

Technical Submission and Methodology for Band 2 Marine Licence

Project Title: Dovey Junction Viaduct No.1 D&C

Client: Network Rail Infrastructure Ltd

Site: DJP 79m 16ch.



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1.0 Scope of Work

Dovey Junction Viaduct is located on the Dovey Junction to Pwllheli line (DJP) over the River Dovey approximately 5 miles south-west of Machynlleth.

The single-track structure comprises of

- 17no. timber spans
- 17no. timber trestles
- 4no. steel spans
- 5no. cast-iron trestles;

Timber trestles no1 and no 22 are 'combined' trestle & abutment arrangements.

The timber decks comprise of 4no. main beams, one under each longitudinal timber & rail and one at either edge of the deck. The main beams each bear onto a timber 'corbel' at both ends, each supported on a timber crosshead member which, in turn, are supported on the timber trestles; spans no5 & no10 bear onto the cast-iron trestles. Transverse timber decking spans across the main beams.

The steel decks comprise of 2no. transverse-braced stiffened main beams, one under each rail, and steel cross-girders. The main beams bear onto cast-iron crosshead members supported on cast-iron twin-trestles. Timber decking spans longitudinally across the cross-girders.

The timber substructure consists of the timber crossheads on timber piles with timber diagonal bracing and timber lower-level wailings - the pile format is generally of 4no. pile/columns, however some have 'twin' outer piles and some have an additional 2no. outrigger piles. The piles are braced with 2no timber diagonals and 2no. low-level timber wailings,

The cast-iron substructure comprise of twin-trestles (3no. of) and single-trestles (2no. of) of 4no or 6no. circular columns supporting cast-iron crossheads (two or one, respectively) with the columns, in turn, supported on a low-level cross-member which is itself supported on 4no. or 6no. circular stub piles or stools. The main beams bear onto cast-iron bearing blocks except for trestle no10 where they bear directly onto the crosshead. All trestles have bracing ties between the middle two columns of each row and trestles no7 & no8 are braced across the outer columns of each row.

This document will deal with the construction of the following

- ✓ 19 No piles replace
- ✓ 11 No lower horizontal wailings replaced
- ✓ 19 No Diagonal wailings replaced
- ✓ All associated metallic fixings and straps replaced
- ✓ Capacity and condition led steel work repairs top metallic spans
- ✓ Full grit blast to SA2.5 and apply paint system to achieve a 25-year design life.

The repair strategy will be as follows

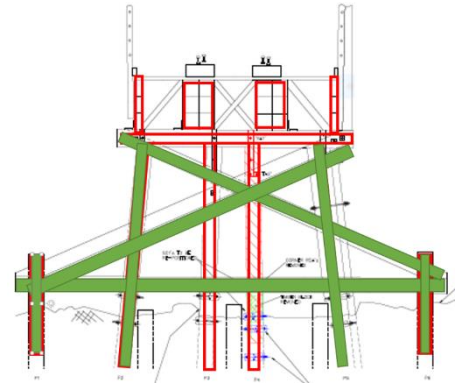
- ▶ Accessing site predominantly from High Mileage area
- ▶ Carry out Scaffold installation to full structure ahead of abnormal possession
- ▶ Replace horizontal and diagonal wailings under live load ahead of possession
- ▶ Prep steelwork ahead of abnormal possession

1.1 Proposed timber replacement strategy

As a general rule, the opposite illustration shows what timber elements can be changed in different circumstances. The temporary works requirements will be covered later in the document.

Green: - Horizontal and diagonal wallings can be changed in a 1 in 1 out process with trains running. These works are dependent on tide only.

Red: - Main rail beams. Piles and bearers to be changed in abnormal only. Temporary works will be installed during normal working days. There is potential that some piles could be change with normal working, subject to temporary works design



Our approach to the phasing and deliver of these works is based on our previous experience of undertaking the same scope of smaller sections of the bridge. We have successfully deployed the methods we have outlined previously, undertaking the exact same repair and replacement of timber elements.

We have experience of dealing with the tidal nature of the location and are well aware of the risks involved in working at this coastal location.

We have developed our approach to the project by learning from this previous experience and enhancing our approach and methods. This will de-risk the programme and provide delivery certainty.

2.0 Pre-Construction Stage and Preliminary / Advance Works

2.1 Pre-start Investigations & Surveys

During the pre-construction period for the scheme, the project team will visit the worksite to carry out further site inspections and initial appraisals to establish any constraints that may affect the works such as the nature of the site topographical conditions, ground condition, access (time of year dependant), local conditions; road widths, turning circles, weight and height restrictions that are likely to affect the execution of the works, the extent of any existing services and the condition of the existing infrastructure. At this time the site team will take the pre-start condition photographs to record site conditions.

The project specific surveys that will be undertaken are listed below

- ▶ Topographical survey
- ▶ Detailed examination of the existing structure – confirming the dimensions provided in the model
- ▶ Paint testing and sampling from the existing structure
- ▶ Under Water Inspection
- ▶ Compound area inspections
- ▶ Services review and correlation of services information

Details of site logistics and welfare/compound areas have been included under Section 4.0.

