

Project HSE Pack & Safe Systems of Work

Project Number: UHC23008

Project Name: Old River Wye Bridge Chepstow Sonar and LiDAR Survey

Customer Name: Monmouthshire County Council

Document Management	
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Section 1 – Project Summary

1.1 Survey Summary

Ultrabeam Limited have been asked by Monmouthshire County Council and WSP UK to perform a high resolution above and below water sonar and LiDAR inspection survey at the Old River Wye Bridge in Chepstow. The purpose of the survey is to perform an above and below water inspection survey of the bridge structure and riverbed, using combined laser scanning and multibeam echosounder bathymetry. This survey will inform ongoing engineering assessment of the structure by WSP UK. The survey location is detailed below in figure 1.1:

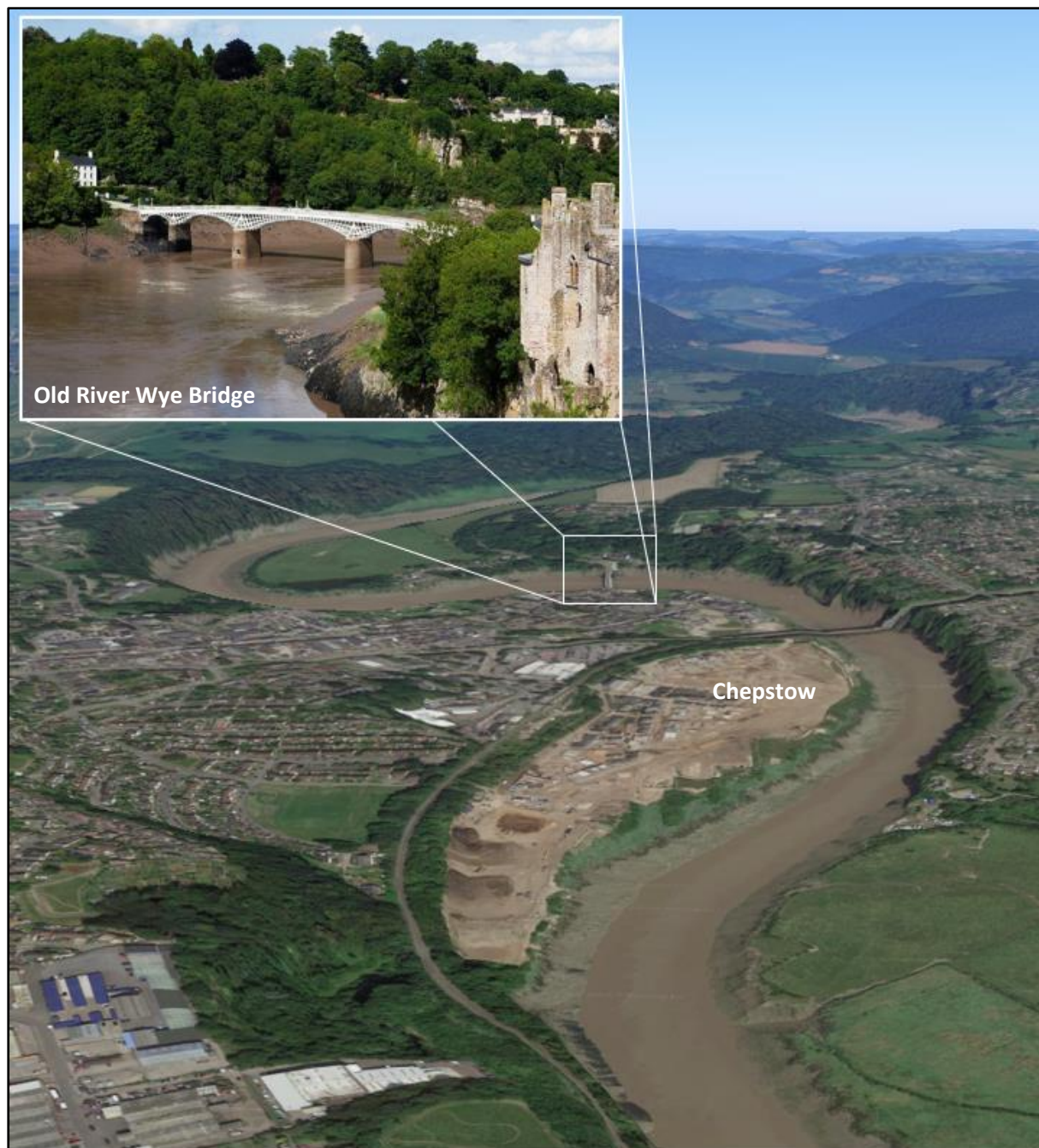


Figure 1.1 – Site Plan

The bridge location to be surveyed is detailed below:

Route	Bridge Street Chepstow
Authority	Monmouthshire County Council
OS Grid Coordinates	ST 5361 9438

1.2 Site Photography

The below photographs illustrate the bridge location at different states of the tide:



Figure 1.2 – Old Wye Bridge at Low Water



Figure 1.3 – Old Wye Bridge at High Water



Figure 1.4 – Old Wye Bridge Pier 3, showing sheet pile base and concrete capping



Figure 1.5 – Old Wye Bridge Pier 2, view from downstream



Figure 1.6 – Old Wye Bridge Pier 2, close up of corrosion to sheet piles, pier 2



Figure 1.7 – Old Wye Bridge Pier 2, close up of corrosion to sheet piles



Figure 1.8 – Old Wye Bridge Pier 2, close up of corrosion to sheet piles



Figure 1.9 – Old Wye Bridge Pier 2, close up of corrosion to sheet piles



Figure 1.10 – Old Wye Bridge Pier 2, close up of corrosion to sheet piles

The requirements of the survey are:

- High resolution bathymetric coverage of the riverbed covering the extent of any scour upstream and downstream of the road bridge.
- High resolution bathymetric coverage of all below water elevations of the bridge structure.
- High resolution true colour laser scanning coverage of all above water elevations of the bridge piers, as well as side elevations and underside of the bridge deck.

