaps in its length or at its base. The surface mass of any timber barrier will be no less than 10 kg/m^2 e.g. 18 mm plywood. Alternatively, proprietary construction noise barriers may be used (such as Echo Barrier[1], Soundbuffer[2] or Hushtec[3]).

[1] https://supplyforce.co.nz/echo-barrier

[2] http://soundbuffer.co.nz

[3] https://duraflex.co.nz/hushtec

9.0 Construction vibration

Typically, vibration levels as low as 0.3 mm/s are perceptible within dwellings and levels of 1 mm/s during the daytime can cause complaints if the vibration is unexpected. Any vibration from the site would only be perceptible during the daytime hours on Monday to Saturday because there will be no works during the night time, on Sundays or on public holidays.

Construction vibration levels are largely dependent on the equipment used, the skill of the operator, the subsoil conditions and the response of the receiving structure. Accurate predictions are not always possible without site, receiver and plant specific data. Examples of similar activities measured by Styles Group at other sites are provided in Table 4 for reference. It must be noted that these are indicative only because variations in the abovementioned factors can make an appreciable difference to the velocity and frequency of the vibration measured.

Table 4: Examples of vibration from construction activities

Plant	Activity	Measurement position	Peak particle velocity (PPV)
20 t Excavator	Excavating soil on residential site	Geophone buried in ground at 3 m	2.5 mm/s
30 t Excavator	Shaking soil from bucket	Geophone buried in ground at 25 m	1.3 mm/s
Truck and trailer	Laden truck and trailer manoeuvring on site	Geophone buried in ground at 22 m	1.7 mm/s
Driven piling	Vibratory pile driving into alluvial soils	Geophone buried in ground at 40m	1.9mm/s

The proposed earthworks will readily comply at all times with the AUP permitted construction vibration limits for human amenity and to avoid building damage, as set out in E25.6.30. This is based on:

- The nature of the vibration generating works
- The distance from vibration generating activities to the nearest buildings (over 45 m)
- Our experience and measurement data from similar projects

10.0 Underwater noise

In an otherwise featureless environment visually, sound underwater provides marine mammals, fish and invertebrates the only sensory cue that is omnidirectional and far-

reaching. As a result, marine mammals, fish and invertebrates have evolved incredible capabilities for detecting, perceiving and using underwater sound. Marine life depend on their ability to listen to biologically-important sounds for communication, predator and prey detection, navigation, coordinating movements, mediating reproductive behaviours, and in mate selection. Their ability to communicate and sense their environment using sound is therefore directly linked to their ambient sound environment – the listener must simply be able to detect. Not being able to do so can lead to increased levels of stress, reduced foraging efficiency or predator avoidance. If close enough to the source, physical injury through temporary or permanent hearing loss can result – an outcome similar to terrestrial animals losing their eye sight.

Underwater noise from anthropogenic activities is a growing concern globally, with coastal activities (pile driving, dredging, shipping, drilling, etc) driving up background noise levels over a wide frequency range – to the point where biologically-important signals for marine mammals and fish can be masked.

Notwithstanding the well-recognised effects of underwater noise on marine mammals, those effects can only occur when marine mammals are exposed to high levels of underwater noise. Therefore, the concern for underwater noise effects is greatest in areas within marine mammal habitats, or nearby enough that the noise from any given development (near or offshore) can propagate into areas where marine mammals are known to be. The Hauraki Gulf boasts high marine mammal diversity and abundance, and therefore any proposal within, or near, the Gulf should consider underwater noise as it has the potential to negatively impact the Gulf's marine mammals. In areas where very few marine mammal sightings have been documented, such as the inner Waitemata Harbour west of the Harbour Bridge, the concern for underwater noise effects on marine mammals diminishes, however there must still be confidence that the noise does not propagate into an area with marine mammals (i.e. the inner Hauraki Gulf).

10.1 Assessment Methodology

To determine the effects radius of both the vibratory and percussive piling of the 750-800mm steel casings and 300mm timber piles, respectively, underwater noise propagation modelling was undertaken. The propagation loss was simply defined as:

$$SPL_{freq}(R) = SL_{freq} - PL_{freq}(R)$$

where SPL_{freq} at distance (R) is the predicted sound pressure level for some frequency bandwidth, SL_{freq} is the source level at that frequency and PL_{freq} is the propagation loss over distance R for that frequency. The propagation loss (PL) was determined using a combination of a range dependent parabolic equation (PE) and ray trace (RT) model in dBSea, for frequencies below and above 2 kHz, respectively, for 360 radials over a 10m grid with 0.2m depth resolution. Since the ray trace model is based on Snell's Law, it is applicable if a signal's wavelength is much less than the layer for which it is propagating. Therefore, a frequency cutoff at the third octave band centered at 2 kHz was selected to ensure that the wavelength of the signal was appropriate for the width of the propagation medium in this

case (which was based entirely on the bathymetry given the shallow depths and reasonable mixing of the water column).

The bathymetry data for the modelling within the project area was obtained by the National Institute of Water and Atmosphere using multibeam and single beam sounding lines spaced 50-120m apart (although 20m resolution in the project area was available)[4]. The bathymetry dataset from NIWA also compared with the bathymetry data obtained by Tonkin & Taylor[5], to ensure accuracy, but the area of the T&T data was limited to the immediate area rather than extending into the Waitemata.

The sound speed profile was simply assumed to be consistent from the sea surface to sea floor, based on the shallow depths and CTD casts from near Point Chevalier[6] during the ebb tide.

The underwater noise modelling was performed for three frequencies within each third octave or full octave band between 50 Hz and 36 kHz, and averaged within each bandwidth to represent the *PL* for a specific band. Third octave bands were chosen for modeling effects on marine mammals, as they are used to represent the critical bandwidths of marine mammals. Full octave bands were chosen for modelling effects on fish, as full octave bands better represent the critical hearing bands of fish.

Source levels, in 1/3 octave and 1/1 octave bands between centre frequencies 63 Hz and 32 kHz, for the vibratory and percussive piling were obtained from previous measurements undertaken by Styles Group (Figure 4). It is important to note that the conditions under which the vibratory and percussive piling was measured differed to those in this project. For the vibratory piling, the *SL*s used were from vibratory piling of 850mm steel casings into sand with gravel and broken shells in approximately 5m of water.

For the percussive piling, the *SL*s used were from driving 500mm timber piles into sand, after being positioned with vibratory methods. Therefore, the source levels used are likely to be higher than those expected for the current project at Hobsonville Point. While the differing sizes are a key difference, the main difference is the water depths and sediment type. Low frequencies will not propagate as well in water depths less than 2 wavelengths of the signal, and therefore the low frequency component of the waterborne piling noise will be dampened. The noise levels used in this assessment are therefore conservative. The poor propagation of lower frequencies was considered in the propagation loss modelling, so to increase the level of conservativeness, the modeling was undertaken during high tide (3.2m tide level[7]), so to assess any potential low frequency propagating beyond the project area during a high tide.

[4] NIWA (National Institute of Water and Atmospheric Research). 2016. New Zealand Bathymetry. www.niwa.co.nz/our-science/oceans/bathymetry, accessed on 24 August 2016.

[5] Tonkin & Taylor. 2019. Marine Recreation Centre: Resource Consent Engineering Design Report. Job No. 1006452.v.1.0. June 2019.

[6] Pine unpublished data, obtained using a StarOddi DST-CT logger during 2011.

[7] Tide level taken from the Tonkin & Taylor Engineering Design Report, Job No. 1006452.v.1.0. June 2019.

10.2 Noise effects modeling

The overall aim of the acoustic modeling is to provide the acoustic footprint of the proposed works in order to inform an assessment of the potential impacts on marine fauna (marine mammals and fish, in this case). The type of potential effects, and severity, depends on the distance between the source and receiver, with injury (permanent threshold shifts, PTS) potentially occurring close to the source, followed by temporary threshold shift (TTS), behavioural responses and auditory masking. Auditory masking is arguably one of the most pervasive impacts of underwater noise due to the potential range over which it can occur for both marine mammals and fish. Furthermore, since behavioural effects generally occur at higher levels of masking, understanding the spatial limits of masking is important[8]. It's inclusion in underwater noise assessments is therefore becoming more mainstream internationally, and to maintain best practice, we have also quantified masking effects. In addition, we have also quantified the audibility contour, within which a marine mammal would be able to hear the sound.

Given the location of the proposed works is in an area with very few marine mammal sightings, we have generalised the limits of audibility across all marine mammals and fish listed in the marine ecology report[9]. The limits of audibility are based on the hearing sensitivities of killer whales, common dolphins, bottlenose dolphins and pinnipeds, as well as the averaged thresholds of a number of fishes with swim bladders (based on the assumption that audibility is related to the difference between the ambient sound level, the anthropogenic noise level and the hearing threshold at each critical bandwidth up to 48 kHz).

Given the expected source levels and location of the piling, the key effects are TTS, auditory masking and behavioural effects. Behavioural effects have not been specifically assessed in this case due to the location of the proposed works – instead, the area within which the onset of behavioural effects may occur can be defined inside the auditory masking zones. The extent of auditory masking from the piling was assessed by calculating the listening space reduction (*LSR*), as a percentage, for common dolphins. Common dolphins were chosen as they are the species seen (albeit very rarely) to venture as far as Hobsonville Point. The algorithm and equations used to calculate the *LSR* followed that of Pine et al. 2018[10] and Pine et al 2019[5], who define the *LSR* as

$$LSR = 100\left(1 - 10^{-2\frac{\Delta}{N}}\right)$$

where *N* is the frequency-specific *PL* slope coefficient and Δ is the difference between the perceived base ambient noise level NL_1 and piling noise level NL_2 at a given distance (NL_2 was the modelled sound pressure levels described in Section 9.1).

[8] Pine MK., Schmitt P., Culloch RM., Lieber L., Kregting LT. 2019. Providing ecological context to anthropogenic subsea noise: Assessing listening space reductions of marine mammals from tidal energy devices. Renewable and Sustainable Energy Reviews 103:49-57.

[9] Tonkin & Taylor. 2019. Marine Ecology Report - Marine Recreation Centre

[10] Pine MK., Hannay DE., Insley SJ,, Halliday WD., Juanes F. 2018. Assessing vessel slowdown for reducing auditory masking for marine mammals and fish of the western Canadian Arctic. Marine Pollution Bulletin 135:290-302.

