



Havant Thicket Reservoir – Main Pipeline Works
Construction Method Statement – Shaft 1 RMA
HTR-WAB-PI-W1-MS-W-0001

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Suitable for construction approval

Issue and Revision Record

Havant Thicket Reservoir – Main Pipeline Works

Construction Method Statement – Shaft 1 RMA

Document Title: Construction Method Statement – Shaft 1 RMA

Project Number: C725

**Client Project
Number:** HTR

Client: Portsmouth Water Limited

Project Location: Meyrick Road, Havant, PO9 1NR

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P01	24/11/2023	AON	BC	JD	Internal review and comment
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1 Abbreviations and Definitions

Client	=	Portsmouth Water Limited
Contractor	=	Ward and Burke Construction Limited
CTMP	=	Construction Traffic Management Plan
HGV	=	Heavy Goods Vehicle
HTR MPW	=	Havant Thicket Reservoir Main Pipeline Works
HTR MRW	=	Havant Thicket Reservoir Main Reservoir Works
PW	=	Portsmouth Water Limited
RAMS	=	Risk Assessment / Method Statement
TPC	=	Travel Plan Coordinator
UTX	=	Under Track Crossing
WBCL	=	Ward and Burke Construction Limited

2 Introduction

This construction method statement has been prepared by Ward and Burke for the construction of launch shaft for the undertrack crossing (UTX) tunnel drive at Bedhampton, Havant.

This method statement will take into consideration and outline the minimum liaison processes with neighbouring Bedhampton train station, and how works will affect users of the train station and take into consideration any works that will be happening simultaneously on the Bellway development.

This document is required to discharge Condition 6 of the planning permissions.

Condition 6 – Construction Method Statement (CMS)	
Detail	Where addressed
<i>No phase of the development approved under Condition 4 shall commence until a Construction Method Statement (CMS) for that phase has been submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved detail.</i>	Section 8
Reason: to ensure that the construction process is carried out in a manner which will minimise disturbance, pollution, and nuisance to neighbouring properties.	

3 Site Details

The launch shaft will be constructed on the former Portsmouth Water laydown yard, bought by Bellway Homes for a new development. This is located on Palk Road, Bedhampton, Havant, adjacent to Bedhampton train station.

These works are part of the Havant Thicket Reservoir Main Pipeline works. Site compound layout is shown in Appendix 1.

4 Programme and Sequence of Works

Works to shaft 1 will begin in August 2024, and will take approximately 16 weeks to construct. Following on from the shaft construction, the pipeline and Under Track Crossing (UTX) will be constructed, which will begin upon confirmation of Network Rail requirements and planning permission confirmation.

Upon completion of these works, the shaft will be backfilled, and landscaping will be complete.

5 Access arrangements

Vehicular access will be entry via Meyrick Road (as per Appendix 1).

The What3Words location to quote for the main site entrance gate is:

///shirt.game.stars

- Deliveries will be managed as per in line with Construction Traffic Management Plan.
- All delivery vehicles will first report to the office.
- Closed gate policy operated on site.
- All deliveries will be pre-planned and will be directed to the works area by the gate man.
- All vehicles with an integral lifting device shall have current lifting certification and will be checked for compliance prior to commencement of work.
- The section supervisor, Slinger signaller and machine operator will be briefed on Lifting Plan.
- All operatives involved will possess current qualified certificate, for relevant plant and activity this will include the delivery driver.

