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PICK EVERARD

Stornoway Airport Coastal Protection

Screening Opinion Request

13 July 2021

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Land: Environment: Utilities
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Project Name					
Stornoway Airport Coastal Protection					
Document Title	**Document Number**	**Revision**			
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Instructed by	**Company**	**Format**			
Trevor Graham	Pick Everard	E-mail			
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Principal Author	Signature	Position	Completed On
Christopher Dosser	[redacted]	Environmental Manager	13th July 2021
Approved By	**Signature**	**Position**	**Reviewed On**
Chris Stones	[redacted]	Environmental Manager	14th July 2021

Table of Contents

1. Executive Summary

The Stornoway Airport Coastal Protection project proposes to construct a series of coastal defences to combat the current, and future effect erosion has upon land occupied by the Stornoway Airport.

In discussion with Marine Scotland's Planning and Policy Team, works are considered a Schedule 2 project by The Marine Works (Environmental Impact Assessment)(Scotland) Regulations 2017 and are therefore is subject to a screening process to determine whether an environmental impact assessment (EIA) is necessary before the project can proceed.

Under Regulation 10 of the abovementioned regulations, a request for screening must include detail established within paragraph 10(2), and where appropriate be supplemented by paragraph (10)3, to meet the selection criteria set within Schedule 3.

This screening opinion request contains the aforementioned detail and is produced on behalf of Pick Everard for their client Highland & Islands Airports Ltd (HIAL), with the express purpose of seeking a screening opinion from the Scottish Ministers.

2. Marine Licence Requirements

The Stornoway Airport Coastal Protection project aims to address the impacts that existing and future erosion forces could have upon the operating capabilities of the airport.

The airport was built during the 1930s and was originally serviced by Scottish Airways civil aircraft before being used primarily for military purposes across WWII. Civil aircraft returned to provide domestic flights in the 1970s whilst it continued to be used as a military staging post until as recently as 1998.

Coastal protection measures proposed include the construction of a Reno mattress and gabion basket at the existing beach and sand dune interface, along with repairs and reinforcements to the existing rock armour defences currently protecting the headland which hosts the main runway.

A marine licence, granted under Part 4 of The Marine (Scotland) Act 2010, is required from the Scottish Ministers if organisations intend on carrying out certain acts below the mean high-water spring (MHWS) tide mark. In the case of the Stornoway Airport project approximately 50% of the coastal protection measures sit below the MHWS (Appendix I).

The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017) are the regulations tasked with assessing whether works below the MHWS require an EIA, and do so by first defining developments as either Schedule 1 works or Schedule 2 works by virtue of factors such as their nature, size, or location.

Schedule 1 projects automatically qualify as requiring an EIA, whilst Schedule 2 works, those which exceed the threshold of factors described in table 1 of Schedule 2 (or are in a sensitive area), must be screened to determine if an EIA is necessary before a project can commence.

The Stornoway Airport Coastal Protection works are qualified as Schedule 2 works based upon the thresholds and criteria established in Paragraph 10(m) of the Schedule 2 table.

Table 1. The applicable thresholds and criteria contained within Schedule 2 of the EIA regulations which qualifies the Stornoway Airport Coastal Protection project as Schedule 2 Works

Paragraph	Description of Development	Applicable Thresholds and Criteria
10. Infrastructure projects	(e) Coastal work to combat erosion and maritime works capable of altering the coast through the construction, for example, of dykes, moles, jetties, and other sea defence works, excluding the maintenance and reconstruction of such works	All works

3. Characteristics of The Works

3.1. The size and design of the works

The proposed coastal protection works is a combined area of approximately 3.6ha and can be broadly summarised under two types of construction work:

1. The construction of coastal protection at the existing beach and sand dune interface

2. The reparation of existing rock armour defences at the north end of the runway

Table 2. A summary of the individual elements of the Stornoway Airport Coastal Protection

	Element of Works		Length
A.	Construction of coastal protection at the existing beach and sand dune interface:		
	(I)	Along the north-eastern boundary of the airport in the form of Reno mattress and gabion baskets, laid on a slope on the dune face	1180m
	(II)	On the estuary side, some further Reno mattress will be installed to halt erosion at this location	100m
B	The existing rock armour defence at the runway end will be repaired and reinforced with further rock armour placed at its toe.		400m

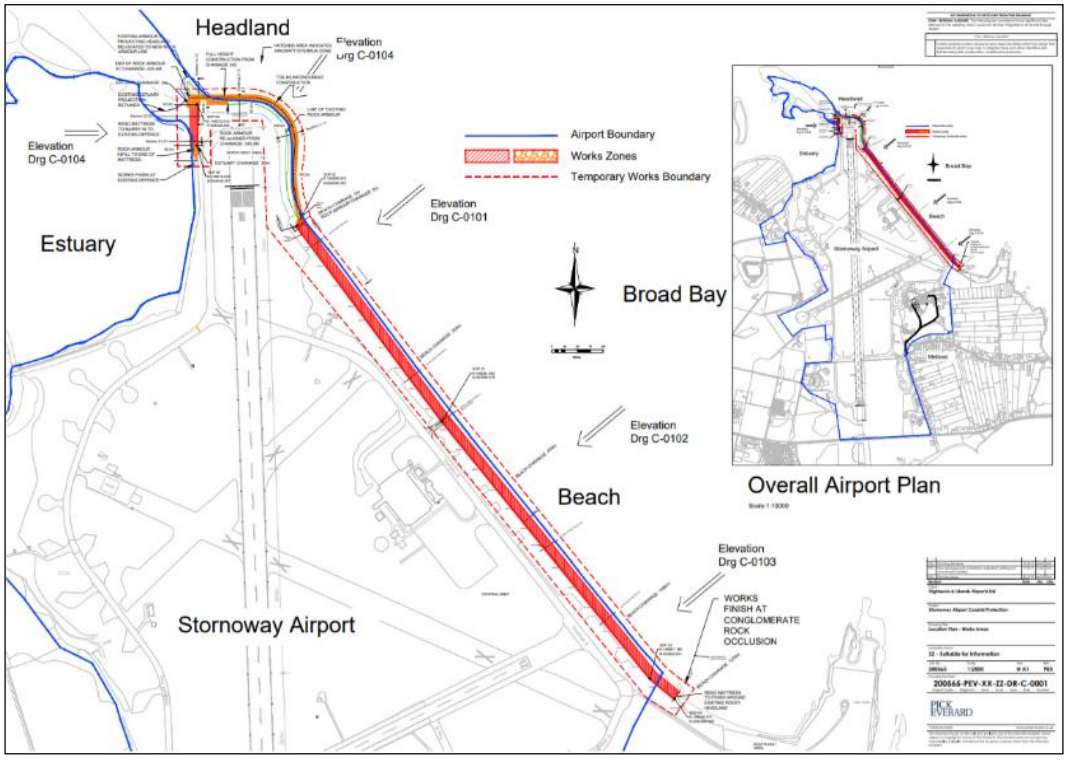


Fig 1. Works areas for both Reno Mattresses (red) and rock armour (orange) are displayed upon the location plan (Also Appendix A)

To provide a visual representation of the works proposed to take place as part of the Stornoway Airport Coastal Protection works, images were captured during the Benbecula Airport Coastal Protection project. These works represent a similar scope and design to the Stornoway project, and were commissioned as part of another Highlands and Islands Airport Ltd project.

Please note that the dune height to the rear of the new defence at Stornoway Airport are not as high as in the images of the Benbecula Airport Coastal Protection.

Fig 2. A cross sectional view of the Reno Mattress and gabion basket configuration

Fig 3. A typical representation of the sloping Reno mattress and top edge basket on a graded sand dune

Fig 4. A view from atop a completed mattress installation prior to the dune face being reinstated

Fig 5. A mattress and basket installation that has been fully reinstated

Work plans and cross sections of the mattress are shown in the appendix

- Appendix B: Works Plan North-West
- Appendix C: Works Plan South-East
- Appendix D: Typical Mattress Cross Section
- Appendix E: Typical Rock Armour Cross Section

3.2. Cumulation with other existing works and/or approved works

The coastal protection works were included in an application for planning that was subsequently consented by the Comhairle nan Eilean Siar on 16th June 2021 (Reference Number 21/00098/PPD).

The works are not associated with, or adjoined to any other developments, either existing or planned.

3.3. The use of natural resources, in particular land, soil, water and biodiversity

To protect the coast from effects of erosion at the Stornoway airport involves utilising rock imported from local quarries.

To preserve the dune grassland requires Reno Mattresses and gabion baskets, cages engineered from double twisted hexagonal woven steel wire mesh that are assembled on site and filled with 100mm-200mm rock to form a flexible and permeable monolithic structure (Appendix D).

Larger rock armour is required to shore up the headland between Broad Bay and the Estuary that hosts the main runway.

Sand displaced from the dune beach interface so as to form the required gradient (between 1:2 and 1:3.5 slope) for the mattresses to be laid will be temporarily stockpiled before being returned to reform the dune face to a natural profile.

3.4. The production of waste

The production of waste during construction will be minimal owing to the coastal protection being new infrastructure that does not require decommissioning of any existing structures.

No rock, sand or soil requires to be removed from site to meet the design brief.

Moreover, access can be achieved without the need to establish and later remove temporary haul roads made from stone.

Rock armour from past constructions works at the headland will be recovered and re-used as opposed to put to waste.

3.5. Pollution and nuisances

3.5.1. Pollution

Potential pollution risks will be assessed thoroughly by the principal contractor when appointed, however experience gained upon projects of a similar nature suggests that potential pollution sources can exist in the following forms.

Plant will be subject to regular, recorded maintenance checks, and where at all possible these machines will be serviced with biodegradable hydraulic oil.

- Fuel stores will be kept in a double skinned bowser upon an impermeable surface and at least 30m from the water environment or a drainage network. A dedicated re-fuelling zone will be established and include an appropriately sized fuel/oil spill kit.
- Clean, locally sourced rock will be used to prevent fine sediment accumulating and being washed away by the tide.

- A low slump mix of concrete is intended to infill gaps between the Reno Mattress and any exposed rock formations at the south of the structure. Concrete use is designed to be minimal with anticipated volumes proposed being around 8cu m. Concrete is proposed to be used entirely above mean high tide levels and 3 metres above extreme sea levels.

3.5.2. Nuisance

The nearest sensitive receptors to the construction zone are inhabited dwelling to the west, situated 200m from the southern perimeter and 700m from the northern perimeter of the temporary works boundary.

Noise generated by the construction activities on site are unlikely to be a significant factor for the vast majority of works as sand dunes act as a natural sound barrier between plant and dwellings in the local vicinity.

Infrequent noise will be created by road going HGV lorries delivering rock to site however this is considered to be less impactful than noise generated by the arrival and departure of aircraft from the airport.

Moreover, noise generating construction activities take place above ground only and thus have no potential to impact upon sensitive receptors underwater.

3.6. The risk of major accidents and/or disasters

The nature of proposed works is such that major accidents or disasters are unlikely to be caused, however the following is possible:

- Excavators attending the construction site between the MHWS and MLWS may fail and cause fuel or oil to be deposited into the tidal zone - To prevent this from happening a rigorous programme of daily plant checks will be implemented, and where possible machines shall be serviced with biodegradable hydraulic oil.
- If installed incorrectly the structure could fail after a storm or period of severe weather - the completion of projects of a similar brief including materials, scale and working environment has allowed the accumulation of experience by the project team to enable sound installation.

3.7. The risks to human health

Construction activities that generate risks to human health exist for both contractors, local homeowners and members of the public, however these are anticipated to be minimal, temporary, and considered insignificant.

- In addition to general construction hazards, workers installing the Reno mattresses may be exposed to particulate disturbed by hauling sand, which may present a temporary reduction in air quality.
- Despite crossing onto land owned by the HIAL, areas of Broad Bay beach are anecdotally used as recreational walking routes. Any temporary restrictions applied to these routes during the construction phase may impact upon the wellbeing of the local community.

4. Location of The Works

The coastal protection works are proposed to take place along the seaward facing boundaries of Stornoway Airport, 3.7km east of the town of Stornoway, Melbost Point, Isle of Lewis, HS2 0BN.

The distance between the MHWS (2.09m) and MLWS (-2.01m) varied between 100m – 200m in width, with all coastal protection measures proposed to be at least partially installed within this corridor.