2.2 Site Survey

AmcoGiffen will develop and will undertake all relevant site surveys to complete the works. All third party access to be provided by Network Rail.

These include:

- ▶ **General Site Walkover/Familiarisation Surveys:** Undertaken by the key design discipline Engineers, the walkover survey will provide a general understanding of the locality and site constraints.
- ▶ **Structural Bridge Survey**
- ▶ **Underwater Survey**
- ▶ **Paint Testing**
- ▶ **Topographical Surveys**
- ▶ **Ecological Surveys**

2.3 Environmental Site Walkover

AmcoGiffen will undertake an environmental site assessment survey to record any environmental features of note throughout the survey area that could impact upon the works or be directly affected by the proposals area. These may include (but not be limited to):

- ▶ Proximity of Sensitive Residential Receptors (identification of outlook from properties, windows present, gardens etc. where impacts likely),
- ▶ Proximity of Sensitive Non Residential Receptors (identification of businesses, community facilities etc. where impacts likely),
- ▶ Evidence of Impacts on 3rd parties through disturbance, installation of infrastructure, impacts of vegetation clearance (also identify areas of encroachment),
- ▶ Areas of existing waste/material stockpiling, e.g. piles of sleepers, rail, etc.,
- ▶ Sources of contamination (rail based oils/lubricants, fly tipping etc.),
- ▶ Water resources (rivers, streams, canals, ponds, drainage ditches, culverts) that could be affected by site activities,
- ▶ Any other features/constraints of note – supported by photographic and reported evidence.

These features will be incorporated into the projects DESMP and Environmental Risk Assessment and will also inform the consents management team of all permissions/consents required as a result of the proposed works.

2.4 Temporary Works

Temporary Works will be carried out and managed in accordance with BS5975. Anticipated items will include but are not limited to:

- ▶ 001 Heras Fence (Compound Perimeter Fencing)
- ▶ 002 Compound backfill and drainage
- ▶ 003 Scaffold access during deck works
- ▶ 004 Pontoon Access to structure and across river
- ▶ 005 Lifting plans for RRV
- ▶ 006 Main beam ties
- ▶ 007 Pile propping
- ▶ 008 Use of block and tackle to replace piles and wallings
- ▶ 009 RRV assessment for working on structure

2.5 Stakeholder Management

A number of key stakeholders have been identified with interests in the scheme, listed below:

- ▶ Local landowners
- ▶ Local Authority
- ▶ Natural Resources Wales
- ▶ Network Rail – Track maintainer

Our Project Manager will be the dedicated point of contact throughout the project, supported by our Sustainability Advisor and Site Agent as required.

Given the diverse range of stakeholders and their differing interests, specific dialogue will be had with each of the above in a structured and planned way to share further information on the project, understand any issues and clarify mutual expectations throughout the life of the project.

2.6 Environmental Considerations

At Dovey Junction there are 5 environmental designations adjacent and within the site (SSSI, SAC, SPA, NNR, Ramsar). The site is within a high risk flood zone (zone 3).

The river Dyfi runs through the site and is a main river, it is also tidal up until the viaduct, and the work scope involves the use of pontoons in the water.

A detailed review of all data and reports made available, along with desk based searches using web resources to identify key designations and environmental features that could impact on or be impacted by the proposed works will be undertaken. An Environmental Management Plan (EMP) for the design phase will provide the framework whereby environmental issues will be addressed through the design process and will form the basis of the subsequent Construction Environmental Management Plan, which will be implemented during construction.

A Preliminary Ecological Appraisal (PEA) survey will be undertaken at the structure / site prior to the commencement of work on site. A biodiversity calculation will also be undertaken. The inspection will include any temporary works areas (e.g., access and storage) as part of the survey scope.

Should the PEA inform that any additional survey will be required, these surveys will be undertaken by our specialist ecologist and the recommendations and actions following made within the project reporting will be in keeping with legal requirements, CIEEM (Chartered Institute of Ecology and Environmental Management) code of practice, BS 42020:2013, Biodiversity – Code of practice for planning and development and CIRIA C587, Working with Wildlife, compliance and beyond in construction.

The environmental issues identified and controls to be applied will be briefed out to all staff involved in the design and construction of the project. Any particular controls or restrictions on planned works will be documented along with implementation of exclusion zones and signage if appropriate. Any invasive species identified on site will be managed in accordance with best practice and returned to the area identified. No material containing invasive species will be removed from site.

The working documentation will detail specific arrangements and controls around environmental issues. We will aim to act in an environmentally responsible manner and conserve and enhance the environment.

Ongoing communication of environmental performance and requirements shall be provided to staff, direct and subcontracted employees, appropriate to their roles and responsibilities. Site inductions and task briefings and tool box talks will be utilised to ensure a high level of awareness of project specific issues and controls.

