

Description of the Existing Environment

The area colloquially known as 'Cape View Corner' is located at the intersection of Clifton Road, East Road and Beach Road (Haumoana) and near the Haumoana shops (located within the Haumoana-Te Awanga Suburban Commercial Zone) (Figure 1).



Figure 1: General Location of Proposed Revetment at 'Cape View Corner', Haumoana

The property at 3 Clifton Road is privately owned, while the properties at 1 and 5 Clifton Road are owned by the Minister of Conservation and are public conservation land. The Open Space Zone to the north of 1 Clifton Road comprises the Haumoana (Clive Grange) Domain, which is owned by the Minister of Conservation, but Hastings District Council has responsibility for Managing and administering it as a public domain under the Reserves Act 1977. It includes a strip of unformed road reserve (possibly East Road) adjoining the northern boundary of 1 Clifton Road.

The Clifton Road reserve adjoining 1, 3 and 5 Clifton Road contains a number of existing services, including a coastal cycle walkway (comprising compacted limestone sand, located 5-10 m landward of the beach crest) and utilities (water and power) on the seaward side of the road (Figure 2).

Privately owned houses and coastal protection structures are located at 3 and 7 Clifton Road. Number 3 Clifton Road comprises a single level derelict timber building with tipped concrete debris providing some protection to erosion in front of the building. Number 7 Clifton Road comprises a single level timber building surrounded by a concrete perimeter wall. The property has a current consent for the construction of a vertical sheet pile seawall capped with concrete to replace the existing failing protection work. The properties at 1 and 5 Clifton Road are owned by the Minister of Conservation and are vacant.

The crest of the gravel beach at the location of the proposed revetment is between 14 m RL and 15 m RL, extending from the edge of the beach crest to Clifton Road, with a width of approximately 15-20 m at Cape View Corner. The upper beach slope ranges from 3(H):1(V) – 5(H):1(V) with a lower slope of approximately 10(H):1(V). At the toe of the gravel beach the sediments transition to fine gravels and sands. The foreshore is relatively flat with the 5 m and 10 m bathymetric contours approximately 650 m and 3,000 m offshore.



Attachment 3b:A

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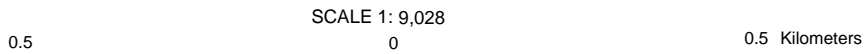


Legend



-  DOC Offices
-  Ecological Districts

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SCALE 1: 9,028

Projection: NZGD_2000_New_Zealand_Transverse_Mercator

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HBLASS Rural Imagery Acquisition: 5-6 January 2015, 11 January 2015, 18-19 February 2015, 28 February 2015, 1-2 March 2015



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Description of the Proposed Activities

Limestone Rock Revetment

It is proposed to construct a new limestone rock revetment, 100 m long and with a footprint (including buried extent) of 1800 m², at a location colloquially known as 'Cape View Corner' in Haumoana, extending from the north-western side of the seawall at 7 Clifton Road to 20 metres north of the East Road/Clifton Road intersection (refer to Figures 3 and 4).

The current Mean High Water Springs (MHWS) line sits outside the footprint of the proposed revetment along the entire length of the site. However, the structure will likely sit within the CMA within its design life of 20 years due to the projected erosion rates, and construction will also result in disturbance of the beach within the CMA.

Should a decision be taken by the Applicant to extend the life of the revetment beyond 20 years, then an additional layer of rock armour will need to be installed in the future and/or regular gravel nourishment undertaken in front of the structure, subject to observed sea level rise and increased requirements for design conditions. Resource consent conditions to this effect are proposed in **Appendix B** of this report. With proper maintenance, a design life of 50 years or more is anticipated. A consent duration of 35 years is sought.

The revetment will be generally parallel to the 9.0 m RL contour at its toe, will have a crest width of 3 m at an elevation of 15 m RL with a 2(H):1(V) slope extending down to the toe (see Figure 4 below). The northern end of the revetment will be rounded with a 'return', so that it 'ties back' into the open space reserve area to minimise end effects. At the southern end of the revetment the works will tie into the existing concrete wall and property boundary of 7 Clifton Road.

