WHITE CROSS

White Cross Offshore Windfarm ES Addendum

Appendix Y: Outline Cable Landfall Plan

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Glossary of Acronyms

Acronym	Definition
AOD	Above Ordnance Datum
CBRA	Cable Burial Risk Assessment
CDM	Construction, Design and Management
ES	Environmental Statement
HDD	Horizontal Directional Drilling
HDPE	High density polyethylene
MCZ	Marine Conservation Zone
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
NDC	North Devon Council
OECC	Offshore Export Cable Corridor
OCLP	Outline Cable Landfall Plan
OSP	Offshore Substation Platform
OWF	Offshore Wind Farm
RIAA	Report to Inform Appropriate Assessment
RIB	Rigid Inflatable Boat
SAC	Special Area of Conservation
TJB	Transition Joint Bay
UXO	Unexploded Ordnance
WCOWL	White Cross Offshore Wind Ltd
WTG	Wind Turbine Generators

Glossary of Terminology

Defined Term	Description
Development area	The area comprising the onshore development area and the offshore development area
Export cable corridor	The area in which the export cables will be laid, from the offshore substation platform to the onshore substation comprising both the offshore export cable corridor and onshore export cable corridor
Inter-array cables	Cables which link the wind turbines to each other and the offshore substation platform
Landfall	Where the offshore export cables come ashore
Offshore development area	The windfarm site and offshore export cable corridor to landfall
Offshore export cables	The cables which will bring electricity from the offshore substation platform to the landfall
Offshore export cable corridor	The proposed offshore area in the which the export cables will be laid, from the perimeter of the windfarm site to landfall
Offshore substation platform	A fixed or floating structure located within the windfarm site, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore
Onshore development area	The onshore area above MHWS including the underground onshore export cables connecting to the onshore Project substation
Onshore export cables	The cables which bring electricity from the landfall to the onshore substation
Onshore export cable corridor	The proposed onshore area in which the export cables will be laid, from landfall to the onshore substation
Onshore substation	Part of an electrical transmission and distribution system. Substations transform voltage from high to low, or the reverse by means of the electrical transformers.
Transition joint bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore export cables
Windfarm site	The area within which the wind turbines, offshore substation platform and inter-array cables will be present
White Cross offshore windfarm (the Project)	100MW capacity offshore windfarm including associated onshore and offshore infrastructure

1. Purpose of this document

1. This document has been prepared in response to comments received from the Marine Management Organisation (MMO), North Devon Council (NDC) and other consultees during the statutory consultations on the offshore and onshore applications for the White Cross Offshore Windfarm (the Project) requesting further detail of the proposed construction methodology at landfall, and of the proposed works in the Saunton Sands car park.

2. This Outline Cable Landfall Plan (OCLP) describes the process of installing the offshore cable in the region between the offshore environment and the car park at Saunton Sands, the works undertaken in the car park for the crossing of Braunton Burrows/Saunton Golf Course using a trenchless technique, and the 'pulling' the onshore cable to meet and be secured to the offshore cable at the Transition Joint Bay (TJB). This includes works in the intertidal, upper foreshore and the car park and will be delivered in six phases over approximately 12 months.

2. Previous landfall design

3. The application for the offshore elements of the Project, which was submitted to the MMO in March 2023, included and assessed two options for the landfall at Saunton Sands. A trenchless technique drilling from the car park, i.e. above Mean High Water Springs (MHWS) to an exit point offshore below Mean Low Water Springs (MLWS). And an open cut option with a trench from MWHS, with the cable installed in the trench and backfilled.

4. The application for the onshore elements of the Project, which was submitted to NDC in August 2023, assessed three options for the landfall at Saunton Sands:

    - Open cut in the intertidal zone with a short trenchless section to cross the dunes at the edge of Saunton Sands car park;
    - Trenchless technique with a Horizontal Directional Drilling (HDD) rig located above MHWS in the car park at Saunton Sands drilling up to 860m to an intertidal exit point above MLWS;
    - Trenchless technique with a HDD rig located above MHWS in the car park at Saunton Sands drilling up to 1850m to an offshore exit point below MLWS.

5. Further design work undertaken since the two applications were submitted has revised these options, with the option presented in this OCLP being the one taken forward. More information on the design work and changes made post-submission

can be found in **Section 5.2.2** of the **Environmental Statement (ES) Addendum**.

6. The landfall design presented in this OCLP has also been informed by the results of the onshore ground investigation which was completed in September and October 2023. The ground investigations included the drilling of 3 no. boreholes within the car park at Saunton Sands, and a seismic refraction survey undertaken within the intertidal zone at Saunton Sands. The results and interpretation of the onshore ground investigation can be found in **Appendix T: Onshore Ground Investigation Interpretative Report** of the **ES Addendum**.

3. Outline Cable Landfall Plan

7. The work at landfall and within the Saunton Sands car park have been split into six phases. These are designed to be undertaken consecutively to minimise the amount of disruption to the public and businesses, although there will be some overlap between some phases. For example, where they will use the same working area or compound.

8. Public access to the beach, including to the sea, will be maintained for the duration of the works at landfall with full access along the existing slipway maintained. More information on how access will be maintained and on how the movements of construction plant, materials and equipment will be managed can be found in **Section 5.2.2** of the **ES Addendum**.

9. These works will also be undertaken simultaneously to the onshore and offshore cable installation: and, phase 6 (**Section 3.6**) will be the final overall stage, during which both cables will be joined. **Figure 1** presents an overall project cable installation programme (both onshore and offshore), showing when works in the intertidal, upper foreshore and the car park will be in relation to other cable installation activities.

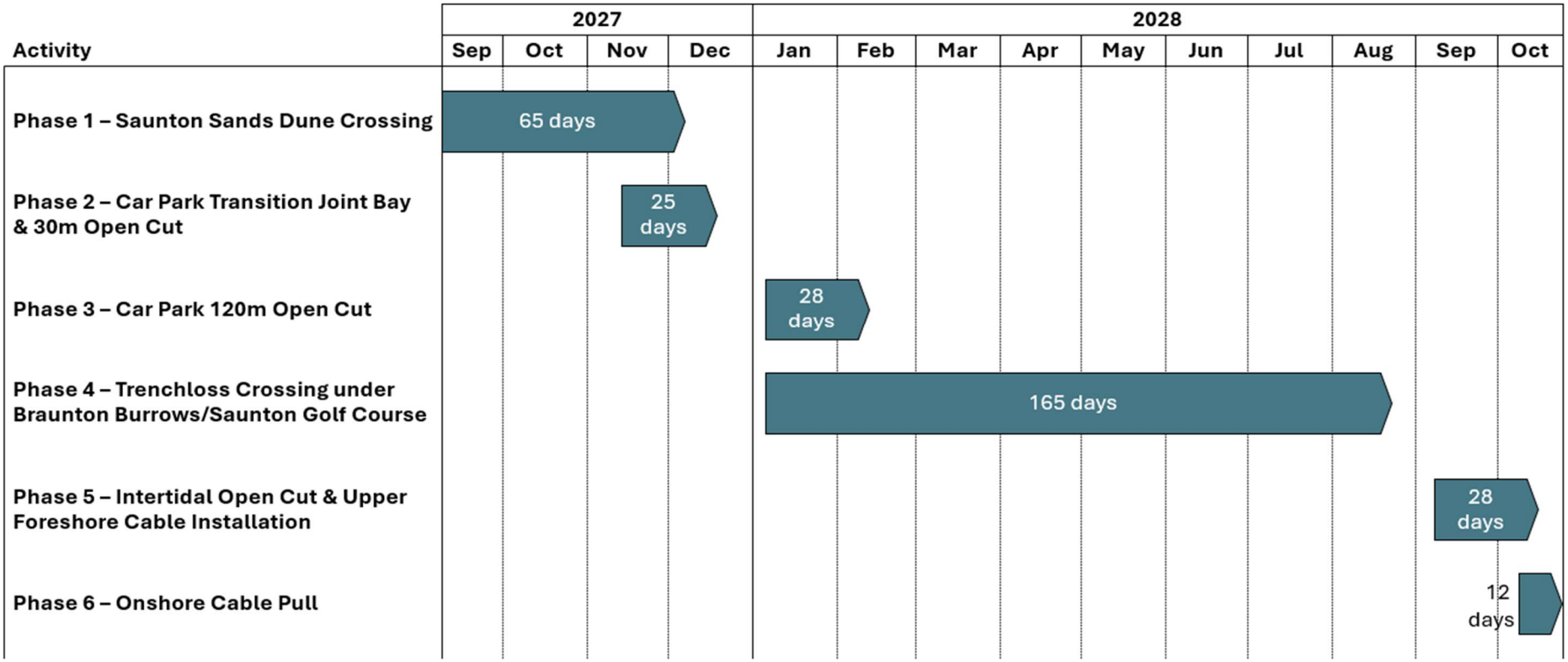

Figure 1 Cable landfall installation programme

10. **Table 1** details the timelines for the six phases of work for the cable landfall and works at Saunton Sands car park.

Table 1 Phasing of Cable Landfall and Works at Saunton Sands Car Park

Phase	Year and month	Duration	Further information
Phase 1: Saunton Sands Dune Crossing	Year 1: September – December	65 days	See Section 3.1
Phase 2: Car Park Transition Joint Bay and 40m Open Cut	Year 1: November – December	25 days	See Section 3.2
Phase 3: Car Park 120m Open Cut	Year 2: January – February	28 days	See Section 3.3
Phase 4: Horizontal Directional Drill under Braunton Burrows	Year 2: February – August	164 days	See Section 3.4
Phase 5: Intertidal and Upper Foreshore Cable Installation	Year 2: September – October	28 days	See Section 3.5
Phase 6: Onshore Cable Pull	Year 2: October - November	12 days	See Section 3.6

3.1 Phase 1 – Saunton Sands Dune Crossing

11. The first phase of landfall construction will consist of trenchless duct installation beneath the dune system shown in **Figure 2,** and illustrative cross sections are presented in **Plates 2** and **3**. This will take place over 65 days between September to November during the first year.

12. It is proposed that piperamming is used as the trenchless method of installing steel ducting in this area of non-cohesive geology (i.e., sands and gravels). Rather than using a cutting face as a conventional augerbore the steel duct is used as a "cookie cutter" cutting through the geology with minimal displacement of the surrounding geology. This provides continuous support to the geology above the duct.

13. Upon arrival at the reception pit, the duct will be cleared of the remaining sediment by mechanical means, using an auger flight (a type of screw conveyor used to remove sediment), or by pressure (fitting a pressure test head and introducing compressed air). Both of these methods are dependent upon the prevailing geology; however, auger flight is likely to be the preferred option given the prevalence of sand in the location.

14. It is intended that ducting will be driven from an east to west direction (i.e., from the drive pit in the Saunton Sands car park into the reception pit on the upper foreshore immediately west of the dune system – See **Figure 2**).