3.0 Construction Stage

3.1 Construction Sequence including Access Strategy

3.1.1 Access Strategy and Enabling works

Access Establishment & Site Compound.

The office and associated welfare facilities are proposed to be situated in a field as indicated subject to Network Rail land access agreement. AmcoGiffen will look to use carbon reducing site welfare that runs bio oil as well as batteries to store power and minimize running time for the generators. Tower lights will be solar where possible

Successful trials of a hybrid power solution have led to reduced site carbon emissions by 90%.

The sustainable solution is a combination of a Hydrotreated Vegetable Oil (HVO) fuel and a battery storage unit (BSU) instead of the conventional red diesel solution most commonly used. The fuel is HVO and its overall carbon footprint is a 94% lower than diesel / gas oil.

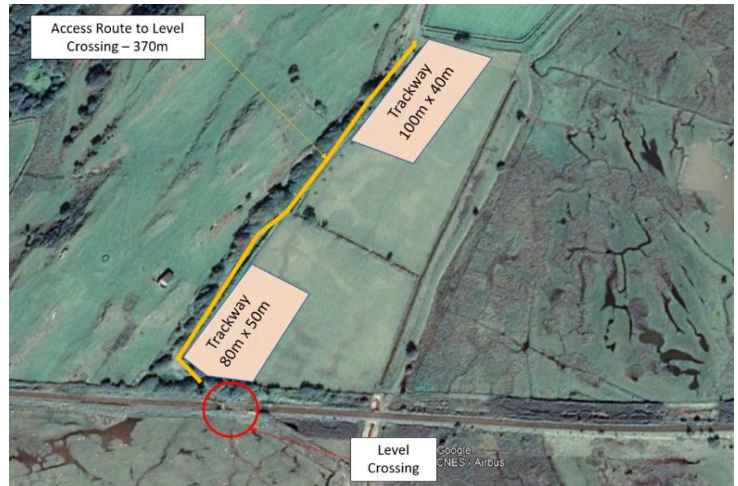
The BSU is an innovative part of this set up, it completely changes the way that power is delivered. The generator runs the site and charges the battery during the day and then is programmed to switch over with the night time power coming from the battery.

Results show that the BSU reduces overall fuel consumption and generator run time by 49%. Not running the generator through the night, not only reduces air emissions improving air quality, it also runs totally noise free offering zero noise pollution to any lineside neighbours or livestock.



Our site set up will comprise of the following:

- ✓ 32ft Offices (including client facilities)
- ✓ WC
- ✓ Mess Rooms
- ✓ Drying Room
- ✓ Silenced generator
- ✓ Secure store and Plant Store
- ✓ Briefing/Control Room
- ✓ One way controlled access
- ✓ Storage for old and new timbers
- ✓ Segregated walking area
- ✓ Parking area

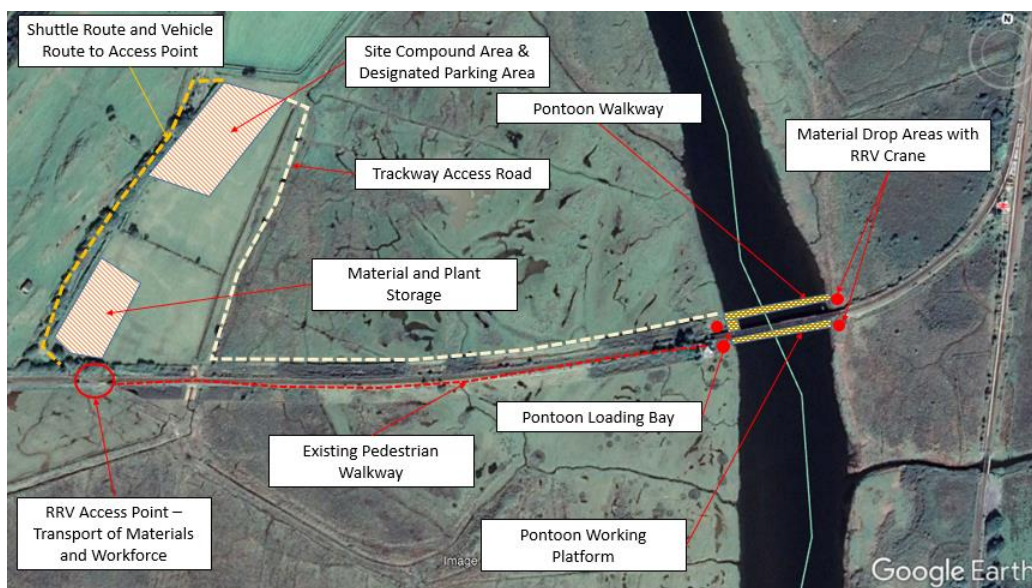


The effluent from the toilet block will be drained into a holding tank and periodically pumped out by a licensed waste removal contractor. The water supply for the site establishment will either come from a local mains source or from a daily filled drinking water bowser that is fed to the cabins via a pump to maintain water pressure.

