

Havant Thicket Reservoir

Construction Method Statement (CMS)

Main Reservoir Works Phase 3

23/02/24 | v8.0

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Version Control Register

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Revisions

Section	Details
	Phasing references revised to suit new sequence
4	Progress of work updated
5	Details of B2149 junction works removed due to it being completed
5	Additional information added to description of work
5	Section added for temporary drainage and haul road construction
5	Section added for Wetlands Earth Embankment construction
5	Addition of the bridge
All	Updated all sections following review
4	Programme of works updated to reflect Phase 3
1	Introduction – Phase 2 Specific
6	Section added for planning
7	Section 7.4 added on On-Site Emergency Flood Plan

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1. Introduction

- a) This Construction Method Statement has been prepared by Future Water MJJV to support the phase 2 reserved matters planning applications at Havant Thicket Reservoir. Remaining Phases are included indicatively only and subject to change as Reserved Matters Phasing Progress.
- b) This document is required to discharge Condition 6 of the permissions. The requirements of Condition 6 and where within this document the requirements are addressed are set out in **Table 1** below.

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>	Sections 3,4 & 5
Reason: To ensure that the construction process is carried out in a manner which will minimise disturbance, pollution & nuisance to neighbouring properties	

- c) This document will remain a live document and will be updated for each phase of reserved matters applications & does not replace any safe system of work / RAMS prepared for site specific activity.
- d) The objective of the scheme is to provide a new resource to supply drinking water in the water-stressed Southeast of England, while maximising the community and environmental benefits of a new Raw Water reservoir. Similarly, one of the strategic drivers for the scheme is to ensure a positive contribution to local and internationally important habitats by supporting Government's objective to reduce the damaging abstraction of water from rivers.
- e) The reservoir, when constructed, will be filled with surplus water drawn from the springs at the Portsmouth Water pumping station at Bedhampton works when flows are at their highest in winter via a new combined inlet/outline pipeline, and will provide water supplies to Portsmouth Water customers in the summer months as required.
- f) This document is to be read in conjunction with the following phase specific documents:
 - Detailed Phasing Plan
 - Construction Noise & Vibration Management Plan
 - Construction Noise Assessment
 - Construction Traffic Management Plan
 - Construction Environmental Management Plan

- Archaeological Management Plan & Written Scheme of Investigation

2. Site Details

- The site is located to the north of Havant in Hampshire
- To the north, the site is bounded by forestry land owned by Forestry England
- To the east, the site is bounded by forestry land and the B2149
- To the south, the site is bounded by a mixture of amenity land (Staunton Country Park) and residential properties forming part of the Leigh Park estate.
- To the west, the site is bounded by further residential properties on Swanmore Road, and amenity land made up of heath and wooded land.

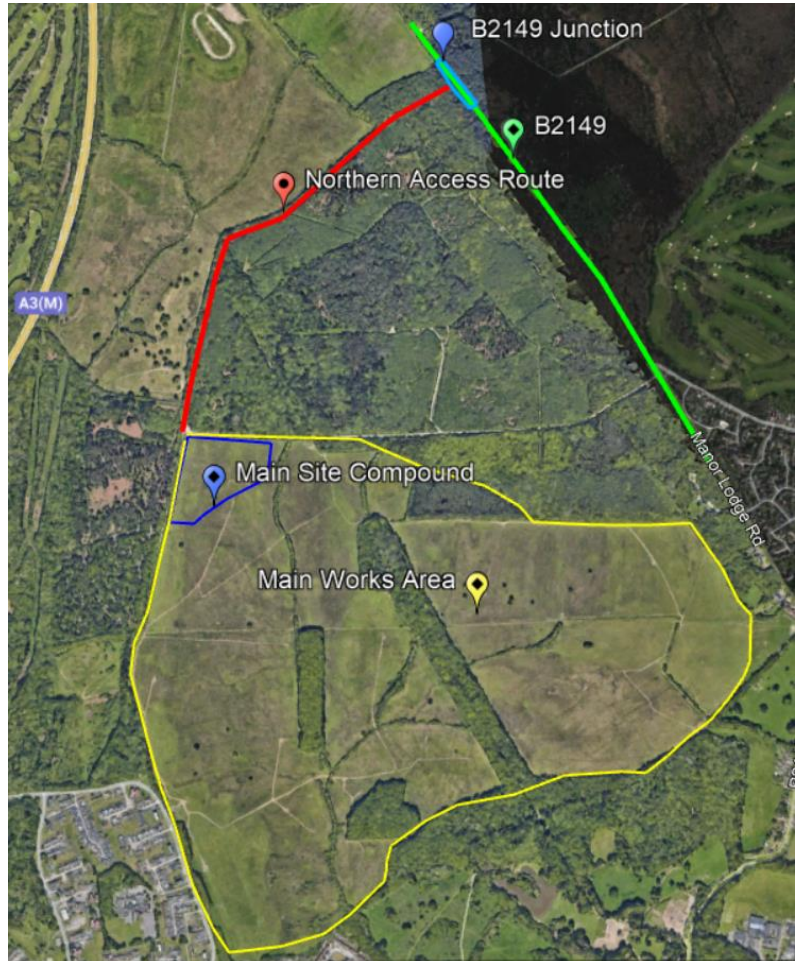


Fig. 1. Site location

3. Scope of Construction Activities

The scope of the works to be undertaken during the main reservoir construction phase is as follows:

- Construction of new junction off the B2149 including carriageway re-profiling
- Construction of new access road into the site from the new B2149 junction henceforth referred to as the Northern Access Route (NAR)
- Establishment of site compound in northwest corner of the site
- Construction of new earth embankments including cut-offs, main reservoir embankment and wetlands
- Construction of new control structures
- Installation of MEICA and associated fit out
- Construction of new access roads and footpaths

- Hard and soft landscaping
- Raising of existing Forestry England track & construction of 2nr new culverts

4. Programme and Sequence of Works

- Works to the B2149 junction commenced in August 2022 with the junction completed December 2022. Further details are available within the Construction Method Statement (CMS) – see appendix. All permits and permissions for the B2149 junction works here been granted by HCC Highways. **** NOTE works now complete.**
- Following the completion of the junction, construction then commenced on the NAR in March 2023. This formed Phase 1 of the works on Havant Thicket Reservoir. Works on the NAR are planned to be completed Feb 2024.
- With the NAR route complete, this provides access to the works area for the construction of the main project compound which will contain the project offices and storage areas.
- Construction works on the main reservoir site are expected to commence in 2023 with a 3-4 year programme of earthworks & civil works expected followed by a 3-year commissioning programme. During the commissioning period the site hard and soft landscaping will also be completed. The indicative construction programme for the MRW is presented below:

Timeline	Construction activities
2024	Wetlands Earthworks & structures Culvert Southern Access Road
2025	Main Embankment Earthworks Reservoir Pipe Culvert & Valve shaft Control House
2026	Main Embankment Earthworks Control House Hard Landscaping
2027	Main Embankment Earthworks
2028	Main Embankment Earthworks Hard Landscaping
2029	Wet Commissioning Hard Landscaping Soft Landscaping
2030	Wet Commissioning Soft Landscaping Forestry England track raising & culverts
2031	Wet Commissioning

5. Consents

- 5.1 **Consents Manager** will be appointed at the start of the project who will be responsible for ensuring all consents are in place for works due to commence. Consents required to commence include environmental and planning consents.

6. Planning

- 6.1 FW is responsible for securing the necessary planning approvals to ensure reservoir implementation under the Main Works contract. This includes necessary applications for Reserved Matters (RM) approval, and applications to secure the discharge of planning conditions attached to the existing Hybrid planning permission. FW is also responsible for securing any further consents required as a result of FW design changes, including Non Material Amendments (NMA), Section 73 (S73) applications for Minor Material Amendments, or new full planning applications.

7. Health and Safety Management

- 7.1 The Principal Contractor must be committed to promoting a positive safety culture. The Health and Safety of the local community and all personnel involved in the project is of the highest importance.
- 7.2 Specific risk assessments and supplementary method statements will be produced and developed, as appropriate, prior to the onset of the works. These will be produced and reviewed prior to works commencing. Any critical works involved with the main reservoir works will be subject to full review by the Construction Engineer.
- 7.3 An emergency response plan will be produced for the site which will detail what procedures to following the event of an emergency. This will also include any environmental emergencies. The emergency services will also be invited to site to see the site access and understand the procedures to follow if they need to attend site. All relevant authorities will be informed of any emergencies or incidents as required, including the Environment Agency.
- 7.4 An On-Site Emergency Flood Plan will be produced in line with government guidelines and planning condition 35 “Emergency Flood Plan shall be submitted to, and agreed in writing by, the Local Planning Authority. The development shall be carried out in accordance with the details approved.”.
- 7.5 A construction Phase Plan (CP) will be produced prior to works commencing detailing arrangements for controlling significant risk on site. Within the construction phase plan, it will provide the management structure and responsibilities of all personnel and staff on site.

7.6 A site Security and communication plan (HTR-FUW-ZZ-ZZ-PL-W-0507) will be produced detailing arrangements to ensure the site is secure from intruders which may cause any security or health & safety issues on site.

7.7 The site manager will be responsible for ensuring suitable controls are applied at all times. The site manager will liaise with the Planning Authority and Environment Agency during the works as necessary and will ensure that, in the unlikely event of any nuisance-related issues, they are dealt with effectively and promptly.

8. Welfare

8.1 All works will be constructed ensuring suitable welfare is provided at all times and in line with CDM regs 2015. Where construction of compound are in progress, mobile welfare units may be used in the short term. Welfare will include, as a minimum but not limited to;

- Drinking Water
- Male & female toilets
- Hot water
- Changing facilities
- Rest facilities with heating
- Canteens with facilities to heat food.
- Smoking areas
- Suitable parking areas

9. Access/Egress

9.1 **Traffic Management Plan** - All access for the main works will be via the Northern Access Route (NAR) as noted in section 2. A Traffic Management Plan (HTR-FUW-RZ-RE-HS-W-506) will be produced and issued for approval to the LPA. This will be issued to discharge condition 12. This will detail the access routes, procedures and timings for deliveries and staff traffic to site to minimise impact. Please refer to the Construction Traffic Management Plan for more details.

9.2 Oversize loads will be delivered to site under traffic order with the local authority. Deliveries will use the NAR at 45min intervals to prevent backlog of deliveries on to the B2149. The NAR has a nominal width restriction of 3.65m and an axle weight limit of 12t per axle. The tree canopy is 4.9m above road level, All deliveries and plant movements are to be booked through Wilson James Flulcrum booking system under the direction of the Logistics Manager.

