

ELSECAR HERITAGE CENTRE DRAINAGE STRATEGY

Curtins Ref: 084010-CUR-00-XX-RP-C-0002

Revision: P01

Issue Date: 01/08/25

Client Name: BARNSELY METROLOPOLITAN BOROUGH COUNCIL

Client Address: ELSECAR HERITAGE CENTRE, WATH RD, ELSECAR, BARNSELY, S74 8HJ

Site Address: ELSECAR HERITAGE CENTRE, WATH RD, ELSECAR, BARNSELY, S74 8HJ

Rev	Description	Issued by	Checked	Date
P01	Preliminary Issue	RT	RT	01/08/25

This report has been prepared for the sole benefit, use, and information for the client. The liability of Curtins Consulting Limited with respect to the information contained in the report will not extend to any third party.

Author	Signature	Date
ROBIN TURNER PRINCIPAL ENGINEER		01/08/25

Reviewed	Signature	Date
ROBIN TURNER PRINCIPAL ENGINEER		01/08/25

CONTENTS

1 introduction	4
1.1 Purpose of the report	4
1.2 Project background	4
2 EXISTING DRAINAGE	5
2.1 Existing connections to Yorkshire Water combined drainage	5
2.2 Southern Pumping station – B21	5
2.3 Northern Pumping station – “DISTILLARY”	6
3 PROPOSED DRAINAGE	7
3.1 Southern Pumping station – B21	7
3.2 Northern Pumping station – “DISTILLERY”	7
APPENDIX A	8
Existing drainage layout pre development	8
APPENDIX B	9
Proposed drainage layout post development	9

1 INTRODUCTION

1.1 Purpose of the report

Curtins have been requested by Barnsley Metropolitan Borough Council to prepare a response to the Yorkshire Water objection to the proposed amendments to the Elsecar Heritage Centre. The purpose of the report is to clarify the purpose of the improvements and to demonstrate that there will be no detrimental effect to the Yorkshire Water drainage network

1.2 Project background

Curtins have been asked to rectify the existing drainage at the Elsecar Heritage site. Historically this site was used for mining purposes, with the site built in 1795 incorporating a forgery and furnace. The existing site contains a mixture of existing and more modern drainage throughout. It has been identified that some of the existing surface water drainage connects to the onsite combined drainage which ultimately discharges to the Yorkshire Water Sewer in Wath Road to the north of the site.

In order to reduce the surface water discharge to the Yorkshire Water sewer it is intended to reconnect existing drainage to meet modern design standards, ie, connect surface water to the watercourse. It is also intended to upgrade the existing foul water system, including providing a new foul pumping station to allow for future development. It is proposed that the reduction in surface water discharge would offset the proposals for improvements to the foul drainage .

2 EXISTING DRAINAGE

2.1 Existing connections to Yorkshire Water combined drainage

On the current site, the main connections to Yorkshire Water server are achieve via 2 No existing pumped rising mains. The existing pumped chambers currently receive a mix of foul and surface water. Since information has been submitted to planning, we have received additional information about the existing pumps used and have been able to determine the maximum flow rate of the existing pumps. The location of the existing pumps and the relevant existing catchments are shown on Drawing No 084010-CUR-XX-XX-D-C-92301 in **Appendix A**.

The Existing brownfield runoff rates and pump discharge graphs are shown in the following sections.