The compound will be required to be of sufficient size to allow storage of materials and site cabins, the compound will be located as per the plan above on land adjacent to the railway crossing. Parking of staff and operative's vehicles will be within the compound area.

A temporary timber processing facility will be established in the compound which will be used to process all timber removed from the structure. The site compound security will consist of CCTV security which will be scrutinised from a centralised control base and will be monitored 24hrs. The compound will be enclosed using 2m high anti climb Heras fencing.

Plan of compound and storage areas:



3.1.2 Construction Methodology (including contingency arrangements)

Initial activities are as follows

- ✓ Carry out ecological survey of proposed compounds and works areas
- ✓ Appoint designer
- ✓ Carry out detailed topo survey
- ✓ Prepare consents documents
- ✓ Joint survey of bridge, compounds and approaches with NR as part of AMP process

During the design phase of the works we will undertake buildability reviews, risk workshops and innovation reviews to identify and review our proposals for delivering the work

The proposal for the main elements of work once design is complete and consents in place are broadly as follows, detailed descriptions later in document

The sequence of works can be summarised below:

1. Pre-Abnormal Possession

- a. Establish site compounds to the high and low mileage of the bridge, satellite to low, main to high
- b. Use RRVs in RoR possessions to transfer temporary works material to site
- c. Install temporary works and change piles (outside only), diagonal and horizontal wallings with trains running
- d. Install scaffold access to the full structure and encapsulation to the metallic section
- e. Grit blast and paint outside beams
- f. Install lateral restraint temporary works between crossheads

2. During Abnormal Possession

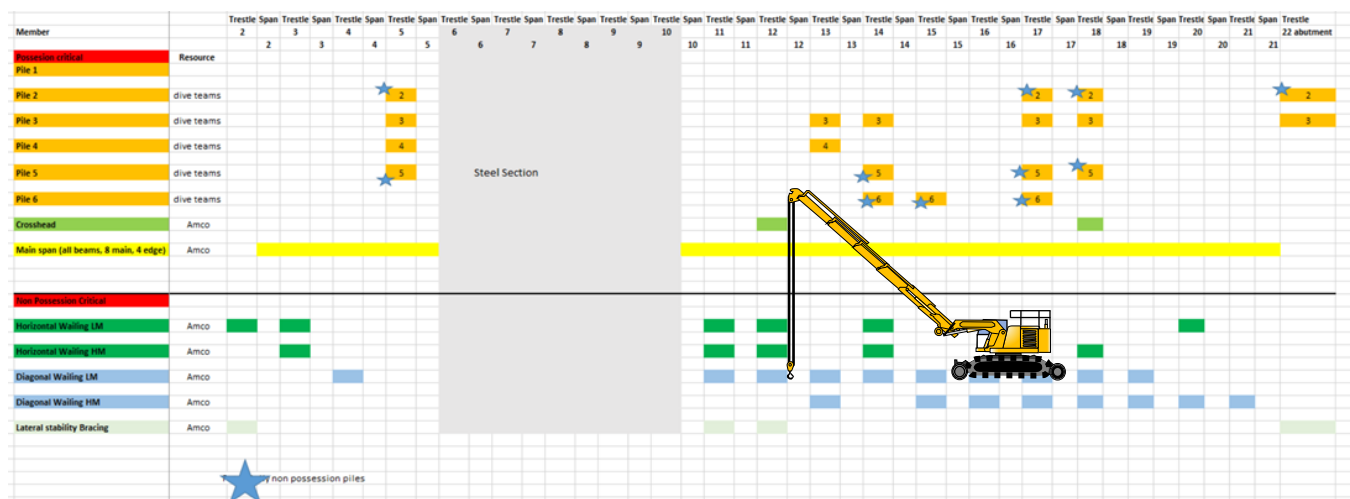
- a. RRVs access site to high and low mileage of structure
- b. Change piles 3 and 4 across structure where required
- c. Grit blast and paint track element of steel spans

3. Post Abnormal Possession

- a. Remove temporary works
- b. Carry out any finishing works
- c. Site demobilization

3.2 Timber Repairs

The below plan highlights the repairs across the structure. The general construction sequence, during the abnormal possession, will involve full scaffold to the structure.



3.2.1 Change Horizontal and Diagonal Wailings

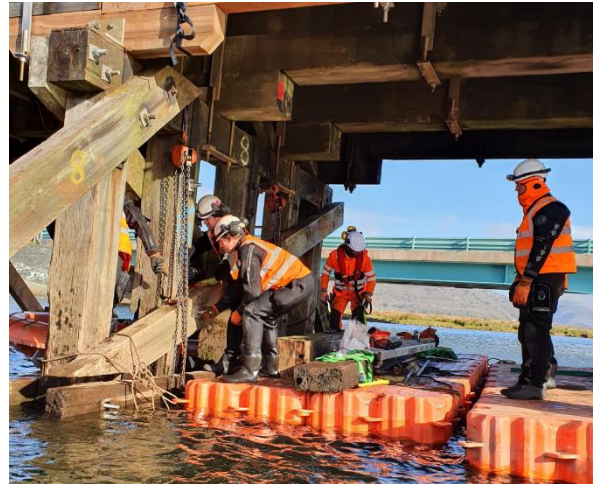
Within the CRT the horizontal and diagonal wailings that require replacement are identified.

