Folkestone Warren Consenting Methodology

Rev P06, 30/06/2025

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Revision Schedule

Revision No.	Date.	Review by.	Purpose of Issue/ Comments
P01	03/02/2025	HM	Initial review for comment
P02	11/02/2025	HM	Updated to include estimated outputs & new reduced stone tonnage at 13,500t
P03	21/03/2025	HM	Updated drainage methodology following design meeting with NR and general updates to the rock placement and walkway repairs following the TW site visit on 06/03
P04	17/04/2025	HM	Updated drainage methodology following design meeting with VF/SRE
P05	24/06/2025	HM	Minor updates to methodology for the rock, walkway & drainage.
P06	30/06/2025	HM	Added POAP, clarified some sections based on MMO feedback

Document Schedule

- The following documents have been used to produce this document: (see 4.1.3 - Q26-04 Drawing Document Register - Rev P01 – 250117)

Drawing No.	Work Location	Originator	Drawing / Document Title	Comments	FastDraft Ref.	Format	Drawing Status	
Site Information - Pre- Construction Information								
A124022-TGEE-M0-XX-RP-C-0001	Seawall Repair	TGP	NR/L2/CIV/003/FormG: COMBINED CERTIFICATE OF APPROVAL IN PRINCIPLE, DESIGN AND CHECK FOR DESIGN CHECK CATEGORY I PERMANENT WORKS	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information"	N/A	PDF	For Information	P01
A124022-TGEE-ZZ-XX-HS-C-0001	Seawall Repair	TGP	Designers CDM Review - Folkestone Warren Holding Works - Design of sheetpile and concrete filling	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information"	N/A	PDF	For Information	P02
S100093-TGP-1702-KNT_XTD-FOB-ECV-003205	Rock Armour	TGP	NR/L2/CIV/003/FormB: Certificate of Design and Check for permanent works	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 28/08/2024	N/A	PDF	For Information	P1.0
Folkestone Warren - Works Activities & MMO Breakdown Sketch	All	VF	Folkestone Warren - Works Activities & MMO Breakdown Sketch	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information"	N/A	PDF	For Information	-
Folkestone Warren - Walkway Pictures 20240919	Walkway Repair	VF	Folkestone Warren - Walkway Pictures 20240919	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 19/09/2024	N/A	PDF	For Information	-
Folkestone Warren - Walkway Pictures 20241210	Walkway Repair	VF	Folkestone Warren - Walkway Pictures 20241210	Email dated 16/01/2025 "Folkestone Warren - General Update on VolkerStevin"	N/A	PDF	For Information	-
Folkestone Warren Rock Armour- Budget for VolkerStevin Works	Rock Armour	VF	Folkestone Warren Rock Armour- Budget for VolkerStevin Works	Email dated 14/10/2024	N/A	Email	For Information	-
RE Folkestone Warren - Walkway Repair Design & Budget	Walkway Repair Drainage	VF	RE Folkestone Warren - Walkway Repair Design & Budget	Email dated 01/11/2024	N/A	Email	For Information	-
Specifications								
A124022-TGEE-M0-XX-SP-C-0001	Seawall Repair	TGP	Folkestone Warren Holding Works Civils Specification	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 16/08/2024	N/A	PDF	For Information	P02
Scope								
Client Remit - Folkestone Warren CP7 Y1 v1.1	All	NR	Project Scope - Folkestone Warren Sea Defence Works	Email dated 21/11/24, "RE_ Folkestone Warren - Site Visit" - document date 09/02/2024	N/A	PDF	For Information	1.1
Design Drawings								
Seawall Repairs								
A124022-TGEE-M0-XX-DR-C-0200-P02	Seawall Repair	TGP	Repair Details - Overall Site General Arrangement	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 16/08/2024	N/A	PDF	For Information	P02
A124022-TGEE-M0-XX-DR-C-0201-P02	Seawall Repair	TGP	Repair Details - Buttress 22-23, Bay 22	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 16/08/2024	N/A	PDF	For Information	P02
A124022-TGEE-M0-XX-DR-C-0202-P02	Seawall Repair	TGP	Repair Details - Buttress 14-15, Bay 14	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 16/08/2024	N/A	PDF	For Information	P02
A124022-TGEE-M0-XX-DR-C-0203-P02	Seawall Repair	TGP	Repair Details - Closure Between Wall and Buttress	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 16/08/2024	N/A	PDF	For Information	P02
Rock Armour								
S100093-TGP-1702-KNT_XTD0-DRG-ECV-003160	Rock Armour	NR	Proposed Rock Armoured Revetment - General Arrangement Plan	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 20/08/2024	N/A	PDF	For Information	P01
S100093-TGP-1702-KNT_XTD0-DRG-ECV-003161	Rock Armour	NR	Proposed Rock Armoured Revetment - Layout 1 of 5	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 20/08/2024	N/A	PDF	For Information	P01
S100093-TGP-1702-KNT_XTD0-DRG-ECV-003162	Rock Armour	NR	Proposed Rock Armoured Revetment - Layout 2 of 5	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 20/08/2024	N/A	PDF	For Information	P01
S100093-TGP-1702-KNT_XTD0-DRG-ECV-003166	Rock Armour	NR	Revetment Details - Typical Details - Sheet 1	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 20/08/2024	N/A	PDF	For Information	P01
S100093-TGP-1702-KNT_XTD0-DRG-ECV-003167	Rock Armour	NR	Revetment Details - Typical Details - Sheet 2	Email dated 25/11/24 "_External Email_ FW_ Folkestone Warren - Intro_ Background Information" - document date 20/08/2024	N/A	PDF	For Information	P01

- Any change to these documents, may have an affect on the methodology proposed in this presentation.
- The information supplied, is believed to be the most up to date and most relevant information at the time.

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Introduction/Project Overview

- Folkestone Warren Sea Defences protect the strategically important rail line that links Folkestone to Dover which forms part of Network Rail's Kent primary route. This area contains coastal defences that front a section of steep chalk cliffs and coastal land slip complex. The defences of Folkestone Warren primary purpose is to prevent radial slippage occurring, wave overtopping protection is only a secondary benefit from the defences.
- Folkestone Warren is approximately 3 km in length and between 50 and 300 m wide. A 100 m high chalk cliff (the High Cliff) defines the back of the Warren. The Warren is located in front of the High Cliff and consists of hummocky lower ground (the Warren Under-cliff). The Warren is comprised of land slip material. The Folkestone to Dover Rail Line runs through Folkestone Warren in cuttings and tunnels.
- The aim of these works is to prevent further erosion and undermining of the coastal defences at frontage 1 of Folkestone Warren, through which the Folkestone to Dover railway runs.
- The coastal defences are split into 3 no. frontages as shown in Figure 1.

Figure 1. Folkestone Warren Coastal Defenses

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Introduction/ Project Overview

- Frontage 1, the western beach is comprised of a vertical mass concrete wall supported by mass concrete buttresses.
- The beach has lowered as a result of wave and coastal actions causing undermining of the concrete sea wall and movement of the buttresses.
- In order to prevent any further undermining of the sea wall, the following works are proposed, (see Figure 2).
- On behalf of VolkerFitzpatrick and Network Rail, through the SRE, VolkerStevin have been asked to look at these coastal defence works in their entirety.
- The aim of this presentation is to provide a high-level methodology for these works. This is to be used for consenting and planning purposes.

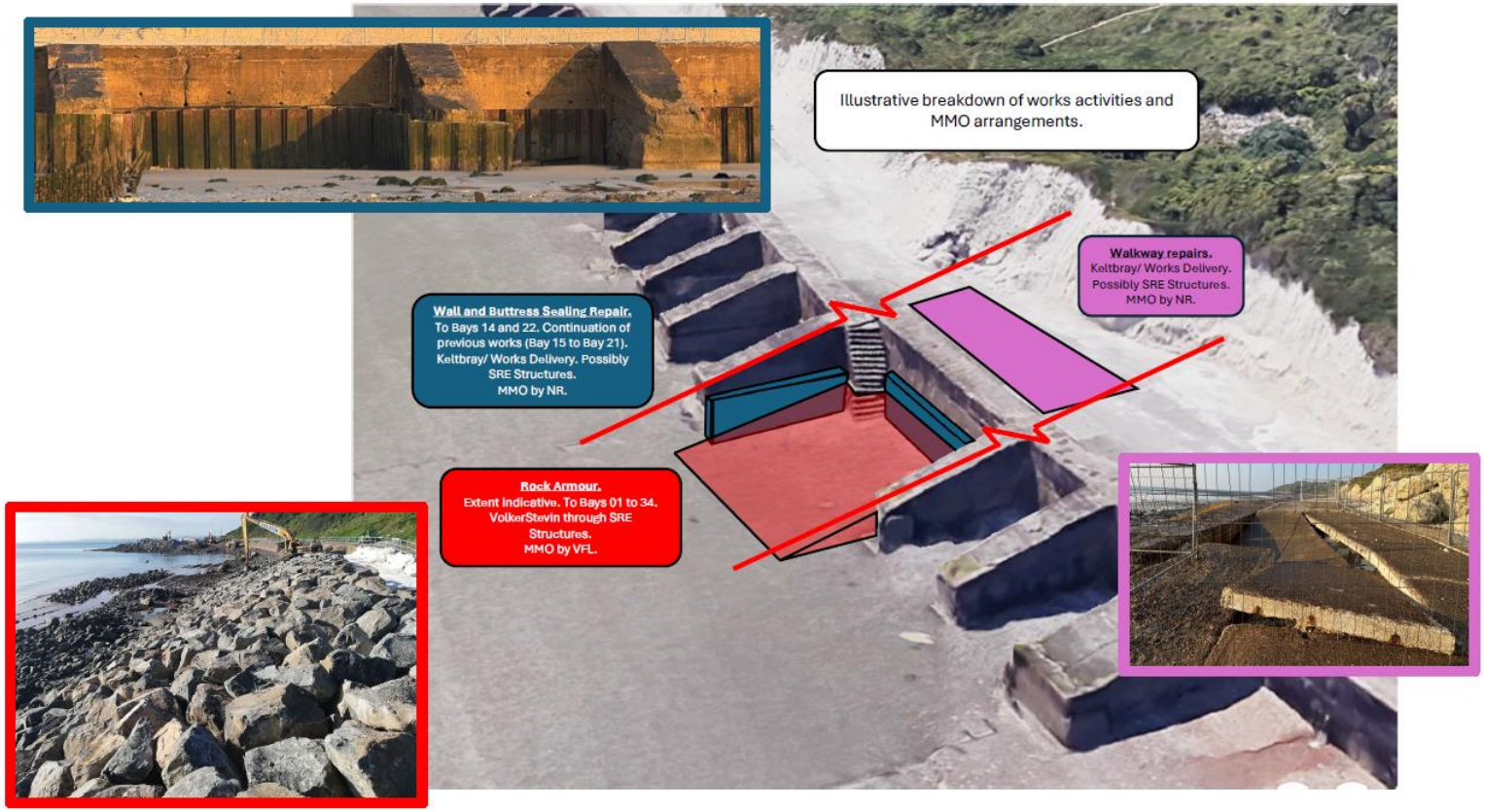

Figure 2a. Folkestone Warren Works Activities & Original MMO Breakdown

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MMO Application – Update 28/02/2025

- The MMO applications for the works are going to be split into two applications as per figure 2b.
- These 2nr applications are going to be applied for by TGP on behalf of VF.
- VS will input into the application with regards to construction methodology, and this presentation aims to fulfil those requirements.

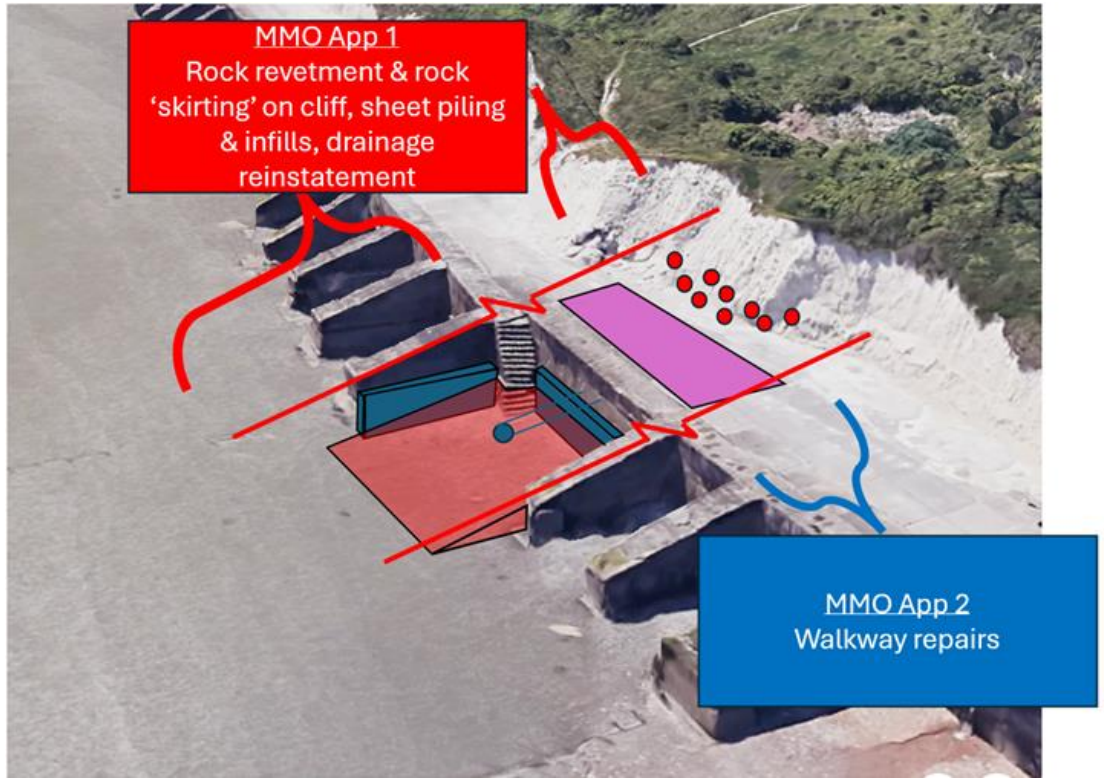

Figure 2b. Folkestone Warren MMO Breakdown Update 28/02/2025

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Key Site Hazards/Risks

The key site hazards & risks include, but are not limited to:

- Existing Track Suitability/ Cliff Slope Stability
- Working next to a live railway
- Working in/ alongside a tidal zone
- Plant Access/Egress onto the beach
- Punctured ships hulls on beach
- UXO

It is assumed that temporary works assessments may be required for the following activities.

- Access tracks inc. cliff and slope stability, as required.
- Track stability – Site compound route
- Site welfare bases.
- Beach access ramp / beach stability
- Walkway stability & cliff stability in the vicinity of these works
- Walkway haul road
- Walkway excavation/ shoring
- Walkway drainage excavation/shoring
- Piling gate
- RC Walkway Formwork
- Barge stability
- Ship moorings/ anchorage

Figure 3. Initial Hazards identified following site visits

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Overall Methodology Sequence:

1. Vegetation Clearance – Main Road & Compound
2. Compound & Site setup
3. Veg clearance – East coastal track (Compound to Frontage 1/ West Frontage)
4. TW – Beach Access Ramp
5. Walkway Repairs
    a) Resin inject settled slabs, bay by bay, east to west.
    b) Breakout and replace fully collapsed slabs with granular zero fines fill. (6a or similar).
    c) Use backfill as haul road for drainage works/ remaining works as required.
    d) Cliff Drainage/ flap valve/ tide valve works
    e) Concrete cap fully collapsed slabs at the end of the works.
6. Beach Clearance / Groyne Removal
7. Wall Repairs
    a) Piling – Bay 14 & 22
    b) Pile tie ins
    c) Buttress repairs – buttresses 10 to 14 and 17 to 19.
    d) Concrete plugs
    e) Piles cut to level
8. Rock delivery & placement - west to east
9. Pour concrete deck slabs - west to east

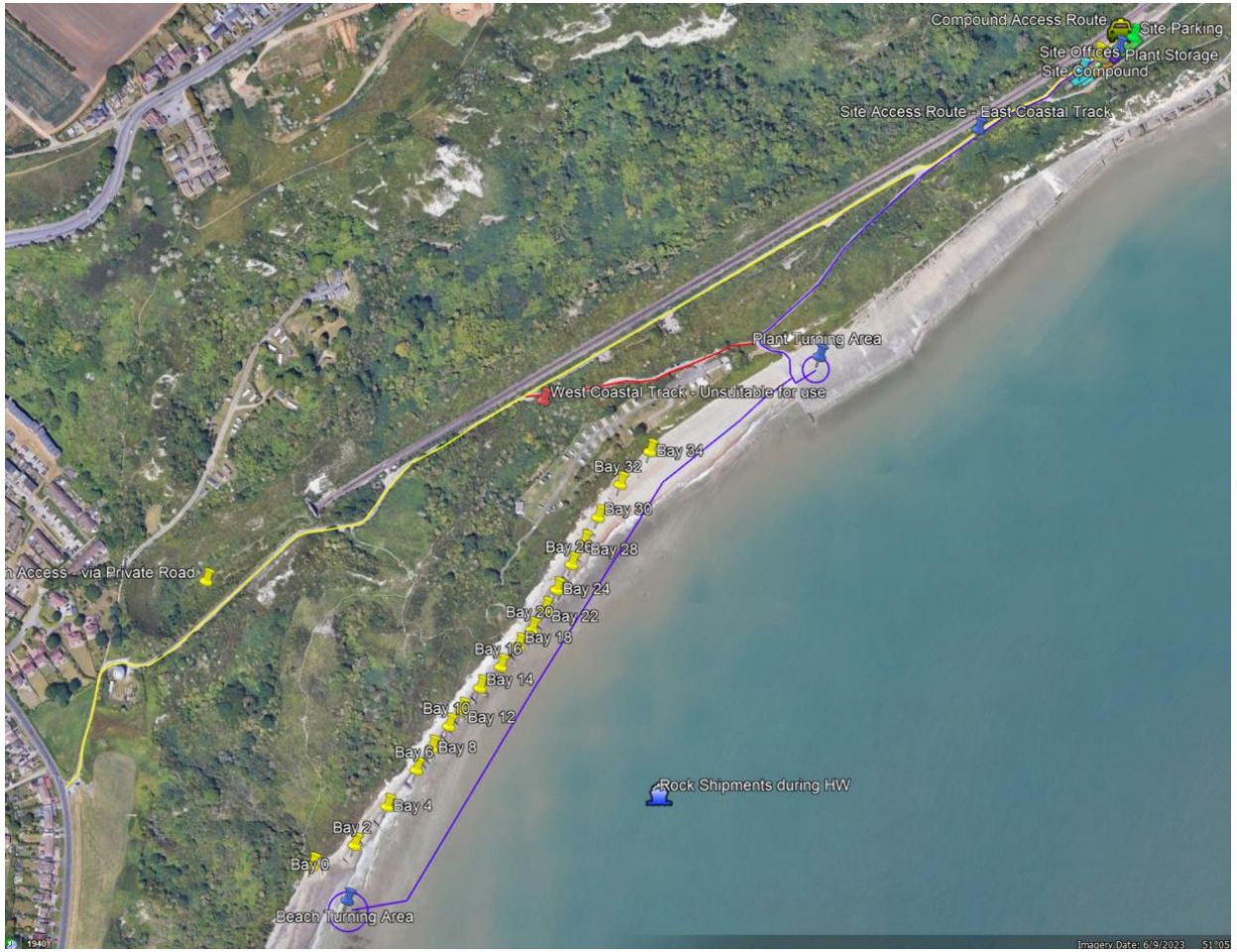

Figure 4. Google Earth Plan of Site

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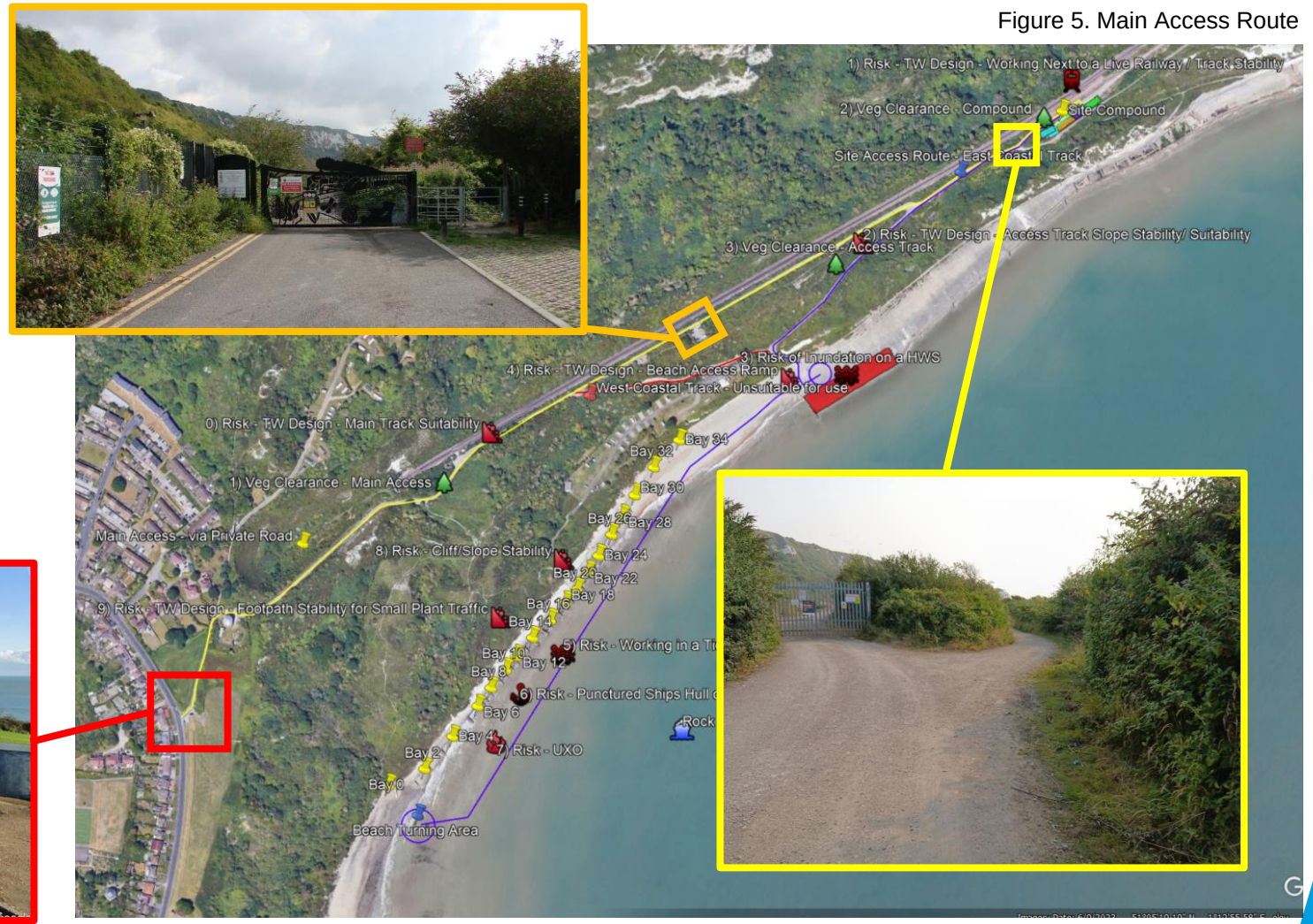
Anticipated Plant Required:

Activity Ref No's:	Activity	Anticipated Plant	Comments/ Additional items
2	Cabin Lift	LTM 1070 Mobile (now by VF)	
4, 5, 6, 7	Beach Access Ramp, Walkway Repairs, Walkway Drainage, Beach clearance, Buttress repairs concrete plugs	16t Excavator	Hydraulic Breaker, Hydraulic Grab, ditching bucket, toothed bucket, 1m3 concrete skip.
6	Beach Clearance	9t Dual view cabbed dumper,	
7	Buttress Repairs (Bays 14 & 22)	50t excavator, movax, vibro	Piling, tie ins, Movax, vibro sizes tbc.
8	Rock Placement (foreshore)	50t excavator, 35t excavator + lifting beam for geotextile. (A 90-100t long reach may be required to place the top layer of primary stone.)	Optional additional plant: 40t moxy (or multiple dumpers), 50t dozer w/ back actor.
9	Rock Placement (barge)	2nr 50t long reach excavators, KML Intrepid Barge (6500t capacity).	Tracked loading shovel may be used instead of an excavator. TBC by rock supplier.
10	RC Walkway Slabs	6m3 wagon	6m3 only due to access & space constraints.
6,7,8	Beach Works – Contingency Rescue Kit	Tractor + trailer or dozer + trailer	Used for sheetpile delivery but also as a contingency to rescue any beach plant following a breakdown. Dozer could also be utilised for the beach clearance works.

Main Access Route

- Main site access will be via a private road off Wear Bay Road.
- This private road will lead to the site compound that will be situated in a Network Rail area of hardstanding trackside.
- There are two locked gates leading to site. The first one has a public car park to the right and the second is the NR gate leading to their area of hardstand.