6 Construction Methodology

Scope of Works

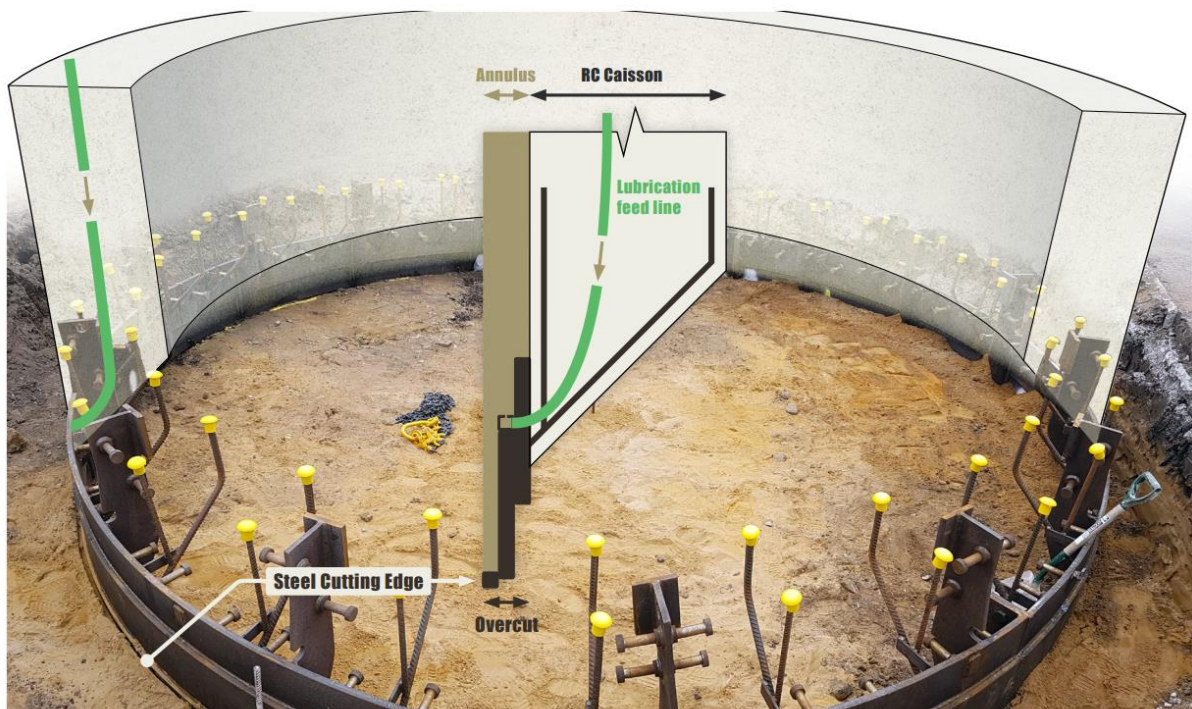
- Compound set-up
- Excavation works
- Installation of cutting shoe
- Concrete pours to form caisson
- Sinking of caisson
- Concrete base pour

Shaft Construction

1. Cat & Genny scans will be carried out by trained and competent Ward and Burke operatives.
2. An initial excavation of 12m x 12m x 1.5m deep will be excavated around the centre of the shaft.
3. The excavation will be stepped and battered. Access will be via ramp/steps formed in the bank by the excavator.
4. A 50mm thick blinding will be poured providing a level surface for the cutting shoe to be installed.

5. Blinding will be poured using the excavator and finished with a tamp finish levelled with a laser level.
6. The cutting shoe will be delivered to site on an articulated trailer.
7. Cutting shoe will be lifted into position by crane or excavator using SWL chains. The shoe will be bolted together using bolts and spanners.
8. The shoe will be supported using timbers or props until sections are bolted together and it is stable, in line with issued Temporary Works drawing.
9. The level of the cutting shoe will also be monitored regularly by the engineer to ensure it is level.

Lubrication in the form of a steel hose will be built into the cutting shoe and additional hoses will be connected to the built-in hose, at the bottom of the cutting shoe. This will assist with the sinking of the shaft once this stage has been reached, if needed. 5 hoses will be fixed to the cutting shoe and will run vertically up the shaft to the bentonite pumping machine, as shown in Fig. 2. Lubrication will then be pumped into the over-cut annulus to reduce skin friction. Interceptor tray to be used to protect from spillages. TK60 lubricant to be used (liquid and produces no dust).



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WARD & BURKE

NOT FOR CONSTRUCTION - Visuals are indicative

Fig. 2 Cutting shoe detail

Cutting Shoe & Internal Shutter

1. The internal and external shutters will be delivered to the site on the flatbed trailer and off-loaded using previous methods and in accordance with the non-crane lift plan.
2. Crane or excavator to lift/lower the shutter sections as required using suitable SWL chains, guided by a slinger signaller.
3. Retarder is to be sprayed onto the Pour 1 shutter. This will be jet washed to remove the laitance and expose the aggregate to create a bond when the plug is poured.