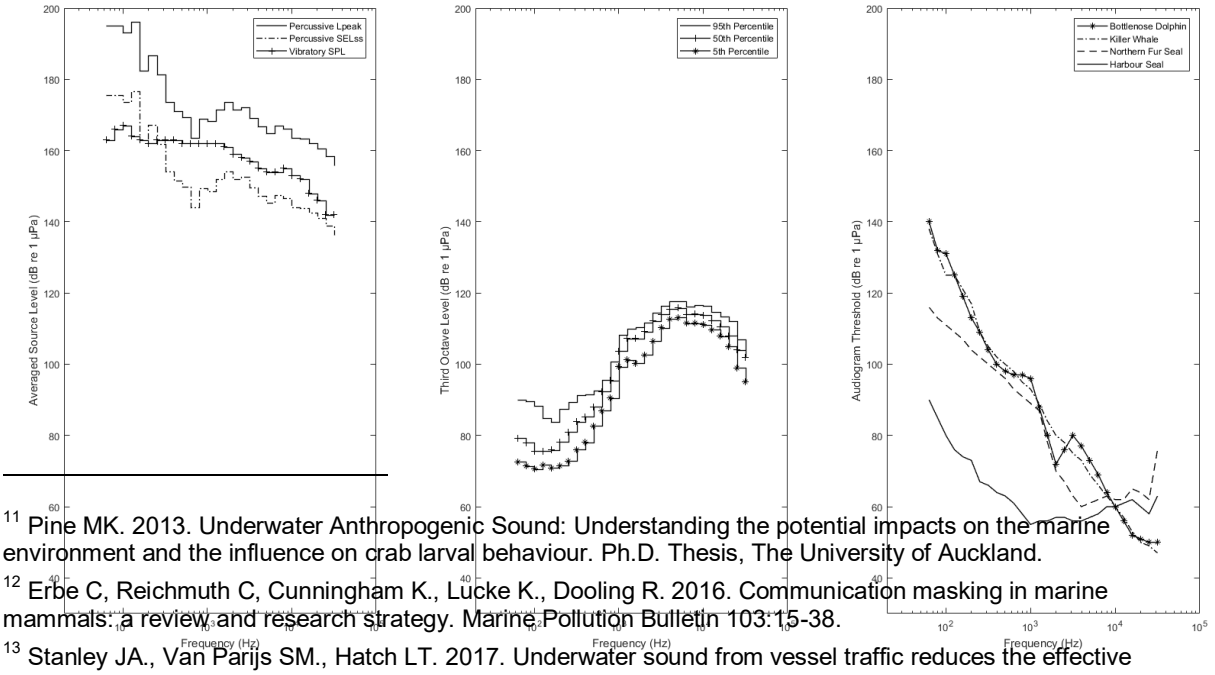
The ambient noise level used was the median level measured off Point Chevalier (36° 51.05' S, 174° 41.49' E) using a bottom-mounted calibrated HTI-96-MIN hydrophone connected to a watertight temporal recording unit at 3m water depth during MLWS (similar to the depths around the proposed works)[11]. Since NL1 is the perceived based ambient noise level, it is the maximum of the receiver's hearing threshold (audiogram value) and the ambient level inside a critical bandwidth[12]. For this project, the critical bandwidths were approximated by 1/3 octave bands for marine mammals[9] and a 1/1 octave band for fish[13].

Audiogram values for bottlenose dolphins and common dolphins were used to estimate hearing thresholds in each critical band. There are no audiograms available for the fish species listed and so fish audiograms were based on the average of several species with swim bladders[14].

The value for *N* was calculated by curve-fitting the modelled *PL* from the listeners location over a distance that represented the listener's maximum listening range under natural sound levels, and was defined using the sonar equation without signal gain:

$$SE = SL - PL - NL_1 - DT$$

where signal excess (*SE*) is set to zero to indicate detection onset, NL_1 was the 5th percentile ambient noise level and *DT* was the detection threshold (conservatively set at 10 dB for common dolphins[5,7,15] and 15 dB for fish[7,10]. This was done because the *PL* slope can have some range dependence. The piling noise source spectra, ambient sound levels and audiogram values used are provided in Figure 4.



[11] Pine MK. 2013. Underwater Anthropogenic Sound: Understanding the potential impacts on the marine environment and the influence on crab larval behaviour. Ph.D. Thesis, The University of Auckland.

[12] Erbe C, Reichmuth C, Cunningham K., Lucke K., Dooling R. 2016. Communication masking in marine mammals: a review and research strategy. Marine Pollution Bulletin 103:15-38.

[13] Stanley JA., Van Parijs SM., Hatch LT. 2017. Underwater sound from vessel traffic reduces the effective communication range in Atlantic cod and haddock. Scientific Reports 7:1–12.

[14] From Nedwell JR., Edwards B., Tumpenny AWH., Gordon J. 2004. Fish and Marine Mammal Audiograms: a Summary of Available Information, Southampton.

[15] Clark CW, Ellison WT, Southall BL, et al. 2009. Acoustic masking in marine ecosystems: intuitions, analysis, and implication. Marine Ecology Progress Series 395: 201e222.

Figure 4: Third octave band source levels (dB re 1 µPa @ 1m) of the vibratory and percussive piling of steel casings and timber piles, respectively, measured ambient sound levels (dB re 1 µPa) and audiogram values (dB re 1 µPa) for marine mammals.

The *LSR* was then calculated for each centre frequency at each depth step – resulting in a *LSR* map for each frequency band. Those maps were then overlaid on top of each other (forming a 3D matrix) and averaged across layers to provide an overall 2D *LSR* map for the project area[7].

In order to ascertain the ranges within which TTS and PTS effects may occur, the modelled sound pressure levels were M-weighted[16]. Killer whales, bottlenose dolphins and common dolphins can be classified as Mid-Frequency cetaceans, while leopard seals are Phocid pinnipeds and fur seals are Otarrids. The M-weightings used were therefore mid-frequency (MF), phocid pinnipeds (PP) and otarrid pinnipeds (OP). No weighting functions were applied for fish.

The criteria for the onset of PTS and TTS are provided in

[16] See **Southall et al. (2007**) (Marine mammal noise exposure criteria: Initial scientific recommendations. Aquatic Mammals 33(4)) for more information about M-weighting and **NOAA (2018**) for the hearing curves used.

Table 5 below, while the onset of PTS/TTS in fish are provided inTable 6.

Table AE-1. Summary of weighting function parameters and TTS/PTS thresholds. SEL thresholds are in dB re 1 µPa²s and peak SPL thresholds are in dB re 1 µPa.

$$W(f) = C + 10\log_{10}\left\{\frac{(f/f_1)^{2a}}{\left[1+(f/f_1)^2\right]^a\left[1+(f/f_2)^2\right]^b}\right\}$$

						Non-impulsive		Impulse			
						TTS threshold	PTS threshold	TTS threshold		PTS threshold	
Group	*a*	*b*	f_1 (kHz)	f_2 (kHz)	*C* (dB)	SEL (weighted)	SEL (weighted)	SEL (weighted)	peak SPL (unweighted)	SEL (weighted)	peak SPL (unweighted)
LF	1	2	0.20	19	0.13	179	199	168	213	183	219
MF	1.6	2	8.8	110	1.20	178	198	170	224	185	230
HF	1.8	2	12	140	1.36	153	173	140	196	155	202
SI	1.8	2	4.3	25	2.62	186	206	175	220	190	226
OW	2	2	0.94	25	0.64	199	219	188	226	203	232
PW	1	2	1.9	30	0.75	181	201	170	212	185	218

Table 5: Dose criteria for the onset of PTS and TTS for each of the hearing functional groups (taken directly from NMFS (2018))

Table 7.3 Pile driving. Data on mortality and recoverable injury are from Halvorsen et al. (2011, 2012a, c) based on 960 sound events at 1.2 s intervals. TTS based on Popper et al. (2005). See text for details. Note that the same peak levels are used both for mortality and recoverable injury since the same SEL_{ss} was used throughout the pile driving studies. Thus, the same peak level was derived (Halvorsen et al. 2011).

Type of Animal	Mortality and potential mortal injury	Impairment			Behavior
		Recoverable injury	TTS	Masking	
Fish: no swim bladder (particle motion detection)	>219 dB SEL_{cum} or >213 dB peak	>216 dB SEL_{cum} or >213 dB peak	>>186 dB SEL_{cum}	(N) Moderate (I) Low (F) Low	(N) High (I) Moderate (F) Low
Fish: swim bladder is not involved in hearing (particle motion detection)	210 dB SEL_{cum} or >207 dB peak	203 dB SEL_{cum} or >207 dB peak	>186 dB SEL_{cum}	(N) Moderate (I) Low (F) Low	(N) High (I) Moderate (F) Low
Fish: swim bladder involved in hearing (primarily pressure detection)	207 dB SEL_{cum} or >207 dB peak	203 dB SEL_{cum} or >207 dB peak	186 dB SEL_{cum}	(N) High (I) High (F) Moderate	(N) High (I) High (F) Moderate
Sea turtles	210 dB SEL_{cum} or >207 dB peak	(N) High (I) Low (F) Low	(N) High (I) Low (F) Low	(N) High (I) Moderate (F) Low	(N) High (I) Moderate (F) Low
Eggs and larvae	>210 dB SEL_{cum} or >207 dB peak	(N) Moderate (I) Low (F) Low	(N)Moderate (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) Moderate (I) Low (F) Low

Notes: peak and rms sound pressure levels dB re 1 µPa; SEL dB re 1 $\mu Pa^2 \cdot s$. All criteria are presented as sound pressure even for fish without swim bladders since no data for particle motion exist. Relative risk (high, moderate, low) is given for animals at three distances from the source defined in relative terms as near (N), intermediate (I), and far (F).

Table 6: Dose criteria for the onset of noise effects for fish (taken directly from ASA S3/SC1.4 TR-2014)

For marine mammals, the NOAA PTS/TTS criteria for marine mammals, and the ANSI criteria for fish are a combination of 24-hour cumulative sound exposure levels (SEL_{cum}) and peak (L_{peak}) sound pressure levels. The SEL_{cum} metric is the cumulative sound energy over a complete 24 hour period, measured as received total sound energy over that 24 hour period. The L_{peak} is the instantaneous peak sound pressure measured at any time during the day.

The SEL_{cum} was therefore calculated using the number of hammer blows required to drive in a single pile, multiplied by the number of piles driven per day. The blow count per pile, or expected blow counts per day, is not known so was estimated based on our experience of other projects within the Auckland Region.

It is understood a total of 22 timber piles are to be driven, with a total blow count per day of 300. A duration of 60mins for the vibratory piling has been assumed, and expected to be longer than required based on the fact bore holes will be drilled first.

10.3 Underwater noise effects

All figures for the underwater noise modelling are provided in Appendix B.

10.3.1 Percussive Piling

- The critical distances for PTS (referred to as the PTS zone) for marine mammals and fish are not applicable - the sound levels are too low and do not exceed the criteria.
- The critical distance for TTS is approximately between 21m and 31m for Phocid pinnipeds (leopard seal).
- TTS effects are within 1m for fish.
- No TTS effects are expected for MF-cetaceans (killer whales, bottlenose dolphins and common dolphins), and Otariid pinnipeds (fur seals) in this case.
- Auditory masking effects may occur within a maximum range of 774 m for common dolphins and 517m for fish.
- The 50% *LSR* contour is at approximately 159m for common dolphins, and 382m for fish.
- The limit of audibility for marine mammals is at a maximum of 1092m, and 456m for fish. Noise-related effects are therefore not possible inside the greater Waitemata Harbour area (east of the Harbour Bridge) where marine mammals are more occasionally seen (albeit, still very rarely).

10.3.2 Vibratory piling

- PTS effects are not expected for marine mammals or fish in this case – the sound levels are too low and do not exceed the criteria.
- TTS effects may occur for MF-cetaceans (killer whales, bottlenose dolphins and common dolphins) between 10m and 14m. For phocid pinnipeds (leopard seals), TTS effects may occur between 43m and 80m. For phocid pinnipeds, however, the TTS radius decreases to between 32m and 63m if the vibratory piling duration halves from 60min to 30min.
- TTS effects may occur between 29m and 63m for fish. This decreases to 21m and 53m if the vibratory piling decreases to 30min from 60min.