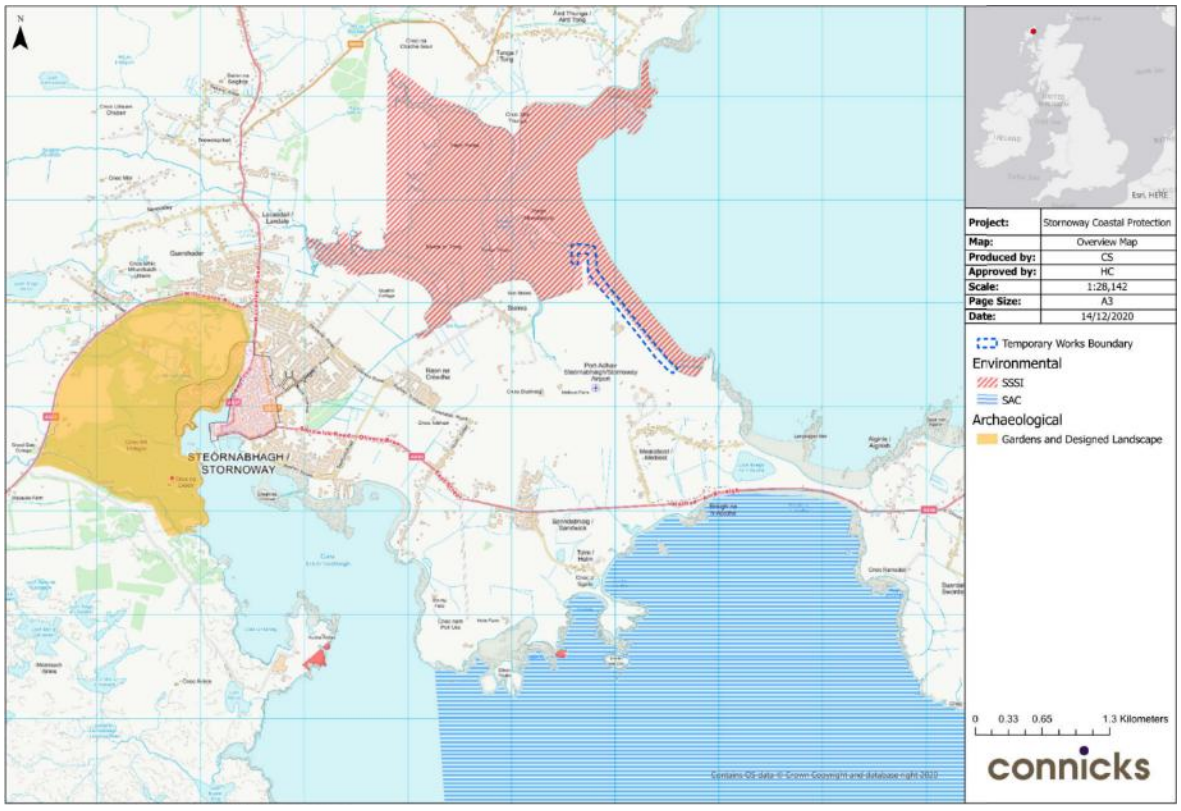


Fig 6. The location of the works boundary in relation to the town of Stornoway and sensitive habitats

Table 3. The co-ordinates that bound the area of the temporary work zone

Boundary Point	Grid Reference	Latitude	Longitude
Northernmost point	NB 4559 3458	58.226246	-6.3348287
Easternmost point	NB 4655 3339	58.216141	-6.3172347
Southernmost point	NB 4653 3337	58.215951	-6.3175523
Westernmost point	NB 4559 3458	58.226246	-6.3348287

Fig 7. An aerial view of the temporary works zone overlayed with the Mean High Water Springs (Also Appendix I)

4.1. The existing and approved land use

The vast majority of land proposed to host the coastal protection measures is owned and operated by Highlands and Islands Airports Ltd (HIAL) as an active airport (IATA code: SYY) serving the domestic flight market.

Construction of the coastal protection measures does extend slightly beyond the airport boundaries at both the northern and southern extremes and key into existing rock occlusions and to repair the toe of the existing rock armour surrounding the headland.

Lands bordering the airport are used for the purpose of conservation, agriculture and recreation purposes.

The airport boundary is shown in relation to the works boundary in Appendix A.

4.2. The relative abundance, availability, quality and regenerative capacity of natural resources

Sensitive natural resources exist within the work zone in the form of:

- Protected habitats
- Protected species
- Areas of cultural heritage

4.2.1 Protected habitats

A proportion of land identified as the work zone overlaps with the sensitive habitats of Tong Saltings Site of Special Scientific Interest (SSSI), an area designated for natural features including mudflats, saltmarsh, sand dunes and breeding bird assemblage.

The extent of Tong Saltings SSSI was recorded as 441ha by the most recent NatureScot citation (2011) and extends along the length of the 3.6ha works area.

Examples of all three sensitive habitats exist within the land that overlaps between the airport and SSSI area with the majority of the coastal protection proposed to be installed upon Marram (*Ammophila arenaria*) dominated coastal dune.

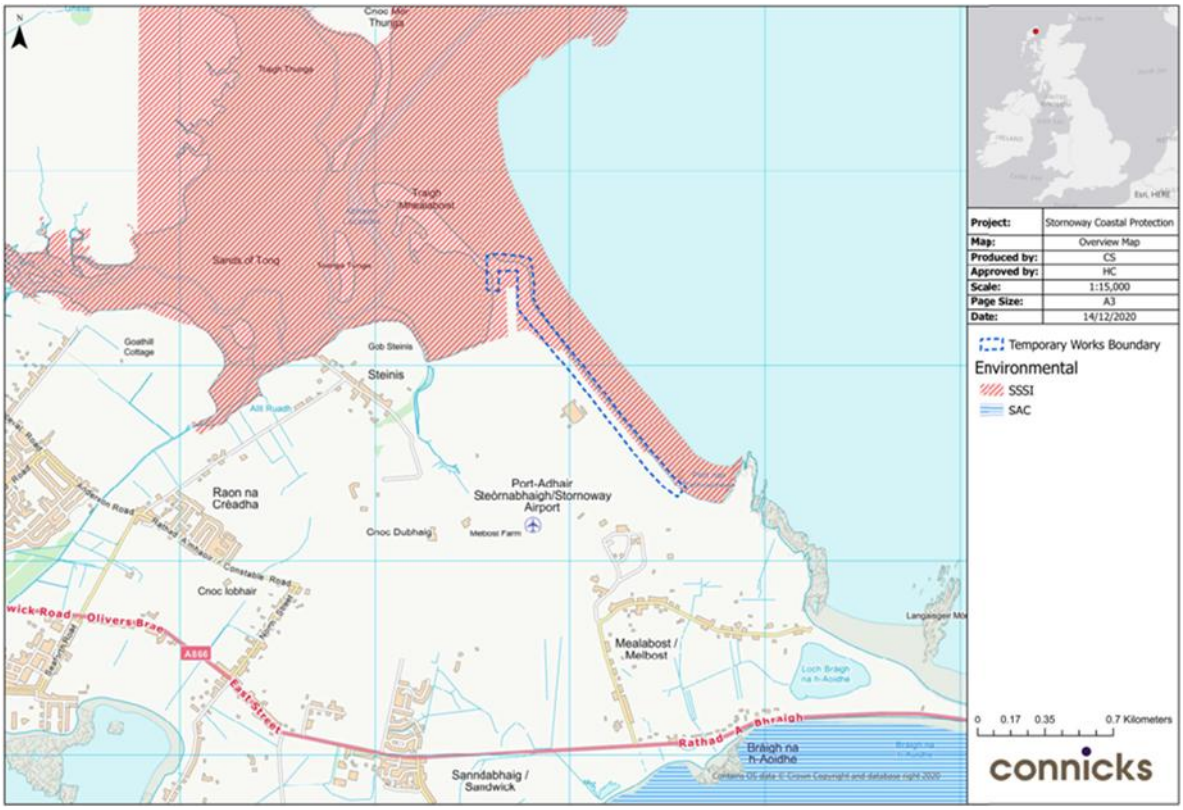


Fig 8. Temporary works boundary in relation to Tong Saltings SSSI

4.2.2 Protected species

Protected species were considered and addressed by ecology surveys conducted during the planning application (Connicks Environmental Constraints Survey 2020).

An extract from this report summarises the presence of breeding bird colonies historically recorded to be in close proximity to the construction zone.

"Tong Saltings SSSI is notable for its breeding bird assemblage and includes the largest Arctic tern (*Sterna paradisaea*) colony on the Outer Hebrides. Their traditional breeding site to the northeast of the runway has been eroding over the years and it appears (anecdotally at least) that numbers of arctic terns using the SSSI have fallen significantly. They were not present in visits made by NatureScot in the previous 2 breeding seasons.

Also, to the northeast of the runway, a smaller little tern colony (*Sternula albifrons*) has been present in previous breeding seasons and it should be assumed that they will be present in subsequent years.

In addition, Tong Saltings SSSI provides areas of grassland and vegetation suitable for nesting waders. Discussions with NatureScot confirmed that the vegetated areas to the west of the runway are regularly used by breeding waders in the spring/summer months."

Whilst the aforementioned Artic tern and little tern colonies are outside of the construction zone, and subject to disturbance only, the dune grassland running parallel to the Broad Bay beach does provide suitable habitat for ground nesting birds.

Numerous incidences of corncrake have been recorded in and around the work area however it is noted that HIAL do not have any records of corncrake being present within the airport boundary.

Protected species present that do not form part of the SSSI site management statement include Otter (*Lutra lutra*). Otter field signs recorded during ecology surveys included spraints and footprints, with potential rest spots existing throughout the headland and dune systems. No holts were observed despite an extensive search.

Ecological surveys, and consultation with NatureScot (formerly SNH) before and during the planning process highlighted that the proposal could only be progressed with appropriate mitigation measures that are captured within an approved Environmental Management Plan (EMP).

Table 4. Planning conditions as part of application 21/00098/PPD set with the purpose of protecting biodiversity

Planning Condition	Detail
Condition 1	Prior to the commencement of development, an Environmental Management Plan (EMP) should be prepared and submitted to the Comhailre as Planning Authority for agreement in writing, in consultation with NatureScot. The EMP must address and contain suitable mitigation measures in relation to – Potential impacts on the Steinish saltmarsh related to access of machinery and equipment and should aim to avoid accessing the site via the saltmarsh. Potential disturbance to tern colonies and other breeding birds, with works in the area related to these birds preferably taking place out with the breeding season (15 March to 31 July)

Planning conditions will be affected into an EMP that is first accepted by the Planning Authority before works commence.

Applying **Condition 1** in practice means works around the headland will be programmed to take place only outside of the breeding bird season (mid-March to the end of July).

Coastal protection measures outside of the headland will also be completed in a manner that imparts the least amount of disturbance to potential nesting habitat. The east facing sand

dune/beach interface will be addressed in phases with protection measures installed and habitat fully reinstated before commencing works in a new area.

Compliance with planning conditions is expected to generate only very slight and temporary impacts upon the SSSI.

4.2.3 Areas of cultural heritage

Four areas of archaeological interest are noted to exist within the construction zone, all recorded upon the Western Isles Sites and Monuments Record.

Three form markers to the Mean High-Water Springs, and subsequently fall within the footprint of the proposed coastal protection:

- Stornoway Dyke Monument – HER 5019 [Easting 145985/Northing 934083]
- Stornoway Dyke Monument – HER 5020 [Easting 146119/Northing 933910]
- Stornoway Rectilinear Enclosure – HER 5021 [Easting 146285/Northing 933716]

One feature exists within the works boundary but is unlikely to be impacted owing to its positioning off the dune:

- Stornoway Stone Alignment – HER 5023 [Easting 145985/Northing 934083]

No objection was raised by the Western Isles Archaeology Service run by the Comhairle nan Eilean Siar during the planning process. Rather, conditions were added to the planning consent that prompts the adoption of an archaeological watching brief during all elements of ground-breaking, as well as an approved mitigation strategy should significant archaeological remains be discovered.

Table 5. Planning conditions as part of application 21/00098/PPD set with the purpose of recording and protection of items of archaeological interest

Planning Condition	Detail
Condition 2	A method statement for enabling an archaeological watching brief on all ground-breaking shall be submitted to and approved by the Comhairle as planning authority
Condition 3	If significant archaeological remains are discovered, an agreed archaeological mitigation strategy should be implemented, following discussion with the Comhairle Archaeologist. It should be submitted to, and approved in writing, by the local planning authority

Archaeological mitigation measures that promote compliance with Conditions 2 and 3 will be written into the contract of the principal contractor, includes measures to monitor works and prompts a halt to works should any artefacts of interest be uncovered.

