Mott MacDonald Bentley Limited

# Construction Method Statement

**HOOK WWTW**

**Growth Scheme**

**ON BEHALF OF DWR CYMRU WELSH WATER**

This document is intended to specifically outline our proposed method of construction and management structure for the proposed works at Hook Wastewater treatment works. A new treatment works is being constructed to replace the existing works, located off Pill Road.

The proposed scheme was granted planning approval by Pembrokeshire County Council subject to a number of conditions. One of these is submission of a Construction Plan for the works prior to start on site for PCC approval.

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# Construction Method Statement

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| MMB | Alliance Partner | MS | 001 |
| COMPANY | DEPARTMENT | TYPE | NUMBER |

| | |
|---|---|
| **PROJECT** | **Hook WwTW** |
| **PROJECT NUMBER** | NN28 |
| **CLIENT** | **Dwr Cymru Welsh Water** |
| **LOCATION** | **Hook WwTW, off Pill road, Hook, Pembrokeshire** |

**DOCUMENT REVISION & APPROVAL**

| Issue | Date | Prepared by | Internally Approved by / Date | Stakeholder Approval Date | Approval Code |
|---|---|---|---|---|---|
| P01 | 01/09/16 | J.O'Keefe | W Wormald<br>M Tyrell | | |
| P02 | 08/11/16 | J.O'Keefe<br>W Wormald | G Tucker | | |
| | | | | | |
| Approval Codes:- | | A – Accepted for construction<br>B – Accepted subject to comments. Incorporate and reissue prior to works commencing.<br>C – Not accepted. Resubmit for acceptance / incorporating comments. | | | |

# 1. Pre-Construction Phase

## 1.1 Construction Management Plan (CMP)

On award of contract our Project Manager will prepare a construction management plan, which will identify all of the major responsibilities and allocate them appropriately. The CMP will also identify required timescales for the design and construction activities.

## 1.2 Health, Safety and Environmental

The CMP will identify who is responsible for preparing the Construction management plan, ensuring that all of the pre-construction information is transferred into this document for use by the construction team. A Site Waste Management Plan (SWMP) will be prepared in readiness for the construction phase.

## 1.3 Logistics and Procurement

Our Project Manager will liaise with our procurement department to ensure that all long lead in materials and sub-contract services are procured appropriately. This will include extensive liaisons with the statutory authorities and the client to agree the full scope of works required for the service diversions necessary. Notices will be served to the relevant local and statutory authorities in readiness for the construction works, including environmental, highways and services.

## 1.4 Quality, Sustainability & Liaison

Our Project Manager will develop/implement and agree a test and inspection plan for the works with the design engineer and relevant overseeing organisations.

## 1.5 Design Development

Our Project Manager will liaise with our in house design team regarding a number of Value Engineering options with a view to streamlining the design for ease of construction. The relevant authorities will be consulted during this period and brought on board with any fundamental changes to the design to ensure a smooth and unhindered approval process.

## 1.6 Designed Utility Service Diversions

Our plan at this stage is that the identified major utility diversions will be undertaken prior to the start of the bulk earthworks. This will comprise of upgrading and permanently diverting the existing HV overhead Cable currently situated within the works from the nearby sub-station on Pill Road.

### 1.7 Un-designed Utility Service Diversions

The termination and diversion of utilities that have not been identified as part of the design have not been included for at this stage. If identified we would re-plan, design and include for these works. Detailed site investigations have been undertaken to minimise the risk of encountering previously unidentified services.

## 2. Mobilisation

### 2.1 Site Establishment

As illustrated on the contract programme, a date will be agreed with Dwr Cymru Welsh Water and relevant stakeholders for us to take possession of the site.

During the mobilisation period the site will be set up with all the facilities as required by the project specification and to satisfy all relevant legislation.

The main site operating times will be 08:00am – 18:00pm Monday to Friday and 09:00am to 13:00pm Saturday where required. Any works that fall outside of the above times will be agreed in advance with Pembrokeshire County Council.

### 2.2 Contractor's Compound

Our site accommodation will be erected within the adjacent field west of the treatment works. The accommodation will consist of offices, a canteen and all of the necessary welfare facilities.