- No TTS effects are expected for otariids (fur seals).
- Auditory masking effects may occur within a maximum range of 1177 m for common dolphins and 488m for fish.
- The 50% *LSR* contour is at approximately 310 m for common dolphins, and 308m for fish.
- The limit of audibility for marine mammals is at a maximum of 1750m, and 477m for fish.

The underwater noise effects can be appropriately managed by ensuring that piling is not carried out if any marine mammal approaches or enters the areas where TTS effects might occur. For simplicity and ease of monitoring, the largest of the TTS areas should be used for monitoring, (rather than having a different distance to monitor for each species). The worst-case for TTS effects is up to 80m for phocid pinnipeds if vibratory piling is consistent for up to 60 minutes. We recommend that this distance is adopted for all visual monitoring, as it is conservative for all other species and piling methods, and is a relatively short and readily observable distance.

If piling is not undertaken when any marine mammal is within 80m of the pile being driven, there will be no TTS or PTS effects on marine mammals. There may still be a range of minor behavioural effects that arise if marine mammals are present at greater distances, (out to approximately 1km) but these will be negligible and rare.

We consider that if the management requirements recommended below are adopted, the effects on marine fauna will be managed as required by objective F2.18.2 and the policies in F2.18.3 of the AUP.

10.4 Underwater noise management recommendations

Despite the fact that the probability of any adverse noise effects arising on marine mammals and fish is generally very low, we recommend that the following mitigation measures are adopted:

- The contractor shall check the area of the harbour readily visible from the piling location for marine mammals 30min prior to start up. If any marine mammals are sighted, piling must not commence until they have left the area.
- During all piling work, the area of harbour enclosed by a radius of 80m from the pile being driven shall be observed for the presence of any marine mammals.
- If any marine mammals approach or enter this zone, the piling work shall cease until the mammal(s) have left the area.

11.0 Construction noise and vibration effects

It is our opinion that the noise from the construction of the marine sports recreation centre (including underwater noise effects) will not exceed a reasonable level in terms of section 16 of the Act. This includes the following considerations:

- The ability of the works to comply with the permitted construction noise limits at all times
- The ability of the works to comply with the permitted construction vibration limits at all times
- The limited exposure times and duration of the noise that will be experienced at the potentially affected sites
- That the AUP objectives and policies for construction noise and vibration set out in E25.2 *Objectives* and E25.3 *Policies* will be met.
- That the AUP objectives and policies for underwater noise effects set out in F2.18.2 *Objectives* and F2.18.3 *Policies* will be met.

The proposed construction works will meet the permitted construction noise limits with the proposed acoustic screening, where required. We consider that the mitigation measures recommended in this report form part of the best practicable option to ensure that the construction noise does not exceed a reasonable level.

The permitted construction vibration limits for human amenity and building damage will be complied with at all times due to the separation distances between the plant on site and the nearest buildings.

The potential effects on marine mammals will be avoided by ensuring that that the piling works do not occur whilst any marine mammal is within the largest area (by species) where TTS effects may occur. Any behavioural effects beyond the TTS zones will be negligible and rare.

12.0 Conclusion

Styles Group has assessed the noise and vibration effects from the construction of a marine sports recreation centre at Catalina Bay, Hobsonville Point.

Our assessment of the proposal has determined that the permitted construction noise and vibration limits of the AUP will be complied with at all times.

It is our opinion that the noise from the proposed construction works will not exceed a reasonable level in terms of section 16 of the Act. This includes the following considerations:

- The ability of the works to comply with the permitted construction noise limits at all times

- The ability of the works to comply with the permitted construction vibration limits at all times
- The limited exposure times and duration of the noise that will be experienced at the potentially affected sites
- That the AUP objectives and policies for construction noise and vibration set out in E25.2 *Objectives* and E25.3 *Policies* will be met.
- That the AUP objectives and policies for underwater noise effects set out in F2.18.2 *Objectives* and F2.18.3 *Policies* will be met.

13.0 Recommended Conditions

Given that the construction noise and vibration levels for receivers on land will comply with the permitted activity criteria in most cases by a considerable margin, we see no reason to recommend conditions requiring any specific mitigation. The relevant construction noise and vibration limits set out in Chapter E25 will prevail in the absence of any specific consent conditions.

We recommend that our suggested mitigation measures for the management of the potential underwater noise effects on marine mammals are attached to the consent as conditions. The following wording is appropriate:

i. The consent holder shall ensure that the area of the harbour readily visible from the piling location is visually observed for marine mammal presence for no less than 30min prior to the commencement of piling each day. If any marine mammals are sighted, piling may not commence until they have left the area.

ii. The consent holder shall ensure that during all piling work, the area of harbour enclosed by a radius of 80m from the pile being driven (the exclusion zone) shall be observed for the presence of any marine mammals.

iii. If any marine mammals approach or enter the exclusion zone, all piling work shall cease until the mammal(s) have left the area.

Appendix A Glossary of terms

Noise	A sound which serves little or no purpose for the exposed persons and is commonly described as 'unwanted sound'. The definition of noise includes vibration under the Resource Management Act 1991.
Best practicable option	Defined in section 2 of the Resource Management Act 1991 as: in relation to a discharge of a contaminant or an emission of noise, means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to— a. the nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and b. the financial implications, and the effects on the environment, of that option when compared with other options; and c. the current state of technical knowledge and the likelihood that the option can be successfully applied.
$L_{Aeq(t)}$ (dB)	The A-weighted equivalent sound pressure level with the same energy content as the measured varying acoustic signal over a sample period (t). The preferred metric for sound levels that vary over time because it takes into account the total sound energy over the time period of interest.
LAFmax (dB)	The maximum A-weighted sound pressure level recorded during the measurement period using a fast time-weighting response.
LWA (dB)	Sound power level (LWA) is the acoustical energy emitted by a sound source. It is an absolute value and is not affected by distance or the environment. The LWA is used in computer noise modelling to calculate the sound pressure level (e.g. LAeq) at a given distance.
NZS 6801:2008	N.Z. Standard NZS 6801:2008 Acoustics – Measurement of environmental sound.
NZS 6802:2008	N.Z. Standard NZS 6802:2008 Acoustics – Environmental noise.
NZS 6803:1999	N.Z. Standard NZS 6803:1999 Acoustics – Construction noise.
DIN 4150–3:1999	German Standard DIN 4150-3:1999 Structural Vibration – Part 3: Effects of vibration on structures. Typically adopted for the assessment of structure borne vibration in New Zealand.
PPV	Peak particle velocity, measured in mm/s. The standard metric for the measurement of ground borne vibration in New Zealand. The instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position.
CNVMP	Construction noise and vibration management plan. A document to help the contractor manage noise and vibration emissions during construction works.

Appendix B Underwater Noise Modelling Results

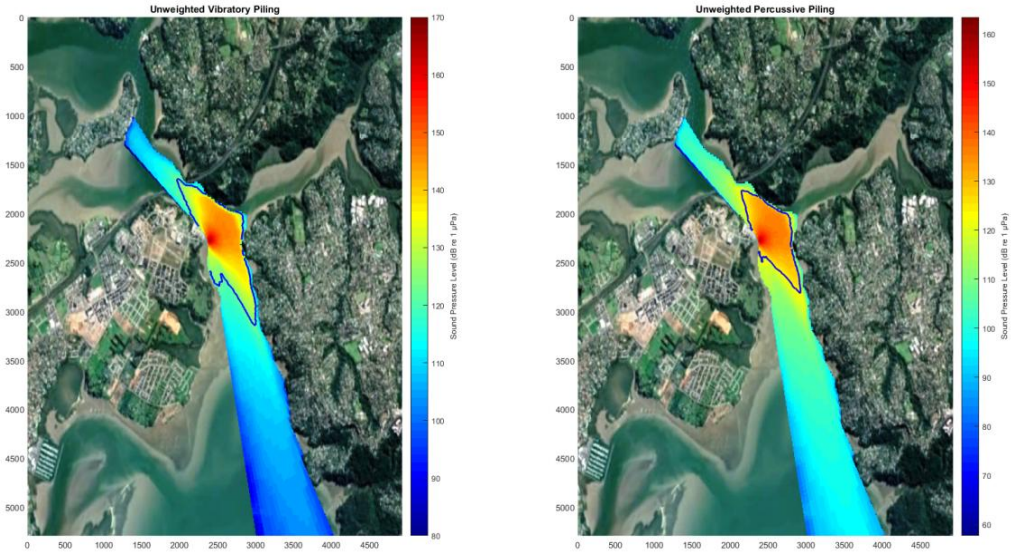


Figure B.1: Broadband noise levels (between 1/3 octave centre frequencies 63 Hz and 32 kHz), for the vibratory piling (as 1-min RMS levels) and percussive piling (as single strike SELs). The blue contour represents the median ambient noise level.

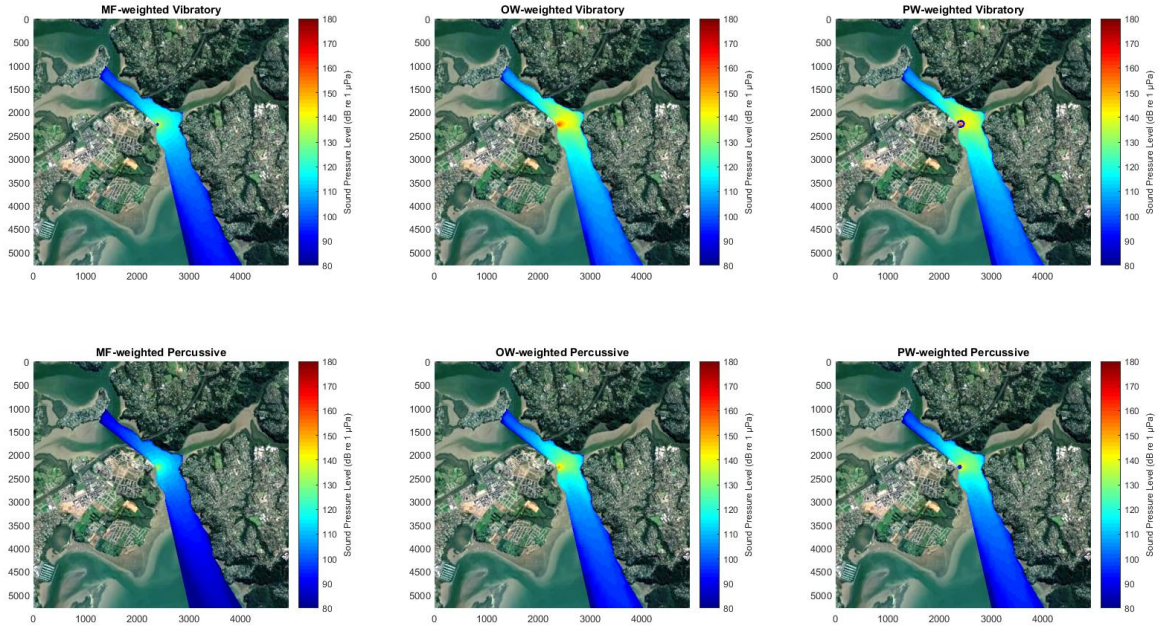


Figure B.2: M-weighted noise levels for the vibratory and percussive piling for mid-frequency (MF), phocid pinnipeds (PW) and otariid pinnipeds (OW). The blue contours (seen in MF-weighted vibratory, PW-weighted vibratory and PW-weighted Percussive plots) represent the TTS contours, based on 300 strikes per day (percussive piling) or 60min vibratory piling duration.

