METHOD STATEMENT

MVV O&M GmBH,
South West Devon Waste Partnership
&
Kier Construction Limited

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FOR

Construction of Access Bridge

DOCUMENT HISTORY

DATE	ISSUE	COMMENTS	ORIGINATOR	CHECKED BY	APPROVED BY
19/01/11	1	With particular reference to environmental considerations	JD		
22/03/11	2	Minor update following client comments	JD		

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1. Scope

This document describes the procedures and method of work for carrying out the construction works for the new access bridge for the Energy From Waste CHP Facility at Devonport with particular reference to environmental considerations. Due to the nature of the immediate surroundings, these will be mainly geared towards protecting the ecology of the watercourse and the surrounding habitats.

2. Introduction

Currently the existing tidal waterway known as Weston Mill Creek is crossed by two narrow access roads neither of which is wide enough for two way traffic. Furthermore the bridge structure that forms the northern crossing has a weight limit of 1.5 tons and is therefore unsuitable for vehicles larger than light cars/vans.

This northern bridge was the earlier crossing and carried the access road that leads to the MOD storage/works facilities towards Bull Point. Immediately on the southern side of the bridge there are a number of what appear to be electrical, and possibly communication, services that are in piped conduits adjacent to the bridge deck.

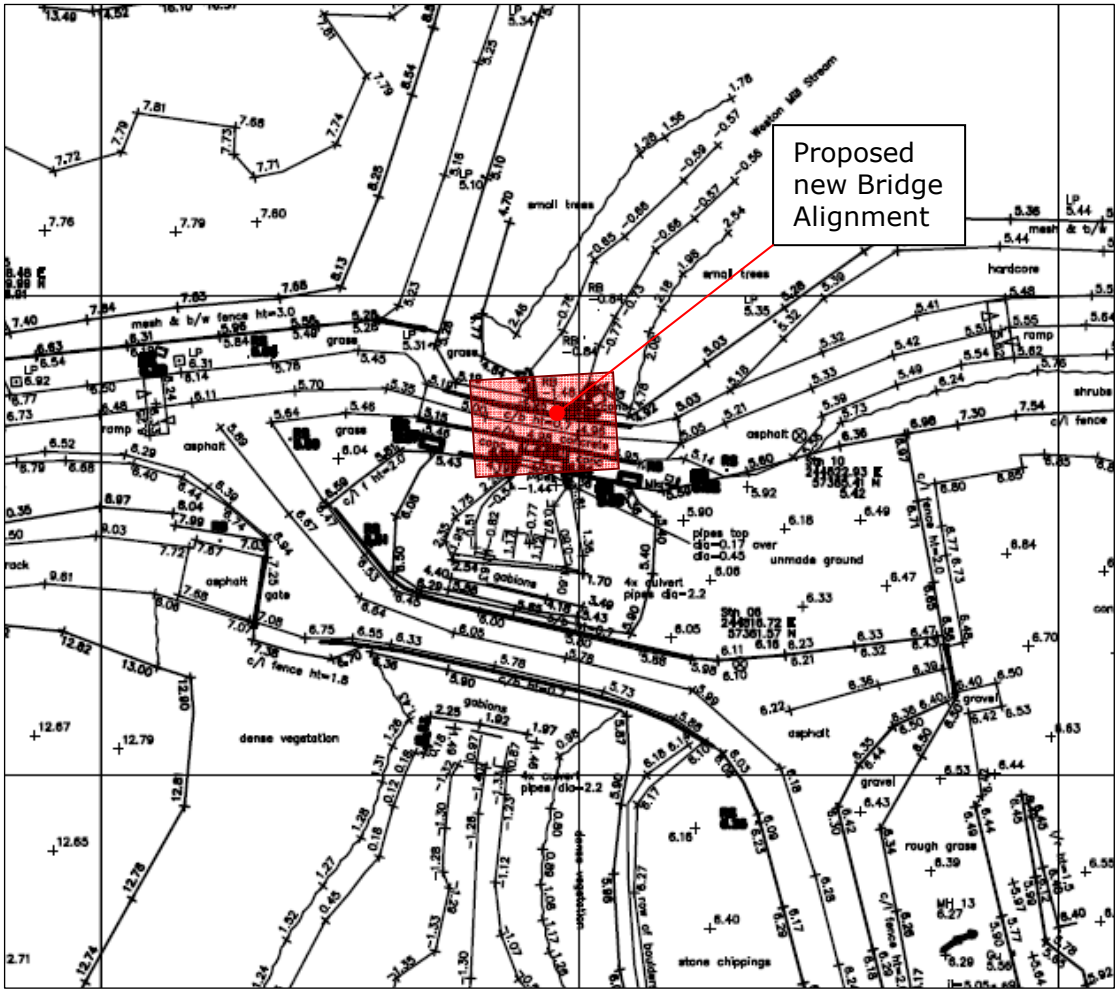
The southern crossing was installed to carry heavy vehicles during previous construction projects within DRDL and takes the form of a buried pipe construction. Four large diameter pipes were installed and covered with approximately 2.5m – 3m of fill, using reinforced earth construction. The design of this crossing has