The timbers will be brought to the shore in a Saturday night possession using RRVs. They then get loaded onto pontoon by telehandler

The works to the wailings will take place in normal working days ahead of the abnormal possession. This process has been previously agreed with the designers as long as certain criteria can be met

The wailings can be changed on a one out one in process only. All steelwork will be replaced and the wailings cannot be left off outside of a shift. The weather conditions also need to be checked prior to removing a wailing.

If the wailing cannot be fully bolted back into place ratchet straps will be used to secure to the structure until the permanent fixings can be used.



3.2.2 Changing the Steel Ties

The process for the work to change the steel ties that pass through the piles will be undertaken with trains running. Where the existing ties are too rusty to be undone, they are cut using a Sthill saw or similar and removed. The new pre-cut timbers are taken to site on a tractor and trailer. One of the pair of horizontals is removed by the excavator and grab, then placed on the sand.

The new timber is lined up against the old and is used as a template to drill the new holes for the stainless steel fixings. Once drilled it is positioned over the new tie bars and loosely bolted into place. The process is repeated for its opposite timber. Once the pair of new are in place, the bolts are secured and the old timbers and fixings removed back to the yard

The old timber will be examined and where possible put to one side to be cut for reuse on the structure, should the beam be beyond serviceable use it will be recycled. It may be possible that it can be used for an edge beam or edge beam corbel.

3.2.3 Protect Existing Services to the Structure

The existing services to the structure and approach will be protected by split ducting. Where they span an open section of deck they will be tied to the scaffold. Outside of the structure they will generally be in troughs but where this isn't the case split ducting will be used

3.2.4 Access Scaffold to the Structure

In order to carry out work to the metallic span we will install scaffold access to the section

The scaffold will be encapsulated to the metallic span. There will be segregated access to this area to ensure that operatives carrying out blasting activities do not come into contact with others before they get to their changing areas.

The final level of the scaffold design will be decided at detailed design stage but it will be suitable for works to main beams, crossheads and handrail. It will reduce the amount of work required from towers on pontoons.

The scaffold will be cleaned every shift and in event of high tides will not be used



3.2.5 Pile Replacement under Live Load

It will be possible to carry out pile replacement works to piles 1, 2, 5 and 6 ahead of the abnormal possession. In order to do this we will use a temporary works support to transfer the load from the crosshead to the wallings. This has been successfully used on Traeth Mawr Viaduct.

The size of timber will be checked and cut in the yard. All metalwork will be changed in advance.

Scaffold will be in place at the top of the pile level to allow access to steelwork.

Specialist dive teams will carry out the pile works. The pile timber will be connected to block and tackle on the crosshead. Any connection to wallings will be removed along with any old splice clamps.

This pile cut line will be agreed with the designers

A specialist chain saw is then used to cut off the existing pile at the top of the proposed splice. The old pile will be lowered onto pontoons with block and tackle.

The splice detail will be cut into the existing timber. This notched detail then used as a template to cut the splice into the new.

The new timber will be lifted from the pontoon and into place using the block and tackle. It will be offered up and straps applied. Hardwood wedges are then used to push it home.

The top connection will be checked

If for any reason, a temporary boot solution has been designed. This consists of a steel frame that sits over the top of the existing pile then steel beams that project to the crosshead. This would allow the track to re-open without the timber pile in place.

Resin infill by Trac Structural will be used where we cannot get the required connection at the top of the pile.

3.2.6 Pile Replacement within Abnormal Possession

The piles identified within the CRT for replacement under the rail bearers will need to be undertaken in the possession with no live load. The programme will show that these piles are replaced once the areas above are complete so there will be no RRVs passing above.

The process for the replacement will be as previous but without the need for temporary propping. The wallings will be removed from one side of the trestle. Block and tackle will be attached to the crosshead to take the weight of the pile and the pile strap removed.

The new pile will be pre-spliced. The existing pile will be cut square and removed on the pontoon. The splice cut into the existing pile will be carried out underwater. The measurement to the crosshead will be checked and new timber cut to suit. The angle of the top of the existing pile will be checked, measured and replicated in the new pile.

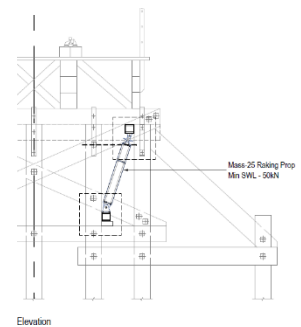
The new pile will be lifted into place with the block and tackle. The splice brackets will be put in place and hardwood wedges hammered in to push the pile to the home. Again, resin can be used if the contact area is not sufficient.

The process will be repeated for the remaining piles.

