

Newry WwTW

upgrade using new treatment process

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DRD Water Service in Northern Ireland has a substantial capital investment programme for the maintenance and upgrading of its water and sewerage facilities to enable it to meet its statutory obligations – including meeting the high quality effluent standards set by Environment and Heritage Service. As part of its plan for continuous improvements the existing wastewater treatment works in Newry, County Down is being upgraded – a new treatment process has been designed and is being constructed on the site of the existing works.



Newry WwTW under construction. (courtesy Ferguson McIlveen)

The existing works was constructed during the early 1960s and provides only primary sedimentation. It is seriously under capacity for current demand and consequently, Water Service appointed *Ferguson McIlveen* to manage the procurement of a new works to meet growing demands of the area for the next twenty years.

Due to the constraints of constructing the new plant within the footprint of the existing site it was decided to use a process involving sequencing batch reactor basins (SBR) and tenders were invited for design and construction on a lump sum basis using IChemE (Red Book) Conditions of Contract. Several joint ventures submitted tenders and following extensive tender assessment, the contract was awarded to Earth Tech/Farrans with McAdam Design providing the civil design.

Design parameters

The new works is required to deal with flows from a population

equivalent of 63,000 which should meet the growing demand of the area until year 2020. The design was based on DWF of 162 litres/sec with peak flows up to 486 litres/sec. Final effluent must meet the following discharge standards:

* Biological Oxygen Demand	25 mg/litre
* Chemical Oxygen demand	125 mg/litre
* Suspended Solids	35 mg/litre
* Total nitrogen	10 mg/l

Plant

Four SBR basins are being provided each 7.4 metres high and 31.0 metres diameter. These provide both primary and secondary treatment. Grit removal will be achieved by the provision of a hydrodynamic grit separator. This will remove grit down to a particle size of 200 microns, which will then be discharged into a grit classifier for washing before disposal.



Newry WwTW under construction. (courtesy Ferguson McIlveen)

The works will become an area sludge processing centre and, therefore, a range of sludge handling facilities, both indigenous and imported, are incorporated. Imported sludge will be screened before being pumped into a holding tank. From there it will be fed to two blending tanks where the indigenous and imported surplus activated sludge will be mixed before being pumped to two belt thickeners. The thickened sludge will then be pumped to two holding tanks sized to provide at least ten days storage.

There will be three main buildings constructed using proprietary cladding on structural steel frames. The control room will be located in the administration building, which is being finished to a high specification.

The process will be controlled by one of a new generation of 'intelligent' MCCs which will allow fully automatic operation of the plant, and will provide the facility to constantly monitor the process and record all operations.

It was decided at pre-tender stage not to connect storm drainage pipework to the local stormwater network, due to the danger of spillage entering the system. Instead, the storm pipework within the works has been designed to facilitate 'in-line' storage which allows flows to be returned to the inlet of the works at a controlled rate.

Site

Particular problems on this project are the confined nature of the site and the absolute necessity to maintain the operation of the existing works without disruption.

Demolition must be carried out in a phased sequence to maintain flows while construction progresses. A proposal by the contractor has resulted in two of the new blending tanks being used temporarily as holding tanks for the existing works. This measure has helped

to overcome the problems associated with lack of space.

Environmental

High priority has been given to issues with an environmental impact. Consequently GGBS cement has been used in the concrete above ground structure, this reduces the requirement for quarried materials and has provided a high quality finish. The new tanks are being tested using final effluent from the existing works together with groundwater and river water, to eliminate the use of mains water. Some of the existing plant, which was to be demolished has been salvaged for re-use by Water Service. Several small treatment works in the area will be abandoned leading to improved quality of local watercourses.

Progress

The contract start date was 1 February 2001 and work on site began during the first week of March. Completion period is 24 months of which 15 months have now (at the time of writing) passed. Latest reports show that progress is six weeks behind programme, of which three weeks is because of disruption due to restrictions during the Foot & Mouth outbreak. Contract value is £6.4 million and expectations are high that the works will be deliver on time and to budget.

Relationships

On a project where existing works must be kept operational whilst being replaced the potential for discord between Client and Contractor is high. However, so far on this project any problems have been minor. This is due to the Partnering arrangement which was implemented as a Client requirement in the contract documents. More importantly, it is due to the spirit of all parties to make the contract work.

Note: The author of this article, Frank Trainor, is a Project Manager with Ferguson McIlveen.