potential to cause some restriction to the flow during high flow rates and there is a risk of debris becoming lodged in the pipes and constricting the watercourse.

The proposal is to demolish the northern bridge and construct a new crossing on an alignment wholly within the existing secure boundary with a width suitable for two lanes of traffic. The clear span of the bridge and the deck soffit level will be determined from a flood risk assessment. The existing piped southern crossing can then be removed to eliminate the risk of blockage and restriction of flow.

Planning Application Drawing PA22 (provided separately) provides a plan and elevation of the bridge.

The topographic plan below shows the two existing crossings and superimposed in red is the alignment of the proposed new crossing.



The proposed bridge is to be an in-situ composite deck with pre-cast concrete parapets on bearings on in-situ reinforced concrete abutments supported on buried base slabs on rotary-bored concrete piled foundations.

3. Construction Sequence

3.1. Site Set-up

Prior to the project starting, a Site Waste Management Plan (SWMP) will be drawn up for continuous monitoring throughout the project under the Site Waste Management Plans Regulations 2008.

The project team will be experienced in their designated areas of responsibility. The integrated project team will ensure the work is competently supervised with respect to environment as well as health and safety and quality.

A detailed environmental risk assessment will be produced and monitored.

All personnel will have attended the mandatory Kier Construction and MVV site inductions and will have been briefed on the contents of the RAMS (risk assessments and method statement) and COSHH (Control of Substances Hazardous to Health) assessments relevant to their operations.

The bridge construction site will be surrounded by a secure 2m high fence to prevent unauthorised access and to clearly show the area that will be under special rules owing to its proximity to the watercourse.

These rules will include:

- a designated, bunded plant refuelling area situated well away from the stream,
- use of biodegradable hydraulic fluid in machines that will work within the boundary,
- all plant must be inspected daily for fluid leaks and must not be used until any leak is rectified,
- no plant, materials, labour or debris may be allowed to enter the water,
- emergency spill kits must be made available and maintained at all times.

All site personnel will be briefed on the environmental emergency response procedure. A flow chart depicting the Kier Environmental Incident Response Procedure is show on the following page.