3.2.7 Grit Blasting and Painting

It is proposed that the majority of the grit blast and painting works will take place ahead of the abnormal possession. When the scaffold has been installed, encapsulation will be put in place to the steel sections below track level.

When the encapsulation has been checked and signed off, work can commence as below.



1. Degrease and freshwater wash 1110sqm
2. Grit blast to the standard SA 2.5 1110sqm
3. Carry out joint inspection for repairs
4. Fully clean the entire surfaces prior application of paint coatings
5. Apply Intergard 251HS at 190 microns dft to the entire prepared surfaces(above water level)
6. Apply Interthane 990 at 50 microns dft to the entire primed surfaces (above the water level)
7. Apply Interzone 954 to a dft Of 400 microns(below water level)
8. Apply black paint



If steel repairs are identified, these would be programmed in where possible.

The works to track side will be undertaken in a mixture of Saturday night possessions and the abnormal possession. During the abnormal possession the area will be kept clear of RRVs for the first 15 days on order to allow works to be complete.

3.2.8 Handback

Our CRE, managed by the CEM, will be responsible for the production and collation of all their respective as-built and Inspection and Test Plan (ITP) documentation. All of this information has to be centrally collated and provided as evidence for the DPE to support the Entry into Service (EIS).

A tracker will be developed by the CEM and agreed with the DPE, it will be updated on a weekly basis to allow the management of the process. This will demonstrate that the works have been constructed in accordance with the design, that all construction works required for EIS are completed, and that a full action plan of snagging issues has been completed.

We have a process, PR21 - Manage Commissioning & Handover, to successfully hand back the asset and obtain a certificate of practical completion.

Our quality manager will be responsible for ensuring that the process is followed, and that all information required for the commissioning and handback is captured and reviewed accordingly.

Our commissioning and handover strategy is part of the construction phase plan and engineering management plan, and the strategy will include scope, cost, timescale, methodology, and resources required to achieve a successful handback.

Commissioning and handover activities are detailed within the project programme, with milestones included to ensure the project team hold a meeting with NR's project manager and relevant stakeholders.

3.2.9 Following Blockade

Any outstanding works such as shrouds, steel repairs and brackets can be completed following the abnormal. It is anticipated that there will be minimal

The works to the pile shrouds involves removing the existing with breakers. Once removed, the GRP shroud will be set at the correct level. This may involve the temporary removal of the fixings to the horizontal wailing.

One the shroud is secured, the grout can be mixed and poured to design

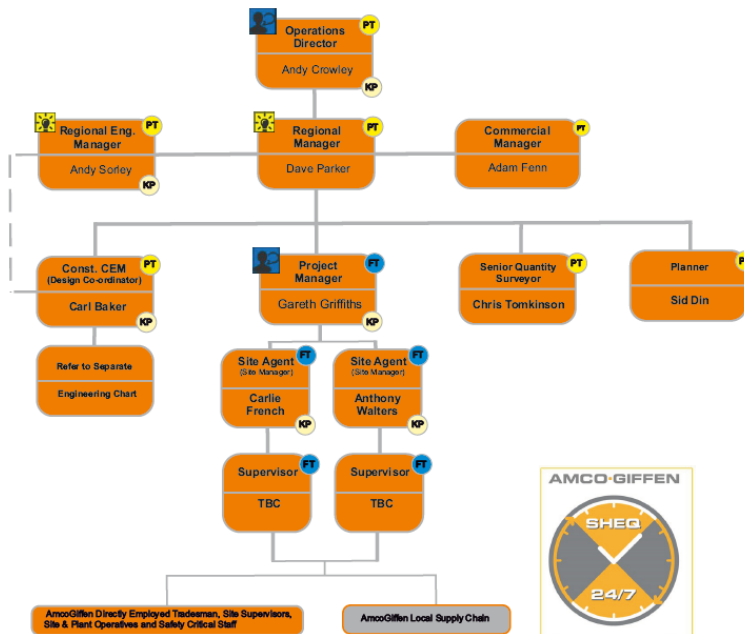
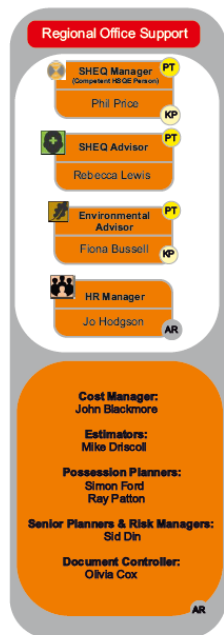
Test cubes will be taken and allowed to cure as close to the bridge as practical before being crushed

The areas where the Reno mattress has been removed will be identified and the mattress replaced in line with manufacture guidance