Figure 5. Main Access Route



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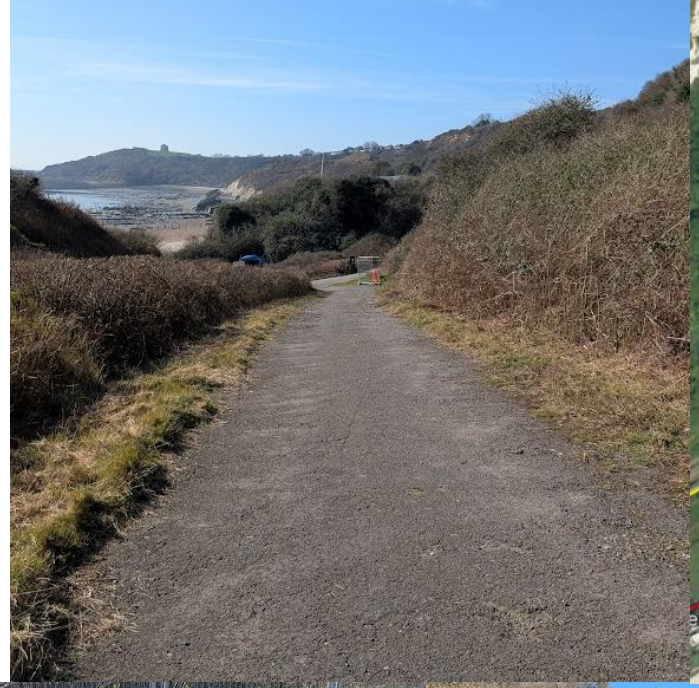
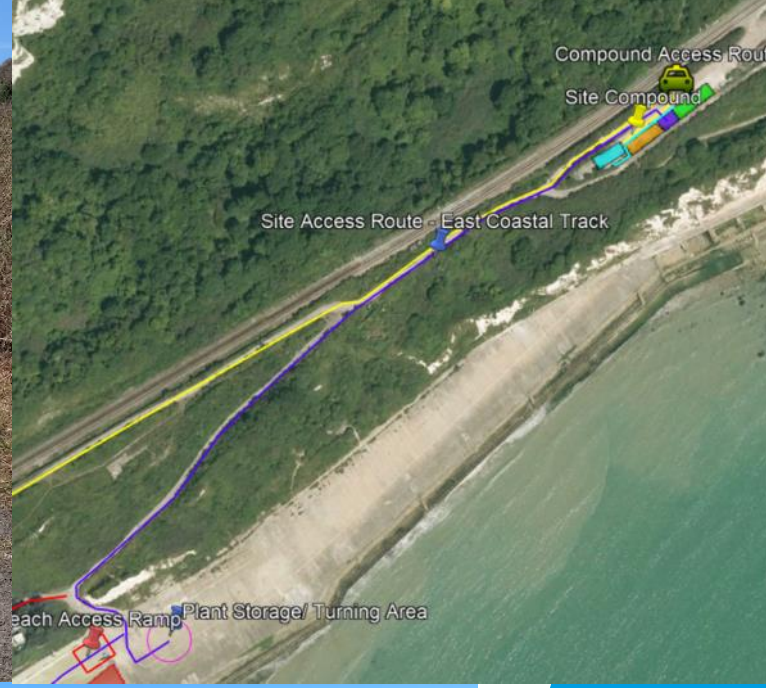
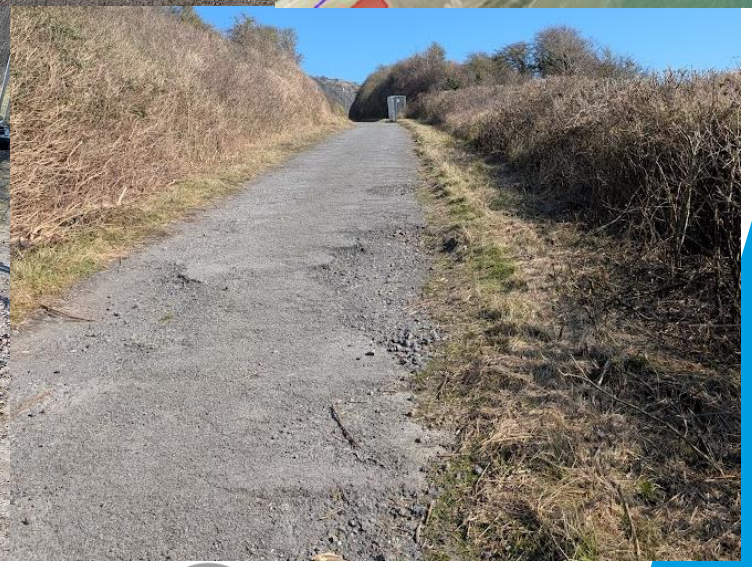
Eastern Site Access Route

- The main access to the works area will be via the existing eastern coastal track.
- Traffic will be limited down this track, with plant only using this track as required.
- When plant is delivered, it is to be stored at the works front on the existing concrete apron until works are complete
- This route has been trafficked in the past by NR, VF and other contractors. **A full TW assessment will be required to confirm its suitability.**
- **Track and slope monitoring, remedial works and track matting may be required throughout the works.**







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1) Veg Clearance

- Minor vegetation clearance may be required in the following three areas, ensuring all access tracks have a minimum of 4m width and the compound is clear of flora & fauna.
  1. Main access road
  2. Network Rail compound
  3. East coastal track leading to frontage 1 (west frontage)

Figure 6. Vegetation Clearance

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2) Site Compound (Now by VF)

- The site compound will be setup in a NR owned area of hard stand. This is to be undertaken by VolkerFitzpatrick prior to VolkerStevin works commencing.
- This hardstand comprises of a mixture of concrete hardstand and stone hardstand.

Site Offices:

- The setup will comprise of the following:
- 6nr 32ft Welfare units in a 3x3 double stack arrangement
- 60kva Generator
- Battery Storage Unit
- 3000litre fuel tank
- 1nr 5000litre waste tank
- 10,000litre potable water
- Circa 20m x 10m total required.

Material Storage Area:

- Existing concrete hardstand
- Circa 24m x 8m

Plant Storage Area:

- Existing area of concrete hardstand
- Circa 12m x 8m

Site Parking:

- Existing area of concrete hardstand
- Circa 25m x 8m

Figure 7. Proposed Site Compound Area

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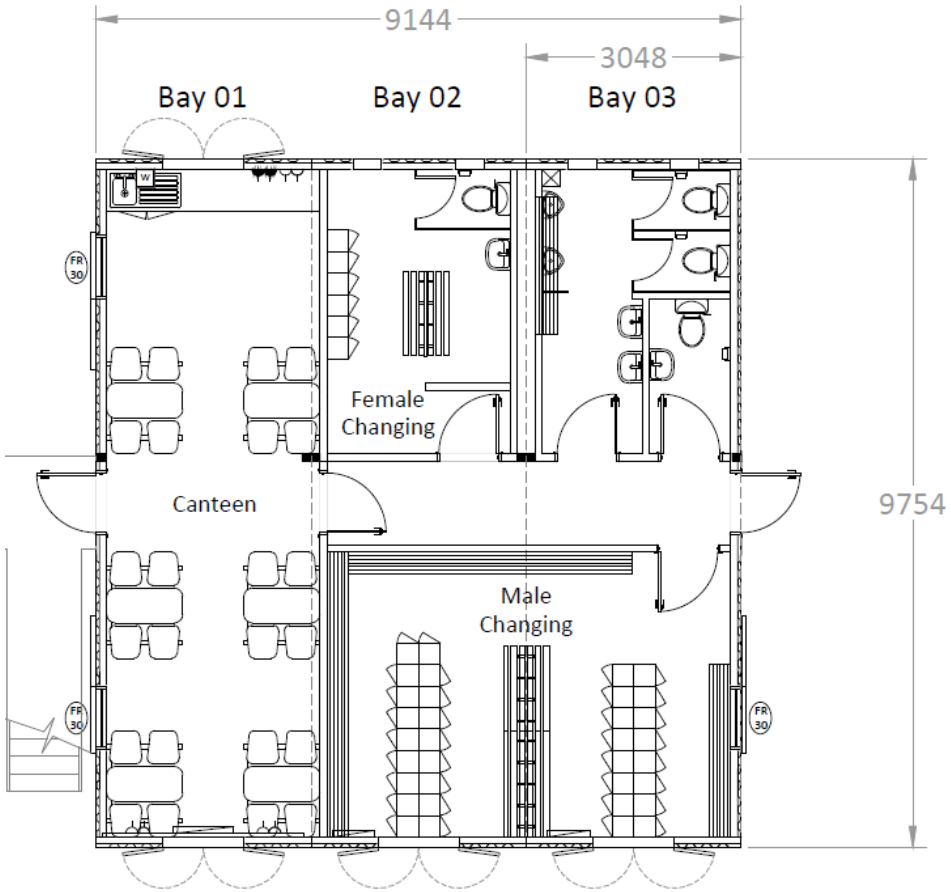
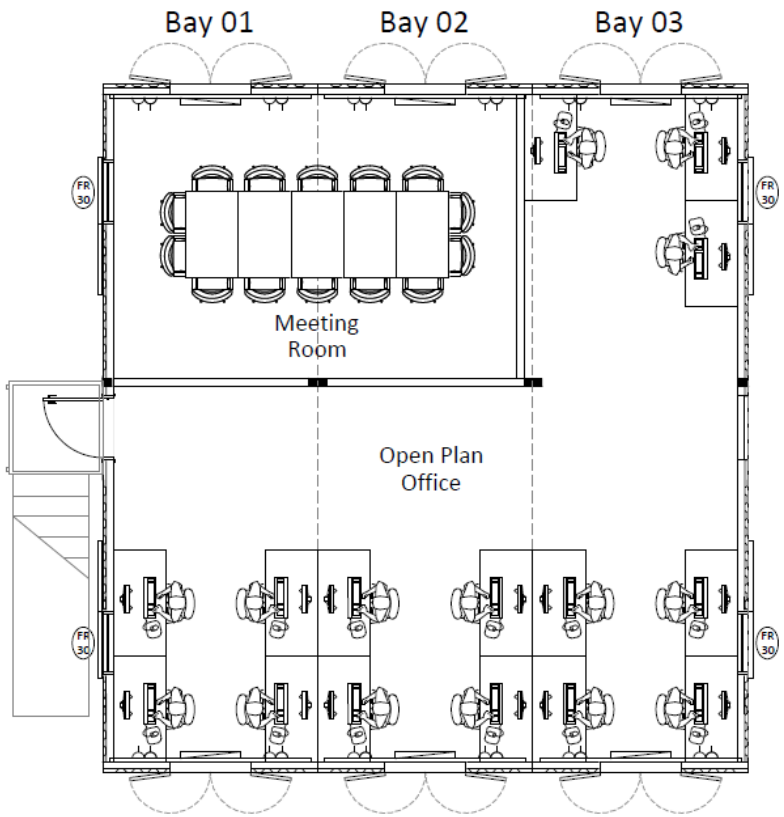
2) Site Compound (Now by VF)

Proposed layout by VF. Drawing 25-0579-001a.



Ground Floor Plan



First Floor Plan

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4) Beach Access

Any non-natural material import may be classed as contamination of the existing beach and may need further approvals.

- To gain plant access onto the beach safely, a ramp will be required.
- Assumed loadings over the course of the project: 50t excavator, 40t moxy, 9t dual dumpers, 16t excavator, 35t excavator.
- The existing beach level is approximately 1m lower than the existing concrete hardstand.
- This ramp is assumed to be outside of the tidal zone, with the bottom photo taken at 07:30 03/12/2024 during the Low Spring tide.
- **This ramp will be subject to a TW assessment and design.**
- However, the assumed dimensions and construction details are a ramp built up using the existing beach material

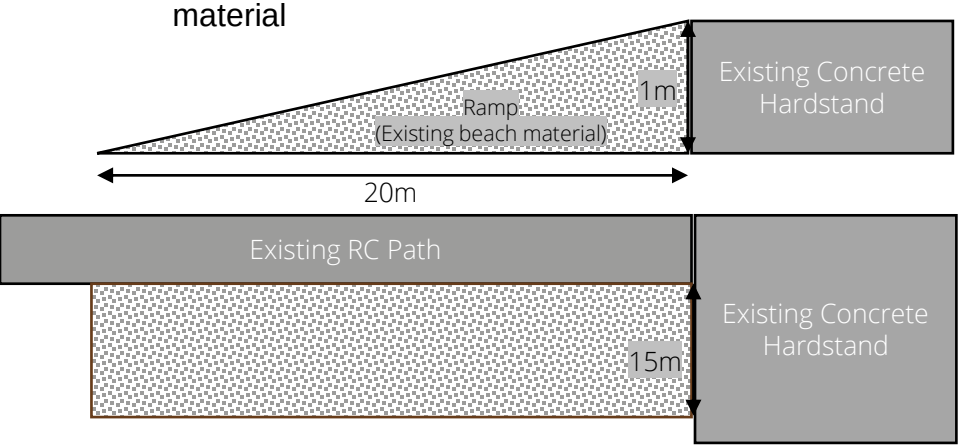

Figure 8a. Area requiring beach access ramp

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4) Beach Compound (by VF)

- A small beach compound will be required on the existing concrete apron. This is to be supplied by VF, prior to VS works commencing.
- This compound will consist of a small towable welfare unit and/or toilets, and an area for plant storage for all the kit required to undertake the works.
- This will ensure the coastal access track is not unnecessarily trafficked throughout the works.
- Precautions will need to be taken to secure all plant from damage or theft when left down here.
- Options to include but not limited to:
  - Hydrogen or Solar CCTV towers
  - Bolt down anchor posts/plates for the plant (TW required)
  - Bolt down perimeter fencing.
  - Plant securing boards/shutters
  - Fuel securing boards for onboard tanks (main refuelling to be undertaken by towable bowser stored in the main NR compound.)

Figure 8b. Beach compound layout

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5) Walkway Repairs

- Frontage 1 has approximately 710m of existing RC slabs along the back of the seawall.
- These slabs are used as footpath for caused however they are not a formal Public Right of Way.
- This permissible right of way, is in a state of disrepair due to loss of fines and gradual calcium carbonate solvation of below the slabs. This has caused many voids to appear and slabs to break.
- There is an aspiration to repair these walkways, however the full extent is yet to be determined, as deterioration continues to worsen.
- Original scope under a previous scheme was estimated at 600m2 of repairs, however the walkway has deteriorated significantly since that total.
- This walkway will have to remain closed for the duration of these works.

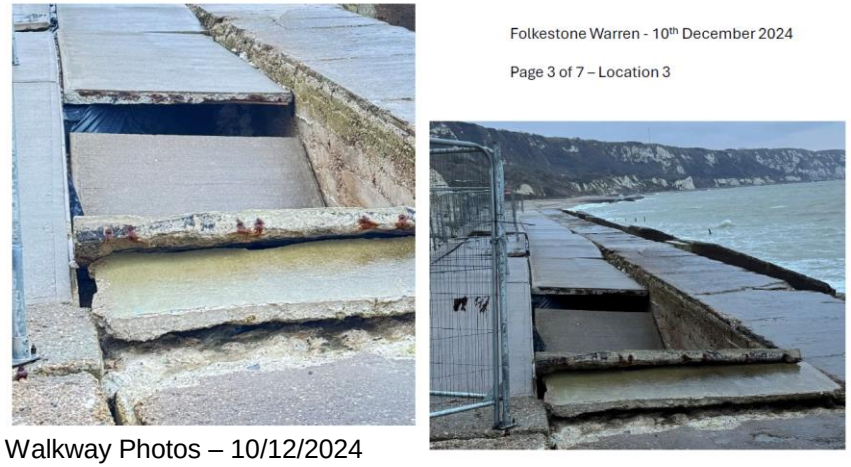

Figure 9. Walkway Photos – 10/12/2024

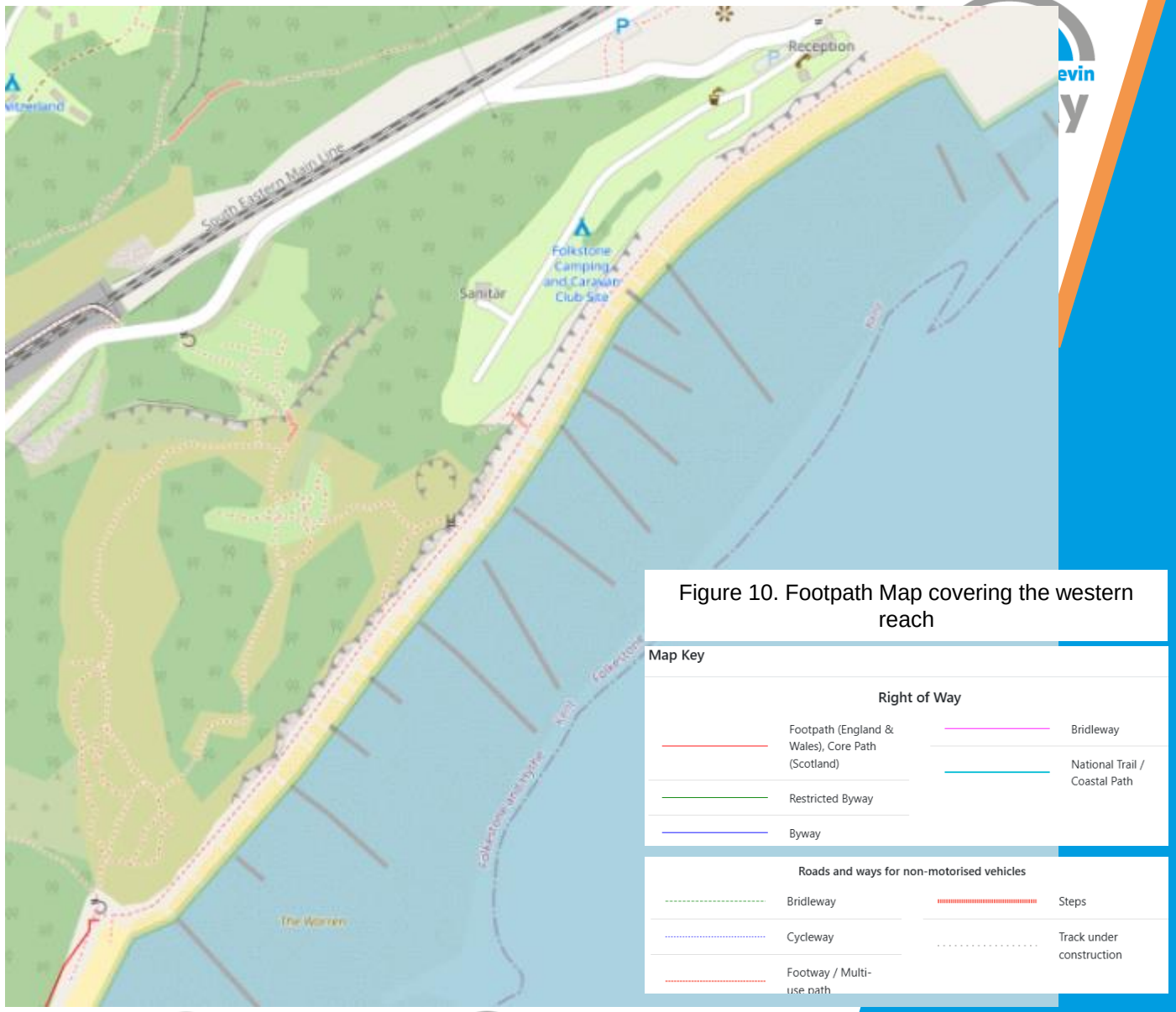

Figure 10. Footpath Map covering the western reach

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5) Walkway Repairs cont.

- There is no formal design for these works, however our assumption for what is required, is detailed below.
- This would also potentially enable the trackway to be used as a temporary haul road to enable the rest of the coastal works but also provide a permanent "soft" solution for Network Rail. **A TW design would be required for this.**
- Working from east to west, bay to bay:
  1. Drill and fix 470 linear metres of keyclamp handrail into the existing wall and timber sleepers edge delineation.
  2. Core and place injection resin beneath all lowered RC slabs. The resin is environmentally friendly and flash cures much quicker than grout/concrete.
  3. For any fully collapsed RC slabs, these are to be broken out locally using a 16t excavator and breaker. Concrete to be broken into <500mm pieces as per the SHW 600 specification for 6a and re-used as backfill.
  4. Excavate the sub-base behind the sea wall to a firm strata as agreed with the designer i.e. only remove any loose materials. **TW designs may be required for shoring. This should be a CAT 0 if using a proprietary system. TW check will be required for the adjacent cliff stability. Assumed 1m deep excavation maximum.**
  5. Initially these locations are to be locally backfilled to the top of the wall, using the site won broken concrete, plus a self compacting granular fill such as Class 6a or track ballast. Class 6a to be a free draining hardrock such as Granite. (VE opportunity here if there is free issue track ballast available).
  6. Once backfilled, CBR or plate load tests may be required by TW as advised by TW.
  7. At the end of the works, these local bays backfilled with stone will be excavated down to a suitable level so a new RC slab can be cast. More information can be seen in section 9.
  8. **Trackway TW design required. Expected plant loadings for consideration: 16t excavator with 1m3 skip, 6m3 concrete wagon, .**

This methodology would **NOT** require the walkway to be excavated in its entirety.

Assumptions:

- The walkway is to be resin injected from Bay 0 to Bay 30 only – approximately 470 linear metres.
- Localised excavation, fill, rc repairs for collapsed bays will be treated when those are bays are reached. Estimated at around 20 slabs. Final number TBC onsite.
- Walkway width varies between 2m to 8m. 5m width assumed for estimating purposes.
- 6a excavation depth is no more than 1m.
- If a full depth excavation is required behind the wall, this will be circa 6m deep (Based on existing levels on the rock armour drawings. 6mAOD to 0mAOD.)

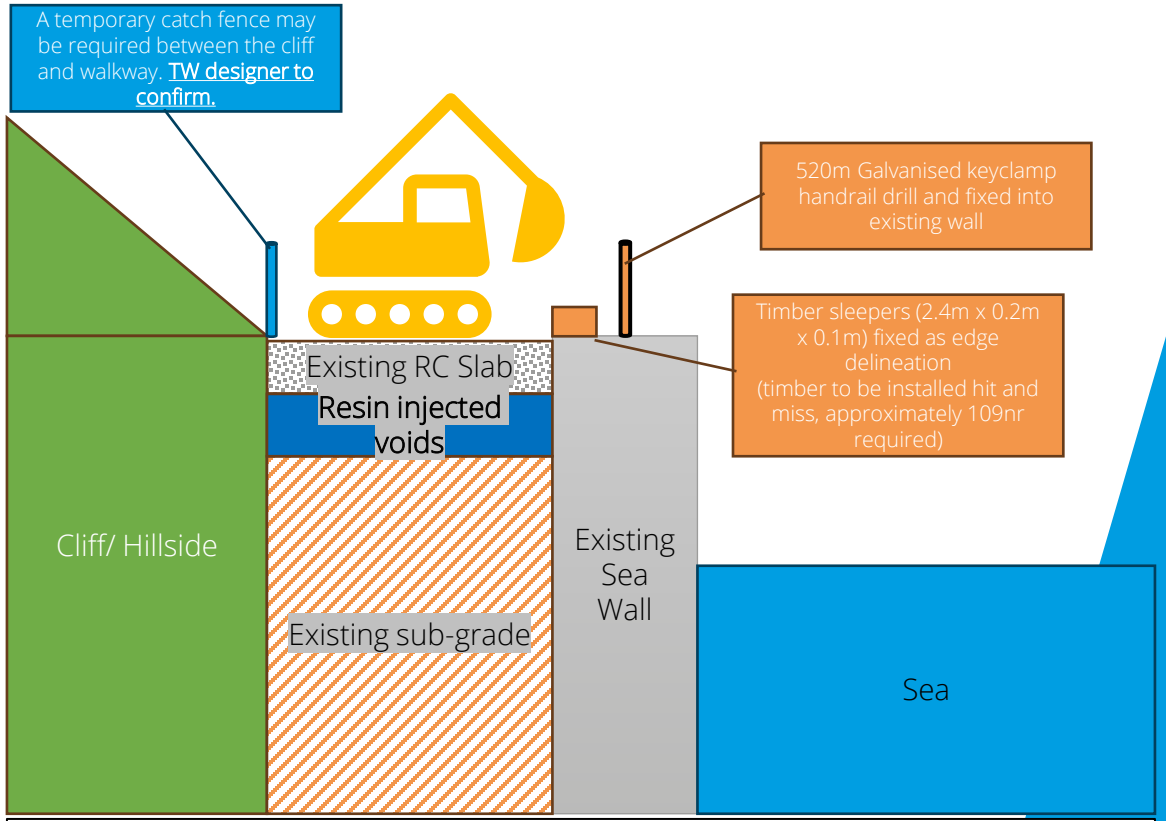

Figure 11c. Assumed General Arrangement/ Section showing the option 3 walkway repair

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5c) Cliff Drainage Repair

- At Bay 25, there is a section of existing surface water drainage that has been hand dug into the chalk cliff. There is then a brick chamber that leads to a presumed 300mm dia. drain and outfall through the existing seawall.
- As the cliff has slipped, this brick chamber has subsided circa 1m, causing the sea outfall drainage run to collapse.
- This is then believed to be causing a backup of the surface water drainage.
- VF/Network rail, require this drainage to be reinstated and new outfall to be installed. The expected extents of the repairs are shown in Figure 12.

