

Whiteladies Road

Overview:

Site Location:	>> Bristol
Client:	>> Wessex Water

Whiteladies Road was located within the University Complex zone of Clifton in Bristol. A heavily populated area with both residential and lecture complexes associated with Bristol University. Severe surface water flooding had been an issue for the area and has hard surfacing covered previously grassed areas along with development the area had significant external flooding. The initial Project Brief dictated the need to separate the combined Storm and Foul system and increase capacity within the system whilst diverting flows to the under capacity main Bristol Trunk Sewer and alleviate the currently over prescribed adjacent storm sewer.

Specific complexities of the scheme from the initial investigation works had indicated that the ground was rock, the road was heavily populated with services from all utility providers and the University's own apparatus, and the proposed connection point to the Bristol tunnel was 65m deep. The original proposal developed through feasibility was to divert the University Apparatus, divert a 300mm Cast Iron Gas Main and lay the new 3—5.5m deep 675dia sewer (800m in length) off line, with an internal backdrop in to an existing shaft on the 65m deep existing sewer on a direct drop.



FIG 1— Demonstrating road gradient of 20degrees



FIG 2— Vehicle lay-by and improved aesthetic impact

At the outset of the scheme Lewis CE challenged the Project Brief, the benefit it provided to the client relative to the Capital Expenditure cost and the need for the diversion of the services planned (costing Circa 300k). Our proposal was to maintain the combined system (which combined further downstream even if separated at source) lay on line, hence avoiding the need for the diversion of the existing 300mm Cast Iron Gas Main and further investigate the route of the University Network using Ground Radar Penetrating Surveys (GRPS), trial hole and non intrusive tracing and mapping.

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To demonstrate the savings available to the client we prepared a high level cost comparison for the off line and on line replacement options. This comparison in isolation provided a saving in excess of £440k and a time saving of 7weeks. This was achieved by removing the excavation in rock (due to the pipeline being on-line), the saving of the diversion of the Gas main and the saving of the need to separate the gullies from what was to be a separated system. Further benefits were the reduced Environmental impact due to the reduction in noise pollution associated with the excavation of rock and the reduction in Road Closure durations. The further challenge of the need to divert the University Apparatus also proved successful and the 250k quotation from Bristol University for the diversionary work was avoided. Our Risk Register developed identified these items are we offered each of these events as Client held risks providing them the financial gain associated with the savings.

Construction works on the scheme went very well with all target outputs being achieved and the proposed flow management system for on-line replacement operated as planned and without issue. Disruption to the operation of University was managed well and works were complete on programme and below budget.

The connection to the 65m deep existing tunnel posed its own difficulties. A close working relationship with the designer and the Operator allowed us to understand the characteristics of the system and develop RAMS which entirely eliminated the risk of working within potential surcharge areas. With early warning triggers/flow monitoring and clear escape procedures.

Pre entry surveys and clear installation sequences/bolting locations/fixing details ensured that all fabrication was complete off site and was 'right first time' minimising the activities within the confined shaft. Further details such as forced ventilation shafts/pre fabricated temporary covers with banksman standpoints etc complimented the pre planning phase and ensured an installation of a 65m long Stainless steel 700mm drop pipe within 10days.



Lewis Civil Engineering Ltd, Mwyndy Cross Industries, Cardiff Road, Pontyclun, Rhondda Cynon Taff. CF72 8PN

Telephone: 01443 449 200 Fax: 01443 449 201

Website: www.lewis-ltd.co.uk E-mail: enquiries@lewis-ltd.co.uk