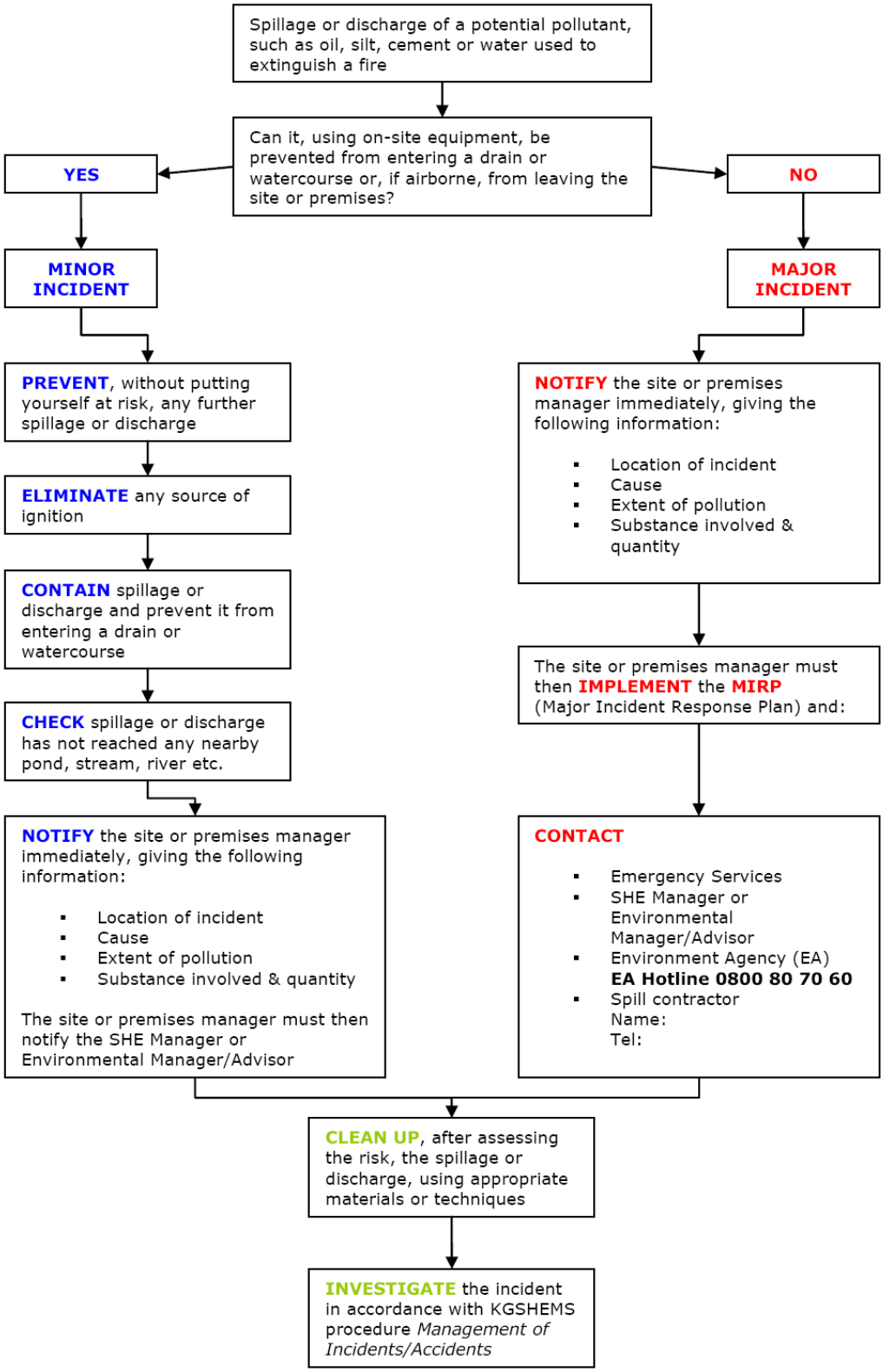
KCL operates various permit-to-work procedures and the following shall be implemented during these activities;

- Permit to Excavate
- Hot Works Permit
- Permit to Load

Consent to Discharge

Consent/permission must be obtained from the relevant enforcing authority, in this case, the Environment Agency (EA), before disposing of any water into a storm drain or controlled water course such as a ditch, stream, pond, lake, river or aquifer. The enforcing authority will require that any water discharged into a drain or controlled water course is free from pollutants, such as silts or hydrocarbons. They may, as a condition of the consent, set absolute limits on the amount of suspended solids or other pollutants the discharged water can contain. Therefore, the quality of the discharged water, for example that pumped out of an excavation and into a watercourse, must be regularly monitored. If it is suspected that the water has become polluted, the discharge must stop until the source of pollution is identified and stopped. The frequency of inspections will be agreed with the regulator. The findings of each inspection will be recorded on the SHE Monitoring Form.

