A57 Link Roads

TR010034

9.82 River Etherow Outfall Technical Note

Rule 8(1)(k)

Planning Act 2008

Infrastructure Planning (Examination Procedure) Rules 2010

April 2022

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Examination Procedure) Rules 2010

A57 Link Roads

Development Consent Order 202[x]

9.82 River Etherow Outfall Technical Note

Rule Number:	Rule 8(1)(k)
Planning Inspectorate Scheme Reference	TR010034
Application Document Reference	TR010034/EXAM/9.82
Author:	A57 Link Roads Project Team, National Highways and Atkins

Version	Date	Status of Version
1	April 2022	Deadline 9

Table of contents

1. Introduction

1.1.1. This technical note is to address the Environment Agency's Response to the Examining Authority's Second Written Question, REP6-039, 11.10 to detail the proposed outfalls from the A57 Link Roads scheme to the River Etherow.

1.1.2. A brief description of both catchments is provided along with the calculated outfall rate which will be used in the design. A Highways England Water Risk Assessment Tool (HEWRAT) assessment has been undertaken for the highway drainage catchment and treatment steps have been introduced to mitigate any pollution resulting from this network.

1.1.3. In addition to the two drainage outfalls the scheme also constructs a bridge across the River Etherow which includes new embankments in the flood plain. The works to mitigate the impact on the flood plain and bridging of the Etherow are not covered in this document and are subject to a separate permit application.

1.1.4. There are a number of other drainage catchments along the A57 Link Roads scheme which outfall to ordinary watercourses. The agreement of outfall rates and treatment requirements for discharge to ordinary watercourses is being sought from the Lead Local Flood Authority and is not covered within this document.

2. Catchments

2.1.1. There are two proposed outfalls to the River Etherow, these are shown on the Catchment Plans which are included in Appendix A. Catchment 4 is the only highway drainage catchment that discharges directly into the River Etherow. Catchment 6 relates to a cut off drainage ditch and a short section of new public footpath.

2.1.2. As part of a Ground Investigation carried out in 2021 infiltration tests were carried out close to the proposed outfall locations. All of these had very low infiltration rates and infiltration was not a suitable method of discharge of surface water runoff. However, the use of swales and unlined attenuation ponds will help promote some level of infiltration and capture of water during periods of low flows.

2.2. Catchment 4

2.2.1. This catchment is to the east of the River Etherow and includes most of the new extents of the junction between the A57 Link Road and Woolley Bridge, as shown on the drainage plans. It also includes the existing Woolley Bridge northbound carriageway which currently outfalls into the Etherow without any restriction.

2.2.2. The outfall to the River Etherow is at the southern end of the junction. The outfall is attenuated and treated by two grassed detention basins linked with an oversized pipe. There are also catchpits throughout the network and trapped gullies to further reduce sediment in the network.

2.3. Catchment 6

2.3.1. Catchment 6 picks up approximately 120m of proposed access track and footway where the levels do not allow it to be directed to the adjacent grassed attenuation pond. This track will be surfaced (impermeable) to provide passage for both pedestrian users and for cattle to be driven to fields either side of the proposed link road. The catchment also includes drainage from the cut off ditch to the north of the proposed scheme. This ditch extends for approximately 570m on the northern side of the scheme as shown in the Catchment Plans.

2.3.2. The outflow from the footway/maintenance track is collected via filter drains and attenuated by a large diameter pipe before it is discharged together with the ditch to the Etherow immediately north of the proposed bridge.

3. Greenfield Flow Assessment

3.1.1. A greenfield flow assessment was undertaken for the two catchments under consideration. This flow will be used as the limiting outfall flow from the proposed networks.

3.1.2. Greenfield flows were calculated using the ICP SUDS method for the two catchments, with the results of this assessment shown in Table 3-1. These flows will be used to develop the detailed design models for the drainage, ensuring the designed flows never exceed these greenfield values for the four return periods in Table 3-1. This flow restriction will be achieved using a combination of flow control devices placed downstream of the attenuation and prior to outfall.

3.1.3. Design inputs for the ICP SUDS calculation were:

- Region 10
- SAAR: 1080
- Soil: 0.45
- % Urban: 0

Table 3-1 - Greenfield Runoff

Catchment Name	Contributing Permeable Area (Ha)	Greenfield Runoff Rate (l/s)			
		1 Year RP	5 Year RP	30 Year RP	100 Year RP
4	0.617	3.9	5.4	7.6	9.4
6	0.624	4.0	5.4	7.7	9.5

Notes on Area Calculations – See Appendix B for diagrams of contributing areas:

- The contributing permeable area for each catchment is not the same as the drainage network catchment area. It is the existing greenfield area that outfalls to the watercourse which is removed by the scheme proposals.
- Catchment 4 has been calculated as the area to the east of the River Etherow that is removed from its catchment. This includes the existing Woolley Bridge northbound carriageway which has been included in the greenfield calculation and not modelled as brownfield.

- Catchment 6 has been calculated as the area removed from the catchment of the Etherow by the proposals to the east of the river.

