ENI UK LIVERPOOL BAY

METHOD STATEMENT

SPOOL PROTECTION & MATTRESS INSTALLATION

Client: **ENI UK**

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1.0 OVERVIEW

1.1 PROJECT OVERVIEW

COMPANY's Liverpool Bay CCS Transport & Storage Project (LBA CCS T&S Project) is being developed in parallel with and as a key part of the HyNet Northwest full-chain hydrogen and CCS industrial decarbonisation project which is designed to transform a region of the UK into the world's first low carbon industrial cluster by 2030.

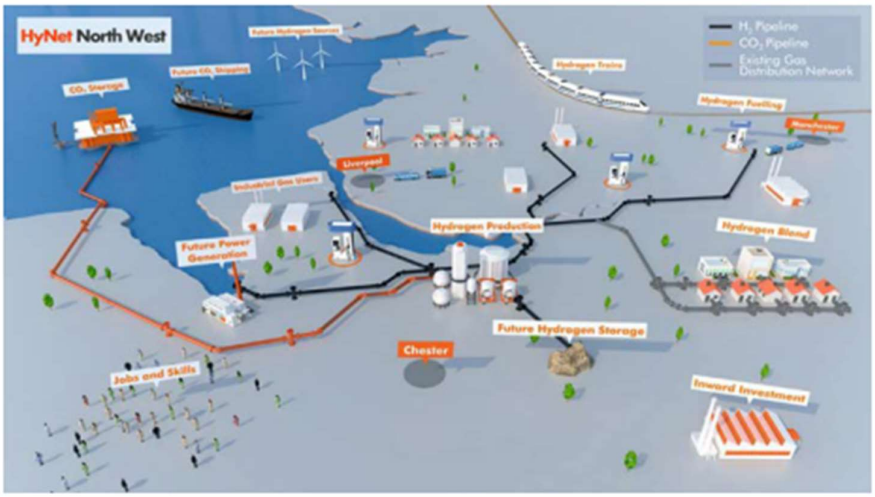


Figure 1-1 Hynet Project North West Project Overview

The HyNet Project is being developed on a phased approach based on CO_2 emissions capture from existing industrial facilities, alongside capture from new-build hydrogen generation facilities.

While industrial decarbonisation is the anchor, the HyNet Project builds the infrastructure backbone for a full regional hydrogen economy and leverages the opportunity to repurpose for future CCS service the existing oil and gas facilities at Point of Ayr and offshore in Liverpool Bay. CO_2 storage is provided in depleted and well-known hydrocarbon fields that are owned and operated by ENI UK.

1.2 SCOPE OF WORK

The Tenderer's scope of work is to prepare Douglas, Hamilton Main, Hamilton North, Hamilton East and Lennox Facilities for CCS repurposing as follows:

Douglas Platform

- Remove and recover protection from pipelines, spools and umbilicals (mattresses and grout bags)
- Locate buried pipelines and umbilicals down to depth of 0.6m DoC and excavate
- Cut and remove spool, pipeline sections and umbilicals to required demolition and repurpose extents
- Remove and recover SSBV structure
- Plug redundant pipelines (11 off) and supply, install and test mechanical connectors on designated repurposed pipelines (5 off)
- Conduct metrology from mechanical connectors to new Douglas Platform Tie-ins
- Construct, install and leak test spools between repurposed pipelines and new Douglas Platform
- Repurposed onshore/offshore pipelines post spools tie-in precommissioning works (Douglas platform to POA)
- Repurposed offshore pipelines post spools tie-in precommissioning works (Douglas to Satellite platforms)
- Spool protection installation (6x3x0.3m mattresses)

Hamilton Main Platform

- Remove and recover protection from pipelines and umbilicals (mattresses and grout bags)
- Locate buried pipelines and umbilicals down to a depth of 0.6m DoC and excavate
- Cut and remove pipeline and umbilicals to required demolition and repurpose extents
- Cut and remove caisson, riser and J-tube sections from platform

Hamilton North Platform

- Remove and recover protection from pipelines and umbilicals (mattresses and grout bags)
- Locate buried pipelines and umbilicals down to a depth of 0.6m DoC and excavate
- Cut and remove pipeline and umbilicals to required demolition and repurpose extents
- Cut and remove caisson, riser and J-tube sections from platform

Hamilton East XT

- Remove and recover protection from flowline and umbilical (mattresses and grout bags)
- Locate buried flowline and umbilical down to a depth of 0.6m DoC and excavate
- Cut and remove flowline and umbilical to required demolition extents

Lennox Platform

- Remove and recover protection from pipelines and umbilicals (mattresses and grout bags)
- Locate buried pipelines and umbilicals down to a depth of 0.6m DoC and excavate.
- Cut and remove pipeline and umbilicals to required demolition and repurpose extents
- Remove and recover SSBV structure
- Cut and remove caisson, riser and J-tube sections from platform

The scope of work covered in this method statement is the new spool protection installation via 6x3x0.3m thick mattresses (approx 324 off).

2.0 METHOD STATEMENT

The below offers a high-level workflow of the preparatory and operational tasks that will be carried out to execute the works. Detailed procedures will be written for the tasks during the project engineering phase and issued to Company for approval.

2.1 ONSHORE PREPARATION

The following onshore operations will be carried out in advance of the offshore phase, and the results will be incorporated into the offshore working procedures:

- Design of crossing / spool protection requirements in line with Client guidance
- Design of any sea-fastening required
- Development of Deck Plans and Mobilisation methodologies
- Development of detailed Operational Procedures
- Hazard Identification and Risk Assessment (HIRA)
- 3rd Party selection, equipment and procedures
- Procurement of materials, consumables, rigging, etc
- Logistics planning
- Liaison with 3rd party operators – through Company (if any)

2.2 OVERVIEW

As part of the demolition and repurposing of the Liverpool Bay Area platform infrastructures for CCS, the following work will be required at the Douglas worksite:

2.2.1 Douglas Platform

At the Douglas Platform location (LAT 26m), it is anticipated that the following repurposed pipelines c/w new spools will require the following quantities of crossing and protection mattresses.

Pipe	Crossing	Protection
SP01: 14” CCS to PL 1041	5	41
SP02: 16” CCS to PL1035		52
SP03: 20” CCS to PL1039	5	57
SP04: 12 CCS to PL 1036A		61
SP05: PL 1030 to CCS	0	103
Total	**10**	**314**
Overall Total	**324**	

Table 2-1 Douglas Platform Worksite Summary
(Numbers estimated)

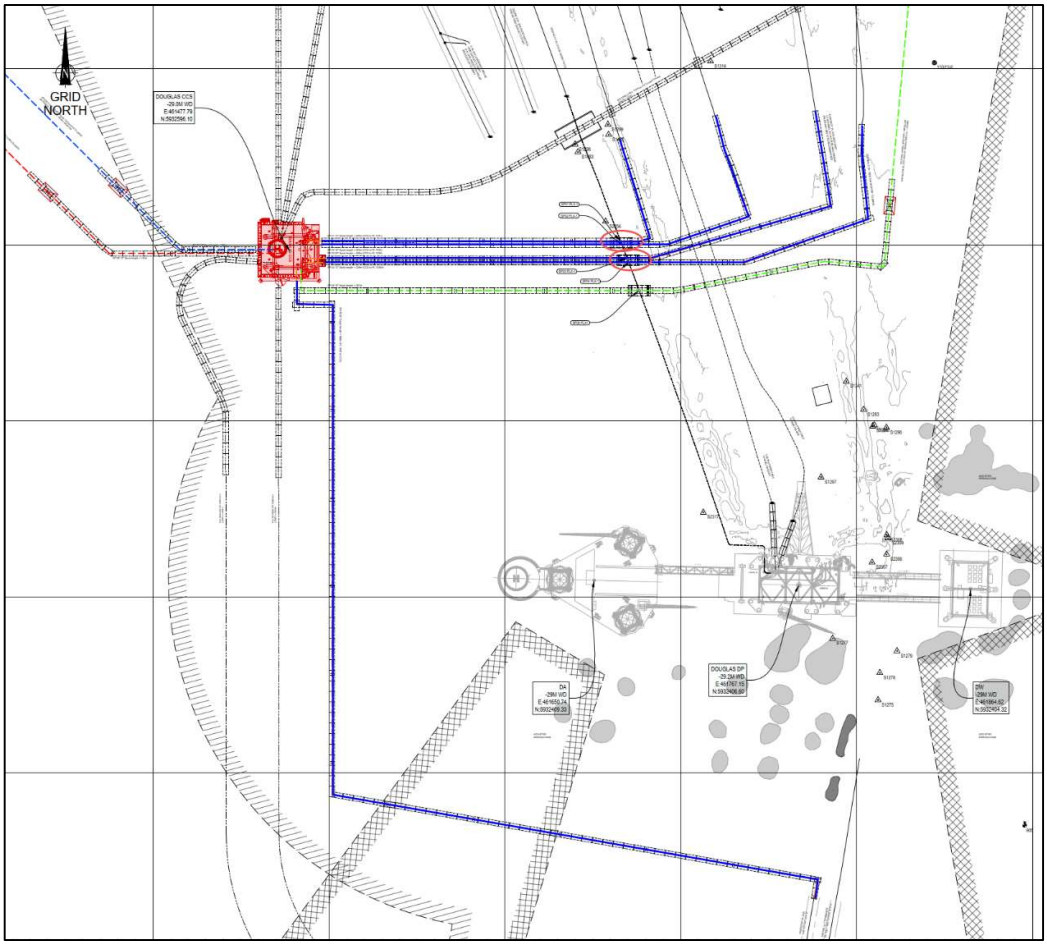


Figure 2-1 Subsea Removals Around Douglas Complex
Repurposed lines highlighted blue / crossings highlighted red

2.3 KEY EQUIPMENT

The following outlines the key equipment required to carry out the tasks outlined in this Method Statement.

2.3.1 Mattress Frame or Beam

A mattress frame or beam will be mobilised to the vessel for mattress installation.

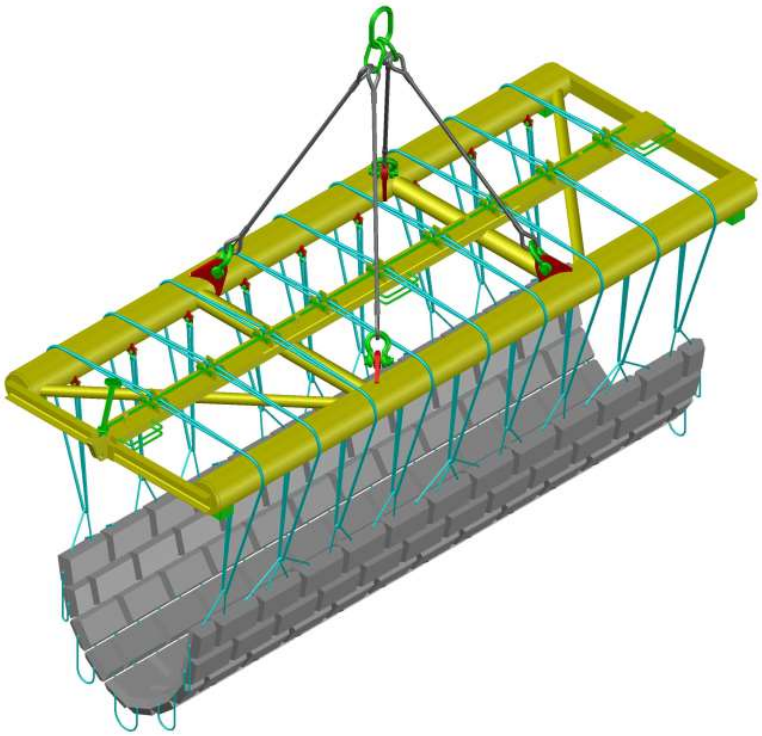


Figure 2-2 Mattress Frame

2.3.2 Bi-Flex Mattress

Approximately 324 off, 6x3x0.3m standard density bi-flex mattresses are required for crossing and protection purposes. Tapered edge or fronded types may be required depending on further protection design engineering and scour assessment.

Weight in air: 8.75t
Weight submerged: 5.0t

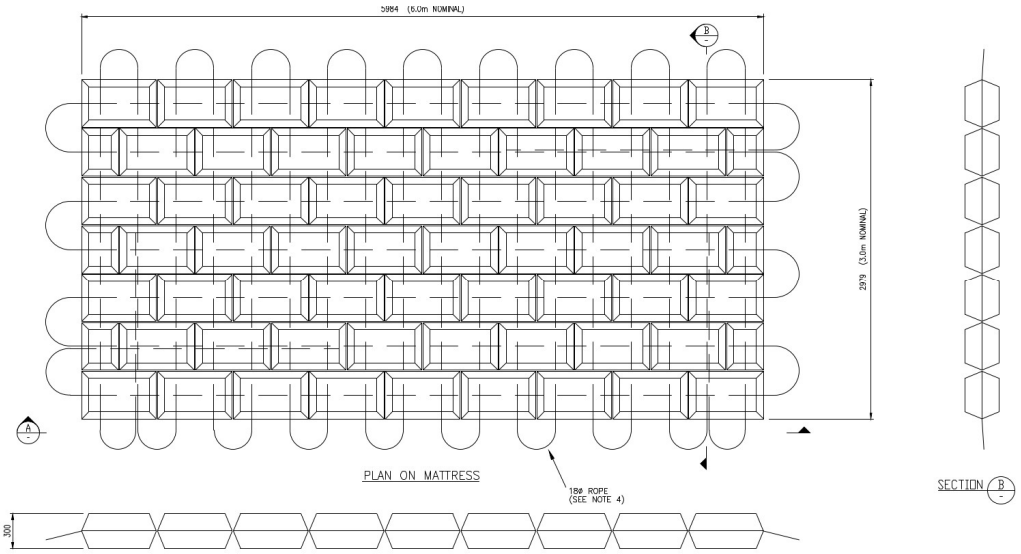
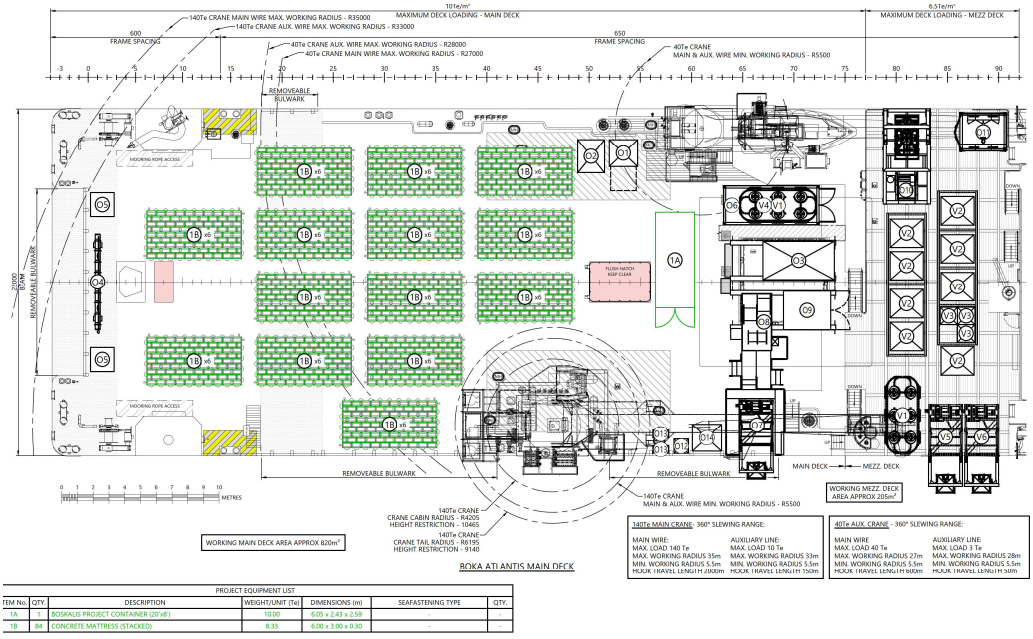
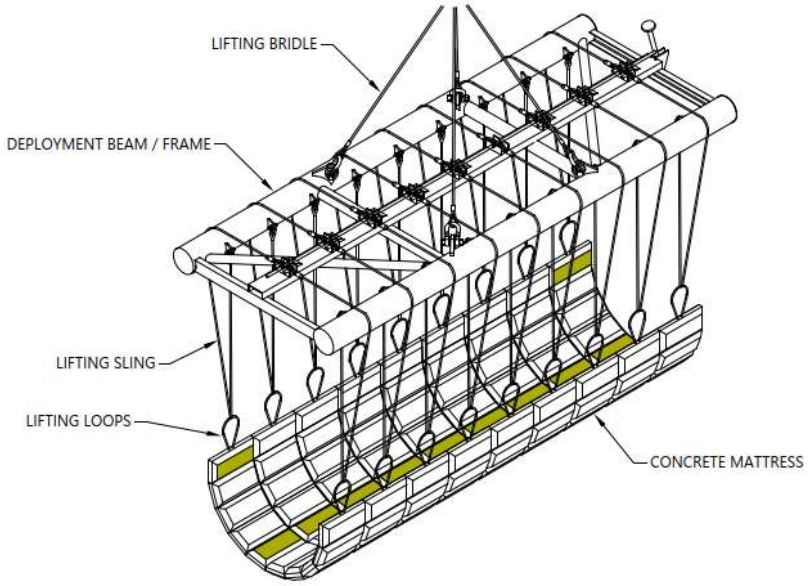
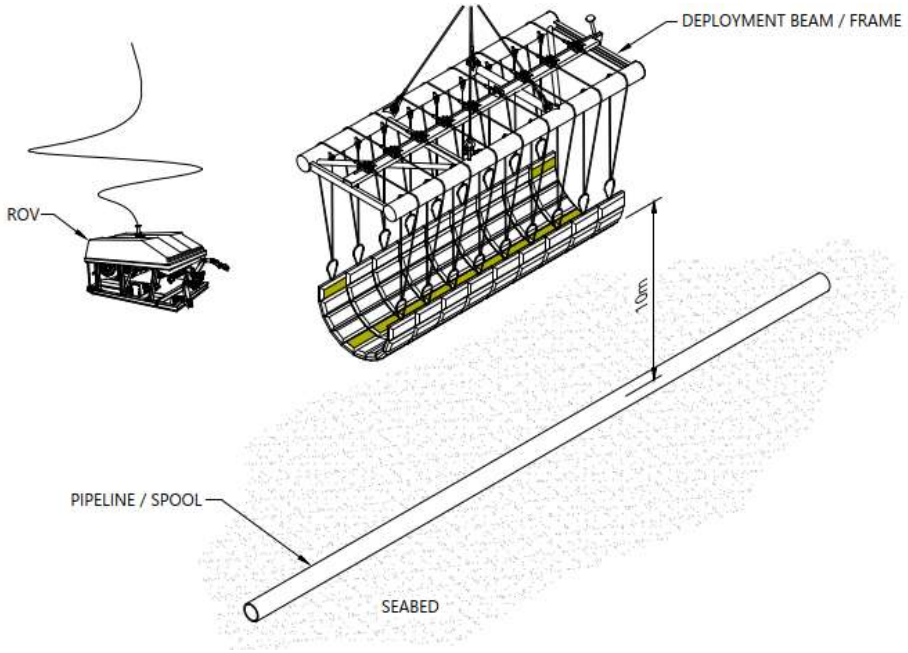


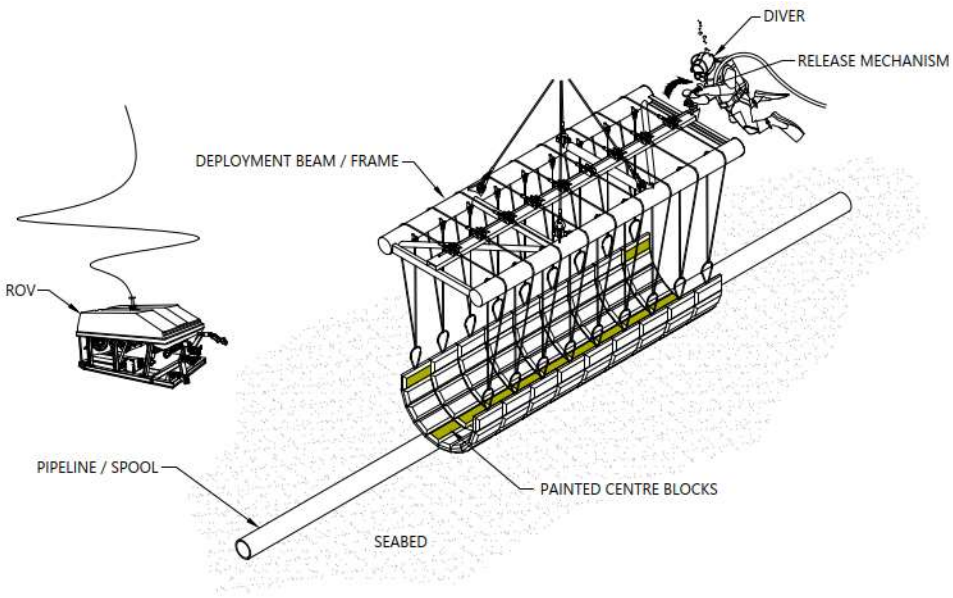
Figure 2-3 Mattress

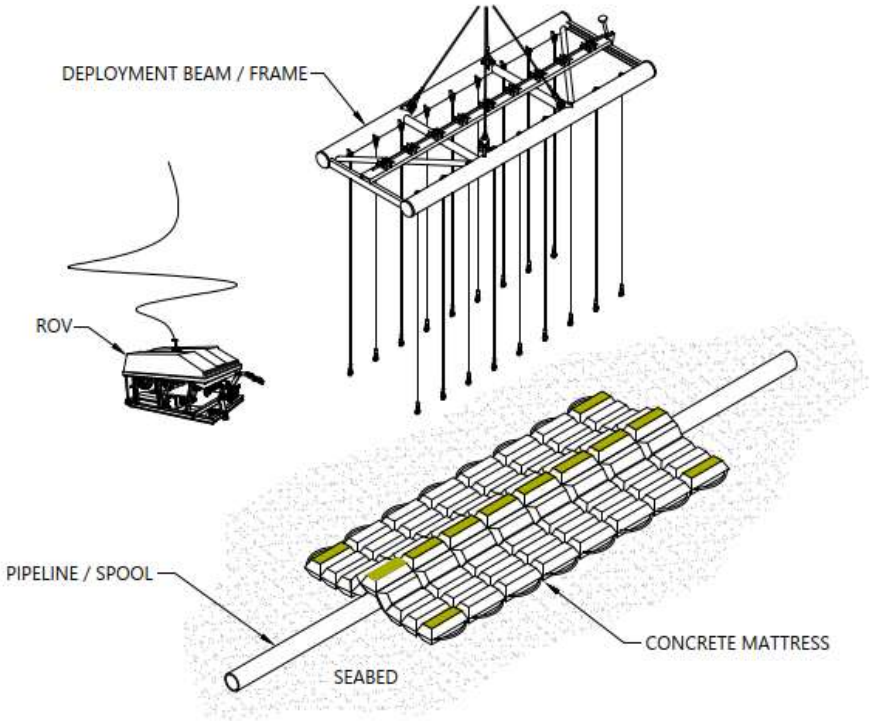
2.4 MATTRESS INSTALLATION

The method for installing the crossing and protection mattresses is from DSV with diver release.

Step	Task
	Load Out / Mobilisation of DSV
1.	The DSV will mobilise the following equipment and personnel at local port: • Mattress Deployment Frame / Beam (2 off) • 6 x 3 x 0.3m Bi-Flex Mattresses (324 off – 84 per trip – 4 trips)  **Ref: Fig 1 in Section 3.0**
2.	A mobilisation procedure will be developed to cover the following areas, typically: Quayside support & loadout, vessel deck layout, security, seafastenings, subcontractor, equipment and mobilisation checklists. Demobilisation will also cover vessel clean up and return of sub-contractor equipment.
	Preparatory Works for Vessel
3.	Vessel will arrive on site and complete field entry and DP trials outside the 500m zone.
4.	Vessel will then set up at the given location to complete an ROV as-found survey around the Douglas worksite.
5.	Upon completion of the as-found survey, the Vessel will set-up for mattressing operations.
	Mattressing Operations
6.	Carry out toolbox talk to review: • Overboarding and deployment of mattresses with approved Lift Plan • Assess current and forecasted weather conditions. • Review HIRA actions. • Ensure everyone is aware of their responsibilities and the mattress installation methodology is fully understood and all operational instructions are clear.
7.	Perform a full radio communications check with all parties involved in the operation.

Step	Task
8.	Deck Crew to prepare mattress frame and 1st mattress for deployment by removing all loose items, attaching weighted tag lines and light sticks then releasing seafastening restraints.
9.	Vessel to be positioned in safe over boarding area, Divers to be located in safe position.
10.	Under Deck Foreman instruction, pick up, overboard and deploy mattress through splash zone.  **Ref: Fig 2 in Section 3.0**
11.	Under ROV observation and Diver Supervisor guidance, lower mattress subsea until approximately 10m above seabed.
12.	With a combination of vessel and crane manoeuvres, move mattress in to position above spool / pipeline.  **Ref: Fig 2 in Section 3.0**

Step	Task
13.	Slowly come down on mattress until just above spool / pipeline and orientate with Divers.  **Ref: Fig 2 in Section 3.0**
14.	With mattress in required position and with Divers and umbilical's clear, come down on crane and land mattress in position until lower slings are slack.
15.	Survey to position fix mattress confirming in correct position and within required Client tolerance.
16.	With mattress position confirmed, Divers to release lower slings from mattress loops.

Step	Task
17.	Slowly come up on the mattress frame, confirming no lower slings have been snagged or crane load increase. 
18.	With Divers in safe position and under ROV observation, mattress frame to be moved to safe recovery location and recovered back to surface for hook-up and deployment of next mattress.
19.	Mattress operations to be repeated until crossings / protection fully installed.
20.	Any gaps or overlaps to be filled / covered with grout bags if out with Client tolerances / requirements.
21.	On completion of mattress operations, ROV to fly along mattresses performing an “as-installed survey”. Surveyor to update NAV screen with installed positions for “as-built” requirements.
Task Complete	

3.0 DRAWINGS AND SKETCHES

Title.	No.
Diver Mattress Installation Storyboard	Technical 8.1.5 - 52967-SK-01-004
Boka Atlantis Deck Layout Mattress Installation	Technical 10.1.23 - 52967-SK-03-005-1