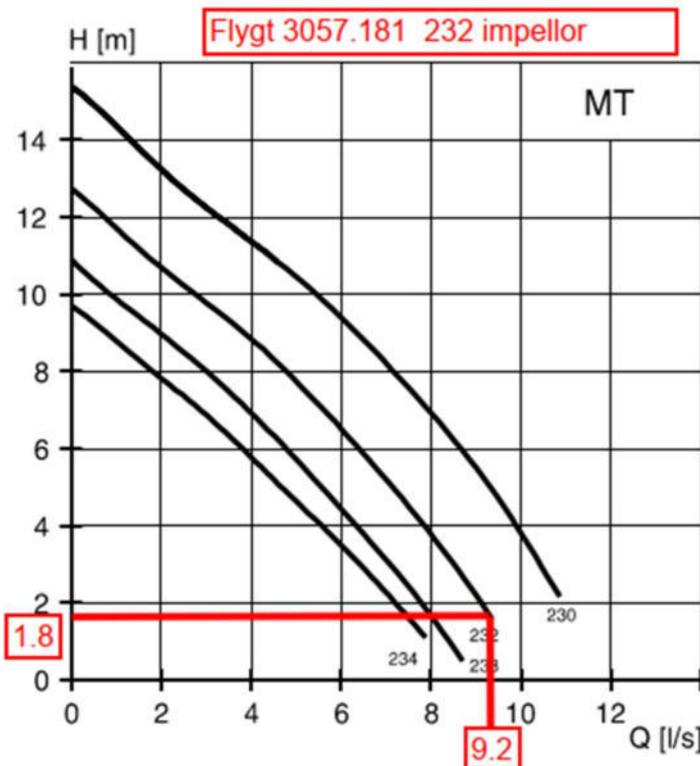
2.2 Southern Pumping station – B21

The south pumping station consists of 2 pumps, being a main and standby. Both pumps are Flygt 3057.181.(232 impellor)

The surface water catchment alone is a total area of 4390 m2. Brownfield runoff calculations for this catchment are shown below:

Storm Event (yr)	M5-60	Growth	Rainfall	Q	Cv	Cr	i	A	Discharge (l/s)
1	19	0.87	16.53	2.78	0.75	1.3	17	0.439	19.7
30	19	1.95	37.05	2.78	0.75	1.3	37	0.439	44.1
100	19	2.63	49.97	2.78	0.75	1.3	50	0.439	59.5

Maximum current flow rate for the pump is 9.2 l/s as shown below:



As brownfield runoff will be in excess of the maximum rate of the pump it can reasonably be expected that during rainfall, the pumps will be operating at the maximum discharge rate of **9.2 l/s**.

2.3 Northern Pumping station – “DISTILLARY”

The north pumping station consists of a single Flygt pump reference 3085.160 with a 463 impellor

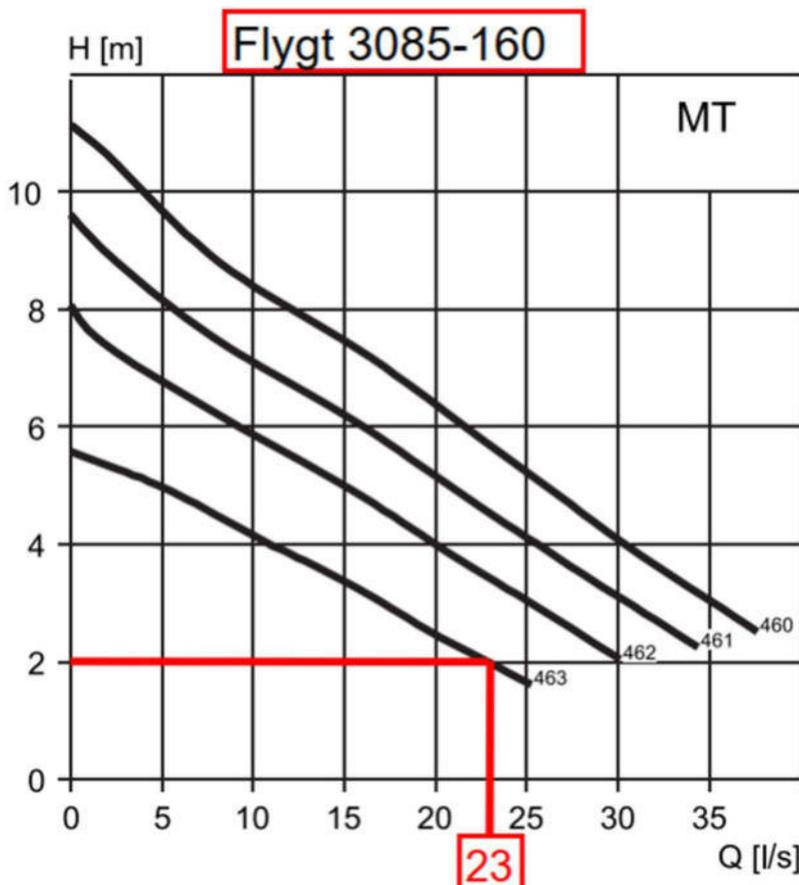
The surface water consists two catchments with area of 912 m² and 502 m². Brownfield runoff calculations for these catchments are shown below:

Storm Event (yr)	M5-60	Growth	Rainfall	Q	Cv	Cr	i	A	Discharge (l/s)
1	19	0.87	16.53	2.78	0.75	1.3	17	0.091	4.1
30	19	1.95	37.05	2.78	0.75	1.3	37	0.091	9.2
100	19	2.63	49.97	2.78	0.75	1.3	50	0.091	12.4

Storm Event (yr)	M5-60	Growth	Rainfall	Q	Cv	Cr	i	A	Discharge (l/s)
1	19	0.87	16.53	2.78	0.75	1.3	17	0.05	2.3
30	19	1.95	37.05	2.78	0.75	1.3	37	0.05	5.0
100	19	2.63	49.97	2.78	0.75	1.3	50	0.05	6.7

Total maximum brownfield discharge=12.4+6.7 = 19.1 l/s

Maximum current flow rate for the pump is 23 l/s as shown below:



In addition to brownfield runoff, the pump also serves existing foul water infrastructure.

The calculated existing foul water peak flows are 7.6 l/s

Maximum flow of brownfield runoff plus foul water peak flow = 19.1 + 7.6 = **26.7 l/s**

Therefore maximum peak flows would range during rainfall events from 7.6 l/s to 26.7 l/s (excluding any allowance for climate change). However in extreme events above the 1 in 100 year event, the maximum pumped flow would not exceed **23 l/s** as that is the maximum pump flow rate.

3 PROPOSED DRAINAGE

3.1 Southern Pumping station – B21

It is intended to disconnect the surface water system currently connected to the southern pumping station. New pipes will be installed and connect the existing surface water drainage to the culverted watercourse. Existing foul drainage shall continue to discharge to the pump which ultimately connects to the Yorkshire Water sewer in Wath Road.

The removal of surface water from the system will allow the pumps to be replaced with a smaller pump rated at 5 l/s.

Therefore the peak discharge would reduce from 9.2 l/s to 5 l/s

Net peak flow reduction – 4.2 l/s

3.2 Northern Pumping station – “DISTILLERY”

It is intended to disconnect the larger surface water catchment currently connected to the northern pumping station. New pipes will be installed and connect the existing surface water drainage to the culverted watercourse. Existing foul drainage shall continue to discharge to the pump which ultimately connects to the Yorkshire Water sewer in Wath Road. An additional pump will be installed to the side of B21 and pump a maximum of 7.6 l/s via a new rising main to the “Distillery” pump. The existing distillery pump will also receive existing foul flows from the site, at a peak rate of 7.3 l/s.

