MMO Subsea Cables Desk Note

Last updated: January 2018

Introduction

1. This desk note provides an overview of the Subsea Cable Sector, the relevant legislation, a description of the different types of cable, the main methods of cable installation, as well as the key impacts to be considered in a subsea cable application.

What are the types of Subsea Cable?

2. There are three primary types of cables which the MMO deal with on a regular basis. These are:

- **Electricity Cables** – This type of cable allows the transfers of electricity from one place to another. This includes interconnector cables, which exchange electricity to and from continental Europe and beyond; ensuring the UK has a secure electricity supply. At times of low power generation in one country, extra electricity can be imported from a country exporting their surplus through an interconnector cable. Some international interconnector cables are classed as Projects of Common Interest (PCIs) by the EU Commission and are subject to the **TEN-E Regulation.**

- **Telecommunication Cables –** This type of cable transfers data from one place to another. Today 97% of the world's communications are transported via fibre optic cable, and as an island nation, submarine telecoms cables are vital to the UK economy.

- **Renewable Energy Export Cables -** This type of cable exports electricity generated by an offshore wind farm or wave/tidal array to a substation on land. This Desk note does not cover this type of cable, as consents for the laying and maintenance of export cables are provided under Development Consent Orders issued by the Planning Inspectorate.

What legislation is relevant to the Subsea Cable Sector?

3. Consents including Marine Licence applications for specific types of cables have to be processed differently due to other international, European or UK legislation. This is summarised below:

United Nations Convention on the Law of the Sea (UNCLOS)

4. The United Nations Convention on the Law of the Sea (UNCLOS) is an international agreement signed in 1982, which provides levels of protection at an international level to all international submarine cables and pipelines (i.e. interconnectors and telecommunications cables). Amongst many other provisions UNCLOS provides the freedom to lay, maintain and repair cables on and off the continental shelf and places obligations on owners of new cables and pipelines to indemnify repair costs for any damage caused to existing cables.

   Article 79 of UNCLOS provides this freedom and states that the coastal State (e.g. MMO when exercising our licensing function) may not impede the laying or maintenance of such cables or pipelines. To ensure compliance with this, Section 81 of the Marine and Coastal Access Act (MCAA) 2009 sets out an exemption for such projects and this is explored in further detail below.

Marine and Coastal Access Act 2009 (MCAA)

5. Section 66 (1) of the MCAA sets out that a marine licence is required for the installation of a subsea cable. Section 66 (8) of the MCAA sets out that a marine licence is required for the removal of a subsea cable. However, case officers must be aware of caveats due to requirements under UNCLOS as stated above.

   Section 71(6) of the MCAA sets out that the MMO must not grant a licence that is contrary to international law. As such the MCAA also includes a number of provisions to ensure the rights conferred by UNCLOS are maintained within the marine licensing regime.

   Section 81 of the Marine and Coastal Access Act (MCAA) 2009

   Section 81(1) of the MCAA 2009 sets out that **nothing in Part 4 of the MCAA applies** to any activity done in the course of **laying or maintaining an offshore stretch** (defined in Section 81(4) as being beyond the seaward limits of the territorial sea) of an '**exempt cable**' (as defined in Section 81(5) below). Further, activities such as clearance dredging and side-casting of sandwaves undertaken to facilitate the laying of a cable would reasonably be considered to be undertaken in the course of laying a cable and may not require a licence beyond 12 nautical miles (nm).

   Under Section 81(5)[1] of the MCAA 2009; a submarine cable is exempt unless it is a cable constructed or used in connection with:

   - the exploration of the UK sector of the continental shelf;
   - the exploitation of natural resources of that sector;
   - the operations of artificial islands, installations and structures under UK jurisdiction; or
   - the prevention, reduction or control of pollution from pipelines.

   Furthermore, Section 81(2a), of the MCAA states that where subsection 81(1) of the MCAA has effect in relation to part (but not the whole) of an '**exempt cable**', the MMO **must grant any marine licence** application to **lay any inshore stretch** (within the seaward limits of the territorial sea (12 nm)) of the cable. However, the MMO has the power to attach **conditions** as normal to such a marine licence under Section 81(3) of the MCAA. In cases where the case team would otherwise be minded to refuse a licence if it were not for Section 81 of MCAA, this should be discussed on a case by case basis with the relevant case managers.