4. Oil is to be sprayed in a mist, using minimal oil, reducing the chance of run-off. Oil to be rubbed in with a sponge in areas where oil is beginning to run down the shutter.
5. Wavy Tail Lifting Anchors will be fixed through holes in the shutter to allow Peri Brackets to be fixed once the shutter is struck.
6. When the internal shutter and the cutting shoe are in place, Type 1 stone or sand will be placed underneath the sloping angle of the cutting shoe by crane or excavator. Polythene will be placed on top of the stone to prevent a bond between the concrete and the stone, as well as making excavation easier at a later stage.
7. This material will be excavated during the sinking of the shaft. The concrete skip will be used to transfer the material into this area or if access is not restricted the 4t excavator will carry out this work.
8. At this stage, the cutting shoe and internal shutter are now in place.

Steel Fixing & External Shutter

1. Steel to be lifted/lowered using crane or excavator with suitable SWL chains/slides. Slinger signaller to control the operation, with appropriate lift plan in place. Adequate access/egress to be established prior to entering shaft, with man basket and ladder access available.
2. All hot works permits will again be issued for these works. Any mobile plant i.e., cut off saws will be placed on plant nappies within the working area.
3. All operatives to wear the appropriate PPE including goggles and ear defenders when cutting steel, as well as gloves and glasses at all times.
4. All steel cut-offs will be placed in a steel skip which will be removed off site for recycling.
5. Once the first section is fixed, the oiled external shutter will be lowered into place with the excavator/crane and chains of suitable SWL and secured into position.
6. Steel will continue to be fixed in sections as to allow to be closed behind as each section of reinforcement is completed.
7. If for any reason operatives need to enter the shutters for work, they must always wear harnesses. Access and egress will be provided using a ladder from the platform fixed to the top of the shutters.

Pouring of Concrete

1. All operatives working with concrete will wear the correct PPE for the task to minimise the risk of concrete burns. This will include PVC gloves, long sleeves, and sufficient eye protection.
2. The concrete quantity will be measured and confirmed for delivery to site. The concrete will be delivered in a 6m³ or 7.5m³ concrete wagon. The wagon will enter the site access gates and will be directed to the point of discharge.
3. The concrete will be poured using a 2m³ or 3m³ skip with a tremie pipe and will be lifted to the point of discharge by the excavator/crane or the concrete will be pumped with a mobile pump.
4. Slinger/signaller will oversee all lifting operations.
5. A high frequency electric poker will then be used to vibrate the concrete. This poker will be powered by a 110v supply from the welfare setup.
6. On completion of the concrete pour the concrete wagon is to proceed to the concrete wash-out skip to wash chute etc. prior to departing site. Banksman will be in place for site movements.
7. Pressure washer uses minimal water at high pressure. Any run-off is to be directed to a sump area and pumped to a concrete washout bund or skip.

8. Concrete Testing: Cubes will be taken on site by the site Engineer and sent away to be tested, with the results forming part of the quality documentation. Cubes will be tested for 7- and 28-day compressive strength.
9. 5N strength is required for the pins of the external shutter, and this should be achieved in 24 hrs. An extra cube can be tested at 2 to 3 days to prove this strength.

Striking External Shutter

1. Ensure the chains of the crane/excavator are attached to the external shutter and any slack is taken before loosening and removing bolts.
2. The shutter will be struck by unbolting the sections and lifting them off the drilled in brackets, and then cleaned using the pressure washer.
3. Minimal water to be used from the high-pressure washer. Shutters to be washed in bunded area.
4. The shutter will be stacked vertically and propped using a fixed Acrow prop.