4. Water Quality and Treatment

4.1.1. A HEWRAT assessment has been carried out for the outfall from highway drainage. After the application of suitable treatment measures the risk to the River Etherow has been categorised as low. The results of the HEWRAT assessment can be viewed in Appendix 13.1 of the Environmental Statement issued for Development Consent Order Application:

[redacted]

4.1.2. Treatment is achieved for outfall 6 via the grassed attenuation ponds and catchpits as described in Section 2 of this document.

5. Summary

5.1.1. This note outlines the design greenfield flow and treatment assessments carried out for the A57 Link Road scheme. Acceptance is requested for the outfalls to Networks 4 & 6 and the flows listed in Table 3-1.

5.1.2. A headwall will be constructed at each outfall location to link the drainage into the existing watercourse. The details of this structure and any erosion protection measures required to the watercourse will be submitted separately to the Environment Agency for approval as part of a Flood Risk Activity Permit.

Appendices

Appendix A. Catchments 4 and 6 – Permeable and Impermeable Areas

Medium

Millimetres 100 0 10

DO NOT SCALE

MOTTRAM IN LONGDENDALE

WEDNESHOUGH

MARKET STREET

A57 WOOLLEY LANE

A57(T) MOTTRAM MOOR

CARRHOUSE LANE

TARA BROOK

WOOLLEY BRIDGE ROAD

LUMB BROOK

MOTTRAM MOOR JUNCTION

POND 2

OUTFALL 2

CARRHOUSE LANE UNDERPASS

OUTFALL 5

RIVER ETHEROW BRIDGE

OUTFALL 6

WOOLLEY BRIDGE JUNCTION

POND 3

OUTFALL 3

OUTFALL 4

RIVER ETHEROW STORAGE AREA

TAMESIDE MBC

DERBYSHIRE CC

This map is based on Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office, © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Highways England 10/030649, 2022.

Scale 1:1

0.01m 0m 0.02m 0.04m 0.06m

KEY

- CATCHMENT 6: IMPERMEABLE AREA
- CATCHMENT 6: PERMEABLE AREA
- CATCHMENT 4: IMPERMEABLE AREA
- CATCHMENT 4: PERMEABLE AREA

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction
N/A

Maintenance / Cleaning
N/A

Use
N/A

Decommissioning / Demolition
N/A

Description	Status	Revision	Issue Date
Description	Status	Revision	Issue Date
Description	Status	Revision	Issue Date
Description	Status	Revision	Issue Date
Description: Submission to Environment Agency	Status: S2	Revision: P01	Issue Date: 27/04/22

Client: national highways

Project Title: A57 LINK ROADS

Drawing Title: CATCHMENTS 4 & 6 PERMEABLE AND IMPERMEABLE AREAS

Drawing Number

Project	Originator	Volume	Location	Type	Role	Number
HE551473	BBA	HDG	S7_DN_N0514	SK	CD	000001

Original Size:	Scale:	Project Ref. No:	Sheet:	Rev:
A1	1:20000	5201114	1 of 1	P01

Appendix B. Existing Catchments – Greenfield Flow Assessment

Medium

DO NOT SCALE

Millimetres 0 10 100

LEAD LOCAL FLOOD AUTHORITY WATERCOURSES

Existing Tara Brook catchment that flows to watercourse in same manner as existing

2.90 Ha Existing Tara Brook catchment that is now collected by highway drainage

Unnamed Watercourse E catchment that flows to watercourse in same manner as existing