[1] If you are exploring for, or producing, oil and gas you do not need a licence if you are: searching for and getting petroleum, constructing or maintaining an energy pipeline, establishing or maintaining an offshore energy installation, unloading, storing and recovering gas and storing carbon dioxide. These activities are regulated under the Petroleum Act 1998 and therefore administered by the Department for Business, Energy & Industrial Strategy. Activities within the UK marine area that require a permit under the Offshore Chemicals Regulations 2002 and the Offshore Petroleum Activities (Oil Pollution Prevention and Control) Regulations 2005 are exempt from requiring a marine licence.

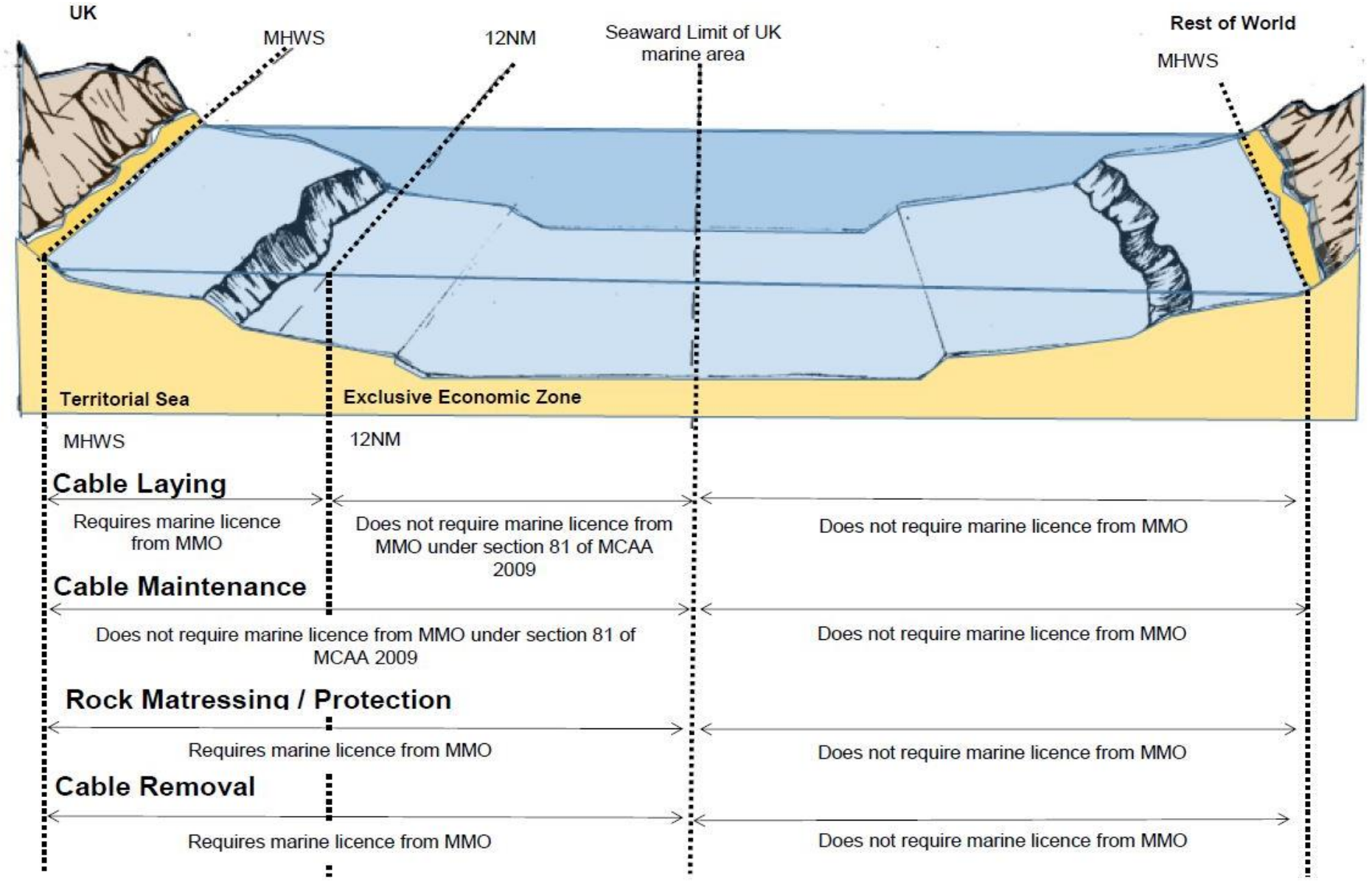
Section 81(2)(b) also provides that any activities undertaken in the course of **maintaining** any **inshore** stretch of such an '**exempt cable**' does **not** require a **marine licence**.