The position of the revetment will be as far landward as practical. Based on current beach levels this will result in most of the sloping face of the structure being covered by the existing beach. This will also act to limit any adverse effects on coastal processes and the visual impact of the structure. However, with continued beach erosion along the coastline it is anticipated that this will become progressively more exposed.

The rock armour required to provide for a stable 2(H): 1(V) slope structures will be locally sourced limestone boulders (likely from the Okaihau Road Quarry, Waimarama) sized to have a median diameter range of 750-1400 mm (D_{50} 1000 mm) for the rock armour and median weight range of 600 kg – 4,000 kg (W_{50} 1500 kg). This will be placed in two layers approximately 1.6 m thick with a 0.6 m thick underlayer of smaller rock (300-550 mm diameter, D_{50} 400 mm) overlying a geotextile filter fabric.

Rock sizes are preliminary and may be adjusted as part of the final design.

While the limestone rock source proposed for the revetment is of low strength and susceptible to weathering, the relatively short, exposed design life of the structure will mitigate (to a degree) risks regarding its design longevity. Detailed design will require geotechnical investigations that allow for confirmation of founding conditions, excavation methodology, and necessary works/design revisions to avoid damage to the existing structures located at 7 Clifton Road.

The limestone rock armour will require ongoing monitoring and maintenance. Details relating to the construction and maintenance of the revetment are provided in Sections 3.1.1 and 3.1.2 below.

A short (less than 10 m long) timber pole wall may be required at the southern end of the works if the replacement wall along the neighbouring property boundary at 7 Clifton Road is not constructed. This would mitigate the potential increased overtopping expected due to wave focusing between the proposed engineered revetment and the existing concrete seawall. To minimise flows, this design proposes additional rock armour be placed informally in this gap as a temporary measure to further dissipate wave energy and

moderate uprush. Following construction of the consented wall on the boundary of 7 Clifton Road, the proposed revetment will be extended to fill the gap negating the requirement for a timber wall.

The depth and methodology of excavation at the southern end of the proposed revetment will need to be modified to ensure that the structural integrity of the adjacent wall at 7 Clifton Road is not adversely affected. To mitigate this risk, it is proposed to batter the founding depth of the revetment down and away from the base of the existing neighbouring foundations. This will also make it easier for construction of the consented replacement wall at 7 Clifton Road. With no rock placed at depth right next to the wall, construction will likely require only the movement of crest rock on the surface of the beach to provide access to the existing wall and property boundary. This will require a geotechnical stability analysis and recommendations (e.g. maximum dimensions, levels, grades, tidal water levels, temporary support or underpinning methodology) to ensure these works do not result in disturbance to the existing structure.

Earthworks will be required to excavate large volumes of beach/gravels to construct the revetment, which will subsequently be used to cover the toe of the revetment and reinstate the beach. There will, however, be minimal disturbance to the foreshore bank.

Although it is anticipated that there will be no rock platform or consolidated substrate within the excavation area, further ground investigation will be carried out as part of the detailed design to ascertain if a mudstone platform is present and at what depth. This may influence the foundation level and detail of the structure. For the proposed revetment design (Figure 4) it is assumed that the foundation of the structure will have to be excavated to a depth that caters for the erosion and scour of finer sediments, if no mudstone platform is present at that depth.

The alignment of the revetment toe has been designed to be parallel to the natural contour (11 m RL contour) of the beach profile in order to minimise wave reflection and sediment transport effects. Physical works will be required both landward and seaward of the existing Mean High Water Springs position.

The proposed position of the revetment is as far landward as is practical, based on current beach levels this will result in most of the sloping face of the structure being covered by the existing beach. This will act to limit any adverse effects on coastal processes and the visual impact of the structure. However, with continued beach erosion along the coastline, it is anticipated that this will become progressively more exposed.