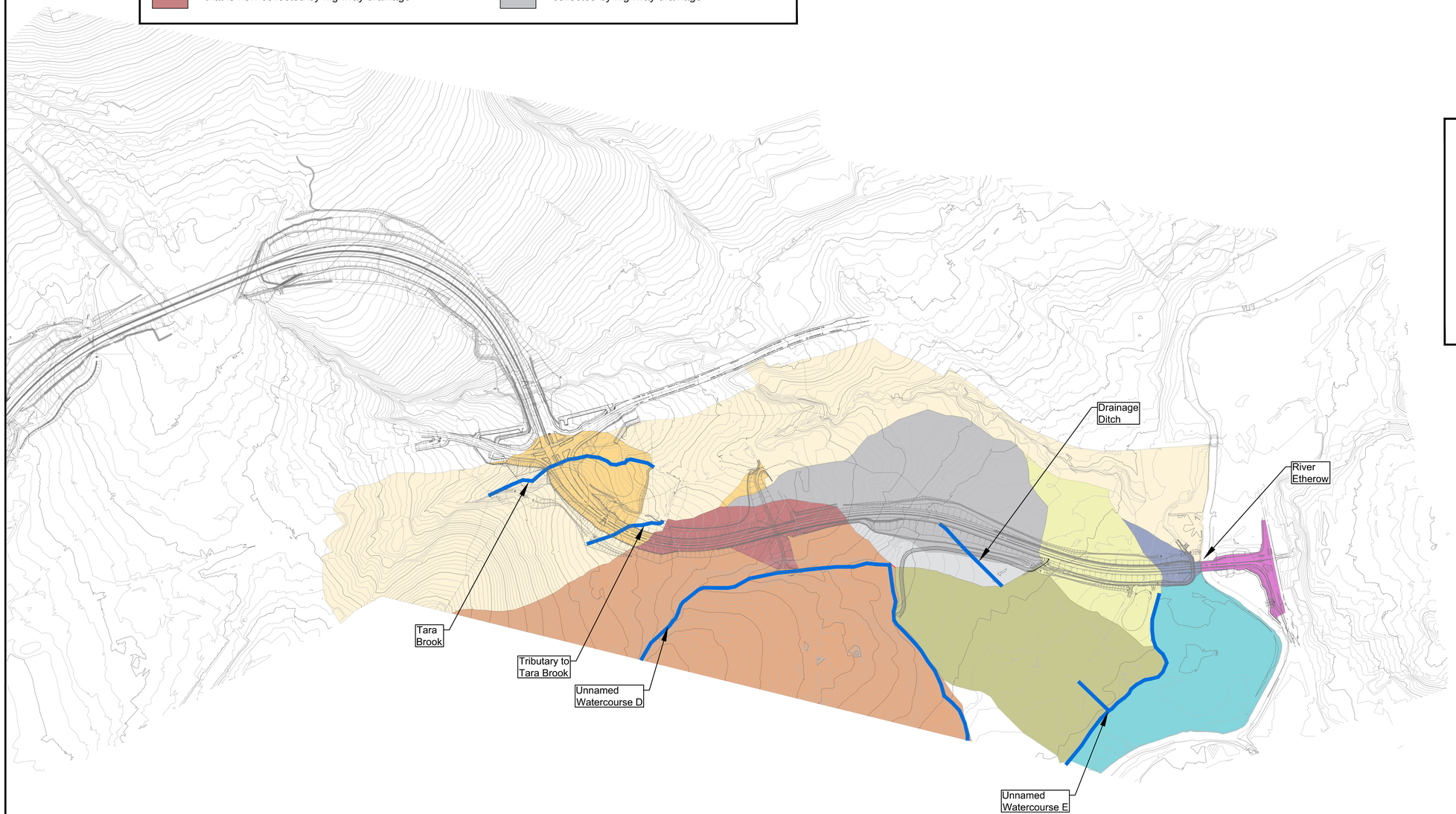
4.03 Ha Unnamed Watercourse E catchment that is now collected by highway drainage

Unnamed Watercourse D catchment that flows to watercourse in same manner as existing

2.37 Ha Unnamed Watercourse D catchment that is now collected by highway drainage

Drainage ditch catchment that flows to watercourse in same manner as existing

Drainage ditch catchment that is now collected by highway drainage



ENVIRONMENT AGENCY WATERCOURSE

0.624 Ha Existing River Etherow catchment that is now collected by drainage catchment 6

0.617 Ha Existing River Etherow catchment that is now collected by highway drainage catchment 4

Existing River Etherow Catchment that flows to watercourse in same manner as existing

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction
REFER TO HEALTH AND SAFETY RISK REGISTER DOCUMENT No: HE551473-BBA-GHS-WHL_AL_SCHME-RA-ZS-000001.

Maintenance / Cleaning
REFER TO HEALTH AND SAFETY RISK REGISTER DOCUMENT No: HE551473-BBA-GHS-WHL_AL_SCHME-RA-ZS-000001.

Use
REFER TO HEALTH AND SAFETY RISK REGISTER DOCUMENT No: HE551473-BBA-GHS-WHL_AL_SCHME-RA-ZS-000001.

Decommissioning / Demolition
REFER TO HEALTH AND SAFETY RISK REGISTER DOCUMENT No: HE551473-BBA-GHS-WHL_AL_SCHME-RA-ZS-000001.

Description	Status	Revision	Issue Date
Description	Status	Revision	Issue Date
Description	Status	Revision	Issue Date
Description	Status	Revision	Issue Date
Tameside Discharge Consent	S2	P01	29/03/22
Description	Status	Revision	Issue Date
Submission to Environment Agency	S2	P02	27/04/22

Status: S2

Drawing Suitability: FOR INFORMATION

Client: national highways

Project Title: A57 LINK ROADS

Drawing Title: DRAINAGE EXISTING CATCHMENTS SHEET 2 OF 2

Drawing Number
Project | Originator | Volume | Location | Type | Role | Number
HE551473 - BBA - HDG - WHL_AL_SCHME- SK - CD - 000003

Original Size: A1 | Scale: NTS | Project Ref. No: 5201114 | Sheet: 2 of 2 | Rev: P02

© Crown copyright (2022).
You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence:

visit [redacted]
write to the Information Policy Team, **The National Archives, Kew, London TW9 4DU**,
or email **psi@nationalarchives.gsi.gov.uk**.

Printed on paper from well-managed forests and other controlled sources.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ
National Highways Limited registered in England and Wales number 09346363