Figure 12. Walkway Drainage Repair Extents – 01/11/2024

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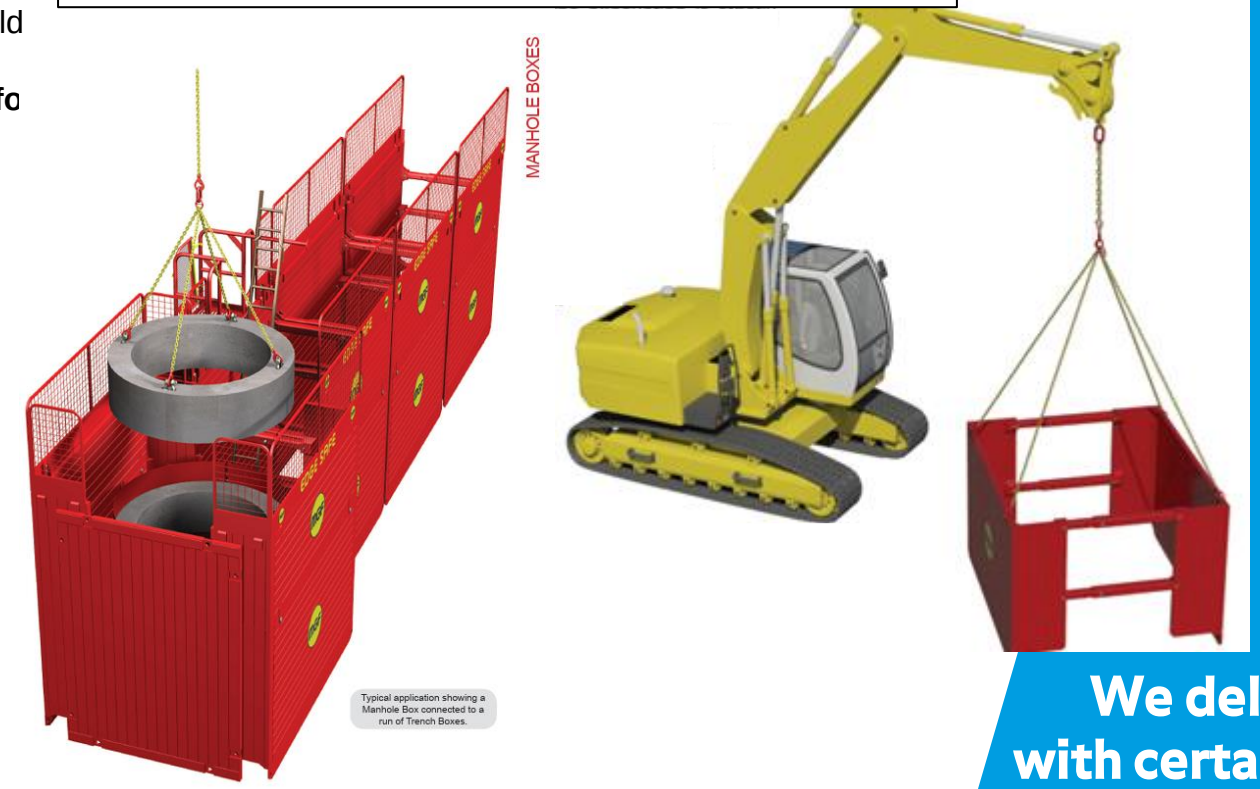
5c) Cliff Drainage Repair cont.

- There is no formal design for these works, however our assumption for what is required, is detailed below.
  1. Break out the existing concrete slab in front of the existing brick chamber using a 16t excavator and breaker.
  2. Excavate the sub-base between the sea wall and existing brick building to a firm strata as agreed with the designer. **Assumed 3.5m maximum depth**.
  3. A proprietary manhole box & trenchbox will be used to go between the seawall and brick building. MGF boxes have been pre-approved by our TW team as a proprietary system, so this should only require a CAT 0 TW check for these works.
  4. **TW designs will be required for excavation or shoring and fo the adjacent cliff stability.**

Figure 13. Assumed Walkway Drainage Repair



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5c) Cliff Drainage Repair cont.

4. Once excavated to a suitable sub-base, the hut rc roof slab is to be removed using a 16t excavator, breaker and grab.
5. DN1500 pre-cast chambers are to be lifted down into the centre of the existing brick chamber using the 16t excvator. Existing brick chamber is circa 2.1m x 3.6m. The bottom ring is to be placed on the existing chamber base. **(assuming the existing base is level and in suitable condition)**
6. The existing armco culvert within the building is to be temporarily half dammed using sandbags and polythene.
7. A suitable sized pipe bung may also be used, however it will need a release valve so it can be drained down slowly before removing. A half dam would allow overtopping following any adverse weather and high run off coming through the system. **TW design would be required for this dam.**
8. Any excess water is to be pumped out using a series of 6", 2" and puddle pumps, as required.
9. If there is high flow through the existing culvert, it may have to be temporarily diverted around the pre-cast units whilst the new drainage is built offline. **A TW design would be required for this.**

Figure 15. Existing Armco Culvert and Proposed half dam

Figure 14. Subsided brick building

Capacity Check: -3m depth
CAT 315, 3m radius, cross track, -3m depth capacity = 6350kg.

1500mm dia. x 1500mm ring		= 1995kg.
	20% FOS	= 399kg
	Hook & tackle	= 150kg
	All up	= 2544kg

2544/6350 * 100 = 40% capacity

Capacity check : -4.5m depth
CAT 315, 3m radius, cross track, -4.5m depth capacity = 3450kg

1500mm dia. x 1500mm ring		= 1995kg.
	20% FOS	= 399kg
	Hook & tackle	= 150kg
	All up	= 2544kg

2544/3450*100 = 74% capacity

Assumptions:
Maximum 4m depth required.
Manhole chamber to finish flush with walkway slab.

Cat 315 Serial Number Prefix 0WKX
Boom Length 4.65m
Stick Length 3m
Track Pad Width 700mm

Standard Lift

		1500mm / 60 in		3000mm / 120 in		4500mm / 180 in		6000mm / 240 in		7500mm / 300 in				mm in
7500 mm 300 in	kg lb					2700	2700					2600 5850	2600 5850	4540 14' 3"
6000 mm 240 in	kg lb					3450 7550	3450 7550	2400	2400			2200 4850	2200 4850	6070 19' 8"
4500 mm 180 in	kg lb					3650 7950	3650 7950	3450 7400	2700 5800			2050 4500	2050 4500	6960 22' 8"
3000 mm 120 in	kg lb			5850 12100	5850 12100	4800 10350	4050 8700	3950 8550	2600 5600			2050 4500	1850 4100	7440 24' 4"
1500 mm 60 in	kg lb			8750 18800	6850 14750	5600 12050	3800 8150	3950 8500	2500 5350	2500	1800	2150 4750	1750 3850	7590 24' 10"
0 mm 0 in	kg lb			7000 16150	6400 13750	5900 12650	3550 7650	3850 8250	2400 5150			2400 5250	1800 3900	7430 24' 4"
-1500 mm -60 in	kg lb	4300 9650	4300 9650	8500 18350	6300 13450	5750 12400	3450 7400	3750 8100	2350 5000			2850 6250	1950 4250	6940 22' 8"
-3000 mm -120 in	kg lb	7450 16700	7450 16700	6650 14350	6350 13600	4700 10000	3450 7450	3000	2350			2950 6400	2350 5200	6050 19' 8"
-4500 mm -180 in	kg lb			3450 7050	3450 7050							2050 4250	2050 4250	4490 14' 4"

Figure 16. CAT 315 Lift Chart – 700mm tracks

Marshalls /commercial

Technical data

DN (mm)	Depth (mm)	Wall thickness (mm)	Outside diameter (mm)	Approx. weight (kg/m depth)
900	250/500/750/1000	70	1040	530
1050		80	1210	710
1200		90	1380	912
1350	500/750/1000	95	1540	1080
1500		105	1710	1330
1800		115	2030	1760
2100		125	2350	2140
2400		140	2680	2740

Figure 17. Marshalls Traditional Manhole Ring Sizes Table

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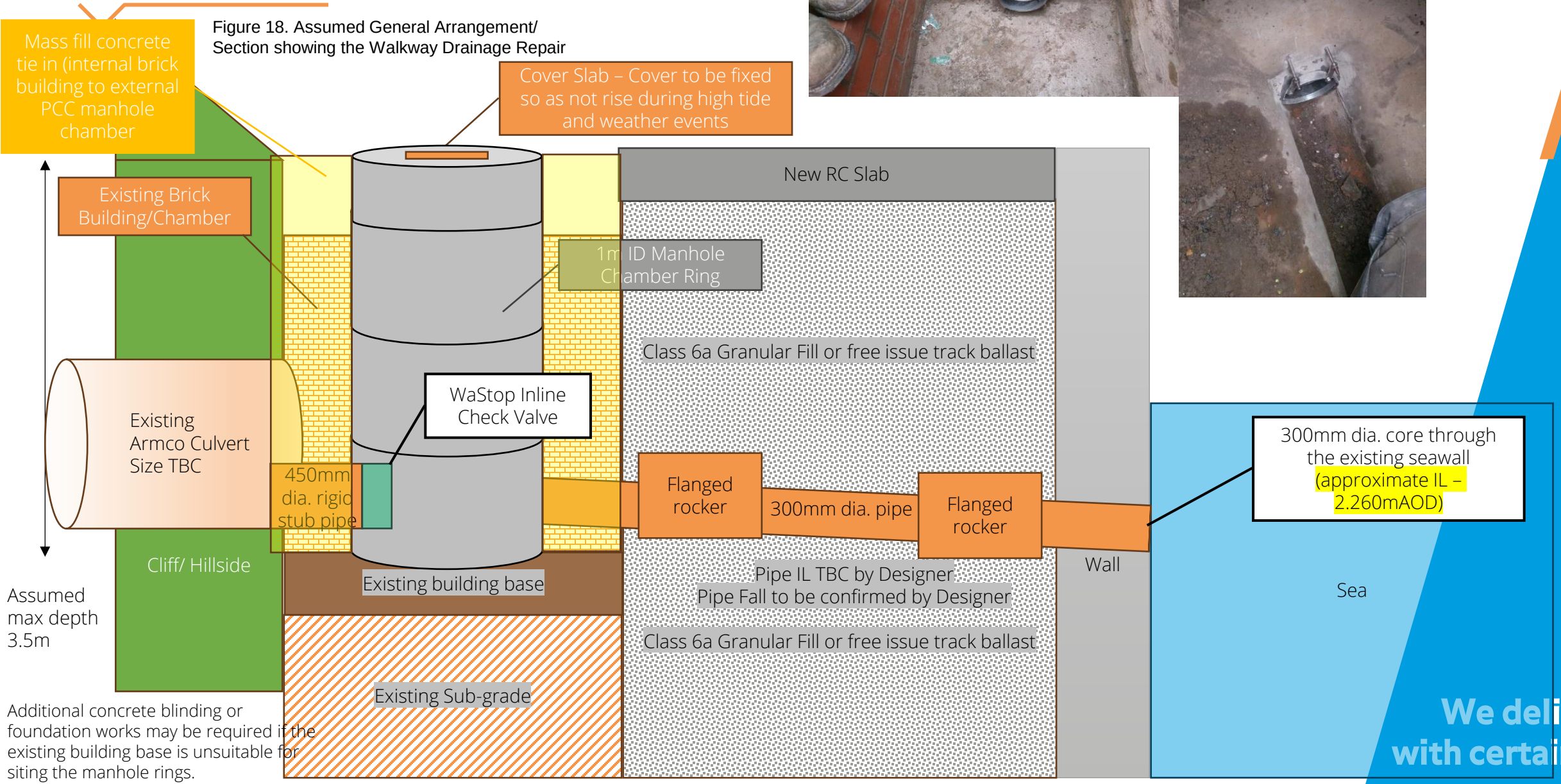
5c) Cliff Drainage Repair

Figure 18. Assumed General Arrangement/ Section showing the Walkway Drainage Repair



Additional concrete blinding or foundation works may be required if the existing building base is unsuitable for siting the manhole rings.

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5c) Cliff Drainage Repair – WaStop Inline Check Valve

About Wastop Inline Check Valves

The WaStop inline check valve can be installed at any angle and even inline. It's also incredibly versatile as it does not require a head wall. Installation is quick and flexible taking only a fraction of the time compared with traditional flap valves. It requires greater pressure to open than it does to close. This ensures your pipelines stay clean and debris passes through with ease because of the flushing action which it creates.

Furthermore, with no mechanical parts which can be prone to blockage from rag and debris. The membrane also ensures that debris cannot prop the valve open which can be an issue for flap valves.

Why Choose Wastop Inline Check Valves

01

Versatile And Easy Installation

The WaStop inline check valve can be installed at any angle and even inline, without requiring a head wall. Its installation process is quick, flexible, and much faster compared to traditional flap valves.

02

Effective Debris Management

The valve requires greater pressure to open than to close, ensuring that pipelines stay clean and debris passes through easily. Additionally, the membrane prevents debris from propping the valve open.

03

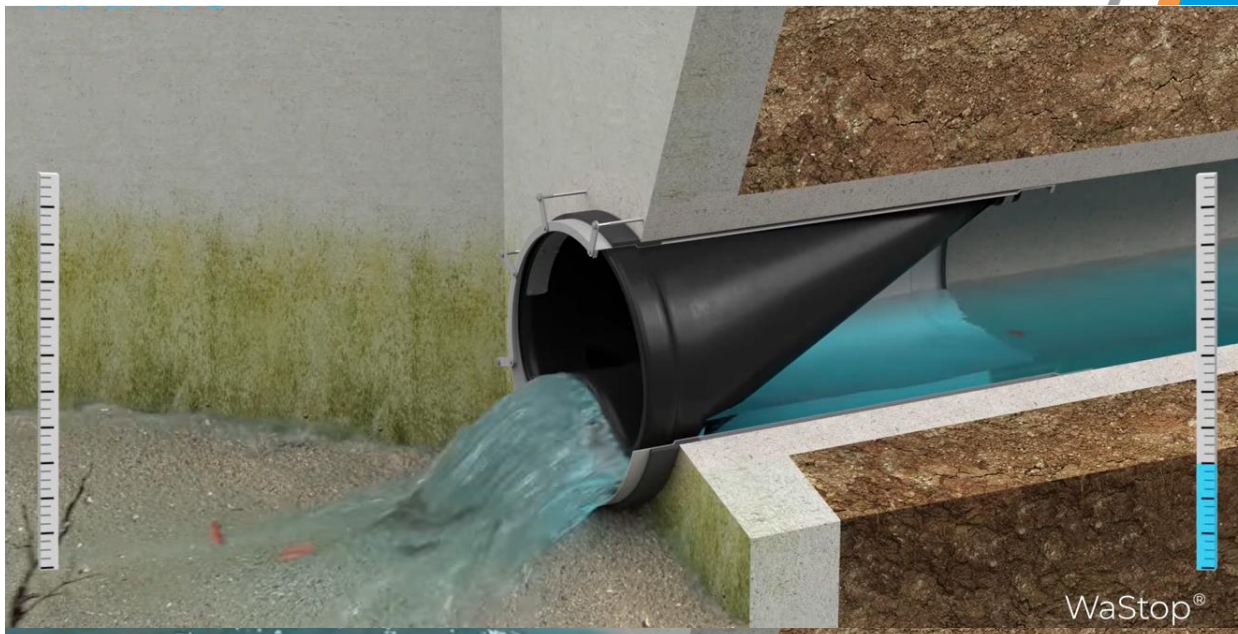
Autonomous Operation

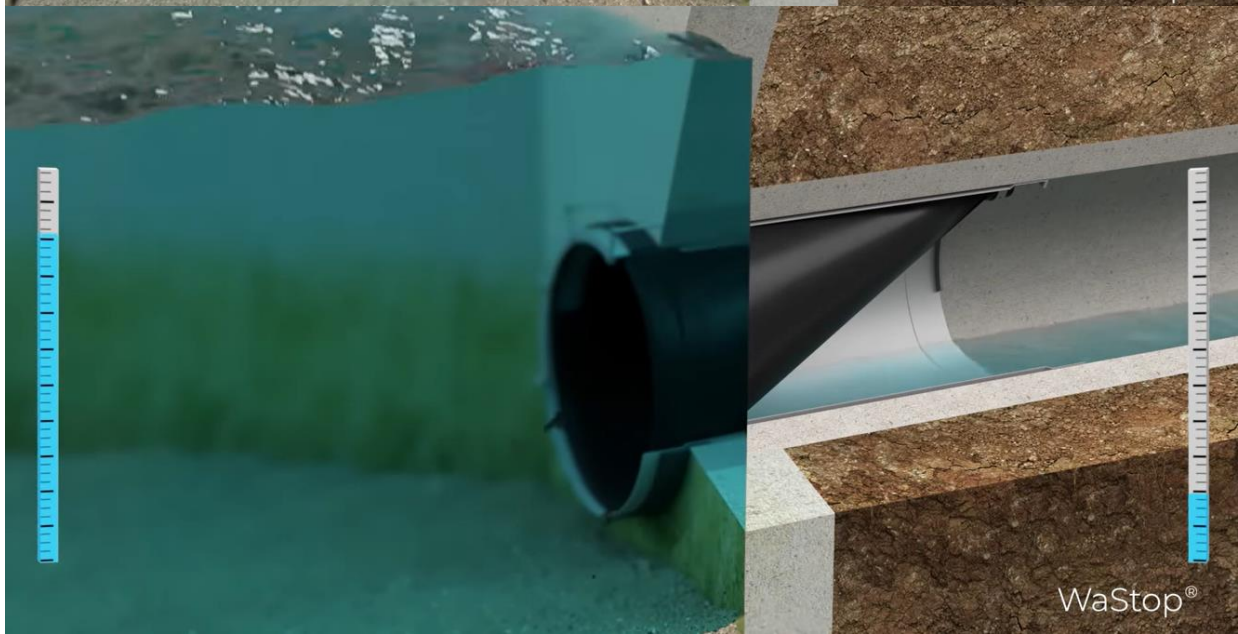
The unique design of the WaStop inline check valve allows it to work autonomously, based on differential pressure. This removes the need for human interaction or electricity, making it a low-maintenance solution.

04

Proven Backflow Prevention

Since its inception in 2000, the WaStop Inline Check Valve has been efficiently preventing backflow and protecting millions of people from flooding worldwide.





5c) Cliff Drainage Repair cont.

Based on Sewers for adoption, 7th edition, the following considerations will be required for the final design:

E6.6 Pipes and Joints Adjacent to Structures

1. Where rigid pipes are used, a flexible joint shall be provided as close as is feasible to the outside face of any structure into which a pipe is built, within 150 mm for pipe diameters less than 300 mm. The design of the joints shall be compatible with any subsequent movement.

2. The recommended length of the next pipe (rocker pipe) away from the structure shall be as shown in Table E.12.

Nominal diameter (mm)	Effective length (m)
150 to 600	0.6
600 to 750	1.0
over 750	1.25

3. Stub pipes into structures shall be of rigid material.

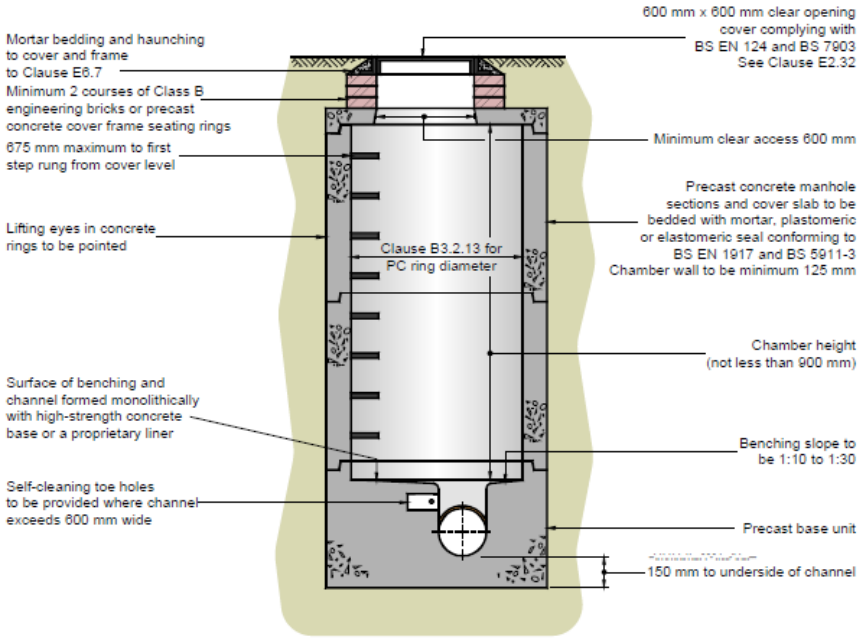
12. Manhole diameters (Type 1 and 2 only) should be in accordance with Table B.1.

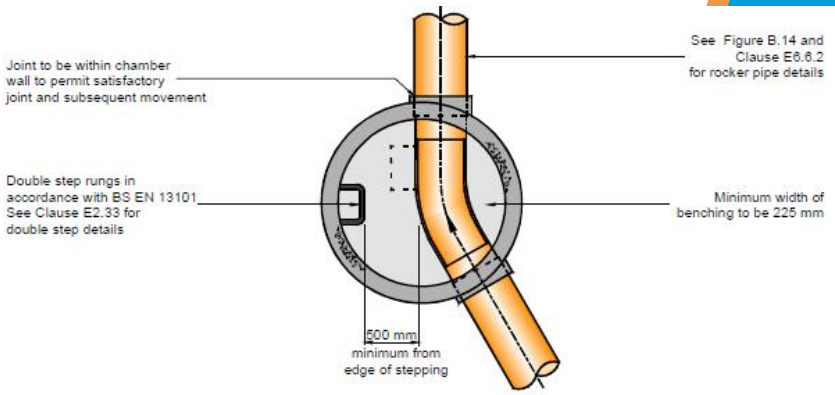
Table B.1 Manhole diameters

Nominal internal diameter of largest pipe in manhole (mm)	Minimum nominal internal dimension of manhole (mm)
Less than 375	1200
375 – 450	1350
500 – 700	1500
750 – 900	1800
Greater than 900	Pipe diameter + 900

13. The height of a Type 1 manhole (benching to slab soffit) should normally be in excess of 2000 mm. When this is impracticable, Type 2 manholes are preferred, subject to an absolute minimum height (benching to slab soffit) of 900 mm.

FIGURE B.13
TYPICAL MANHOLE DETAIL - TYPE 2 (Alternative construction detail)
Maximum depth from cover level to soffit of pipe 3.0 m





Not to scale

Assumptions based on SFA – chamber dimension 1350ID, therefore 1350-900 = max 450mm dia. for inlet. Outlet to be 300mm dia. leading to 300mm flap valve.

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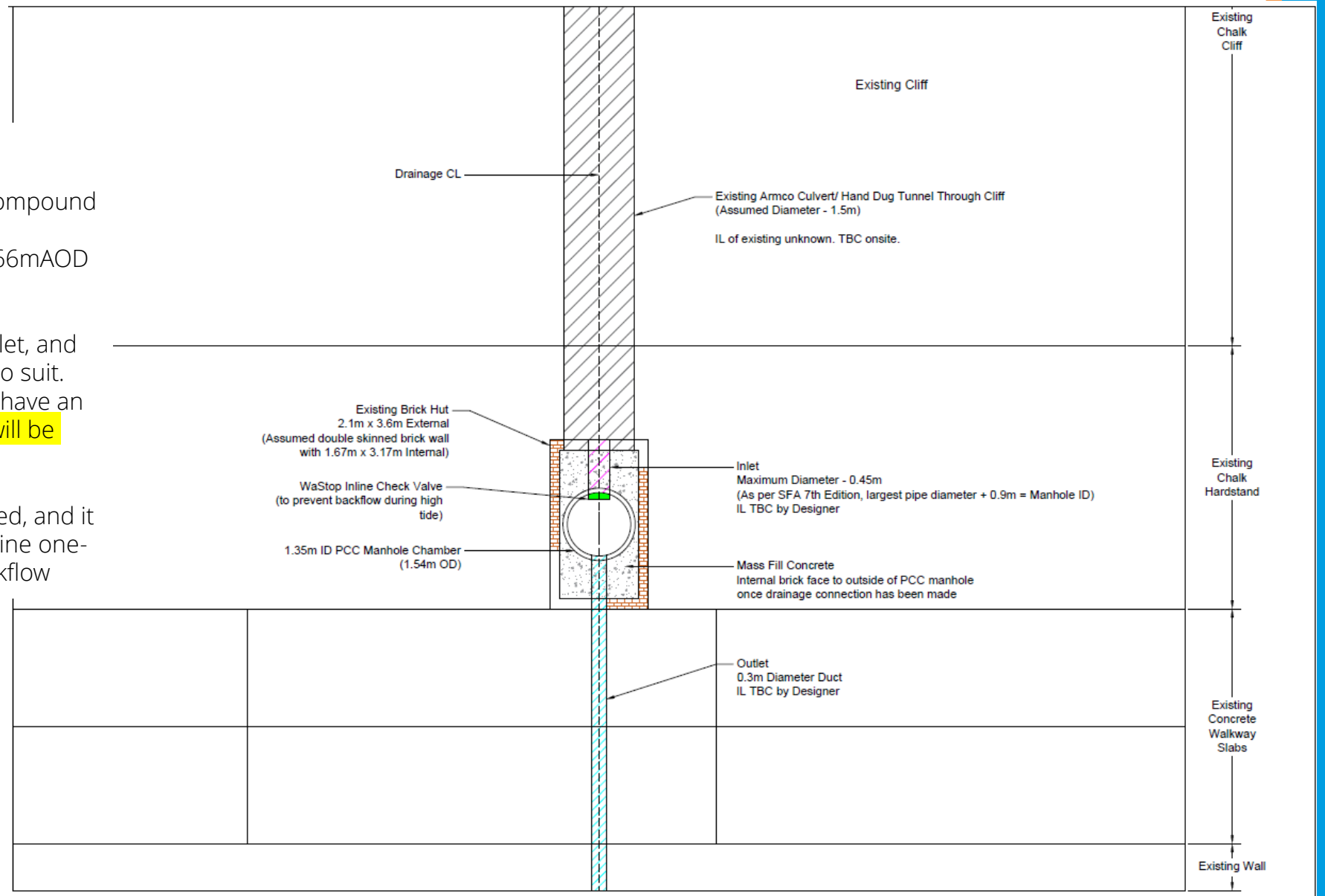
5c) Cliff Drainage Repair cont.