10. Environmental

10.1 **Construction Environmental Method Statement** (HTR-RHD-P2-RE-PL-Z-018) - Prior to any works commencing a Construction Environmental Management Plan (CEMP) will be produced detailing all the relevant environmental issues on the project. This will be issued to the LPA under condition 5 of the hybrid planning permission 51680_001-Decision_Notice-1167843 and APP_20_00990-

DECISION_NOTICE-1539466. This will be a live document and will be updated as the project develops.

- 10.2 **Environmental Manager** – an environmental manager will be appointed at the start of the project who will be responsible for producing and updating the CEMP. They will be the point of contact for all environmental issues on site; ensure all works are carried out inline with the CEMP and commitments under the Record of Environmental Actions and Commitments (REAC).
- 10.3 **Ecological Clerk of Works (ECoW)** - Ecological Clerk of Works (ECoW) to be appointed, to be full time on site during site preparation and clearance and during any works in sensitive areas, and to undertake regular monitoring visits throughout construction programme.
- 10.4 **Toolbox Talk** – Toolbox talk will be issued throughout the work. A schedule of Toolbox talk will be listed in the CEMP. These will be provided during relevant works require and where the risk is higher during any specific seasons.
- 10.5 **Waste – Concrete Washout** – Concrete washout from deliveries will be disposed of using a silt-buster (or similar) concrete wash out skip. The washout skip will be used to wash down machinery, process and cutting or coring slurry and treat surface water run-off from concrete activities. The unit uses filtration and CO2 to process the dirty water and separate the solids from liquid waste. The solid waste is collected in bags and disposed of through licenced haulier and the treated water is then tested and either used in site processes or disposed of by licenced haulier.
- 10.6 **Environmental Checks prior to construction**
- **Birds** – Precautionary pre-clearance survey will be undertaken at areas of suitable habitat. Vegetation clearance in these areas will follow a Precautionary Method of Working (PMW). Any clearance completed inside the bird nesting season will follow the precautionary method of works and ensuring all bird nesting checks are completed by a qualified ecologist on site.
 - **Reptiles** - Clearance of suitable habitat will follow a Precautionary Method of Works. This is likely to include a combination of translocation and displacement of animals into enhanced adjacent retained habitat. The PMW will set out the season and method of clearance. This will include stage cutting of grassed areas prior to any stripping of grassland.
 - **Amphibians** – common amphibians encountered during site clearance will be moved to safe areas of retained habitat. An eDNA survey will be completed on upper lake to confirm no great crested newts.
Dormice - Vegetation clearance and tree felling methods to minimise risks to individual dormice will be followed as set out in the dormouse licence method statement.

- Bats – Mitigation will be provided for lighting during construction and operation. Any temporary lighting required during construction will be designed to minimise light spill. Permanent lighting will comprise hooded luminaires directed away from vegetation, particularly the boundary hedgerows and treelines to avoid any light spill onto retained vegetation. Lighting will follow good practice current at the time of detailed design. The new lighting will be task-related, associated with the visitor centre and associated car park and with no lighting on the access roads. The lux level will be as low as possible to meet their purpose safely and effectively.
- Noise – A Noise Impact Assessment (HTR-RHD-P2-RE-W-017) will be completed ahead of the construction works phase to confirm mitigation required. A Noise & Vibration Management Plan will also be produced and discussed with the Environmental Health Officers. Monitoring will take place 4 times a year or as new activities with potential for noise commence.
- Vibration – A noise & vibration Management Plan (HTR-RHD-P2-RE-W-017) which will state monitoring will only take place when there is a significant risk of vibration to receptors.
- Dust – a Dust Management Plan (HTR-FUW-P2-RE-PL-W-0517) will be produced detailing the control measures in place. This will include speed limits and dampening down of haul roads via water bowser. Water will be taken from settlement ponds on site.
- Silt/Water management – a temporary watercourse diversion will be installed with the inclusion of a minimum of two settlement ponds to allow water to settle prior to leaving site. This will also include the introduction of silt fencing, checks dams and other methods to slow down the water to allow settlement. A water quality management plan (HTR-FUW-P2-RE-EN-W-0014) will be produced which will include the monitoring regime of silt within the watercourse and use of flocculent where required. This will be discussed with the EA prior to use. All works will be in accordance with the CEMP
- Site Waste Management – a Site Waste Management Plan (HTR-FUW-P2-RE-RM-W-0008) will be produced for the site listing all activities producing waste. A Materials Management Plan (MMP) will also be produced detailing where all the material will be excavated from and used within the embankments.
- Fish – a Fish management Plan will be produced, and precautionary methods of works completed prior to any clearance. Ecologist will be on site during all clearance of existing ditches and any waterbodies. Where required a fish licence will be applied issued for any translocation.
- Refuelling – All plant and equipment will be refuelled in designated re-fuelling areas or via a tractor & bowser. All refuelling to be a minimum of 10m away from any watercourse. Refuelling to be completed by competent

and trained operators. Spill kits available at all refuelling areas. TBT and spill kit training will be provided prior to works commencing.