1.3 Project Programme

The survey operations of the inspection of the bridge are expected to take 1 day (Thursday 30th March) with mobilisation taking 1 day and demobilisation also taking 1 day.

A site visit shall also be carried out on Thursday the 23rd March, In order to determine the ideal USV launch & recovery locations and to also review tidal conditions around the bridge. The programme of works is planned to be:

	Day 1 (23 rd March 2023)	Day 2 (29 th March 2023)	Day 3 (30 th March 2023)	Day 4 (31 st March 2023)
Site Visit				
Mobilisation				
Old Wye Bridge Survey				
Demobilisation				

1.4 Tides

The tides at Chittening, immediately down the Severn, from Chepstow, are shown below, for the week of survey operations. The bathymetric survey is planned to occur over a neap period.

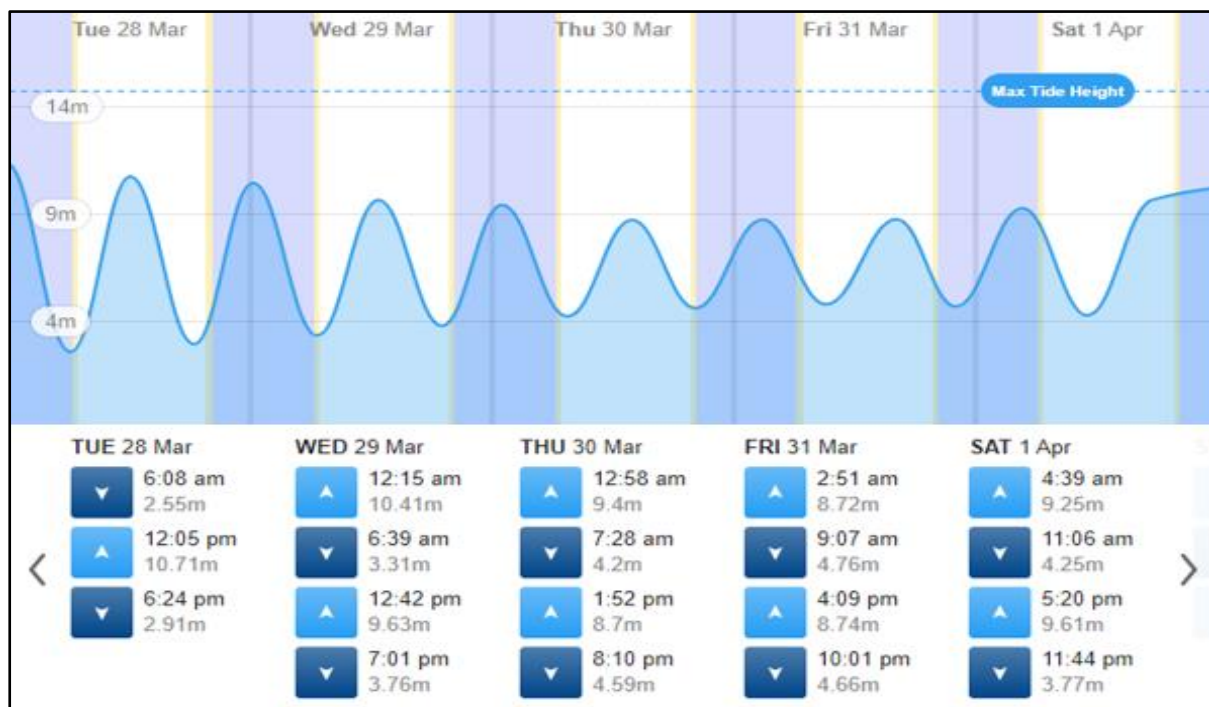


Figure 1.11 – Tide Heights, Week of the Survey

1.5 Unmanned Survey Vehicle

Due to the tidal nature of the water course in this location, along with the difficulties associated with launching a traditional manned survey craft to this location, Ultrabeam propose to use their own custom designed and built lightweight carbon fibre modular 'Black Swan' USV.

The Black Swan is a capable light weight survey vehicle with 4 axis electric thrusters allowing solid positioning performance for navigating around structures. The Black Swan is controlled remotely from the riverbank within line of site. The system has been designed to be easy to carry by hand and can be mobilised at most sites where water conditions are suitable, < 4knots of current.

The USV will be launched and recovered from the riverbank and piloted by the operator whilst monitoring MBES coverage and quality to ensure the Client specification is met.

Images of the Black Swan performing Network Rail bridge inspections are provided below and overleaf:

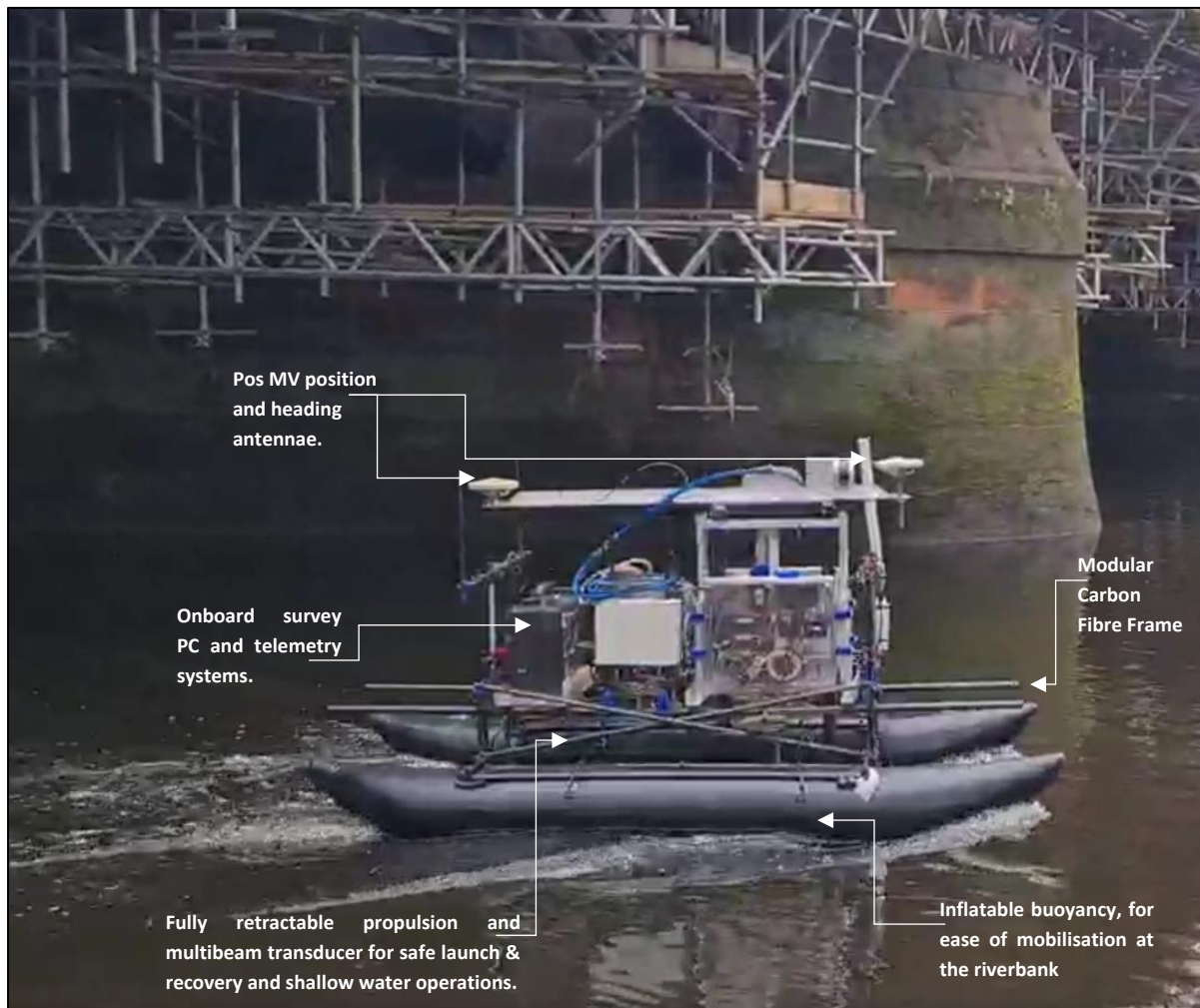


Figure 1.12 – Black Swan USV



Figure 1.13 – Black Swan USV, performing a Network Rail Bridge Inspection in Glasgow

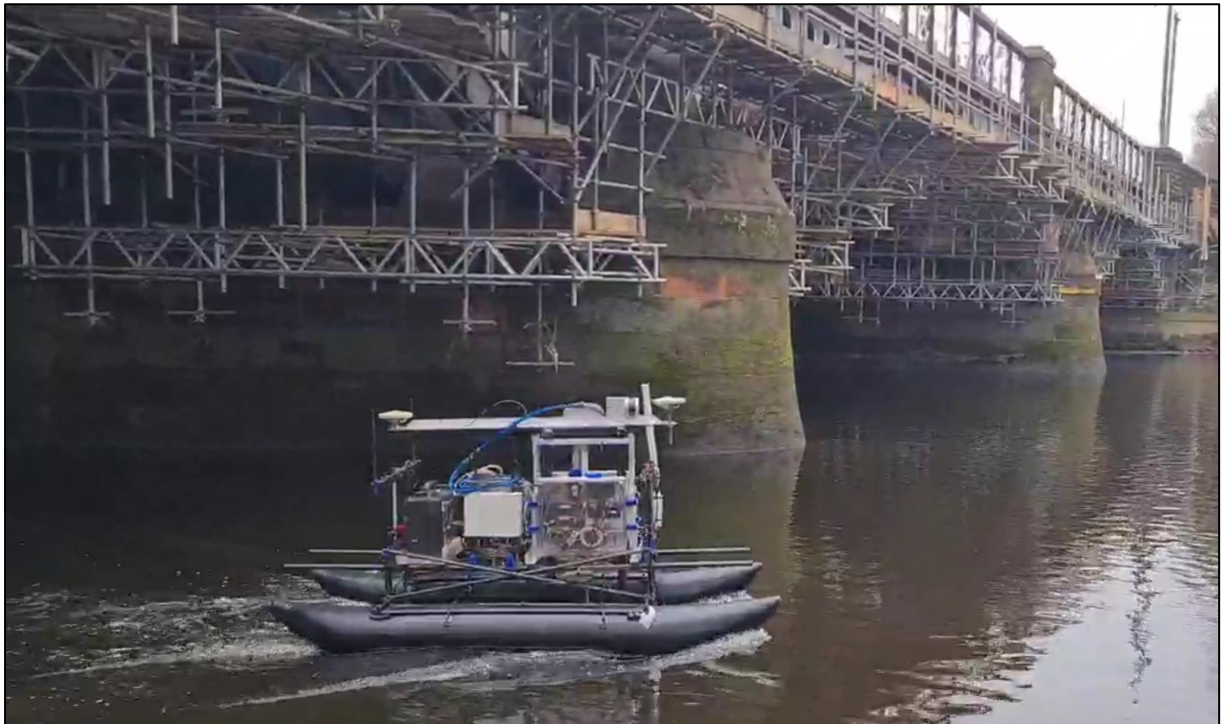


Figure 1.14 – Black Swan USV, performing a Network Rail Bridge Inspection in Glasgow



Figure 1.15 – Black Swan USV, performing a Network Rail Bridge Inspection in Motherwell

1.6 USV and RIB Launch and Recovery Location

The launch and recovery of the USV and RIB is particularly challenging at the Old Wye Bridge location, due to the large tidal range of the watercourse at the bridge location and the steep, muddy estuarine banks of the river.