15. **Table 2** presents details of the dimensions of the Phase 1 construction compounds in the car park and of the working area in the upper foreshore, as well as the dimensions of the drive pit and reception pit and indications of the volumes of sediment to be excavated, where relevant. Vehicles, plant and machinery will access the upper foreshore using the existing slipway (see **Figure 2**), but these movements will be managed to avoid disturbance to other beach users. For example, all movements will take place at the start and end of the day.

16. The working area in the upper foreshore will not be a permanently fenced area, instead access around this area will be managed/controlled by banksman and marshals. Some temporary fencing may be required around the excavated area for the reception pit to comply with the requirements of the Construction, Design and Management (CDM) regulations.

Table 2 Parameters of construction compounds, drive and recption pits and excavated sediment volumes for Phase 1

Location	Length (m)	Width (m)	Depth (m)	Volume of excavated sediment (m^3)
Phase 1 & 2 car park construction compound	70	50	N/A	N/A
Car park drive pit	35	14	3.5	1,715 sand
Phase 1 upper foreshore working area	50	40	N/A	N/A
Upper foreshore reception pit	9	14	3	378 sand

17. The proposed sequencing of ducting installation will be as follows:

- Car park construction compound and upper foreshore working area establishment[1]
- Material mobilisation

[1]Site establishment is the process of creating a secure work site: consisting of fencing of area, installing a temporary working surface (stone), and the delivery of welfare/offices/stores, plant, equipment, materials, and personnel.

- Equipment mobilisation
- Installation of temporary trench support for drive pit (sheet piled pit)
- Excavation of drive pit sediment (approx. 80% to be stockpiled for backfilling around the TJB, the remaining to be removed from site[2])
- Installation of temporary trench support for reception pit (sheet piled pit)
- Excavation of reception pit sediment (stockpiled to be used for backfilling)
- Preparation of Piperam dune crossing
- Driving of duct number 1 and duct number 2
- Installation of temporary caps on ducts within drive and reception pits (to prevent ingress of debris)
- Temporary backfilling of reception pit (using material stockpiled)
- Installation of temporary HERAS fencing around reception pit
- Upper foreshore working area demobilised
- Piperam equipment demobilised
- Car park construction compound extended to accommodate next phase (See **Section 3.2**)

[2]Excavated sediment is sand. The project preference is to re-use the excess excavated sediment throughout the project (subject to suitability). Where this is not possible or preferable, it will removed from site in accordance with measures set out within the Construction Environmental Management Plan (CEMP).

PHASE 1 - DUNE CROSSING (PIPERAM) - SEPTEMBER TO NOVEMBER (65 DAYS)

SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV

GENERAL NOTES

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3. THE CONTRACTOR MUST ENSURE AND WILL BE HELD RESPONSIBLE FOR THE OVERALL STABILITY OF THE BUILDING/STRUCTURE/EXCAVATION AT ALL STAGES OF THE WORK.
4. ALL WORK BY THE CONTRACTOR MUST BE CARRIED OUT IN SUCH A WAY THAT ALL REQUIREMENTS UNDER THE HEALTH AND SAFETY AT WORK ACT ARE SATISFIED.
5. ALL WORK IS TO BE CARRIED OUT IN COMPLIANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES AND REGULATIONS.

PHASE 1 CONSTRUCTION SEQUENCE

a. SITE ESTABLISHMENT
b. MATERIAL MOBILISATION
c. EQUIPMENT MOBILISATION
d. INSTALL TEMPORARY TRENCH SUPPORT FOR DRIVE PIT (SHEET PILED PIT)
e. EXCAVATE DRIVE PIT (SAND TO BE REMOVED FROM SITE)
f. INSTALL TEMPORARY TRENCH SUPPORT FOR RECEPTION PIT (SHEET PILED PIT)
g. EXCAVATE RECEPTION PIT (SAND NOT TO BE REMOVED FROM SITE)
h. PREPARE PIPERAM DUNE CROSSING
i. DRIVE DUCT #1 & #2
j. TEMPORARY CAP DUCTS (DRIVE AND RECEPTION PITS)
k. TEMPORARY BACKFILL RECEPTION PIT
l. HERAS FENCE TO RECEPTION PIT, WIDER FORESHORE SITE DEMOBILISED
m. PIPERAM EQUIPMENT DEMOBILISED
n. CAR PARK SITE EXTENDED TO ACCOMMODATE PHASE 2 (TRANSITION JOINT BAY + OPENCUT SECTION)

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Amendments

Project: WHITE CROSS FLOATING WINDFARM

Title: LANDFALL CONSTRUCTION SEQUENCE PHASE 1 - DUNE CROSSING

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3.2 Phase 2 – Car Park Transition Joint Bay and 30m Open Cut

18. The second phase of landfall construction will consist of establishing a TJB within the drive pit in Saunton Sands car park and creating a 30m trench via open cut in a location immediately to the east (in a west to east direction), as shown in **Figure 3** and illustrated on **Plate 4**. This will take place over 24 days between November to December during the first year.

19. It is proposed that a pre-cast concrete TJB will be used as this reduces the number of HGV movements required, the TJB can be delivered in one or two deliveries ahead of when needed. The TJB will be installed in the drive pit that was excavated in Phase 1 to reduce the need for additional excavation. The majority of the stockpiled material excavated for the drive pit during Phase 1 will be used to backfill below and around the TJB. Excess excavated material will first be screened and tested for suitability for re-use elsewhere on site, and if it can't be re-used it will be removed from site for disposal.

20. Once installed the cover of the TJB will sit flush with the surface of the car park and would be available for vehicles to park over like any other area within the car park.

21. A short section of open cut trench, approximately 30m, will be excavated as part of this phase with the ducting installed and the trench backfilled. There will be a maximum of two trenches, one for each 66kV export cable, each approximately 4m wide with a minimum of 5m separation between the two cable centres. The area within which the open cut trench will be excavated will therefore be a maximum of 12m wide. Due to the ground conditions, predominantly wind-blown sand, trench supports may be required during excavation to prevent collapse.

22. **Table 3** presents details of the dimensions of the construction compound, TJB and trench working area, as well as an indication of the volume of sediment to be excavated.

Table 3 Parameters of construction compounds, TJB and excavated sediment volumes for Phase 2

Location	Length (m)	Width (m)	Depth (m)	Volume of excavated sediment (m^3)
Phase 2 car park construction compound	70	50	N/A	N/A
Car park drive pit (excavated during Phase 1)	35	14	3.5	1,715 sand

Location	Length (m)	Width (m)	Depth (m)	Volume of excavated sediment (m^3)
Car park TJB	20	8	2	N/A
Trench Excavation Area	30	12	N/A	N/A
40m open cut trench	30	4	1.9	228 sand

23. The proposed sequencing of TJB establishment and 30m open cut trench creation will be as follows:

- Site establishment
- Material mobilisation (including pre-cast TJB)
- Equipment mobilisation
- Preparation of drive pit for instillation of TJB (levelling and backfilling in base to correct finished level)
- Preparation and installation of pre-cast TJB to existing drive pit
- Strip 30m of trench excavation area
- Excavation of 30m open cut trench sediment (approx. 70% to be stockpiled for backfilling the cable trench, the remaining 30% to be removed from site[2])
- Installation of cable ducting and backfilling of sediment
- Phase 1 & 2 car park construction compound site demobilised
- Car park construction compound reinstated, TJB cover to be installed

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PHASE 2 CONSTRUCTION SEQUENCE

a. SITE ESTABLISHMENT (ADOPT PHASE 1 SITE)
b. MATERIAL MOBILISATION
c. EQUIPMENT MOBILISATION
d. EXCAVATE REMAINING SPOIL FROM DRIVE PIT (SAND TO BE REMOVED FROM SITE) FOR TRANSITION JOINT BAY PREPARATION
e. PREPARE AND INSTALL TRANSITION JOINT BAY TO EXISTING DRIVE PIT EXCAVATION (ASSUME PRECAST TRANSITION JOINT BAY DROP IN)
f. EXCAVATE OPENCUT TRENCH (STARTING WEST TO EAST)
g. INSTALL CABLE DUCTING AND INTIMATE FILL (EXCESS SPOIL REMOVED FROM SITE)
h. BACKFILL OPENCUT TRENCH (STARTING WEST TO EAST)
i. DEMOBILISE SITE
j. REINSTATEMENT

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Project
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3.3 Phase 3 – Car Park 120m Open Cut

24. The third phase of landfall construction will consist of creating a 120m trench via open cut in a location immediately to the east of the 30m open cut trench (in a west to east direction), as shown in **Figure 4**. This will take place over 28 days between January and February during the second year.

25. As the works progress from west to east the cable trench will be backfilled and reinstated in order that areas can be returned to use as a car park as quickly as possible. It is proposed that the trench will be excavated in a minimum of three phase (3a – 3c) as shown on **Figure 4**, although there will be some overlap between the phases as the excavations progress west to east.

26. As for Phase 2 there will be a maximum to two trenches, one for each 66kV export cable, each approximately 4m wide with a minimum of 5m separation between the two cable centres. The area within which the open cut trench will be excavated will therefore be a maximum of 12m wide. Due to the ground conditions, predominantly wind-blown sand, trench supports may be required during excavation to prevent collapse.

27. **Table 4** presents details of the dimensions of Phase 3 car park working area for the 120m trench, as well as an indication of the volume of sediment to be excavated for the trench.

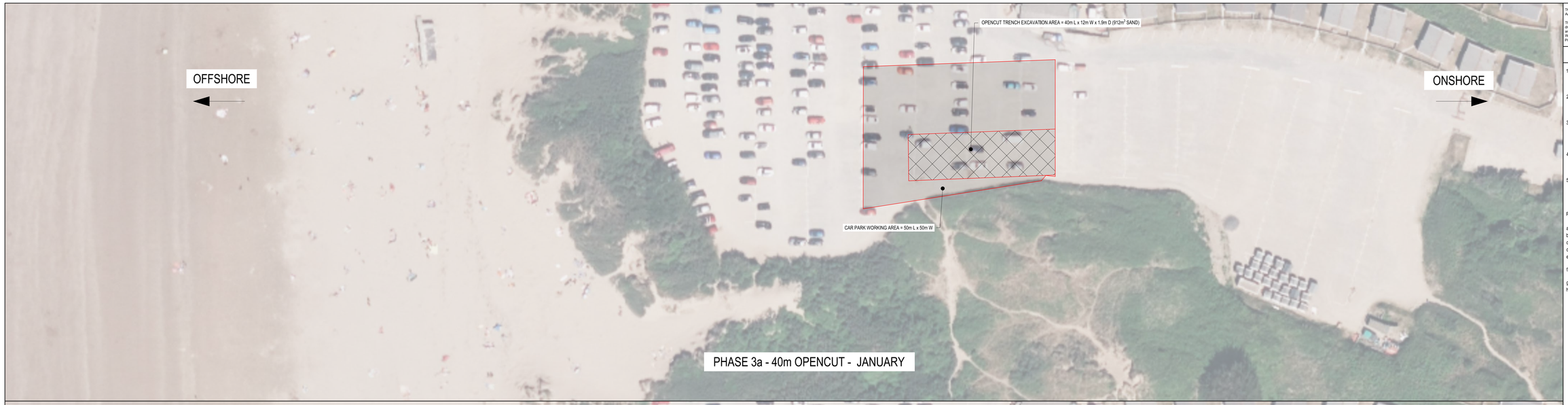
Table 4 Parameters of working area and excavated sediment volumes for Phase 3

Location	Length (m)	Width (m)	Depth (m)	Volume of excavated sediment (m^3)
Phase 3 car park working area	120	20	N/A	N/A
Trench Excavation Area	120	12	N/A	N/A
120m open cut trench	120	4	1.9	532 sand

28. The proposed sequencing of the 120m open cut trench creation will be as follows:

- Site establishment[1] (extension of phase 2 car park construction compound)
- Material mobilisation
- Equipment mobilisation
- In phases strip 120m of trench excavation area

- In phases excavation of 120m open cut trench sediment (approx. 70% to be stockpiled for backfilling the cable trench, the remaining 30% to be removed from site[2])
- Installation of cable ducting and backfilling of sediment
- Phase 3 car park construction compound site demobilised.
- Car park working area reinstated with excavated material.