The MMO's view is that most maintenance activities on 'exempt cables' would be covered by Section 81(1) and Section 81(2)(b) of the MCAA 2009, such as the execution of a cable repair or replacement of a faulty stretch of cable and activities associated with such maintenance (e.g. removal of sediment to access the cable or removal and replacement of existing cable protection to access the cable asset). **No approval or notification** is required by the MMO for maintenance / repair works under Section 81 of the MCAA 2009.

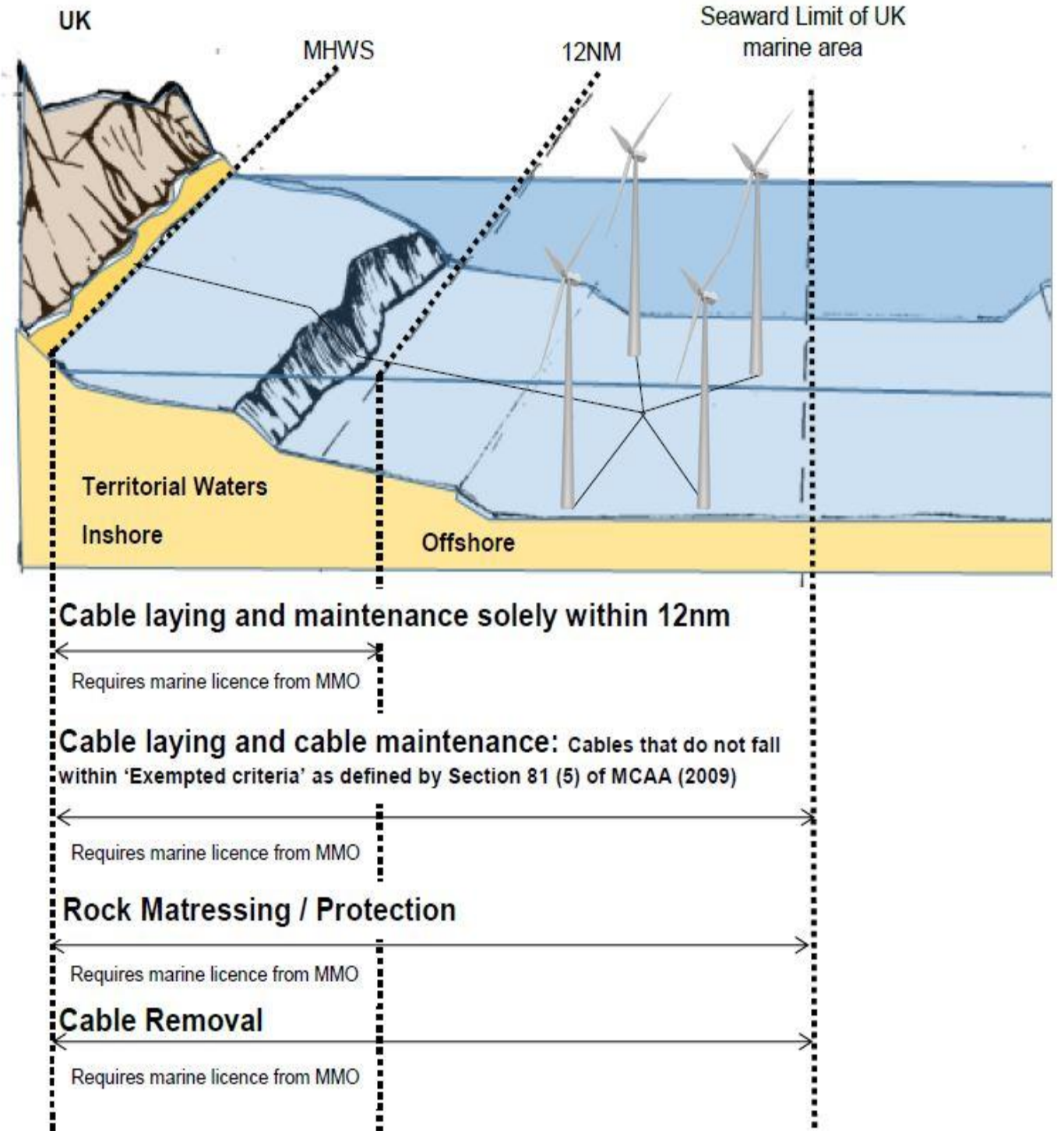
However, Section 81 of the MCAA 2009 **does not apply** to the deposition of any additional **mattressing or rock protection** and does not absolve the undertaker from seeking any other consents or approvals which may be required before embarking upon the works. Please see table and diagrams below for further detail.