For this reason, the launch and recovery of all equipment and personnel to the watercourse is planned to be done by deploying a temporary sheet footway down the muddy bank, on the western bank, immediately downstream of the bridge. The planned location of this launch/recovery site is detailed below:

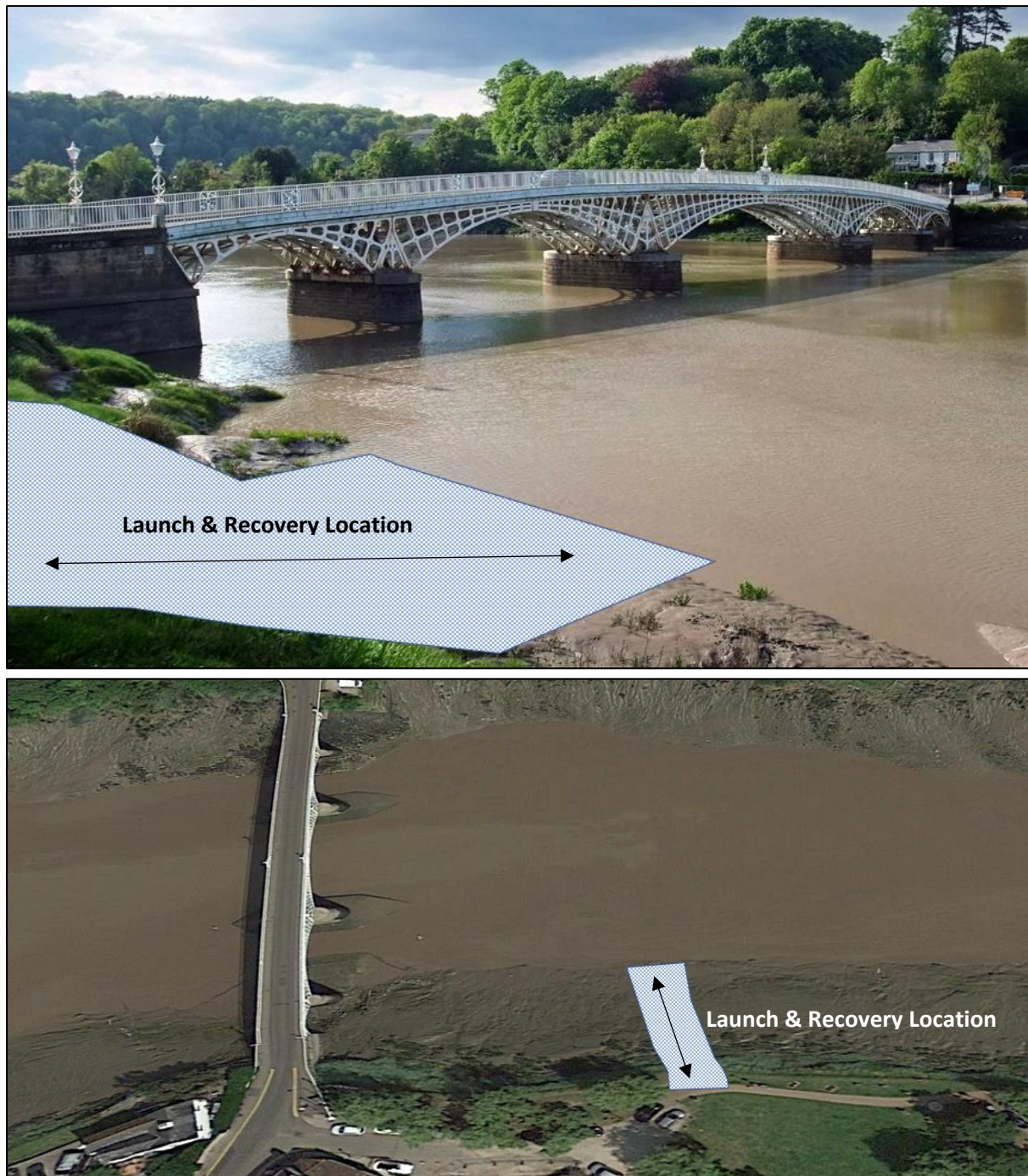


Figure 1.16 – Launch & Recovery Location

1.7 Temporary Sheet Footway Type

The temporary footway down the southern bank shall be provided for the purposes of supplying additional support when moving up and down the bank at low tide. The footway shall comprise:

- A tarpaulin roll, unrolled down the bank. The roll of tarpaulin shall be circa 1.8m wide and shall have a total unrolled length of up to 100m, however it is planned that only around 20-30m.
- A 6m extendable ladder overlain onto the tarpaulin. This ladder shall be used to further spread the load of personnel moving up and down the bank. All of whom shall have full PPE including a works buoyancy aid.