3.3 Resources

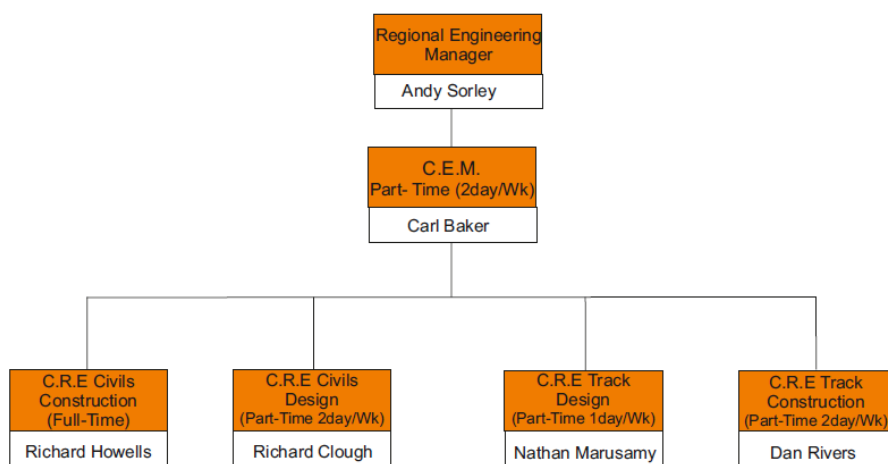
The Organisation Chart included below identifies the AmcoGiffen key personnel including titles of who will be involved in the management of the contract. Labour requirements will be identified and recorded on a detailed project programme, and throughout the duration of the project, progress will be monitored by the Project Team and the programme updated accordingly.



ALLOCATION: Full Time: FT Part Time: PT As Required: AR Key Person Role (CV Included): KP

We have also produced an Org. Chart for the Engineering Project Team for clarity:

Engineering Project Team



Resource levels are assessed to ensure optimum efficiencies are achieved, particularly during critical periods e.g. abnormal possessions where successful completion of works is critical to the overall programme and safety of the public and NR personnel.

In the preparation of these works, AmcoGiffen have engaged with their supply chain to source specialist, experienced and competent contractors.

4.0 Key Risks, Mitigation and Contingencies

With reference to the relevant documentation, AmcoGiffen's initial assessment of the site and required works, tabulated below are the key risks together with corresponding mitigation/ contingency measures that may be adopted.

This list is not exhaustive and the Project Hazard/Risk Log will be incorporated into the Construction Phase Plan. This document will be updated throughout the duration of the project.

Risk	Mitigation / Contingency
Working on or near the line	Valid Safe System of Work (SSOW) to be in place Persons to have valid PTS card or Track Visitors Permit and must be in possession of these at all times if working on track Employees to sign in and out of the Sentinel app Works to be planned in line with NR Standard – NR/L2/OHS/019 – Safety of people on or near the line Only use approved POS provider No access on to the track until COSS has given their briefing, acceptance by those involved in the works and given authorisation to access
Working at Height	Suitable access point to working are must be used at all times. Provide built for purpose scaffold to undertake the works. Only trained competent persons to erect scaffold Task brief, permit to work, TBTs, Whiteboard WaH assessments in place
Working in and over Water	Pontoons and rescue boats in area. Check river flows ahead of works. Correct PPE including dry suits and life jackets. Life lines and rigs at bridge. Fully qualified divers for underwater works
Injury from lifting activities	Lift operations to be part of a lift plan and permit to lift issued Lifting equipment to be marked with its safe working load and not to be used to move loads heavier than SWL Only trained people to use lifting equipment Exclusion zone to be established and controlled throughout the lift journey Any authorised persons within the exclusion zone never to stand under a suspended load Ensure landing destination is prepared and ready prior to the lift being commenced Lifting equipment and accessories to be inspected and certified prior to use with any defective equipment/accessory to be quarantined until repaired or replaced Ensure outriggers are used where fitted Effective communication to be in place at all times between the operator and slinger/signaller
Injury from Hand Arm Vibration	Assessment to be carried out on equipment to use lowest HAV's tool available & establish activity duration Equipment to be checked before each shift with any faults notified to the supervisor and quarantined until repaired or replaced. Equipment to be regularly serviced and cleaned in line with manufacturer's recommendations Operatives to be rotated on operations HAVS trigger time recorded and recorded in site files. Monitoring/management of trigger times in accordance with HSE guidelines.
Cutting and drilling of tropical hardwood	Secure area on pontoon to be established for all cutting and drilling operations. Competent persons to carry out the task wearing the appropriate PPE. Use of hand held grinders-ensure correct tool selected, ensure working platform is at correct height and stable. Use fixed scaffold where possible Use of Pontoons-Operatives to be briefed and practical demonstration on use of pontoons and how they react whilst carrying out different activities from them. Supervisor to check tide levels that could change during an activity introducing new risks