## 2.3 Liaison

We believe our proposed method of working is compliant with the project specification and any statutory duties we have. However, during the Pre-Construction phase we will liaise with Dwr Cymru Welsh Water, Principal Designer and any other stakeholders regarding the site set up and overall site arrangements regarding security, safety, access, communication and construction works. We will use this period to agree and finalise our plans to take forward into the construction phase. We will agree the following:

- Name and appoint all CDM duty holders
- Induction procedures
- Our plan for access and egress to the works area
- Traffic & Pedestrian Management Proposals
- Emergency procedures
- Communication protocols
- Community notice board
- Programme
- Procurement
- Value Engineering options
- Discharge Consent and Marine license Requirements
- Extent of existing statutory services and scope of works for diversions
- Statutory Orders

## 2.4 Inspection

Once our arrangements are in place we would undertake a ‘walkthrough’ with Dwr Cymru Welsh Water and Pembrokeshire County Council to gain their approval if this is requested as part of the approval of this Construction Method Statement.

## 2.5 Utilities

During the mobilisation period arrangements will be made to gather all information available and to locate and physically mark all of the existing utilities. They will be clearly marked with pegs, markers and spray paint to assist in the avoidance of services whilst excavating.

## 2.6 Securing the Site

The existing treatment works site will be secured with the existing security fencing and gate. Where this needs to be removed for construction access then security will be maintained through the use of heras fencing. Any open excavations will also be fenced off during the works. All fencing panels will be suitably clipped and braced. Anti-Vandal panels may be used to cover clips where solid panels are used.
The fencing will be maintained by having daily inspections by the workforce to ensure it is still secure and suitably erected.

The site compound within the field adjacent to the works will have timber hoarding erected around the compound extents to provide visual screening from the residents of Pill Road.

All employees and visitors to the construction site will be required to sign in and will be directed to the site offices for meetings or for a site induction prior to undertaking any work.

## 2.7 Programme & Notice

The works have been considered in some detail to ensure no unplanned disruption is caused to the travelling public on the highway or any health and safety risks are posed to the public, operatives, staff, or visitors.

A detailed construction programme for the execution of the works has been agreed and has been submitted to Dwr Cymru Welsh Water for approval.

Particular consideration will be given to adequate design periods as required under the new CDM regulations and statutory periods required for approvals of temporary traffic orders.

## 2.8 Permit to Work

Prior to commencing works on the Hook waste water treatment works the site supervisor will ensure that we fully comply with the MMB permit to work system. He/she will issue any permits to the site teams and brief them all on the works to be carried out in that shift.

## 2.9 Minimising Dust and Dirt

It is inevitable that some dust will be created when carrying out the works. To limit the effect of this will have on the surrounding environment we will implement dust suppression measures as necessary. This will take the form of:

- Water bowser's / sprayers to dampen down the dust.
- Regular cleaning of carriageways using road sweepers to prevent the build up of dust and dirt.
- Manned wheel wash positions to wash down wagons prior to them exiting the site onto the public highway.
- Using dust suppressed tools i.e., road saws / disc cutters.
- Erecting dust screens where there may be a concentration of dust being produced.

## 2.10 Minimising Noise Emissions

Outside of the working hours stated previously the site will be operated to ensure noise levels do not disturb nearby residents and will be below the 55dB level stated in the planning application conditions. Temporary treatment units and site compound cabins will be operated from a temporary electrical power supply, avoiding the need for generators.
While the temporary treatment units have mechanical plant, the plant that is of concern is located within noise attenuation kiosks to attenuate emissions.
While the temporary treatment plant is operational regular background noise levels will be taken at the boundary of the nearest residential receptors to ensure continued compliance with the planning condition.

## 2.11 Controlling Surface Water and Dewatering

Prior to starting the bulk earthworks a bund or cut off ditches will be constructed along the south perimeter of the working areas to prevent site surface water from running into Nash lake stream and then into the Cleddau Ddu during times of bad weather.

During the bulk earthworks a sump will be constructed at one end of the dig where the groundwater will be pumped through a lamella clarifier (which will be situated within the adjacent field) to settle any solids, before the groundwater is then discharged in a controlled manner onto a bunded area within the field where it will find its way back into the Nash Lake stream. As a secondary precaution straw bails will be placed around the discharge point to provide further protection. All surface water run-off will be re-directed into the main sump within the bulk excavation.