This planned setup is illustrated below:

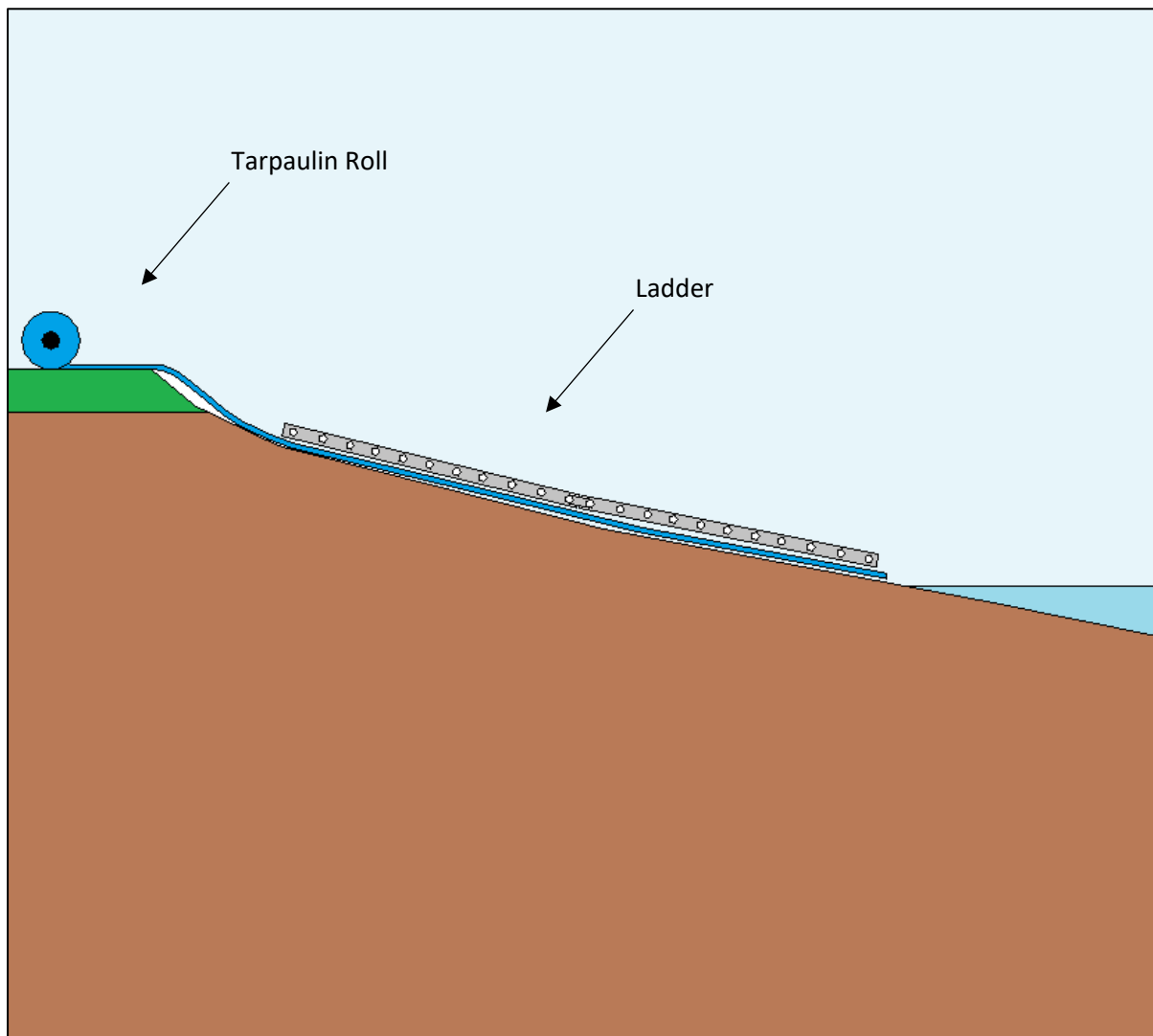


Figure 1.17 – Temporary Footway Illustration

1.8 Temporary Sheet Footway Detailed Location Planning

The tarpaulin roll, extending ladder and all other survey equipment to be deployed to the water course shall be hand carried from the parked van, which will likely be parked at the western end of the parkland at the end of 'The Back' road. Once this equipment is carried to the river bank, it shall be kept clear of the public footpath along the river bank, and shall be deployed to the north of this path, causing no obstruction to any members of the public using the footpath. These locations are detailed below:

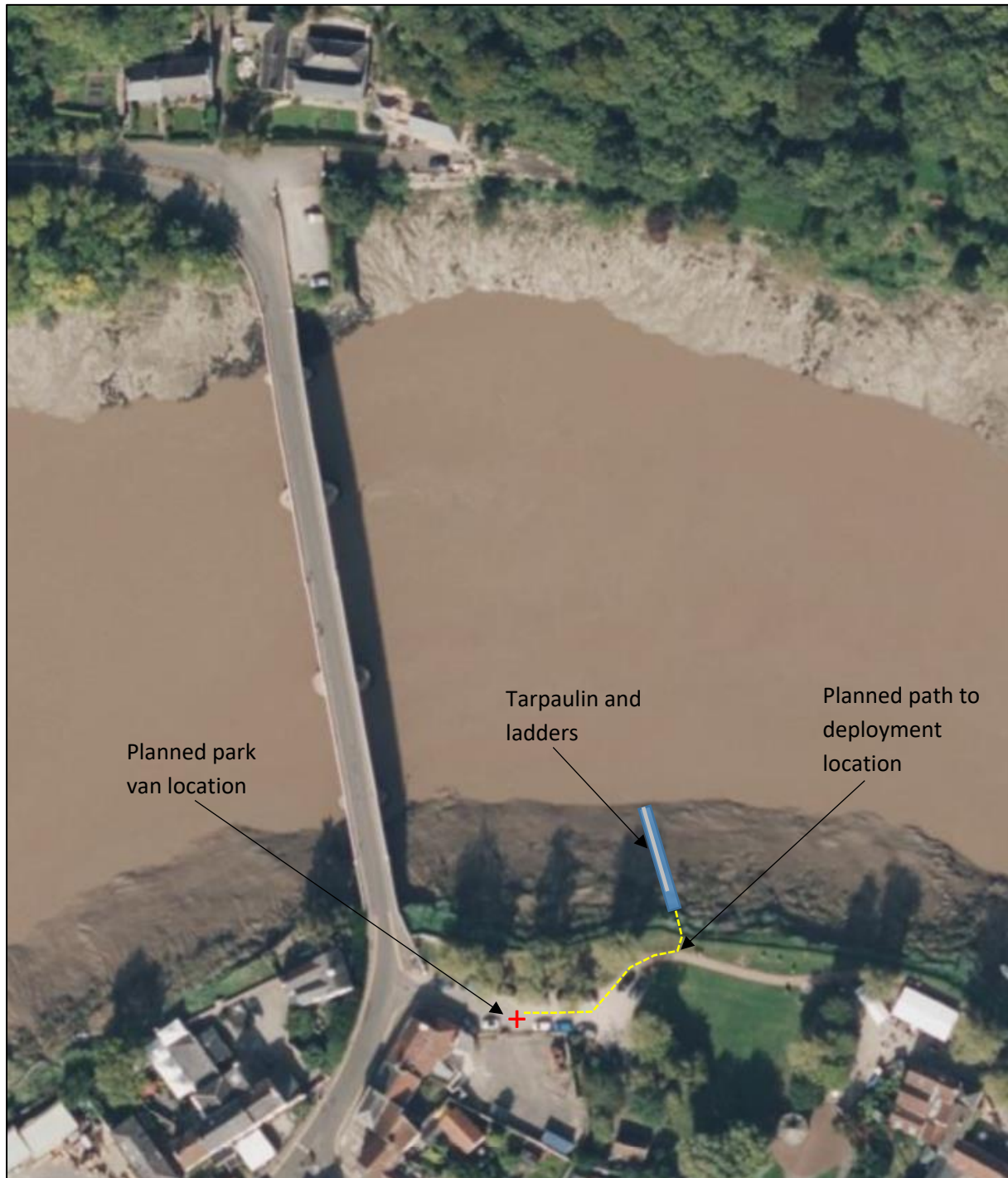


Figure 1.18 – Temporary Sheet Footway Detailed Location Planning

1.9 Project Communications

All project communications between survey team members and the office support staff shall be via mobile telephones. Mobile phones shall be retained within waterproof cases when used over water.

1.10 Working Hours and weather conditions

Survey operations shall be conducted in daylight hours only and in favourable weather conditions.

1.11 Project Staff

Party Chief: Gabriel Walton

Mobile Telephone Number: 07926 149876

Email Address: gabriel.walton@ultrahydrographic.com

Support RIB Coxswain: Ross Shephard

Mobile Telephone Number: 07813 651 194

Project Manager: Simon Baldwin

Mobile Telephone Number: 07583 919 661

Email Address: simon.baldwin@ultrahydrographic.com

1.12 Survey Equipment

The following survey equipment shall be mobilised for the survey works.

Item / Activity	Equipment Proposed	Comments
Integration and data capture	QPS QINSy	Fully featured survey software on high end PC platform
Positioning, Vessel Heading and Motion Reference (MRU)	Applanix POS MV Wavemaster II	Precise inertial navigation system (INS) outputting heave, pitch, roll, speed and heading at up to 200hz
Multibeam Echo Sounder	Norbit Winghead	Fully featured high frequency 0.5° x 0.9° beamwidth system.
Laser Scanning	Leica P20	Ultra-high resolution terrestrial laser scanning system
RTK Base Station	Trimble SPS 855	Trimble's reliable, easy-to-use base station solution. With remote monitoring and alerts, an internal radio and rover capability, the SPS855 meets all our needs.

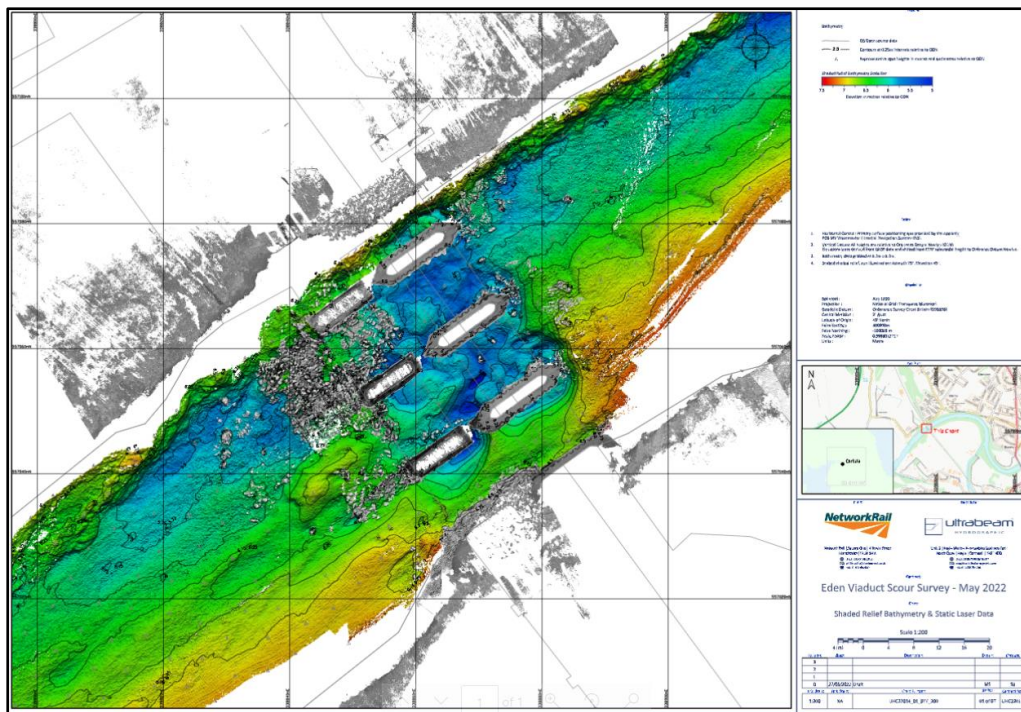
1.13 Processing and Reporting Program

The current processing and reporting program accounts for a period of 28 days following demobilisation for the production of reports and digital deliverables.