11. Archaeology

- 11.1 All works will be completed in line with the Archaeological Management Plan (HTR-ECU-RZ-ZZ-PL-X-0001) and Written Scheme of Investigation (HTR-ECU-RZ-ZZ-PL-X-0002). This will be reviewed and accepted by the county archaeologist ahead of any stripping works.

12. Quality

- 12.1 **Construction Engineer** – Prior to works commencing, all design, specifications, inspection & tests plan will be reviewed by the construction engineer.
- 12.2 **Inspection & Test Plan** -an inspection & test plan will be produced prior to works commencing. This will detail all relevant checks, inspections and testing required at different stages of the works. Quality assurance form will be created and reviewed by all parties. The ITP will outline the testing frequency and method of recording/storage of information and responsibility for checks, witnessing and inspection between all parties. The ITP will be agreed prior to works commencing.
- 12.3 **Checklists** – The ITP will identify how quality checks will be managed. For site construction activities, this will be predominantly via the use of inspection checklists. The checklists will be produced as works commence (as outlined in the Quality Plan) and the engineer will cross check elements of the work for testing or inspection as outlined in the ITP. These will be informed to the client as Hold-Points so that works can only progress once an item has been checked.
- 12.4 **Testing** – a site testing lab will be set up on site and certified by UKAS. This will enable earthwork materials testing to be completed on site. All labs and technicians will be trained and certified to UKAS standards.

13. Methodology

Phase 1 – Phase Discharged	
Activity	Construction of Northern Access Route (NAR)
Description	
New running surface to be constructed for construction traffic and then for use by visiting traffic when the reservoir is operational. The running surface is to be constructed from both sections of tarmac surfacing & stone surfacing underlain by Cellweb to provide protection to the existing tree root zones of adjacent trees. Works will commence at the northern end and will proceed southwards using small plant and completing the running surface as works progress. The NAR will be closed off in sections as works proceed using Heras fencing. Public access will be prohibited during construction and when the NAR becomes operational. A compound will be formed at the B2149 end of the NAR where plant, materials and welfare facilities will be delivered, stored and located. An archaeologist will monitor any excavation works in accordance with the frequencies set out in the approved Archaeological Management Plan / Written Scheme of Investigation (HTR-NA-WSI-1.3) Following the approved construction details, sub-base will be initially laid and compacted using a small sit on roller. The number of passes required will be in accordance with the Specification for Highway Works MCHW table 6/1. Where new surface water drainage is to be provided this will be installed below the formation level as required in accordance with the approved drawings. Edgings & bollards will be installed in accordance with the approved details. Geotextile will then be laid and secured. Cell web will then be overlain, secured and filled in accordance with the manufacturer's instructions. Another geotextile separating layer will then be placed before topping with type 3. Throughout the process the phase specific Inspection & Test plan will be followed to ensure that all works comply with the specification.	
Welfare Provision	Self-contained welfare units
Working Hours	0730-1800hrs
Plant & Equipment Employed	
Tracked excavators – varying in size from 3 to 13t	
6t cabbed swivel dumpers	
Road going tippers, grab lorries & concrete delivery vehicles (volumetric & drum)	

Smooth drum sit on roller

Activity	Establishment of Site Compounds (Enabling Works 2023)
Description	
Compound to be constructed by stripping topsoil & excavating sub-soil. During these processes, ecologists & archaeologists will supervise the works. Where there is a requirement for cut & fill, this will be completed New below ground ducts for services & drainage will be laid followed by sub-base material. Tarmac surfacing will then be laid in for the car park, access roads and unloading areas. Foundations will be formed for the project accommodation and utility connections prepared. The compound will be surrounded a 2m high chain-link fence and access will be controlled by a security officer and a facial recognition-controlled turnstile. A satellite compound will also be constructed in the centre of the site to facilitate some of the workforce. The double stacked accommodation units will be bought to site by articulated lorries and craned into place using a 120t crane. Utilities will then be connected, and the offices fitted out. The offices will be delivered to site under traffic order with the local authority. Deliveries will use the NAR at 45min intervals to prevent backlog of deliveries on to the B2149. The offices will be placed and unloaded by a 120t mobile crane located on the deigned crane pad, constructed within slew of the office foundations. The 120t crane has a transport weight of 60t (gross) and an axle weight of less than 12t per axle, in line with the design parameters of the NAR. Finally, line marking will be laid within the car park and trafficked areas.	
Welfare Provision	Anti-vandal units with generator & septic tanks
Plant & Equipment Employed	
Tracked excavators – varying in size from 3 to 30t	
6 & 9t cabbed swivel dumpers	
Road going tippers	
Grab lorries	
Concrete delivery vehicles	
Smooth drum sit on roller	
Rigid flat bed & articulated lorries	
120t mobile crane	