Proposal Sketch, final design TBC by Designer.

- MHWS in relation to the works are as follows:
- MHWS = 3.13mAOD or 6.8mCD. The beach compound will be on the existing concrete apron at circa 5.850mAOD, the walkway repairs vary from 4.66mAOD to 6.33mAOD.
- The lowest part of the drainage will be the outlet, and as there is no design yet this can be adapted to suit. The two existing outlets of the failed drainage have an invert level of 2.26mAOD and the new outlet will be cored at the same level.
- As per NR requests no flap valve will be installed, and it will be left as an outlet/core in the wall with inline one-way valve back at the chamber to prevent backflow



5c) Cliff Drainage Repair

10. Following installation of the manhole rings and tie into the existing culvert, the seawall outfall is to be cored from inside out using a Hilti D400 rig (or similar). **Designer to confirm the required IL for the outlet, existing IL is approximately 2.260mAOD**.

As per NR requests, no flap valve will be installed, and it will be left as an outlet/core in the wall with an inline one-way valve back at the chamber to prevent backflow. These cores are standard practice along the seawall at the locations of the other existing cliff drainage outfalls.

10. The area is to be backfilled using class 6a (or similar) up to the required IL for the pipe. **Designer to confirm IL for the pipe at the manhole chamber/ existing culvert tie in.**
11. The 300mm diameter pipe is to be installed and grouted into position at both the chamber tie in and seawall tie in using a suitable underwater non-shrink grout. **This activity is to be undertaken on the ebb of the tide to give the grout enough time for the initial cure, prior to inundation.**
12. Once cured and set in position. The remainder of the excavation is to be backfilled with the granular fill, to the underside of RC slab level.

Figure 19. Bay 24 2nr existing drainage outfalls to be replaced with single 300mm diameter core.

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6) Beach Clearance

- Prior to any rock shipments to site, the beach will require clearance of all protruding materials such as old groyne steels/ timbers.
- This is required for several reasons, mainly to provide a clear bay to allow for safe rock deliveries by ship and barge. Any materials left protruding the beach level could puncture the hull of the floating plant potentially causing both an environmental and H&S incident.

1. On Low Tide using the 16t excavator, from East to West the beach is to be cleared of all debris, rocks and failed groyne materials using the bucket, breaker and grab attachments as required. **Consideration on requirement for a second excavator so one can clear, and one can load.**
2. Any protruding materials are to be removed wherever possible.
3. For the existing rocks, mudstone and chalk, it is anticipated that these will be left in-situ wherever possible, and the rock is to be delivered and unloaded into two drop zones that are clear of all rocks,debris and obstructions. For the drop zones, the 16t excavator will be able push these into the sand to create a level platform for any floating kit to beach onto without risk of puncturing the hull.
4. Any steelwork and timbers are to be removed with 16t excavator and loaded to a 9t dual view dumper and temporarily stockpiled on the concrete platform/apron to the East.
5. On High Tide or once all debris is cleared from the beach, the 16t is to load the dumper from the stockpile on the hardstand, and transport to the site compound for muck away.

Figure 20. Holobuilder Scene 09 – Foreshore and Debris Extents adjacent to Bay 27 – Low Spring Tide

Beach debris includes a mixture of general washup, old groyne steelwork and timber, mudstone & chalk from the cliff slip, concrete and general rocks.

Figure 21. Holobuilder Scene 89 – Bay 24 to Bay 25 Groyne

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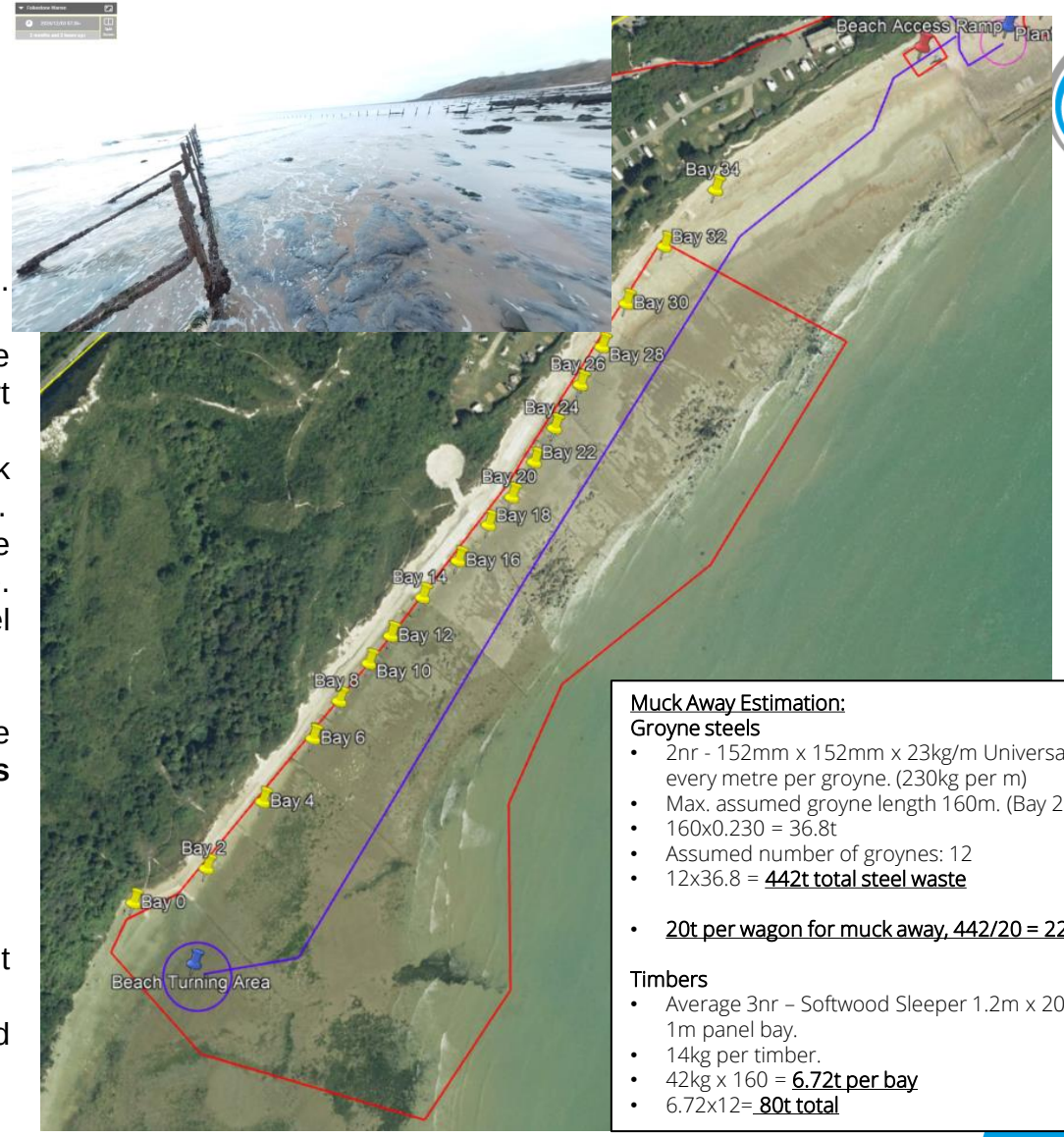
6) Beach Clearance cont.

4. Debris to be mucked away using a 20t wagon and grab via EcoEfficiency . Classification testing will be required for muck away.
5. It is assumed that the debris is to be taken away as waste. However, there is potential Bio-diversity opportunity to put back after as it is currently part of the existing beach habitat. **For discussion.**

- Beach debris includes a mixture of general washup, old groyne steelwork and timber, mudstone & chalk from the cliff slip, concrete and general rocks.
- For this methodology, only the steel work and timber groynes are to be removed. All other materials are to be left in-situ wherever possible. However, some areas will need to be levelled to match the beach level using the back of the excavator bucket or a dozer and blade.
- Total muck away is estimated at **442t steel & 80t timber.**
- This equates to an estimated 22nr steel wagons and 4nr wagons for the timber. **TW assessment on all access tracks will need to consider this loading.**
- Beach Clearance Assumptions:
  - Quantity = see table to the right.
  - Extents = Clearance only required from Bay 0 to Bay 32.
  - Clearance is only undertaken on a low spring tide, and to the extent of that tide.
  - Groyne steels located beyond the LWS tide extent are to be removed on LWS only, using the excavator.
  - No diving works, diver beach clearance or floating plant is required.
  - Muck away via Road. (water or rail muck away not considered).



Muck Away Estimation:

Groyne steels

- 2nr - 152mm x 152mm x 23kg/m Universal Column, 5m long every metre per groyne. (230kg per m)
- Max. assumed groyne length 160m. (Bay 25 to 26)
- 160x0.230 = 36.8t
- Assumed number of groynes: 12
- 12x36.8 = 442t total steel waste
- 20t per wagon for muck away, 442/20 = 22 wagons.

Timbers

- Average 3nr – Softwood Sleeper 1.2m x 200mm x 100mm per 1m panel bay.
- 14kg per timber.
- 42kg x 160 = 6.72t per bay
- 6.72x12= 80t total

Figure 22a. Estimated Beach Clearance Area – Steel and timber only (approximately 75,120m2)

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6) Beach Clearance cont.

- For the beach clearance, the following proposed localised areas will require clearing in their entirety (figure 22b). Final drop zone positions may vary slightly along the beach; this is dependant on the site walk and surveys with the barge master prior to the rock delivery. Drop zone 2 may have to move westward to allow a safe zone between the vessel and concrete apron. Any mudstone, chalk, rock or debris that cannot be levelled in the below two locations, will be temporarily re-located to the adjacent bays using an excavator. All relocation of materials will be kept to a minimum. Any beach materials that require temporary relocation will be reinstated at the end of the project following the completion of the rock revetment installation. Exact quantities for temporary relocation of materials are unknown at this point, however assuming 10% at a depth of 200mm, this would equate to a volume of approximately;
- 39000/100 = 390, 390*10= 3900, 3900*0.2=**780m3**.

Figure 22b. Rock Drop Zone 1 (13,000m2 approx)

Figure 22c. Rock Drop Zone 2 (26,000m2 approx)

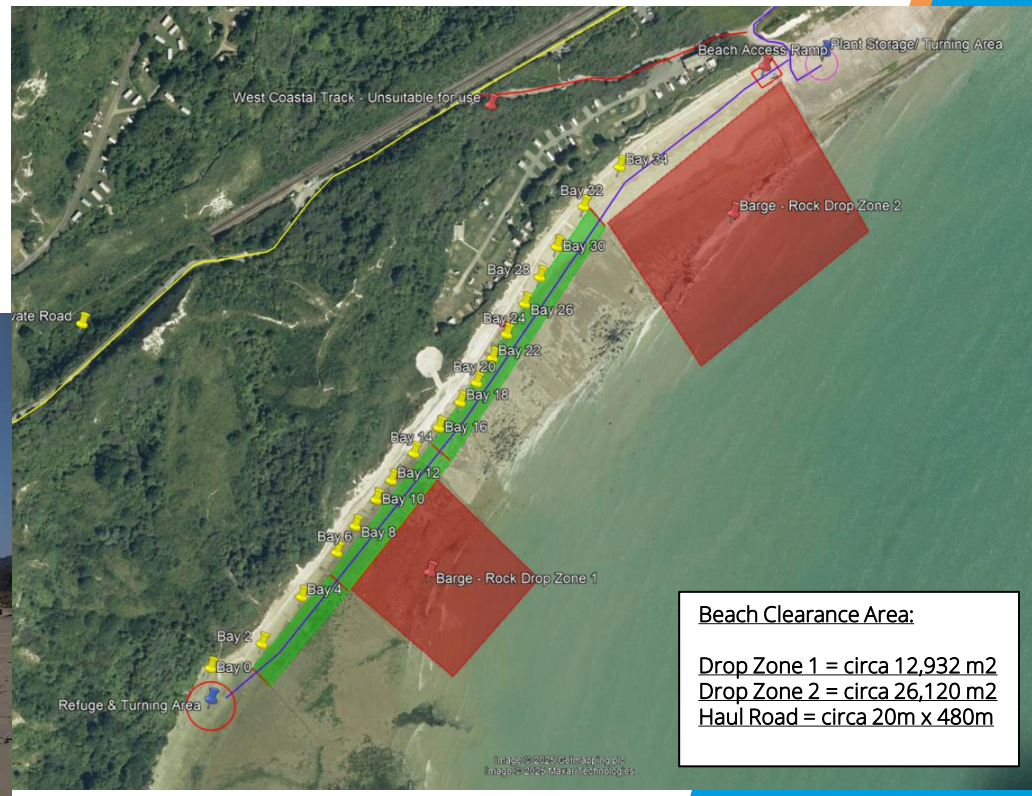

Figure 22d. Beach Clearance Plan (localised full clearance areas)

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7) Wall Repairs Overview

- Once beach clearance has been undertaken, the wall repairs may be undertaken.
- The wall repairs will need to be undertaken in a number of stages, and the General Arrangement can be seen in Figure 23.
- These works includes:

7. Wall Repairs
   a) Piling – Bay 14 & 22
   b) Pile tie ins
   c) Buttress repairs – buttresses 10 to 14 and 17 to 19.
   d) Concrete plugs

- Access for these works will be a combination of beach access and topside haul road access. A breakdown of each activity can be seen in the upcoming slides.

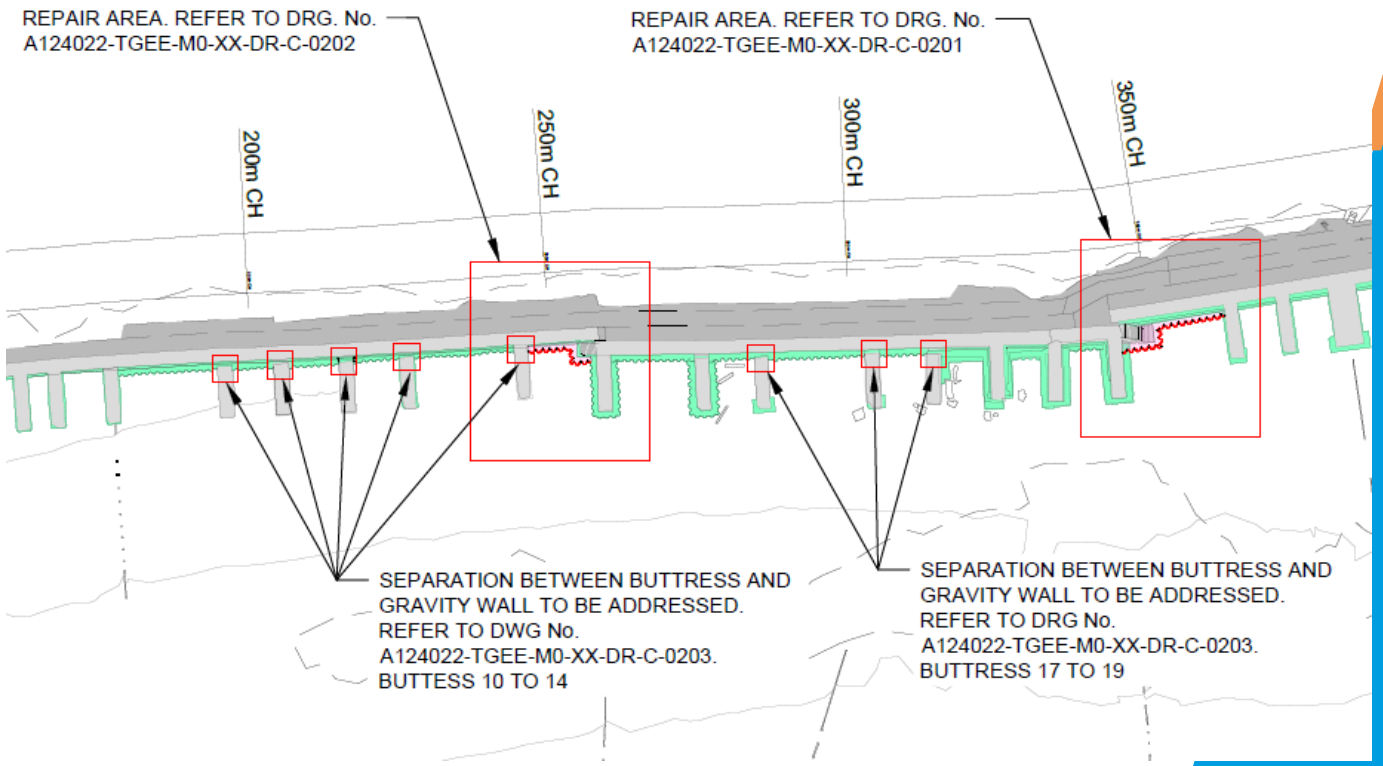
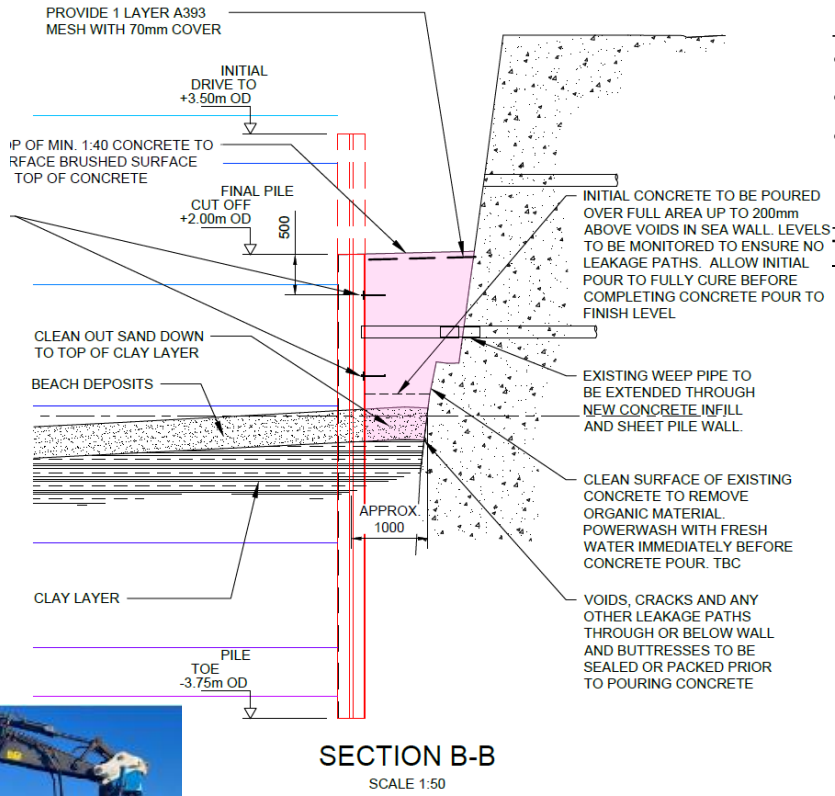


Figure 23. Wall Repair – Overall Site GA, extract A124022-TGEE-M0-XX-DR-C-0200, Rev P02

7a,b) Wall Repairs – Bay 14 & 22 Piling w/ tie ins

- There are a total of 34nr sheets required for Bay 22 works and 20nr sheets required for Bay 14 works.
- **A full drivability assessment will need to be undertaken based on the latest geotechnical information to confirm final hammer sizes, drive time, vibration limits etc. Pre-augering may be required.**
- An assumption has been made that these piles are to be installed using a 35t excavator and Movax SG75. **A TW assessment will be required to assess the existing wall stability during piling. Other methods such as a pile press may be required if the wall stability is too low.**
- Once the piles have been installed to Bays 14 and 22, the tie in sizes will be surveyed and tie in closures/ plates will be made to suit to tie the sheetpile wall into the adjacent buttresses for both bays.

Figure 24a. Drawing extract.



Pile Weight:

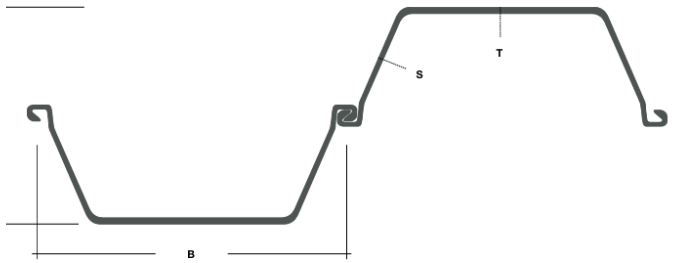
- 7.25m pile length
- VL605A/ PU piles = 76.5kg/m
- 76.5 x 7.25 = 555kg

Hammer Selection:

TBC

PRODUCT SHEET VL 605 A

T +44 (0)1202 894 000
E sales@maxxpiling.com
W www.maxxpiling.com



Single Pile						per m of wall			
Width	Height	Coating Area*	Thickness		Weight	Weight	Cross Sectional Area	Moment of Inertia	Elastic Section Modulus
B	H	C	T	S	G	M	A	I_x	W_x
mm	mm	m²/m	mm	mm	kg/m	kg/m²	cm²/m	cm⁴/m	cm³/m
600	420	1.89	10.7	9.0	76.5	127.5	162.5	38,243	1,821

Figure 24c. Pile datasheet extract.

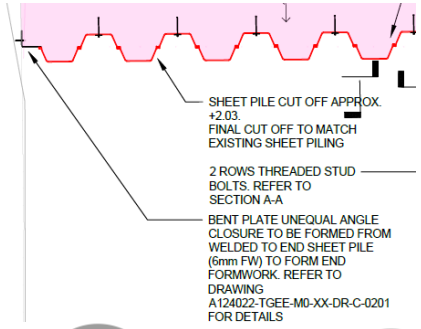


Figure 24b. Excavator and Movax

Piling will be undertaken on low tide for access reasons.
This will also provide wintering birds and wildlife places of refuge during this activity.

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7a,b) Wall Repairs – Bay 14 & 22 Piling w/ tie ins cont.

- It is expected that the Movax will be able to pile directly from the existing beach. **A TW assessment will be required to confirm.**
- Worst case: 5m x 1m x 0.150m Ekki bogmats may have to be placed and pinned down onto the beach to provide a suitable working platform. The density of Ekki hardwood(1065 kg/m3) is greater than seawater (1029 kg/m³), so tides should not be an issue. **Consideration for tidal inundation will be required in the TW assessment.**
- Delivery of the piles to the works areas will be via a suitably sized tractor and trailer or dozer and trailer. The piles are to be stockpiled on the concrete apron to the east and delivered to the works area in the required quantities for each shift.
- They will be delivered at the beginning of each tidal window using a tractor and trailer similar to that shown in Figure 24d.
- The tractor & trailer will also act as a contingency to recover any plant, should there be breakdowns on the beach. **A contingency plan and emergency refuge locations will need to be in place for these works.**
- A tracked carrier could also be used for pile transport to the works area. However, this will not provide a contingency should there be a plant breakdown.

M24 - 32 x 14 STEEL HEX NUT (RM BM00011)

Thickness	Width	Length	Load Bearing Capacity*	Materials
70mm	1000mm	5000mm	20 - 30 Tons Per Mat	EH (D30), ET (D70)
100mm	1000mm	5000mm	45 - 55 Tons Per Mat	EH (D30), ET (D70)
140mm	1000mm	5000mm	60 - 70 Tons Per Mat	EH (D30)
150mm	1000mm	5000mm	60 - 70 Tons Per Mat	ET (D70)
200mm	1000mm	5000mm	70 - 80 Tons Per Mat	EH (D30), ET (D70)

Material Strength Grade	Bending (N/mm²)	Tension Parallel to Grain (N/mm²)	Tension Perpendicular to Grain (N/mm²)	Compression Parallel to Grain (N/mm²)	Compression Perpendicular to Grain (N/mm²)	Shear (N/mm²)
D30	30	18	0.6	23	8	3
D70	70	42	0.9	34	13.5	6

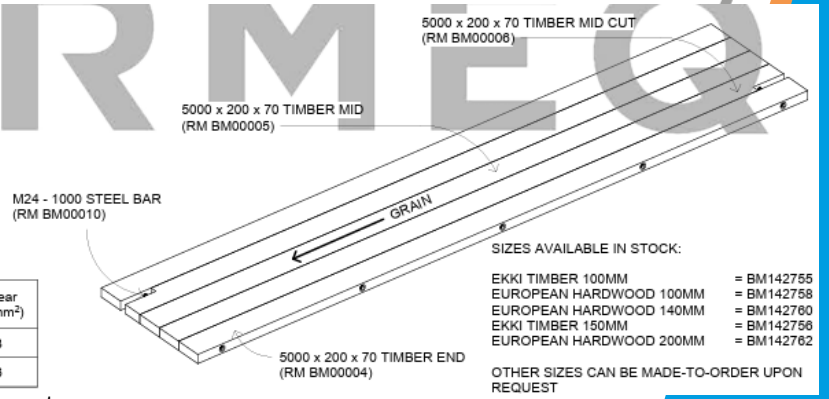

Figure 24d. Example spec for 5mx1m Ekki hardwood timber mat.

Figure 24e. Example of a tractor trailer used for beach works.

