HTM/11/11
Mid Devon Highways and Traffic Orders Committee
17 October 2011

Gornhay Syphon Improvements

Report of the Head of Highways and Traffic Management

Please note that the following recommendations are subject to consideration and determination by the Committee before taking effect.

Recommendation: It is recommended that:

(a) the scheme layout shown in Appendix I be approved for construction at an estimated cost of £198,500;
(b) permission be granted to secure the necessary land by negotiation.

1. Summary

This report discusses the proposed improvements to the syphon beneath the A361 North Devon Link Road at Gornhay, Tiverton.

2. Background/Introduction

The inverted syphon conveying Chettiscombe Stream under the A361 was constructed as part of the trunk road scheme in the 1980's. The Department of Transport had been advised that if the road profile at this point could not be raised sufficiently to allow the provision of a conventional culvert crossing the stream should be diverted into the River Lowman immediately upstream of the new road. The syphon was built as an alternative.

The syphon has never performed well and is not consistent with modern engineering practice. The stream carries significant sediment loads in times of higher flows and also transports large amounts of buoyant and semi-buoyant debris to the syphon entrance where blockage of the trash screen is experienced frequently. The resultant overspill onto the A361 carries sediment onto the carriageway and then downstream into the road drainage system which outfalls into the flood relief culvert under the A361. This overflow onto the carriageway can be a serious hazard to road users.

The syphon is cleaned annually at a typical cost of £20,000 cost but this does not solve the overflow problem.

The site requires regular maintenance, involving pressure jetting to dislodge accumulated silt and man entry to remove the large boulders that collect in the syphon. Each time this maintenance work is required the watercourse has to be overpumped and the syphon emptied. This operation also requires man entry into the syphon to install temporary pump discharge pipework.

3. Previous Scheme

There is a history in seeking a workable solution to the syphon problem. The last scheme to be proposed looked to provide an overflow channel to convey excess flows alongside the A361 and through a new pipe beneath Little Gornhay Lane and the A361 east bound on slip, discharging into the existing ditch and ultimately the River Lowman.

This scheme could not be delivered due to a combination of high cost and unsuccessful land negotiations with the Knightshayes Estate and their tenant farmer.

4. Proposal

The proposed scheme aims to reduce the risk of flooding, identify when the watercourse may be at risk of flooding, reduce the frequency of maintenance works and remove the requirement for man entry, thereby reducing the risk to users of the A361, reducing revenue expenditure and improving the safety for contractors employed to carry out maintenance.

The scheme is based on the installation of 6 no. catchpits to intercept the large boulders that are carried along the bed of the watercourse. The catchpits are to be formed from large precast concrete box culvert sections laid on their side.

In addition the spacing of the existing trash screen is to be reduced from 200mm to 150mm to reduce the opportunity for large debris to enter the syphon. Current Environment Agency guidance suggests that reducing the angle of the screen to 45^{o} will also help to prevent debris accumulating on the bars and restricting the flow.

Removal of large debris that accumulates in the catchpits will be undertaken from the new working space provided alongside. The removal of silt and smaller debris that does accumulate in the syphon will still be carried out by jetting and suction. This operation will be made safer by the installation of a permanent pump discharge pipework which will be fixed to the sofit of the culvert for use during overpumping.

It is also proposed to provide a water level detector that will issue an alarm via SMS (text message) to the local maintenance team and the Highways Operations Control Centre to warn of rising water levels.

5. Consultations/Representations/Technical Data

The Environment Agency stated in their letter dated 26 June that they support the use of in-line ponds to reduce the volume of stream bed material that currently enters the A361 syphon. This support has been reiterated during discussions for a Drainage Consent.

6. Financial Considerations

There is a budget provision for this scheme in the 2011/12 Highway Structural Maintenance LTP Capital programme.

7. Sustainability Considerations

The scheme aims to reduce the maintenance requirements of the syphon, providing a positive economic benefit. Incidental environmental benefits will be offered through otter ramps, requested by the Environment Agency.

8. Legal Considerations

There are no specific legal considerations

9. Risk Management

This proposal has been assessed and all necessary safeguards or actions have been taken to safeguard the Council's position.

10. Options/Alternatives

The previous scheme proposed for this location could not be delivered due to the high cost and difficulties associated with the purchase of land.

This scheme is significantly cheaper and requires less land. Initial enquiries with the land owner and their tenant have been positive.

The other alternative is to maintain the status quo and accept the current level of maintenance expenditure, risk to maintenance operatives and risk of flooding of the A361.