Revetment Construction

The construction of the new revetment is predicted to take approximately 6 weeks. Access to the site will be via Clifton Road.

Generally, the works sequencing and construction methodology for the project is likely to be as follows:

- Create temporary haul road access, demarcate site perimeter and mark out laydown areas;
- Remove existing buildings and beach debris and inorganics from the revetment site (e.g. concrete and building material and inorganics);
- Excavate beach and stockpile sediments;
- Install rock revetment, including geotextile lining and underlayer;
- Reinstate beach in front of revetment; and
- Remove haul road access and reinstate site.

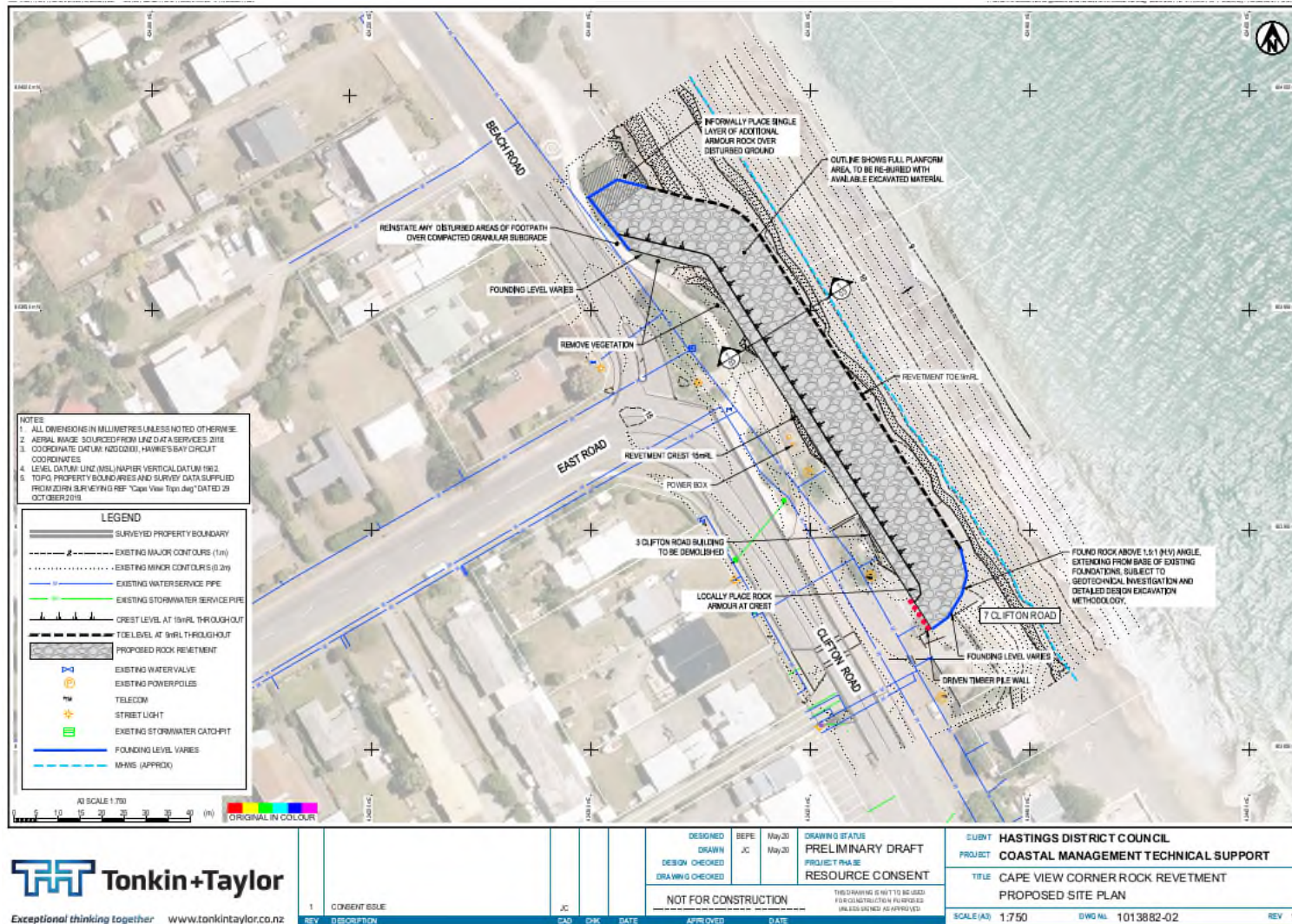
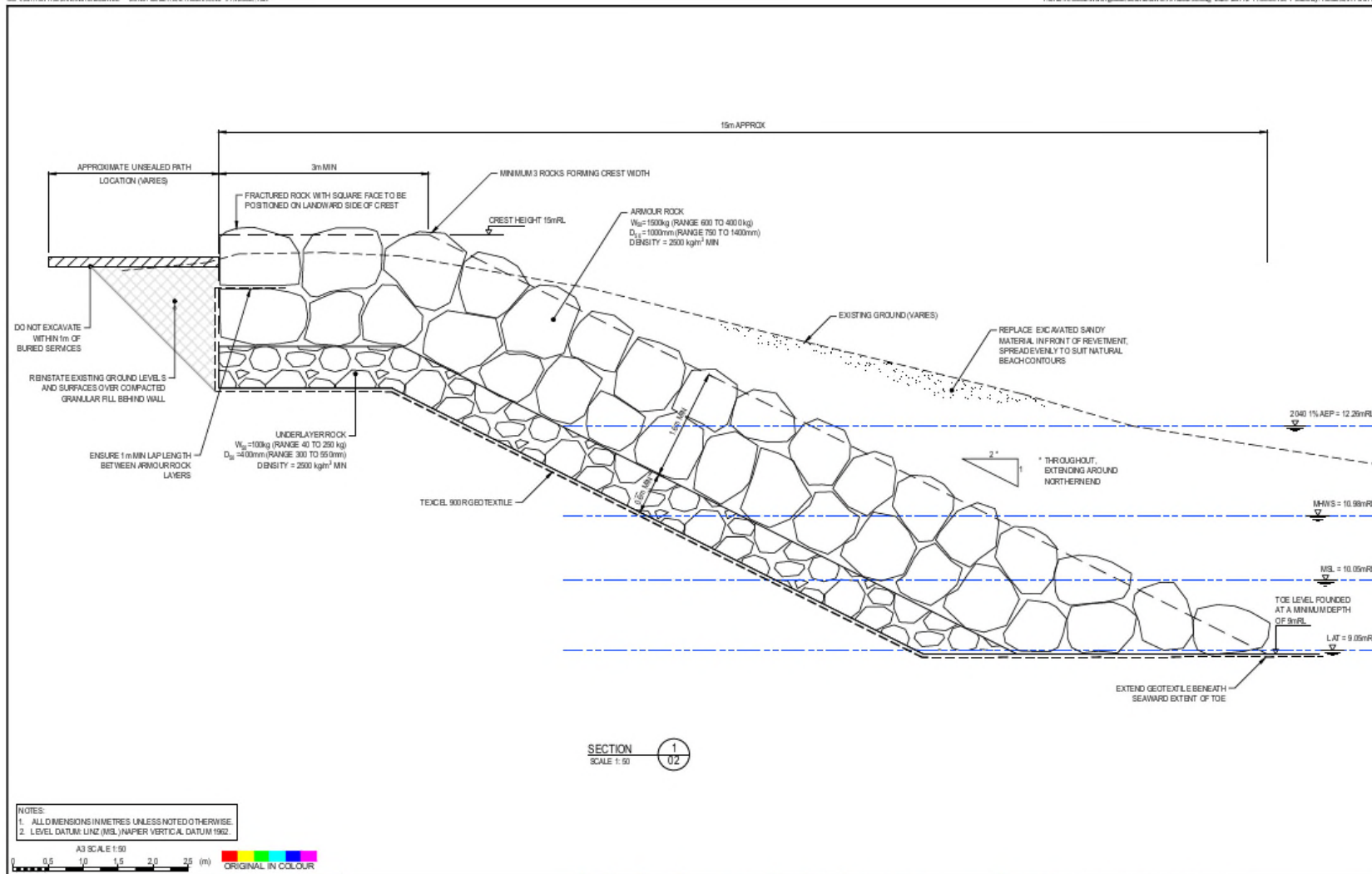