Therefore new peak discharge from the Distillery pump would be:

Existing surface water retained plus existing foul plus proposed foul peak discharge = $6.7 + 7.3 + 7.6 = 21.6$ l/s

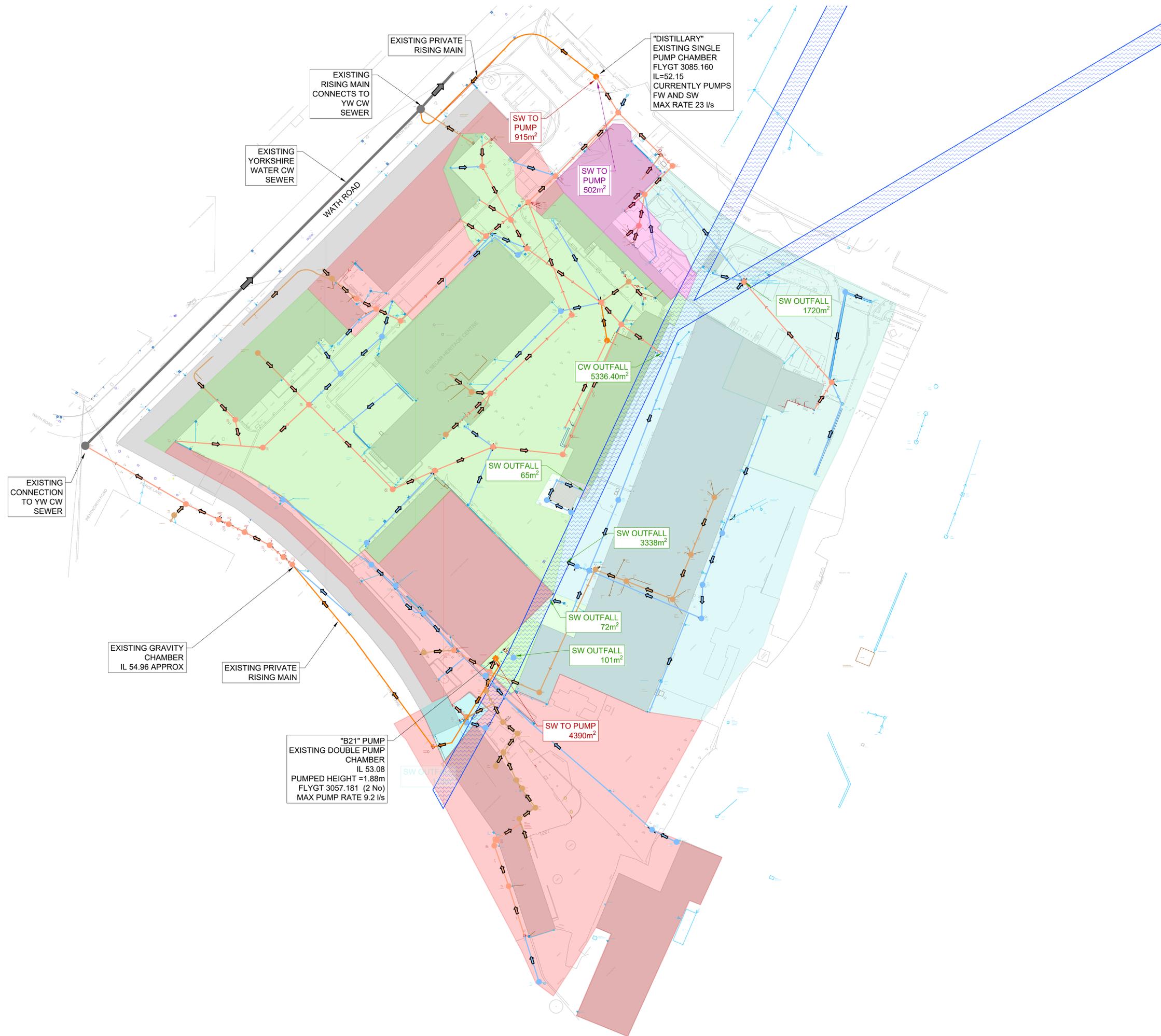
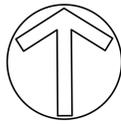
Peak flow would be reduced from 23.0 l/s to 21.6 l/s

Net peak flow reduction – 1.4 l/s

The proposed drainage layout is shown on drawing No 084010-CUR-XX-XX-D-C-92302 in Appendix B