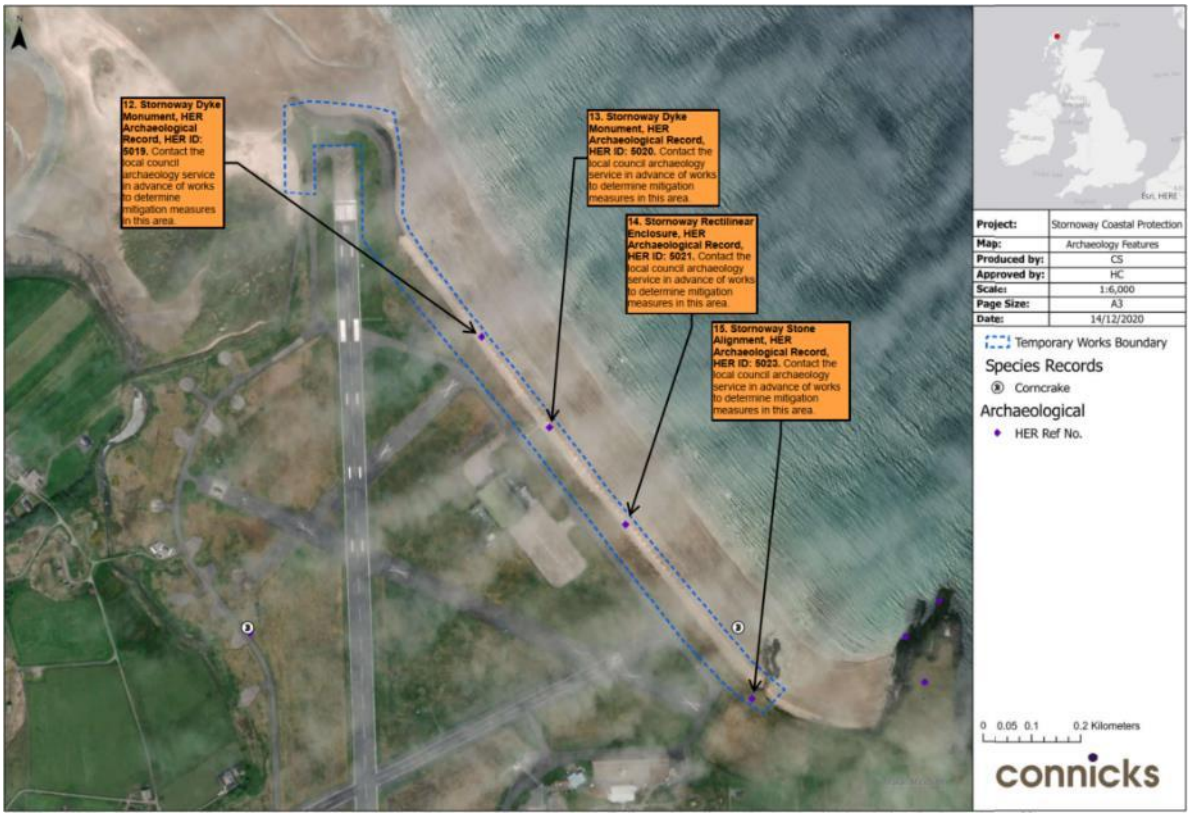


Fig 9. An overview of the location of the 4 known items of archaeological interest within the works boundary.

4.3. The absorption capacity of the natural environment

Considering the absorption capacity of the natural environment is best explored in reference to the method of the protection measures being proposed.

Reno mattresses and gabion baskets - The establishment of Reno mattresses and gabion baskets accounts for over 75% of the overall construction (1280m of a total 1680m) and involves the grading of sand dunes and dune grassland habitat to install.

The mattress and baskets are likely to have a locally disruptive effect upon coastal zones but with the reinstatement of natural dune forms, and re-planting of marram grass tufts saved in the original excavation this is expected to be short lived.

Areas of archaeological interest including a dyke and rectilinear enclosure have been identified along the MHWS mark and so fall within construction zone and will likely be impacted by construction. These features are considered to have local, if not regional or national significance.

Rock armour - The headland is an existing structure supported by a rock armour installation that is failing. Proposed works involve reparation of the toe by extending the existing rock armour from the mean sea level to a point whereby the base of new anchor rocks will be 1.5m below beach level. A minor area of the beach will be lost to this extension.

Applicable to both protection measures is the absorption capacity of areas for the purpose of conservation.

A significant proportion of coastal protection measures, and the airport grounds, exists within Tong Saltings SSSI, an area qualified by coastal habitats and breeding bird assemblage.

Objectives for Tong Salting management established by NatureScot's Site Management Statement can be met by programming works closest to known colonies to take place outside of the breeding bird season, and thus cause no long-term detrimental effects to the resident and migrant populations.

All materials and construction will follow "The Rock Manual" (Circa C683 2nd edition), to best reduce potential long lasting negative impacts which seeks to promotes environmentally awareness when working with rock in coastal and shoreline engineering.

5. Characteristics of the Potential Impact

The potential significant effects of the works upon the environment are considered in relation to the location and characteristics of work with regard to the impact of the works on (1) **population and human health**; (2) **biodiversity**; (3) **land, soil, water, air, climate**; (4) **material assets, cultural heritage, landscape.**

Table 6. The potential significant effects of the works on the environment in relation to the location and characteristics of work

Area Potentially Impacted	Cause of Potential Impact	Potential Significant Effect?	Potential Mitigation	Additional Assessments or Work Required?	Significant Effects Following Mitigation?
Noise	Construction activity	**Possible** – Noise created by plant during operation as well as construction traffic	Construction site deliveries and operation restricted to daylight hours	No	None
Protected Species (Birds)	Construction activity	**Possible** –Potential disturbance to little tern (Schedule 1 bird) and other bird colonies during construction Ground nesting birds within the work zone may sustain damage to nests	Programme works to take place outside of the breeding bird season Establish buffer zones around sensitive areas (nests) should works take place during the breeding bird season Establish access to the work zone that avoids crossing the Steinish Saltmarsh	Pre-construction surveys Creation of an Environmental Management Plan that is approved by NatureScot prior to works commencing	Minimal to None

Area Potentially Impacted	Cause of Potential Impact	Potential Significant Effect?	Potential Mitigation	Additional Assessments or Work Required?	Significant Effects Following Mitigation?
Protected Species (Otter)	Construction activity	**Unlikely** – No holts or rest spots confirmed during ecology surveys however the work zone has the potential to host rest spots in many locations	Establish exclusion zones around suspected otter rest sites Communicate otter protected species status to work crews	Pre-construction surveys Creation of an Environmental Management Plan that is approved by NatureScot prior to works commencing	Minimal to None
Protected Habitats	Construction activity	**Possible** – The work zone comprises multiple sensitive habitats, including those that are qualifying features for Tong Saltings SSSI. Construction involves direct interaction with several of these habitats (salt marsh, sand dunes) Temporary land take will disrupt dune ecosystem processes	An assessment of the effects upon Tong Saltings SSSI has been undertaken by NatureScot. Key mitigation proposals are listed in table 4 Establish access to the work zone that avoids crossing the Steinish Saltmarsh Retain marram grass currently growing in the dune grasslands and replant upon reinstatement	Creation of an Environmental Management Plan that is approved by NatureScot prior to works commencing	None
Land	Construction activity	**Unlikely** – Use of natural resources (rock) to create coastal protection measures	Source rock from suppliers who are able to demonstrate responsible sourcing (BES 6001)	No	None

Area Potentially Impacted	Cause of Potential Impact	Potential Significant Effect?	Potential Mitigation	Additional Assessments or Work Required?	Significant Effects Following Mitigation?
Water	Construction activity Post construction activity	**Possible** – Temporary increase in suspended sediment created by plant movement within MHWS-MLWS zone Potential for contamination of coastal water through spillages or sediment transfer Indirect impacts around the headland through interruption of existing coastal processes including tidal flows and sediment movement	Works to be undertaken at low water levels. Restrict plant movement to designated access/egress Conduct and record daily plant checks, equip the CDM with suitably sized spill kits, establish a spill response process and train crews on how to implement the process	No	Minimal
Air Quality	Construction activity	**Possible** - Airborne particles created when moving sand or crushed stone, dust generated by construction traffic	Dust suppression measures to be implemented should construction traffic generate Operatives to have access to appropriate PPE including eye protection and face masks	No	None
Archaeology and Cultural Heritage	Construction activity	**Possible** - Movement of plant as well as excavations associated with the coastal protection could disturb the	Appoint an archaeologist to provision the project with support pre- and during construction	Establish a method statement for enabling an archaeological watching brief on all ground-	Minimal

Area Potentially Impacted	Cause of Potential Impact	Potential Significant Effect?	Potential Mitigation	Additional Assessments or Work Required?	Significant Effects Following Mitigation?
		historic environment including potentially uncovering significant remains		breaking shall be submitted to and approved by the Comhairle as planning authority If significant archaeological remains are discovered, an agreed archaeological mitigation strategy should be implemented, following discussion with the Comhairle Archaeologist. It should be submitted to, and approved in writing, by the local planning authority	

6. Conclusion

The extent of the construction of new coastal protection measures at Stornoway Airport does not fall into a category considered as a Schedule 1 development. Consequently, the screening assessment should take place in regard to the proposed works being classed as Schedule 2 works, specifically under paragraph 10(m) of the Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

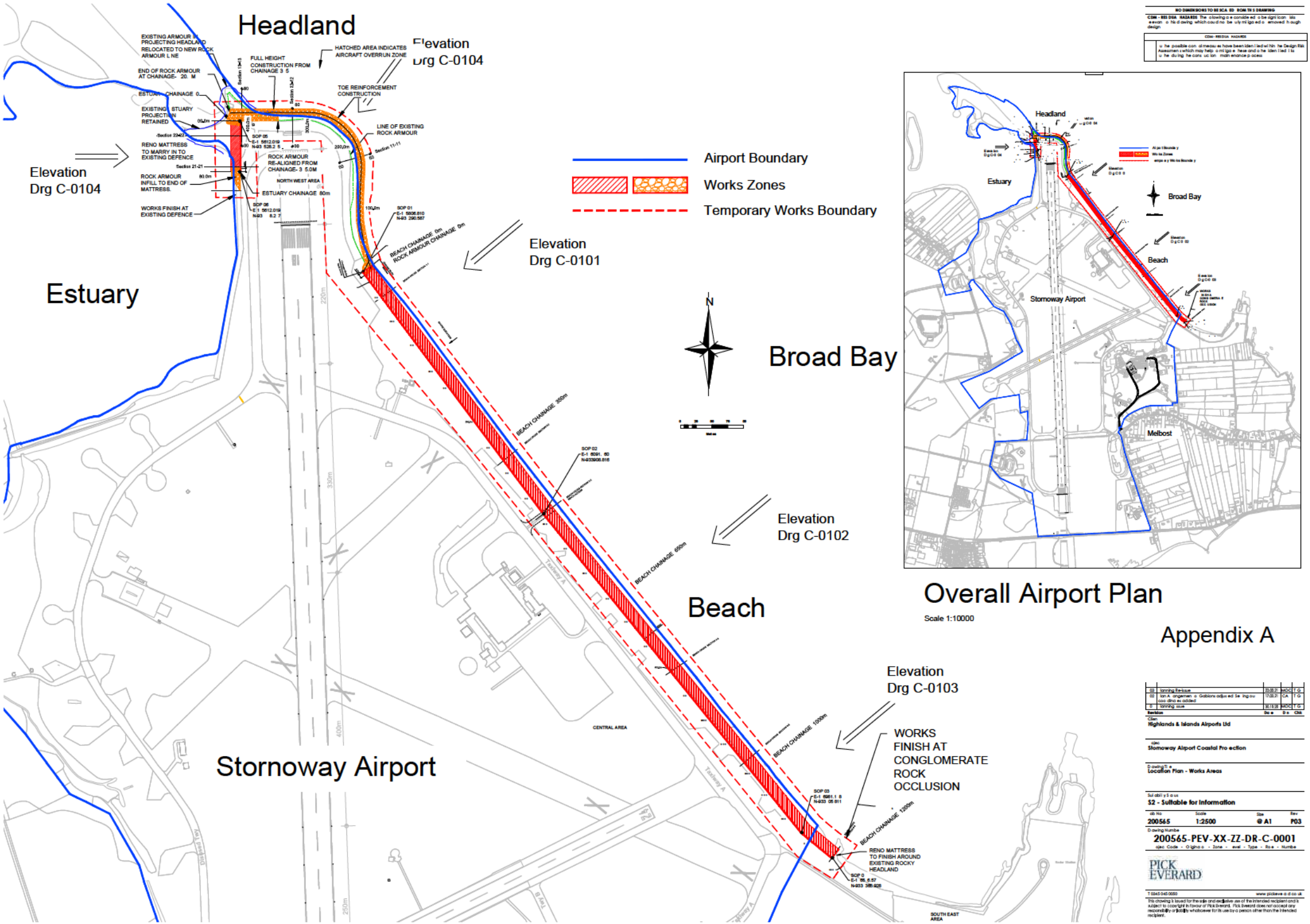
As is true with almost all construction projects, if left unaddressed there is potential for these coastal protection works to have a negative influence upon the environment.

That being said, constraints identified by pre-construction surveys, and early consultation with environmental stakeholders allow potential concerns to be mitigated to an almost negligible level simply through compliance with conditions established during the planning process.

Combined with the assessments already carried out, the characteristics and duration of the works, Connicks does not believe that the coastal protection works should be considered an EIA development.