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PHASE 3 CONSTRUCTION SEQUENCE

a. SITE ESTABLISHMENT (ADOPT PHASE 2 SITE)
b. MATERIAL MOBILISATION
c. EQUIPMENT MOBILISATION
d. EXCAVATE OPENCUT TRENCH (STARTING WEST TO EAST)
e. INSTALL CABLE DUCTING AND INTIMATE FILL (EXCESS SPOIL REMOVED FROM SITE)
f. BACKFILL OPENCUT TRENCH (STARTING WEST TO EAST), ROLL BACK SITE AS OPENCUT TRENCH IS COMPLETED
g. DEMOBILISE SITE
h. REINSTATEMENT

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Title: LANDFALL CONSTRUCTION SEQUENCE PHASE 3 - OPENCUT

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3.4 Phase 4 – Trenchless Crossing under Braunton Burrows / Saunton Golf Course

29. The fourth phase of landfall construction will consist of undertaking a trenchless crossing using HDD in a west to east direction under Braunton Burrows / Saunton Golf Course, there will be a maximum of two drills, one for each 66kV export cable, each 1,300m in length. The entire series of horizontal directional drills will take place over 165 days between January and August during the second year.

30. The entry for the drills will be located in the Phase 4 car park construction compound, as shown in **Figure 5**, this is the same area as a retained portion of the Phase 3 car park working area. Further detail and information on the trenchless crossing, including an indicative layout for the construction compound, is provided in **Appendix 5A: Braunton Burrows and Taw Estuary Crossing Method Statement** of the **Onshore ES**.

31. The 1,300m drills will exit in an arable field to the east of Braunton Burrows / Saunton Golf Course within the onshore export cable corridor (this is not shown in **Figure 5**).

32. High density polyethylene (HDPE) ducts which will be prefabricated off site will be strung out and welded together in the arable fields to the east. These will then be connected to drill string and pulled into the bore trajectory.

Table 5 Parameters of working area and excavated sediment volumes for Phase 4

Location	Length (m)	Width (m)	Depth (m)	Volume of excavated sediment (m^3)
Phase 4 car park working area	50	50	N/A	N/A

33. The proposed sequencing of the first of the horizontal directional drills will be as follows:

- Site remobilisation (retention of a portion of the Phase 3 car park construction compound)
- Material mobilisation
- Equipment mobilisation (including HDD rig)
- Installation of the HDD anchor (sheet piling)
- Temporary excavation of drive pit sediment (to be removed from site)
- HDD Drive 1
- Pull back and installation of HDPE ducting by drive number 1

- HDD Drive 2
- Pull back and installation of HDPE ducting by drive number 2
- HDD equipment demobilised
- Car park construction compound and drive pit reinstated with excavated material.

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5. ALL WORK IS TO BE CARRIED OUT IN COMPLIANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES AND REGULATIONS.

PHASE 4 CONSTRUCTION SEQUENCE

a. SITE ESTABLISHMENT (REMOBILISE)
b. MATERIAL MOBILISATION
c. EQUIPMENT MOBILISATION
d. INSTALL HDD ANCHOR (SHEET PILES)
e. EXCAVATE DRIVE PIT (SAND TO BE REMOVED FROM SITE)
f. INSTALL HDPE DUCTING BY HDD DRIVE #1
g. INSTALL HDPE DUCTING BY HDD DRIVE #2
h. HDD EQUIPMENT DEMOBILISED
i. REINSTATEMENT

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P03	31.05.24	UPDATED WITH CLIENT COMMENTS	ED	CG
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Amendments

Project
WHITE CROSS FLOATING WINDFARM

Title
LANDFALL CONSTRUCTION SEQUENCE PHASE 4 - GOLF COURSE CROSSING

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Suitability
INFORMATION S2

Designed By LP	Director CG	Waterman Ref WIE12731-153
Drawn By LP	Date APRIL 24	Scales @ A0 1:400
Stockton Checker	Stockton Approver	Date

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12731-153-WIE-LF-XX-DR-C-90104	P04
110-099-DRG-026	A04

A0-Wat-SDL-S

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3.5 Phase 5 – Intertidal Open Cut and Upper Foreshore Cable Installation

34. The fifth phase of landfall construction will consist of cable installation in the intertidal (**Section 3.5.1** below) followed by the 'pulling' and securing of the offshore cables across the upper foreshore and into the TJB through the previously installed cable ducts. This will take place over 28 days between September and October during the second year.

35. **Figure 6** shows the construction compounds, re-excavated TJB, winch spread and reception pit; and **Table 6** presents details of their dimensions as well as an indication of the volume of sediment to be re-excavated at the reception pit and the volume of sediment excavated by the cable plough for the intertidal cable trench.

36. **Figure 6** also shows the working area required on the beach for the installation of the offshore cables using a cable plough, this area will not be fenced during construction with access for the public maintained for most of the duration of this phase. During the cable installation in the intertidal access through the controlled area will be managed by banksmen and marshals to ensure the safety of the public and to comply with all relevant health and safety legislation and guidance. This will include lifeguards and safety boats in the water to ensure the safety of any other beach/sea users.

37. Vehicles, plant and machinery will access the upper foreshore using the existing slipway (see **Figure 6**), but these movements will be managed to avoid disturbance to other beach users. For example, all movements will take place at the start and end of the day.

38. The TJB will not need to be re-excavated during this phase as it is designed to allow the concrete lid to be removed to provide access for the pulling and jointing of the cables. An onshore cable winch spread will be required within the car park, but this will be installed on skids or sleepers with temporary works only required to provide anchoring of the winch, for example sheet pilling.

Table 6 Parameters of construction compounds, TJB, winch spread, controlled area, cable plough trench and excavated sediment volumes for Phase 5

Location	Length (m)	Width (m)	Depth (m)	Volume of excavated sediment (m^3)
Phase 5 car park working area	120	50	N/A	N/A
Car park TJB (already installed)	20	8	2	N/A

Location	Length (m)	Width (m)	Depth (m)	Volume of excavated sediment (m^3)
Winch spread	50	15	N/A	N/A
Phase 5 upper foreshore working area	120	50	N/A	N/A
Upper foreshore reception pit	9	14	3	378 sand
Intertidal controlled area	1,000[3]	50	N/A	N/A
Intertidal cable trench (ploughed)	1,000[3]	0.5	3	1,500 sand

39. The proposed sequencing of the upper foreshore cable installation will be as follows:

- Site remobilisation (offices, cabins and welfare as needed will be relocated from the Phase 4 HDD construction compound)
- Material mobilisation
- Equipment mobilisation
- Installation of cable winch spread within the car park construction compound, no excavation required but some temporary works to provide anchoring such as sheet piles or anchor pins
- Re-excavation of reception pit and preparation of cable ducts (excavated material to be stockpiled and reused for backfilling)
- Re-opening of TJB and preparation for jointing of cables
- Installation of intertidal cables with cable plough (see **Section 3.5.1**)
- Backfilling of reception pit, using the stockpiled excavated material
- Reinstatement within the car park or areas not needed for Phase 6 (TJB will remain open for Phase 6 and offices, cabins and welfare retained).

3.5.1 Intertidal Open Cut

40. The methodology for installing the offshore export cable through the intertidal and near shore is outlined below, the working area required is shown on **Figure 6** and illustrative cross sections of each stage are presented in **Plates 6** to **11**. These

[3] The cable laying vessels will be located offshore so the intertidal controlled area/cable trench will extend through the intertidal area to whatever distance the vessel is from the shore. Given then topography of the beach this is likely to be at least 1000m (1km).

stages would take approximately 5 days to complete, including all set up, but the installation with the cable plough through the intertidal area would be completed within a single tidal period (approximately 6 hours) from flood tide to ebb tide to take advantage of the high tide.

41. A messenger wire will be delivered from the onshore winch spread through the already installed ducts below the dune to the cable lay barge waiting offshore using a rigid inflatable boat (RIB) (see **Plate 6**). Once the messenger wire is pulled through the duct and across the beach access for the public to the controlled area and working area will be managed/controlled by banksmen or marshals to ensure the safety of the public and construction workers. Access to the rest of the beach will be maintained.

42. The messenger wire will be attached to the offshore export cable on the cable lay barge, and the onshore winch will haul the offshore export cable to the TJB (see **Plate 7**). Buoys will be used to float the offshore export cable ashore through the marine environment, once ashore it will be hauled across the beach and through the already installed ducts into the TJB. These works would typically be undertaken at high-tide to ensure that the cable can be floated ashore as far as possible. During the hauling ashore of the offshore export cable access to the controlled area and working area will be restricted, once the cable is ashore access will be managed/controlled. Access to the rest of the beach will be maintained.

43. The offshore export cable is made secure in the TJB (see **Plate 8**) and the cable plough is deployed at the reception pit on the foreshore (see **Plate 9**). The cable plough can either be delivered via land and unloaded into position, or be deployed from the offshore cable lay barge. If deployed from offshore it will be winched ashore using the onshore winch. The offshore export cable is threaded through the cable plough ready for installation. Once the cable plough is deployed to the beach public access to the working area will need to be restricted. Access to the rest of the beach will be maintained.

44. The cable plough is winched towards the cable lay vessel using the offshore winch, initially tension is maintained from the onshore cable winch (see **Plate 10**). The cable plough can be operated either from onshore or offshore, after is crosses the intertidal the plough continues subsea, installing the cable below the seabed. The cable lay vessel will then make way installing the cable to the sea bed offshore using the cable plough. During the install through the intertidal access to the controlled area will need to be restricted. Access to the rest of the beach will be maintained.

45. The width of the intertidal area affected by the installation depends on the type and specification of the cable plough used, but they are typically 4m to 6m wide. The cable trench would be up to 0.5m wide, with a burial depth of between -0.5

to -3m AOD (above ordnance datum), this is likely to be -2m AOD but the specifics of the depth are awaiting finalisation of the Cable Burial Risk Assessment (CBRA). A draft CBRA is provided as **Appendix U: Updated Cable Burial Risk Assessment** of the **ES Addendum**.