Activity	**Requirements**
Laying an "exempt cable" under S.81 of MCAA both beyond and within the territorial sea (12 nm).	**Inshore Stretch:** A marine licence **is** required, however, this **must be** granted by the MMO subject to any conditions considered necessary for that part of the cable. **Offshore Stretch:** A marine licence **is not** required.
Laying an "exempt cable" under S.81 of MCAA both beyond the territorial sea (12 nm).	A marine licence **is not** required.
Maintaining an "exempt cable" under S.81 of MCAA both within and outwith 12 nm.	A marine licence **is not** required.
Laying / maintaining any cable wholly within the seaward limits of the territorial sea (12 nm).	A marine licence **is** required.
Laying / maintaining any cable not an "exempt cable" under S.81(5) of MCAA both within and outwith 12 nm.	A marine licence **is** required.
Laying cable protection.	A marine licence **is** required.
Removing a cable.	A marine licence **is** required.

Exempt cables under Section 81 of MCAA (2009)



Domestic/ Non-exempt cables under Section 81 of MCAA (2009)



The Marine Licensing Exempted Activities Order 2011 (as amended)

6. Article 34 of The Marine Licensing Exempted Activities Order 2011 provides an exemption for any 'deposit, removal or dredging activity' carried on for the purpose of executing emergency inspection or repair works to a cable solely inshore (within 12 nm) or for emergency works that do not fall within the criteria of Section 81 of MCAA 2009. This exemption is to be used in an **emergency only**.

   "Emergency" is defined by the MMO as imminent risk to human health, property (including the cable itself) or the environment. This exemption must **not be used for general maintenance** of a subsea cable.

   This exemption is subject to the condition that the activity may only be carried out in accordance with an **approval granted by the MMO**. Therefore, for any individual or organisation to execute such an emergency repair, they must submit a notification of an exempted activity on MCMS and not undertake the activity until an approval response has been provided. If the exemption is submitted from 15:00 on a Friday to 23:59 on a Sunday, the following number must be called for the MMO to undertake a compliance test: 07770 977 825. If the works are compliant with the emergency exemption, verbal approval will be provided and a confirmation email will be sent within 24 hours. However, an exemption request must still be submitted to MCMS.

   This exemption does not apply to any deposit falling under Item 10 of Section 66 MCAA (deposit or use any explosive substance or article).

TEN-E Regulation

7. The regulation on guidelines for trans-European energy infrastructure (EU 347/2013) (the TEN-E Regulations) sets out a series of guidelines for streamlining the consenting process for major trans-European energy network infrastructure projects (e.g. submarine interconnectors) known as Projects of Common Interest (PCIs).

   The TEN-E Regulations set the policy direction that PCIs are necessary to take forward EU energy policy and that such projects should be given the most rapid consideration in the consenting process that is legally possible. To ensure this, the Regulations set a timetable of 3.5 years for the permitting process, with a 2 year period for the pre-application phase and coordination across consenting regimes, and 18 months for the determination process on the Application File (Marine Licence Application and Planning Permission Application(s)).