Appendix

A. C-0001 - Site Plan
B. C-0011 - Works Plan: North & West
C. C-0012 - Works Plan: Central & Southeast
D. C-0201 - Typical Mattress Cross Section
E. C-0211 - Typical Rock Armour Toe Cross Section
F. C-0104 - Estuary Elevation
G. C-0101/2/3 - Beach Elevation
H. C-0000 - Topographical Plan
I. - Works Location in Relation to Mean High Water Spring Plan



Overall Airport Plan

Scale 1:10000

Appendix A

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

CDM - RESIDUAL HAZARDS The following are considered to be significant residual hazards which could not be fully mitigated or removed through design.

CDM - RESIDUAL HAZARDS
To the best possible control measures have been identified within the Design Risk Assessment which may help to mitigate these and other identified risks to the health and safety during the construction maintenance process

Rev	Description	Date	By	Chk
03	Planning Re-Issue	23.03.21	MDC	TG
02	Text Amendments to Gabions adjusted Setting out coordinates added	17.03.21	CA	TG
01	Planning Issue	30.10.20	MDC	TG

Client: Highlands & Islands Airports Ltd

Project: Stornoway Airport Coastal Protection

Drawing Title: Location Plan - Works Areas

Suitability Status: S2 - Suitable for Information

Job No	Scale	Size	Rev
200565	1:2500	@ A1	P03

Drawing Number: 200565-PEV-XX-ZZ-DR-C-0001

Project Code - Originator - Zone - Level - Type - Role - Number

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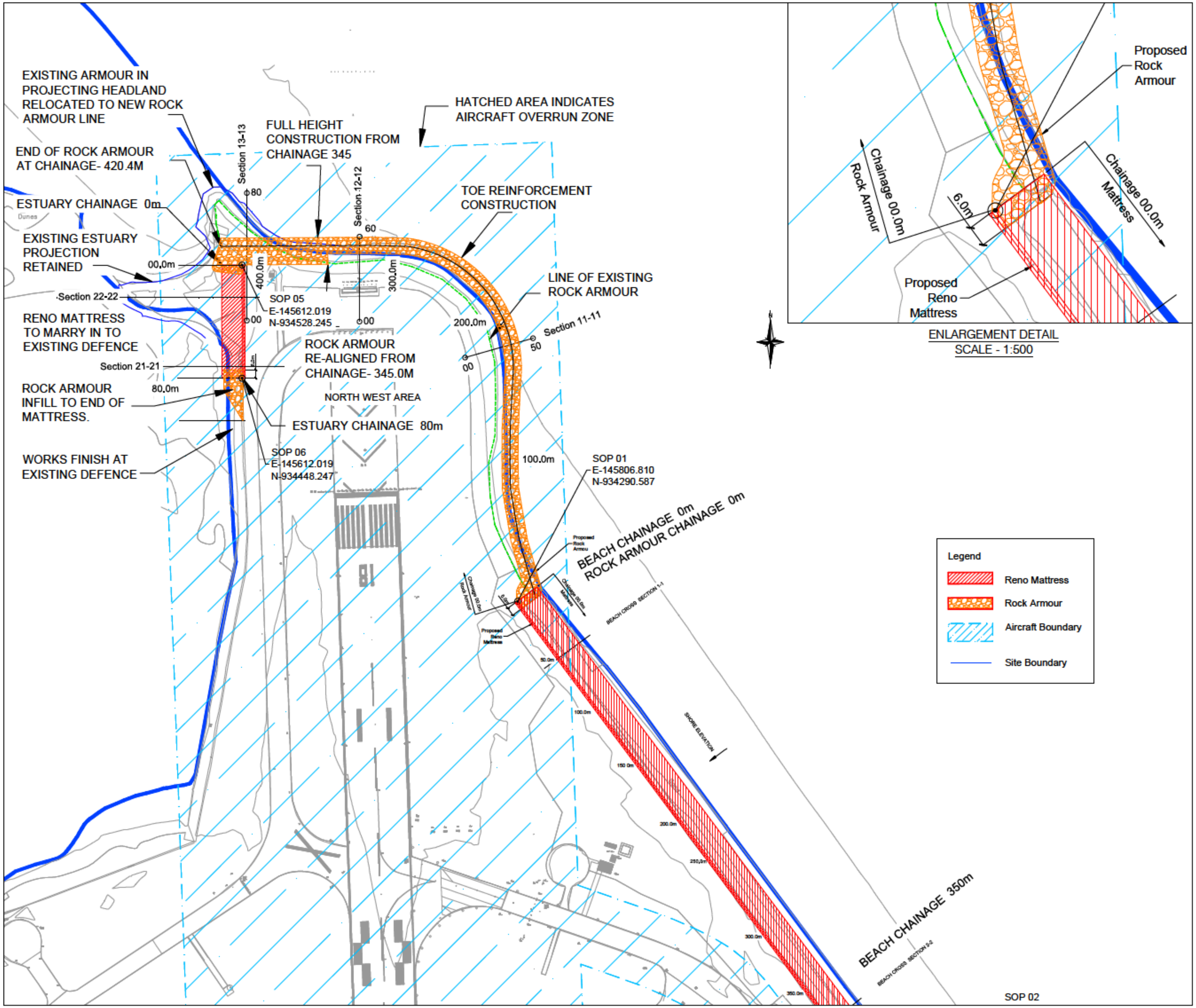

EXISTING ARMOUR IN PROJECTING HEADLAND RELOCATED TO NEW ROCK ARMOUR LINE
END OF ROCK ARMOUR AT CHAINAGE- 420.4M
ESTUARY CHAINAGE 0m
EXISTING ESTUARY PROJECTION RETAINED
00.0m
Section 22-22
RENO MATTRESS TO MARRY IN TO EXISTING DEFENCE
Section 21-21
ROCK ARMOUR INFILL TO END OF MATTRESS.
80.0m
WORKS FINISH AT EXISTING DEFENCE
Section 13-13
FULL HEIGHT CONSTRUCTION FROM CHAINAGE 345
Section 12-12
HATCHED AREA INDICATES AIRCRAFT OVERRUN ZONE
TOE REINFORCEMENT CONSTRUCTION
400.0m
300.0m
200.0m
100.0m
SOP 05
E-145612.019
N-934528.245
ROCK ARMOUR RE-ALIGNED FROM CHAINAGE- 345.0M
NORTH WEST AREA
ESTUARY CHAINAGE 80m
SOP 06
E-145612.019
N-934448.247
LINE OF EXISTING ROCK ARMOUR
Section 11-11
SOP 01
E-145806.810
N-934290.587
BEACH CHAINAGE 0m
ROCK ARMOUR CHAINAGE 0m
BEACH CHAINAGE 350m
SOP 02
Proposed Rock Armour
Chainage 00.0m Rock Armour
Chainage 00.0m Mattress
6.0m
Proposed Reno Mattress
ENLARGEMENT DETAIL
SCALE - 1:500
Legend
Reno Mattress
Rock Armour
Aircraft Boundary
Site Boundary

NO DIMENSIONS TO BE SCA ED ROM TH S DRAWING

CDM - RES DUA HAZARDS The o owing a e conside ed o be signi ican isks eevan o his d awing which cou d no be u ly mi iga ed o emoved h ough design

CDM - RESIDUA HAZARDS

u he possible con ol measu es have been iden i ied wi hin he Design Risk Assessmen s which may help o mi iga e hese and o he iden i ied isks u he du ing he cons uc ion main enance p ocess

Appendix B

04	anning Re issue	23.03.21	MOC	T G
03	an A angemen o Gabions adjus ed Se ing ou coo dina es added Si e Bounda y added	17.03.21	CA	T G
02	Sec ions - o 3- 3 2 -2 & 22-22 Added Rock A mou ayou adjus ed o sui exis ing g ound p o iles Ai c a Zone Chainages and Rock A mou ove laps evised	18.12.20	CA	T G
0	lanning ssue	30.10.20	MOC	T G
Revision		Da e	D n	Chk

Clien
Highlands & Islands Airports Ltd

ojec
Stornoway Airport Coastal Protection

D awing Ti e
Works Plan- Sheet 1 of 2
North West

Sui abili y S a us
S2 - Suitable for Information

ob No	Scale	Size	Rev
200565	1:1250	@ A1	P04

D awing Numbe
200565-PEV-XX-ZZ-DR-C-0011
ojec Code - O igina o - Zone - evel - Type - Ro e - Numbe

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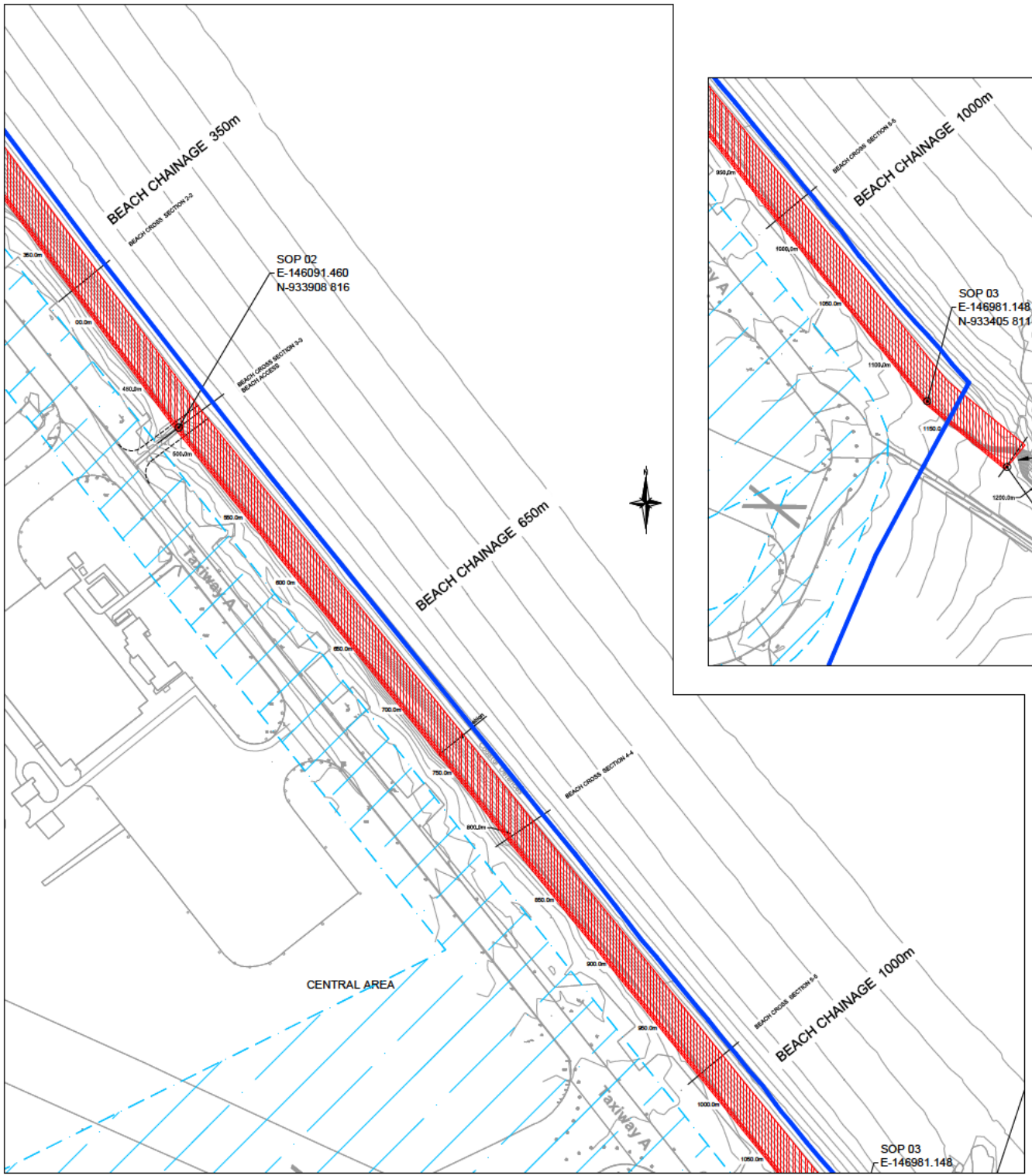