46. A non-displacement type cable plough will be employed to minimise disturbance. This type of cable plough is particularly suited to installing long continuous lengths of cable in a variety of ground conditions, including fine sand like that encountered at Saunton Sands. As it installs the cable the excavated material falls back into the cable trench so that the topography post-installation will be the same as the topography pre-installation (**Plate 11**). To confirm this, monitoring prior to cable installation in the intertidal and following backfilling will be undertaken, including remedial action if the levels do not match. Once any remedial backfilling, if required, is undertaken access to the full working area will be restored.

47. If the final design for the export cable is two 66kV cables, then first offshore export cable will be cut and capped. The cable lay vessel will then return to repeat the installation through the intertidal using the open cut technique for the second cable.

PHASE 5 - CABLE INTERTIDAL INSTALL - SEPTEMBER TO OCTOBER (28 DAYS)

SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV

GENERAL NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEER'S, ARCHITECTS OR OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO PREPARING ANY WORKING DRAWINGS OR COMMENCING ON SITE.
3. THE CONTRACTOR MUST ENSURE AND WILL BE HELD RESPONSIBLE FOR THE OVERALL STABILITY OF THE BUILDING/STRUCTURE/EXCAVATION AT ALL STAGES OF THE WORK.
4. ALL WORK BY THE CONTRACTOR MUST BE CARRIED OUT IN SUCH A WAY THAT ALL REQUIREMENTS UNDER THE HEALTH AND SAFETY AT WORK ACT ARE SATISFIED.
5. ALL WORK IS TO BE CARRIED OUT IN COMPLIANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES AND REGULATIONS.

PHASE 5 CONSTRUCTION SEQUENCE

a. SITE ESTABLISHMENT (REMOBILISE)
b. MATERIAL MOBILISATION
c. EQUIPMENT MOBILISATION
d. EXCAVATE RECEPTION PIT AND PREPARE DUCTS FOR CABLE INSTALL
e. OPEN TRANSITION JOINT BAY IN PREPARATION FOR CABLE LANDFALL
f. INSTALL CABLE WINCH SPREAD
g. INSTALL INTERTIDAL CABLE WITH CABLE PLOUGH #1
h. INSTALL INTERTIDAL CABLE WITH CABLE PLOUGH #2
i. WINCH CABLE INTO TRANSITION JOINT BAY AND SECURE (x2)
j. BACKFILL RECEPTION PIT
k. DEMOBILISE CABLE PLOUGH INTERTIDAL
l. REINSTATEMENT

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Amendments

Project: WHITE CROSS FLOATING WINDFARM

Title: LANDFALL CONSTRUCTION SEQUENCE PHASE 5 - CABLE INTERTIDAL INSTALL

Client: FLOTATION ENERGY LTD

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3.6 Phase 6 – Onshore Cable Pull

48. The sixth (and final) phase of landfall construction will consist of pulling the onshore export cable through the already installed ducts below Braunton Burrows / Saunton Golf Course and connecting/jointing of the offshore and onshore export cables together in the TJB. This phase will take place over 12 days between October and November of the second year.

49. This will begin by establishing the final car park construction compound which is a reduction of the Phase 5 car park construction compound as shown in **Figure 7**. The 'pulling' of the onshore export cables from east to west into the already constructed TJB, the connection/jointing together of the offshore and onshore export cables, and finally the demobilisation and reinstatement in the car park.

50. **Table 7** presents details of the dimensions of Phase 6 car park construction compound, note there will be no excavation during this phase so no material volumes are provided.

Table 7 Parameters of construction compound for Phase 6

Location	Length (m)	Width (m)	Depth (m)	Volume of excavated sediment (m^3)
Phase 6 car park construction compound	70	50	N/A	N/A
Car park TJB (already installed)	20	8	2	N/A

51. The proposed sequencing of the onshore cable pull will be as follows:

- Site establishment (reduction of the area used in Phase 5)
- Material mobilisation
- Equipment mobilisation
- Installation cable winch spread (within the TJB) and onshore export cable spool (cable spool will be installed to the east of Braunton Burrows / Saunton Golf Course)
- Cable pull through duct 1
- Cable pull through duct 2
- Connections/jointing of the offshore and onshore export cables in the TJB
- Cable testing
- Closure of TJB
- Demobilise cable pull equipment/cable spool
- Car park construction compound reinstated, all remaining plant and equipment removed from site

GENERAL NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEER'S, ARCHITECT'S OR OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.
2. ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED ON SITE BY THE CONTRACTOR PRIOR TO PREPARING ANY WORKING DRAWINGS OR COMMENCING ON SITE.
3. THE CONTRACTOR MUST ENSURE AND WILL BE HELD RESPONSIBLE FOR THE OVERALL STABILITY OF THE BUILDING/STRUCTURE/EXCAVATION AT ALL STAGES OF THE WORK.
4. ALL WORK BY THE CONTRACTOR MUST BE CARRIED OUT IN SUCH A WAY THAT ALL REQUIREMENTS UNDER THE HEALTH AND SAFETY AT WORK ACT ARE SATISFIED.
5. ALL WORK IS TO BE CARRIED OUT IN COMPLIANCE WITH THE REQUIREMENTS OF THE RELEVANT STATUTORY AUTHORITIES AND REGULATIONS.

PHASE 6 CONSTRUCTION SEQUENCE

a. SITE ESTABLISHMENT (REDUCTION OF PHASE 5 SITE BOUNDARY)
b. MATERIAL MOBILISATION
c. EQUIPMENT MOBILISATION
d. OPEN TRANSITION JOINT BAY IN PREPARATION FOR CABLE PULL
e. INSTALL CABLE WINCH SPREAD / CABLE SPOOL
f. CABLE PULL DUCT #1
g. CABLE PULL DUCT #2
h. TRANSITION JOINT BAY CONNECTION AND TESTING
i. CABLE TESTING
j. CLOSE TRANSITION JOINT BAY
k. DEMOBILISE CABLE PULL EQUIPMENT / CABLE SPOOL
l. REINSTATEMENT

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Amendments

Project
WHITE CROSS FLOATING WINDFARM

Title
LANDFALL CONSTRUCTION SEQUENCE PHASE 6 - CABLE PULL ONSHORE

Client
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Suitability: INFORMATION S2

Designed By	Director	Waterman Ref
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A0-Wat-SDL-S