1.14 Digital Deliverables

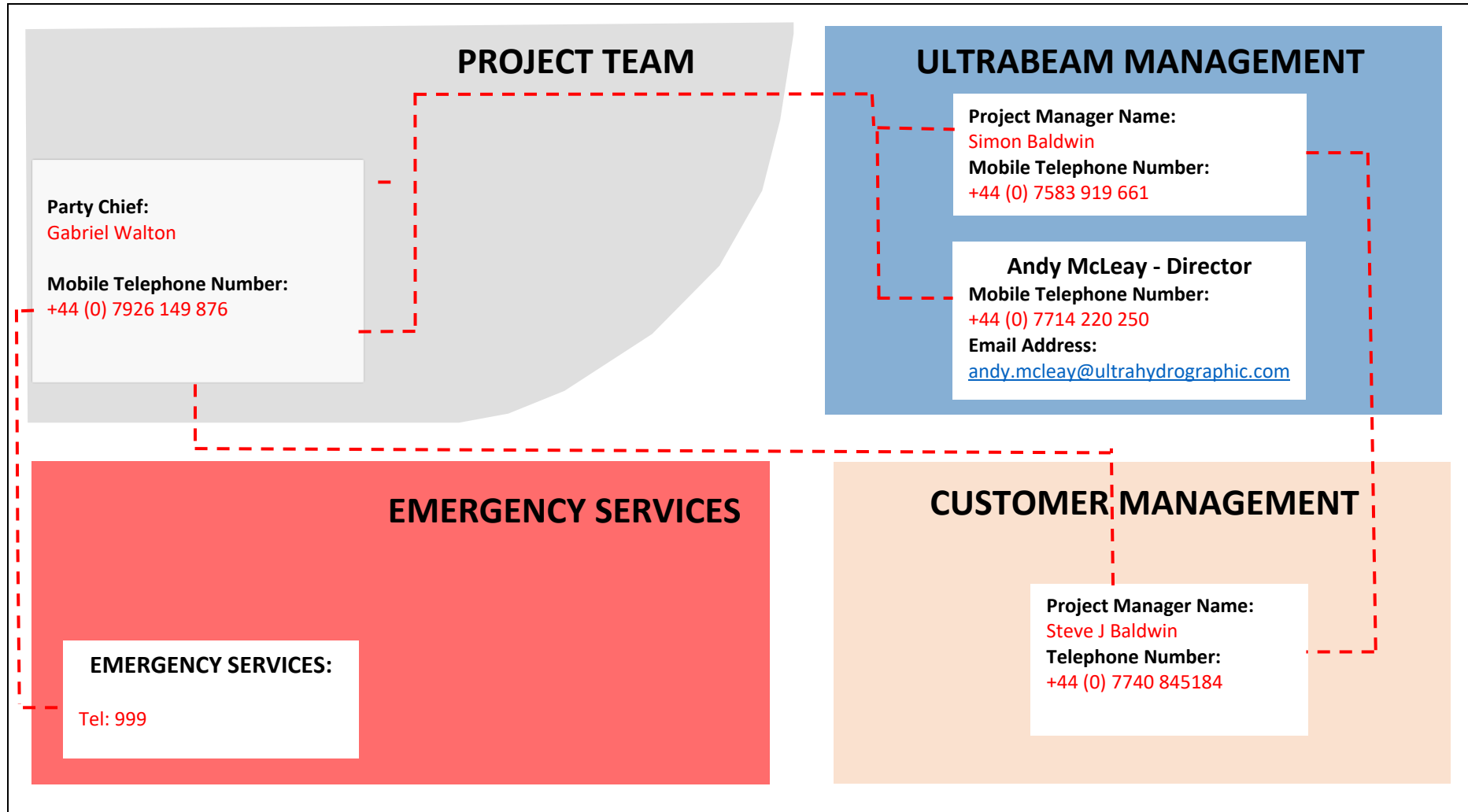
High-Resolution Multibeam Scour Survey

- Factual report detailing siteworks, methods, timing and data return.
- Plan View and Profile Charts of River Bed and Bridge Structure
- 3D high-resolution rendered images and fly through of data.
- Digital xyz data files (Point Cloud)
- Cloud Compare Project containing all point cloud data.



1.15 Emergency Response Diagram

The following emergency response diagram illustrates the lines of communication to be adopted in the event of an emergency during the project.