11. Reason for Recommendation/Conclusion

This scheme provides reduced maintenance costs, improved safety for operatives and reduces the risk to users of the A361.

Lester Willmington
Head of Highways and Traffic Management

Electoral Division: Tiverton East

Local Government Act 1972: List of Background Papers

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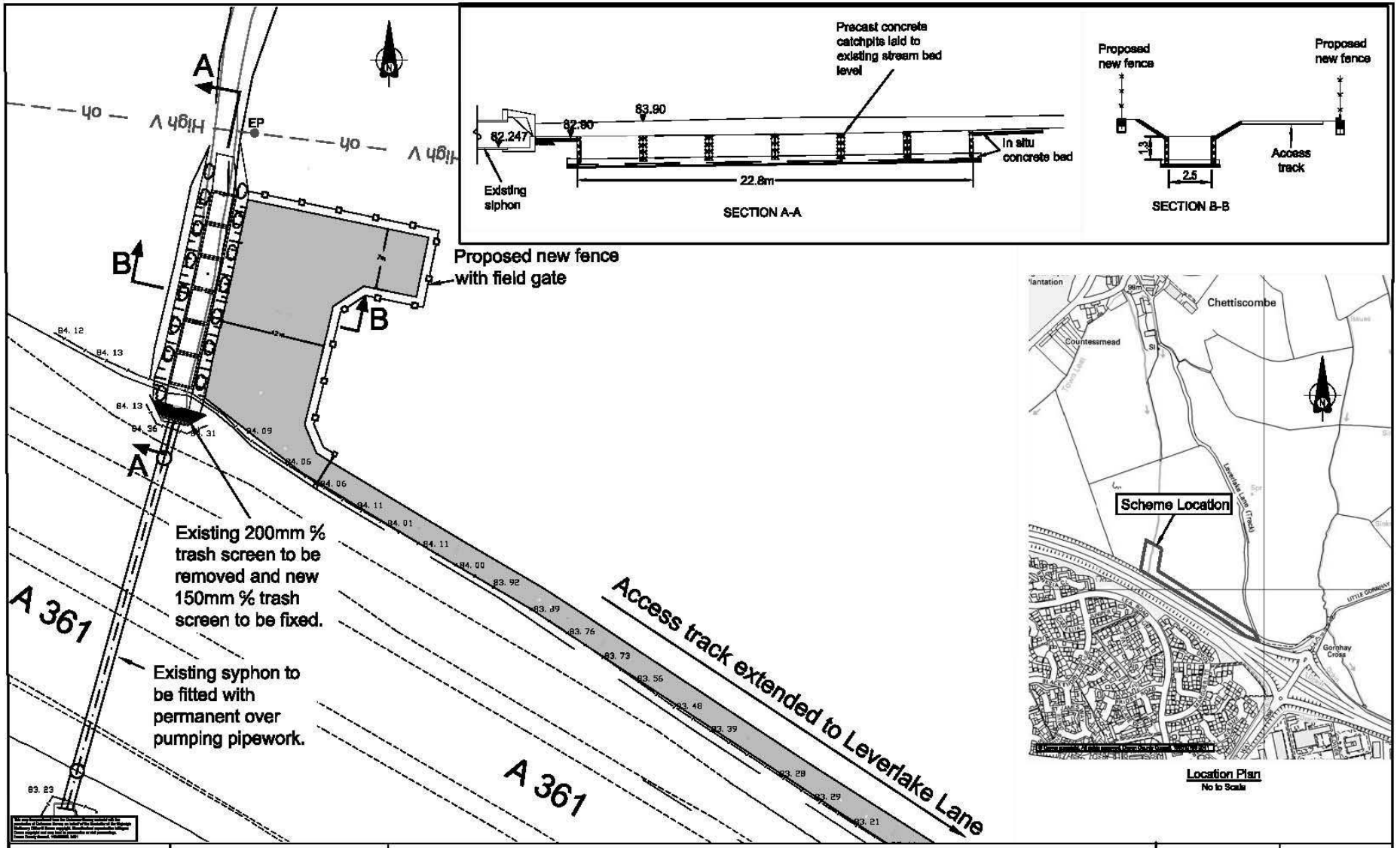
Background Paper	Date	File Reference
1. Nil		

rr260911mdh
sc/cr/gornhay syphon improvements
02 hq 031011

Appendix I
To HTM/11/11



Devon County Council	**Engineering Design Group**	HATOC job/title/proposal GORNHAY SIPHON IMPROVEMENTS	date September 2011	scale NTS
			number Appendix	
				ACAD Ref