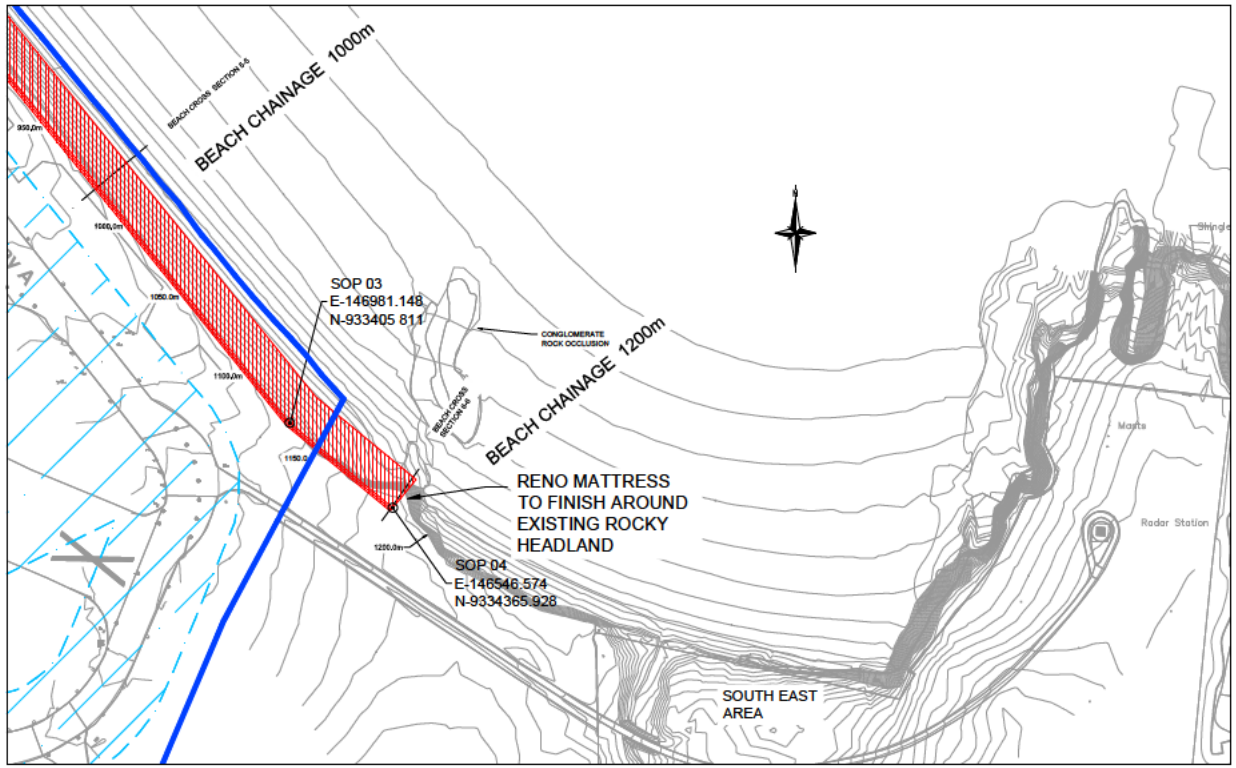

Legend

- Reno Mattress
- Rock Armour
- Aircraft Boundary
- Site Boundary

Appendix C

04	anning Re issue	20.03.21	MOC	T G
03	an A angemen o Gabions adjus ed Se ing ou oss dina es added Si e Bounda y added	17.03.21	CA	T G
02	A c o Bounda y Added	18.12.20	CA	T G
01	anning issue	26.10.20	MOC	T G
Revision		De e	B s	Chk

Clien
Highlands & Islands Airports Ltd

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Stornoway Airport Coastal Protection

Drawing Ti e
Works Plan4- Sheet 2 of 2
Central & South East

Sui abili y S a us
S2 - Suitable for Information

ob No	Scale	Size	Rev
200565	**1:1250**	**@ A1**	**P04**

D awing Numbe
200565-PEV-XX-ZZ-DR-C-0012
ojec Code - O igina o - Zone - eve - Type - Ro e - Numbe

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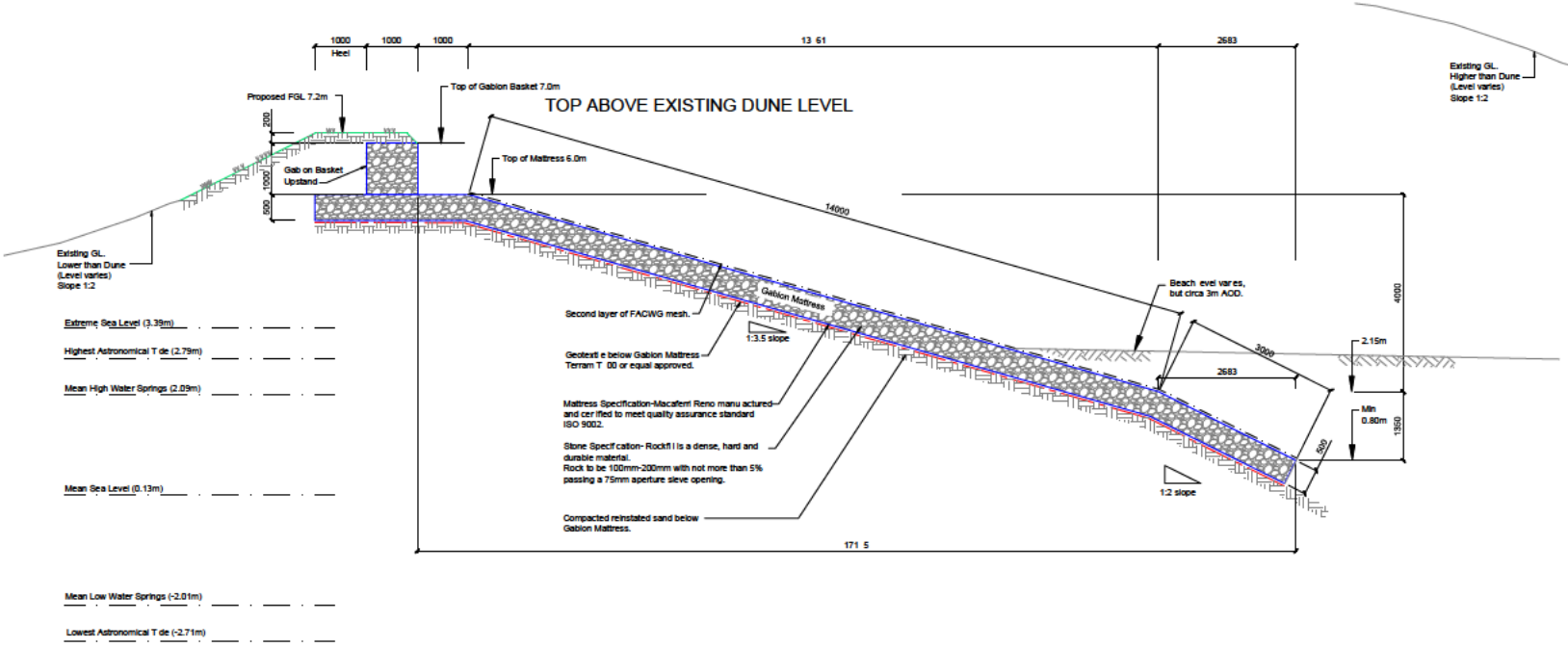
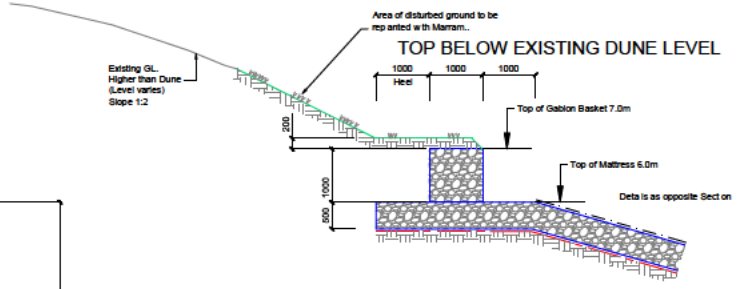
NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

CDM - RESIDUAL HAZARDS The following are considered to be significant residual hazards even though a risk drawing which could not be fully mitigated or removed through design.

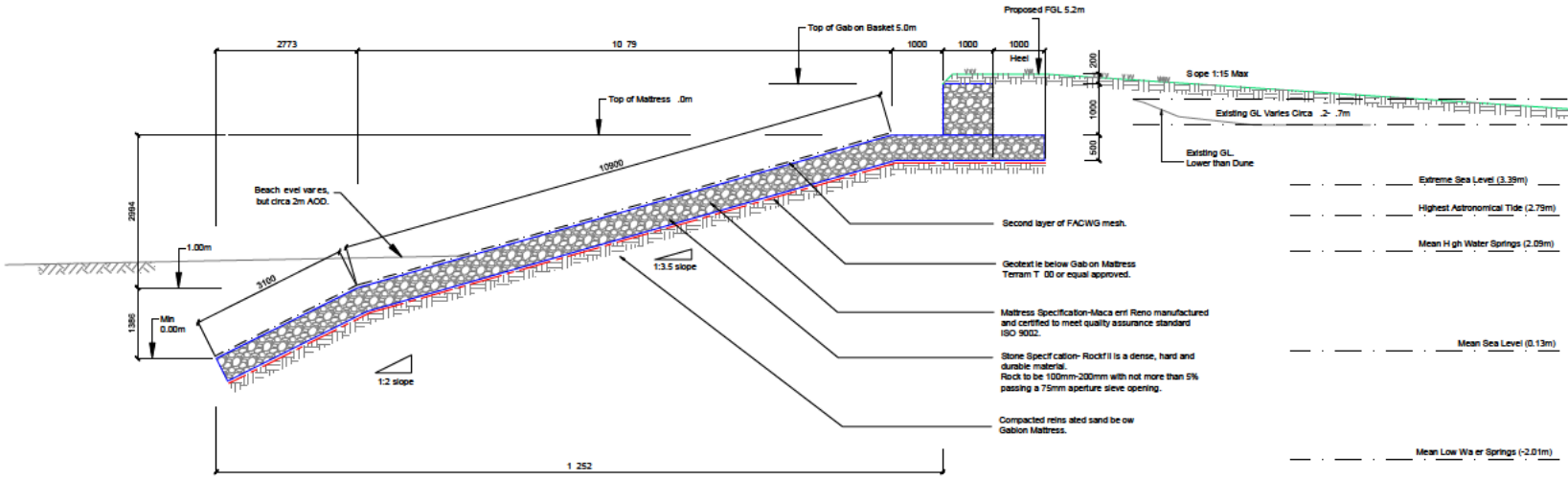
CDM - RESIDUAL HAZARDS
Due to the possible construction measures have been identified within the Design Risk Assessment which may help to mitigate these and to be identified to be due during the construction maintenance process



TYPICAL CROSS SECTION CONSTRUCTION DETAIL ALONG BEACH



TYPICAL CROSS SECTION CONSTRUCTION DETAIL -



TYPICAL CROSS SECTION CONSTRUCTION DETAIL ALONG ESTUARY

Appendix D

Rev	Issue	Date	Drn	Chk
S4	Issue for Re-issue	23.02.21	MDC	T G
S3	Dimensions and axes called	17.02.21	CA	T G
S2	Typical Beach Section Added View 1 as changed Dims ammended	18.12.20	CA	T G
S1	Issue for Issue	30.10.20	MDC	T G

Client
Highlands & Islands Airports Ltd

Project
Stornoway Airport Coastal Protection

Drawing Title
Typical Mattress Cross Section

Suitability Status
S2 - Suitable for Information

Job No	Scale	Size	Rev
200565	1:50	@ A1	P04

Drawing Number
200565-PEV-XX-ZZ-DR-C-0201
Project Code - Originator - Zone - Level - Type - Role - Number