Annex 1 – Plates

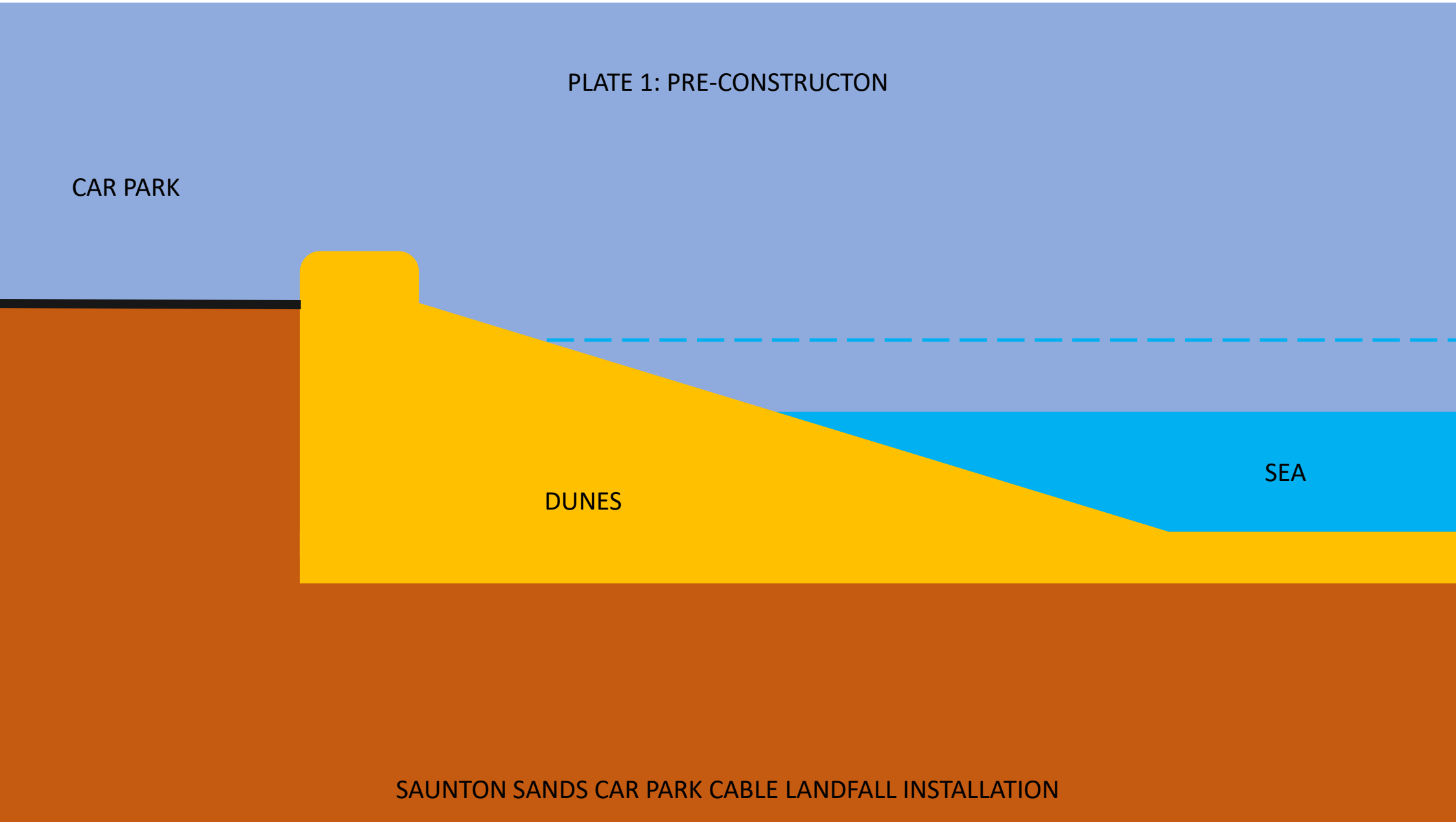


PLATE 1: PRE-CONSTRUCTON
CAR PARK
DUNES
SEA
SAUNTON SANDS CAR PARK CABLE LANDFALL INSTALLATION

PLATE 2: Phase 1 – Saunton Sands Dune Crossing

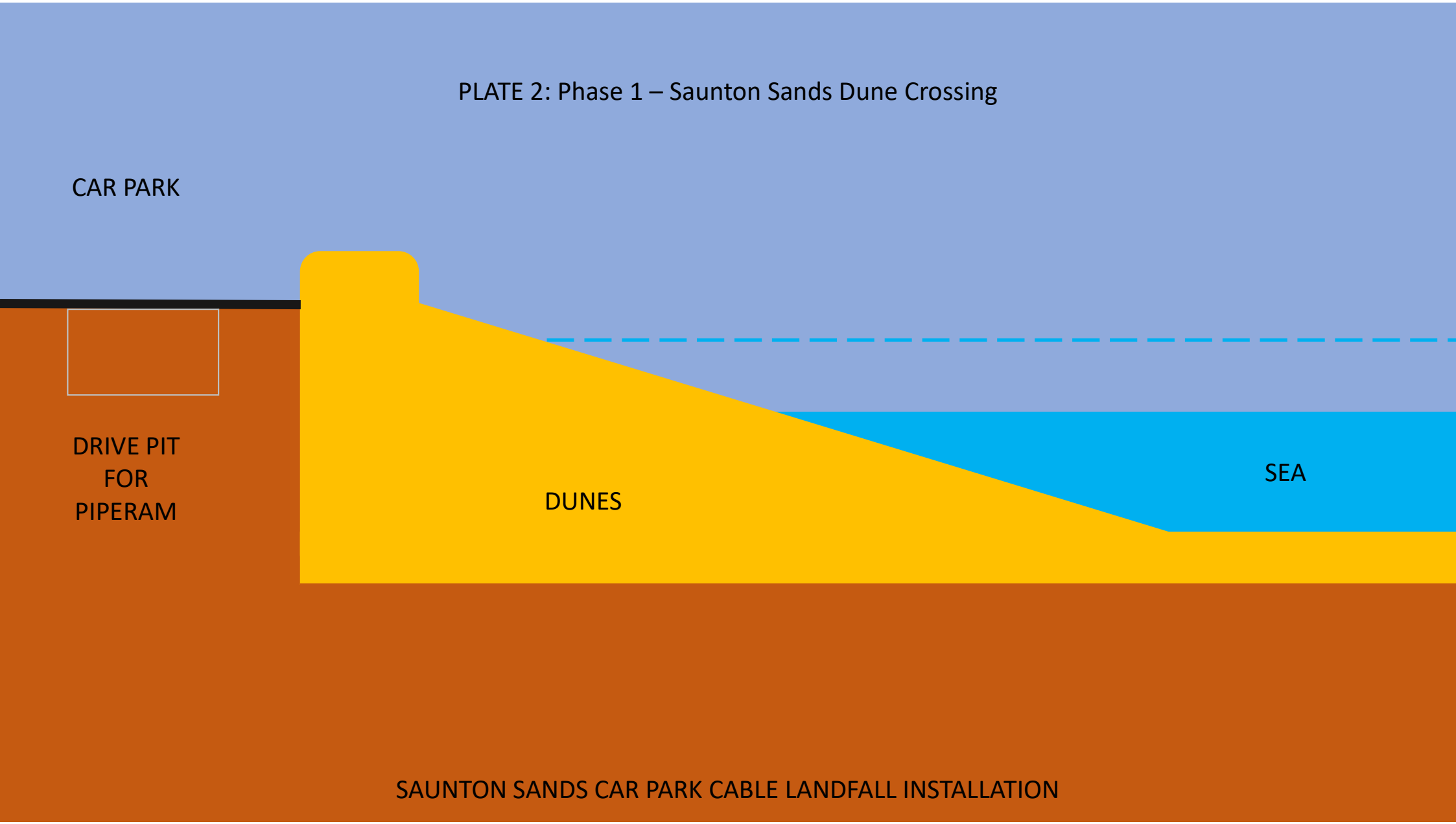
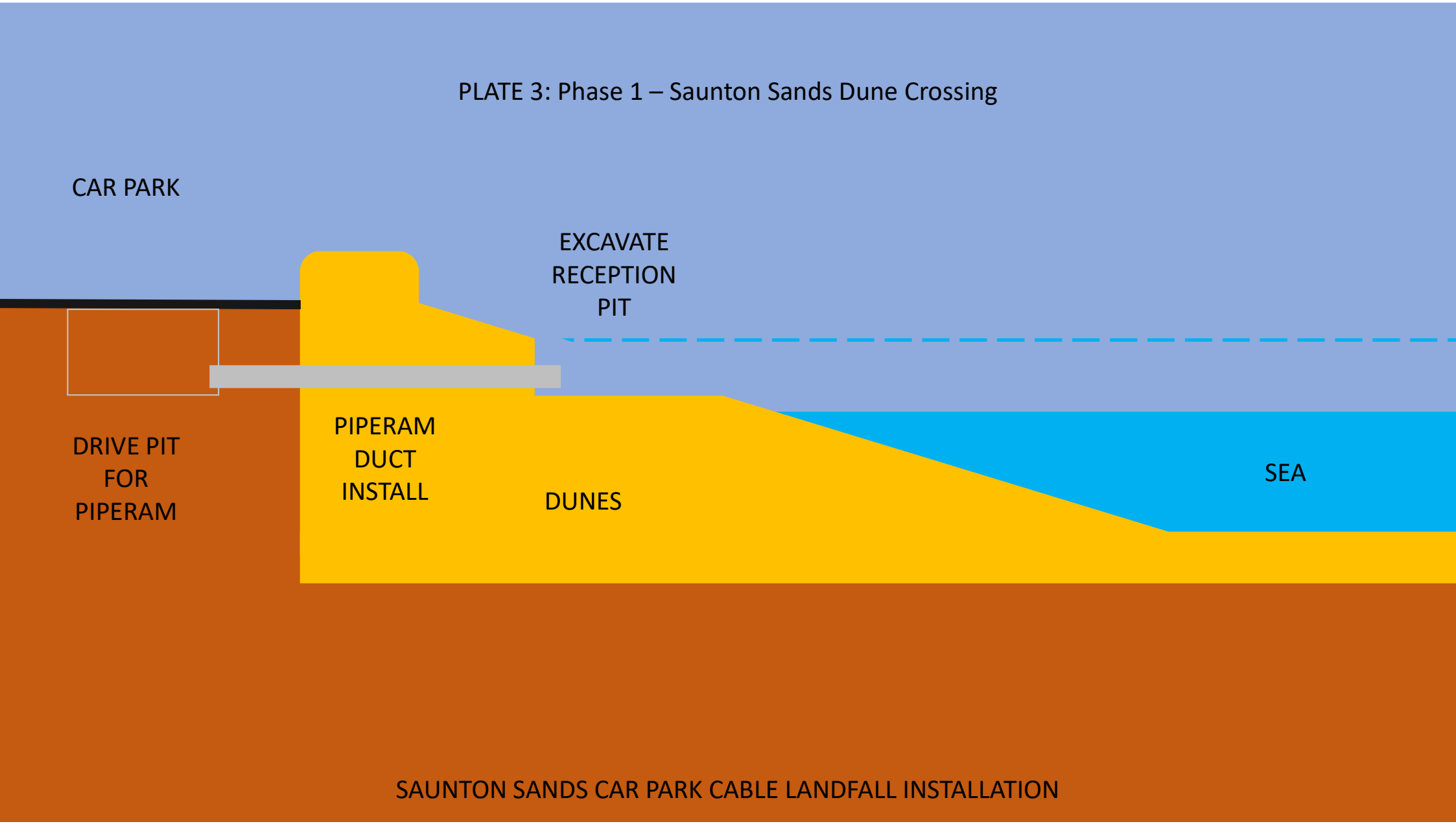
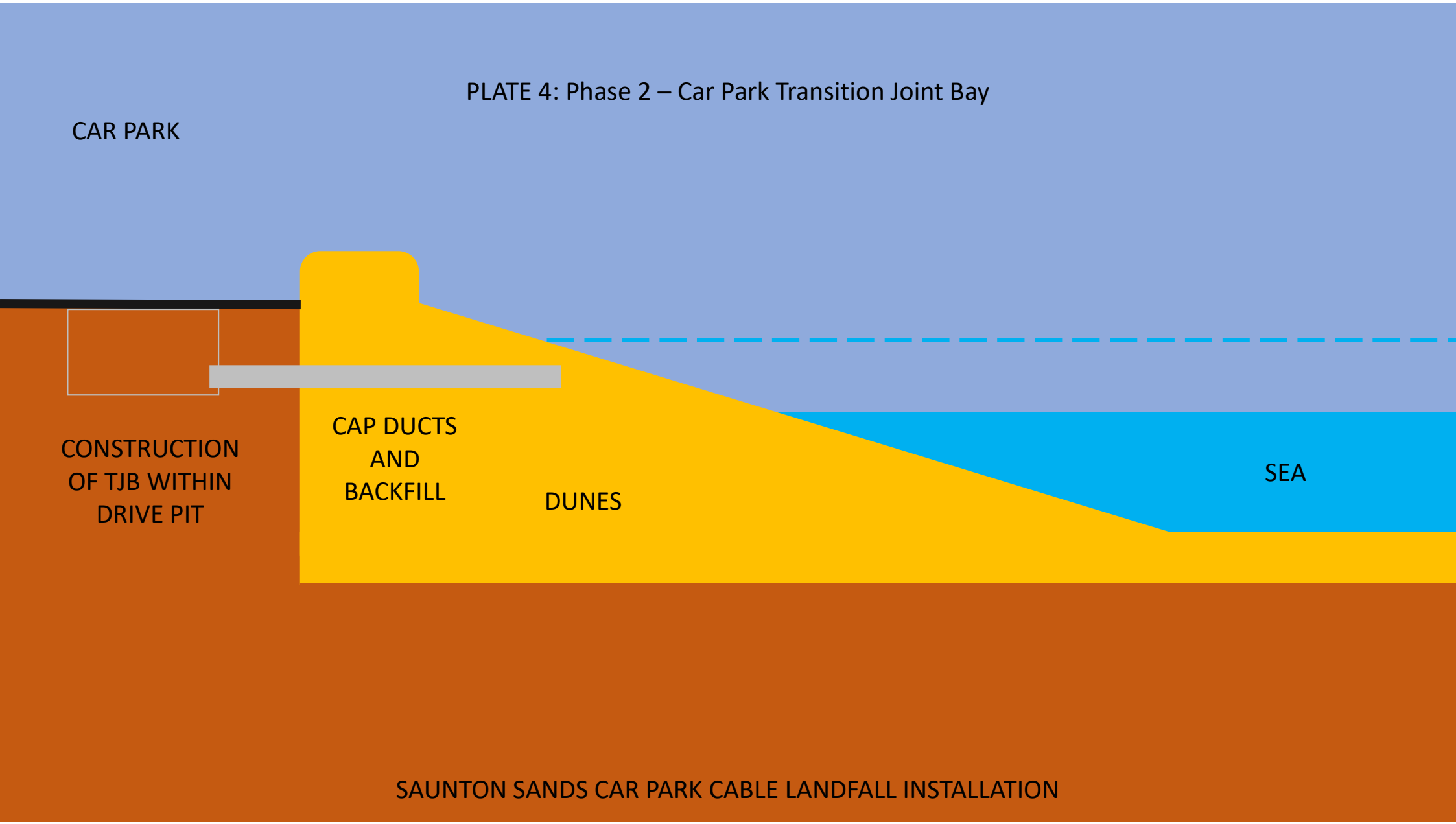