Once the bulk excavation has been completed down to formation level a de-watering well will be constructed to control the ground water throughout the construction phase where it will be pumped through the treatment process as mentioned above.

The site dewatering will be constructed in accordance with NRW agreement and approval of the dewatering method. Should NRW agree a different dewatering method then the Construction method statement will be revised detailing the approved method.

## 3. Traffic Management

All traffic management will be designed in accordance with the requirements of chapter 8 and the plans will be submitted to the local highways department for approval prior to any works commencing.

All large deliveries will be co-ordinated in advance with the Local Authority Highways department and any notices submitted. Local residents will be informed in advance of any large deliveries, particularly the pre-cast concrete units, through use of a publicly displayed notice board on Pill Road.

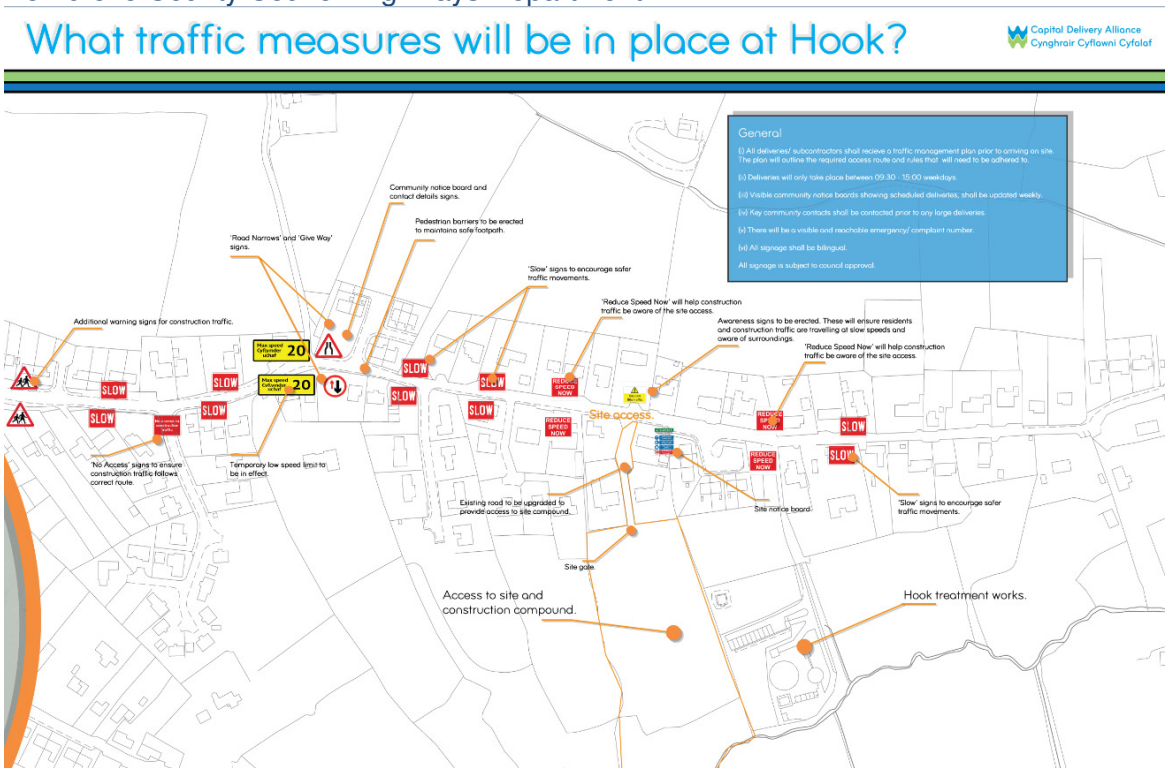
The following table summarises the anticipated vehicle movements during construction;