Striking Internal Shutter

1. The internal shutter will have the striking pieces released after the shaft has been sunk to the desired level – see below for sinking process.
2. Two Ward and Burke operatives will be lowered into the shaft using the man basket.
3. The striking pieces located around the shutter will be released. This will provide an approximately 20mm gap around the shutter.
4. The internal shutter pieces will be struck from the inside.
5. Man-basket is removed from shaft.
6. Internal Shutter is removed using crane and placed onto Ground Level.
7. As per the wall reinforcement drawing the vert bars will extend up from the previous pour approximately 1.1m.
8. Steel fixing will begin from ground level. Aluminium podium hop-ups will be used as more height is required to fix steel.
9. Once the steel is again fixed, the external shutter will be lifted into position and rest on brackets drilled into the external face. TW will again be issued to specify the no. of brackets.
10. When all pours are complete the internal shutter will need to be completely struck from the caisson, the shutter should then be placed in a lay down area and power washed, ready to leave site.

Excavation Works

1. First section of excavated works is as detailed above in 13.1 Shaft Construction. The initial 10m x 10m x 1.5m is excavated to the required level.
2. The initial sinking process can be done with a large excavator digging out from the external of the shaft whilst sitting on a pile of stored material, alternatively if dry the 4t excavator can be lifted into the shaft using a crane which will dig and load the muck skip.
3. An excavator with a clamshell bucket can also be used to continue excavation works inside the launch shaft.
4. Gas monitors to be bump tested daily as per manufacturers recommendations.
5. When diesel plant is operating in the shaft forced air ventilation will be utilised.
6. An operative will be present in the basket of a boom lift to oversee the workings inside the shaft. This operative is known as a "Top Man," and it is their job to record the confined space and bank the crane.
7. If a mini excavator inside the shaft is used for excavation, a muck skip will be lowered into the shaft by a crane on the outside of the shaft, for the mini excavator to fill. The skip will be

guided by the “Top Man” viewing from the top of the shaft. This excavated material will be stored in a laydown area until taken away by the waste contractor. All lifts of material/plant will be done with an excavator in accordance with the non-crane lift plan.

8. Referring to emergency and access plans, the primary means of access/egress will be the man-basket for the operative to enter the shaft during excavation. Ladders or davit arm may also be available as alternative access/egress in line with confined space procedure.
9. Davit arm is to be used as a secondary means of escape during sinking process and construction. Davit arm is to be fixed to the shaft wall.
10. When the shaft has sank to a level where the rebar can be tied, and it is still sinking to desired level steel fixing may commence. An exclusion zone must be set up in the slew radius of the muck skip to keep operatives safe.
11. As the shaft walls have been constructed, injection pipes have been cast into the walls from the cutting shoe upwards to allow for the TK60 lubrication/bentonite solution to be applied during sinking. This process will also be ongoing until the shaft has been sunk to the correct formation level.

Wall & Base Pours

1. The procedure for striking the shutter will be as per previous pours.
2. Walls to be washed of any muck from mucking out before installing external shutter.
3. The external shutter as before will be installed as the steel for that pour is completed.
4. Excavation and pour stages will be repeated until formation is reached.
5. If dry, the shaft wall, 45 degree cutting slope and cutting shoe will be pressure washed to provide a clean surface for the base pour concrete.
6. If wet, the required depth will be checked by the site Engineer using a plumb bob, and the shaft kept full of water to balance any pressure from existing groundwater.
7. The plug will be poured using a funnel and tremie pipe, with the plug poured underwater. Concrete trucks can reverse up to the shaft and discharge straight into the funnel.
8. When the shaft has been sealed and the plug has set, the base can then be poured.
9. Steel rebar is to be installed as per schedule and checked by the engineer before the pour takes place.
10. Concrete is to be poured by mobile crane with a 2m³ or 3m³ concrete skip with tremie pipe or concrete is to be poured with a mobile pump. The skip is to be lowered into the shaft guided by slinger/signaller and discharged into the base.
11. Once the base is poured, the shaft will be prepared, to enable the launch of a 1980mm ID tunnel pipe.

Shaft Access & Egress

1. Access will be via the man-basket lifted into the shaft by the crane, this method may be used until the shaft has reached formation, Davit arm and winch may be used as a secondary means of escape when sinking.
2. A shaft ladder will also be installed when the shaft has reached formation level, with access via gated access platform and steel ladder bolted to the shaft wall.
3. Maximum length of ladder is not to exceed 6m without a landing platform.
4. Any issues with shaft access/egress must be reported to the site management.

7 Environmental Controls

All Environmental incidents should be reported to Ward & Burke Site Management as soon as reasonably practicable. The following information is displayed on the Ward & Burke Site notice board or in the folder.