Road paver

Activity	Construction of temporary drainage system, access track & haul roads (Enabling Works 2023)
Description	
Prior to works beginning, the grass within the areas of work will be cut down in accordance with the agreed method contained within the CEMP under the supervision of a trained ecologist & the project ECOW. Topsoil & subsoil will then be stripped using a combination of excavators & bulldozers in accordance with the written scheme of investigation agreed with the County Archaeologist. Stripped material will be taken to stockpiles by articulated dump trucks (ADT`s). Temporary drainage ditches will then be excavated and shaped in accordance with the approved temporary drainage design along with any control structures and lagoons. Culverts will be installed as required to allow access across site. This will divert water around the works. When the embankment is constructed, water will be pumped and flumed through the culvert. This will be managed on site throughout the works. All excavated material will be hauled by ADT`s to stockpiles on site. Haul roads will be constructed in 2 ways. The first method will consist of the use of imported crushed stone laid and compacted in layers with geogrids to improve performance. The second method will consist of the placement and compaction of site won materials to create smooth & continuous haulage routes for vehicles such as ADT`s & tractors. The existing watercourses will be diverted around the works which will consist of excavating new channels and improving existing ditches. This will also include the installation of 2no settlement ponds where water will be treated prior to leaving site. Culvert crossing will be installed to allow construction traffic to pass around site. These will consist of concrete/plastic pipes within the ditch channel.	
Welfare Provision	Anti-vandal units with generator & septic tanks
Plant & Equipment Employed	
Tracked excavators – varying in size from 22 to 50t	
Road going tippers	
40t articulated dump trucks	
24t D65 dozers	
18t smooth & padfoot rollers	
Tractors & bowlers	

Phase 2	
Activity	Construction of Wetlands Earth Embankments & Control Structures
Description	
Material for the Wetlands Embankment will be won from site. Prior to works beginning, the grass within the areas of work will be cut down in accordance with the agreed method contained within the CEMP under the supervision of a trained ecologist & the project ECOW. Topsoil & subsoil will then be stripped using a combination of excavators & bulldozers in accordance with the written scheme of investigation agreed with the County Archaeologist. Stripped material will be taken to stockpiles by articulated dump trucks (ADT`s). Clay will be excavated from the borrow pits using excavators and loaded into articulated dump trucks. The clay will then be taken to the deposition point via haul roads and tipped. Once tipped, a bulldozer will push the clay out in layers before the clay is compacted using a roller. The excavators and dozers will be fitted with GPS guidance systems to ensure that the clay is placed to the correct thicknesses in the correct locations. The clay will then be compacted using vibrating rollers. This will ensure the clay is compacted to specification. Where required, water will be used to ensure the moisture content is within specification range and for dust suppression. The GPS is also used for trimming up the shoulders of the embankment to the correct gradients. This process is repeated until the required level is reached. Throughout the placement, in-situ and off-site testing will be undertaken to ensure that the specification for the works is adhered to. Control structures will be built within the embankment to maintain the required water levels in the area when the reservoir is operational. Where possible these will be constructed from pre-cast concrete elements to reduce the amount of assembly and construction on site. Elements will be delivered to the compound and taken to the workface by excavator & installed. Following completion of the embankment, topsoil will be placed on the embankment slopes and the access track on the top will be constructed in line with the approved drawings and details.	
Welfare Provision	Main project accommodation and satellite compounds
Plant & Equipment Employed	
Tracked excavators – varying in size from 8t to 50t	
40t articulated dump trucks	

9t cabbed dumpers
24t D65/D71 dozers
18t smooth & padfoot rollers
2t twin drum ride on roller
Tractors and bowser

Phase 3 – Phase to be discharged at later date	
Activity	Construction of Reservoir Earth Embankment
Description	
For the main embankment, clay will be excavated from the borrow pits using excavators and loaded into articulated dump trucks. The clay will then be taken to the deposition point via haul roads and tipped. Once tipped, a bulldozer will push the clay out in layers before the clay is compacted using a roller (padfoot). The excavators and dozers will be fitted with GPS guidance systems to ensure that the clay is placed to the correct thicknesses in the correct locations. All clays will be tested prior to use and during installation to ensure it is in line with the specification and inspection & test plan. A geotechnical engineer will also be on site during all works to ensure all works are in line with the specification. Toolbox talks and some training will be provided to all operatives prior to commencement providing them with information on the types of material on site and their intended use. Where there is ground improvement, this will be completed prior to any main embankment works (above ground). Within the ground improvement, the core will be constructed within it, forming the start of the core. Once above ground, the core and the shoulder will be constructed at the same time ensuring the embankment is brought up at the same time. The core will not be more than two layers. Where the clays need water adding, the Wirtgen or bulldozer will be used to break up the material. Water will then be added using a water bowser and then mixed together using the bulldozers. This will then be put into stockpile or completed on the working area and compacted to specification. Where the embankment has any drainage, the material will be imported and stored on site. Material will be tipped at the location with ADTS and placed using the excavators and bulldozers. Once placed to level, the smooth drum rollers will be used to compact the material to specification. All material will be tested when installed, in line with the approved Inspection & Test Plan. GPS on the plant will be used for trimming up of all zones of the embankment to the correct gradients and levels. Topsoil will then be placed on the batters once complete. This will protect the clays from the elements in between seasons. This process is repeated throughout the earthworks season and until the maximum amount of clay has been placed for the period worked. It is expected to take 3-4 earthworks seasons to complete all the embankments. An earthwork season is defined as March - September. Where possible, works will continue into October however this will be weather dependant. No earthworks will be completed during the winter season however there will be teams on site managing the water during the wet weather. This will include the dewatering and desilting of settlement ponds ensuring no silt pollution. Works will continue on site with the civil works during the winter period therefore there will still be a presence on site.	