Figure 3: Proposed revetment footprint



 Tonkin+Taylor <small>Exceptional thinking together www.tonkintaylor.co.nz</small>	1 CONSENT ISSUE	JC	CAD	CHK	DATE	BEPE JC May 20	DRAWING STATUS PRELIMINARY DRAFT PROJECT PHASE RESOURCE CONSENT	CLIENT HASTINGS DISTRICT COUNCIL PROJECT COASTAL MANAGEMENT TECHNICAL SUPPORT
	REV DESCRIPTION	CAD	CHK	DATE	APPROVED	DATE	THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS SIGNED AND APPROVED	TITLE CAPE VIEW CORNER ROCK REVETMENT TYPICAL CROSS SECTION

Figure 4: Proposed revetment Cross Section

There is currently an unused bore located on the property at 1 Clifton Road. This bore will be decommissioned prior to construction of the revetment commencing.

Construction of the rock revetment can be carried out from the foreshore using standard construction machinery which can access the site via temporary haul road access (to be established and de-established during works) from the seaward side of Beach Road and/or Clifton Road.

Rock will be inspected for various factors including cleanliness, quality, size conformity, etc. at the local quarries from where it will be sourced, rather than at the construction site. The rock will then be transported by trucks to the construction site.

A laydown area will be required for the temporary stockpiling of rock with most suitable locations being in the vicinity of the haul road access points shown on the drawing in Figure 2.

Effects on existing vegetation, primarily comprising small Pohutukawa trees and mixed coastal vegetation will be mitigated by locating the vehicle access routes away from more mature and established plants, and plants located close to the existing beach crest. Reinstating and replacement of vegetation will be considered on completion of the works by Hastings District Council. It is proposed that a condition(s) to this effect be imposed as a condition of resource consent (if granted).

Approximately 300 truck movements (assuming 8 m³ per truck) are anticipated to deliver rock to the site. This is expected to be undertaken throughout the construction period. It is expected that these truck movements will result in damage to the existing cycle walkway which will require replacement in trafficked areas (approximately 100 m in length) upon completion of the works.

Trucks approaching the site are likely to do so from East Road to reduce the complexity of turning manoeuvres and minimise effects on through traffic. Likewise, it is anticipated that departing trucks will head south along Clifton Road. Due to high typical traffic flows along Clifton Road, Beach Road access is likely to affect fewer vehicles. Beach Road access would likely necessitate a turning circle for truck and trailer units to avoid vehicles travelling through residential areas of the Haumoana Township. It is proposed that a condition be imposed (if granted) to require a Traffic Management Plan to be prepared as part of a Construction Management Plan to be submitted to Hastings District Council at the detailed design stage of the project, to confirm more specific details.

Roadside services will require temporary protection throughout the proposed works from vehicle passing and excavation, which is to be addressed in the proposed Construction Management Plan.

Lastly, the works will be undertaken outside the main summer holiday period and Easter to avoid high use periods. Works will be undertaken Monday to Friday (inclusive), between the hours of 7:00am and 7:00pm, tide permitting, and will not be undertaken on Saturdays, Sundays or public holidays, or between 24 December and 15 January (inclusive). All construction will be undertaken to comply with the Construction Noise Standard NZS6803:1999 to avoid adversely affecting residents of neighbouring dwellings.