Figure 24f. Example of a tracked carrier (1200R PRO).

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7c) Wall Repairs – Buttress 10 to 14 & 17 to 19 repairs

- Several buttresses have fallen/ failed, seaward away from the existing Sea Wall.
- VolkerStevin have been asked to undertake mass concrete fill repairs to the worst buttresses, which are buttresses 10 to 14 and 17 to 19.
- These repairs are to be undertaken to a finish level of +2.00m OD. Beach level is assumed at +0.00m OD.
- Assumed pour volumes for this methodology are 2m x 1m x 1m = 2m3, 8 bays = **<u>16m3 total. Actual volumes TBC onsite.</u>**
- Dimensions of the required plates are to be double checked prior to fabrication as these may require amending.

1. The existing concrete is to be cleaned of all organic material as best as possible using a combination of a long-handled scraper/brush and a jet wash.
2. The plates are to be drill and fixed into position using with suitable fixings **(mechanical fixings/anchor bolts preferred, TBC by designer).** Access is to be via a PASMA mobile access tower or similar.

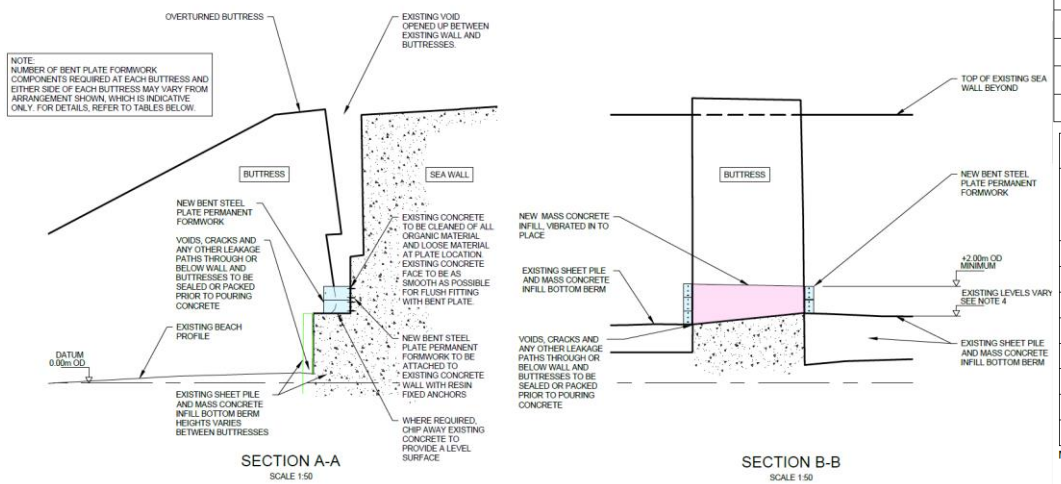

Figure 25. Buttress Repairs, extract A124022-TGEE-M0-XX-DR-C-0203-P02, Rev P02

TABLE 1: PLATE TYPES AND DETAILS

TYPE	WIDTH (mm)	LENGTH	WEIGHT (kg)	NUMBER OF
A	300	500	15	7
B	240	800	15	20
C	200	1000	15	9

TABLE 2: PLATES REQUIRED AT BUTTRESSES

BUTTRESS	WEST SIDE HEIGHT (+mOD)	GAP WIDTH (m)	PLATE TYPE NUMBER OF	EAST SIDE HEIGHT (+mOD)	GAP WIDE (m)	PLATE TYPE NUMBER OF
10	1.13	0.70	B 4	1.11	0.41	A 3
11	1.15	0.58	B 4	1.10	0.78	C 5
12	1.09	0.49	B 4	1.16	0.67	B 4
13	1.18	0.63	B 4	1.05	0.31	A 4
14	1.22	-	-	-	-	-
17	2.46	-	-	2.44	-	-
18	2.55	-	-	2.81	-	-
19	2.59	-	-	1.26	0.90	C 4

MEASUREMENTS TO BE CONFIRMED ON SITE

Figure 26. PASMA Mobile Access Tower

Figure 27. Bay 12 to 13 Buttress

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7c) Wall Repairs – Buttress 10 to 14 & 17 to 19 repairs cont.

3. Any voids, cracks and leakage paths through the existing wall are to be sealed and plugged, as reasonably practicable, to reduce grout loss.
4. An underwater concrete mix is to be used, as agreed with the Designer, to reduce the likelihood of grout loss.
5. Once all buttress plates are installed to the buttresses, and concrete cubed up, the concrete pours are to be planned and booked in to commence on the ebb of the tide, once the area is accessible. This is to allow as much time as possible prior to inundation.
6. The buttress repair pours are to be poured using the 16t excavator, concrete skip and tremie.
7. The concrete pour is to be monitored throughout for any leaks and grout loss, and concrete activity stopped should any minor leaks occurs. The minor holes are to be plugged as required, prior to re-commencing the pour.

- A lightweight aluminium temporary ladder or stair set may be useful to gain beach access at the Bay that is being worked on. **This may require a TW assessment should a proprietary system not be available.**

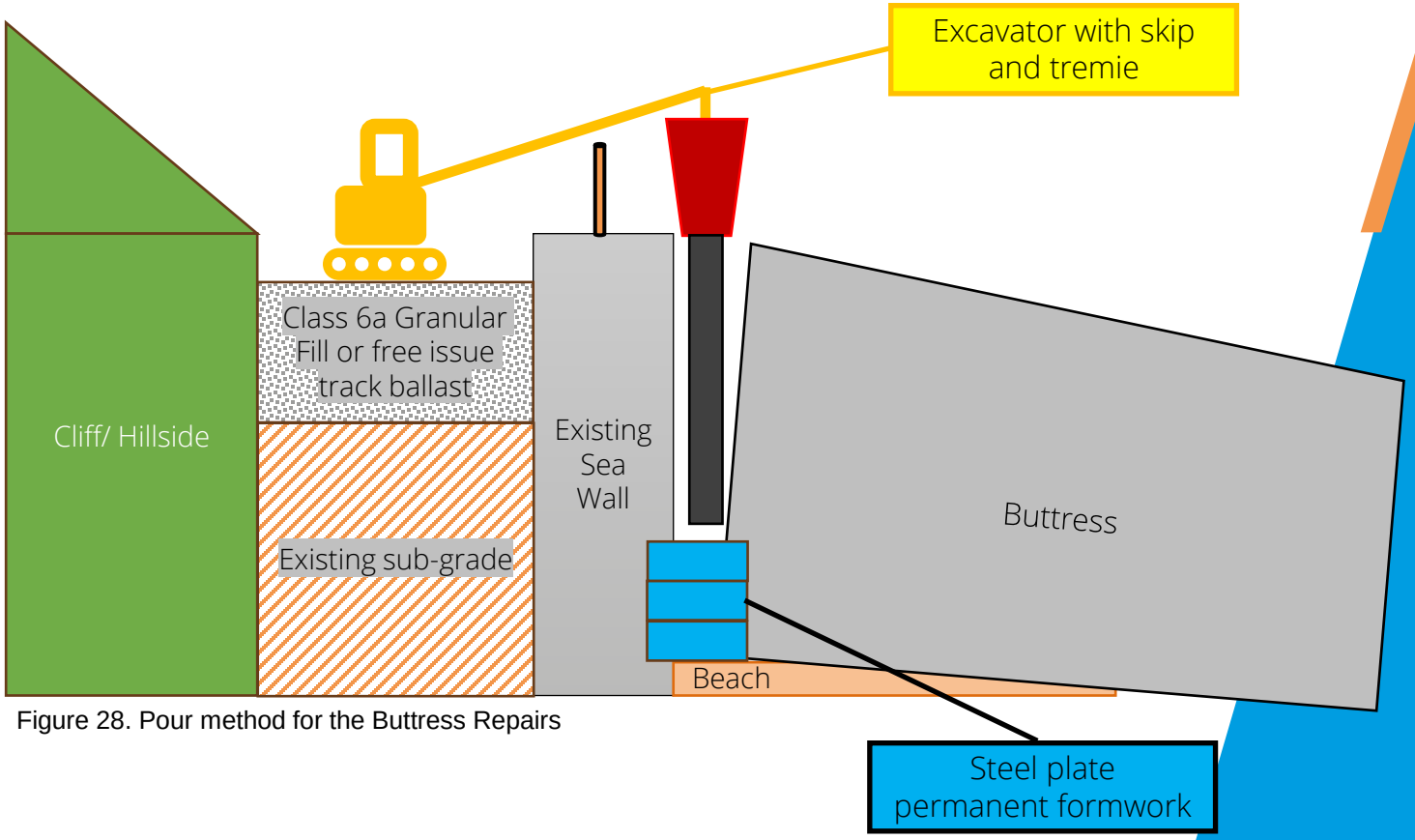

Figure 28. Pour method for the Buttress Repairs

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7d) Wall Repairs – Concrete Plugs

- Following the buttress repairs the main concrete plugs for Bay 14 & 22 are to be poured.

1. The existing concrete is to be cleaned of all organic material as best as possible using a combination of a long-handled scraper/brush and a jet wash.
2. The existing sand is be reduced to the top layer of clay and expose the full extents of the scour between the sheetpile and seawall using a small vacuum excavator. This will be undertaken from the existing walkway on low tide.
3. Any voids, cracks and leakage paths through the existing wall are to be sealed and plugged, as reasonably practicable, to reduce grout loss.
4. Welded shear studs are to be installed to the sheetpile, where possible these studs are to be welded to the sheets prior to installation. **Designer to confirm shear studs are acceptable to replace threaded stud bolts. Should a pile refuse and new studs be required, confined space working may be required.**
5. An underwater concrete mix is to be used, as agreed with the Designer, to reduce the likelihood of grout loss.
6. The concrete pours are to be planned and booked in to commence on the ebb of the tide, once the area is accessible. This is to allow as much time as possible prior to inundation.
7. Bay 14 & 22 are to be poured straight from the wagon using an aluminium concrete chute extension and if required, a tremie pipe.
8. Each bay is to be split into two pours. The initial pour is to be undertaken to a height of approximately 200mm above the existing voids in the wall and allowed to cure fully before the main pour.
9. The concrete pour is to be monitored throughout for any leaks and grout loss, and concrete activity stopped should any minor leaks occurs. The minor holes are to be plugged as required, prior to re-commencing the pour.

Figure 29 – Sheetpile closure sealed ready for underwater concrete.

Concrete Chute Extension

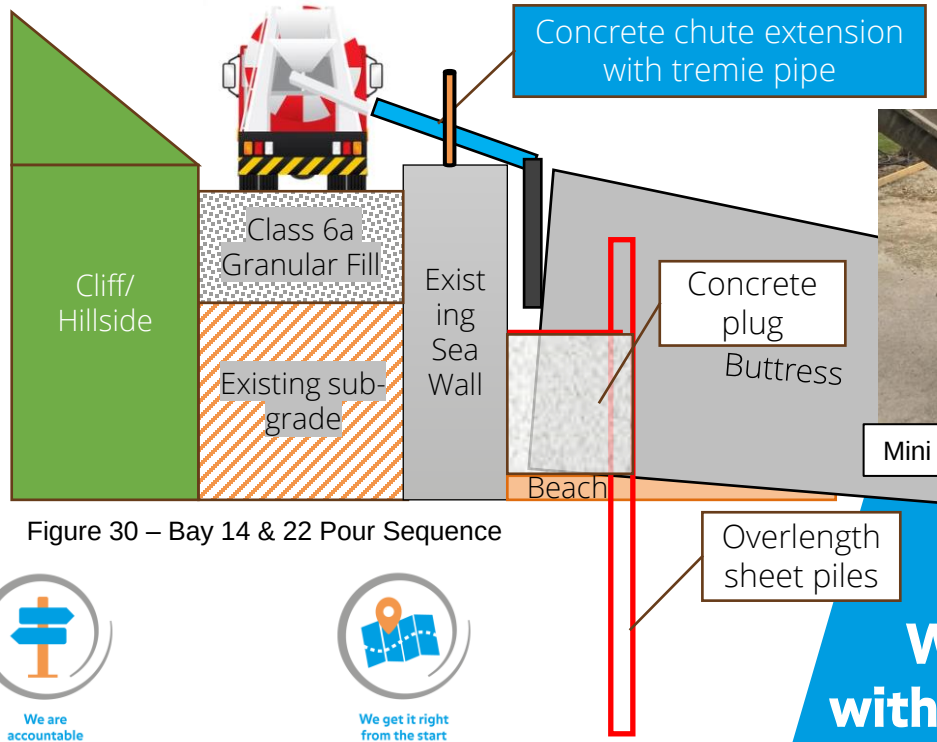

Figure 30 – Bay 14 & 22 Pour Sequence

Mini Tremie Pipe & Hopper

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7d) Wall Repairs – Concrete Plugs cont.

Assumed volumes:

Bay 14

- Pour 1 (scour) = 10m long x 4m wide x 0.5m depth = 20m3
- Pour 2 (bay) = 10m long x 1.5m wide x 2.5m depth = 38m3
- Total m3 = **58m3,** (9nr 6m3 wagons + a part load.)
- Actual volume TBC following sheetpile install and final scour/void measurement.
- 6m3 wagons assumed due to access.

Bay 22

- Pour 1 (scour) = 18m long x 4m wide x 0.5m depth = 36m3
- Pour 2 (bay) = 18m long x 1.5m wide x 2.5m depth = 68m3
- Total m3 = **104m3,** (17nr 6m3 wagons + a part load.)

- Actual volume TBC following sheetpile install and final scour/void measurement.

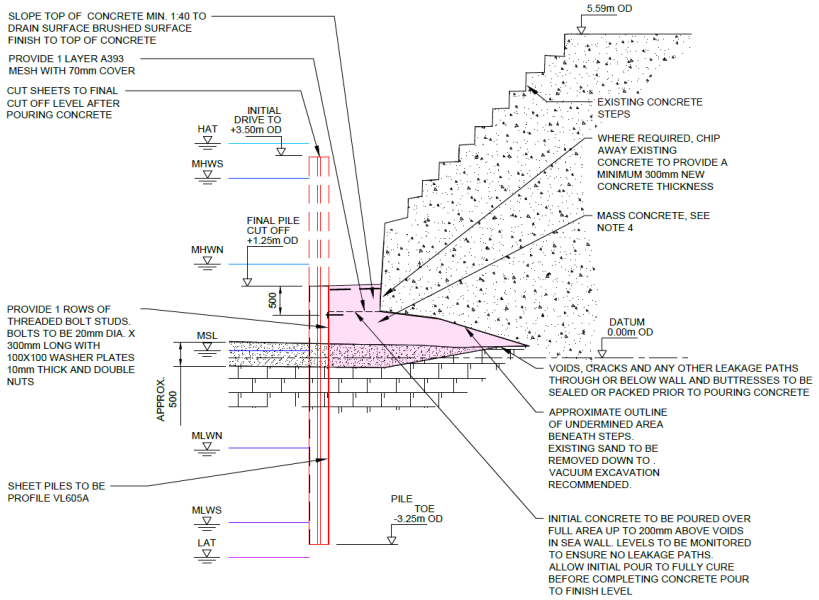

Figure 31a – Bay 14 – dwg extract: A124022-TGEE-M0-XX-DR-C-0202, Rev P03

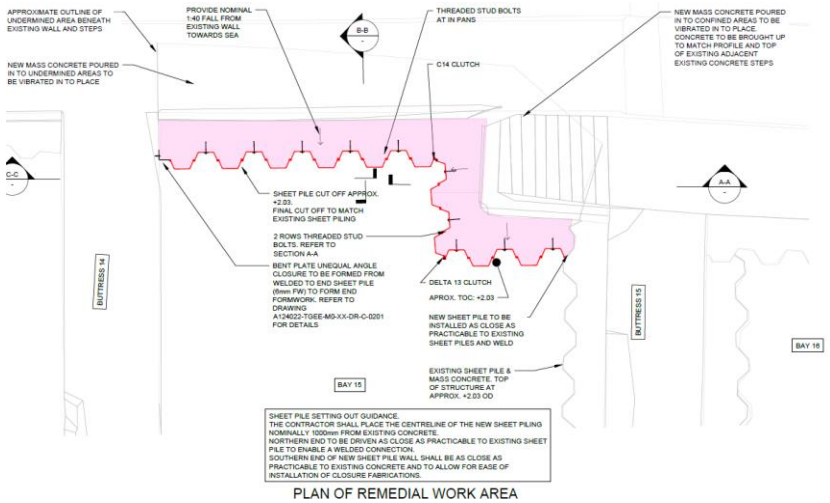

Figure 31 – Bay 14 – dwg extract: A124022-TGEE-M0-XX-DR-C-0202, Rev P02

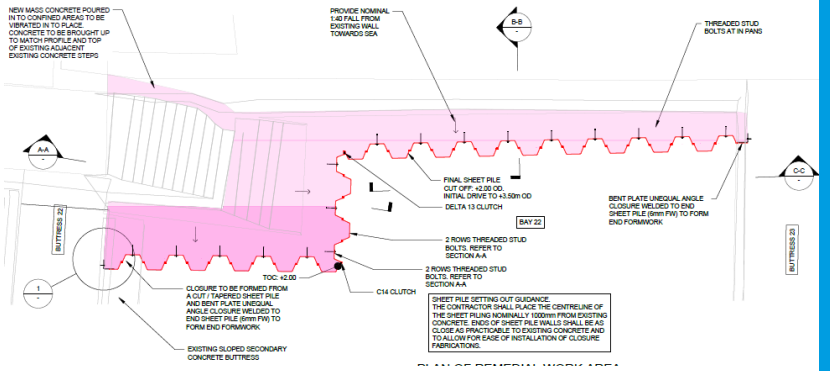

Figure 32 – Bay 22 – dwg extract: A124022-TGEE-M0-XX-DR-C-0201, Rev P02

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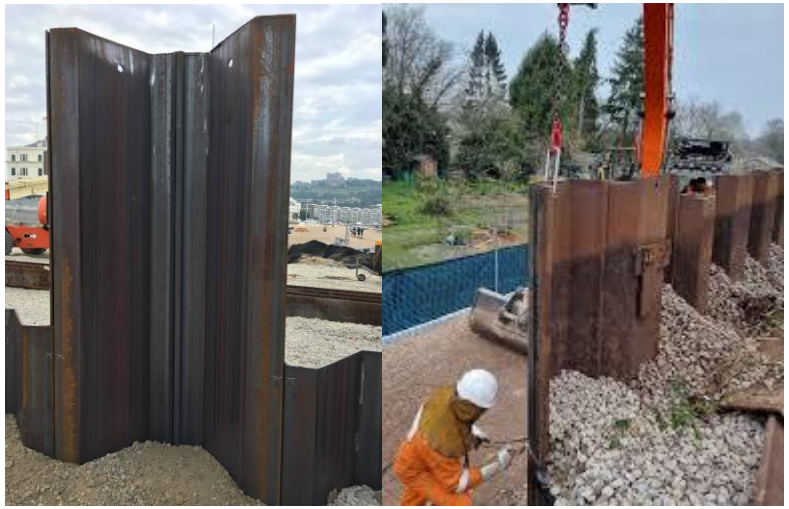
7e) Wall Repairs – Cut piles to level

- Once the concrete has cured, the sheets are to be cut to their finish level of 2.03m OD.

1. From the seawall haul road, the excavator is to hold the sheetpile in preparation for cutting.
2. The top 1.5m of the sheetpile is to be cut using a cutting torch, from a PASMA mobile access tower situated on the beach.
3. The excavator is to hold and lift the 1.5m pile cap (115kg estimated weight) and load into the dumper situated on the beach.
4. The dumper is to stockpile the pile tops onto the Eastern concrete hardstand, ready to be taken to the compound and mucked away.



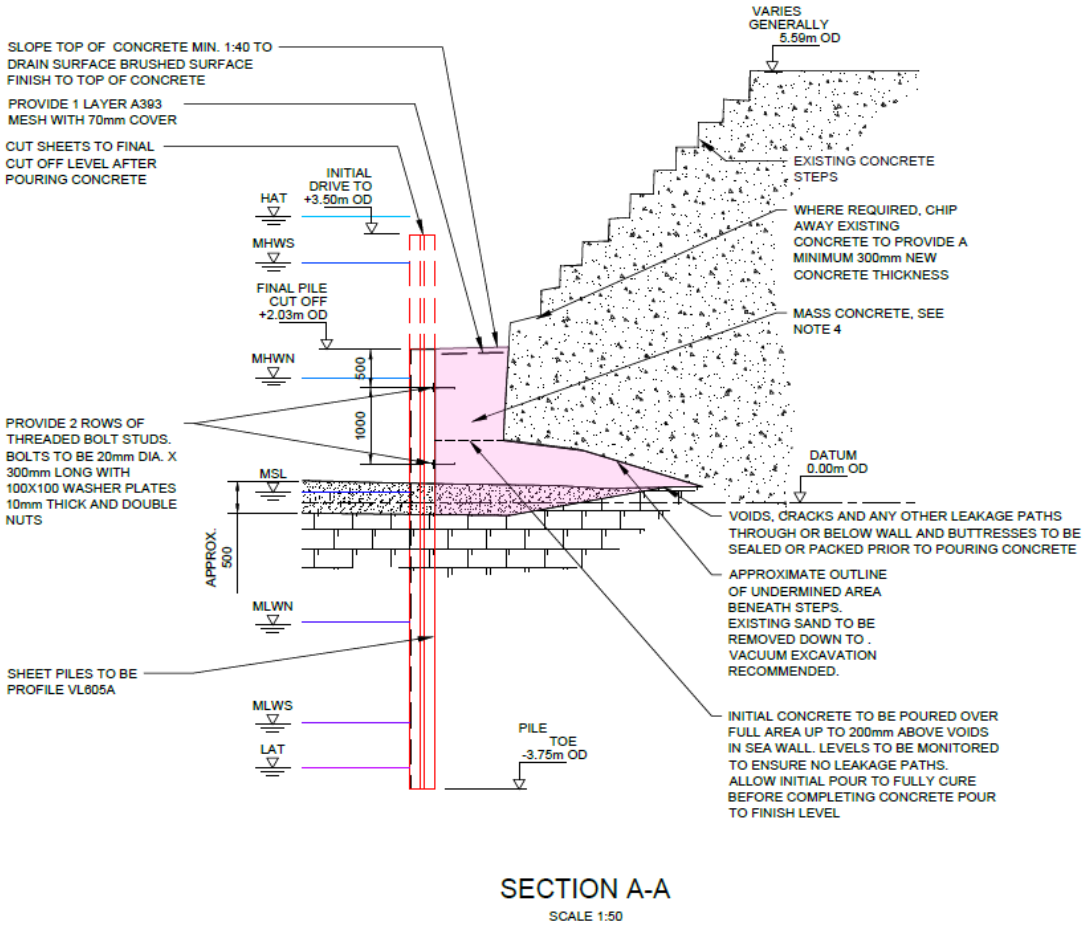


Figure 31 – Bay 22 – dwg extract: A124022-TGEE-M0-XX-DR-C-0201, Rev P02

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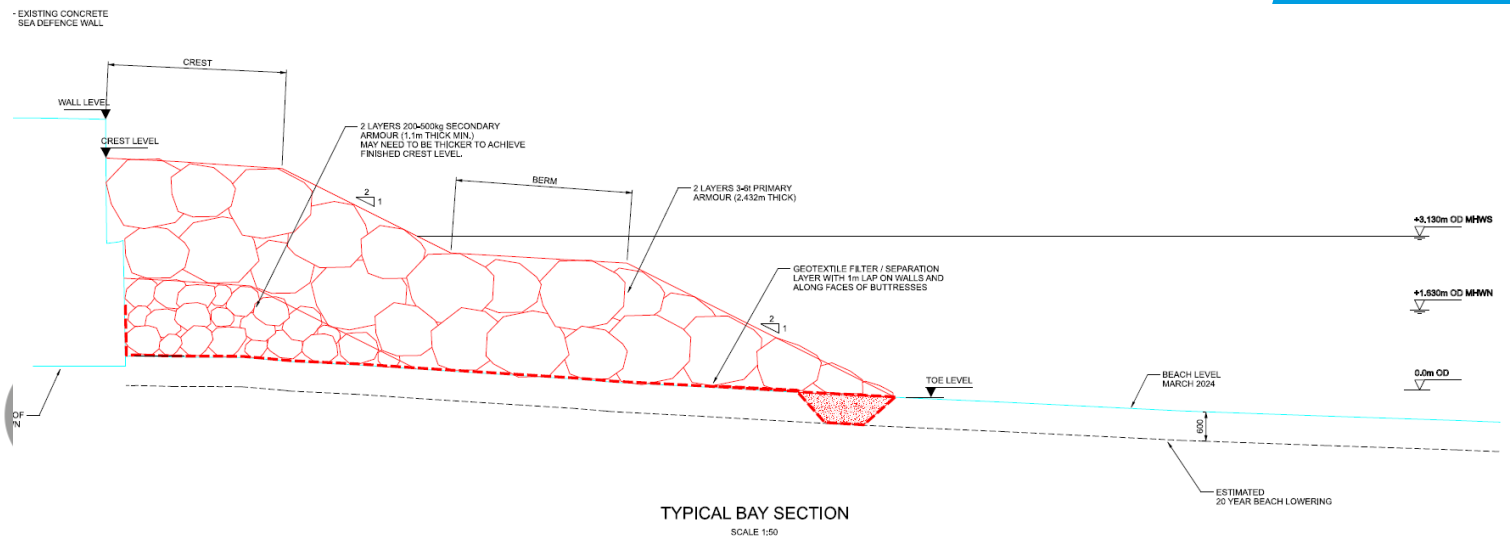
8) Rock Armour

- There are currently 19 bays of rock armour envisaged for installation across the western beach (Frontage 1) spanning from Bay 11 to Bay 29.
- The total rock order within these bays equates to circa 17,200t of rock in the following grades:

Grade	Tonnage
3-6te	15,440.00
200-500kg	1394.00
500-1000kg	310.70
50-100kg	57.90
Total	17202.70

- Each bay will consist of 2 layers of primary rock (3-6t rock, 2.4m thick) and 2 layers of secondary 2 layers of secondary (0.2 to 0.5t, 1.1m thick min.)
- Geotextile is to be placed directly onto the beach at the existing beach profile and the rocks are to be place above this. The only excavation required for the rock placement will be a small key trench 500mm to 1m in width/depth however the current design shows the existing beach material to be placed back into this key trench once the geotextile has been installed. For all the bays the toe excavation totals approximately **219m3.**
- **Assumptions:**
- Circa 6500t rock per shipment, 3nr barges.
- It is assumed that the draught is suitable for the barge to unload the rock into the proposed Drop Zone 1 and Drop Zone 2. **(Updated Bathymetric survey to be provided prior to works commencing)**

Figure 32 – dwg extracts: S100093-TGP-1702-KNT_XTD0-DRG-ECV-003160,003162 & 003166, Rev P02



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Rock Transport

- The rock is to be delivered using KMLs Intrepid barge with a fully laden deck capacity of 7000t DWT.
- The maximum volume of each delivery will be 6500t.
- The proposed rock for the works is to be produced and sourced from a quarry in Bolougne and delivered direct from quarry to beach.
- Due to the proximity from this quarry to Folkestone (<50km), this rock provides significant carbon, cost and programme savings compared to a Larvik Granite from Norway.
- For material shipped from Bolougne the cycle time for each round voyage is circa 4 days.
- The delivery rate for this method is therefore approximately 10,000t a week, or an average of 1500t a day (750t per tide). This is weather dependant and may increase.

