

Teign Estuary CSOs

providing screening, storage & reduction of spills to estuary

by
Dave Backway, Andy Dawe & Matt Rankin

As part of its approved AMP3 programme, it was necessary for South West Water to provide adequate screening and storage for all CSOs identified by the Environment Agency and listed on the NEP as discharging into the Teign Estuary, including a reduction in the overall number of significant spills to the Estuary. This is required to comply with the Shell Fish Waters Directive. It is also necessary to ensure that all pumping station emergency overflows (EO) comply with the directive to reduce the impact on the environment in the event of mechanical or electrical failure.



Work on Teign Estuary CSO Project

courtesy: South West Water

Drainage studies and hydraulic modelling

Faber Maunsell were commissioned in 2002 to undertake a Drainage Area Study for the Teign Estuary CSO project, which included construction of hydraulic models for the catchment areas draining to Buckland WwTW. The model construction was based upon data collection surveys, which included manhole, ancillary, impermeable area, CCTV and short term flow monitoring.

The Teign Estuary drainage catchment has a total modelled population of approximately 68,000 and all CSOs in the nine catchment areas of Newton Abbot, Aller Valley, Kingsteignton, Teignmouth, Shaldon and the Teign Villages of Bishopsteignton, Stokeinteignhead, Combeinteignhead and Netherton were considered in the modelling assessment. These CSOs discharge either directly or indirectly, via the River Lemon or Aller Brook, into the Teign Estuary.

A total of six hydraulic models were produced, which were Newton Abbot combined with the Aller Valley, Kingsteignton, Teignmouth, Shaldon, Bishopsteignton, and the Teign villages comprising Stokeinteignhead, Combeinteignhead, and Netherton. The verified *Infoworks* models were issued to the EA for approval and notification that they were fit for purpose to be used to assess the works required to comply with the Shellfish Water Directive.

Design option modelling.

The verified models were combined into a single design model to consider the agglomerated spills from all CSOs within the Teign Estuary catchments. This assessment was based on the need to limit the

discharge of significant spills to a maximum of 15 per annum from the combined Teignmouth and Shaldon sewerage catchments and 10 per annum from the Newton Abbot, Kingsteignton, Teign Villages and Bishopsteignton sewerage catchments. The significant spill volumes were defined as 50m³ for Bishopsteignton, which discharges directly into the shellfish area, and 100m³ for the remaining catchments.

CSOs requiring improvement

The original NEP list identified that there were 57 CSOs that required additional screening within the Teignmouth and Newton Abbot catchment areas and £10 million of capital expenditure was allocated to undertake the works. Upon completion of the DAS it was found that a large proportion of the CSOs were either duplications or bifurcations. It was then necessary to review the NEP list and reassess all the discharges within the catchment and formulate a new list of CSOs that spill during a one in five year or greater storm event. This proposed list was discussed with the EA and finally submitted in accordance with the change protocol requirements whereby replacement CSOs had to be like for like and cost neutral.

The final list agreed with the EA has fewer CSOs than the original NEP list. 44 CSOs now have to be improved. Six would require storm water attenuation tanks of varying volumes between 250 and 1,000 cubic metres.

To facilitate the construction process and concur with the overall modelling programme, the storage requirements were programmed in the later stage of the overall programme.

CSO improvements to be completed by 31st March 2004

With the number of CSOs to be improved it was important to programme the work carefully to ensure minimum disruption to the local community. Also it was important to ensure continuity and efficient use of resources.

The project team consisted of *South West Water, Faber Maunsell, M J Gleeson and Purac*. To this was added South West Water's frame work screen supplier *COPA* whose input was vital. The team was empowered to identify the programme for the CSOs. It was determined that those CSOs not requiring additional storage or affected by the change protocol would be identified as outputs achievable before March 2004. Twentyfive of the 44 were identified for completion and sign off by the EA prior to the end of March 2004.

CSOs are located in gardens, roads and public areas. Extensive liaison with land owners was required, and this had to be undertaken in accordance with Code of Practice notice periods. To enable this, design information and scope had to be outlined well in advance of construction.

Majority of the CSOs to be improved required new chambers to house the necessary screening equipment as the existing overflow chambers were either too small to accommodate the proposed screens, or in major roads where it was not practical to disrupt existing traffic flows. Where possible existing overflows were sealed, or if a number of overflow chambers were within close proximity to each other a solution was identified to replace these with one new overflow, thereby limiting the number of discharges.

Major problems

Major problems in most of the CSOs' locations were the location of

existing services and unforeseen obstructions. Information was gathered from all the relevant Utilities and Authorities prior to outline design to assess the extent and location of existing services, thus enabling the location of new apparatus in the ground. However, the actual position of the existing services rarely matched that of the service drawings, in addition old services and abandoned services were encountered, which had to be verified. This process could have been costly in terms of programme as well as financially but was managed carefully to avoid overruns. Many old culverts up to 2-3m diameter have been discovered, re-routing pipelines under/over/around these obstacles has been very difficult.

Wartime road strengthening

Road strengthening carried out during the war has been encountered. This has taken the form of reinforced concrete beams 2m wide for the full road width and deeper than the 2m trench depth. Due to the proximity of other services in poor condition, breaking out of the concrete has had to be undertaken very carefully, using diamond cutting equipment.

Careful consideration had to be given to the logistical side of our works, close liaison with the local Highways Department was maintained. Programming of the road works had to be considered with regard to each other, otherwise we could have shut down the whole of Newton Abbot.

The Teign Estuary CSOs project is currently on track and within budget. ■

Note on the authors: *Andy Dawe is Programme Leader with South West Water; Dave Backway is Project Engineer with Faber Maunsell; Matt Rankin is Project Manager with M J Gleeson.*



clearly a winner

Our Raked Bar CSO Screen's excellent track record speaks for itself

Over 400 installations...No failing consents

YOU FIGURE IT OUT!

Copa LIMITED

FREEFONE 0800 783 6102
www.copa.co.uk
enquiries@copa.co.uk

679c