Public access to the affected part of the beach will be restricted for the full duration of the construction activity.

Public access will be formed over the structure to the beach where the structure is located, in line with the end of East Road, where it will be most accessible to beach users. This will be achieved by placing fully interlocking rocks over this section of the structure, such that all voids will be filled, which will then be covered by lime sand material (being the same crushed rock used for the nearby cycleway/walkway) to form a walking surface over the structure. Alternatively, access will also be available from the Open Space reserve, immediately beyond the northern end of the revetment.

The remainder of the revetment structure will require care if being walked over to gain informal access to the beach.

All plant working on the foreshore will have an oil spill kit and operators will be trained in their use. Sediment and erosion control measures (which may include silt fences) will be put in place to ensure that all works, including disturbance of fine soils along the upper beach and crest, achieve the relevant principles and practices for 'Erosion and Sediment Control' and 'Works in Waterways' set out in the HBRC's "*Hawke's Bay Waterway Guidelines*" (dated April 2009).

All plant refuelling will take place on land away from the foreshore and outside the coastal marine area.

All construction plant will be removed from the beach during high tides and during periods of high wave energy as necessary.

The management of windblown dust may be necessary, with measures such as the wetting down of finer sediments and /or preferential early burial of materials over completed areas of the structures.

All construction equipment, machinery and any debris or excess construction materials will be removed from the construction sites at the completion of the works.

Revetment Maintenance

Although the revetment is expected to last 20 years before any significant maintenance would be necessary, the actual design life of the structure is dependent on the level of maintenance and the frequency of significant storms. With proper maintenance, including installing an additional layer of rock armour in the future and/or regular gravel nourishment in front of the structure, a design life of 50 years or more is anticipated.

Regular annual inspections of the revetment, as well as inspections after significant storms occurring during high tide, are recommended by Tonkin & Taylor. These inspections may find that periodic replacement of dislodged rocks may be necessary.

Beach Nourishment

Mitigation in the form of beach nourishment may be required to offset any negative effects to the natural sediment transport budget and shoreline position, for the potential local down-drift erosional effects at the northern end of the proposed revetment.

Following construction there will not be a requirement to renourish due to the location of the revetment being positioned as far landward as practical and a healthy beach placed in front of the structure. Over time, as the revetment gets exposed, mitigation is proposed to account for the reduction in supply to the north from protected land that otherwise would have been eroded, and end effects at the northern end of the structure.

With consideration of the worst-case scenario, when the revetment is fully exposed, the design report calculates just under 300m³/year required to mitigate reduced supply to the north. This is not mutually exclusive to dealing with the end effects, and the material could be used for that purpose. Given the variability, in both the number and magnitude of storms each year, a maximum annual quantity of 1,000m³ will be required for the beach nourishment to allow some flexibility in future years.

The material to be deposited for beach nourishment will consist of clean gravel (that is similar sized material to the existing beach gravel) and it will not include any of the following (as required under the standards for deposition within CHZ1 in Rule 104 of the Regional Coastal Environment Plan):

- Septic tank sludge
- Hazardous wastes
- Organic materials, or
- Any other domestic or industrial waste, except cleanfill such as concrete, sand or gravel.

Landowner concessions

As part of obtaining approvals from the owners of properties which the works will cross over or abut, the following is proposed as part of this application.

7 Clifton Road

It is proposed that rock will be placed in front of the seaward face of the wall at the front of the property at 7 Clifton Road to mitigate any perceived effects of the revetment on the existing dilapidated wall. It is proposed to place a small quantity of rock along the front of the wall that is no wider or higher than two rock diameters, and that is consistent with the grading specification for the proposed rock revetment.

The rock will be removed if the existing seawall is replaced in the future, unless it forms part of the replacement seawall design or, following the collapse of the seawall, the landowner decides not to replace the existing wall.