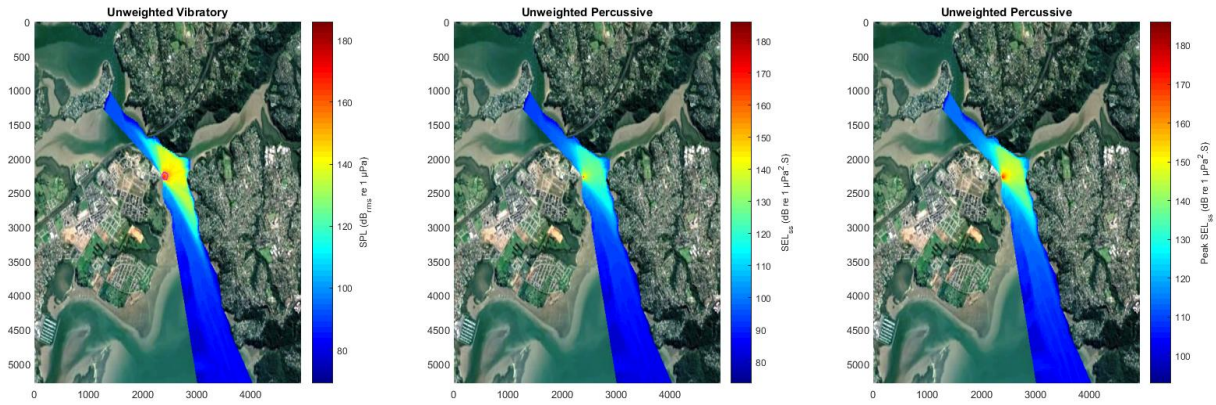


Figure B.3: Plots show the unweighted noise levels between 63 and 1000 Hz, and TTS effects contours (red line) for fish.

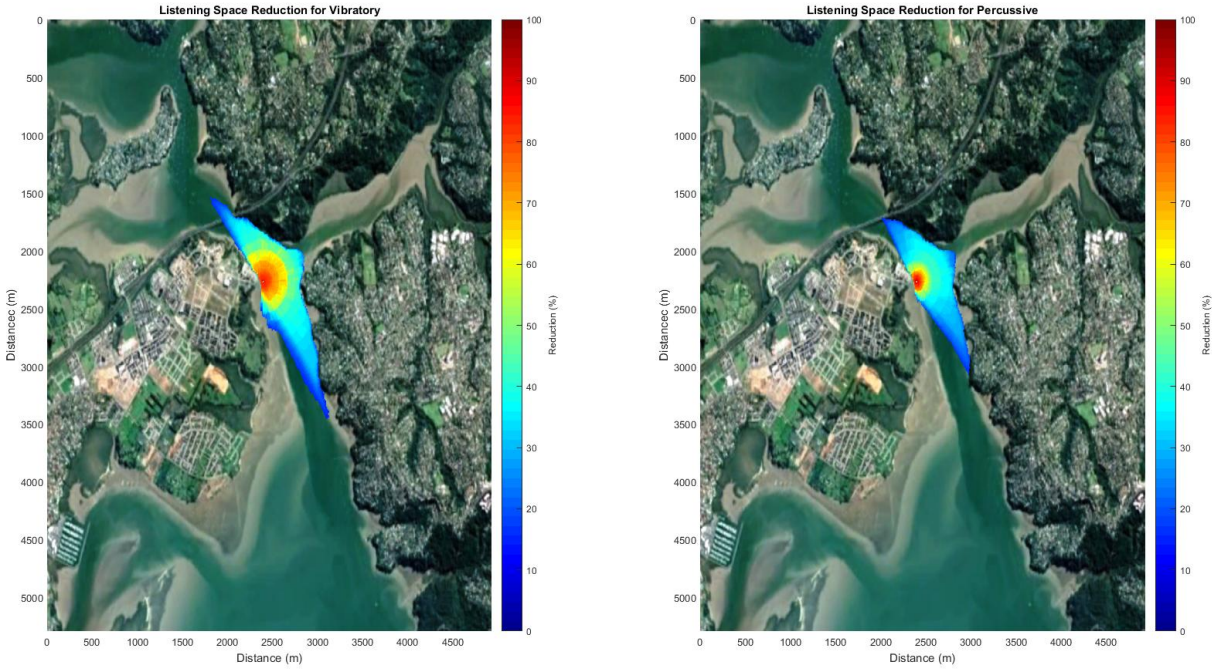


Figure B.4: Plot showing the spatial extent of listening space reductions for common dolphins during the vibratory (left panel) and percussive (right panel) piling.

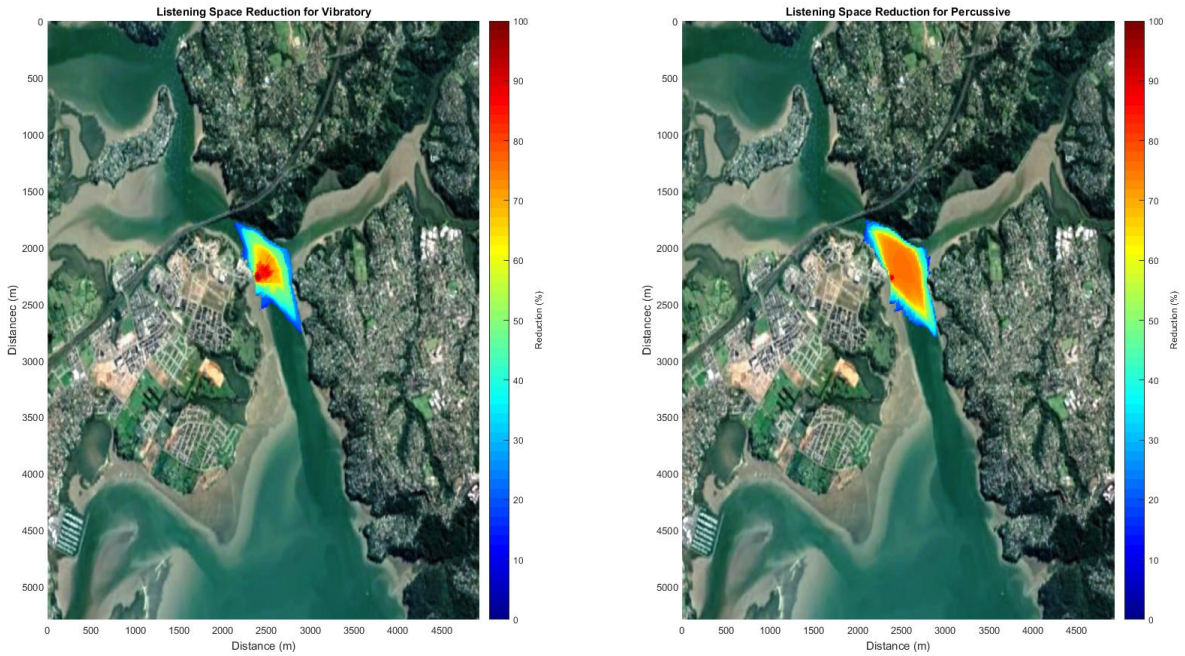


Figure B.5: Plot showing the spatial extent of listening space reductions for fish during the vibratory (left panel) and percussive (right panel) piling.

Figure B.6: Plot showing the limits of audibility for common dolphins during the vibratory (left panel) and percussive (right panel) piling.

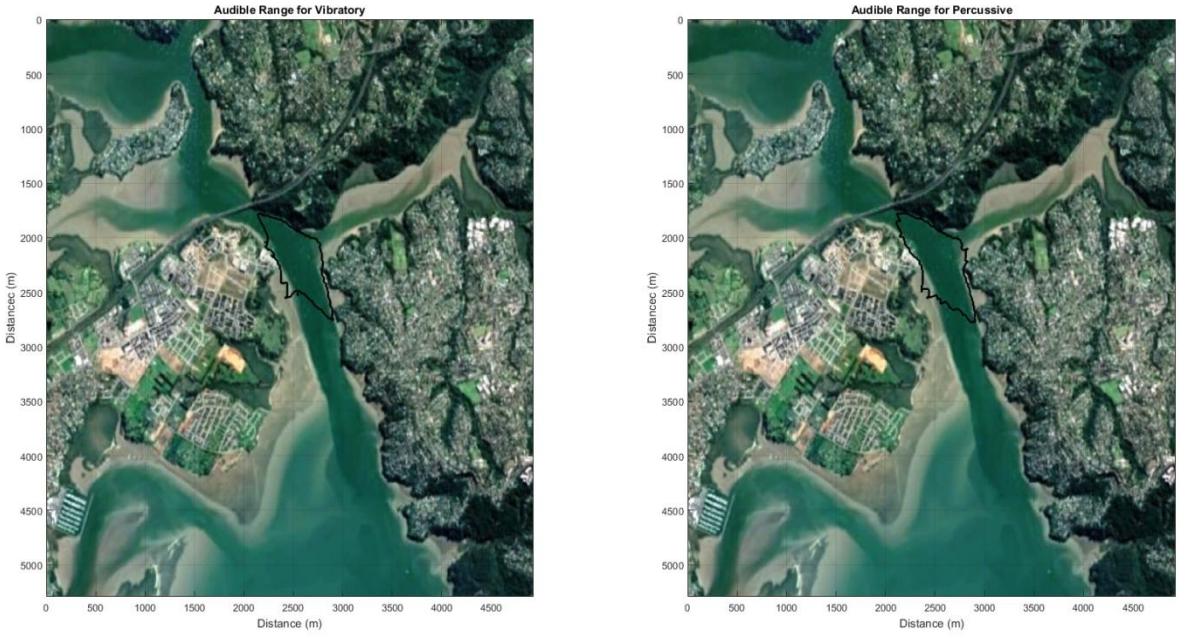


Figure B.7: Plot showing the limits of audibility for fish during the vibratory (left panel) and percussive (right) piling.

Styles Group
Acoustics & Vibration Consultants

ASSESSMENT OF NOISE EFFECTS

MARINE SPORTS RECREATION CENTRE
CATALINA BAY, HOBSONVILLE POINT

PREPARED FOR

HLC (2017) Ltd

DATE

7 April 2020

Assessment prepared by Styles Group for HLC.

REVISION HISTORY

Rev:	Date:	Comment:	Version:	Prepared by:	Reviewed by:
1	7/04/20		Final Draft	Kelly Leemeyer, MASNZ Consultant Styles Group	Jon Styles, MASNZ Director and Principal Styles Group

Table of Contents

Appendices

Executive Summary

Styles Group has assessed the noise effects from the operation of the proposed Marine Sports Recreation Centre at Catalina Bay, Hobsonville Point. This report has been prepared to accompany the resource consent application and Assessment of Environmental Effects for the proposal.

We have prepared noise level predictions for the proposal using computer noise modelling software.

Our assessment demonstrates that noise from the Marine Sports Recreation Centre will comply with the Auckland Unitary Plan permitted noise limits for the surrounding zones during the day and at night with the proposed mitigation measures.