- Spill Response Plan,
- Emergency Plan (Location Drawing),
- Emergency Procedures,
- Incident Reporting Guide
- Environmental Management Plan

Throughout the construction of these works, WBCL will monitor and manage the below elements, in link with the Construction Environmental Management Plan:

- Air quality,
- Spills containment,
- Runoff management.

In line with the construction method statement, a concrete washout will be provided to ensure any concrete brought to site will have an area to safely wash all concrete lorries. This will be in the form of a skip to collect the water, followed by a water treatment facility, before discharging the clean and treated water back into the nearest watercourse.

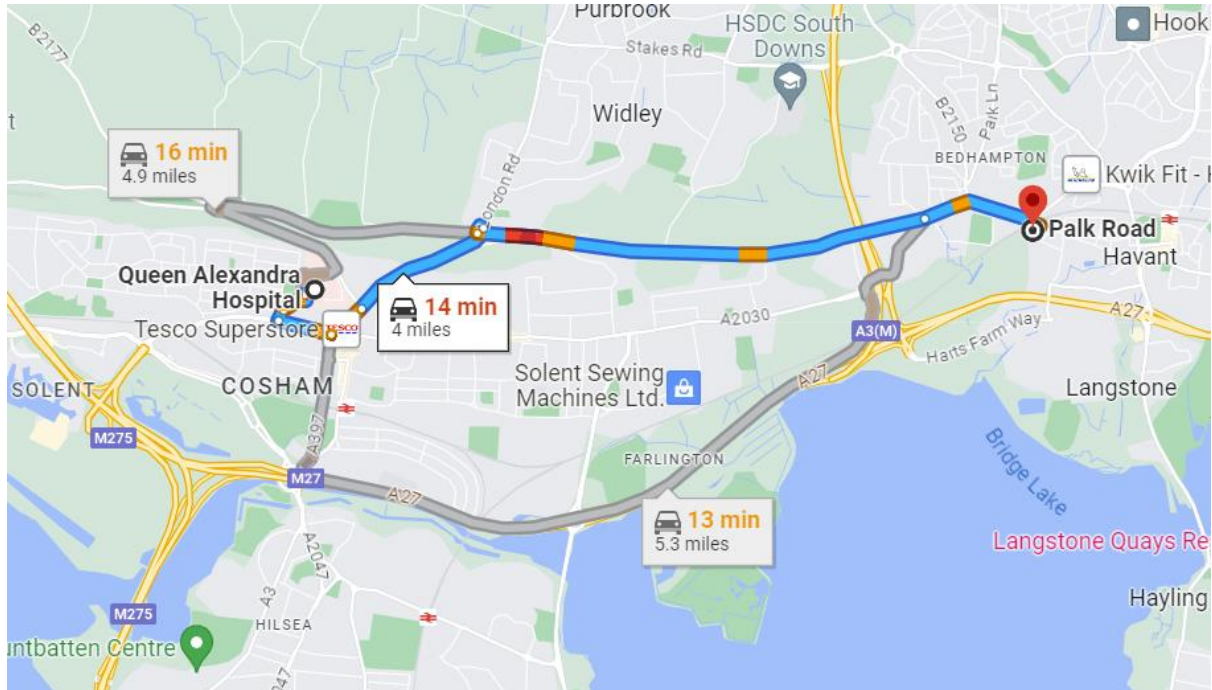
In addition to this, with the vicinity of the works area to shaft W1, there is a large growth of Japanese knotweed. Prior to starting the works, WBCL will carry out an invasive survey of the areas affected and remove, or contain, any part of this plant that will protrude into the works area. Throughout the construction, this will be monitored and further works and removal, where necessary.

8 Emergency Procedures

In the event of an emergency, Ward and Burke management shall inform Portsmouth Water of such happening while another member of the Ward and Burke team awaits the arrival of emergency services at the entry gate and directs them to the working area. WBCL to assemble at designated site assembly point opposite site welfare unit and do roll call.