| Activity | Approx. start date | Frequency/Duration | Vehicle size | Comments |
|---|---|---|---|---|
| **General Plant deliveries i.e. excavators under 10t, rollers, dumpers 9t and below** | N/A | Once every 2-3 months | Low Loader | Delivery to be arranged outside of peak traffic hours |
| **Large plant deliveries i.e. Articulated Dump trucks, Excavators above 10t** | 30/01/2017 | 3-4 week hire on site | Low Loader (44t) | Plant hire company to carry out site visit prior to delivery. Highways Authority to be contacted prior to delivery |
| **Welfare delivery** | 15/11/16 | Long hire duration. Collection Summer 2017 | Flat bed vehicle plus trailer attachment | |
| **General material deliveries i.e. builders merchants** | N/A | Weekly/Fortnightly | 7.5t ridged wagon | |
| **Concrete pour to structures** | 10/11/16 – Summer 2017 | Throughout scheme. Large concrete pours to be carried out Mid Feb 2017-March 2017 therefor construction traffic will increase | 6-8 wheeled concrete wagon | |
| **Precast Concrete unit delivery** | 27/03/2017 | 7 weeks | Articulated vehicle carrying precast wall units (44t) | Supplier to carry out site visit prior to delivery. JNB to liaise with Highways |
| **Ductile Iron pipework delivery** | 15/01/2017 | 1 week | Flatbed vehicle | |
| **Muck away** | 30/01/17 | 2-3 weeks | 8 wheeled muck away wagons | |
| **Aggregate delivery** | 24/10/16 | 3-4 weeks/ infrequent throughout 2017 | 8 wheeled wagon | |
| **Mobile Cranes** | 22/11/16 | Daily/infrequent | 80t crane | |
| **Crawler Crane** | 24/02/17 | 4-6 weeks | 100t | Slave crane required to erect crawler crane i.e. 50t mobile crane. Crane to be erected on site |
| **Cleaning of highway** | N/A | Throughout the scheme | Road Sweeper | |

All traffic signage will comply with the requirements of the chapter 8 manual and any other relevant statutory requirements. Suitable signage will also be erected to direct pedestrians, deliveries and site traffic and also warn/inform the general public travelling both by foot and vehicle and to highlight any designated routes and dangers that may be encountered near the works access. All signs will be bi-lingual.

To ensure the effective operation of our site access arrangements we would ensure that all of our suppliers and workforce were fully briefed in a formal manner. Briefing notes covering the traffic management arrangements and particular areas of concern (for example the speed restrictions through Hook village, school location, and areas with poor visibility/narrow access) will be issued with any orders to our suppliers to inform them prior to visiting site. We would also incorporate information on these arrangements into the site induction given to all visitors and operatives.

Below is the proposed traffic management arrangement, which has been approved by Pembroke County Council Highways Department:




(Proposed TM at Pill Road)

## 4. Provision of emergency services

Prior to commencement on site the main emergency services will be contacted in writing, to inform them of the forthcoming work. This will inform them of the location, duration and any restrictions which will be in place.

## 5. Site set-up and deliveries

The site will be set up within the agreed compound area (field adjacent to Hook treatment works). This area will predominantly contain the offices and welfare cabins for the contractors workforce and parking facilities. This area will also provide a secure location for the delivery and storage of plant, equipment and materials.

The delivery of the construction plant and materials to the site compound will assist in ensuring the proper procedures are adhered to, for the loading and unloading of the plant and materials prior to being distributed onto site. The site supervisor will endeavour to ensure deliveries to site are received during off peak hours. Pembrokeshire County Council Highways department will be contacted in advance during the time and date(s) of the pre-cast concrete panels.

Material Suppliers are to provide COSHH information, instructions for use etc. as appropriate. Materials suppliers are also to provide method statements for lifting & delivery and proof of competence of drivers for specific loads as required. COSHH data is to be filed on site.
Plant & Machinery suppliers are to provide proof of competence of drivers as required.
Certification for Plant & Machinery and all associated lifting equipment will be provided on delivery, and all Certificates will be filed in the site H&S Plan on site

Deliveries will be co-ordinated with our supply chain so that any deliveries to site via Pill Road will be received outside of peak traffic flows avoiding school start and pick up times. It is envisaged that during the civil construction period there will be an increase in traffic flows to and from the site. This will consist mainly of concrete wagons and flatbed lorries (delivering items of plant, reinforcement and formwork). The pre-cast concrete wall units will be delivered once the base structures have been constructed. It is envisaged that the pre-cast wall units will be delivered via flat bed vehicles and a crane will be required to off load the wall units and place them into position. No delivery vehicles will park out on the main carriageway to prevent disruption to general road users along Pill Road.