Welfare Provision	Main project accommodation and satellite compounds
Plant & Equipment Employed	
Tracked excavators – varying in size from 21t to 70t	
40t articulated dump trucks	
Graders	
Soil Compactors	
24t D65/D71 dozers	
18t smooth & padfoot rollers	
Tractors and bowers	
Wirtgen soil mixer	
Pumps, settlement tanks and generators	

Activity	Construction of Reservoir Culvert
Description	
There are several new reinforced concrete control structures to be constructed as part of the scheme with the embankment culvert and valve tower being the most significant. To facilitate construction of the culvert and valve tower, a working platform will be constructed 20m wide through the culverts centre line, for the entire length of the structure; Circa 200m. The footprint of the platform will be excavated to 400-500mm below the bottom of concrete for the structure. This will allow for 350mm stone mattress to be installed and 50-75mm blinding to give the structure a level working base. Where the works area is below existing ground level, the sides of the excavation will be battered to a 45 degree angle by “benching” of the excavation sides. Excavated material will be retained on site for testing and re-use where possible. Stored materials will be utilised in line with materials management plan. Following initial ground preparation works being completed, the reinforced concrete structures will be created by following industry standard procedures – fix reinforcement, erect formwork, place concrete, allow to cure and strike formwork. Lattice boomed crawler cranes will be employed to lift materials, formwork & place concrete through the process with attendant excavator and concrete pumps assisting where required. Concrete will be delivered to the work face by road going drum mixer lorry, accessing the site via the NAR and then the on-site haul roads. Concrete will be discharged and then the vehicle washed out into a concrete wash-out system which captures the cement laden water and filters it for re-use. The cement slurry is separated from the water and is disposed of once hardened. Where below ground structures and pipework is required to be installed, proprietary excavation support systems will be employed. All shoring systems will be subject to Temporary Works approval and design and checking in line with the risk and check class of the temporary works solution. To install shoring, excavation will be marked out, permit to dig issued and excavation and installation progress as per manufactures/designers methodology – i.e. dig and push for sheets and frames, bulk dig and install for drag box, MH box. Once the pipework or structure is completed, the excavations are backfilled, and the support removed. As above these works are undertaken using tracked excavators and crawler cranes.	
Welfare Provision	Main project accommodation and satellite compounds
Plant & Equipment Employed	
Tracked excavators – varying in size from 8t to 21t	
9t cabbed swivel dumpers	
80t & 120t lattice boomed crawler cranes	

Various lifting equipment – chains, slings, skips, lifting beams
Boom concrete pump
Jet wash bowzers and concrete wash out units
Proprietary and timber formwork systems
Access scaffold and powered access (MEWPS)
Temporary excavation support systems – boxes, sheets and frames
Edge protection systems

Activity	Valve Tower
Description	
Following initial culvert construction, the valve tower will be created by following industry standard procedures – fix reinforcement, erect formwork, place concrete, allow to cure and remove formwork. Lattice boomed crawler cranes will be employed to lift materials, formwork & place concrete through the process with attendant excavator and concrete pumps assisting where required. Concrete will be delivered to the work face by road going drum mixer lorry, accessing the site via the NAR and then the on-site haul roads. Concrete will be discharged and then the vehicle washed out into a concrete wash-out system which captures the cement laden water and filters it for re-use. The cement slurry left behind is safely captured and is disposed of once hardened. Where below ground structures and pipework is required to be installed, proprietary excavation support systems will be employed to provide safe working conditions for the workforce. Once the pipework or structure is completed, the excavations are backfilled, and the support removed. As above these works are undertaken using tracked excavators and crawler cranes.	
Welfare Provision	Main project accommodation and satellite compounds
Plant & Equipment Employed	
Tracked excavators – varying in size from 8t to 21t	
9t cabbed swivel dumpers	
80t & 120t lattice boomed crawler cranes	
Various lifting equipment – chains, slings, skips, lifting beams	
Boom concrete pump	
Jet wash bowzers and concrete wash out units	
Proprietary and timber formwork systems	
Access scaffold and powered access (MEWPS)	
Temporary excavation support systems – boxes, sheets and frames	
Edge protection systems	

Phase 4 - Phase to be discharged at later date	
Activity	Southern Access Road
Description	
The southern access road (SAR) will be constructed out of tarmac. Works at the interface with Swanmore Road will require 278 agreement and traffic management for the duration of the works. It is proposed that the Eastbound carriageway, immediately adjacent the bell-mouth, is subject to lane control under 2 way lights. This arrangement is pending agreement from Highways, Local Authority and subject to booking. The ground along the footprint of the SAR will be stripped to formation level and prepared. Subbase will be placed and compacted before edgings or kerbs laid. A drainage ditch will be formed on the western edge of the SAR to carry surface water away from the road, this ditch will be connected via a small culvert to the swale located to the east of the SAR, linking to the temporary site drainage system and the embankment toe drainage. The drainage will be subject to OWC and Local Flood Authority approval. All work will be undertaken, working progressively along the route of the road, completing the works up until the point where final surface dressings are laid so as not to become damaged or contaminated. Small excavators and dumpers will be used to complete the works with materials being imported onto site via the NAR and distributed to the work face. Materials will be delivered to site using the NAR and distributed using the access tracks. Small telehandlers and dumpers will be used to convey materials to the work face being installed either by hand or by using small excavators. On completion of the construction works, white lining and signage will be installed as per the approved design. During construction of the NAR, all site deliveries and vehicles will use the Northern Access Road to access the site. Once in operation, the SAR will provide access to the pipeline contractors compound and will serve as emergency access should the need arise.	
Welfare Provision	Main project accommodation and satellite compounds
Plant & Equipment Employed	
Tracked excavators – varying in size from 3 to 13t	
6t cabbed swivel dumpers	
1t forward tipping dumpers	
Road going tippers and concrete delivery vehicles (volumetric & drum)	
Smooth drum sit on roller	
Plate compactor	
Hand tools	