APPENDIX A

Existing drainage layout pre development



- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

KEY:

- EXISTING SURFACE WATER SYSTEM AND FLOW DIRECTION
- EXISTING FOUL WATER SYSTEM AND FLOW DIRECTION
- EXISTING COMBINED WATER SYSTEM AND FLOW DIRECTION
- EXISTING RISING MAIN AND FLOW DIRECTION
- YORKSHIRE WATER SEWER
- EXISTING SURFACE WATER CATCHMENT AREAS:
 - RED - CURRENTLY DISCHARGE INTO YW SEWER (SHADES VARY)
 - GREEN - CURRENTLY DISCHARGE INTO CULVERT (SHADES VARY)

Rev	Description	Date	By	Chk
P01	INITIAL ISSUE	29/07/25	DH	RT



Status: **SUITABLE FOR INFORMATION** **S2**

Project: **ELSECAR FORGING AHEAD**

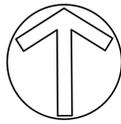
Draw Title: **DRAINAGE LAYOUT PRE DEVELOPMENT**

Drawn By	Designed By	Checked By
DH	DH	RT
Date	29/07/25	Scales @ All
Project No - Originator - Function - Spatial - Form - Discipline - Number	084010 - CUR - XX - XX - D - C - 92301	Revision
		P01

W:\Projects\084010 - CUR - XX - XX - D - C - 92301\Drawings\084010 - CUR - XX - XX - D - C - 92301 - Drainage Layout Pre Development.dwg

APPENDIX B

Proposed drainage layout post development



EXISTING RISING MAIN TO BE SURVEYED AND MAY NEED TO BE REPLACED IF FOUND TO BE IN POOR CONDITION

EXISTING CONNECTION TO YW CW SEWER

EXISTING YORKSHIRE WATER CW SEWER

"DISTILLARY" EXISTING SINGLE PUMP CHAMBER
FLYGT 3085.160
IL=52.15
CURRENTLY PUMPS FW AND SW
MAX EXISTING RATE 23 l/s.
TO BE REPLACED WITH 2 NEW PUMPS (MAIN AND STANDBY) AT PROPOSED FLOW RATE 23l/s

PROPOSED NEW RISING MAIN

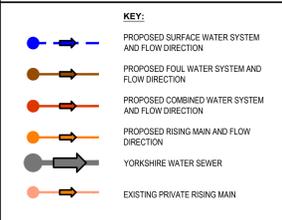
"B21" PUMP.
PROPOSED NEW FW PUMP
MAX RATE 8 l/s
with 40 cu m STORAGE

EXISTING CONNECTION TO YW CW SEWER

EXISTING RISING MAIN TO BE SURVEYED AND MAY NEED TO BE REPLACED IF FOUND TO BE IN POOR CONDITION

"B21" PUMP
EXISTING DOUBLE PUMP CHAMBER
IL 53.08
PUMPED HEIGHT =1.88m
FLYGT 3057.181 (2 No)
MAX PUMP RATE 9.2 l/s
TO BE REPLACED WITH NEW PUMPS (MAIN AND STANDBY) AT 5.0 l/s

- GENERAL NOTES:**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
 - DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
 - ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.



Rev	Description	Date	By	Chk
P01	INITIAL ISSUE	29/07/25	DH	RT

Rose Wharf Ground Floor 75-80 East Street Leeds LS9 8EE
0113 274 8509
www.curtins.com

Status: **SUITABLE FOR INFORMATION** S2

Project: **ELSECAR FORGING AHEAD**

Proposed: **PROPOSED DRAINAGE LAYOUT POST DEVELOPMENT**

Drawn By	Designed By	Checked By
DH	DH	RT
Date	29/07/25	Scales @ A0
Project No - Originator - Function - Spatial - Form - Discipline - Number	084010 - CUR - XX - XX - D - C - 92302	Revision
		P01

084010 - CUR - XX - XX - D - C - 92302 P01