PLATE 3: Phase 1 – Saunton Sands Dune Crossing



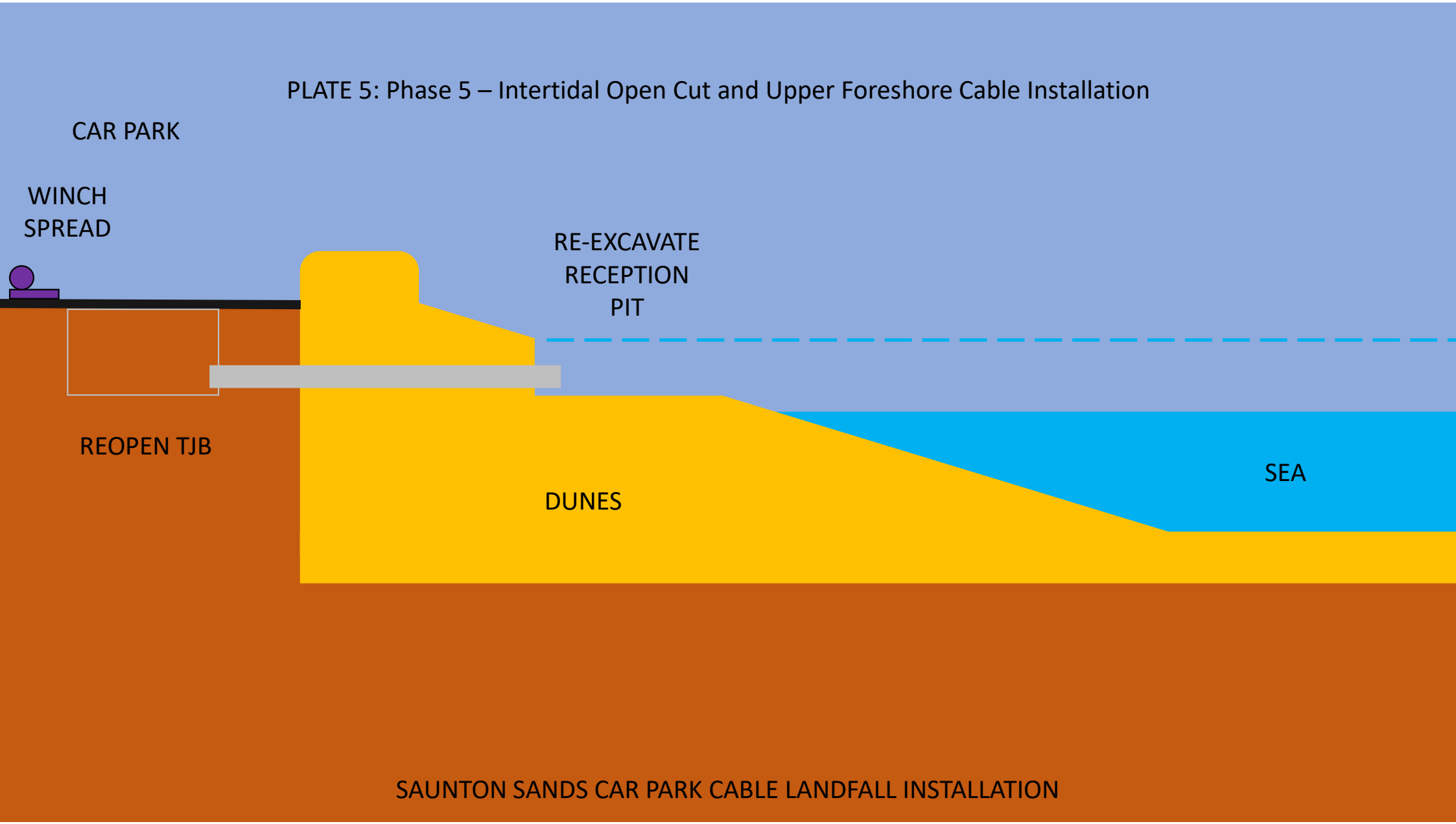
SAUNTON SANDS CAR PARK CABLE LANDFALL INSTALLATION

PLATE 4: Phase 2 – Car Park Transition Joint Bay



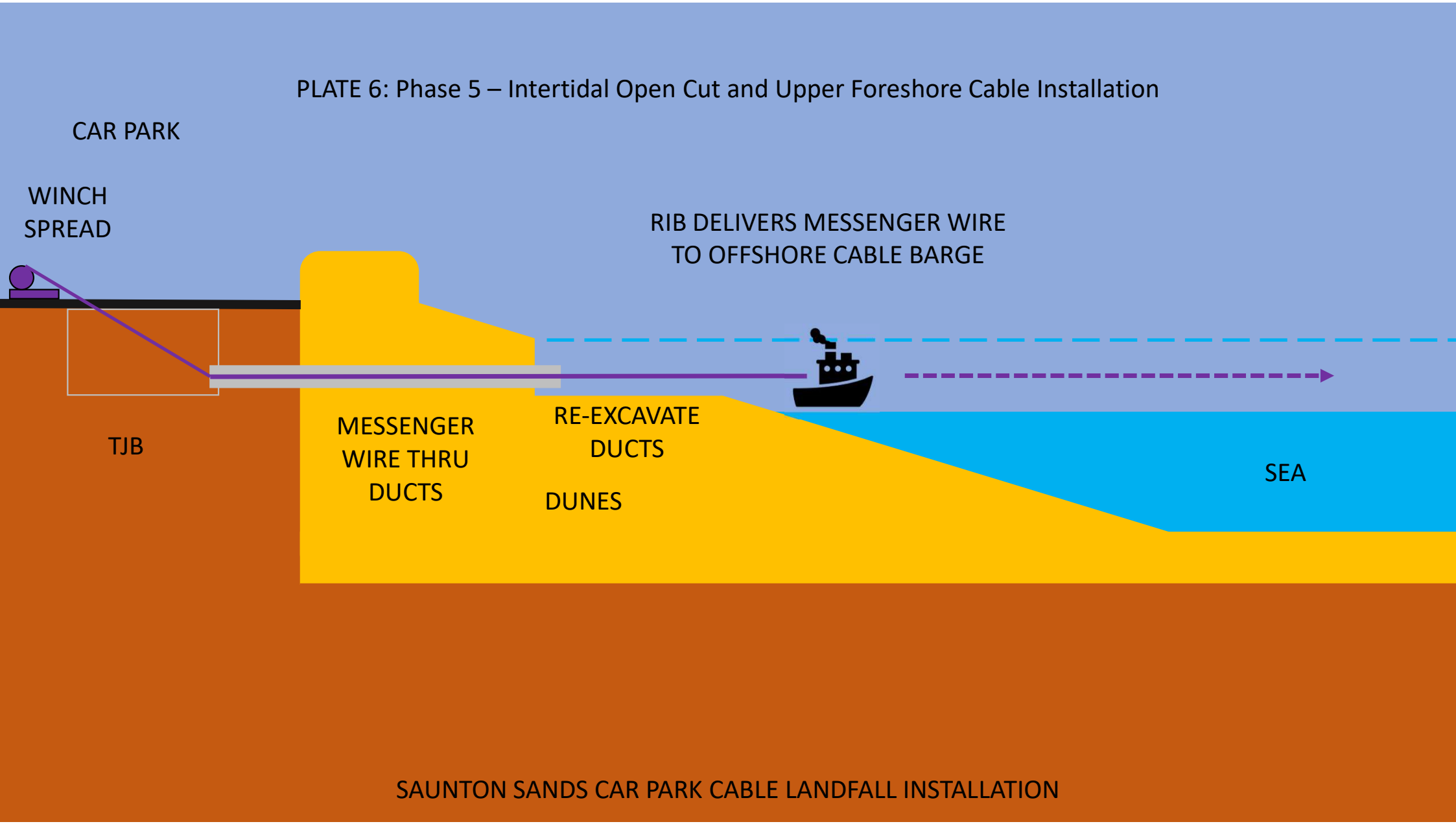
SAUNTON SANDS CAR PARK CABLE LANDFALL INSTALLATION

PLATE 5: Phase 5 – Intertidal Open Cut and Upper Foreshore Cable Installation



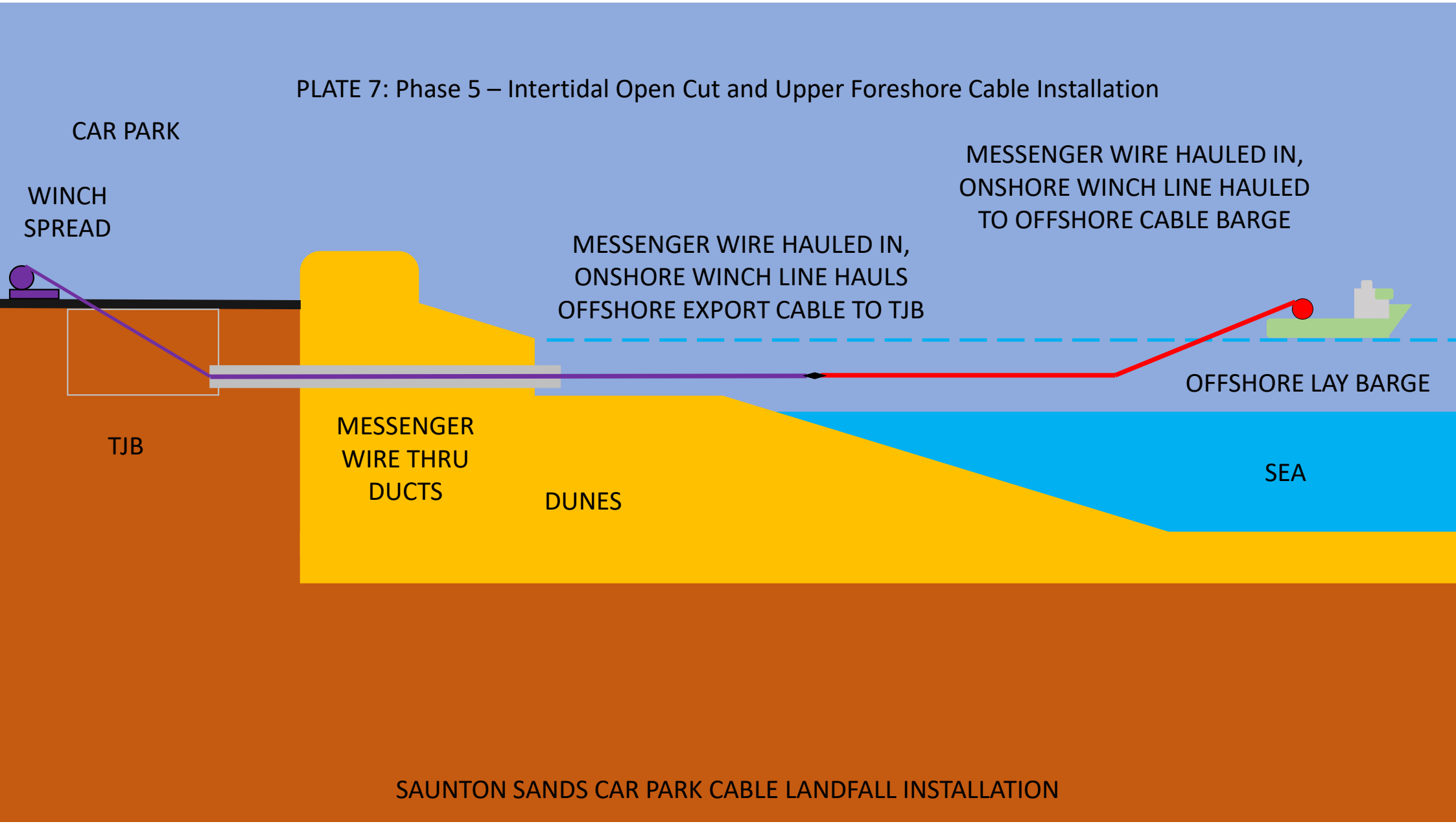
SAUNTON SANDS CAR PARK CABLE LANDFALL INSTALLATION

PLATE 6: Phase 5 – Intertidal Open Cut and Upper Foreshore Cable Installation



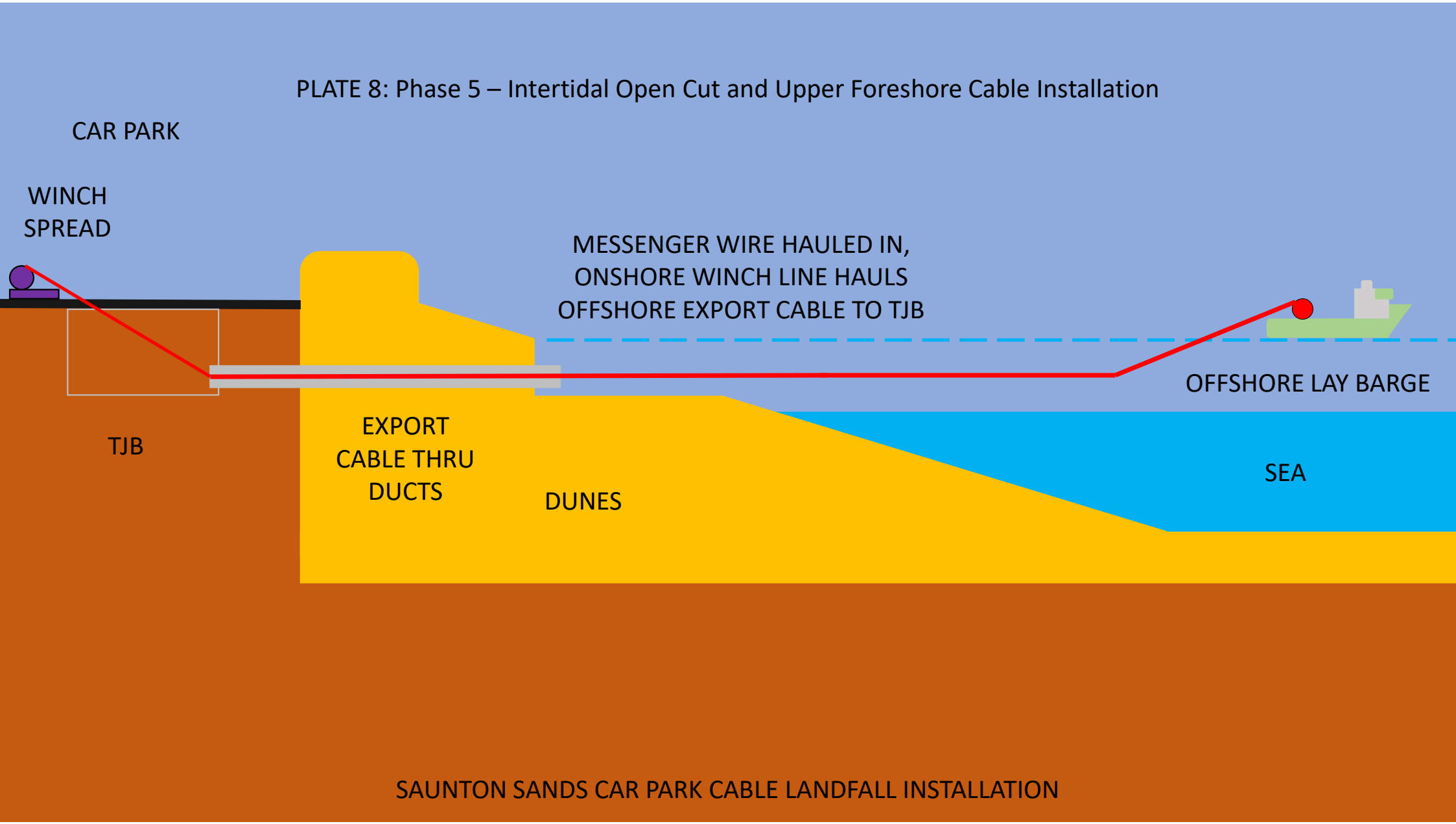
SAUNTON SANDS CAR PARK CABLE LANDFALL INSTALLATION

