DEPARTMENT OF ENVIRONMENT
CAYMAN ISLANDS GOVERNMENT

Coastal Works Review

Theo Bullmore

Rum Point – Construction of a Seawall

Block: 33B **Parcel:** 106

Ref: DOE/CWK/425

PREPARED FOR: MINISTRY OF SUSTAINABILITY AND CLIMATE RESILIENCY

April 27, 2022

Authored by Technical Review Committee - Department of Environment, on behalf of the Director, Department of Environment

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Rum Point – Construction of a Seawall
Block: 33B Parcel: 106

Project Proposal

The applicant-George Theo Bullmore- is seeking permission for the construction of a seawall in order to prevent further erosion of his property.

FIGURE 1: GEO REFERENCED IMAGE SHOWING THE PROPOSED SEAWALL WALL ON LIS 2018 IMAGERY SHOWING PROPOSED SEAWALL (IMAGERY SOURCE: LIS, 2018).

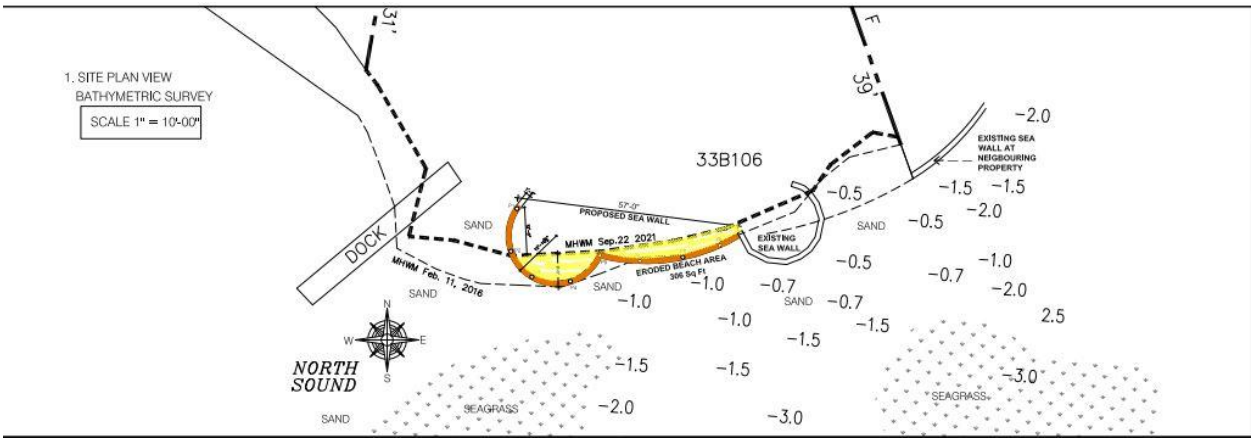

FIGURE 2: PLAN EXTRACT SHOWING PROPOSED WORKS (SOURCE: ARCO, 10 OCTOBER, 2021)

The works will affect approximately 306 square feet of Crown property. The seawall will directly impact an area of 115 square feet of Crown Property while the nourishment will impact an area of approximately 191 square feet. A backhoe will be used to excavate the trench required for the footing of the seawall removing 22 cubic yards of sand. The seawall will be supported by 10-inch concrete reinforced PVC piles that will be embedded into the bedrock. The cement for the wall will be mixed on-site using a concrete mixer. The excavated sand will be used to backfill behind the seawall.