Risk of people & objects falling from open and unprotected edges	Fall prevention PPE to be worn at all times when a risk from falling from height exists when collective measures not in place ie. Inertia reels, harnesses and restraints. Rescue plan in place if full suspension rope access is used Permit to work at height issued Use designated walkways/access No access on to incomplete fixed or mobile scaffold unless trained to do so and wearing correct PPE Scaffold to side of bridge for handrail works Exclusion zones to be erected below / around scaffolding
Striking Services	Refer to buried service information provided by the client and Network Rail Hazard Directory. Copies to be readily available on site. CAT scan of area by competent person for signs of known or unknown services. Mark up on site using a line marker or reference point. Any unknown services to be updated on service drawings and NR notified. Excavate hand trial holes using insulated spades & shovels to locate known or unknown services. Do not use picks, pins or forks Issue and brief Permit to dig – NO PERMIT NO DIG No mechanical excavation within 1.2m of any service unless authorised by Regional managing Director Protect existing services on deck
Working with plant and equipment	All works to be carried out in line with 019 standards. All plant to be accompanied by a MC/Banksman at all times. Exclusion zones to be erected around all plant while working. Detcom radios to be used between all banskmen & MCs. Install and use of designated walkways Slinger/signallers to be used for all plant/crane movements where required, if possible exclude banksman/vehicle marshal they will be in control of an area of working plant and will not allow any persons to enter the exclusion zone until the plant has stabled and isolated. Only certified operators to operate plant. Suitable signage to be erected prior to works commencing. PPE to be worn at all times. Lifting of materials to be done when slew radius is clear from workforce. No personnel to be positioned below lifts at any time. Designated vehicle access to be established for site access. Briefings on controls to be undertaken during induction. Exclusion zones to be established around working area, Personnel to be briefed in safe systems of works and working boundaries prior to accessing site, plant/pedestrian segregation using physical barriers when working adjacent to machines, Adequate lighting provided at work site, PPE to be worn at all times, acknowledgment by operatives/operators to be briefed and enforced throughout scheme, designated pedestrian walkways established prior to work start.
Working on scaffold	Scaffold approved, inspected and fit for purpose. Appropriate hoarding and segregation in place Form005 completed by the CRE construction or nominated person once the scaffold is complete and inspected Temporary Works Coordinator to be formerly appointed Temporary works Supervisor to be formerly appointed Scaffold to be installed as per approved design and using recommended/approved materials Scaffold only to be installed, altered and dismantled by trained and competent persons No access, except for scaffolders until signed of and permit to load issued Weekly check by competent scaffolder Form005 completed by the CRE construction or nominated person once the scaffold is complete and inspected
Working on and over water	Consents in place with agreed designed fully encapsulated scaffold to metallic section. Scaffold boards lined with sheeting to ensure no lead loss Scaffold level set to give working room below platform but higher than average water level

	Scaffold encapsulation to be air tested. Access from pontoons and deck during possession work Area below to be monitored
Accident or Incident to people and or property from an unplanned change or circumstance	Agree a plan to control the activity Compile a "Point of Work Risk Assessment" with everybody's input (POWRA) Contact line manager for confirmation Brief the control measures to those concerned On completion of new work return to original documentation and SSOW 1. Notice it 2. Stop Works 3. Determine the effects it might have 4. Deal with the change to achieve the right outcome
Work exposing workers to the risk of drowning	Works to be undertaken from a safe pontoon system qualified dive personnel and safety boat attendance to be in attendance during all diving operations. Monitoring of river levels to be undertaken to be aware of any risk of flooding. Permit to work on water to be in place prior to commencement of works. Compressor filters to be checked before each dive, if necessary the filters should be changed. Make sure all intakes are well away and up wind of exhaust. Regular air checks are to be completed and a certificate of air purity issued before diving commences. If radio communications have been lost, revert to hand signals until the diver has left the water (SWP1, 1:2). Dive operations not to commence, until radio communications have been re-established. Diver's umbilical to be tended by experienced linesman only and the umbilical held tight but not to impede the divers work. Keep the number of lines/ropes from the surface to a minimum. Diver to wear the correct protective equipment, gloves etc., limit dive times to the prevailing conditions and or when the diver complains he is cold. Standby diver situated in sheltered area. Warm drinks supplied – divers in water time restricted. The seabed may have small debris the diver is to be made aware and briefed of sharp edges, needle stick injuries etc. Report any such injury to the supervisor. Emergency Medical Care to be provided and emergency services informed if needed.
Moving vessels during dive operations	Flag to be flown during diving operations. Work will be carried out using a permit to work issued to by the appropriate harbor authority. When diving operations are in progress Radio contact to be maintained and monitored on working channels
Spreading of COVID 19	Follow Government guidelines

We Stop when things change on site

On the Dovey Junction Viaduct No.1 contract we will enable an open environment where everyone is empowered to speak up to contribute to the development and undertaking of works safely. If anyone is not clear on what is required or wishes to challenge or stop a work activity we have a 'change equals stop' mandate.

Using a targeted poster campaign our initiative promotes the use of POWRA (Point of Work Risk Assessment) and



the ability for our people to stop work, when plans change or there are unplanned events, confident they have the full support of their fellow workers, management and clients.

Every employee and worker will receive an induction to the business and/or site. At this induction we highlight the various channels we utilise to encourage feedback and create opportunities for safety conversations.