PLATE 7: Phase 5 – Intertidal Open Cut and Upper Foreshore Cable Installation



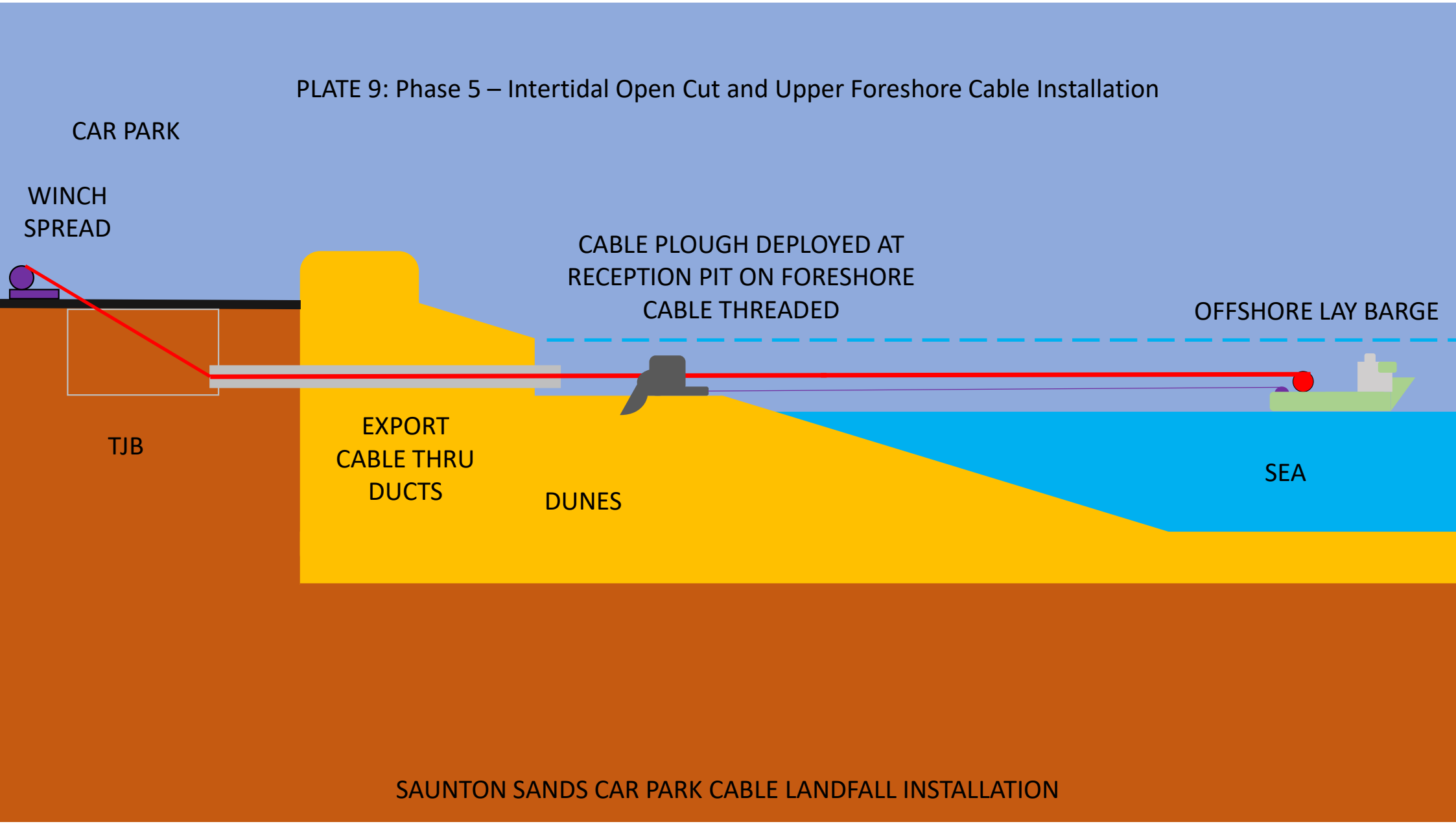
SAUNTON SANDS CAR PARK CABLE LANDFALL INSTALLATION

PLATE 8: Phase 5 – Intertidal Open Cut and Upper Foreshore Cable Installation



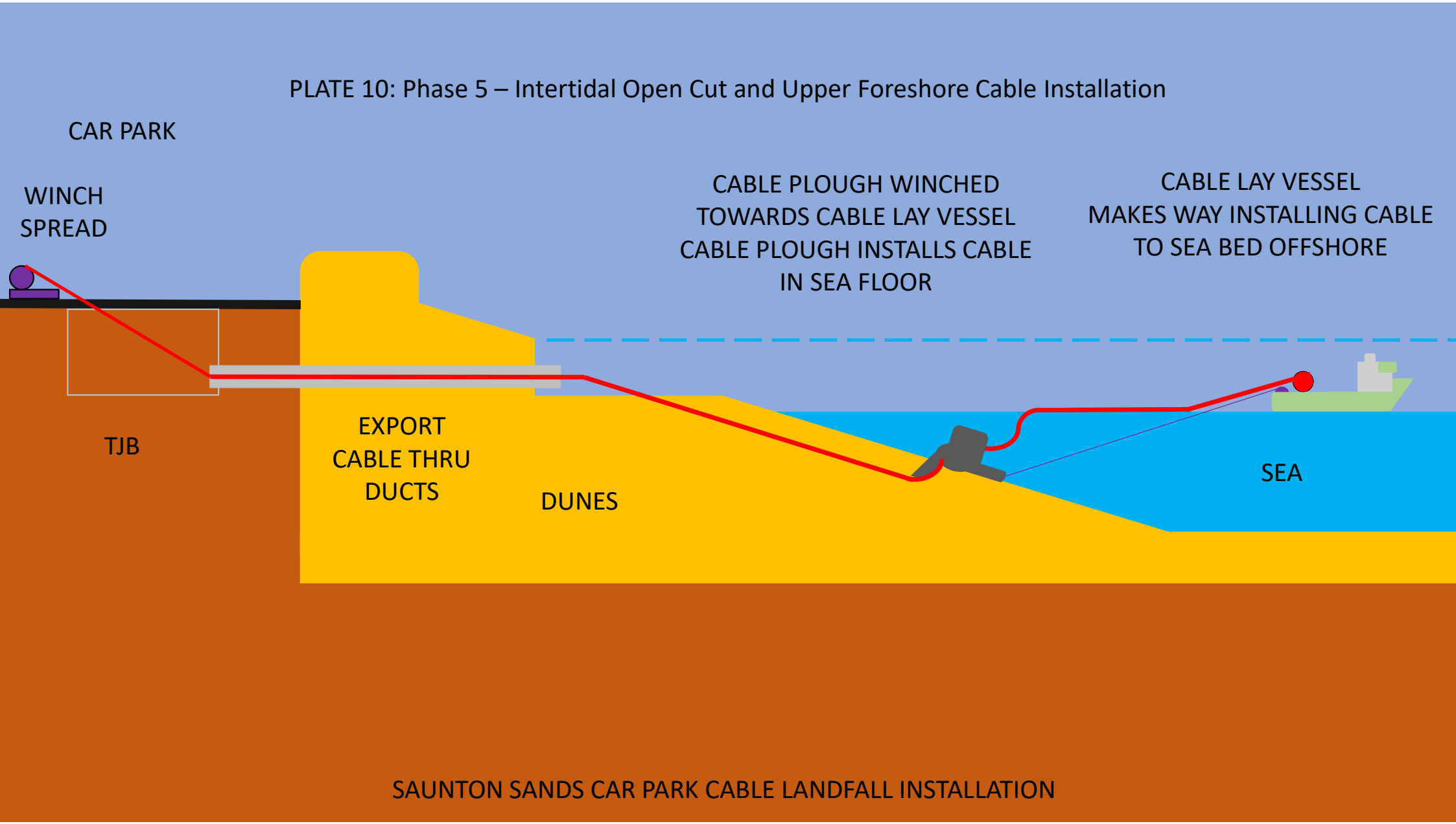
SAUNTON SANDS CAR PARK CABLE LANDFALL INSTALLATION

PLATE 9: Phase 5 – Intertidal Open Cut and Upper Foreshore Cable Installation



SAUNTON SANDS CAR PARK CABLE LANDFALL INSTALLATION

PLATE 10: Phase 5 – Intertidal Open Cut and Upper Foreshore Cable Installation



SAUNTON SANDS CAR PARK CABLE LANDFALL INSTALLATION