## 6. Site Clearance

Major plant items will be mobilised to site including excavators and dumpers. All plant will have the annual inspection certificate and weekly inspections will be carried out.

Site clearance works will consist of removing 2 no. 10m wide access points within the existing tree line separating Hook waste water treatment works and the adjacent field. These works will be discussed with NRW and the works carried out under the supervision of an MMB Ecologist. Where trees have impacted the works area JN Bentley will initially carry out a surface strip where the topsoil will be stripped and stored suitably for reuse later. JN Bentley envisage that no material is to be disposed of off- site, however should material need to be removed from site then all materials will receive a WAC test prior to disposal/re-use on site.

The effects of dust and noise will be continually monitored ensuring the planning conditions are stringently met and the appropriate control measures implemented wherever necessary. It may be necessary to use hosepipes, water or screens to negate the presence of dust and to change equipment or alter the timings of works to avoid noise disturbance.

## 7. Installation of Access Track

A permanent access track will be constructed off Pill road between the two adjacent properties and through the adjacent field to provide a new access route to the works and also the temporary site compound. Details for the access track off the highway to the field boundary will be submitted to Pembrokeshire County Council highways department for approval. This part of the access track will consist of a flexible road construction finished with macadam. Prior to the works starting the local residents will be contacted and the working method discussed. Within the field an excavator will strip the topsoil and place to one-side for re-use later, edging timber/slabs will be installed and a geotextile membrane placed along the foundation level. The sub-base material will be delivered to site and spread along the proposed access road route via the excavator. The sub-base material will be compacted in layers using a roller to the correct design depth. The wearing course will then be installed (macadam for the upper section joining Pill Road, and stone-infilled geocellular units for the track through the field).

## 8. Installation of Temporary Treatment

In order to construct the new waste water treatment works the existing filter beds must be demolished to enable safe construction of the new SBR tanks. A temporary treatment process will be constructed prior to demolition of the existing filter beds. The temporary treatment will consist of the construction of concrete/stoned bases to house the temporary treatment tanks along with the construction of a temporary pumping station, which will be constructed from pre-cast concrete manhole rings, with flexible armoured hoses used to connect the temporary treatment process. JN Bentley process engineers will be involved in setting up and maintaining the temporary treatment process during the construction period.

A crane will be used to lift the temporary tanks into position, which will need to access the site along Pill Road and use the existing site access road.

## 9. Demolition Works and Earthworks

Once the temporary treatment process has been installed and samples taken ensuring the process is meeting the NRW discharge consent then the existing filter beds and sludge holding tanks can be demolished. All services to the structures will be isolated and a 20t excavator will demolish these in a controlled manner ensuring the media is removed prior to demolition of the structures. The filter bed media will be washed/screened and offered back to DCWW for re-use on another treatment works via consultation with NRW. All materials will be segregated and re-used on site where applicable. Material that cannot be used on site will be removed from site via a licenced waste carrier. The 20t excavator fitted with a hydraulic breaker will demolish the existing concrete bases, and all concrete will be stockpiled on site to be crushed at a later date. Crushed concrete will then be used to backfill excavations during construction of the permanent works.

The earthworks at the SBR tank locations will be carried out by a 20ton excavator(s) and the material transported to the adjacent field via A25 articulated dumpers. The site engineer will set out the extent of the earthworks within the waste water treatment works and the excavator will carry out the bulk earthworks down to formation level. The excavated material will be loaded into the A25 dump trucks and transported to the agreed stockpile area (within the adjacent field) where another 20t excavator will form a bund and ensure the bund is sealed as the earthworks progress. The Southern/West batter will need additional temporary works via soil nailing to secure the batter safely due to the fact that the tree line cannot be removed apart from the 2 no 10m access paths. The remaining batters will be battered back at a 1:2 gradient. Wagons or dumpers exiting the site onto the public highway will exit via manned wheel wash positions, to wash down the wagons and prevent dirt and muck being taken onto the public highway. This facility will be maintained until a clean running surface is achieved and the risk of muck being taken onto the public highway has diminished.

