Balmerino Outfall Repair – Outline Methodology for Pipe Repair Works

This document has been prepared as an outline methodology for the pipe repair works at Balmerino outfall for the purposes of supporting Morrison Construction's Marine Scotland application. This document should not be considered as a health and safety method statement nor used for that purpose. This document should be read in conjunction with the relevant Scottish Water drawings for the project including the site plan, long section and outfall pipe support plinth details.

The outfall repair works consist of the replacement of 24m of 250mm ductile iron pipe as the end of the existing outfall is heavily corroded and broken away from the upstream section of the pipe. The existing pipe is elevated on concrete plinths and it is intended that the replacement section is suitably elevated on pre-cast concrete plinths with their bases set approximately 500mm below bed level.

It is anticipated that the majority of the 24m outfall replacement will be laid below mean low water springs (MLWS) and therefore a significant element of the work will take place below water, albeit at the lower end of the tidal range when water depths are at their lowest. We anticipate selecting a spring tide and suitable weather window to undertake these works at some point between late spring and early autumn 2023.

The principal items of plant to be used in the works are as follows:

- 2no spud legged dumb barges (an excavating barge and a carry barge), similar to that shown in the photo below
- 1no supporting workboat
- 1no safety boat
- 1no 8t to 14t excavator with bio-oil
- Plant nappies and spill kits
- Welfare unit for our operatives

Our floating plant will be mobilized downstream of the site at Tayport with all future vessel movements being undertaken with the approval of the Harbourmaster. A Notice to Mariners will be published by the Harbourmaster's office to advise river users of the proposed working activity. Our marine operatives and crew are suitably qualified and experienced at working in tidal waters and hold both the necessary commercially endorsed vessel operation and construction related certification. We recognize that flow rates in the River Tay can be fast (up to 8knots between the downstream bridge piers) and it may be necessary to remove vessels from site at the end of each shift to a safe haven.

Once mobilized, our floating plant will be towed by workboat to site and moored on spud legs at the end of the outfall pipe. At low tide we will inspect the river bed for debris as it is intended that one of our barges dries out on the river bed at low tide for the purposes of excavating some of the redundant assets and foundation pits for the pipeline.

The redundant pipework and three redundant pipe plinths will be lifted from the foreshore and placed on the deck of the barge for later disposal at an appropriately licensed facility.

We anticipate that excavation of the 700mm deep foundation pits will take place primarily from the barge using the 8t to 14t excavator. Excavated arisings will be temporarily stored on the foreshore adjacent to the excavation in preparation for backfilling. In some instances it may be necessary for the excavator to climb off of the barge and work from the foreshore. The foreshore is assessed as suitably competent for loading and operation with an excavator without the risk of sinking. The recent trial pit works at the end of the existing outfall pipe were successfully completed by an excavator working solely from the foreshore.

A second flat top spud leg barge will be used for materials transport including bagged stone, precast concrete pipe plinths, pipework, skip, etc. Once the pipe plinth foundation excavation is complete, it will be filled with a circa 200mm layer of single sized large stone to act as a levelling and bedding layer for the pre-cast concrete pipe plinth. The stone will be spread and levelled by excavator and checked for correct level by a marine operative wearing a dry suit working in the water. Once the correct level is achieved the excavator will lower a pre-cast concrete pipe plinth onto the stone bedding and this too will be checked for level and alignment. This process will be repeated until all five pipe plinths have been installed to the correct level. The individual excavations will then be backfilled with the excavated bed material.

The replacement ductile iron pipework will then be installed on the top of the pipe plinths such that the invert of the pipe is elevated above current bed level. The pipe will be secured to the pipe plinths with stainless steel straps. The pipe will be checked for alignment and operation.

Upon completion of the works any excess excavated arisings will be placed in a skip on the barge and transported to land for disposal at a suitably licenced facility. The barges and other plant will be demobilized at Tayport in the opposite manner to mobilization.

We anticipate that the on-site works will take no longer than two weeks to complete.