   The Secretary of State for Business, Energy and Industrial Strategy is the designated National Competent Authority for PCIs in the UK. However, various tasks relating to certain PCI projects have been delegated to the MMO where a marine licence is the primary consent required for the PCI. In such cases the MMO will act as the National Competent Authority and must co-ordinate the permitting process for both the marine licence and the planning permissions required. The MMO will also liaise with the National Competent Authorities of the other Member States involved in the project to ensure that procedures are undertaken in accordance with the timescales prescribed in the TEN-E Regulation. Detailed guidance can be found in the TEN-E Regulation Desk Note.

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Impacts that could be assessed in a Subsea Cable Application

8. It should be noted that subsea cable installation is not a Schedule A1 or Schedule A2 project under the Marine Works Regulations (Environmental Impact Assessment (EIA)) 2007 (as amended) (MWR), therefore, the applicant is not required to undergo the EIA process and produce an Environmental Statement. However, the applicant under Regulation 5 of the MWRs may choose to undertake an EIA in agreement with the MMO.

   The following areas may be assessed in a subsea cable marine licence application and any associated environmental report, however, this should not be viewed as a definitive list, nor should all of these areas be included in every application; this must be viewed on a case by case basis and through discussion with case managers.

   - *Marine coastal processes;*
   - *Benthic sub-tidal and intertidal ecology;*
   - *Fish and shellfish ecology;*
   - *Marine mammals;*
   - *Ornithology;*
   - *Nature conservation*
   - *Proximity to designated sites;*
   - *Commercial fisheries;*
   - *Shipping and safety of navigation:*
   - *Aviation, military and communications;*
   - *Marine Archaeology;*
   - *Electromagnetic field generation impacts (not usually considered to be an issue);*
   - *Unexploded ordnance (UXOs);*
   - *Infrastructure and impacts other users of the sea (and inter-tidal area);*
   - *Waste management / Waste Framework Directive;*
   - *Water Quality / Water Framework Directive;*
   - *Impacts on other marine licensed activities;*
   - *Relevant Policies (i.e. Marine Policy Statement or relevant MMO Marine Plan):*
   - *Cumulative and in-combination effects*.

What are the methods used in Subsea Cable installation?

Cable Burial

9. On the continental shelf (0 -130 m water depth) power cables are typically buried beneath the seabed to provide a reasonable degree of protection from other marine users, such as vessels and fishermen (due to anchors and inadvertent fishing activity over the cables), shifting sediments and currents. Cable burial depth depends on the substrate type; in hard substrate the cable does not need to be buried deep (1- 2 m) as the risk of cable becoming un-buried is low and fishing gear penetration depth is diminished. Telecom cables are buried up to water depths of 1,500 m due to the potential risks of deep water trawling.

Installation of a cable is undertaken from a vessel utilising a burial tool usually a plough or a Remotely Operated Vehicle (ROV) (See videos in references for visual aids). The type of burial tool used to excavate a trench will be influenced by the sediment type present:

- Jetting ROVs (high pressure water jets or swords covered with jets to fluidise sediment) – typically best for sandy sediments.
- Ploughing ROVs / ploughs – typically best for mud and clay sediments.
- Cutting ROVs – typically best for harder substrates (often using chain cutters or less commonly rock wheels).

Telecom cables are generally installed using a towed cable plough, as they are generally smaller (~55 mm diameter compared to ~350 mm for interconnector power cables). Ploughs offer the benefit of both laying and burying the cable in one operation. ROV burial can sometimes be carried out after the cable has been laid on the surface. Different burial tools can be utilised for different sections of the cable, typically changing as the cable spans areas of different sedimentary geology. Some ROVs have a combination of burial tools in one machine, which reduces the need for ROV recovery/ re-launch or repeated burial.

Even though the ROVs/ ploughs are large machines the component that excavates the trench is small (a few centimetres to half a metre in width), therefore, the main area of seabed impact is usually relatively small (a few metres across). The ways burial tools are used on each project should be described in licence application.

Where jetting ROVs are utilised the cable is usually surface laid first and then subsequently buried in a separate operation. These use a pre lay plough to form a trench in the seabed and then days or even weeks later a cable is laid into the pre-cut trench.

Cables can be manufactured and transported in lengths that ensure multiple sections of cable aren't required. However, when smaller lengths are deployed or when an offshore section of cable needs to be attached to the intertidal section of cable; joints can be utilised to link the cables together. The joint will usually be a few meters long and slightly larger in diameter than the cable and is laid utilising the same method as the cable. Submarine branching units can also be used for telecommunication cables where the cable needs to split to more than one destination and repeaters can also be used to extend transmissions.