## 10. Construction of SBR Base and Walls

Once the bulk excavation works has been carried out to formation level and safe access has been installed, the site engineer will mark out the extent of the tank base within the excavation. Blinding concrete will be placed into position via a concrete pump and the engineer will check to ensure level is installed correctly. Shutters will be installed around the perimeter of the base and strutted securely. An anti-floatation concrete plug will then be poured via a concrete pump in 4 sections due to the size of the base. SBR base steel will be fixed into position (on top of the anti-floatation concrete plug) and shutters will be installed ensuring the correct cover is provided to the reinforcement. Once the pre concrete pour check has been signed off the RC SBR slab will then be poured via a concrete pump. Concrete wagons will wash out back at the concrete batching plant, however on the occasions where the wagons need to wash out on site a skip will be lined and situated at least 10m away from the watercourse and the concrete wagon will wash out within the skip. Once the concrete washout has solidified in the skip it will then be removed and loaded into a muck away wagon to be disposed of off-site.

Once the base has been poured the shutters will be striped and the base allowed the correct curing time. A crawler crane will be delivered to site and the boom will be fitted to the crane on site. The crane operator will track the crane onto the SBR slab, where the panels will be off-loaded from flat bed lorries via the access road adjacent to the bulk excavation and placed into position. JN Bentley operatives will then fix the PCC wall units into position as per the manufacturers guidelines. Once the wall units have been installed temporary props will be installed as per manufacturers guidelines to allow the perimeter walls to be backfilled. Panel will be left out at the south west corner of the tanks to allow access for the removal of the crawler crane.
Once the crawler crane has been removed from within the tanks the crawler crane will be dismantled and de-mobilised from site. The remaining panels will be installed via a mobile crane.

## 11. Road Sub-Formation

The capping and sub-base layers for access roadways within the site boundary will be installed following the earthworks. This will ensure that the formation is left exposed for the minimum amount of time. The relevant testing (including CBRs) will be carried out on the formation if required to ensure compliance with the specification. Material will be compacted in accordance with the specification with a 120 roller. Material will be delivered via 8 wheel tipper lorry gaining access via the dedicated access and egress points. Any reversing vehicles will be accompanied by a banksman.

## 12. Kerbs and Edgings

The kerbs and edging will be installed by suitable means avoiding any risk of Muscular Skeletal Injuries. Lines and levels will be set by our engineer and the installation team will ensure that the new kerbs tie in sweetly to the existing kerbs where these are retained.

## 13. Surfacing

The surfacing will be carried out by our specialist surfacing contractor. They will provide the necessary resource to achieve the programme and outputs proposed. The surfacing contractor will also carry out any breaking out or cold milling operations. These will be carried out as late as possible and in principle immediately before the new surfacing is laid. This will avoid any contamination of the existing surfaces to ensure the best adhesion of the new surface is achieved and to reduce the possibility of any defects.

## 14. Sludge Tank and Sludge Thickener Installation

RC bases will be cast as per the design detail dimensions. The sludge tank and sludge thickener will be installed via specialist sub-contractors. The sludge tank will be fabricated off site and constructed on site.

## 15. Pipework

All pipework will be installed by trained and competent operatives and will be constructed ad per the DCWW specification. All pipework will installed will receive a pressure test prior to final commissioning.

## 16. Commissioning & Handover

Our site supervisor will take responsibility for ensuring that all parties are notified in accordance with the specification of the commissioning and inspection periods. We will complete our works and vacate all areas as required by the Project Manager.

Only when the new Hook WwTW is fully commissioned and operational will flows be transferred from Johnston via the new pipeline (constructed separately under another project).

## 17. General Method Statements and Risk Assessments

There will be numerous Specific Method Statements and Risk Assessments that will have to be carried out through the course of the project. The following risk assessments are some of the key risks that will need to be specifically addressed:

**17.1 Concreting**

**17.2 Manual handling**

**17.3 Hand arm vibration assessment (HAVS)**

**17.4 COSHH assessment for concrete**

**17.5 Site Set up**

**17.6 Working around live services**

**17.7 Traffic management**

**17.8 Construction of access road**

**17.9 Installation of temporary treatment process**

**17.10 Leptospirosis**

**17.11 Bulk excavation works**

**Note: The above RAMS can be found within the on-site Health and Safety folder.**