It is our opinion that noise from the Marine Sports Recreation Centre will not exceed a reasonable level in terms of section 16 of the Act.

We have recommended conditions of consent based on our findings.

1.0 Introduction

HLC has engaged Styles Group to assess the effects of the operation of the proposed Marine Sports Recreation Centre (MSRC) at Catalina Bay, Hobsonville Point.

This report sets out an assessment of the proposal from an acoustics perspective, including:

i. Noise level predictions at the surrounding sites prepared using Brüel & Kjær Predictor computer noise modelling software;

ii. Recommended noise management measures and conditions of consent;

iii. An assessment of the noise in accordance with the Auckland Unitary Plan (AUP), section 16 of the Resource Management Act (the Act) and the relevant New Zealand acoustics standards.

This assessment has been prepared following a visit to the Site and discussions with the project team. This report should be read in conjunction with the Assessment of Environmental Effects (AEE), plans and other relevant information to ensure a full understanding of the proposal.

A glossary of acoustical terms used within this document is attached as Appendix A.

2.0 The proposal

HLC are managing the development of the former Hobsonville Air Force base into a new township at Catalina Bay, Hobsonville Point. The project involves several stages and will include the removal of the existing sailing facilities, construction of residential apartments where the sailing facilities have been removed and adjacent to the Hangar, and the construction of a MSRC. This assessment is for the operation of the recreation centre only.

The recreation centre will include:

- Storage facilities for the rowing and yacht clubs
- An oar and blade store
- Changing rooms and toilets
- Meeting rooms
- A function space
- A restaurant and bar

The centre will regularly be used as follows:

2.1 Hobsonville Yacht Club

This section sets out the typical (and existing) use of the MSRC by the Hobsonville Yacht Club.

2.1.1 Junior sailors

Junior sailors (aged 7 – 14 years) will use the MSRC and water access as follows:

- Wednesday and Friday nights, arrival between 4:00 – 4:30 pm. 15 – 20 yachts and up to 3 support tenders will be brought out of the club and launched. These will be moved around using hand-held trailers and will be rigged on the deck area to the north of the MSRC. They will be launched from the pontoons at the end of the water access and the juniors will sail for up to 2.5 hours maximum. The yachts and tenders will then be brought back up to the deck area to be washed and de-rigged and put back in the storage area. Juniors will leave the MSRC at around 7 pm.
- Sunday, used in the same manner as set out above. Timing will vary depending on the tide, starting sometime between 10:00 am – 2:00 pm and running for up to 3 hours maximum.

2.1.2 Senior sailors

Senior sailors will use the MSRC and water access as follows:

- Sundays for races. Senior sailors use larger yachts that are already moored off Kauri Point or berthed at Hobsonville Point. Races start from one of these two locations and finish between 4 – 5 pm. Races usually involve 4 – 8 yachts and a maximum of 40 people. This is anticipated to increase up to 15 yachts over time, to a maximum of 75 people. Following the completion of the races, sailors will drive to the MSRC for prizegiving at 6 pm. Most people will leave the centre before 7 pm.

2.2 Rowing

This section sets out the typical (and existing) use of the MSRC by Westlake Boys High School rowing club and the high performance rowing team, the Regional Performance Centre (RPC).

2.2.1 Westlake Boys High School rowing club

Westlake Boys will use the MSRC and water access as follows:

2.2.1.1 Summer training – up to 60 athletes and several coaches (October to March)

- Monday to Friday, arrival at 4:45 am. Rowing skiffs and up to 6 support boats will be carried from the MSRC storage area and launched from the pontoon at approximately 5 am. Rowers will return to the wharf around 7:00 am to hose

down the skiffs and tenders on the deck area to the north of the MSRC. Students get collected at 8:00 am and taken to school by bus. The remaining coaches or senior students who drive will also leave at this time.

- Weekends. Westlake Boys typically participates in rowing regattas approximately every two weekends throughout summer. There may be some weekends where there is no regatta and they will train out of the facility throughout the morning.

2.2.1.2 Winter training (April to September)

- Westlake Boys may occasionally use the facility for training over similar hours, but with significantly reduced frequency and participants.

2.2.2 Regional performance centre

The RPC (approximately 20 rowers and several coaches) will use the MSRC and water access as follows:

- Monday to Friday, weekly training sessions from 4:45 am - 10:30 am and 4:00 pm – 7:00 pm
- Weekends, 4:45 am – 11:00 am

2.3 Function area, restaurant and bar (upstairs)

We understand that 1 – 2 times per week this area will be used for events, functions or gatherings of up to 100 people.

The proposed hours of operation for the function area are 10.00 am – 10.30 pm, Sunday to Thursday and 10.00 am – 11.30 pm Friday and Saturday. It is unlikely the function area will be used before 4:00 pm.

The function space upstairs will accommodate up to 300 people for special events that are proposed to occur much less frequently.

3.0 The site and surrounding environment

The Site for the proposed marine recreation centre is partly on land and partly in the sea and crosses a number of zones, including the *Coastal – Marina Zone, Coastal – General Coastal Transition Zone, Coastal – Coastal Transition Zone* and *Open Space – Informal Recreation Zone.*

The surrounding sites are zoned *Business – Mixed Use Zone, Residential – Mixed Housing Urban Zone* and *Residential – Terrace Housing and Apartment Buildings Zone.*

Across the channel there are also receiving sites zoned *Open Space – Conservation Zone, Coastal – Ferry Terminal Zone* and *Residential – Single Housing Zone* in Beach Haven and Greenhithe. These sites are all at least 500 m from the Site.

Activities in the business zone include:

- Little Creatures brewery and a co-working space with desks, studios, meeting rooms and function areas in the Hangar building
- Pacific Destinations travel agents
- A number of shops including Fabric, Siamese Doll, Gourmet Gannet, Hushwood Hollow, Kittyhawk Cafe and the Catalina Bay Farmers Market.

The site and surrounding sites are illustrated in Figure 1 below.

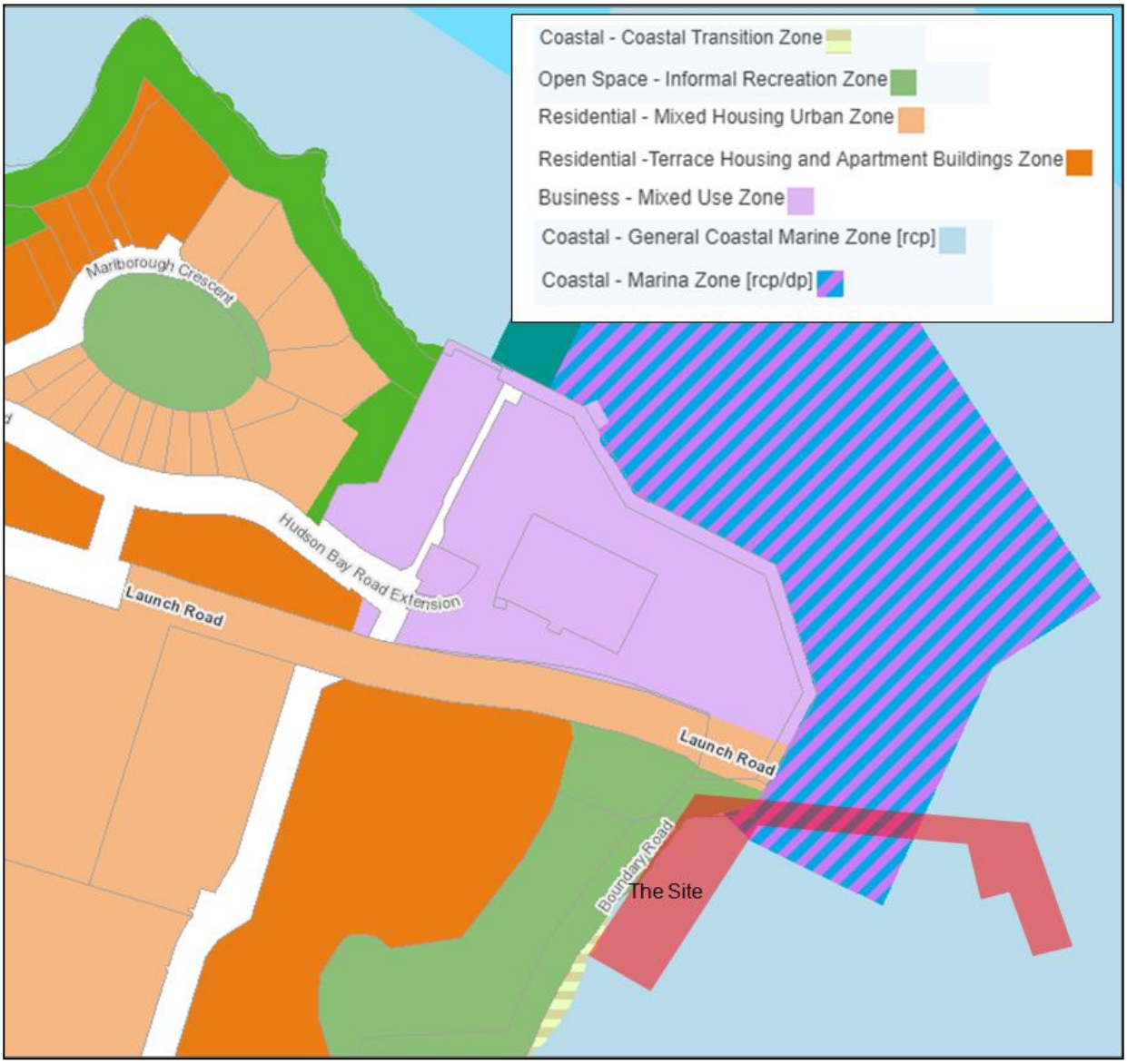


Figure 1: The site and surrounding receivers

4.0 Noise standards for the operation of the marine sports recreation centre

This section sets out the framework for the management of noise effects under the Auckland Unitary Plan, relevant New Zealand acoustics standards for the measurement and assessment of noise and the Act.

4.1 Auckland Unitary Plan

The site for the marine sports recreation centre crosses a number of AUP zones. The permitted noise limits for these zones and any adjacent zones are outlined below.

4.1.1 Permitted noise limits for Open Space – Informal Recreation Centre

E25.6.18. Open Space – Conservation Zone, Open Space – Informal Recreation Zone, Open Space – Civic Spaces Zone or Open Space – Community Zone interface

1) The noise (rating) level and maximum noise level from any activity in the Open Space – Conservation Zone, Open Space – Informal Recreation Zone Open Space – Civic Spaces Zone or Open Space – Community Zone when measured within the boundary of a site in a residential zone or notional boundary of a site in a rural zone must not exceed the levels in Table E25.6.18.1 Noise levels at the Open Space – Conservation Zone, Open Space – Informal Recreation Zone, Open Space – Civic Spaces Zone or Open Space – Community Zone interface below:

Table E25.6.18.1 Noise limits at the Open Space – Conservation Zone, Open Space – Informal Recreation Zone, Open Space – Civic Spaces Zone or Open Space – Community Zone interface

Time	Noise level
Monday to Saturday 7am – 10pm	50 dB L_{Aeq}
Sunday 9am – 6pm	
All other times	40 dB L_{Aeq} 75 dB L_{AFmax}

4.1.2 Permitted noise limits for Coastal – Marina Zone

E25.6.11. Noise levels in the Coastal – Marina Zone [rcp/dp]

1) The noise (rating) level arising from an activity in the Coastal – Marina Zone measured within the boundary of any other site in this zone must not exceed the levels in Table E25.6.7.1 Noise levels in the Coastal – Marina Zone.