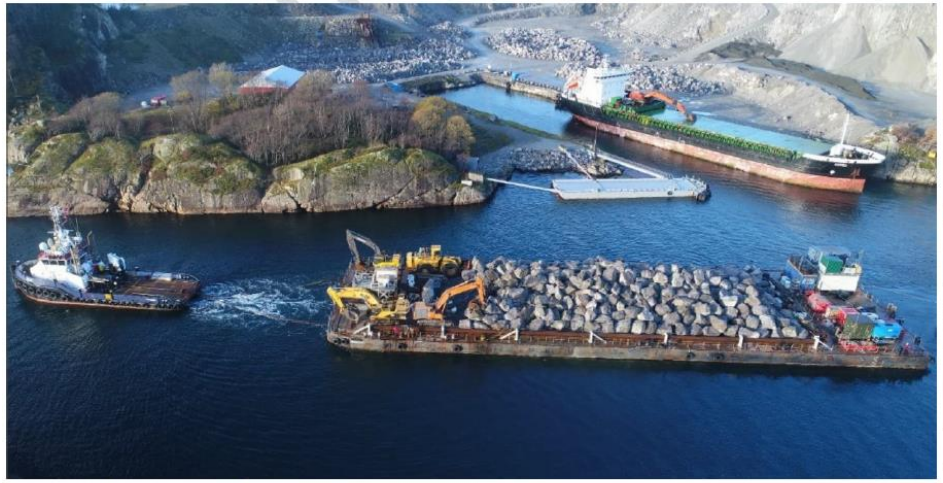

Figure 1: KML Intrepid sailing from Norwegian quarry

Figure 2: Quarry floor in Boulogne, showing sorting of 3-6te rock grade

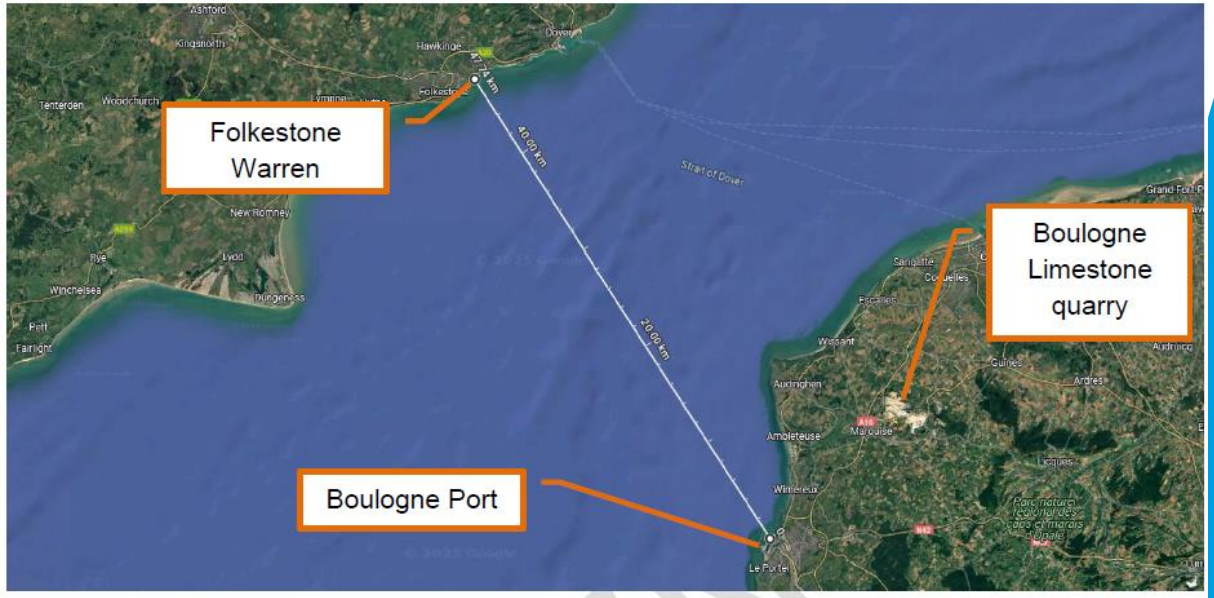

Figure 3: Shipping route between Boulogne and Folkestone. The distance is less than 50km.

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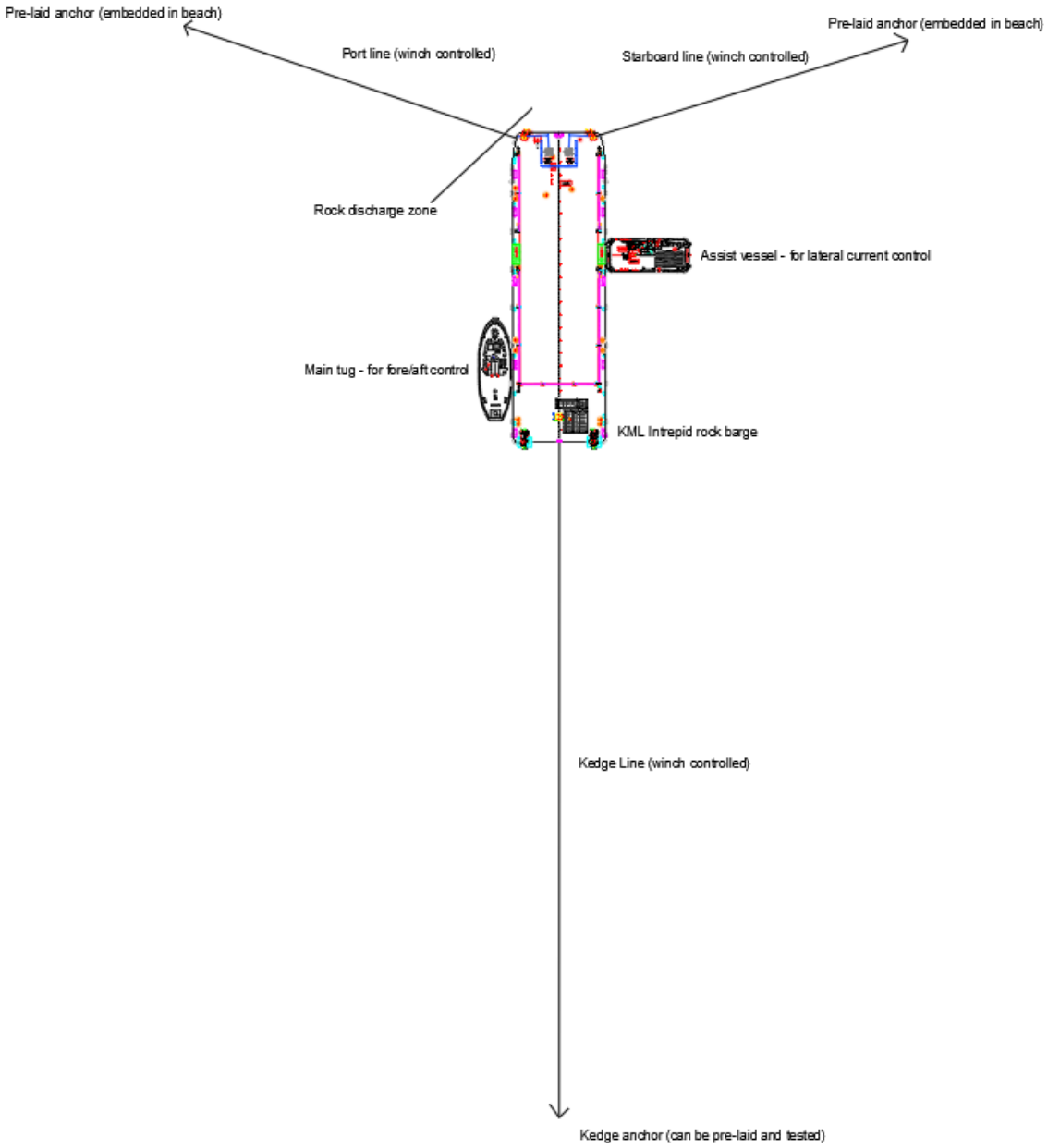
Rock Delivery

- The rock delivery is to be arranged and undertaken on a suitably high tide.
- The draught of the Intrepid when loaded is about 4.3 metres, however the trim will be adjusted so will be adjusted so that the profile of the barge matches the profile of the beach.
- If a floating discharge is to be undertaken, the barge will come in and out approximately 1 hour either side of high tide, assuming there is a minimum of 1m freeboard beneath the barge at all times. i.e. a minimum of 5.3m water depth.
- Worst case (neap tides) the working window for this tide cycle will be approximately 2.5 hours.
- The barge will be brought in to location at the agreed drop zones and held by 2nr tugs for the duration of unload.
- As a contingency to account for power loss in the tugs, anchors will be utilised, although in no scenario would we conduct any movements while trailing an anchor beneath a vessel. We would intend to set up an arrangement similar to the adjacent diagram.
- The kedge anchor is necessary to ensure that the barge can steadily approach the shore, and haul herself off the beach in a fully controlled manner without the aid of the main tug. Kedge anchoring is standard procedure for these kind of beaching operations. The port/starboard anchors are necessary for keeping the bow in a stable position across both flood and ebb tides and other lateral metocean forces including wind.



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The VolkerStevin Way

Rock Delivery (Floating Discharge) – Example Nov Tides

Folkestone - November 2025

Date	Day	Tide 1	Tide 2	Tide 3	Tide 4
01	Sat	01:23 2.5m	07:03 5.6m	14:08 2.1m	19:42 5.7m
02	Sun	02:41 2.1m	08:03 6.1m	15:17 1.6m	20:33 6.3m
03	Mon	03:47 1.6m	08:50 6.7m	16:19 1.0m	21:16 6.9m
04	Tue	04:48 1.1m	09:32 7.3m	17:16 0.5m	21:56 7.4m
05	Wed ○	05:42 0.6m	10:12 7.7m	18:06 0.2m	22:35 7.8m
06	Thu	06:30 0.3m	10:54 8.0m	18:53 0.0m	23:18 8.0m
07	Fri	07:16 0.2m	11:38 8.0m	19:36 0.1m	
08	Sat	00:03 7.9m	07:58 0.4m	12:25 7.7m	20:16 0.4m
09	Sun	00:52 7.6m	08:38 0.7m	13:17 7.3m	20:56 0.9m
10	Mon	01:46 7.1m	09:18 1.1m	14:13 6.7m	21:36 1.4m
11	Tue	02:44 6.6m	10:02 1.6m	15:16 6.1m	22:24 1.9m
12	Wed ◑	03:50 6.0m	10:58 2.1m	16:29 5.6m	23:24 2.3m
13	Thu	05:04 5.7m	12:08 2.3m	17:50 5.4m	
14	Fri	00:42 2.5m	06:24 5.5m	13:25 2.3m	19:08 5.4m
15	Sat	01:58 2.5m	07:33 5.6m	14:34 2.2m	20:11 5.6m
16	Sun	03:03 2.3m	08:28 5.8m	15:30 1.9m	20:57 5.9m
17	Mon	03:55 2.1m	09:10 6.1m	16:18 1.7m	21:35 6.2m
18	Tue	04:40 1.8m	09:46 6.4m	16:59 1.4m	22:08 6.5m
19	Wed	05:20 1.6m	10:18 6.6m	17:37 1.2m	22:39 6.7m
20	Thu ●	05:57 1.4m	10:50 6.7m	18:13 1.1m	23:10 6.8m
21	Fri	06:31 1.3m	11:23 6.8m	18:46 1.1m	23:43 6.8m
22	Sat	07:05 1.3m	11:56 6.8m	19:18 1.2m	
23	Sun	00:16 6.8m	07:37 1.3m	12:31 6.7m	19:50 1.3m
24	Mon	00:52 6.7m	08:09 1.4m	13:08 6.5m	20:21 1.4m
25	Tue	01:28 6.5m	08:42 1.6m	13:47 6.3m	20:55 1.7m
26	Wed	02:10 6.3m	09:20 1.8m	14:33 6.0m	21:35 1.9m
27	Thu	02:58 6.1m	10:05 1.9m	15:26 5.8m	22:25 2.1m
28	Fri ◐	03:55 5.9m	11:01 2.0m	16:30 5.7m	23:26 2.2m
29	Sat	05:00 5.9m	12:08 2.1m	17:40 5.7m	
30	Sun	00:38 2.2m	06:09 5.9m	13:21 1.9m	18:51 5.9m

Guide Heights for Folkestone

Find times when tide height(m) 6.97 Find

Tuesday 04 November 2025
08:46 Rising
10:23 Falling
21:04 Rising
22:59 Falling

Wednesday 05 November 2025
09:10 Rising
11:31 Falling
21:32 Rising
23:59 Falling

Thursday 06 November 2025
00:00 Falling
09:46 Rising
12:24 Falling
22:11 Rising

Friday 07 November 2025
00:51 Falling
10:31 Rising
13:09 Falling
22:58 Rising

Saturday 08 November 2025
01:31 Falling
11:24 Rising
13:44 Falling
23:55 Rising

Sunday 09 November 2025
02:04 Falling
12:33 Rising
14:06 Falling

Monday 10 November 2025
01:14 Rising
02:18 Falling

- Actual beach levels TBC following updated surveys.
- Based on TGP drawings, the beach level at the proposed dropzone is approximately -2.000mOD (1.67mCD). Therefore, 1m free draught below the intrepid would require a water depth of 5.3m, which would equate to 1.670mCD + 5.3m = 6.97mCD tide level.
- For the month of November, there are only 7 days in which the tide reaches this level. For these days the working window is approximately 2 hours per tide.
- Due to this short duration and unload being able to be only undertaken on a spring tide, the barges may need to beach to undertake the unload. TBC by the rock supplier.

8) Rock Armour

- The following methodology will be used for the rock placement.

1. Bay numbers to be clearly marked out onsite by the Engineer.
2. All works are to be undertaken from West to East.
3. As the rock is to be supplied from Bolougne, it is unlikely that transhipment location will now be required. For information this has been left shown in figure 35. By supplying material from Boulogne the rock shipments presence on site is reduced to the absolute minimum.
4. Fair weather anchorage will be located in the port at Bolougne and the barge will not leave port unless there is a safe weather window. Should the weather detiorate, there are local ports (Dover/Folkestone) that could be used in an emergency. This will all be outlined in the vessel contingency plan provided by KML.
5. As per the previous slide, on high tide, the flat top is to be moved and positioned adjacent to the applicable drop zone and held in position using suitably sized tugs, (no more than 20m from the existing seawall along frontage 1.) **A bathymetric survey will be required to confirm bed level and exact vessel draught for the tides for each delivery.**
6. The 2nr 50t long reach excavators are to unload the rock one at a time using the grab buckets and load to the stern of the barge. (approximately 1nr barge load per bay). One excavator will prep the next rock, and one excavator will place. (a shovel loader could also be used, if allowable by the Designers, exact plant tbc by rock supplier)
7. On low tide, the shoreside 35t excavator + lifting beam is to place the terram into position, there will also be at least 2nr 50t excavators and 1nr 40t moxy for recovering the dropped rock on each low tide. 1nr 50t excavator is to lift and load the moxy from the stockpile, whilst the second 50t excavator is to lift and place the rock armour into its final position.
8. Steps 5 to 7 are to be repeated until all Bays are complete.
9. **TW will be required for the Barge Stability calculations.**

Figure 34, MORMAEN 15, flat top barge (60 x 22m, 2731 DWT), delivering armour stone to Slaughden Beach, Aldebrugh for the Environment Agency (EA).

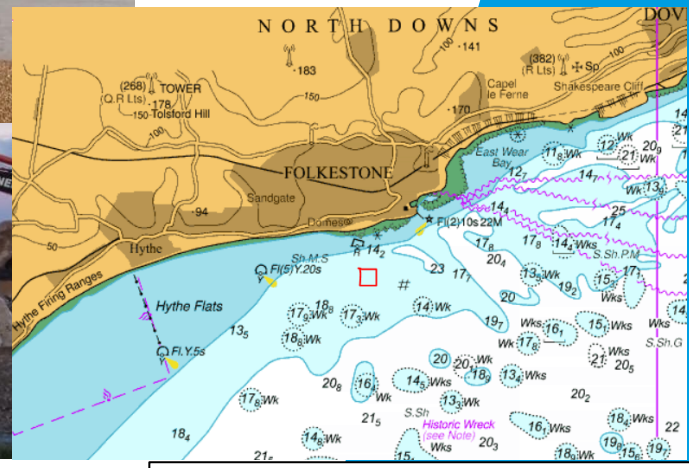

Figure 35 – Approx. Transhipment & anchorage area, South of Folkestone, outside of MCZ zone. Exact location TBC by stone supplier.

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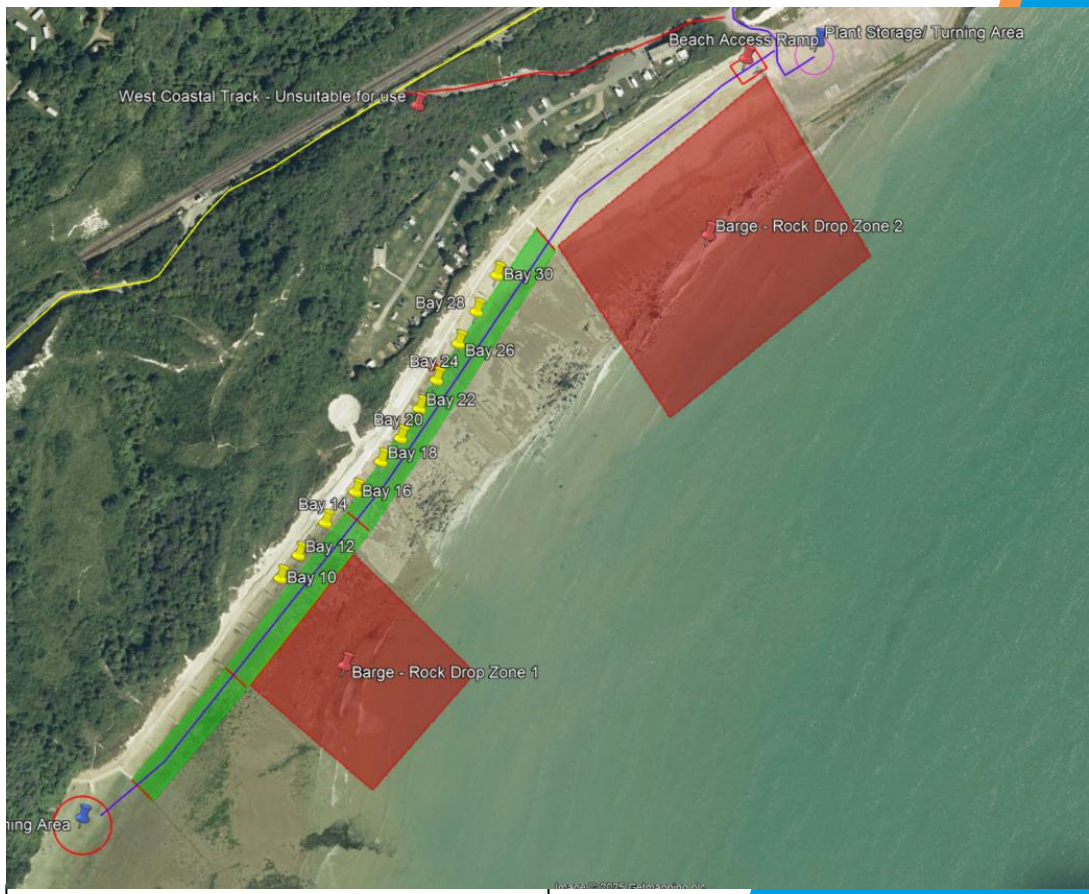
8) Rock Armour

If good spring tides and good weather conditions align, there may be an opportunity to work both low tides in a 24hr period. However, this will only be possible for short durations.

- Expanding on points 6 &7 on the previous slide, the following will be undertaken for the rock placement.
- A 10m test panel is to be constructed and testing undertaken as per the specification and as agreed with the designer. This will be undertaken using a loading shovel with weightloader. Each rock will be weighed prior to being installed into the panel. These weights will be recorded alongside the finished panel as-built and submitted to the Designer so that they can calculate the density of the panel.
- On acceptance of the rock and test panel by the Designers, construction shall commence.
- Works shall commence on the ebb and as soon as the works area is accessible, this is expected to be approximately 3.5 hours before low tide.
- The following methodology is expected for placement:

1. 1nr 50t excavator **(Machine 1- M1)** will load the 40t moxy **(M2)** from the relevant drop zone.
2. 1nr 35t excavator **(M3)** is to excavate the bays as required, in preparation for rock placement, using the lifting beam the machine will place the terram into position and weigh down each corner with a primary rock.
3. 1nr 50t excavator **(M4)** is to lift and place the rock from the moxy and place into its final position within the bay in the following sequence:
4. Each rock bay is to be constructed in the following sequence:
    - Layer 1 (bottom layer) is to be constructed from the toe inwards towards the sea wall for both the primary and secondary rock.
    - The excavator is then to create a temporary ramp using beach material and track onto the 1st layer.
    - Layer 2 (top layer) of the rock is to then be constructed from the Sea Wall out to the toe, in sections.
    - The terram is to be placed in sections and overlapped as required.
5. Due to the height of the existing sea wall (approx.+6.000mAOD), finish rock crest level (approx. +5.000mAOD) and existing beach level (approx. 0.000mAOD) the rock will need to be constructed in two levels. This is to mitigate the need for a larger long reach machine (90/100t) and because the top Primary rock must be placed at a height of approximately 5m above existing ground level. .
6. For the core, the bottom 2nr layers are to be constructed using the Secondary rock.
7. The first layer of the Primary rock is to be constructed placing the largest primary rocks at the bottom (6t).
8. A temporary ramp is be constructed using the existing beach material so the 50t excavator can track safely onto the rock revetment.
9. The machine is to place the final top layer of primary rock consisting of the smaller Primary Rock (3t).
10. Traditionally, for the toe, this is excavated, terram placed and a large single primary rock (6t) is placed to seal and hold back the rest of the rock bay. However the current design shows the revetment toe to be filled and wrapped with existing beach material. **A technical query will need to be raised to confirm this detail.**
12. Steps 1 to 11 are to be repeated until all Bays are complete.



Plan of works area.

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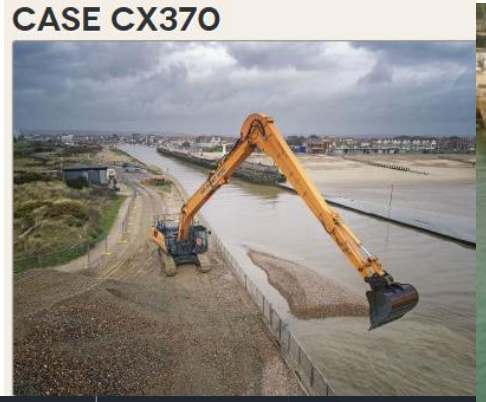
8) Rock Armour



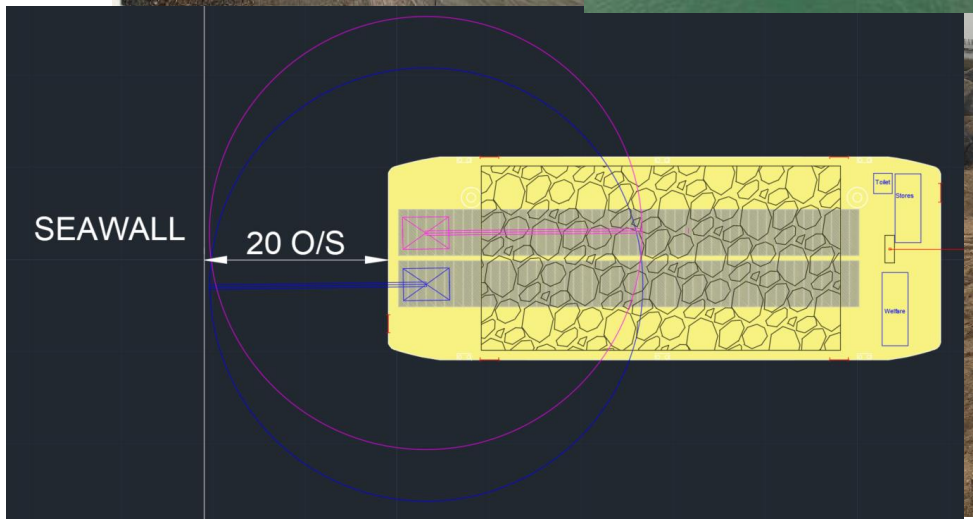


Figure 36 – Example barge layout – 60mm x 22m (2300t DWT) flat top – 2nr CX370 23.5m long reach excavators, 780m2 rock laydown area, 100 bogmats, toilet, stores and welfare.