Phase 5 - Phase to be discharged at later date

Activity	Control House
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Description

Prior to works commencing, the footprint of the control house and courtyard will be excavated to formation level and a granular sub-base, working platform constructed to give 5m clear space to the two sides. The rear wall, facing the embankment will have 0.5-1m clearance when constructed to allow for shuttering.

The Control house will be constructed on mass concrete strip foundations situated within virgin ground. The control house will be constructed on top of reinforced concrete culvert outlet chamber. That will be covered with access covers at floor level. These lower structures will be formed during excavation of the foundations before the floor slab and walls are cast

The superstructure will be formed of reinforced concrete walls, created by following industry standard procedures – fix reinforcement, erect formwork, place concrete, allow to cure and remove formwork.

The reinforced concrete roof slab, cast atop the structure walls using approved propping methodology – in line with temporary works design.

The control house courtyard will be flanked by RC retain walls to embankment level and finished with hard standing for maintenance vehicle access. These will be cast in-situ by first fixing steel reinforcement then fitting formwork shutters in sections to pour concrete. Concrete will be distributed using static pump. Concrete will be compacted by concrete finishers using 50mm pokers. Access for the finishers will be via scaffold tower or proprietary formwork platform – depending on formwork supplier.

During construction, the courtyard will be utilised for material laydown and storage, the hard standing will be constructed once the main structure is complete.

Lattice boomed crawler cranes will be employed to lift materials, formwork & place concrete through the process with attendant excavator and concrete pumps assisting where required.

Concrete will be delivered to the work face by road going drum mixer lorry, accessing the site via the NAR and then the on-site haul roads. Concrete will be discharged and then the vehicle washed out into a concrete wash-out system which captures the cement laden water and filters it for re-use. The cement slurry left behind is safely captured and is disposed of once hardened.

All excavated material will be segregated and stored on site for landscaping.

Where below ground structures and pipework is required to be installed, proprietary excavation support systems will be employed to provide safe working conditions for the workforce.

Once the pipework or structure is completed, the excavations are backfilled, and the support removed.

As above these works are undertaken using tracked excavators and crawler cranes.

Welfare Provision	Main project accommodation and satellite compounds
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Plant & Equipment Employed

Tracked excavators – varying in size from 8t to 21t

9t cabbed swivel dumpers

80t & 120t lattice boomed crawler cranes
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Various lifting equipment – chains, slings, skips, lifting beams
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Boom concrete pump

Jet wash bowzers and concrete wash out units
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Proprietary and timber formwork systems

Access scaffold and powered access (MEWPS)
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Temporary excavation support systems – boxes, sheets and frames

Edge protection systems

Activity	Reservoir – Duel Pipeline
Description	
The Reservoir Pipeline will be comprised of a fill and extraction pipe as a “duel pipeline”. Both pipes will terminate at Bedhampton at one end and the reservoir at the other. The Duel Pipeline will be constructed in two parts. The section between Bedhampton Pumping Station and the boundary of the main reservoir is to be completed as part of a separate scheme, delivered by Ward & Burke. The second section, within the Main Reservoir site, will be completed by Future Water. The duel pipeline within the Main Reservoir Site will carry the inlet pipe, from a reception pit 10m inside the site, along the south western edge of the main embankment, through the main embankment at high-level and into the main body of the reservoir. The inlet pipe will be buried, installed by open-cut excavation between the reception pit and the embankment. The pipe will be buried within the main reservoir using the same technique to the low water line. Open cut excavation will be carried out using tracked excavators opening a trench, 1-3m deep and 1.2-1.5m wide. Shoring will then be installed in line with the Temporary Works Design. Once shoring is installed, pipe bedding will be laid and then the pre-fabricated section of pipe. Process repeated until length is complete. The line and extent of the pipe will be excavated to formation between the location at the site boundary (red line) and its upstream end at the reservoir. The pipe will be installed in the excavated trench in appropriate prefabricated lengths with engineered pipe surround. The pipe will be backfilled, post installation and will be landscaped as part of the phase 6 works. Once installed, the pipe will be tested for its installed length pending commissioning.	
Welfare Provision	Main project accommodation and satellite compounds
Plant & Equipment Employed	
Tracked excavators – varying in size from 8t to 21t	
9t cabbed swivel dumpers	
Various lifting equipment – chains, slings, skips, lifting beams	
Telehandlers and forklift	
Lorry mounted crane	
Temporary excavation support systems – boxes, sheets and frames	
Edge protection systems	

Phase 6 - Phase to be discharged at later date	
Activity	Secondary Means of Access
Description	
Subject to option selection	
Welfare Provision	Main project accommodation and satellite compounds
Plant & Equipment Employed	