Table E25.6.7.1 Noise levels in the Coastal – Marina Zone

Time	Coastal marine zone
All times	60 dB L_{Aeq}

4.1.3 Permitted noise limits for Coastal – Coastal Transition Zone and Coastal – General Coastal Marine Zone

The AUP does not reference specific noise rules for the *Coastal – Coastal Transition Zone* or the *Coastal – General Coastal Marine Zone.*

The rule for noise levels at the coastal interface and for all other one interfaces are provided below for reference:

E25.6.14. Noise levels at the coastal interface [rcp/dp]

(1) The noise (rating) level generated by any activity in the coastal marine area or on a lake or river must not exceed the levels in Table E25.6.14.1 Noise levels at the coastal interface when measured within the boundary of a site in a residential zone or notional boundary of any site in the Rural – Rural Production Zone, Rural – Mixed Rural Zone, Rural – Rural Coastal Zone; Rural – Rural Conservation Zone, Rural – Countryside Living Zone, Rural – Waitākere Foothills Zone and Rural – Waitākere Ranges Zone.

Table E25.6.14.1 Noise levels at the coastal interface

Time	Noise level
7am - 10pm	50 dB L_{Aeq}
10pm - 7am	40dB L_{Aeq} 75dB L_{AFmax}

(2) The noise levels in Standard E25.6.14(1) above do not apply to:

a. the operational requirements of vessels (including cargo vessels, tugs, passenger liners, naval vessels and commercial fishing vessels); and

b. temporary activities in E40 Temporary activities

E25.6.22. All other zone interfaces

1) Except as provided for in Standards E25.6.14 to E25.6.21 above, where noise generated by any activity on a site in one zone is received by any activity on a site in a different zone, the activity generating the noise must comply with the noise limits and standards of the zone at the receiving site.

4.1.4 Permitted noise limits for Residential – Mixed Housing Urban Zone and Residential – Terrace Housing and Apartment Buildings Zone

The AUP zone specific rule for noise in these residential zones is provided below for reference:

E25.6.2 Maximum noise levels in residential zones

1) The noise (rating) levels and maximum noise level arising from any activity in the Residential – Large Lot Zone, Residential – Rural Coastal Settlement Zone, Residential – Single Housing Zone, Residential – Mixed Housing Suburban Zone, Residential – Mixed Housing Urban Zone and the Residential – Terrace Housing and Apartment Buildings Zone measured within the boundary of an adjacent site in these residential zones must not exceed the levels in Table E25.6.2.1 Noise levels in residential zones below:

Table E25.6.2.1 Noise levels in residential zones

Time	Noise level
Monday to Saturday 7 am - 10 pm	50 dB L_{Aeq}
Sunday 9 am – 6 pm	
All other times	40 dB L_{Aeq} 75 dB L_{AFmax}

2) The levels for the daytime hours in Table E25.6.2.1 Noise level in residential zones may be exceeded by intermittent noise for reasonable periods where that noise is associated with normal household activities, such as lawn mowing or home handyman work.

4.1.5 Permitted noise limits for Business – Mixed Use Zone

E25.6.8. Noise levels in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone

The noise (rating) level and maximum noise level arising from any activity in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone measured or assessed as the incident level on the façade of any building on any other site in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone must not exceed the limits in Table E25.6.8.1 Noise levels in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone below:

Table E25.6.8.1 Noise levels in the Business – City Centre Zone, Business – Metropolitan Centre Zone, Business – Town Centre Zone or the Business – Mixed Use Zone

Time	Business – City Centre Zone	Business – Metropolitan Centre Zone	Business – Town Centre Zone	Business – Mixed Use Zone
7am - 11pm	65dB L_{Aeq}	65 dB L_{Aeq}	65 dB L_{Aeq}	65 dB L_{Aeq}
11pm – 7am	60dB L_{Aeq}	60dB L_{Aeq}	55dB L_{Aeq}	55dB L_{Aeq}

	65dB at 63Hz L_{Aeq} 60dB at 125Hz L_{Aeq} 75dB L_{AFmax}	65dB at 63Hz L_{Aeq} 60dB at 125Hz L_{Aeq} 75dB L_{AFmax}	65dB at 63Hz L_{Aeq} 60dB at 125Hz L_{Aeq} 75dB L_{AFmax}	65dB at 63Hz L_{Aeq} 60dB at 125Hz L_{Aeq} 75dB L_{AFmax}

2) The 63Hz and 125Hz octave band limits do not apply to fixed mechanical plant.

4.2 Applicable noise limits

The noise limits for noise received from the marine recreation centre in the surrounding zones are summarised in Table 1 below:

Table 1: Applicable noise limits under AUP

Zone	Time	Noise level
Business – Mixed Use	7am – 11pm	65 dB L_{Aeq}
	11pm – 7am	55dB L_{Aeq} 65dB at 63Hz L_{Aeq} / 60dB at 125Hz L_{Aeq} 75dB L_{AFmax}
Residential - Mixed Housing Urban Zone and Terrace Housing and Apartment Buildings Zone	Monday - Saturday 7am - 10pm Sunday 9am – 6pm	50 dB L_{Aeq}
	All other times	40 dB L_{Aeq} / 75 dB L_{AFmax}
Coastal Marina	All times	60 dB L_{Aeq}
Open Space – Informal Recreation	All times	No limit
Coastal - Coastal Transition and General Coastal Marine	All time	No limit

The most stringent noise limits applicable to the operation of the recreation centre are those for the *Residential* receivers, being 40 dB L_{Aeq} after 10pm on Monday to Saturday and after 6pm on Sunday.

4.3 New Zealand acoustics standards

Rule E25.6.1(1) *General Standards* of the AUP requires that noise levels are measured and assessed in accordance with the New Zealand Standard NZS 6801:2008 Measurement of

environmental sound and the New Zealand Standard NZS 6802:2008 Acoustics - Environmental noise except where more specific requirements apply.

Where an adjustment is applied to any noise containing special audible characteristics in terms of Appendix B4 Special Audible Characteristics in New Zealand Standard NZS 6802:2008, Rule E25.6.1(2) stipulates that an adjustment noise may apply to the A weighted level, but an adjustment must not be applied to any level measured in the 63Hz and 125Hz octave bands.

4.3.1 NZS6802:2008 Special audible characteristics

Section 6.3 of NZS 6802:2008 states that where the sound being assessed has a distinctive character which may affect its subjective acceptability (for example it is noticeably impulsive or tonal), the representative sound level shall be adjusted to take this into account (in accordance with Appendix B4 of the Standard).

There will be no outdoor speakers for the function centre. Music will not be the dominant noise source from the centre and will not be audible for most receivers. This noise source is not unusual in the area, with a number of other hospitality businesses located nearby. There will not be a strong bass component to the music or any subwoofers or large diameter speakers capable of producing significant levels of bass.

It is our opinion that an adjustment for special audible characteristics is not required to be applied to the amplified music noise from the recreation centre.

4.3.2 NZS6802:2008 Duration adjustment

Section 6.4 of NZS 6802:2008 states that if a sound is not present all of the time it is likely to create lesser annoyance than the same sound if it were continuously present. The Standard recommends that an adjustment of up to 5 dB shall be applied to the representative sound level to take this into account. The more the sound under investigation is present, the less the duration adjustment value is. If a sound is continuous then no duration adjustment is warranted.

Because of the importance of protecting sleep, no adjustment is allowed during a prescribed time frame defined in a consent condition, rule or national environmental standard as night-time.

With reference to Appendix A, Table A7 of NZS 6802:2008, section 6.4.6 Duration is the appropriate reference for the application of the duration correction, as follows:

> For situations where the level of the sound reduces significantly for large periods of time but the sound does not switch off completely, some adjustment to account for this relief to persons exposed to the sound is also appropriate. In these cases the energy average of the sound under investigation should be calculated over the entire prescribed time frame. The rating level shall be the greater of this average value or the representative level over the reference time interval - 5 dB.

The proposal will involve noise from activities in the marine sports recreation centre over the daytime period and up until 10.30pm on Sunday – Thursday and up until 11.00pm on Friday - Saturday.

There will be little to no audible noise from the centre before 4 pm on any day. Before 4 pm noise will be from smaller groups using the storage area and taking boats down to the water.

A duration adjustment of 3 dB has been applied to the noise levels from use of the function centre.

4.4 Resource Management Act 1991

The overarching requirement for noise arising from the proposed activity is compliance with Section 16 (1) of the Act, which states:

> Every occupier of land (including any premises and any costal marine area), and every person carrying out an activity in, on, or under a water body or the costal marine area, shall adopt the best practicable option to ensure that the emission of noise from that land or water does not exceed a reasonable level.

5.0 Noise sources

Noise arising from the proposal will be from amplified music, people using the marine recreation centre during the day and in the evening, vehicles movements and mechanical plant. These noise sources are discussed below.

5.1.1 Amplified music

Amplified music is proposed at background levels only. There will be no DJ's or live music.

The speakers will only be located inside, with no music played on the deck at any time. There will be no subwoofer or significant bass component played. The speakers and sound system will be sized, located and designed to ensure that the noise is minimised beyond the MSRC building.

5.1.2 People noise

The proposed recreation centre will cater for up to 300 people, but more commonly it will be used for approximately 100 people.

We have undertaken a detailed people noise assessment in this report based on our own measurements of existing establishments.

We have assessed the following scenario, to represent the worst case scenario:

- 200 people on the deck area

- 100 people inside with the windows and doors to the north open (we understand that the south-facing facade does not have any openable doors or windows)

The noise levels used in the model are based on people socialising in an animated way, with raised voices and laughter. We have used a sound power level (SWL) of 96dB for a group of 40 people. The noise level from people engaged in a relaxed conversation would be 5 – 6 dB lower.

5.1.3 Vehicle movements

There will be no new parking area constructed for the recreation centre. The traffic assessment[1] undertaken by Flow Transportation Specialists Ltd concluded that the parking available on Launch Road is sufficient to meet the minimum AUP requirements.

5.1.4 Mechanical plant

Mechanical plant will be required to service the kitchen and bar areas. There will also be a lift within the centre and a mechanical heating and cooling system.

Specific details and specifications for any mechanical plant have not been confirmed at this early stage of the development. The noise from the mechanical plant will be designed and located to ensure full compliance with the AUP noise limits.

When considering the scale of the development, the layout of the site and the availability of screening for the plant if required, it is our opinion that any noise from mechanical plant received at the nearest sites will likely be significantly below the ambient noise and the noise generated by other sources on site.

6.0 Noise mitigation

We do not consider that restrictions or mitigation measures are necessary to control the noise of the MSRC for the use of recreational boating and sports. The only aspect of the activity that we consider requires control and mitigation is the use of the MSRC for gatherings of people for events or functions.

The noise controls set out below in Table 2 and Table 3 are proposed to reduce noise emissions from the site and have been included in our calculations. These are recommended as conditions of consent.

The controls are based on the sound system being designed and installed according to our recommendations in all cases.