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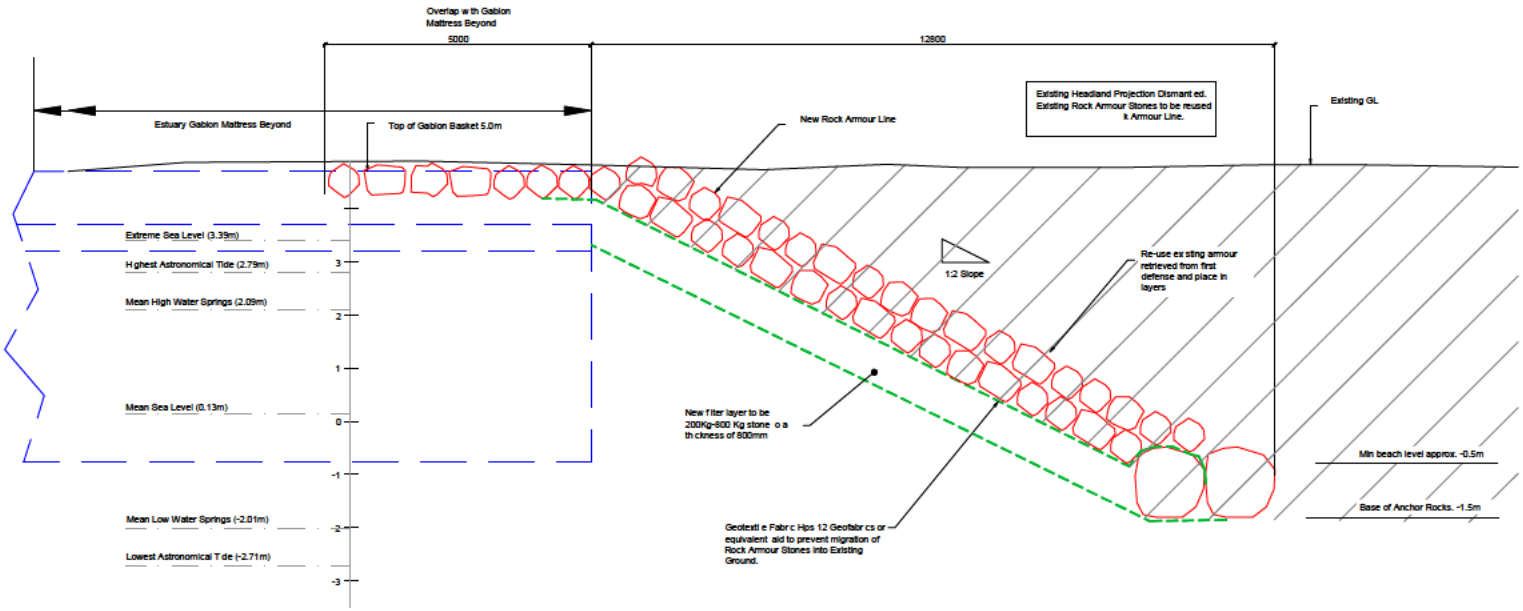
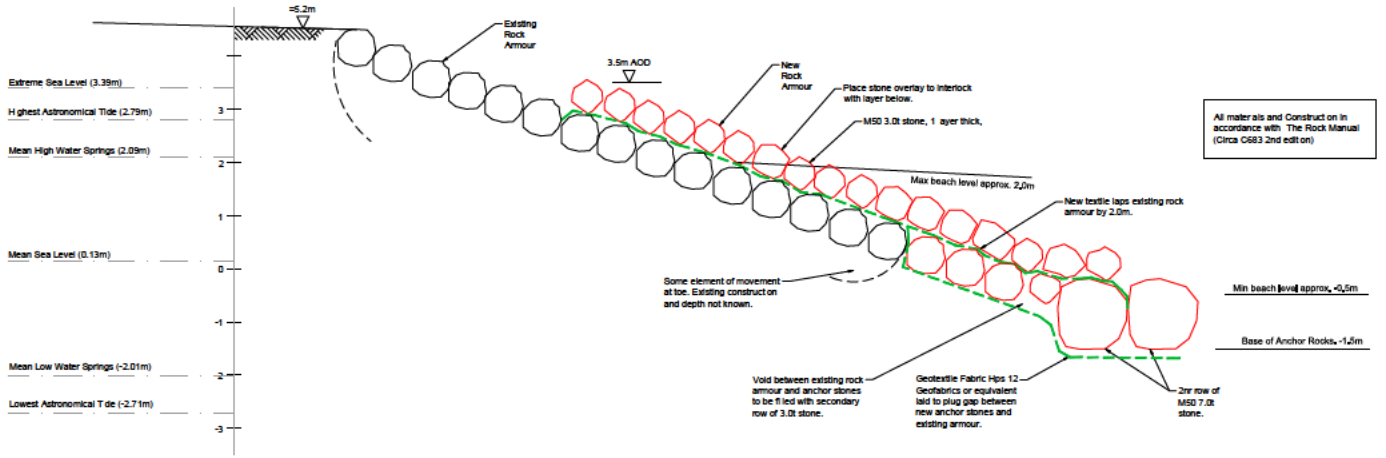


New Rock Armour Cross Section

Scale: 1:50



Toe Repair at Existing Rock Armour Section

Scale: 1:50

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

CDM - RESIDUAL HAZARDS The following are considered to be significant residual hazards which could not be fully mitigated or removed through design.

CDM - RESIDUAL HAZARDS
Due to the possible construction methods we have been identified within the Design Risk Assessment which may help to mitigate these and other identified risks due to the during the construction maintenance process

Appendix E

Rev	Revision	Date	Drn	Chk
03	Planning Re-issue	31/01/20	MDC	TG
02	Section Update and outline existing profiles and New Rock Armour Details added	16/12/19	CA	TG
01	Planning Issue	30/10/19	MDC	TG

Client: Highlands & Islands Airports Ltd

Project: Stornoway Airport Coastal Protection

Drawing Title: Typical Rock Armour Cross Sections

Suitability Status: S2 - Suitable for Information

Job No	Scale	Size	Rev
200565	As Noted	@ A1	P03

Drawing Number: 200565-PEV-XX-ZZ-DR-C-0211

Project Code - Originator - Zone - Level - Type - Role - Number

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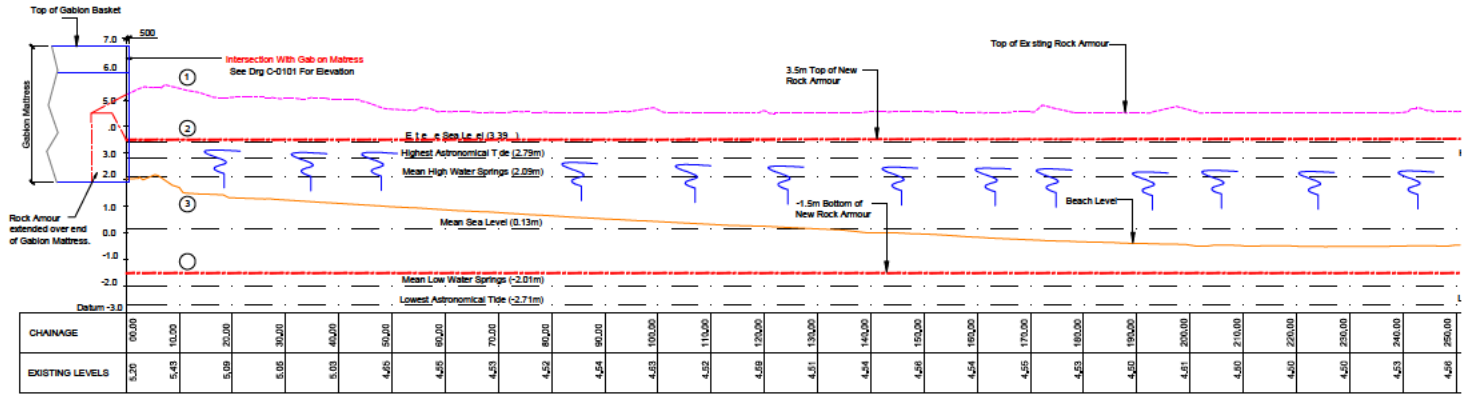
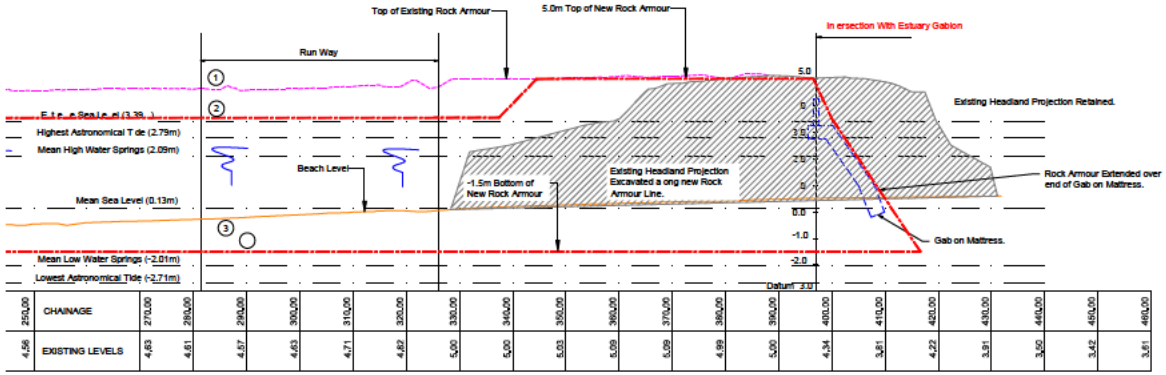


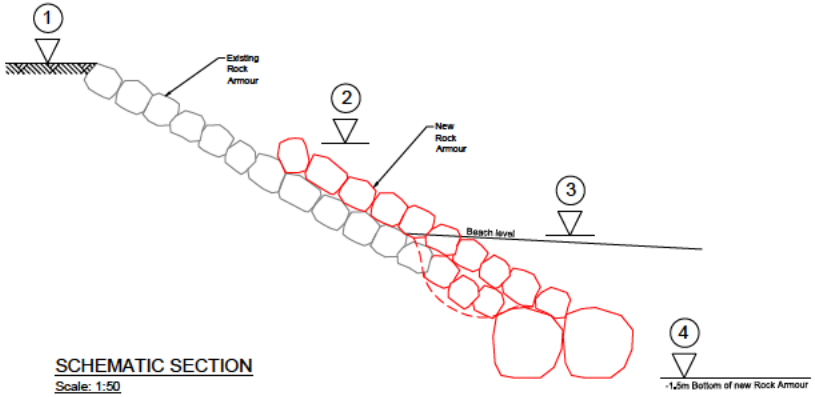
HEADLAND LONG SECTION (VIEW FROM SEA) CHAINAGE 0.00m - 250m.
SCALE: H 1:500,V 1:100. DATUM: -5.000

HEADLAND ELEVATION CH 0.0-250 NOTE: EXAGGERATED VERTICAL SCALE

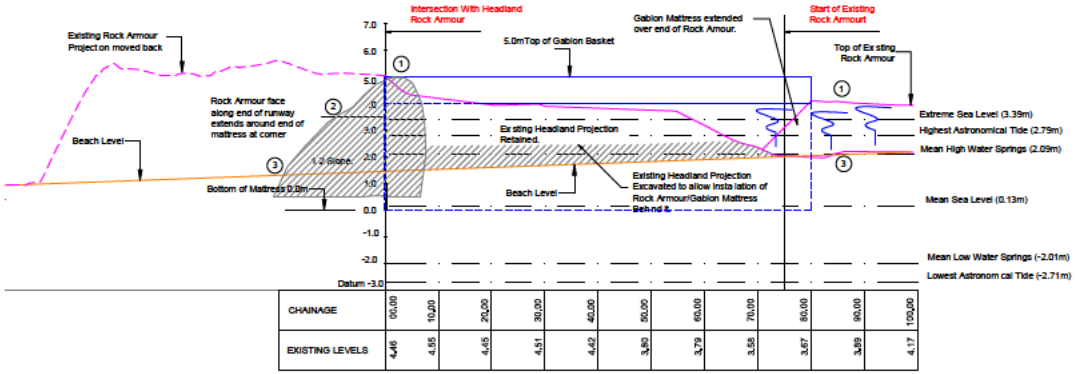


HEADLAND LONG SECTION (VIEW FROM SEA) CHAINAGE 250m - 60m.
SCALE: H 1:500,V 1:100. DATUM: -5.000

HEADLAND ELEVATION CH 250-430
NOTE: EXAGGERATED VERTICAL SCALE



SCHEMATIC SECTION
Scale: 1:50



ESTUARY LONG SECTION (VIEW FROM SEA)
SCALE: H 1:500,V 1:100. DATUM: -5.000

ESTUARY ELEVATION CH 0.0-100
NOTE: EXAGGERATED VERTICAL SCALE

Appendix F

03	Planning Re-issue	25.02.21	MOC	T G
02	Rock Armour cross sections updated	18.12.20	CA	T G
01	Issued for planning	19.11.20	CA	T G
Revision		Date	Drn	Chk

Client: Highlands & Islands Airports Ltd

Project: Stornoway Airport Coastal Protection

Drawing Title: Headland & Estuary Elevations

Suitability Status: S2 - Suitable for Information

Job No	Scale	Size	Rev
200565	As Noted	@ A1	P03

Drawing Number: 200565-PEV-XX-ZZ-DR-C-0104
Project Code - Originator - Zone - Level - Type - Role - Number

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NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

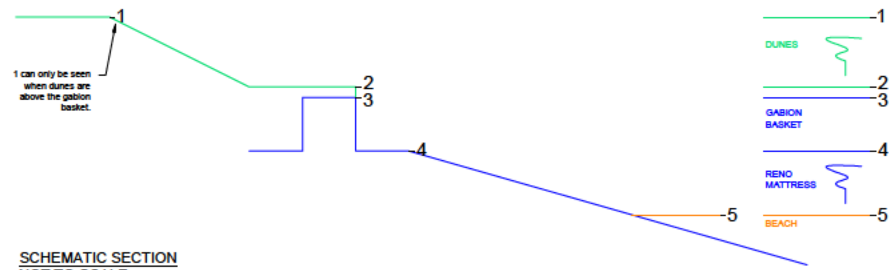
CDM - RESIDUAL HAZARDS The following are considered to be significant residual hazards even though this drawing which could not be fully mitigated or removed through design.