3 Clifton Road

It is understood that the owner of the property at 3 Clifton Road intends to apply separately to Hastings District Council for a building consent to construct a building on their land. If consent for the proposed rock revetment is granted, the rock revetment may make construction of the building difficult and incur the landowner additional costs. As part of the subject application, it is proposed to allow for the installation of up to 12 x 900 mm caisson shell steel liners within the proposed rock revetment footprint and section boundary (Figure 5). Should the landowner be granted building consent (and any other resource consents that may be required for a building), the casings would form the basis for screw pile foundations for the building. These will be installed prior to construction of the revetment, be capped, and protrude no more than 450 mm from the design surface of the armour rock layer. The rock revetment will be constructed around the casings and require holes to be cut in the geotextile and reduce the interlocking properties of the rock.

To mitigate this, an extra layer of geotextile with a 900 mm diameter hole will be placed over each casing, large enough to allow the placement of rocks on each side to prevent movement. This will reduce the potential loss of fines through the holes in the geotextile. It is proposed that rocks at the larger end of the specified grading range will be placed seaward of each casing to improve the stability and minimise any effects resulting from reduced interlocking. Tonkin & Taylor consider that these measures will not result in any negative effects, in terms of the performance or integrity of the proposed revetment, being less than minor¹.

If building consent, and any other necessary resource consents, are not granted to the landowner, or 5 years lapses from the date on which consent is granted for the proposed revetment and the building has not been constructed, it is proposed that the casings will be removed or cut at a level consistent

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with the rock underlayer and the resultant voids filled with armour rock of the same type and specification as the revetment. A condition of consent to this effect is suggested in **Appendix B**.

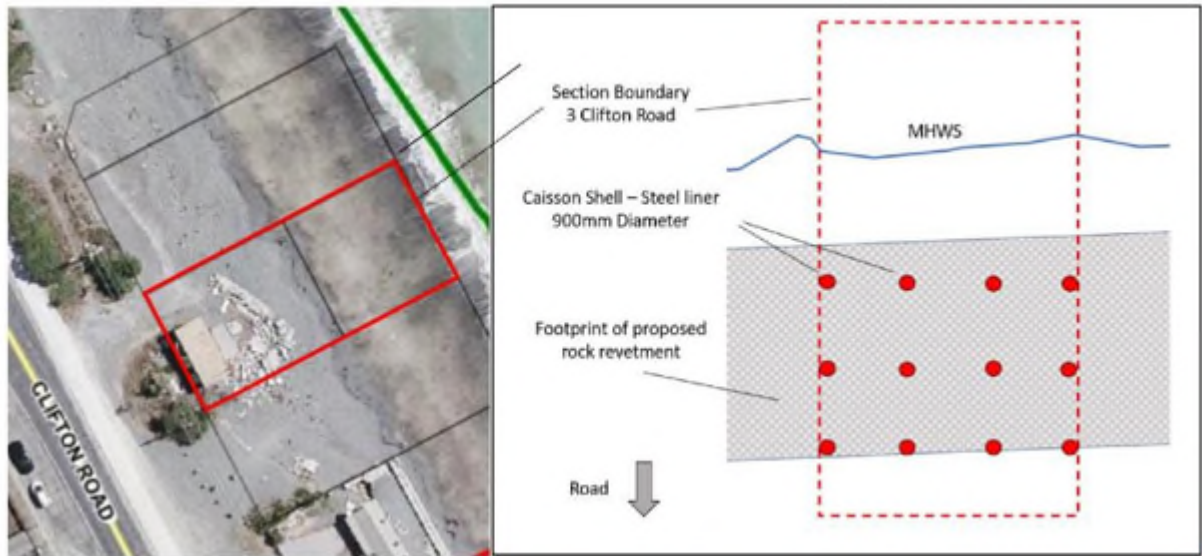


Figure 5: Indicative location of proposed 900 mm diameter caisson shell steel liners

1 & 5 Clifton Road

As the properties at 1 and 5 Clifton Road are owned by the Minister of Conservation, Hastings District Council will require a Concession (a form of easement) from the Department of Conservation.