Scottish Water UID Programme 2008/09

£30m scheme to reduce environmental impact in Central Belt of Scotland

by
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New European directives mean that improvements are required to reduce pollution caused by unsatisfactory intermittent discharges (UID's) across the Central Belt of Scotland. Scottish Water's Capital Investment Delivery Strategic Studies Delivery Team was tasked to deliver these improvements while managing the increasingly significant risk for Scottish Water regarding the asset planning and delivery stages of the programme being delivered within the single four year investment period. Some solutions in complex catchments involve the construction of substantial engineering installations including large scale storage and transfer infrastructure with extensive construction in urban areas. During the 2008/09 delivery period, the team exceeded its targets by outperforming a very challenging target of 56 UID outputs by delivering an impressive 61 projects.

Mini excavator with breaker breaking hole in a 7.5m diameter, 7.0m deep Overflow Connection Chamber shaft for a 1.05m diameter inlet pipe. *Courtesy of Scottish Water Capital Investment Delivery*

Design Development

The delivery of the SW Business Investment Plan for the UID Strategic Studies Programme has been supported by Engineering and Hydraulic specialists as part of multi organisational and multi disciplinary teams by following Scottish Water's established procedure as described below. The Engineering and hydraulic specialists input to generate design briefs, these were then developed by consultants to detailed design information packages for construction.

The outputs of the design development stage included:

- Preparation of the Approved Solution Agreement Report.
- Preparation of the Initial Health &Safety information.
- Development of an Initial Project Risk Register.
- Preparation of Initial Target Cost summary pages.
- Preparation of the Initial Communications Plan.
- Preliminary design including Hydraulic Design through to hydraulic design freeze, including selection of major plant and equipment, using Scottish Water's framework agreement lists and selection protocol. The Hydraulic Design of Combined Sewer Overflow (CSO) chambers required use of CSO design tools, verification of hydraulic solutions in models carried out in conjunction with modelling teams, achievement of design freeze of agreed hydraulic parameters to pass on to detailed design teams.

The same Overflow Connection Chamber nearing completion, showing the "Tideflex" non return valve on the 1.05m diameter inlet pipe. *Courtesy of Scottish Water Capital Investment Delivery*

- Production of Geotechnical Desk Studies to specify any geotechnical site surveys required, and to interpret the results of the surveys once carried out. The output of this forming short reports issued to the detailed design teams.
- Coordination with the UID Programme Management Office to carry out asset surveys at the location of all UIDs where work was proposed, topographic surveys of all sites to aid design development, ground radar surveys at all sites to clarify scale and position of existing utilities and GSM surveys to confirm the preferred communication medium necessary to allow remote monitoring. The design development teams identified survey requirements, procurement of the survey work was through the Construction Delivery Partners as Principal Contractor, undertaken as a subcontract order by Scottish Water's Framework Services Contractor.
- Production of Design Briefs and outline design drawings allowed detailed design teams to carry out civil and structural design.
- Confirm telemetry requirements, taking into account SEPA's and SW Operations' monitoring and recording requirements, and whether static or powered screens at each site.
- Gather and collate relevant Planning, Land and Environmental Reports and Information, identifying all statutory notices and consents required and progressing these where possible.
- Understanding and progressing engagement with relevant stakeholders to progress any site specific planning issues, land access and purchase issues, sensitive environmental issues, Roads Authorities issues, customer care, power issues, property surveys, MSPs and Councillors. It was essential in all cases to liaise with internal SW stakeholders.
- Preparation of SEPA Controlled Activity Regulations Discharge Licence Application including tracking the detailed hydraulic flow information as it developed through the data verification and design process.
- Gathering Existing Asset information such as Existing as-built drawings, operating manuals and topographical surveys, and supplementing these as necessary.
- Carry out any necessary impact assessments, and preparation of preliminary Operation and Maintenance Manuals and Telemetry Data for the new installation.
- Completion of Project QA procedures.

Technical Review Team/Technical Reviews: Design development teams contributed to the design review process in conjunction with the Technical Review, Construction, Commissioning Support Team (TRCCS). All design briefs were reviewed by the TRCCS prior to issue to the detailed design consultants.

Signature Solutions: Design development utilised all relative signature designs and framework suppliers. To optimise performance it was essential to maintain excellent liaison with kit suppliers.

Technical Programme: All design development teams support the Programme Delivery Managers in the development of the technical programme.

DSEAR Assessments (Dangerous Substance and Explosive atmospheres Regulations): All design development teams coordinated with the Scottish Water appointed DSEAR who completed FLIDS assessments for all existing sites on the programme. This promoted consistency of approach and provided efficiency to the programme.

Construction

By dedicating significant resource to the optioneering, the hydraulic, civil engineering and structural design, construction was able to be compressed into the second half of the delivery period with a significant ramp up to deliver a peak of 37 jobs handed over to the Client in March 2009.

Best Practice and Stakeholder Risk Management

The team shared lessons learned across the programs by maintaining an open and free access to information, templates, documents, experiences and practice throughout the supply chain including designers, suppliers, contractors, project managers, senior project managers, commercial and technical governance team leaders and members.

The UID programme also implemented a schedule of formal and informal meetings, workshops and focus groups within the larger Scottish Water Delivery Team which included key members of Scottish Water asset planning and capital investment teams, regulators, the supply chain, delivery Partners (both consultants and contractors) and the public to include key players and members of councils and local governments and other industries such as Network Rail, Scottish Gas Networks and Scottish Power.

Progress

The UID Team faced considerable challenges from the very start of the year. Targets were set based on the information available at the time but unfortunately significant portions of the programme were undefined at that stage. This combined with issues surrounding the hydraulic model and unforeseen ground conditions resulted in an average design slippage across the 2008 projects of 181 days. The UID Programme Delivery Team was able to dramatically recover this half year slippage by micro-managing programme level risks and the supply chain to create a focused environment of ownership in delivery. The UID team delivered both its delivery plan milestone for Glasgow and Portobello as well as Meadowhead and Stevenston catchments and also outperformed the regulatory output target of 56 outputs.

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