

Meden Vale Flood Alleviation Scheme

innovative techniques and products reduce flooding, and health, safety & environmental risks

by Matthew Rogers

Meden Vale is a small mining village located between Mansfield and Worksop in Nottinghamshire. The driver for this £490,000 project, was to alleviate internal foul flooding to 5 (No.) properties, and external foul flooding to 1 (No.) additional property. The project involved the replacement and upsizing of 483m of storm water sewer, the construction of a new outfall structure into the River Meden, and 220m of combined sewer including 100m of online gravity tank sewer and associated manholes. All the works were to be carried out in a residential area under road closures. The existing foul and storm sewerage systems ran parallel with each other, separated by as little as 600mm. Prior to the project commencing on site, all the affected properties were protected from flooding by non-return valves and flood porches as a temporary toolkit solution by the FLOODS team.



Mid-Entry manhole on a 45° bend. Note the proximity of the foul system and existing utilities

Courtesy of CPM Group

The challenge

Severn Trent Water (STW), working closely with North Midland Construction (NMC), permitted the development of a solution that could address the key drivers of:

- Reduce Health, Safety and Environmental Risks
- Reduce waste and environmental Impact
- Realising maximum potential efficiencies
- Reduced footprint and land usage
- Reduce site time and disruption to the local community
- Consistency of design and construction
- Waste generated at point of production

STW and NMC realised the value of engaging key skills in all stages. Throughout the design process strategic supply chain partners

were engaged to utilise their experience, review options and mitigate significant risks.

The solution

Three key innovations were incorporated within the scheme each addressing some of the design drivers. These included the use of mid-entry manholes on the storm system, a precast dry weather channel on the gravity tank sewer and a precast outfall structure.

Mid-entry manhole

The storm manholes were designed to be constructed in line with Sewers for Adoption (6th Edition). The upsizing of the storm system utilised 1,200mm diameter pipes requiring a minimum manhole dimension of 2,100mm. The existing foul system and the proximity of existing utilities conflicted with the manhole position requiring



*Precast dry weather channel cast off site. No confined space entry required
Courtesy of CPM Group*

a solution with a reduced footprint. In consultation with the CPM Group the use of mid-entry manholes was proposed. This consisted of 1,200mm turrets being manufactured as part of the pipe and could be located within both straight and angled sections. Standard 1,200mm manhole rings could be used to provide an access for CCTV and jetting and man access in periods of low flow.

The use of the mid-entry manholes addressed a number of the design drivers. No in-situ concrete benching was required removing the need for confined space working. There was no requirement for in-situ concrete for the base where traditionally there would have been substantial waste. The mid-entry manhole is installed as



Outfall structure delivered to site and installed in a single day

part of the pipe construction with no delay to the programme and therefore reduced disruption to the local community.

Precast dry weather channel

Traditionally a dry weather channel is constructed on site after the pipes have been laid. The work would be categorised as confined space and is both costly and difficult. Where the pipes have been laid as an on-line replacement, over-pumping must be maintained to provide a safe environment for personnel to install the channel. Through the development works carried out by the design and site teams, a solution was found that totally eliminated confined-space working, shortened the contract programme, achieved factory controlled finishes, no wastage of concrete on site, and reduced the disruption to the general public. In consultation with the CPM Group the dry weather channel was constructed off site after the pipe had been manufactured. The pipes were installed on site in a conventional manner with no further works required. Savings of 30% have been achieved over traditional methods. As part of our commitment to other members of the Severn Trent Water One Supply Chain we have shared this innovation and it has been replicated into schemes across the STW region.

Precast outfall structure

In consultation with Carlow Precast and the Environment Agency the outfall structure was designed as a single unit that was manufactured off site. The installation was completed in a single day, greatly reducing the environmental impact of working adjacent to rivers. Traditionally this would have taken approximately two weeks depending on the complexity of the structure. Again this fulfilled a number of the design challenges. Health and safety issues were addressed reducing the period for working adjacent to a watercourse. The programme savings and the potential for disruption to the local residents were reduced. A factory finish was achieved and all waste was kept at the source. Savings of 25% were achieved.

Conclusion

STW and NMC have promoted innovations at every stage of the Design and Build process by actively engaging with the strategic supply chain partners and bringing value to the key stakeholders. The concepts for the manholes, dry weather channels and outfall structures, along with other precast structures are now widely used by NMC across their construction works, and shared with members of the STW Supply Chain. NMC is continually striving to maintain its position as a key contractor in the STW One Supply Chain by introducing innovative techniques and products.

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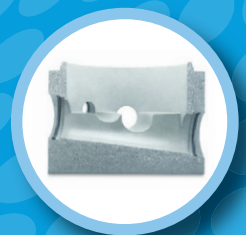
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