Typical Environmental Incident Response Procedure for Site/Premises



3.2. Decommissioning and Removal of the existing bridge

All traffic will be diverted onto the adjacent buried pipe bridge.
A full survey of existing services (buried or otherwise) will be carried out using a Cable Avoidance Tool, existing statutory undertakers' plans and ground-penetrating radar and all services shall be clearly marked using wooden pegs, or other marks. The existing services (power and communication cables and water-main) will be disconnected / diverted before any demolition works may commence.

The deck will be carefully dismantled and removed by mobile crane in large pieces ensuring that nothing is dropped into the stream. The deck will then be deposited outside the fenced-off area for breaking up and dismantling and either recycling or disposal to a licensed disposal facility off-site in accordance with the SWMP. Waste materials will include concrete, steel and other metals from the existing services and from the excavation of the approach ramps, asphalt.

3.3. Excavation

As soon as the deck has been removed the exposed edge shall be protected by ensuring that no personnel can get close. Following the issue and briefing of a Permit to Excavate to all personnel involved, a 360^{o} excavator will be used to dig out the asphalt road surface and the fill that exists behind the existing sheet-pile abutment wall down to a level suitable for the piling mat and formation for the abutment base. If necessary, the sheet pile wall may be extended to the sides to ensure the stream is protected for the full width of the new bridge construction. The extra sheet piles will be driven into the ground ahead of the excavation using the 360^{o} excavator with a special piling attachment. During excavation, piling or any other relevant works, the stream and its banks will be continually monitored so prevent anything falling in.

During this excavation a containment bund shall be incorporated into the excavation to stop any silty water in the excavation entering the stream. The excavation shall be kept dry at all times using a 'silent' pump so that even between shifts there will be no chance of water over-topping the bund. The discharge from the excavation will be sent to a 'Silt-Buster' settlement tank and the discharge from this will be regularly monitored for turbidity and other pollutants before it enters the stream.

3.4. Piling

To create a stable platform for the piling rig to sit on it is necessary to construct a temporary piling mat. This will be in the form of layers of compacted stone to achieve a specified CBR value.

The pile design will utilise in-situ reinforced concrete rotary-bored piles; these cause less noise and vibration than driven piles. The piling rig will be set up in position and drill into the soil down to a specified depth, dependant upon bearing capacity indicated by the site investigation. The

concrete will be delivered ready-mixed by road-truck and will be poured into the newly bored hole from a position that will not allow any concrete to spill near to the watercourse or its banks. Any concrete that does spill will be disposed of in a specially designated skip and this skip will also be used to contain the water used for washing out the mixer. The skip's contents will be disposed of as inert waste when all the cement has cured. Reinforcement will be pushed into the wet concrete and the completed pile left to cure before the top is cut off to the correct level to suit the design and disposed of as inert waste at a licensed disposal facility in accordance with the SWMP.

When the piling is complete, the piling mat will be removed for re-use elsewhere on the site.

3.5. Abutment Construction

A layer of blinding concrete will be placed to provide a clean, level working surface on which to construct the reinforced concrete base slab. As with the piling operation and all forthcoming concrete placing operations, the same controls will be employed to prevent concrete being deposited in or near the stream. If, after thorough risk assessment, the level of risk to the watercourse from contamination from cement remains too high, fast-setting concrete mixes may be specified.

Timber shutters and steel reinforcement will be constructed in-situ to form the abutment base and walls in a number of separate pours.
The bridge bearings will be installed and fixed using a cementitious grout ensuring the same levels of environmental protection as for concrete pours.

Backfilling around the abutment walls will be done in layers to ensure adequate compaction and with very great care to ensure that no fill material falls into the stream. If necessary due to constraints of space, debris netting may be erected on the bank of the stream and this to be continually monitored during filling and cleared of material whenever necessary. Once back fill is complete, safety edge protection will be erected.

Scour protection in the form of large and medium-sized boulders will be carefully placed above the low water line using the excavator sited on the backfill behind the abutment wall. Any works to be carried out in the inter-tidal zone shall be done at or around low water so that nothing enters the water at any time.

3.6. Deck Construction

The design of the bridge deck incorporates four steel beams spanning between each abutment and fixed to the bearings. A reinforced concrete deck is then placed on top and all fittings and surfacing placed on the deck.