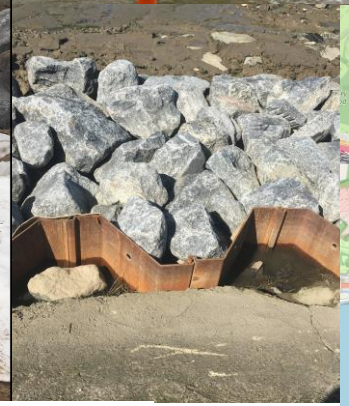


Figure 37 – General construction photos

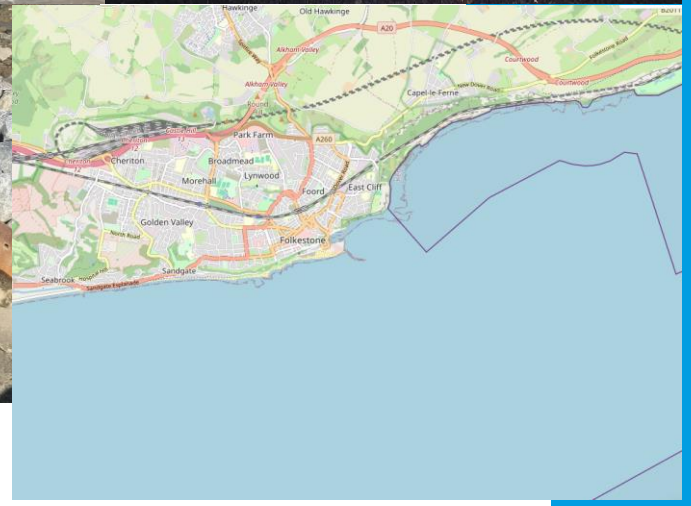


Figure 38 – MCZ Zone (purple area)

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9) Walkway RC Slab. (Walkway Option 3 – Localised Repairs)

- Following on from section 5, there is no formal design for the walkway works. Final Design TBC by Designer.
- This design option is only to be used if option 3 is chosen for the walkway repairs and this is for localised repairs only where the walkways have collapsed, and resin injection is not a viable solution.
- The walkway is to be backfilled with the remaining 6a to a final depth of 200mm below top of wall, prior to the RC slab works.
- Based on the assumptions made in section 5, once all construction works are complete, from west to east, new RC slabs are to be cast.
- It is assumed the RC slabs will consist of the following:
  - 10m x 5m x 0.2m RC Bay (10m3),
  - 2 layers of **A393 mesh**
  - 50mm cover top and bottom
  - **Visqueen** separation layer between 6a sub-base and rc slab.
  - 200mm long, 20mm dia. **stainless steel dowels** – 2nr per bay (optional to connect the existing bays to the new bay/s).
  - Assumed C40/50 mix.
- These bays would be cast sequential from west to east, the total number of bays are TBC.
- Keyclamp handrail to be removed and holes made good.

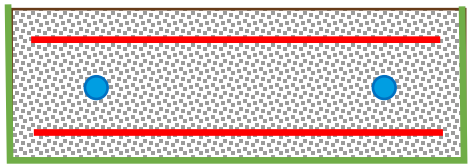

Figure 39 - Slab Elevation/ Section

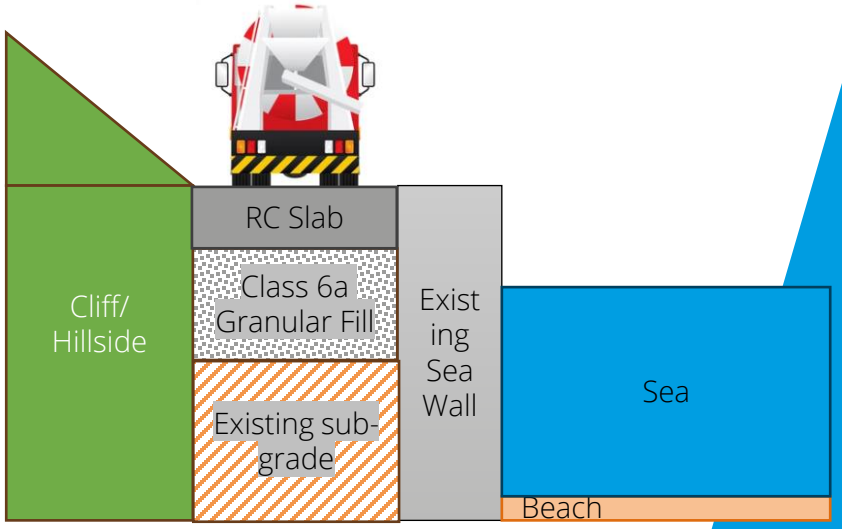

Figure 41 – GA – Localised repairs undertaken from the wagon

We are one team | We care | We act with integrity | We manage risk | We are accountable | We get it right from the start

We deliver with certainty

9) Walkway RC Slab. cont

- Once all concrete walkway pours are complete, the new walkway arrangement will look something similar to, Figure 40 shown below.

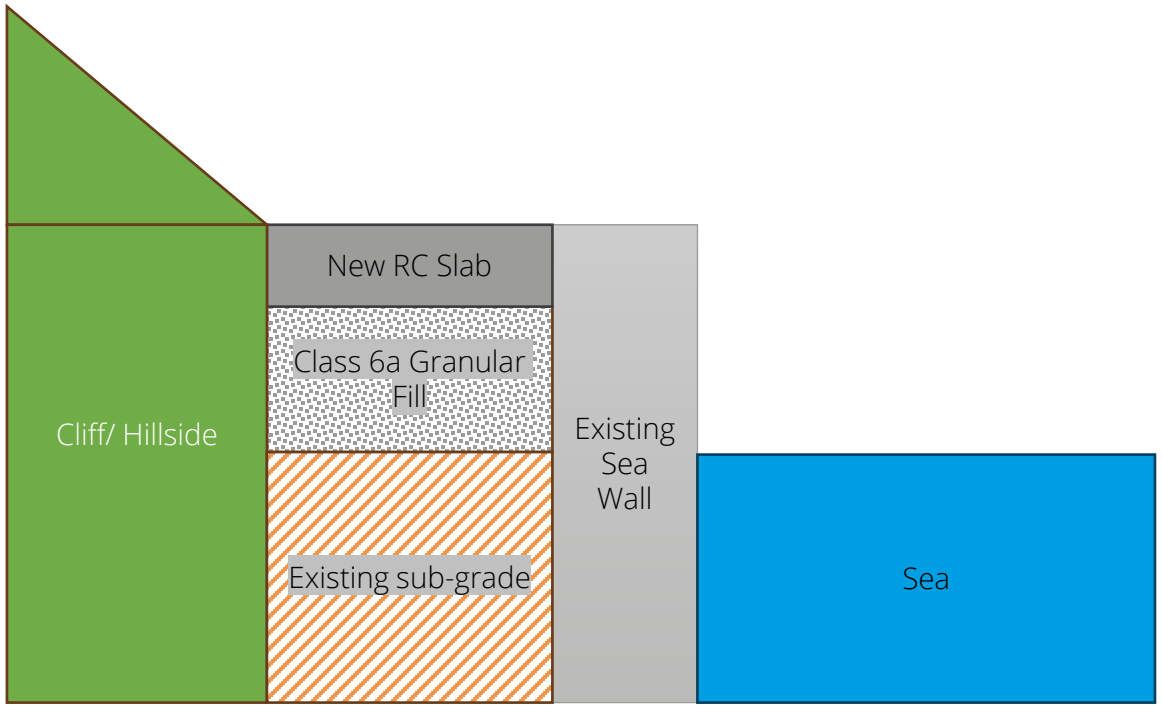

Figure 42 - Assumed General Arrangement/ Section showing the Walkway Repairs

We are one team
We care
We act with integrity
We manage risk
We are accountable
We get it right from the start

We deliver with certainty

Assumptions Summary

Our assumptions include, but are not limited to:

General
- MMO to be undertaking by VF/NR
- MMO applications to be split in 2 separate applications as per NR request (1nr emergency works, 1nr rock armour)
- Beach access ramp outside of tidal zone
- Existing Access tracks/ roads and cliff stability to site are in an acceptable condition for the required plant loadings required. All plant to be delivered to site via road only.
- No UXO clearance is required for the works. Watch & brief required as a worst case for the piling only.
- The existing roads and walkways to site are of sound condition and only require general maintenance (stone top up). Track and slope monitoring, remedial works and track matting may be required throughout the works for the eastern track following the TW assessment.

Veg Clear
- Veg clearance is to be undertaken by VF prior to March and nesting bird season.

Walkway
- Existing walkway to remain closed to the public for the duration of the works.
- The walkway is to be repaired using resin injection from Bay 0 to Bay 30 only, as required, – approximately 470 linear metres.
- Localised repairs will be undertaken for fully collapsed sections using traditional concrete. For this:
    - Walkway width varies between 2m to 8m. 5m width assumed for estimating purposes.
    - RC slab depth is no more than 200mm.
    - 6a excavation depth is no more than 1m.
    - If a full depth excavation is required behind the wall, this will be circa 6m deep (Based on existing levels on the rock armour drawings. 6mAOD to 0mAOD.) This would equate to circa 14,100m3 muck away and fill import.
- Designer to confirm walkway repair and cliff drainage repair designs.
- The walkway is to be replaced/ repaired as required.
- The existing walkway is to be used as a haul road for the works once the aforementioned repairs are undertaken.
- Localised RC walkway slabs are to be cast once all other works are complete.

Drainage
- Designer to confirm the required IL for the flap valve
- Designer to confirm the required IL for the pipe connection at the manhole chamber/existing culvert tie in.
- Designer to confirm final design.

Beach Clearance
- Extents = Clearance only required from Bay 0 to Bay 32.
- Clearance is only undertaken on a low spring tide, and to the extent of that tide.
- Groyne steels located beyond the LWS tide extent are to be removed on LWS only, using the excavator.
- No diving works, diver beach clearance or floating kit is required
- Muck away via Road. (water or rail muck away not considered).
- Beach ramp to be constructed using existing beach material
- Assumed number of groynes 12.
- Steel and timber muck away only.
- Rocks, mudstone and chalk to remain in-situ and left untouched where possible. If required, they are to be pushed flat/ flush with the existing beach level with the excavator.

Wall Repairs
- Drivability and wall stability suitable for pile installation using a 35t excavator and Movax SG75. No augering allowed for.
- Beach level assumed at 0.00mOD
- Shear studs to be used and welded to the sheetpile in pans rather than threaded stud bolts.
- Mechanical fixings to be used for the buttress repair bracketry, rather than chemical fixings.

Rock Armour
- There are currently 19 bays of rock armour envisaged for installation across the western beach (Frontage spanning from Bay 11 to Bay 29.
- This equates to approximately 17,200t rock.
- Circa 6500t rock per shipment/ barge movement.
- Draught suitable to get the barge to the proposed rock drop zones. (Updated Bathymetric survey to be provided prior to works commencing)
- KML Intrepid barge with 7000t DWT.
    - Max allowable load 6500t
- Low tide working window – 6 hours (4 hours working).
- Primary Rock armour to be constructed in two layers and a temporary ramp made up using existing beach material to the first layer, so the second layer can be placed using the 50t excavator. **If this cannot be undertaken a 90/100t long reach may be required.**
- There may be periods of working both tides in a 24hr period. This will be for short durations only, where the weather and tides are favourable.

Tidal Window – Feb/May 2025

Actual beach levels TBC following updated surveys.

Tidal windows assuming 0.000mAOD beach level (3.67m Chart Datum), 6hour window (1 hour mob, 4-hour work, 1 hour demob).

Folkestone - February 2025

01 Sat	00:33 08:24 12:53 20:43	7.8m 0.3m 7.6m 0.4m	02 Sun	01:13 09:05 13:34 21:21	7.8m 0.3m 7.6m 0.5m	03 Mon	01:54 09:43 14:19 21:59	7.7m 0.5m 7.3m 0.8m	04 Tue	02:41 10:21 15:10 22:37	7.4m 0.8m 6.9m 1.3m	05 Wed	03:34 11:00 16:06 23:18	6.9m 1.3m 6.4m 1.7m	06 Thu	04:32 11:47 17:12	6.3m 1.8m 5.9m	07 Fri	00:13 05:44 12:51 18:33	2.2m 5.8m 2.1m 5.6m	08 Sat	01:31 07:12 14:17 20:05	2.5m 5.5m 2.3m 5.5m	09 Sun	03:04 08:40 15:43 21:20	2.4m 5.6m 2.2m 5.8m	10 Mon	04:22 09:46 16:52 22:14	2.1m 5.9m 1.9m 6.2m	11 Tue	05:24 10:34 17:47 22:54	1.7m 6.3m 1.5m 6.6m
12 Wed	06:14 11:12 18:33 23:29	1.3m 6.7m 1.2m 6.9m	13 Thu	06:56 11:45 19:13 23:59	1.0m 6.9m 1.0m 7.2m	14 Fri	00:00 07:33 12:17 19:49	7.2m 0.9m 7.1m 0.9m	15 Sat	00:32 08:07 12:49 20:19	7.3m 0.8m 7.1m 0.9m	16 Sun	01:03 08:36 13:20 20:47	7.2m 0.8m 7.0m 1.0m	17 Mon	01:34 09:03 13:52 21:13	7.1m 1.0m 6.8m 1.2m	18 Tue	02:06 09:28 14:26 21:37	6.9m 1.2m 6.5m 1.5m	19 Wed	02:41 09:54 15:03 22:04	6.5m 1.6m 6.2m 1.9m	20 Thu	03:20 10:24 15:45 22:36	6.1m 1.9m 5.8m 2.2m	21 Fri	04:04 11:01 16:37 23:22	5.8m 2.3m 5.4m 2.6m	22 Sat	05:04 11:58 17:49	5.3m 2.6m 5.1m
23 Sun	00:34 06:29 13:26 19:27	2.9m 5.1m 2.7m 5.1m	24 Mon	02:17 06:06 15:02 20:48	2.8m 5.2m 2.5m 5.5m	25 Tue	03:44 09:16 16:17 21:43	2.3m 5.7m 2.0m 6.1m	26 Wed	04:51 10:03 17:18 22:21	1.8m 6.3m 1.5m 6.7m	27 Thu	05:48 10:40 18:14 22:57	1.1m 7.0m 0.9m 7.4m	28 Fri	06:41 11:15 19:04 23:32	0.5m 7.5m 0.4m 7.9m																

Folkestone - May 2025

01 Thu	01:53 09:39 14:20 21:59	7.6m 0.6m 7.4m 0.9m	02 Fri	02:44 10:16 15:12 22:38	7.1m 1.1m 6.9m 1.4m	03 Sat	03:40 10:55 16:11 23:23	6.5m 1.6m 6.3m 1.8m	04 Sun	04:43 11:44 17:17	5.9m 2.1m 5.8m	05 Mon	00:19 05:57 12:48 18:34	2.3m 5.4m 2.5m 5.5m	06 Tue	01:35 07:22 14:10 19:57	2.5m 5.2m 2.7m 5.4m	07 Wed	02:56 08:40 15:26 21:02	2.4m 5.3m 2.5m 5.6m	08 Thu	04:00 09:35 16:26 21:51	2.2m 5.6m 2.3m 5.8m	09 Fri	04:52 10:18 17:16 22:30	1.9m 5.9m 2.0m 6.1m	10 Sat	05:37 10:52 17:57 23:02	1.7m 6.2m 1.8m 6.4m	11 Sun	06:16 11:22 18:35 23:33	1.4m 6.5m 1.5m 6.6m
12 Mon	06:52 11:53 19:11	1.2m 6.7m 1.4m	13 Tue	00:04 07:28 12:24 19:46	6.8m 1.1m 6.8m 1.3m	14 Wed	00:37 08:01 12:57 20:19	6.8m 1.1m 6.8m 1.3m	15 Thu	01:11 08:33 13:31 20:51	6.8m 1.2m 6.8m 1.4m	16 Fri	01:46 09:05 14:07 21:24	6.7m 1.3m 6.7m 1.5m	17 Sat	02:24 09:38 14:47 21:59	6.5m 1.5m 6.5m 1.6m	18 Sun	03:07 10:15 15:32 22:41	6.2m 1.7m 6.3m 1.8m	19 Mon	03:57 11:00 16:25 23:32	6.0m 1.9m 6.1m 2.0m	20 Tue	04:56 11:56 17:27	5.8m 2.1m 5.9m	21 Wed	00:35 06:05 13:04 18:37	2.0m 5.7m 2.2m 5.9m	22 Thu	01:48 07:19 14:21 19:47	2.0m 5.8m 2.1m 6.1m
23 Fri	03:03 08:26 15:37 20:49	1.7m 6.1m 1.8m 6.5m	24 Sat	04:13 09:23 16:44 21:43	1.3m 6.5m 1.5m 6.8m	25 Sun	05:16 10:13 17:45 22:31	1.0m 6.9m 1.1m 7.2m	26 Mon	06:13 10:58 18:41 23:18	0.7m 7.3m 0.8m 7.5m	27 Tue	07:06 11:44 19:32	0.4m 7.5m 0.6m	28 Wed	00:04 07:54 12:31 20:19	7.6m 0.4m 7.6m 0.6m	29 Thu	00:53 08:40 13:20 21:04	7.5m 0.6m 7.5m 0.8m	30 Fri	01:43 09:22 14:10 21:45	7.2m 0.8m 7.2m 1.0m	31 Sat	02:34 10:02 15:01 22:27	6.9m 1.2m 6.8m 1.3m						

Guide Heights for Folkestone

Find times when tide height(m) 3.67 Find

Saturday 01 February 2025
04:25 Falling
10:31 Rising
16:43 Falling
22:47 Rising

Sunday 02 February 2025
05:06 Falling
11:12 Rising
17:25 Falling
23:27 Rising

Monday 03 February 2025
05:47 Falling
11:54 Rising
18:09 Falling

Tuesday 04 February 2025
00:09 Rising
06:33 Falling
12:38 Rising
18:57 Falling

Wednesday 05 February 2025
00:54 Rising
07:23 Falling
13:26 Rising
19:52 Falling

Thursday 06 February 2025
01:42 Rising
08:20 Falling
14:21 Rising
20:58 Falling

Friday 07 February 2025
02:42 Rising
09:31 Falling
15:31 Rising
22:22 Falling

Saturday 08 February 2025
04:01 Rising
10:58 Falling
16:57 Rising
23:54 Falling

Sunday 09 February 2025
05:33 Rising
12:21 Falling
18:16 Rising

Monday 10 February 2025
01:04 Falling
06:49 Rising
13:24 Falling
19:20 Rising

Tuesday 11 February 2025
01:56 Falling
07:47 Rising
14:12 Falling
20:09 Rising

Wednesday 12 February 2025
02:37 Falling
08:33 Rising
14:53 Falling
20:50 Rising

Thursday 13 February 2025
03:13 Falling
09:11 Rising
15:28 Falling
21:25 Rising

Friday 14 February 2025
03:47 Falling
09:47 Rising
16:02 Falling
22:00 Rising

Saturday 15 February 2025
04:19 Falling
10:20 Rising
16:34 Falling
22:30 Rising

Sunday 16 February 2025
04:50 Falling
10:50 Rising
17:04 Falling
22:59 Rising

Monday 17 February 2025
05:20 Falling
11:20 Rising
17:35 Falling
23:28 Rising

Tuesday 18 February 2025
05:52 Falling
11:49 Rising
18:08 Falling
23:57 Rising

Wednesday 19 February 2025
06:25 Falling
12:21 Rising
18:44 Falling

Thursday 20 February 2025
00:28 Rising
07:03 Falling
12:55 Rising
19:26 Falling

Friday 21 February 2025
01:04 Rising
07:49 Falling
13:38 Rising
20:22 Falling

Saturday 22 February 2025
01:51 Rising
08:53 Falling
14:37 Rising
21:41 Falling

Sunday 23 February 2025
03:03 Rising
10:20 Falling
16:05 Rising
23:18 Falling

Monday 24 February 2025
04:45 Rising
11:48 Falling
17:35 Rising

Tuesday 25 February 2025
00:30 Falling
06:12 Rising
12:53 Falling
18:45 Rising

Wednesday 26 February 2025
01:23 Falling
07:15 Rising
13:41 Falling
19:37 Rising

Thursday 27 February 2025
02:04 Falling
08:04 Rising
14:24 Falling
20:25 Rising

Friday 28 February 2025
02:45 Falling
08:50 Rising
15:04 Falling
21:07 Rising

Guide Heights for Folkestone

Find times when tide height(m) 3.67 Find

Thursday 01 May 2025
05:44 Falling
11:51 Rising
18:12 Falling

Friday 02 May 2025
00:12 Rising
06:31 Falling
12:35 Rising
19:03 Falling

Saturday 03 May 2025
01:00 Rising
07:25 Falling
13:22 Rising
20:00 Falling

Sunday 04 May 2025
01:53 Rising
08:27 Falling
14:15 Rising
21:06 Falling

Monday 05 May 2025
02:56 Rising
09:42 Falling
15:20 Rising
22:24 Falling

Tuesday 06 May 2025
04:14 Rising
11:09 Falling
16:39 Rising
23:43 Falling

Wednesday 07 May 2025
05:33 Rising
12:23 Falling
17:51 Rising

Thursday 08 May 2025
00:41 Falling
06:35 Rising
13:16 Falling
18:49 Rising

Friday 09 May 2025
01:28 Falling
07:24 Rising
13:59 Falling
19:37 Rising

Saturday 10 May 2025
02:07 Falling
08:05 Rising
14:33 Falling
20:15 Rising

Sunday 11 May 2025
02:40 Falling
08:40 Rising
15:05 Falling
20:51 Rising

Monday 12 May 2025
03:12 Falling
09:14 Rising
15:37 Falling
21:26 Rising

Tuesday 13 May 2025
03:45 Falling
09:47 Rising
16:10 Falling
22:00 Rising

Wednesday 14 May 2025
04:19 Falling
10:20 Rising
16:43 Falling
22:34 Rising

Thursday 15 May 2025
04:52 Falling
10:53 Rising
17:17 Falling
23:08 Rising

Friday 16 May 2025
05:27 Falling
11:26 Rising
17:53 Falling
23:44 Rising

Saturday 17 May 2025
06:05 Falling
12:02 Rising
18:32 Falling

Sunday 18 May 2025
00:22 Rising
06:47 Falling
12:42 Rising
19:18 Falling

Monday 19 May 2025
01:09 Rising
07:38 Falling
13:29 Rising
20:12 Falling

Tuesday 20 May 2025
02:03 Rising
08:37 Falling
14:25 Rising
21:14 Falling

Wednesday 21 May 2025
03:09 Rising
09:48 Falling
15:33 Rising
22:23 Falling

Thursday 22 May 2025
04:23 Rising
11:01 Falling
16:46 Rising
23:30 Falling

Friday 23 May 2025
05:35 Rising
12:09 Falling
17:57 Rising

Saturday 24 May 2025
00:32 Falling
06:40 Rising
13:09 Falling
19:00 Rising

Sunday 25 May 2025
01:27 Falling
07:36 Rising
14:01 Falling
19:56 Rising

Monday 26 May 2025
02:17 Falling
08:28 Rising
14:49 Falling
20:48 Rising

Tuesday 27 May 2025
03:06 Falling
09:17 Rising
15:37 Falling
21:38 Rising

Wednesday 28 May 2025
03:54 Falling
10:04 Rising
16:25 Falling
22:26 Rising

Thursday 29 May 2025
04:43 Falling
10:51 Rising
17:13 Falling
23:14 Rising

Friday 30 May 2025
05:31 Falling
11:36 Rising
18:01 Falling

Saturday 31 May 2025
00:00 Rising
06:20 Falling
12:21 Rising
18:51 Falling

We are one team

We care

We act with integrity

We manage risk

We are accountable

We get it right from the start

We deliver with certainty

Actual beach levels TBC following updated surveys.

The VolkerStevin Way

Tidal Window – Oct/Dec 2025

Tidal windows assuming 0.000mAOD beach level (3.67m Chart Datum), 6hour window (1 hour mob, 4-hour work, 1 hour demob).