CDM - RESIDUAL HAZARDS
The following are considered to be significant residual hazards even though this drawing which could not be fully mitigated or removed through design.

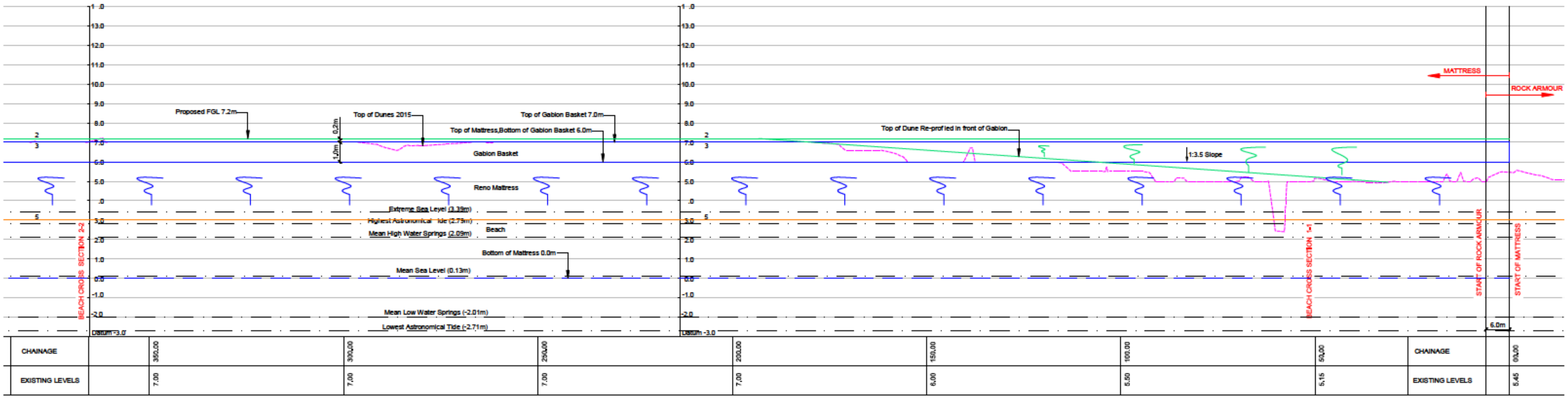
NO DIMENSIONS TO BE SCA ED ROM THIS DRAWING

CDM - RES DUA HAZARDS The o lowing a e conside ed o be signi ican isks e evan o his d awing which cou d no be u ly mi iga ed o emoved h ough design

CDM - RES DUA HAZARDS	
	u he possible con ol measu es have been iden i ied wi hin he Design Risk Assessmen s which may help o mi iga e hese and o he iden i ied isks u he du ing he cons uc ion main enance p ocess



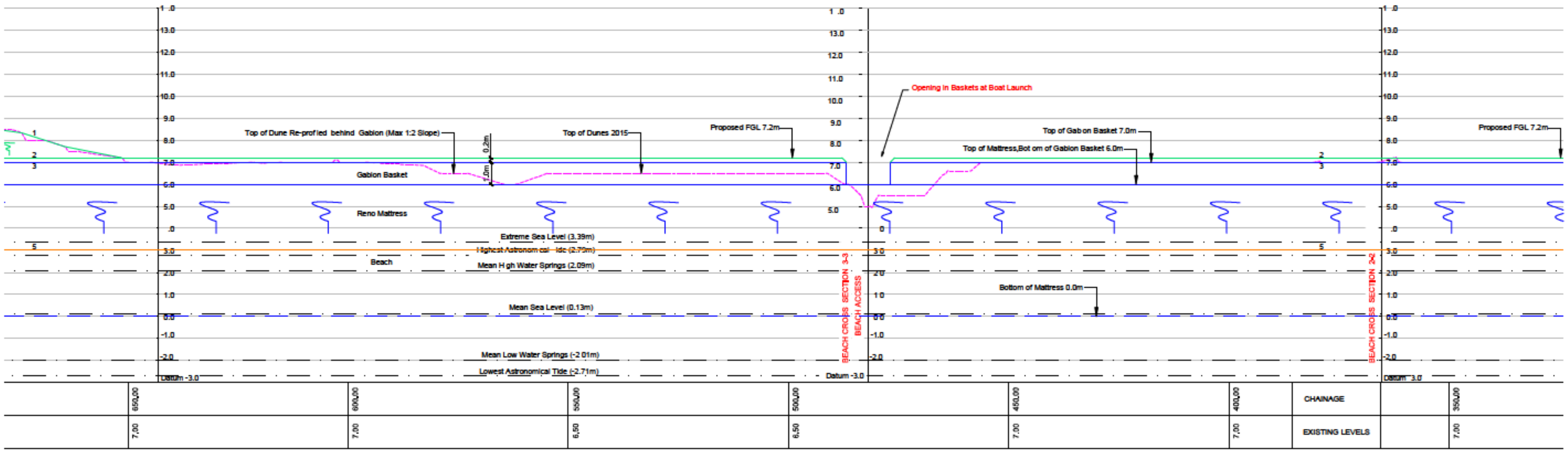
SCHEMATIC SECTION
NOT TO SCALE



Proposed FGL 7.2m
Top of Dunes 2015
Top of Gabion Basket 7.0m
Top of Mattress,Bottom of Gabion Basket 6.0m
Gabion Basket
Reno Mattress
Extreme Sea Level (3.39m)
Highest Astronomical Tide (2.79m)
Beach
Mean High Water Springs (2.09m)
Bottom of Mattress 0.0m
Mean Sea Level (0.13m)
Mean Low Water Springs (-2.01m)
Lowest Astronomical Tide (-2.71m)
Top of Dune Re-profiled in front of Gabion
1:3.5 Slope
MATTRESS
ROCK ARMOUR
BEACH CROSS SECTION 2-2
BEACH CROSS SECTION 1-1
START OF ROCK ARMOUR
START OF MATTRESS
6.0m
CHAINAGE
EXISTING LEVELS

BEACH LONG SECTION (SOUTH WEST VIEW FROM SEA)
SCALE: H 1:500,V 1:100. DATUM: -5.000

ELEVATION CH 350-0 NOTE: EXAGGERATED VERTICAL SCALE



Top of Dune Re-profiled behind Gabion (Max 1:2 Slope)
Top of Dunes 2015
Proposed FGL 7.2m
Opening in Baskets at Boat Launch
Top of Gabion Basket 7.0m
Top of Mattress,Bottom of Gabion Basket 6.0m
Gabion Basket
Reno Mattress
Extreme Sea Level (3.39m)
Highest Astronomical Tide (2.79m)
Beach
Mean High Water Springs (2.09m)
Bottom of Mattress 0.0m
Mean Sea Level (0.13m)
Mean Low Water Springs (-2.01m)
Lowest Astronomical Tide (-2.71m)
BEACH CROSS SECTION 3-3
BEACH ACCESS
BEACH CROSS SECTION 2-2
CHAINAGE
EXISTING LEVELS

ELEVATION CH 650-350 NOTE: EXAGGERATED VERTICAL SCALE

BEACH LONG SECTION (SOUTH WEST VIEW FROM SEA)
SCALE: H 1:500,V 1:100. DATUM: -5.000

Appendix G

03	lanning Re-issue	23.03.21	MOC	T G
02	Ma ess eve s indica ed	18.12.20	CA	T G
0	lanning I sue	30.10.20	MOC	T G
Revision		Da e	D n	Chk

Clien
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Stornoway Airport Coastal Protection

D awing Ti e
Beach Elevation - Chainage 0.00m - 650.00m

Sui abil i y S a us
S2 - Suitable for Information

ob No	Scale	Size	Rev
200565	As Noted	@ A1	P03

D awing Numbe
200565-PEV-XX-ZZ-DR-C-0101
ojec Code - O igina o - Zone - evel - Type - Ro e - Numbe

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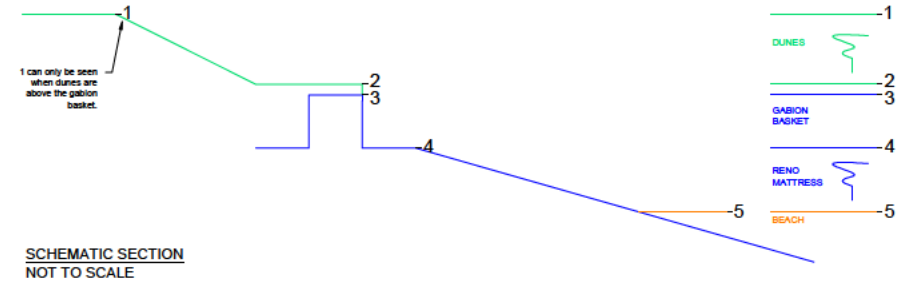
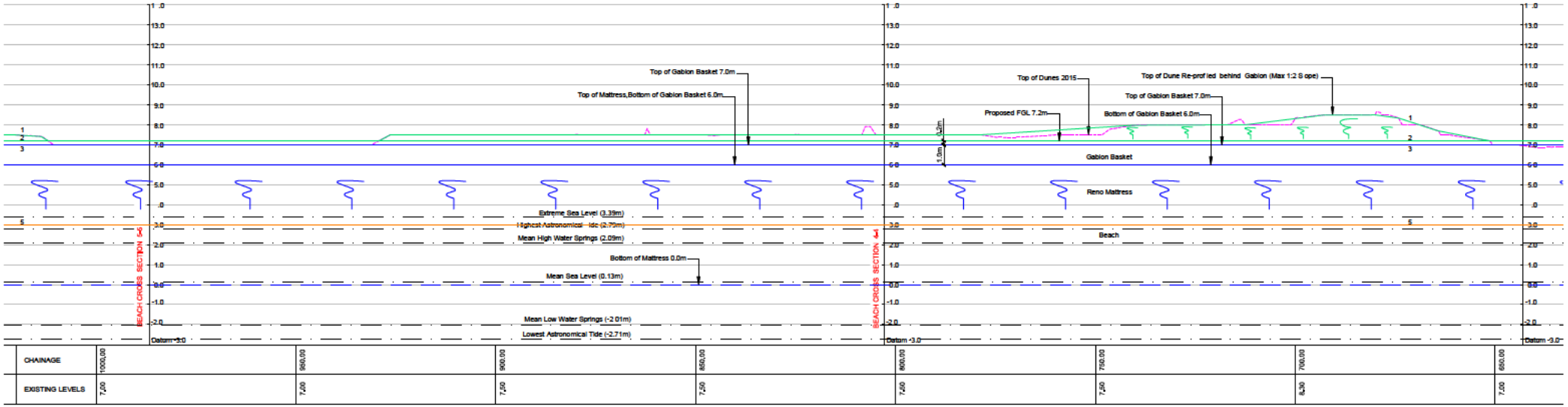


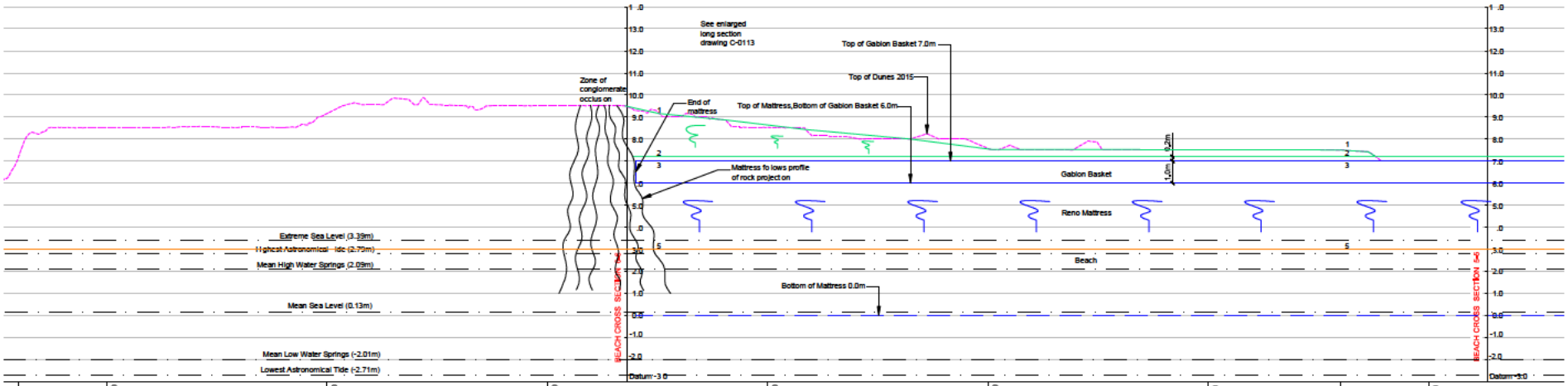
SCHEMATIC SECTION
NOT TO SCALE



CHAINAGE	1000.00	950.00	900.00	850.00	800.00	750.00	700.00	650.00
EXISTING LEVELS	7.20	7.20	7.20	7.20	7.20	7.20	6.30	7.20

BEACH LONG SECTION (SOUTH WEST VIEW FROM SEA)
SCALE: H 1:500,V 1:100. DATUM: -5.000

ELEVATION CH 1000-650 NOTE: EXAGGERATED VERTICAL SCALE



CHAINAGE	1300.00	1250.00	1200.00	1150.00	1100.00	1050.00	CHAINAGE	1000.00
EXISTING LEVELS	8.33	9.16	9.40	8.32	7.25	7.50	EXISTING LEVELS	7.20

BEACH LONG SECTION (SOUTH WEST VIEW FROM SEA)
SCALE: H 1:500,V 1:100. DATUM: -5.000

ELEVATION CH 1200-1000 NOTE: EXAGGERATED VERTICAL SCALE

BEACH LONG SECTION (SOUTH WEST VIEW FROM SEA)
SCALE: H 1:500,V 1:100. DATUM: -5.000

NO DIMENSIONS TO BE SCALED FROM THIS DRAWING

CDM - RESIDUAL HAZARDS The following are considered to be significant residual hazards which could not be fully mitigated or removed through design.