To mitigate any risk of materials contaminating the stream, pre-cast concrete will be used wherever practical.

The steel beams will be specified in weathering grade steel so that there is no need for coating the surface, thus eliminating the risks associated with the long-term maintenance of coatings.

The beams will be lowered into position using a mobile crane sited behind the abutment wall on one side on the span and once these are aligned and completed, pre-cast concrete permanent formwork will be placed onto the top flanges of the steel beams in the form of PCC planks spanning between adjacent beams. Once the planks are in position over the whole deck, the top layer of steel reinforcement is fixed and temporary timber edge shutters fitted to the deck edges. These will be over-height to prevent any spillage during the concrete pour.

Concrete will be delivered ready-mixed by road-truck and placed using a truck-mounted boom pump, again with care not to place concrete directly within 2m of the deck edge. The wet concrete will be spread by hand tools and compacted using electric vibrating pokers. The surface will be finished using a rotating beam-screed.

3.7. Parapets

The fixing positions will be pre-drilled into the concrete deck using a hand-held percussion drill. The surface will be kept damp to prevent air-borne dust. Pre-cast concrete parapet sections (notionally 3m long) will be delivered by road vehicle and placed in position using a mobile crane sited behind the abutment wall. These sections will be bolted down using epoxy resin-anchored holding-down bolts.

Any epoxy packaging and residue will be disposed of as hazardous waste in accordance with the SWMP.

3.8. Movement Joints

The bridge deck expansion joint will be fixed down to the concrete structure either side of the gap between the deck and the abutment ballast wall using a similar method to that of the PCC parapet sections and similar controls will be employed.

3.9. Surfacing

Before the wearing surface can be placed on the deck, a waterproofing layer must be placed. This is commonly applied in liquid spray form, but owing to the environmentally sensitive locality, a sheet applied system will be used.

These basically consist of pre-formed sheets based mainly on bituminous polymeric and elastomeric materials. They are bonded to the bridge deck, to form a continuous membrane, using roller-applied bitumen adhesive.

PCC 'bridge-deck' kerbs will be laid to delineate the footway and the asphalt surfacing shall then be laid using a paving machine and compacted using a ride-on vibrating roller. The bridge parapets will help prevent any of these materials being inadvertently dropped into the stream and as for other operations, the critical areas such as at the ends of the parapets, continuous monitoring will ensure the stream is not contaminated.

4.0 Quality

All project operations will be controlled by Kier's quality procedures, industry standards and project specific quality control plans as agreed and approved by MVV. The quality control plans will define all project documents required including ITP's, all approvals, project hold points, records required, and verifying authorities.

5.0 Safety

All personnel accessing the site will be subject to MVV and KCL site rules and will wear PPE as required.

In addition to the above, all operatives will wear appropriate PPE relevant to the tasks being carried out. These include the mandatory long sleeves, long trousers, safety boots, task-specific gloves, safety helmet, and safety glasses. Other task-specific PPE may include disposable overalls, face protection, hearing protection, Wellington boots (for concreting) or full body safety harness where there is a risk of falls from height.

The following Safety Risk Assessments are relevant to the works and will be produced by competent persons and attached to the detailed Method Statement in accordance with the Construction Phase Plan:

- Initial site setup
- Manual Handling
- Working at Height
- Slips, trips and falls
- Power tools and abrasive wheels
- Working near mobile plant and plant movement
- COSHH Assessment for all hazardous products.
- Weil's Disease
- Lift Plans
- Surfacing works

All personnel will be fully briefed on the safe method of work, via the use of a site specific induction and operation specific SMART (Specific Method And Risk Training) briefings, prior to the works being carried out.

All crane movements will be controlled by the lift supervisor and SQEP banks-men.

The site safety and environment will be continually monitored via weekly site inspections as well the continual monitoring as described in the above paragraphs. These inspections are carried out independently of the project

management and are recorded. Inspection results will be made available upon request. The Health and Safety Plan will also be continually reviewed, the results recorded and changes implemented.