Folkestone - October 2025

Date	Day	Tides
01	Wed	05:50 5.2m; 12:40 2.8m; 18:34 5.0m
02	Thu	01:23 2.8m; 07:25 5.1m; 14:20 2.8m; 20:13 5.1m
03	Fri	03:04 2.6m; 08:52 5.4m; 15:50 2.3m; 21:26 5.6m
04	Sat	04:24 2.1m; 09:49 6.0m; 16:58 1.7m; 22:13 6.3m
05	Sun	05:25 1.6m; 10:28 6.7m; 17:54 1.1m; 22:49 6.9m
06	Mon	06:19 1.0m; 11:03 7.3m; 18:46 0.5m; 23:23 7.5m
07	Tue	07:10 0.5m; 11:38 7.8m; 19:34 0.1m; 23:58 7.9m
08	Wed	07:55 0.2m; 12:15 8.1m; 20:17 -0.1m
09	Thu	00:37 8.1m; 08:38 0.1m; 12:55 8.2m; 20:58 -0.1m
10	Fri	01:19 8.0m; 09:17 0.2m; 13:40 8.0m; 21:35 0.2m
11	Sat	02:05 7.7m; 09:53 0.6m; 14:28 7.5m; 22:10 0.7m
12	Sun	02:55 7.2m; 10:29 1.1m; 15:22 6.8m; 22:48 1.3m
13	Mon	03:55 6.5m; 11:10 1.7m; 16:25 6.1m; 23:32 1.9m
14	Tue	05:01 5.9m; 12:06 2.2m; 17:43 5.5m
15	Wed	00:42 2.5m; 06:30 5.4m; 13:32 2.5m; 19:22 5.3m
16	Thu	02:16 2.6m; 08:04 5.4m; 15:05 2.4m; 20:49 5.4m
17	Fri	03:42 2.4m; 09:18 5.7m; 16:20 2.1m; 21:51 5.8m
18	Sat	04:48 2.1m; 10:08 6.0m; 17:15 1.7m; 22:33 6.2m
19	Sun	05:39 1.8m; 10:46 6.4m; 18:01 1.4m; 23:06 6.5m
20	Mon	06:21 1.5m; 11:17 6.7m; 18:39 1.1m; 23:34 6.8m
21	Tue	06:57 1.2m; 11:45 7.0m; 19:14 0.9m
22	Wed	00:02 7.0m; 07:30 1.1m; 12:13 7.1m; 19:45 0.8m
23	Thu	00:31 7.1m; 08:01 1.0m; 12:43 7.1m; 20:15 0.8m
24	Fri	01:02 7.1m; 08:30 1.1m; 13:15 7.0m; 20:43 1.0m
25	Sat	01:34 6.9m; 08:57 1.2m; 13:48 6.8m; 21:09 1.2m
26	Sun	01:07 6.7m; 08:24 1.4m; 13:22 6.5m; 20:36 1.5m
27	Mon	01:44 6.4m; 08:52 1.7m; 14:02 6.2m; 21:05 1.8m
28	Tue	02:25 6.1m; 09:26 2.0m; 14:47 5.8m; 21:43 2.2m
29	Wed	03:16 5.7m; 10:12 2.3m; 15:46 5.4m; 22:36 2.5m
30	Thu	04:22 5.4m; 11:19 2.5m; 17:04 5.2m; 23:53 2.6m
31	Fri	05:44 5.4m; 12:45 2.5m; 18:31 5.3m

Folkestone - December 2025

Date	Day	Tides
01	Mon	01:54 2.0m; 07:16 6.2m; 14:33 1.6m; 19:53 6.2m
02	Tue	03:05 1.7m; 08:14 6.5m; 15:40 1.2m; 20:46 6.6m
03	Wed	04:11 1.4m; 09:06 6.9m; 16:42 0.9m; 21:35 7.1m
04	Thu	05:12 1.0m; 09:54 7.3m; 17:38 0.6m; 22:21 7.4m
05	Fri	06:06 0.7m; 10:41 7.5m; 18:30 0.4m; 23:07 7.6m
06	Sat	06:56 0.5m; 11:28 7.6m; 19:18 0.4m; 23:54 7.6m
07	Sun	07:43 0.6m; 12:17 7.5m; 20:03 0.6m
08	Mon	00:43 7.5m; 08:28 0.7m; 13:08 7.2m; 20:46 0.9m
09	Tue	01:36 7.2m; 09:11 1.0m; 14:02 6.8m; 21:29 1.3m
10	Wed	02:29 6.8m; 09:54 1.3m; 14:59 6.4m; 22:12 1.7m
11	Thu	03:25 6.4m; 10:39 1.7m; 15:56 6.0m; 22:57 2.0m
12	Fri	04:22 6.0m; 11:29 2.0m; 16:59 5.7m; 23:52 2.3m
13	Sat	05:25 5.7m; 12:28 2.2m; 18:06 5.4m
14	Sun	00:54 2.5m; 06:30 5.6m; 13:30 2.3m; 19:12 5.4m
15	Mon	01:58 2.6m; 07:33 5.6m; 14:31 2.2m; 20:11 5.5m
16	Tue	03:06 2.4m; 08:36 5.6m; 15:36 2.2m; 21:03 5.7m
17	Wed	03:54 2.2m; 09:15 5.9m; 16:17 1.9m; 21:43 6.0m
18	Thu	04:42 2.0m; 09:56 6.1m; 17:03 1.7m; 22:21 6.2m
19	Fri	05:27 1.8m; 10:33 6.3m; 17:45 1.5m; 22:56 6.5m
20	Sat	06:08 1.6m; 11:09 6.5m; 18:25 1.3m; 23:30 6.6m
21	Sun	06:48 1.4m; 11:44 6.6m; 19:03 1.3m
22	Mon	00:04 6.8m; 07:26 1.3m; 12:20 6.7m; 19:41 1.2m
23	Tue	00:40 6.8m; 08:03 1.3m; 12:57 6.7m; 20:16 1.3m
24	Wed	01:16 6.8m; 08:39 1.3m; 13:35 6.6m; 20:53 1.4m
25	Thu	01:56 6.8m; 09:17 1.3m; 14:17 6.5m; 21:32 1.5m
26	Fri	02:37 6.7m; 09:58 1.4m; 15:02 6.4m; 22:13 1.6m
27	Sat	03:24 6.5m; 10:42 1.5m; 15:54 6.2m; 23:01 1.8m
28	Sun	04:19 6.3m; 11:35 1.7m; 16:55 6.0m; 23:59 2.0m
29	Mon	05:22 6.2m; 12:37 1.8m; 18:03 5.9m
30	Tue	01:07 2.1m; 06:32 6.1m; 13:49 1.7m; 19:16 6.0m
31	Wed	02:24 2.0m; 07:44 6.2m; 15:02 1.6m; 20:24 6.2m

Guide Heights for Folkestone

Find times when tide height(m 3.67 Find

Date	Times
Wednesday 01 October 2025	02:34 Rising; 09:44 Falling; 15:13 Rising; 22:24 Falling
Thursday 02 October 2025	03:58 Rising; 11:18 Falling; 16:54 Rising; 23:57 Falling
Friday 03 October 2025	05:34 Rising; 12:34 Falling; 18:22 Rising
Saturday 04 October 2025	01:05 Falling; 06:49 Rising; 13:27 Falling; 19:24 Rising
Sunday 05 October 2025	01:52 Falling; 07:43 Rising; 14:09 Falling; 20:12 Rising
Monday 06 October 2025	02:33 Falling; 08:29 Rising; 14:49 Falling; 20:56 Rising
Tuesday 07 October 2025	03:13 Falling; 09:13 Rising; 15:29 Falling; 21:38 Rising
Wednesday 08 October 2025	03:52 Falling; 09:55 Rising; 16:09 Falling; 22:19 Rising
Thursday 09 October 2025	04:33 Falling; 10:37 Rising; 16:50 Falling; 23:01 Rising
Friday 10 October 2025	05:15 Falling; 11:18 Rising; 17:33 Falling; 23:42 Rising
Saturday 11 October 2025	05:59 Falling; 12:01 Rising; 18:18 Falling
Sunday 12 October 2025	00:25 Rising; 06:47 Falling; 12:46 Rising; 19:10 Falling
Monday 13 October 2025	01:12 Rising; 07:43 Falling; 13:37 Rising; 20:10 Falling
Tuesday 14 October 2025	02:05 Rising; 08:52 Falling; 14:42 Rising; 21:31 Falling
Wednesday 15 October 2025	03:17 Rising; 10:22 Falling; 16:10 Rising; 23:10 Falling
Thursday 16 October 2025	04:47 Rising; 11:51 Falling; 17:41 Rising
Friday 17 October 2025	00:32 Falling; 06:09 Rising; 12:58 Falling; 18:52 Rising
Saturday 18 October 2025	01:31 Falling; 07:11 Rising; 13:46 Falling; 19:43 Rising
Sunday 19 October 2025	02:13 Falling; 07:58 Rising; 14:24 Falling; 20:24 Rising
Monday 20 October 2025	02:48 Falling; 08:36 Rising; 14:57 Falling; 20:58 Rising
Tuesday 21 October 2025	03:19 Falling; 09:09 Rising; 15:27 Falling; 21:30 Rising
Wednesday 22 October 2025	03:48 Falling; 09:41 Rising; 15:57 Falling; 22:00 Rising
Thursday 23 October 2025	04:18 Falling; 10:11 Rising; 16:28 Falling; 22:30 Rising
Friday 24 October 2025	04:49 Falling; 10:42 Rising; 16:59 Falling; 23:00 Rising
Saturday 25 October 2025	05:20 Falling; 11:12 Rising; 17:30 Falling; 23:29 Rising
Sunday 26 October 2025	04:52 Falling; 10:42 Rising; 17:04 Falling; 23:00 Rising
Monday 27 October 2025	05:29 Falling; 11:16 Rising; 17:42 Falling; 23:34 Rising
Tuesday 28 October 2025	06:10 Falling; 11:55 Rising; 18:28 Falling
Wednesday 29 October 2025	00:15 Rising; 07:03 Falling; 12:45 Rising; 19:29 Falling
Thursday 30 October 2025	01:10 Rising; 08:12 Falling; 13:55 Rising; 20:49 Falling
Friday 31 October 2025	02:24 Rising; 09:32 Falling; 15:22 Rising; 22:14 Falling

Guide Heights for Folkestone

Find times when tide height(m 3.67 Find

Date	Times
Monday 01 December 2025	04:17 Rising; 10:58 Falling; 17:04 Rising; 23:37 Falling
Tuesday 02 December 2025	05:24 Rising; 11:56 Falling; 18:05 Rising
Wednesday 03 December 2025	00:32 Falling; 06:25 Rising; 12:50 Falling; 19:00 Rising
Thursday 04 December 2025	01:24 Falling; 07:21 Rising; 13:41 Falling; 19:51 Rising
Friday 05 December 2025	02:13 Falling; 08:13 Rising; 14:30 Falling; 20:40 Rising
Saturday 06 December 2025	03:01 Falling; 09:02 Rising; 15:18 Falling; 21:27 Rising
Sunday 07 December 2025	03:49 Falling; 09:51 Rising; 16:07 Falling; 22:14 Rising
Monday 08 December 2025	04:37 Falling; 10:40 Rising; 16:57 Falling; 23:01 Rising
Tuesday 09 December 2025	05:27 Falling; 11:29 Rising; 17:48 Falling; 23:48 Rising
Wednesday 10 December 2025	06:19 Falling; 12:19 Rising; 18:42 Falling
Thursday 11 December 2025	00:36 Rising; 07:13 Falling; 13:10 Rising; 19:39 Falling
Friday 12 December 2025	01:24 Rising; 08:09 Falling; 14:05 Rising; 20:42 Falling
Saturday 13 December 2025	02:19 Rising; 09:11 Falling; 15:06 Rising; 21:51 Falling
Sunday 14 December 2025	03:19 Rising; 10:14 Falling; 16:09 Rising; 22:57 Falling
Monday 15 December 2025	04:22 Rising; 11:13 Falling; 17:09 Rising; 23:55 Falling
Tuesday 16 December 2025	05:32 Rising; 12:20 Falling; 18:03 Rising
Wednesday 17 December 2025	00:44 Falling; 06:17 Rising; 12:51 Falling; 18:49 Rising
Thursday 18 December 2025	01:25 Falling; 07:03 Rising; 13:32 Falling; 19:31 Rising
Friday 19 December 2025	02:04 Falling; 07:47 Rising; 14:11 Falling; 20:10 Rising
Saturday 20 December 2025	02:40 Falling; 08:27 Rising; 14:48 Falling; 20:47 Rising
Sunday 21 December 2025	03:15 Falling; 09:05 Rising; 15:24 Falling; 21:23 Rising
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Tuesday 23 December 2025	04:27 Falling; 10:20 Rising; 16:37 Falling; 22:35 Rising
Wednesday 24 December 2025	05:03 Falling; 10:58 Rising; 17:16 Falling; 23:13 Rising
Thursday 25 December 2025	05:42 Falling; 11:39 Rising; 17:58 Falling; 23:52 Rising
Friday 26 December 2025	06:24 Falling; 12:22 Rising; 18:43 Falling
Saturday 27 December 2025	00:35 Rising; 07:11 Falling; 13:11 Rising; 19:36 Falling
Sunday 28 December 2025	01:25 Rising; 08:06 Falling; 14:07 Rising; 20:38 Falling
Monday 29 December 2025	02:24 Rising; 09:08 Falling; 15:12 Rising; 21:47 Falling
Tuesday 30 December 2025	03:32 Rising; 10:17 Falling; 16:23 Rising; 23:01 Falling
Wednesday 31 December 2025	04:47 Rising; 11:26 Falling; 17:34 Rising

We are one team

We care

We act with integrity

We manage risk

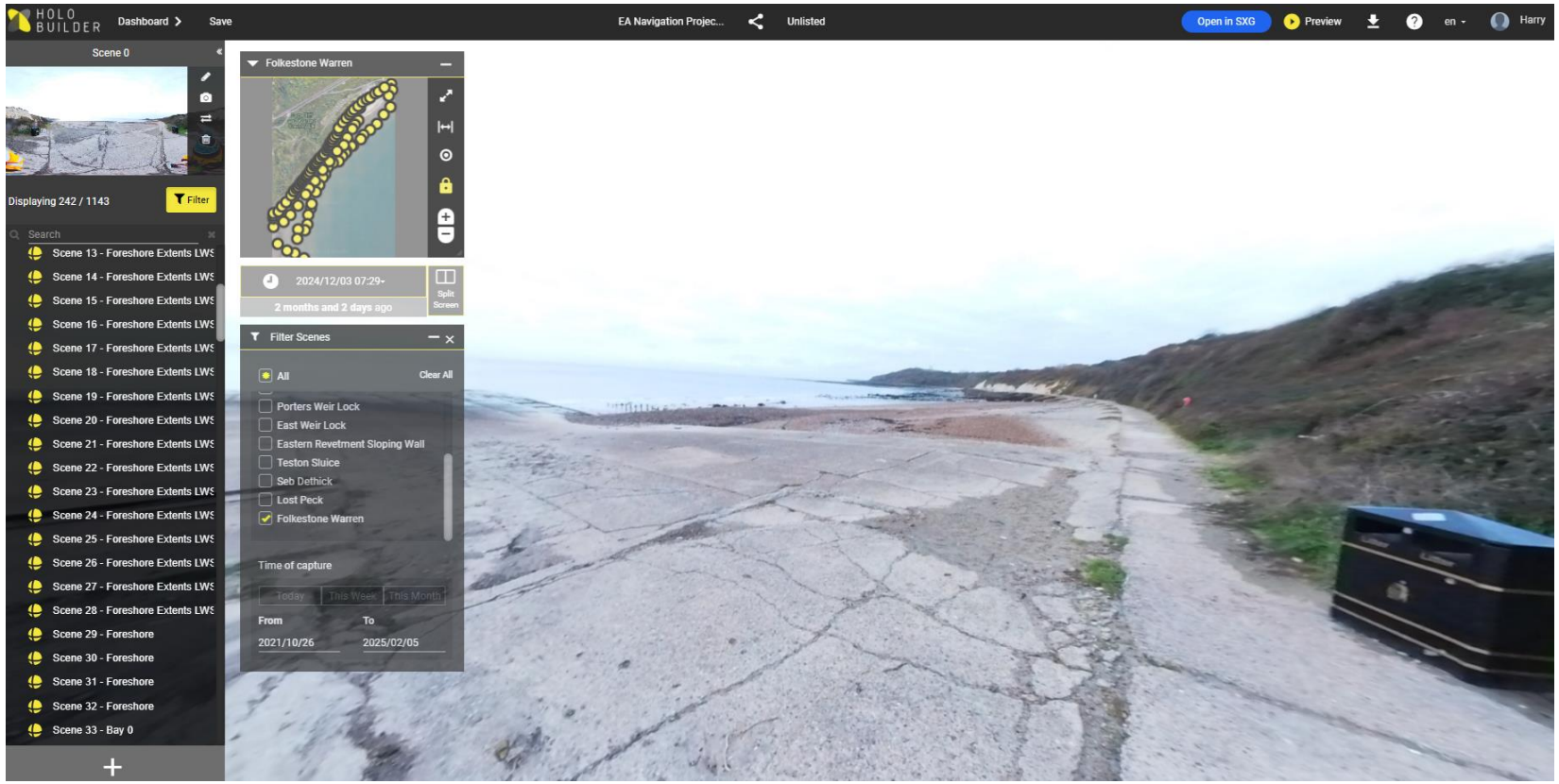
We are accountable

We get it right from the start

We deliver with certainty

Additional Links/ Information

- 360 degree photos of site can be found on Holobuilder here:
- https://app.holobuilder.eu/app/?p=cffc8275-f3a8-465b-9216-316c246d67d3&c=Folkestone%20Warren&ts=1635202800000&te=1736207999999



We are one team

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Estimated outputs

Activity	Quantity/Volume	Output (per day)	Duration (total days)	Comments
1 – veg clear	By others	By others	By others	By others
2 – compound/ site setup	6x6 double stack & foundations, inc. setup (plumbing, electrical etc.)	-	10	-
4 – temp beach ramp	(20m x 15m x 1m)/2 150m3	96t/day	3	1nr 16t excavator
5a – Concrete slab break out (only required for Walkway Repair Option 1)	470 linear metres	40lm/ day	12	1nr 16t excavator, breaker and bucket
5a – loose material bulk excavation and transportation	470m x 5m x 1m 2350m3	80m3/ day	29	1nr 9t dumper (4m3 per load, 20 loads per day) One way access to east hardstand, unable to increase dumpers.
5a – 6a fill part 1 (only required for Walkway Repair Option 1)	470m x 5m x 0.5m 1175m3	160m3/ day	8	2nr 16t excavator 2nr 9t dumpers (4m3 per load, 20 loads per day, per dumper) 1n dumper & excavator in compound loading, 1nr dumper & excavator at works location laying stone.
5c – drainage excavation	10m x 5m x 5m = 250m3 Batter (10m x 5m x 5m/2 *2)= 250m3 500m3	80m3 / day	6.25	Worst case – assuming 5m deep dig. . 1nr 9t dumper (4m3 per load, 20 loads per day) One way access to east hardstand, unable to increase dumpers
5c – drainage excavation	10 x 3.5 x 3.5 = 122.5m3 2nr 45deg. batters = 10x3.5x3.5 = 122.5m3 245m3	80m3 / day	3	Best case 3.5m deep dig 1nr 9t dumper (4m3 per load, 20 loads per day) One way access to east hardstand, unable to increase dumpers

Estimated outputs

Activity	Quantity/Volume	Output (per day)	Duration (total days)	Comments
6 – beach clearance	12nr groynes	1nr/ per tide	12	4hr tidal window 12 groynes, 37t steel per groyne, 7t timber per groyne 1nr 16t excavator bucket & grab.
7a/b – Piling	54nr sheets, 4nr tie ins/closures = <u>58 total</u> Bay 22 - 34nr sheets Bay 14 - 20nr sheets	4nr/tide	15	4hr tidal window 35t excavator & movax
7c – buttress repairs	Buttress repairs bay 10 to 14 and 17 to 19. 4 brackets per buttress <u>8 buttresses total</u>	1nr/ tide	8	4hr tidal window Pasma tower, sds max with mechanical fixings
7d – concreting- sheetpile bays.	2nr bays. Bay 14 – 2nr pours per bay – 58m3 total Bay 22 – 2nr pours per bay - 104m3 total <u>4nr pours</u>	1nr/ tide	4	5.67CD top of concrete, (2mAOD) – circa 9hr tidal window . Concrete to be poured /sequenced on the ebb. 6m3, wagons extended chute and tremie
7d – concreting - buttresses	<u>8nr bays ,</u> (2m3 per bay)	3nr/tide	3	5.67CD top of concrete, (2mAOD) – circa 9hr tidal window . Concrete to be poured /sequenced on the ebb. 16t excavator, 0.5m3 skip & tremie.
7e – cut piles to level	54nr sheets, 4nr tie ins/closures = <u>58 total</u>	8nr/ tide	7	

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Estimated outputs

Activity	Quantity/Volume	Output (per day)	Duration (total days)	Comments
8 – rock delivery	13,500t	3000t/ 24 hours (both high tides)	5	HW delivery, 1500t per delivery, double tide shifts, 1 delivery per high tide, 2 deliveries per 24 hours. - need to check on shipment quantities and time between ships. May need to split the activity over a couple of months. Transhipment from ship to barge will be undertaken at the transhipment location, during low tide. Will need resource for 2nr 12hr shifts for crew.
8 – rock placement, inc. excavation etc.	16000t total, 50t/ hr 200t per shift (4hrs)	200t/tide	80	4hr tidal window (daylight tides only) – no beach night working 1nr 50t loading 1nr 50t placing 1nr 16t excavating 1nr 35t placing terram/ excavating 1nr 40t moxy
9 – 6a fill part 2 (only required for Walkway Repair Option 1)	470m x 5m x 0.3m = **705m3**	160m3/day	5	2nr 16t excavator 2nr 9t dumpers (4m3 per load, 20 loads per day, per dumper) 1n dumper & excavator in compound loading, 1nr dumper & excavator at works location laying stone.
9 – walkway concrete pours	470 linear metres, 10m x 5m x 0.200m bays. 47 bays total (only required for Walkway Repair Option 1) Localised repair volume will be much lower, bay quantities TBC onsite.	1bay/day	47	6m3 concrete wagons

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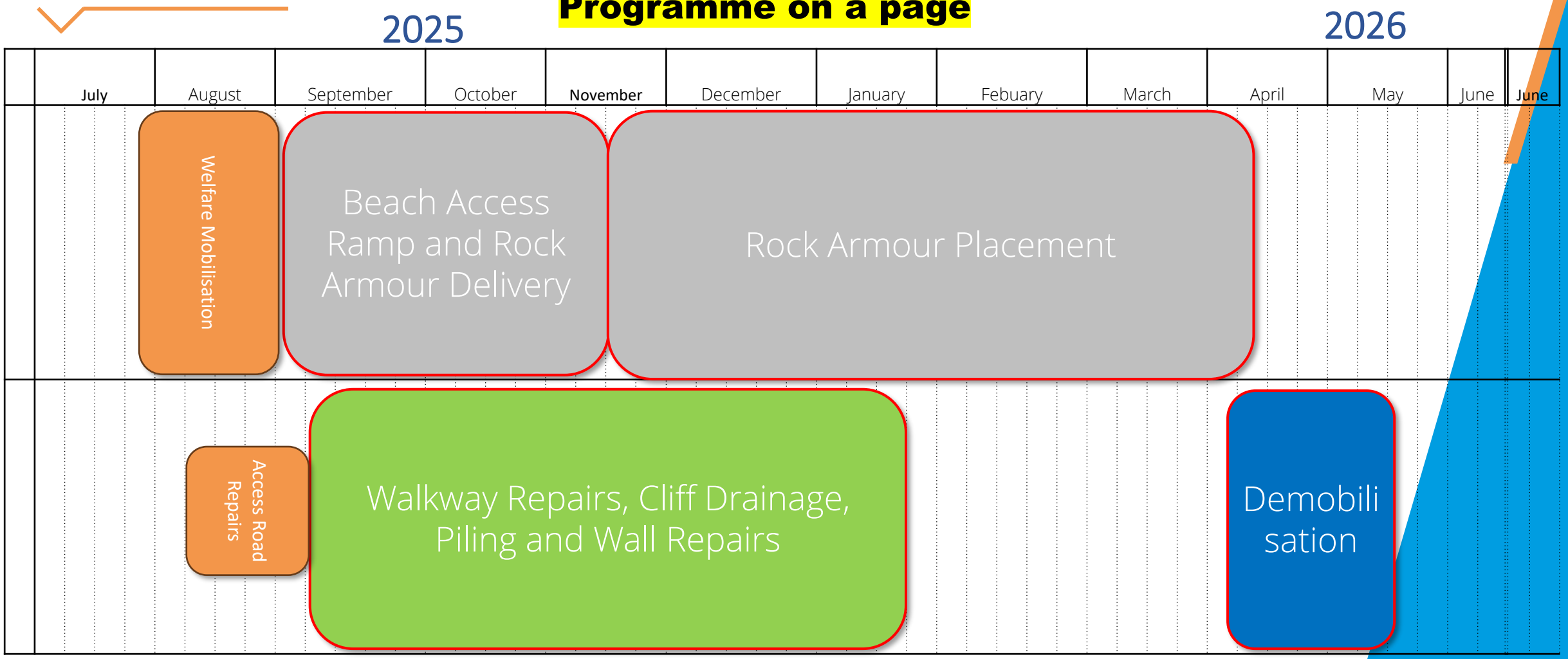
VolkerStevin

Folkestone Warren POAP Programme on a page

VolkerFitzpatrick



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