[1] Flow Transportation Specialists – Catalina Bay Marine Sports Recreation Centre car parking requirements – 18 July 2019

Table 2: Noise mitigation controls, Monday to Saturday

Operating scenario	Noise control	
	Before 10:00 pm	After 10:00 pm
Up to 100 people in function area, inside and on the deck	No restrictions	All people must move inside. Doors can remain open. Windows on eastern facade can remain open; all other windows must be closed.
100 - 300 people in function area, inside and on the deck	No restrictions	Event must finish before 10:00pm, or be reduced to a maximum of 100 people on site. All remaining people must move inside. Doors can remain open. Windows on eastern facade can remain open; all other windows must be closed.

Table 3: Noise mitigation controls, Sunday

Operating scenario	Noise control	
	Before 6:00 pm	After 6:00 pm
Up to 100 people in function area, inside and on the deck	No restrictions	All people must move inside. Doors can remain open. Windows on eastern facade can remain open; all other windows must be closed.
100 - 300 people in function area, inside and on the deck	No restrictions	Event must finish before 6:00pm, or be reduced to a maximum of 100 people on site. All remaining people must move inside. Doors can remain open. Windows on eastern facade can remain open; all other windows must be closed.

7.0 Noise modelling and predictions

To understand the spatial propagation of noise across and beyond the site, we have prepared noise level predictions using Brüel & Kjær Predictor computer noise modelling software. This enables the accurate prediction of noise levels at multiple receivers under a wide range of meteorological and operational conditions. The computer noise models are three-dimensional and take into account the topography, buildings, ground coverage, the physical attributes of the sound sources and receivers and many other physical factors. The

Brüel & Kjær Predictor software is globally recognised and has been successfully implemented on a large number of projects throughout New Zealand.

This section sets out the methodology and results of our noise modelling.

7.1 Noise model parameters

Noise predictions have been calculated based on the International Standard ISO 9613-1/2 Attenuation of sound during propagation outdoors. Terrain contours, building footprints and parcel boundaries were imported from the Auckland Council GIS service, surveys and site plans. The topographical contours encompass the entire site and a large area of the surrounding land. We have ensured the integrity of the noise model by careful scrutiny of the final three-dimensional model.

The noise levels produced by the model include the effects of the abovementioned factors and assume meteorological conditions that slightly enhance propagation in all directions in accordance with NZS 6802:2008.

The input parameters of the noise model are displayed in Table 4.

Table 4: Predictor noise model input parameters

Parameters/calculation settings	Details
Software	Brüel & Kjær Predictor
Calculation method	ISO 9613.1/2
Meteorological parameters	Single value, C0 = 0
Ground attenuation over land	General method, ground factor: 0.8
Ground attenuation over sea	General method, ground factor: 0
Air temperature	293.15K
Atmospheric pressure	101.33kPa
Air humidity	60%
Receiver heights (relative)	1.5m above ground or 1.5m above the finished floor level of multi-storey buildings
Function room building facade (doors and windows open)	L_{WA} 84 dB/m^2
People congregating in external area (per group of 40 people)	L_{WA} 96 dB

7.2 Noise rating level predictions

Table 5 displays the noise rating level predictions at 1.5 m above the local ground level or floor level. These are the highest noise rating levels expected at any location within the receiving sites and include the reduction afforded by the noise mitigation measures discussed within this report. Any site not specifically referenced in Table 5 is separated further from the proposed activity than those listed. The noise rating level at the more distant sites will be lower due to the additional separation distance and the screening provided by surrounding structures or terrain (or both).

The predicted noise rating levels displayed in Table 5 demonstrate that the AUP permitted noise limits will be complied with at all surrounding properties.

During the night time period (after 10:00 pm, Monday to Saturday, and after 6:00 pm, Sunday) there will be no more than 100 people on site, and they will be inside with doors and windows on the western facade shut. The noise levels during the night time period will comfortably comply with the night time noise limits.

Table 5: Noise rating level predictions

Address and assessment position		Noise rating level in accordance with NZS 6802:2008 (L_{Aeq})	AUP permitted noise limit
Yacht Club apartments	1.5 m	63 dB	65 dB L_{Aeq}
	First floor	64 dB	
	Second floor	64 dB	
Catalina Bay Apartments	1.5 m	58 dB	65 dB L_{Aeq}
	First floor	59 dB	
	Second floor	58 dB	
	Third floor	58 dB	
39 Launch Road	1.5 m	47 dB	50 dB L_{Aeq}

8.0 Assessment of noise effects

It is our opinion that noise from the centre will not exceed a reasonable level in terms of section 16 of the Resource Management Act. This takes into account the following:

- The predicted noise levels are compliant with the permitted daytime and night-time noise limits, based on an assessment of the worst case scenario for noise
- All events in the function area with up to 100 people will move indoors from 10:00 pm on Monday to Saturday, and 6:00 pm on Sunday
- All events in the function area with 100 - 300 people will either finish or be reduced to 100 people by 10:00 pm on Monday to Saturday, and 6:00 pm on Sunday
- The proposed noise conditions and mitigation measures that form part of the application.

During daytime hours, we expect that the noise from the normal use of the site will be mostly inaudible for receivers.

During a function or event, the noise will be noticeable at the nearest receiving sites, but it will be compliant with the permitted noise limits at all times. Events will take place over several hours, but not the entire daytime period. On days when there are no events, and during winter when there is minimal use of the centre by the Hobsonville Yacht Club or the rowing clubs, there will be little to no noise from the site. There will be little or no noise audible at the receivers after 10 pm.

We have recommended a condition of consent that requires the sound system to be installed and managed to minimise the noise level received off the MSRC site, and to ensure that low frequency / bass noise is minimised.

Management-based noise mitigation measures are proposed as part of the application and are offered as conditions of consent. In our opinion these measures form part of the *best practicable option* to minimise noise emissions from the site.

9.0 Recommendations

We recommend the following conditions of consent are imposed and complied with. These are in addition to the standard condition requiring compliance with the application documents as lodged, including this report. They are also on the basis that the noise limits for the proposal will be the permitted noise limits of the Unitary Plan.

1. The facility must not operate with more than 300 people on site at any time.
2. After 10 pm on Monday to Saturday, and after 6 pm on Sunday, there shall be no more than 100 people in the function centre
3. The outdoor deck area must be closed and vacated at the following times:
    i. After 10 pm, Monday to Saturday
    ii. After 6 pm, Sunday

4. All external windows and doors on the western facade of the upper level of the centre must remain closed at the following times:

   iii. After 10 pm, Monday to Saturday

   iv. After 6 pm, Sunday

5. Amplified sound must not be played outside at any time. No speakers shall be installed or used outdoors.

6. Live music or performances including DJs, percussion (drums), amplified instruments, is prohibited at all times.

7. Other than the permanently installed sound system that is specified and defined in accordance with condition (8), and other than small personal devices such as small Bluetooth speakers, mobile phones or televisions, no other system for amplifying sound or music shall be brought into or used at the facility at any time.

8. At least 3 months prior to the operation of the centre, the consent holder must prepare a Noise Management Plan (NMP) for submission to Auckland Council. The objective of the NMP is to set out the methods and measures required to minimise noise emissions from the use of the marine sports recreation centre as far as practicable and to ensure compliance with the consented noise limits. The NMP must include the following provisions, as a minimum:

   (i) Operating hours of the marine sports recreation centre, including the function centre.

   (ii) Specific details of the requirements for closing external doors and windows, including provision for signage on doors where necessary.

   (iii) Details of all other noise mitigation measures that are required to be adopted including restrictions on amplified music outside, live bands, and patrons in the outdoor licensed area.

   (iv) Specifications for the in-house sound system, including loudspeaker locations and design, and the specific measures that will be implemented to ensure that the bass level is managed to avoid the application of an adjustment for Special Audible Character when assessed from the nearest receiver of noise.

   (v) A procedure for receiving, handling and recording noise complaints.

   (vi) Provision for signage outside the centre reminding users to minimise noise levels when leaving the centre when the night time noise limits are applicable.

9. All staff on site will be made aware of the NMP and the requirement to avoid excessive noise and minimise noise emissions from the site. The NMP must

be observed for as long as the consent is given effect to and shall be made available for inspection at the reasonable request of Auckland Council.

10.0 Conclusion

Styles Group has assessed the noise effects from the operation of the proposed Marine Sports Recreation Centre at Catalina Bay.

We have proposed a number of mitigation measures, including:

- Restrictions on the number people on site at any one time
- Restrictions on event timing and use of the deck area
- Restrictions on the use of amplified sound, including prohibiting live music
- The preparation of a noise management plan setting out the methods and measures required to minimise noise emissions from the use of the marine sports recreation centre as far as practicable and to ensure compliance with the consented noise limits

Noise from the Marine Sports Recreation Centre will comply with the Auckland Unitary Plan permitted noise limits for the surrounding zones during the day and at night with the proposed mitigation measures. The noise emissions from the proposed activity are therefore within the level of effect that the Auckland Unitary Plan anticipates and provides for.

It is our opinion that noise from the Marine Sports Recreation Centre will not exceed a reasonable level in terms of section 16 of the Act.

Appendix A Glossary of terms

Noise	A sound which serves little or no purpose for the exposed persons and is commonly described as 'unwanted sound'. The definition of noise includes vibration under the Resource Management Act 1991.
Best practicable option	Defined in section 2 of the Resource Management Act 1991 as: in relation to a discharge of a contaminant or an emission of noise, means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to— a. the nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and b. the financial implications, and the effects on the environment, of that option when compared with other options; and c. the current state of technical knowledge and the likelihood that the option can be successfully applied.
dB (decibel)	The basic measurement unit of sound. The logarithmic unit used to describe the ratio between the measured sound pressure level and a reference level of 20 micropascals (0 dB).
A-weighting	A frequency filter applied to the full audio range (20 Hz to 20 kHz) to approximate the response of the human ear at lower sound pressure levels.
$L_{Aeq(t)}$ (dB)	The A-weighted equivalent sound pressure level with the same energy content as the measured varying acoustic signal over a sample period (t). The preferred metric for sound levels that vary over time because it takes into account the total sound energy over the time period of interest.
LAFmax (dB)	The maximum A-weighted sound pressure level recorded during the measurement period using a fast time-weighting response.
Noise rating level	A derived noise level used for comparison with a noise limit.
NZS 6801:2008	N.Z. Standard NZS 6801:2008 Acoustics – Measurement of environmental sound.
NZS 6802:2008	N.Z. Standard NZS 6802:2008 Acoustics – Environmental noise.
The Act	The Resource Management Act 1991.
s16	Section 16 of the Act states that "every occupier of land (including any premises and any coastal marine area), and every person carrying out an activity in, on, or under a water body or the coastal marine area, shall adopt the best practicable option to ensure that the emission of noise from that land or water does not exceed a reasonable level".
ISO 9613-1/2	International Standard ISO9613-1/2 Attenuation of sound during propagation outdoors

Appendix B Noise rating level contours

Table 5.1.3 Commercial - dry retail, office and wet retail design wastewater flow allowance and peaking factors