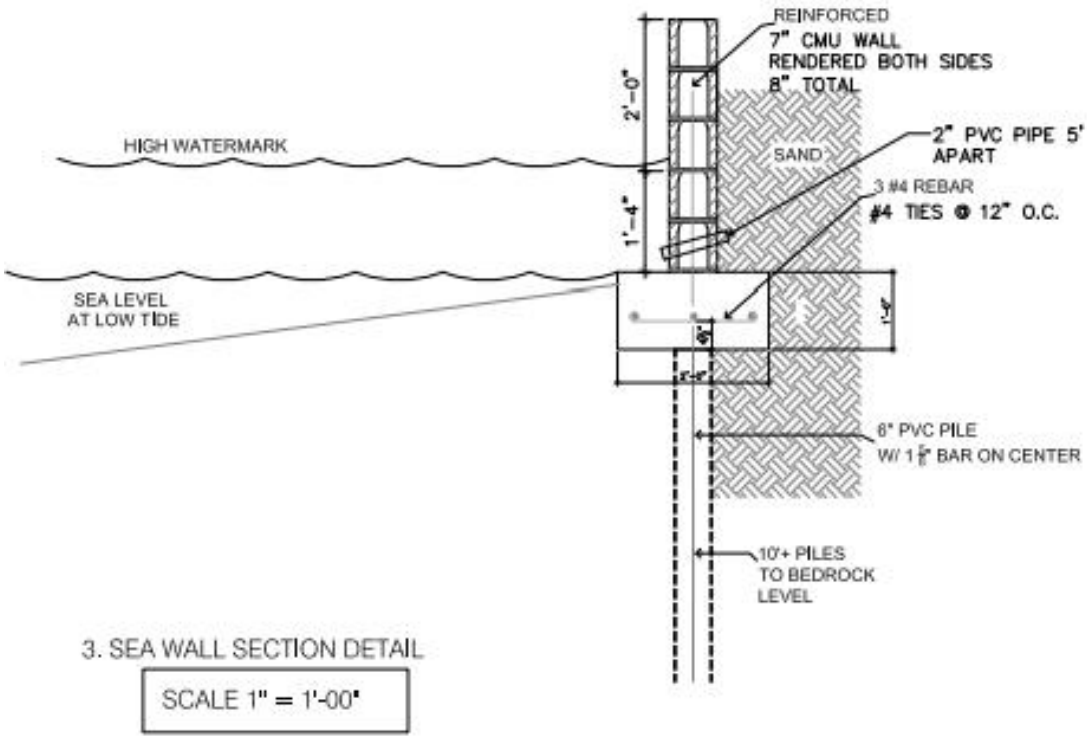

FIGURE 3: EXTRACT FROM APPLICANT'S SUBMISSIONS SHOWING THE CROSS SECTION OF THE PROPOSED SEAWALL. (SOURCE: ARCO, 10 OCTOBER, 2021)

Background of Area

The beaches, shoreline and landmasses within the Rum Point and Cayman Kai area are not natural formations; most are the result of dredging and land reclamation projects conducted in the 1970s. As a result, natural processes such as wind, waves and water currents that would normally contribute to a sediment budget, shaping and ultimately stabilising a natural coastline, in particular a beach environment, are not working in equilibrium in this area. Sand is being removed by normal wave action processes, and rainwater runoff but with little to no corresponding deposition mechanisms (usually larger waves or storm events) or supply of upstream or offshore sand sources, there are no periods of accretion when the beach is replenished. Thus, the beach is eroding and the entire system is trying to return to an equilibrium similar to its pre-dredged state.

Environmental Impacts

The applicant's property is showing signs of erosion hence the request to build a seawall to mitigate against further loss of upland beach sand which can be seen in in Figures 1 and 2 above. While noting that the proposed works are located in a marine protected area (the North Sound Marine Reserve), there appears to be no major impacts to marine sensitive habitats such as seagrass. The potential environmental impacts are discussed below.

Figure 4: *DoE site visit photos from 30 March 2022 showing the area proposed for the seawall.*

Marine Reserve Zone

Whilst the works will be taking place in the North Sound Marine Reserve, according to the plans submitted and the site visits conducted, it appears that there are no seagrass beds directly in the footprint of the seawall and the works will not directly impact seagrass beds located in the bay if the appropriate mitigation steps are taken. Seagrass beds are important for marine fauna such as lobster and conch and likely contribute significantly to the bioluminescence that makes the bay a popular marine tourism attraction known locally as Bio Bay. The construction of the seawall through the excavation of the trench for the footing of seawall also has the potential to impact these important habitats indirectly (through siltation) if the appropriate mitigation measures are not implemented.

Seawall Impacts

There is a high risk that the beach seaward of the wall will not return due to the proximity of the seawall to the high-water mark. The presence of a seawall interacting with wave activity on a beach is known to cause the potential for long-term beach erosion. This raises concerns that the proposed seawall while protecting the property, may result in increased beach erosion/scouring on the remaining beach west of the proposed wall. The DoE had previously noted that erosion would have been exacerbated once a wall was constructed from the previous coastal works application as shown in Figure 4. As anticipated, the alteration in erosion patterns has resulted in this application for the currently

proposed wall. Given that the coastline in this location has been artificially created and that the parcels and properties to the North have already armoured their beaches to protect against the forces of erosion such as wind and rain runoff, the construction of a seawall may be the only long-term solution, particularly as there is no nourishment plan or policy for the Rum Point area.

Construction Impacts

The construction impacts would primarily be turbidity resulting from the excavation works required to embed the footing of the concrete wall and the pouring of cement. To mitigate against these potential impacts, the area of works must be enclosed with securely anchored silts screens and if possible, enclose and shutter the seawall with timber framing and sandbags to prevent cement from leaching into the marine environment. In addition, the mixing of cement should occur away from the water's edge.

Comments & Recommendations

Generally, the Department would recommend against the use of seawalls and armouring to stabilise a beach. However, this particular beach system does not represent a natural coastline and as a result requires continuous nourishment with sand extracted from other sources which often creates offsite impacts. A seawall, in this particular location, represents the most likely long-term solution. Therefore, in the absence of a Government-led coastal nourishment policy for the Rum Point area, the Department **recommends this application for approval** subject to the standard Permit conditions and recommended licence fees (Royalty, Environmental Mitigation and Administration & Monitoring) outlined in Appendix 1.

Technical Review Committee – Department of Environment

On behalf of the Director, Department of Environment