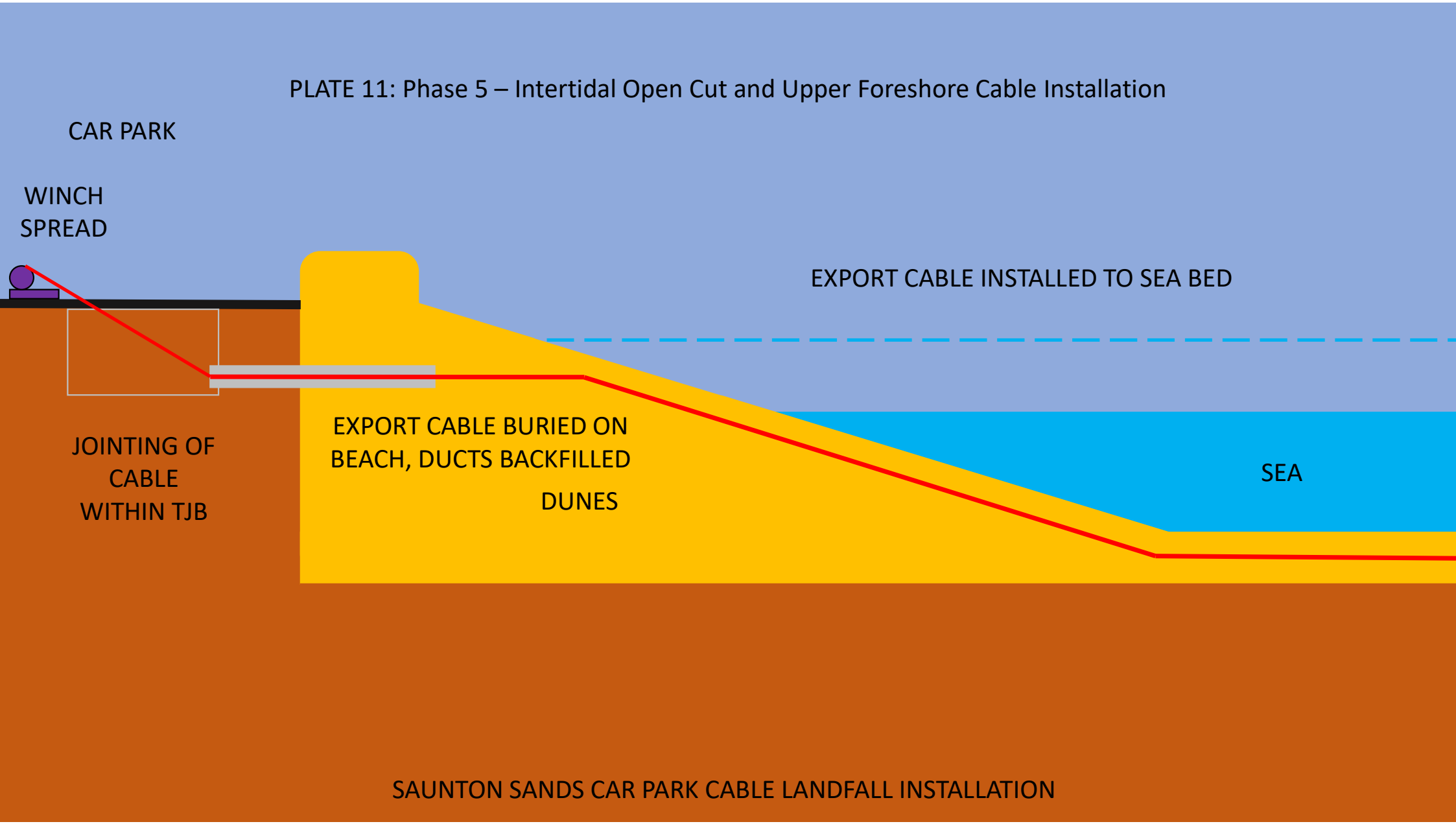


PLATE 11: Phase 5 – Intertidal Open Cut and Upper Foreshore Cable Installation
CAR PARK
WINCH SPREAD
EXPORT CABLE INSTALLED TO SEA BED
JOINTING OF CABLE WITHIN TJB
EXPORT CABLE BURIED ON BEACH, DUCTS BACKFILLED
DUNES
SEA
SAUNTON SANDS CAR PARK CABLE LANDFALL INSTALLATION

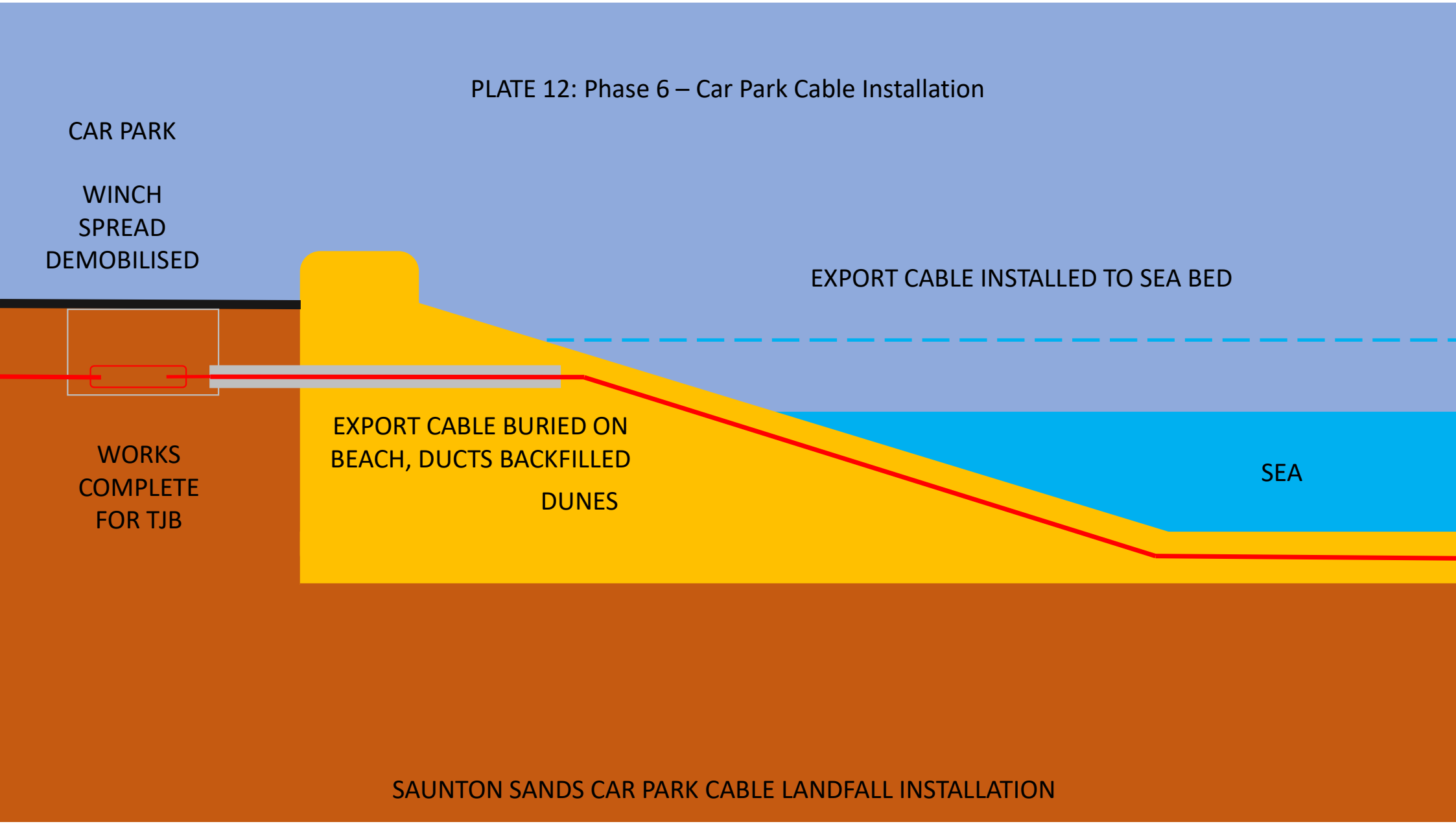


PLATE 12: Phase 6 – Car Park Cable Installation
CAR PARK
WINCH SPREAD DEMOBILISED
EXPORT CABLE INSTALLED TO SEA BED
WORKS COMPLETE FOR TJB
EXPORT CABLE BURIED ON BEACH, DUCTS BACKFILLED
DUNES
SEA
SAUNTON SANDS CAR PARK CABLE LANDFALL INSTALLATION