Commercial activity type	Design wastewater flow allowance	Design wastewater peaking factors	
		Peaking factor: Self-Cleansing Design Flow (Normal PDWF)	Peaking factor: Peak Design Flow (PWWF or Exceptional PDWF)
Dry retail (Note 1) (where kitchen/toilets are not normally made available to customers)	1 person per 50m² net floor area at 65 litres per person per day.	2.0	5.0
Office buildings and dry retail where toilet facilities, etc. are provided to customers.	1 person per 15m² net floor area at 65 litres per person per day.	2.0	5.0
Wet retail (Note 2): Food and or beverage retail/preparation e.g. coffee shop, restaurant, bar, butcher, fresh fruit and vegetable retail.	15 litres per day per net m² of floor area (including kitchen and dining areas).	2.0	6.7

Marine Rec Centre

Gross Floor Area = 500m²/floor (assume 2 floors)

Net Floor Area = 80% Gross floor area = 800m²

Design ADWF (l/s) = 800/15 * 65 = 3467 l/d

= 3467/86400 (seconds/day) = 0.04 l/s

Self-Cleansing Design Flow (l/s) = ADWF x $PF_{Self\text{-}Cleansing}$ = 0.04l/s x 2 = 0.08 l/s

Peak Design Flow (L/s) = ADWF x $PF_{Peak\ Design\ Flow}$ = 0.04 l/s x 5 = **0.20 l/s (MRC)**

Contributing flows from Catalina Bay Development = 2.25l/s

Capacity of Public Pipe

WW Pipe - 150Ø uPVC - Minimum gradient 1:100

Dia, m	d/D	α, rad	P, m	A, m²	R	1:S	n	V, m/s	Q, m³/s	Q, l/s
0.150	1.000	0.000	0.4712	0.0177	0.038	**100**	**0.0100**	1.120	0.0198	19.798

Wastewater flows << Pipe Capacity

FUTURE BUILDING 2

REFER TO DRAWING DLH013-02-404

REFER TO DRAWING DLH013-02-401

EXISTING BUILDING

LAUNCH ROAD

BOUNDARY ROAD

ESPLANADE

FUTURE BUILDING 1

BOUNDARY

FUTURE MARINE RECREATIONAL CENTRE

CATALINA BAY

DN 300 RCRRJ CLASS 4 23.2m @ 0.50%

DN 150 uPVC SN16 5.8m @ 1.39%

PROPOSED WATERMAIN CONNECTION FIRE PROTECTION SUPPLY 100 OD PE PIPE POTABLE SUPPLY 80 OD PE PIPE

PROPOSED WASTEWATER CONNECTION 2-A

PROPOSED STORMWATER CONNECTION 2-1

DN 225 uPVC SN16 3.1m @ 1.00%

PROPOSED TELECOM CONNECTION

SWMH 2-3
LID LEVEL:3.24
SE INV IN:1.59
NW INV IN:1.77
NE INV OUT:1.51

PROPOSED CONNECTION TO EXISTING 180 OD PE PIPE TO COMPLETE RING MAIN.

PROPOSED CONNECTION TO EXISTING POWER CABLE LINES

PROPOSED POWER CONNECTION (ELECTRICAL PIT - 160A THREE-PHASE CONNECTION)

EX. WWMH C4
LID LEVEL:3.15
NE INV IN:2.09
SW INV IN:2.12
NW INV IN:2.12
SE INV IN:2.17

DN 100 uPVC SN16 6.9m @ 1.20%

DN 225 RCRRJ CLASS 4 6.9m @ 1.00%

PROPOSED WASTEWATER CONNECTION 1-B

CP2-3
LID LEVEL:3.13
NW INV OUT:1.66

PROPOSED TELECOM CONNECTION

DN 225 RCRRJ CLASS 4 14.3m @ 1.00%

CP3-2
LID LEVEL:2.94
NE INV OUT:1.98

PROPOSED WATERMAIN CONNECTION FIRE PROTECTION SUPPLY 100 OD PE PIPE CWS (FOR DOMESTIC) 40 OD PE PIPE

EXISTING 525Ø PIPE STORMWATER OUTFALL 4

DN 150 uPVC SN16 45.1m @ 1.00%

SWMH 10-1
LID LEVEL:3.41
S INV IN:1.53
SW INV IN:1.25
NE INV OUT:1.25

PROPOSED MANHOLE OVER EXISTING SW LINE

DN 300 RCRRJ CLASS 4 9.2m @ 1.30%

PROPOSED WASTEWATER LINE A

WWMH B-1
LID LEVEL:3.93
SW INV IN:2.60
NE INV OUT:2.57

SWMH 10-2
LID LEVEL:3.25
W INV IN:1.90
N INV OUT:1.85

DN 300 RCRRJ CLASS 4 18.2m @ 1.30%

SWMH 10-3
LID LEVEL:3.87
SW INV IN:2.42
E INV OUT:2.37

DN 150 uPVC SN16 22.1m @ 1.00%

SWMH 10-4
LID LEVEL:3.93
NE INV OUT:2.60

WWMH B-2
LID LEVEL:3.93
NE INV OUT:2.82

PROPOSED WATERMAIN CONNECTION

PROPOSED TELECOM CONNECTION

PROPOSED POWER CONNECTION

375ø CL2 RJ Pipe / 62.94m @ 5.94%

300ø CL4 RJ Pipe 13.31m @ 0.98%

300ø CL4 RJ Pipe 10.57m @ 1.00%

LEGEND

PUBLIC

PRIVATE

NOTES:

1. ALL WORKS AND MATERIALS ARE TO COMPLY WITH AUCKLAND COUNCIL'S ENGINEERING STANDARDS INCLUSIVE OF AUCKLAND TRANSPORT & WATERCARE.
2. ALL WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH RELEVANT CONDITIONS CONTAINED IN THE CATALINA BAY INTEGRATED CONSENT BUNDLE CONTAINING THE FOLLOWING CONSENTS: DIS60328753, LUC60328754, SUB60328755 and CST60328756.
3. ALL WORKS ON EXISTING STORMWATER, WASTEWATER LINES AND WATERMAINS TO BE CARRIED OUT BY AN APPROVED LICENSED CONTRACTOR AT DEVELOPERS EXPENSE.
4. CONTRACTOR TO LOCATE / MARK AND CONFIRM ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORK ON SITE AND PROTECTION OF SAME.
5. ALL STORMWATER PIPES SHALL BE CLASS 4 REINFORCED CONCRETE RUBBER RING JOINTED (RCRRJ) UNLESS SHOWN OTHERWISE.
6. ALL DN 100 & DN 150 STORMWATER LINES SHALL BE uPVC DWV SN16 AS/NZ 1260, UNLESS SHOWN OTHERWISE.
7. ALL MANHOLES SHALL BE DN 1050 RC WITH CLASS D LIDS BEING USED IN PAVEMENT AREAS, UNLESS SHOWN OTHERWISE.
8. ALL PROPOSED CONNECTIONS SHALL BE DN150, UNLESS SHOWN OTHERWISE AND ARE DIMENSIONED FROM THE DOWNSTREAM MANHOLE.
9. ALL SINGLE CATCHPIT LEADS SHALL BE DN 225 RCRRJ CLASS 4 PIPE, UNLESS SHOWN OTHERWISE.
10. ALL DOUBLE CATCHPIT LEADS SHALL BE DN 300 RCRRJ CLASS 4 PIPE, UNLESS SHOWN OTHERWISE.
11. ALL WASTEWATER LINES SHALL BE DN 150 uPVC DWV SN16 AS/NZ 1260, UNLESS SHOWN OTHERWISE.
12. BEDDING TO COMPLY WITH AUCKLAND COUNCIL DETAILS.
13. ALL BACKFILL ON DRAINAGE TRENCHES TO BE GAP65 HARDFILL BACKFILL.
14. REFER TO UTILITY SERVICE PROVIDERS TO BACKFILL DETAILS.
15. ALL PIPE CROSSING WITH LESS THAN 150mm TO BE POLYSTYRENE PACKED (24Kg/m^3) AND HARDFILL BACKFILLED.
16. REFER TO DLH013-02-490 TO 494 FOR STORMWATER AND WASTEWATER STANDARD DETAILS.
17. REFER TO DLH013-02-500 FOR STANDARD WATERMAIN DETAILS.
18. REFER TO DLH013-02-600 FOR TYPICAL COMMON SERVICES TRENCH DETAILS.
19. PROPOSED SERVICES (HV, LV & COMMUNICATIONS) LAYOUT SHOWN IS INDICATIVE AND SUBJECT TO CONFIRMATION BY THE UTILITY SERVICES PROVIDER.
20. ALL CESSPITS ADJACENT TO KERBS TO BE FITTED WITH HYDROCYCLE CLASS D GRATES. REFER TO DWG NO. DLH013-02-493 FOR DETAILS.
21. OTHER CESSPITS TO BE FITTED WITH HEELGUARD GRATES CLASS D TO MANUFACTURER'S DETAILS.
22. ALL CESSPITS TO BE FITTED WITH 200MM ENVIROPOD TO MANUFACTURER'S SPECIFICATIONS.

LEGEND:

- EXISTING CONTOURS SHOWN AT 0.1m INTERVALS
- PROPOSED CONTOURS SHOWN AT 0.1m INTERVALS
- FUTURE BUILDING
- EXISTING BUILDING
- BOUNDARY LINE
- PROPOSED STORMWATER LINE
- PROPOSED STORMWATER MANHOLE
- PROPOSED WASTEWATER LINE
- PROPOSED WASTEWATER MANHOLE
- PROPOSED CATCHPIT / DOUBLE CATCHPIT
- PROPOSED WATERMAIN
- PROPOSED HYDRANT
- PROPOSED LV POWER LINE
- PROPOSED HV POWER LINE
- PROPOSED TELECOM LINE
- EXISTING PRIVATE STORMWATER LINE TO BE VESTED
- EXISTING PRIVATE STORMWATER LINE
- EXISTING STORMWATER LINE
- EXISTING WASTEWATER
- EXISTING PRIVATE WASTEWATER
- EXISTING STORMWATER / WASTEWATER MANHOLE
- EXISTING CATCHPIT
- EXISTING PRIVATE WATERMAIN AND HYDRANT TO BE VESTED
- EXISTING WATERMAIN
- EXISTING POWER LINE
- EXISTING TELECOM LINE

NOTE:
1. REFER TO DRAWING NO. DLH013-02-450 and 451 FOR MANHOLE AND CESSPIT SIZES.
2. 630A THREE-PHASE SUPPLY FROM HANGER LV FRAME TO BOUNDARY OF FUTURE BUILDING 2.

				SURVEYED	-	-
C	FOR ENGINEERING PLAN APPROVAL	WLA	04.10.2019	DESIGNED	MYR	OCT 2019
B	FOR REVIEW	WLA	24.09.2019	DRAWN	WLA	OCT 2019
A	FOR REVIEW	MYR	17.09.2019	CHECKED	DER	OCT 2019
REVISION DETAILS		BY	DATE	APPROVED	DER	OCT 2019

HLC

Piritahi
LAYING THE GROUNDWORK

CATALINA BAY

PROPOSED DRAINAGE AND SERVICES PLAN SHEET 2 OF 4

STATUS	FOR APPROVAL	REV
SCALE	1:200 - A1 1:400 - A3	C
PRECINCT	HOBSONVILLE	
DWG NO	DLH013-02-402	

Synergy Version: L:\CATALINA BAY\CAD\03 SHEETS\DLH013-02-400.DWG

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