CDM - RESIDUAL HAZARDS	
	Due to the possible construction measures have been identified within the Design Risk Assessment which may help mitigate these and other identified risks due to the during the construction maintenance process

Appendix G

S3	Planning Re-issue	23.02.21	MDC	TG
S2	Minor revisions indicated	18.02.21	CA	TG
S1	Planning Issue	30.10.20	MDC	TG
Revision		Date	Drn	Chk

Client: Highlands & Islands Airports Ltd

Project: Stornoway Airport Coastal Protection

Drawing Title: Beach Elevation - Chainage 650.00m - 1300.00m

Suitability Status: S2 - Suitable for Information

Job No	Scale	Size	Rev
200565	As Noted	@ A1	P03

Drawing Number: 200565-PEV-XX-ZZ-DR-C-0102
Project Code - Originator - Zone - Level - Type - Role - Number

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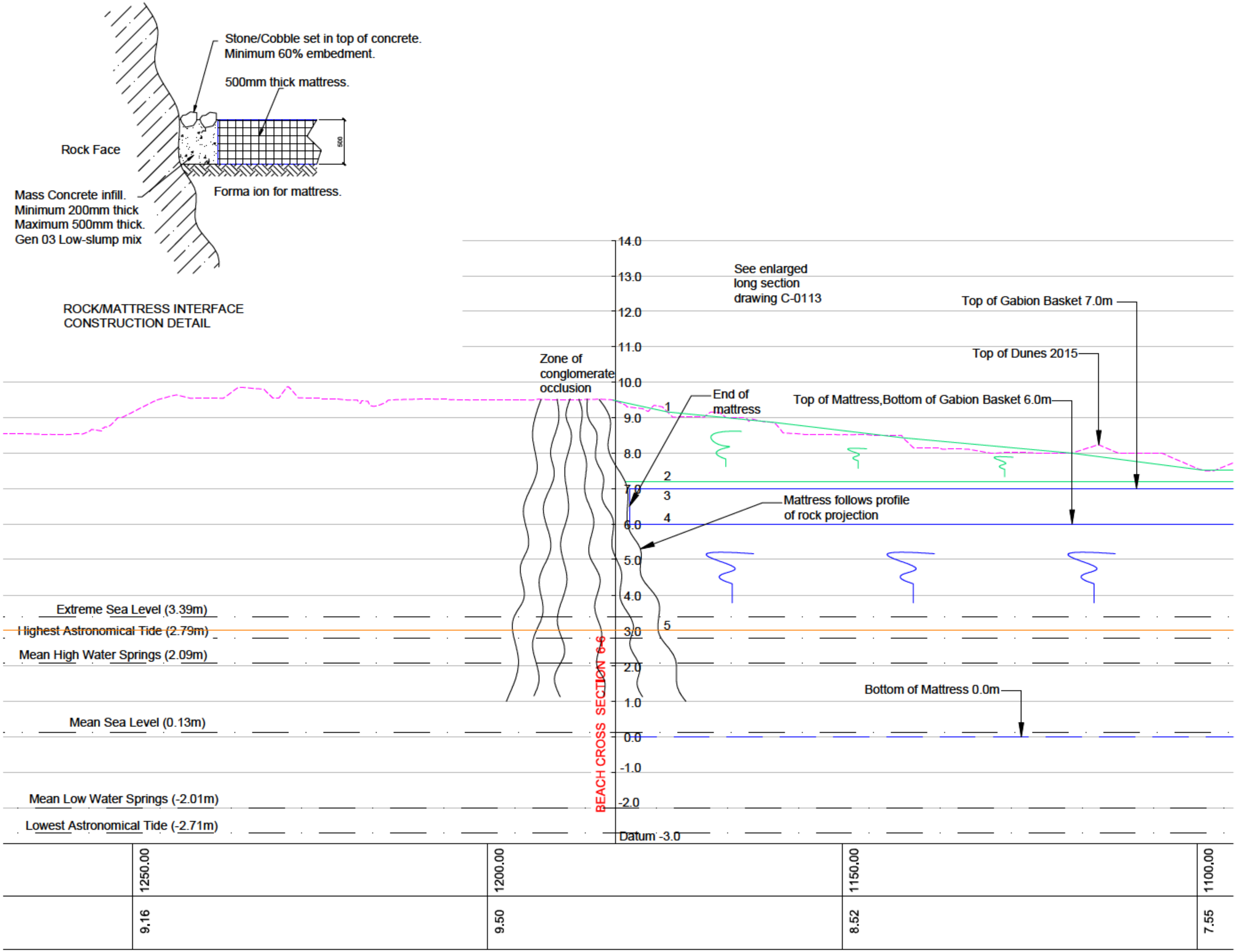

Stone/Cobble set in top of concrete.
Minimum 60% embedment.
500mm thick mattress.
500
Rock Face
Mass Concrete infill.
Minimum 200mm thick
Maximum 500mm thick.
Gen 03 Low-slump mix
Forma ion for mattress.
ROCK/MATTRESS INTERFACE
CONSTRUCTION DETAIL
See enlarged
long section
drawing C-0113
Top of Gabion Basket 7.0m
Top of Dunes 2015
Zone of
conglomerate
occlusion
End of
mattress
Top of Mattress,Bottom of Gabion Basket 6.0m
Mattress follows profile
of rock projection
Bottom of Mattress 0.0m
Extreme Sea Level (3.39m)
Highest Astronomical Tide (2.79m)
Mean High Water Springs (2.09m)
Mean Sea Level (0.13m)
Mean Low Water Springs (-2.01m)
Lowest Astronomical Tide (-2.71m)
BEACH CROSS SECTION 6-6
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
Datum -3.0
1
2
3
4
5
1250.00
1200.00
1150.00
1100.00
9.16
9.50
8.52
7.55

BEACH LONG SECTION - CHAINAGE 1100 TO 1250 - (SOUTH WEST VIEW FROM SEA)
SCALE: H 1:250,V 1:50. DATUM: -5.000

Appendix G

03	lanning Re-issue	23.03.21	MOC	T G
02	Ma ess eve s indica ed Rock Ma ess in e ace de ail added	18.03.20	CA	T G
0	lanning I sue	30.10.20	MOC	T G
Revision		**Da e**	**D n**	**Chk**

Clien
Highlands & slands Airports Ltd

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Stornoway Airport Coastal Protection

D awing Ti e
Beach Elevation - Chainage 1100m - 1250m

Sui abili y S a us
S2 - Suitable for Information

ob No	Scale	Size	Rev
200565	**As Noted**	**@ A1**	**P03**

D awing Numbe
200565-PEV-XX-ZZ-DR-C-0103
ojec Code - O igina o - Zone - evel - Type - Ro e - Numbe

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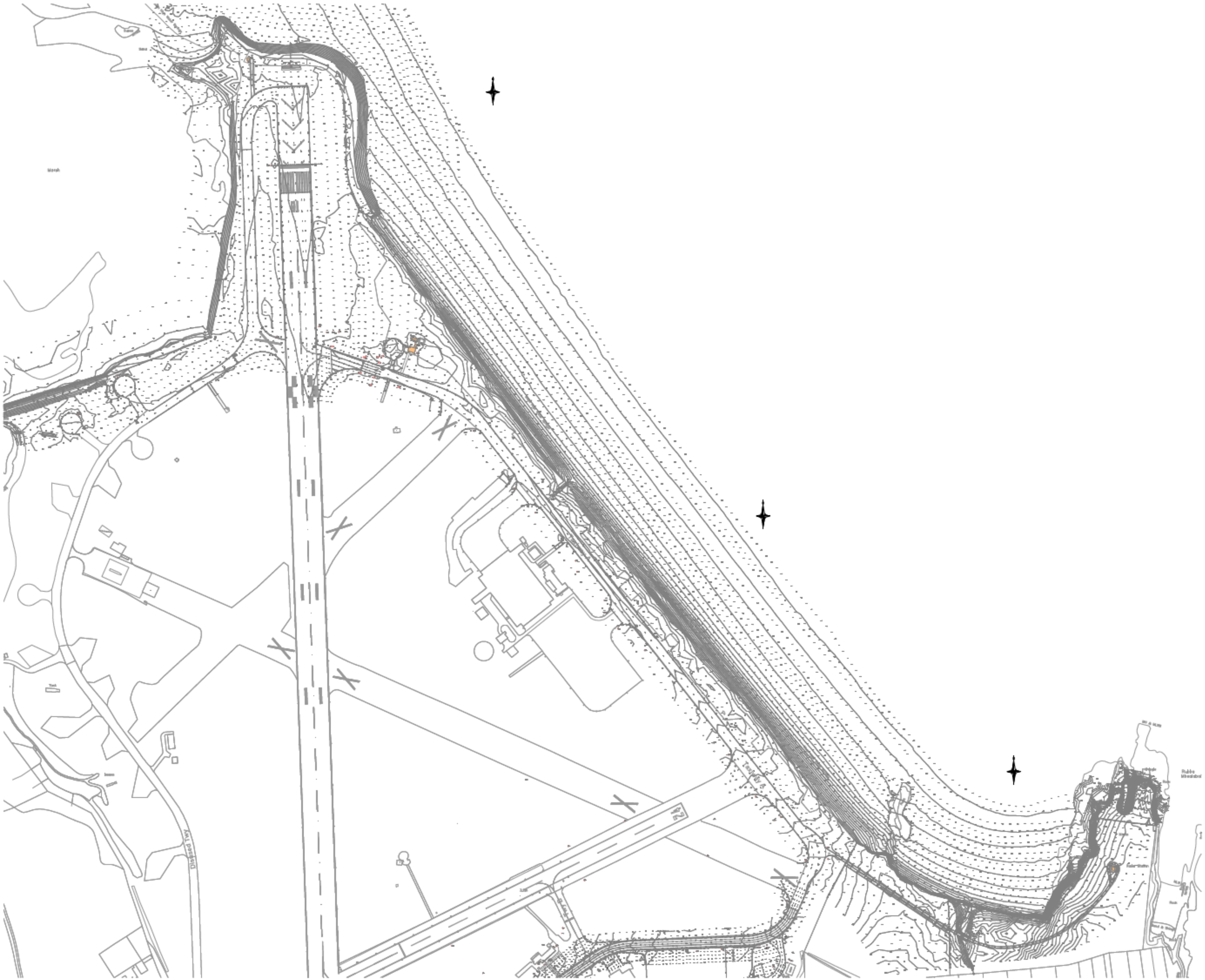

NO DIMENS ONS TO BE SCA ED ROM THIS DRAWING

CDM - RESIDUA HAZARDS The o lowing a e conside ed o be signi ican isk eevan o his d awing which cou d no be u ly mi iga ed o emoved h ough design

CDM - RESIDUA HAZARDS	
	u he possible con ol measu es have been iden i ied wi hin he Design Risk Assessmen s which may help o mi iga e hese and o he iden i ied isk u he du ing he cons uc ion main enance p oce s

Appendix H

02	lanning Re-issue	23.02.21	MOC	T G
0	lanning Is ue	30.10.20	MOC	T G
Revision		**Da e**	**D n**	**Chk**

C ien
Highlands & Islands Airports Ltd

ojec
Stornoway Airport Coastal Protection

D awing Ti e
Exist ng Topographical Plan

Sui abi i y S a us
S2 - Suitable for Information

ob No	Scale	Size	Rev
200565	**1:2500**	**@ A1**	**P02**

D awing Numbe
200565-PEV-XX-ZZ-DR-C-0000
ojec Code - O igina o - Zone - evel - Type - Ro e - Numbe

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Project	Stornoway Coastal Protection
Map	MHWS
Produced By	CS
Approved By	CD
Scale	1:10,000
Page Size	A3
Date	11/06/21

Work Zone
MHWS

Appendix I

0 100 200 300 m

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