Pre-Sweeping

10. In areas where large sandwaves or surface boulders exist it may be necessary to clear these obstructions before cable laying commences. This ensures the burial tool remains stable and the cable doesn't become exposed after burial due to mobile sediments. Telecom cables are usually micro-sited to avoid the need for pre-sweeping.

Cable Protection

11. Cables on the continental shelf are usually buried for protection; however, when burial is impossible the cable can be protected using rock armour (dumping various-sized rocks on top of the cable in a controlled manner) or mattressing (large plastic or concrete protection mats).

    Cables may also require the use of mattresses when they cross an existing cable; mattresses are placed on top of the existing cable for up to tens of metres either side of the crossing point to protect the existing cable. The new cable is then laid over the mattresses across the existing cable route and if required further mattresses are placed on top of the new cable. It can also be protected by rock placement. If the existing cable to be crossed is out of service or retired, a section can be removed and the open ends of the cable can be weighed down (this route clearance occurs in advance of the cable laying operation).

Landfall (onshore cable installation)

12. Cable landfall (intertidal installation) can be undertaken using a variety of methods and depends on the conditions at the coast. The length of the landfall depends on the distance between the Mean High Water Springs (MHWS) and the Mean Low Water Springs (MLWS). Usual onshore cable burial depth is to at least 1 m and can be up to 5 m depending on substrate condition (The Crown Estate, 2013).

    Horizontal Directional Drilling (HDD) is sometimes used when the cable needs to be installed under a feature which is difficult to pass or disturbance is required to be minimal such as coastal defences or environmentally protected features. HDD creates a duct under the beach for the cable to be winched through. HDD lengths can vary depending on the project requirements, cable diameters and geology. The HDD methodologies used on each project should be provided by the marine licence applicant.

    Trenching is another landfall installation method and can be used for part or all of the landfall installation. Standard terrestrial civil engineering trench construction techniques are used to bury the cable in the intertidal zone. Sometimes additional protection such as cast-iron split pipe can be applied (and may also extend into the wet section of the route offshore). This provides physical protection in the surf zone where the environment is most dynamic and subsequent terrestrial works may pose a risk to the cable.

    ### Connection to onshore cable

    For power cables, a transition joint pit (TJP) is usually excavated where the submarine cable can be connected to the onshore power cable via a joint. The joint may be housed in a concrete chamber and backfilled. Submarine power cables can be connected directly to an overhead line via a wooden pole or steel lattice (The Crown Estate, 2013).

    For telecom cables a Beach Manhole (BMH) is constructed near the landfall. This is a purpose built structure above MHWS, where the marine cable is jointed to a terrestrial cable. Telecom cables sometimes require a system earth where either an earthing plate is installed in the beach or sea or an ocean ground bed (OGB) anode array is constructed nearby to the BMH.

Further information on Subsea Cables

13. Further details on UNCLOS can be found at http://www.un.org/depts/los/convention_agreements/texts/unclos/UNCLOS-TOC.htm, while further interpretation of each part of UNCLOS related to submarine cables can be found at https://www.thecrownestate.co.uk/media/5708/submarine-cables-and-offshore-renewable-energy-installations-proximity-study.pdf

Further information on Ten-E can be found in the UK Manual of Procedures: The permitting process for Projects of Common Interest in the UK (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/311184/uk_manual_procedures_ten_e_regulation.pdf).

Further information on cable installation techniques and environmental effects can be found at: http://webarchive.nationalarchives.gov.uk/+/http:/www.berr.gov.uk/files/file43527.pdf

YouTube video demonstration of a combination jetting / cutting ROV: https://www.youtube.com/watch?v=cFxlwWPm4f0

YouTube video demonstration of a ploughing ROV: https://www.youtube.com/watch?v=d9tRmJLOCdg

YouTube video demonstration of a telecoms cable plough burial: https://www.youtube.com/watch?v=9hEDTRU_F2s

YouTube video demonstration of a simultaneous power cable ROV lay and burial: https://www.youtube.com/watch?time_continue=66&v=UKp_0CBJm7E