Phase 7 - Phase to be discharged at later date	
Activity	Spillway
Description	
Following construction of the main embankment, the spillway will be constructed of cast insitu, reinforced concrete: The footprint of the spillway will be trimmed to formation level with attendant long-reach excavator and the lines and levels checked by engineer. The spillway will be constructed on made ground that has been installed to rough level so that arisings are minimal. All excavated material to be retained on site for future use. Once formation is established, blinding will be poured to give stable, level working area for the concrete activities to commence. The spillway will be formed in 6-10m sections commencing from the highest point, working down the slope. The channel will be formed by casting the RC base and then the walls before re-using shutters to form the next section. The spillway will be constructed by following industry standard procedures – fix reinforcement, erect formwork, place concrete, allow to cure and remove formwork. Access to the slopes will be via Haki Stairs installed wither side of the spillway with scaffold working platforms at 5m intervals. Concrete will be distributed to forms using a 22m mobile boom pump that will reach the highest section of the pour. Once the sections have cured, the embankment will be reinstated to level, ready for soft landscaping.	
Welfare Provision	Main project accommodation and satellite compounds
Plant & Equipment Employed	
Tracked excavators – 22t long reach	
Boom Pump	
6t cabbed swivel dumpers	
Telehandler	
Road going tippers and concrete delivery vehicles (volumetric & drum)	
Smooth drum sit on roller	
Plate compactor	
Hand tools	

Phase 8 - Phase to be discharged at later date	
Activity	Hard & Soft Landscaping
Description	
Soft landscaping will be phased differently to the hard landscaping due to the specific planting timetable which will be dictated by the progress of the works up until that point. As above materials will be delivered using the NAR and then distributed to the workface. Due to the nature of the contract, full and final details of the landscaping are not yet developed but will be in due course. Hard landscaping consisting of fencing, walling and the Avenue staircase will be constructed following on from the earth embankment works and alongside the access tracks and footpaths. Materials will be delivered to site using the NAR and distributed using the access tracks. Small telehandlers and dumpers will be used to convey materials to the work face being installed either by hand or by using small excavators.	
Welfare Provision	Main project accommodation and satellite compounds
Plant & Equipment Employed	
Tracked excavators – varying in size from 3 to 13t	
6t cabbed swivel dumpers	
1t forward tipping dumpers	
Telehandler – including roto type	
Road going tippers and concrete delivery vehicles (volumetric & drum)	
Smooth drum sit on roller	
Plate compactor	
Hand tools	

Activity	Raising of FE CAT, A Track & Installation of New Culverts
Description	
The FE track will be required to be closed for the duration of the works. Access for the public, pedestrian and horse riders will be via the new access track to the south of the site for the duration of the phase 5 works. Trees will be felled & vegetation cleared to make way for the works, with the works being undertaken under the permissions already in place for the clearance of the main site. Vehicles making deliveries to the site for this phase of works will use the NAR and will unload as close as possible to the works. Prior to works starting, silt control measures will be installed downstream of the work site, within the existing watercourse channel, to ensure that silt is not mobilised during the works. Works will also be programme during the summer season, when the ditches are dry and to avoid the winter period. Excavations will be formed along the line of the existing watercourses and new pipes installed. New headwalls will then be formed around the pipes. The track level will be raised in accordance with the design using site won material from the adjacent borrow pits. The material will be excavated and hauled to the work are using articulated dump trucks. The haulage route will be confined to within the working area and there will be no interface with the public. The clay will be tipped at the work face and then spread using an excavator and compacted using a pad foot roller before testing to ensure the compaction has met the specification. Once the embankment has reached the design level vehicle restraints and fencing will be installed before the final surfacing layer.	
Welfare Provision	Anti-vandal units with generator & septic tanks located within the main site compound.
Plant & Equipment Employed	
Tracked excavators – varying in size from 8 to 22t	
9t cabbed swivel dumpers & 30t articulated dumpers	
Road going tippers, grab lorries & concrete delivery vehicles (volumetric & drum)	
Smooth drum & pad foot sit on rollers	
Articulated & rigid lorries for delivery of materials	

Post Reserve Matters Construction Phases	
Activity	Installation of MEICA and Associated Fit Out of Culvert
Description	
The draw off, filling pipework and associated systems will be located within the embankment culvert and tower. Materials and equipment will be delivered to the workforce from the compound using the on-site haul roads and will be stored in designated compounds before being distributed for installation. The pipework will be installed using small lifting gantries following completion of the structure along with cable containment systems for the various controls, lighting and power required. The valve tower will also require access stairs and platforms to be installed. These will also be installed using lifting gantries and powered access equipment. Once pipework and containment are completed, 2nd fix activities can commence including wiring, installation of control panels and finally testing before energisation and filling. The control structures will also require varying types of security fencing, gates, doors and barriers to be installed. Where practicable these will be installed as soon as they are available to provide additional levels of safety and security. Dry commissioning of the reservoir will only be commenced once all criteria within the project commissioning plan have been satisfied and signed off.	
Welfare Provision	Main project accommodation and satellite compounds
Plant & Equipment Employed	
Hiab equipped lorries	
Telehandler	
Spider cranes & lifting gantries	
Powered material handlers	
Powered access equipment (MEWPS)	
Temporary lighting and generators	
Access scaffold and temporary access stairs	

Appendix A – Site Plan