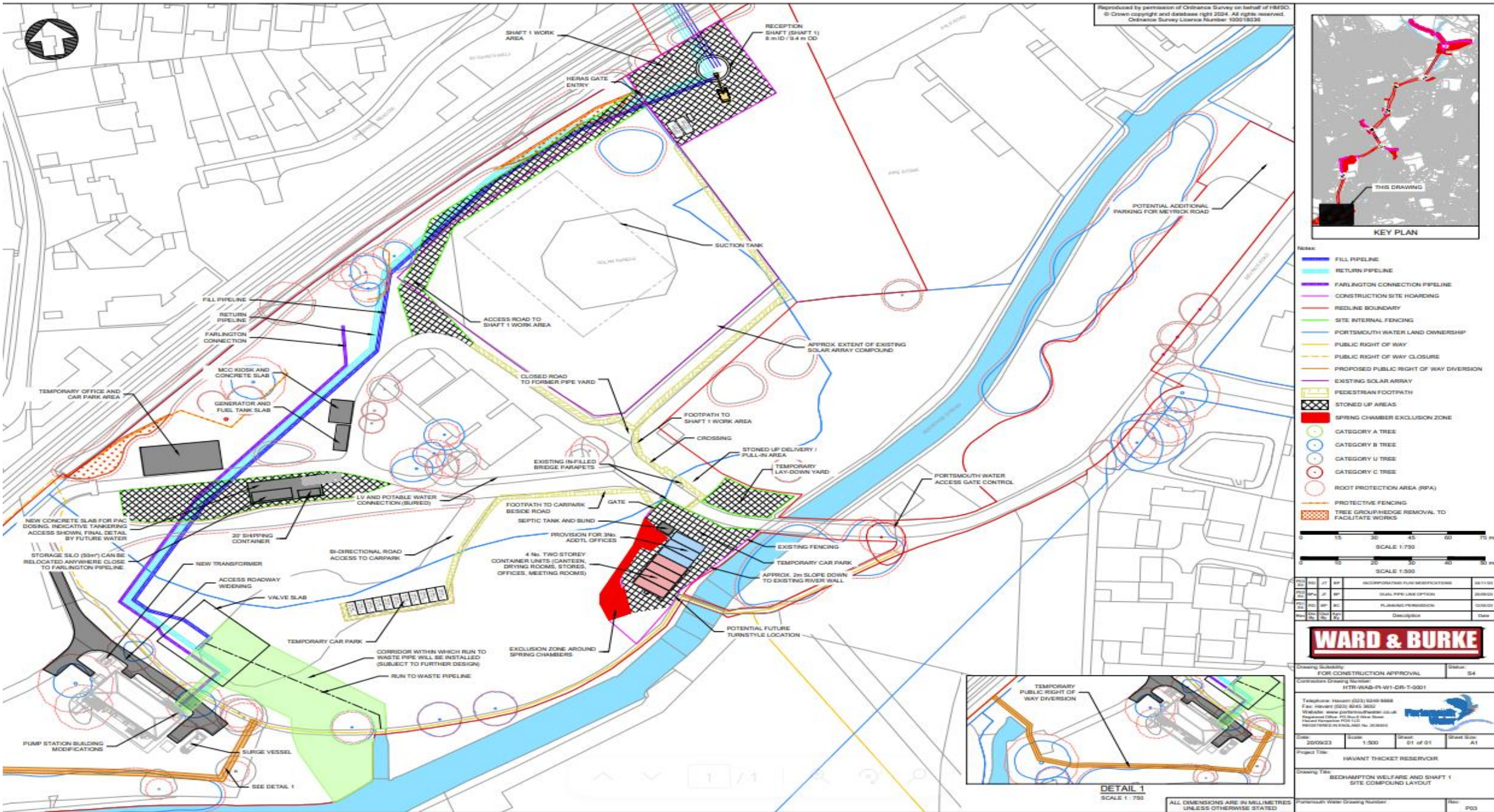
The following visual displays will be located at the site welfare unit.

- Hospital Route (*Queen Alexandra Hospital, Southwick Hill Road, Portsmouth PO6 3LY*)
- Emergency Plan (Location Drawing)
- First Aiders
- Emergency Procedures
- Incident Reporting Guide



Appendix

Appendix 1



Appendix 2