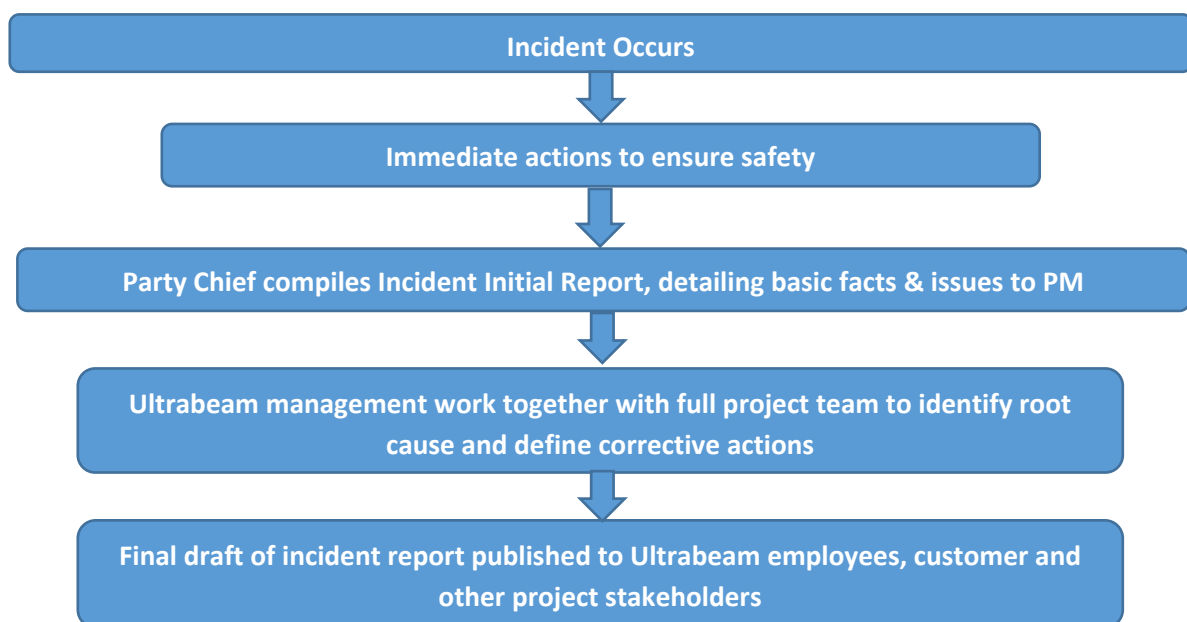
1.16 Environment & Spills

All works will be carried out in full compliance of any marine licencing conditions governing the project. Where licence conditions are in place to prevent harm to marine mammals then these conditions shall be complied with fully including but not limited to logging sightings of marine mammals and performing soft starts of any high power low frequency survey equipment as detailed in the licence conditions for the project.

In the event of a spill of any fluid such as fuel oil, chemicals or lubricants during the course of the project, the USV pilot shall conduct the response to the spill in accordance with UK MCA guidelines and shall inform the relevant authorities as well as the project management team of both Ultrabeam limited and Bam Nuttall.

1.17 Incident Reporting

All accidents and incidents, however minor, shall be reported by the party chief to the Ultrabeam project manager. Incident reports shall be reviewed immediately and where necessary, root cause analysis and corrective actions will be provided, and a full incident report issued to all parties. The incident reporting and review process is detailed below:



In accordance with RIDDOR - Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013, any of the following occurrences will be reported to the HSE Incident Contact Centre (ICC):

- Death of major injury;
- Absence from normal work for seven consecutive days or more due to a work related incident;
- An employee suffering a work related reportable disease (as notified by a doctor);
- A dangerous occurrence which could have resulted in a reportable injury; and/or
- An injury to a member of the public or person not at work where they are taken from the scene of an accident to hospital.

All incidents can now be reported online within ten days, however the ICC telephone service can also be used (only) in the case of death or major injury. The ICC contact details are presented below: (Opening hours Monday to Friday 8:30am to 5:00pm)

RIDDOR Reports
Health & Safety Executive
Redgrave Court
Merton Road
BOOTLE
L20 7HS
Tel: 0345 300 9923

To submit a report online, please follow the link and choose the appropriate report: -
<http://www.hse.gov.uk/riddor/report.htm>

Similarly, in line with the Merchant Shipping (Accident Reporting and Investigation) Regulations 2005, any marine based, notifiable incident will be reported to the Marine Accident Investigation Branch

Marine Accident Investigation Branch
1st Floor, Spring Place
105 Commercial Road
Southampton,
SO15 1GH,
United Kingdom
Tel: +44 23 8023 2527

1.11 Personal Protective Equipment

The following minimum personal protective equipment shall be worn at all times during mobilisation, operations and demobilisation.

- Coveralls
- Steel toe cap boots
- Hard hat

The following items of PPE shall also be worn where relevant to reduce risk following risk assessment of individual activities.

- Protective eyewear
- Gloves
- Ear defenders
- Lifejacket

1.12 QHSE Compliance

Ultrabeam Limited shall conduct the works in compliance with recognised HSEQ management systems which are aligned with OHSAS 18001, ISO 14001 and ISO9001. **Ultrabeam Limited** shall prepare the following documentation prior the commencement of works:

- Project HSE pack & Safe Systems of Work (This Document - Includes Emergency Response Plan);

- Risk assessed method statements (RAMS);
- Project Hazard Identification and Risk Assessment (HIRA);
- A bridging document linking all HSE systems.

1.13 Safety Observations

Ultrabeam limited operate a safety observation database, where all hazardous observations, near misses, accidents, and incidents are recorded. These are reviewed by the Ultrabeam staff, to assign corrective action and improve overall HSE performance.

1.14 Media Relations

If any member of the project team is contacted by any media outlets then they shall be directed to Andy McLeay of Ultrabeam Limited. Project team members should not discuss any matters directly with the media. No project related material shall be disclosed upon social media platforms.

Section 2 – Hazard Identification, Risk Assessment & Method Statements

2.1 Hazard Identification and Risk Assessment

Every project activity shall undergo a thorough process of hazard identification and risk assessment by an Ultrabeam Project Manager, certified by NEBOSH in 'Health and Safety at Work Award'. The HIRA shall be drafted initially by the project manager and then passed to the project team for a further onsite review during the project start-up in order to include any additional hazards identified at the project location.

The project HIRA will remain a live document with any new hazards that are identified during the course of the project being fully assessed and mitigations put in place and documented to prevent harm.

2.2 Method Statements

All complex project activities are covered by an Ultrabeam limited method statement such that there can be uniformity in the way in which they are carried out and in doing so they are carried out in a manner which has been fully risk assessed.

Section 3 – HSE Pack Signatories

3.1 HSE Pack Signatories

All project team members must read this document in full and sign below to confirm their understanding.

Name:	Date:	Signature: