

DRAINAGE CALCULATIONS

Client: **Lovell Homes Partnership**

Site Address: **Former Mill, Saville Road,
Skelmanthorpe**

Project Number: **21374**

Reference (Revision): **CAL01 (D)**

Date: **05.03.2025**

Author: M.Johnston Date: March 25

Checker: P.Dixon Date: March 25

Job No.	21374	Sheet No.	i
Calcs By:	MDJ	Date	05.03.2025

CLIENT: Lovell Homes Partnerships

PROJECT TITLE: Former Mill of Saville Road, Skelmanthorpe

ARCHITECT: STEN

The existing site is a mill and industrial site which is split into a number of buildings across the 1.2 Hectare site.

The site is on a hillside and has a watercourse along its northern boundary with Laurel Bank. To the south and east of the site is the private road Marston St which has a number of other properties not owned by the landowner. To the east of these properties is another watercourse. Along the northern boundary is a railway, which the two watercourses meet prior to a culvert which drains north. The south and western boundary has Saville Road, which is a steep adopted highway fronted by residential properties.

The proposed development is for the demolition and erection of 46 residential properties, which will be served by an adoptable highway and drainage system.

The existing site surface water drains to the watercourse to the north, and to a combined sewer to the south and east of the site. This has been proven via CCTV and Dye pack surveying on site. The total area draining to the watercourse to the north is 5944m² with a discharge rate of 83.2l/s (based on 140l/s/ha). The area draining to the watercourse to the south via the surface water sewers is 2221m² with a discharge rate of 31.1l/s. The total area draining to the existing combined sewer is 3999m² with a discharge rate of 56l/s (based on 140l/s/ha). The site has a total existing discharge rate of 170.3l/s.

The drainage strategy has been assessed in accordance with the drainage hierarchy within NPPF.

Soakaways have been considered, and discounted due to the steep slopes across the site and the potential to cause damage to downstream third-party properties, and the potential for contamination of groundwater due to contaminants leaching from due to the previous industrial use of the site.

The site is served by a watercourse to the southeast of the site and a smaller watercourse between the railway embankment and the site boundary. Both currently receive water from the site via various connection points. It is expected that surface water currently directed towards the combined sewer will be redirected to the watercourses with the existing privately owned surface water sewers on site decommissioned as a part of the redevelopment of the site.

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The use of the combined sewer and existing surface water sewers has been discounted as other preferable discharge points are available.

The proposed discharge rate has been worked out on a minimum of 30% saving from existing rates.

It is proposed that a minimum of 30% will be taken from the discharge to the north watercourse. From the south watercourse and the combined sewer, a saving of 50% will be offered as the outfall locations are changing.

The proposed discharge rate, on the basis of the above split, is 108.1 l/s, which is a reduction of 40% from the existing discharge from the site. This split and calculation is shown in Table 1 below.

Table 1 - Discharge Rate and Areas

To Watercourse – North	Area (m2)	Ext Dis Rate (l/s)	Prop Dis Rate (70%) (l/s)	Prop Dis Rate (50%) (l/s)
West Unit	3814	53.4	37.4	N/A
East Unit	2130	29.8	20.9	N/A
Total = West + East	5944	83.2	58.3	N/A
To Watercourse – South				
MH8 Catchment	905	12.7	8.9	N/A
MH4 Catchment	1316	18.4	12.9	N/A
Total = MH8 + MH4	2221	31.1	21.8	N/A
To Combined Sewer J				
MH3 Catchment	3999	56.0	N/A	28.0
Site Total	12164	170.3	N/A	N/A
			Proposed Discharge Rate	108.1
			Proportion of Existing	63%

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The catchment areas for this survey are based on the manhole references within the CCTV survey attached.

The proposed impermeable area is 8500 m². This is a reduction of 30.1% from the existing site. Based on a discharge rate of 108.1l/s, the attenuation volume is 231.9 m³ (flow calculations are in the information provided). This will be accommodated in a single attenuation tank in the POS to the southeast of the site.

A flow control located at the outfall, will manage the entire site before discharge to the watercourse. Should the flow control become overwhelmed, a flood path is designed to be directed towards the watercourse. Please see the flood exceedance routing plan in the information provided.

Foul water from the site will be directed into the existing combined sewer on Saville Road for several of the plots, a new S106 connection will be required and also utilising an existing manhole outside of plot 1 which discharges directly onto the combined sewer. For those plots at a lower level, will be directed towards the existing combined sewer located to the southwest of the site.

This drainage strategy is shown on drawing 21374-100 attached.

There is an existing watercourse route to the west of the site which has been adapted and managed as part of the proposals, in terms of flood routing and also facilitating the development layout. See the proposed wetland area layout on drawing 21374-180 included in the information provided.

This has been developed following multiple correspondence and discussions with the LLFA. The watercourse remains open for the majority of the route before it is culverted in a 750mm diameter pipe prior to discharge to the watercourse at the northern boundary. A stepped baffle block has been incorporated into the outfall headwall to ensure the force of discharge from the site is dissipated in high critical events. A weir wall headwall has also been incorporated at the open watercourse diversion outfall, and scour protection will need to be provided surrounding this outfall for scour protection.

Following further consultation with the LLFA, comments have been incorporated to the Althon SFA headwall & weir wall headwall, these changes have been shown marked up on the headwall drawings included in the information provided.

Site Outfall Headwall

- Outfall grill has been adjusted for 200mm vertical bar spacing
- Outfall grill has been adjusted for 150mm clearance from bottom of outfall grill to top of apron

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V notch weir wall

- 150mm clearance on vertical bar spacing on sloped grating.
- Sloped grating at front will be at 60-degree angle.
- Sloped grating will have 150mm clearance from bottom of grating to top of apron
- Landing section will need incorporating on top of weir wall headwall and be capable of withstanding pedestrian loading for maintenance
- Landing section will have 75mm bar spacing

The proposed SW Section 104 drainage from the development discharges into the watercourse manhole W-MH1 at 108.1l/s. The proposed culverted pipe downstream of this has a discharge capacity of 618.3l/s based off Colebrook-White (see figure 1 below).

Colebrook-White Formula			
Internal Pipe Diameter =	<input type="text" value="0.750"/>	m	
Hydraulic Gradient =	1 in = <input type="text" value="396"/>		
Pipe Type =	<input type="text" value="Surface Water"/>		
Kinematic Viscosity of fluid =	<input type="text" value="0.000001141"/>	m ² /s	Velocity, V = <input type="text" value="1.400"/> m/s
Gravitational Constant =	<input type="text" value="9.81"/>	m ² /s	Discharge, Q = <input type="text" value="618.35"/> l/s

Figure 2 – Discharge capacity calculation

This leaves an available discharge capacity of 82.5% for the watercourse diversion considering a peak discharge rate of 108.1l/s from the development in the 1 in 100 year + 40% climate change event.

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Maintenance Strategy

The private systems will be managed by the landowner and the individual tenants for the site, whereas the adoptable drainage will be maintained by Yorkshire Water. The system has been designed so that the drainage system is fully accessible and maintainable with flooding easily visible if it occurs. The maintenance schedule for the individual private elements of the scheme is as per manufacturer's recommendations and as follows.

Pipe Network/Manholes/Headwalls	
Operation	Frequency
Inspect and identify any areas that are not operating correctly, if required, take remedial actions.	Monthly for 3 months as a part of normal post completion monitoring, then biannually. If flooding is identified, take immediate action.
Debris removal from manholes (where may cause risk performance)	As required, but at least twice a year
Where rainfall into network from above, check surface or filter for blockage or silt, algae or other matter by jetting	As required, but at least twice a year
Remove sediment from pipework by jetting.	Annually or as required
Inspect/check all inlets, outlets, and overflow pipes to ensure that they are in good condition and operating as designed	Annually, or as required and after large storms

Wetland	
Operation	Frequency
Remove litter and debris	Monthly or as required.
Cut grass	Monthly during growing season.
Manage vegetation and nuisance plants .	Monthly at start, then as required.
Inspect chambers and perforated pipework for silt accumulation. Establish silt removal process.	Six Monthly

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Inspect incoming and outgoing pipework, clear if required.	Monthly
Inspect banks, slopes, structures, inlets and outlets for damage. Inspect infiltration surface for ponding and compaction. Inspect silt treatment chambers.	Monthly to begin with, then as required. Remedials may be necessary.
Inspect any mechanical devices, eg penstocks	Annually.
Reseed areas of poor vegetation growth and monitor vegetation coverage.	As required.
Inspect infiltration and base surfacing. Scarify or spike as necessary if infiltration performance reduces.	As required.
Relevel uneven surfaces and reinstate design levels.	As required.
Repair erosion, rip rap, gabions, mattress or other damage to banks, base and accesses.	As required.
Remove tree roots where they are encroaching the sides of the basin.	As required
Remove bank vegetation annually where there is overgrowth.	As required.
Remove excess sediment from forebays, ponds and basins.	As required.
Aerate pond and standing water where there is signs of eutrophication	As required.
Clear pipework of blockages.	As required
Replace filter media.	Every 10 – 20 years, or if identified by inspector.
Removal of unsuitable residue (oil, pollutants, silt)	As required.

The maintenance of the drainage network and SuDS features are to be linked with the wider site maintenance.



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A log of all maintenance activities is to be kept and made available to the local planning authority (LPA) and / or the Lead Local Flood Authority (LLFA) on request.

Note that following further correspondence with the LLFA they recommend that additional precaution is required on the maintenance of the headwall structures. Particularly to ensure that where accessing the drainage by the lockable grills on the headwalls that lone working is discouraged. To minimise the risk of person being trapped within the drainage system. It is recommended that this detail is included within the provisions of the estate management company to ensure it is picked up accordingly.

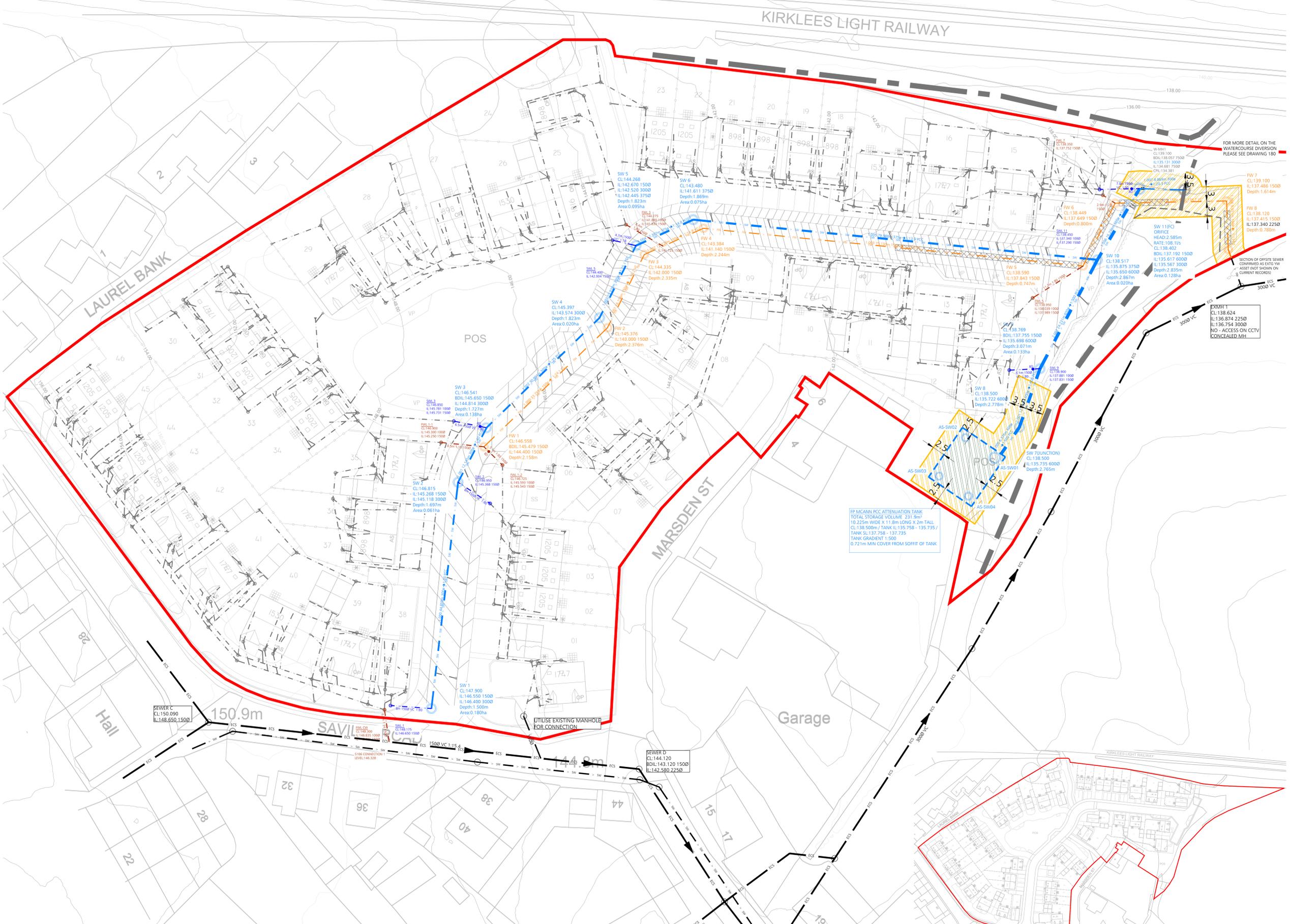
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CODES OF PRACTICE

SW Drainage Outfall	Agreed Discharge Outfall Point	Watercourse
	Soakaways Viable / Rate	Not Viable. Potential Contamination
	Watercourse Discharge Available	Yes
	Surface Water Sewer	No
	Combined Sewer	N/A
	Invert Level of Outfall	134.665 TBC
Drainage Assessment Constants	Scenarios to be Tested	1:2, 1:30, 1:100 + 40% CC
	FFL	155.75 – 138.375
	Existing Impermeable / Permeable Area	12164 m ² / N/A m ²
	Proposed Impermeable Area	8500m ²
	Proposed Attenuation Storage Volume	231.9m ³ PCC Tank.
	Attenuation Storage Method	PCC Tank
	Flow Control Unit	Site Outfall FC – 108.1l/s at 2.585m head.
Hydraulic Calculation	M5-60 / R	19 / 0.3
	MADD	0
	Global Time of Entry	4 mins
	Summer / Winter Coeffs	1.0 / 1.0
SUDS	Water Quality Methods Used	Gully and Sumps, Catchpit, Channel Drainage, Attenuation Tank
	Hydrocarbon Interception	Not Required
	Silt Capture	None used.
	Ponds / Swales	Yes, for open watercourse diversion
	Permeable Pavement	None used.
Information Provided	21374-100 – Drainage Strategy 21374-101 – Existing Impermeable Area 21374-102 – Proposed Impermeable Area 21374-150 – Overland Flood Routing 21374-155 – External Level Strategy 21374-180- Wetland Area Layout Yorkshire Water Records Hydraulic Calculations & Headwall Specifications CCTV Survey	



YW REF: H-3-264-956



KIRKLEES LIGHT RAILWAY

LAUREL BANK

MARDEN ST

Garage

SAVILLE ROAD

LOCATION PLAN @ 1:1000

DRAINAGE STRATEGY PLAN @ 1:250

DO NOT SCALE

DESIGNERS HAZARD IDENTIFICATION
IT IS ASSUMED THAT ALL WORKS WILL BE UNDERTAKEN BY A COMPETENT CONTRACTOR WORKING WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT IN ADDITION TO THE HAZARDS TYPICALLY ASSOCIATED WITH THE TYPE OF CONSTRUCTION DETAILED ON THIS DRAWING. ANY KNOWN ABNORMAL HAZARDS SPECIFIC TO THIS DRAWING HAVE BEEN IDENTIFIED.



1. DO NOT SCALE FROM THIS DRAWING.
- SITE BOUNDARY
 - - - PROPOSED SW SEWER
 - - - PROPOSED FW SEWER
 - PROPOSED SW MANHOLE
 - PROPOSED FW MANHOLE
 - - - PROPOSED SW LATERAL
 - - - PROPOSED FW LATERAL
 - PROPOSED SW DEMARCATION PNC
 - PROPOSED FW DEMARCATION PNC
 - - - PROPOSED SW GULLY
 - ▨ PROPOSED SEWER EASEMENT
 - ▨ FINISHED FLOOR LEVELS
 - - - EXISTING CW SEWER
 - - - EXISTING SW WATERCOURSE DIVERSION
 - - - EXISTING SW WATERCOURSE
 - ▨ IDENTIFY CONCRETE PROTECTION COVER SLAB WHERE COVER IS LESS THAN 1.2m

FOR MORE DETAIL ON THE WATERCOURSE DIVERSION PLEASE SEE DRAWING 100

SECTION OF OFFSITE SEWER CONFIRMED AS EXISTING ASSET NOT SHOWN ON CURRENT RECORDS
NO ACCESS ON CCTV CONCEALED MH

PP/MANN PCC ATTENUATION TANK
TOTAL STORAGE VOLUME: 231.9m³
10.225m WIDE X 11.8m LONG X 2m TALL
CL:138.500m / TANK IL:135.755 - 135.735 / TANK SL:137.758 - 137.735
TANK GRADIENT 1:500
0.721m MIN COVER FROM SOFFIT OF TANK

SEWER C
CL:150.090
IL:148.650 1500

SEWER D
CL:144.120
BDIL:143.120 1500
IL:142.580 2250

03.01.25	UPDATED TO SUIT LATEST SECTION 104 AND WETLAND AREA LAYOUT	MDJ	PD	P5
16.08.21	UPDATED TO SUIT REVISED TURNING HEAD ARRANGEMENT	MDJ	PD	P4
15.03.21	STORAGE RELOCATED	MDJ	PD	P3
18.11.21	FW PRINCIPLE ROUTES ADDED	MDJ	PD	P2
08.11.21	PRELIMINARY ISSUE	MDJ	PD	P1
Date	Revision	By	Chkd	Ref

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DRAINAGE STRATEGY

Scale	1:250	Sheet	A0	Drawn	MDJ	Check	PD
Date	NOV 21	Status	PRELIMINARY				
Job No.	21374	Draw No.	100	Rev.			P5



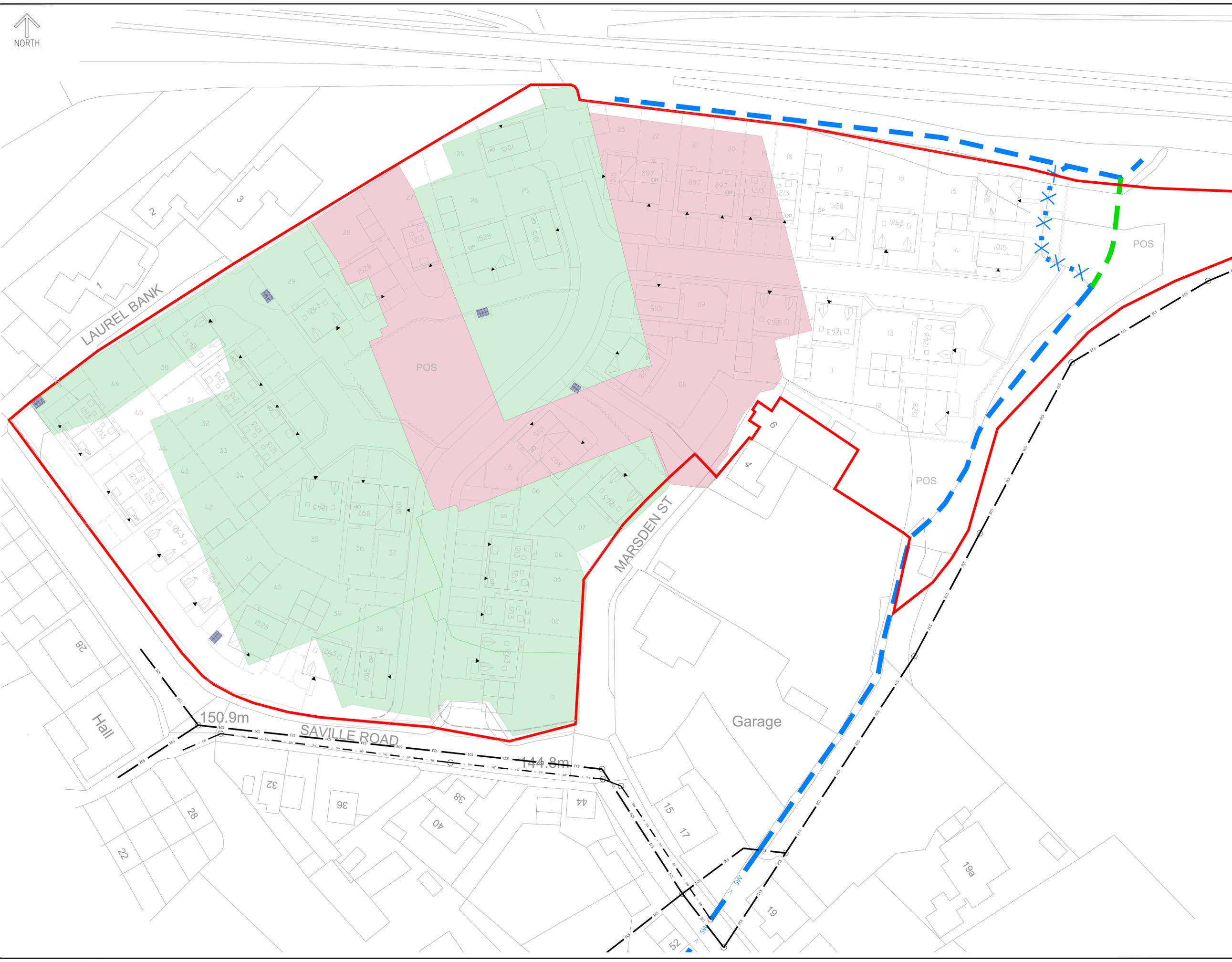
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1. DO NOT SCALE FROM THIS DRAWING.

- KEY
- EXISTING IMPERMEABLE TO WATERCOURSE = 0.817 ha
 - EXISTING IMPERMEABLE TO COMBINED SEWER = 0.400 ha



Date	Revision	By	Chkd	Ref
08.11.21	PRELIMINARY ISSUE			

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Title
EXISTING IMPERMEABLE AREA
PLAN

Scale	1:250	Paper	A0	Drawn	MDJ	Check	PD
Date	NOV 21	Status	PRELIMINARY				
Job No.	21374	Drp. No.	101	Rev.	P1		



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ABNORMAL HAZARD REFERENCE

- THIS DRAWING IS BASED FROM:
 - TOPO SURVEY - 2456/001 (MAR 21)
 - ARCHITECT LAYOUT - 2156.01 K (12/01/23)
- DO NOT SCALE FROM THIS DRAWING AS IT MAY NOT BE REPRODUCED TO SCALE.
- THIS DRAWING IS TO BE REPRODUCED IN COLOUR.
- PLEASE REPORT ANY DISCREPANCIES TO DUDLEYS CONSULTING ENGINEERS PRIOR TO CONSTRUCTION.

KEY

- S104 BOUNDARY
- EXISTING YW COMBINED SEWER
- PROPOSED SW SEWER
- IMPERMEABLE AREAS

YORKSHIRE WATER GENERAL NOTES

- ALL ADOPTABLE SEWER WORKS AND MATERIAL TO BE IN ACCORDANCE WITH SEWERAGE SECTOR GUIDANCE DESIGN AND CONSTRUCTION GUIDANCE (CODE FOR ADOPTION), THE RELEVANT BRITISH/BROSPAN AND YORKSHIRE WATERS STANDARDS/REQUIREMENTS/LOCAL PRACTICE FOR THE ADOPTION OF SMALL SUBMERSIBLE FOUL AND SURFACE WATER PUMPING STATIONS AND KITEMARKED.
- MANHOLE COVERS SHALL HAVE A CLEAR OPENING OF 600MM AND SHALL BE CLASS D400 TO BS EN 124 WITH 150MM DEEP FRAMES IN HIGHWAYS.
- FILLED GROUND MUST BE FILLED AND CONSOLIDATED UNDER THE SUPERVISION AND TO THE SATISFACTION OF YORKSHIRE WATER BEFORE ANY SEWER WORKS ARE CARRIED OUT.
- YORKSHIRE WATER IS NOT OBLIGED TO ACCEPT FILTER DRAIN/AND DRAINAGE RUN-OFF INTO THE PUBLIC SEWER NETWORK OR DISPOSAL DRAINAGE SYSTEM DIRECTLY OR INDIRECTLY. AN ALTERNATIVE METHOD OF DISPOSAL OF THE LAND DRAINAGE RUN-OFF WILL THEREFORE BE REQUIRED AND YOU WILL HAVE TO LAISE WITH THE LOCAL AUTHORITY, LAND DRAINAGE SECTION WITH REGARD TO THE DISPOSAL OF THE FILTER DRAIN/AND DRAINAGE RUN-OFF.
- THE ADOPTABLE SEWERS SHOULD BE A MINIMUM OF 1M AND MANHOLES 0.5M FROM KERB FACES AND SERVICE MARGINS.
- SEWERS MUST HAVE 5 METRES CLEARANCE FROM TREES AND HEDGES OR THE WIDTH OF THE CANOPY AT MATURE HEIGHT.
- SEWERS TO BE Laid IN CLASS "B" BEDDING (150MM GRANULAR BED AND SURROUND), WHERE DEPTH OF COVER TO TOP OF THE SEWER IS LESS THAN 1.2M IN HIGHWAYS AND VERGES OR LESS THAN 900MM IN NON-VEHICULAR ACCESS AREAS THEN A CONCRETE SLAB SHOULD BE PROVIDED ABOVE GRANULAR BED AND SURROUND.
- BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENT OF WATER INDUSTRY SPECIFICATION 4-08-02 (TABLE A2).
- YORKSHIRE WATER POLICY IS THAT TYPE "CC" BRICK MANHOLES AND 1050MM DIA. MANHOLE BRICKS ARE NOT PREFERRED. INSTEAD IT IS PREFERRED THAT YOU USE A TYPE "B" MANHOLE WITH 1000MM DIA OR 1500MM DIA RINGS, WITH THE OPENING SITED OVER THE CHANNEL. WHERE DEPTH OF COVER TO PIPE SOFFIT IS 1 - 1.5M.
- ADOPTABLE PLASTIC SEWER PIPES TO BE BS1 KITEMARKED (CERTIFIED TO WIS 4-35-01 AND BS EN 13476). ADOPTABLE PLASTIC SEWER PIPES TO BE Laid IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS. PLASTIC CHANNEL SECTIONS IN MANHOLES ARE NOT ACCEPTABLE AND YORKSHIRE WATER WOULD PREFER CLAYWARE CHANNEL IN MANHOLES.
- THE MINIMUM CRUSHING STRENGTH FOR CLAY PIPES SHOULD BE AS FOLLOWS: 1000MM DIA. 40KNM, 1500MM DIA. 40KNM, 225MM DIA. 45KNM AND 300MM DIA. 720KNM. THE MINIMUM CRUSHING STRENGTH FOR CONCRETE PIPES SHOULD BE - (CLASS 120 TO EN 1916/BS5911-1 2002). PLASTIC PIPES SHOULD CONFORM TO WIS 4-35-01 AND BS EN 13476.
- WHERE A B125 COVER AND FRAME HAS BEEN APPROVED, THIS MUST NOT BE COATED IN PLASTIC AND MUST HAVE LIFTING EYES SUITABLY SIZED TO ACCOMMODATE STANDARD LIFTING KEYS. SCREW DOWN COVERS ARE NOT ACCEPTABLE.
- THERE MUST BE ENOUGH CLEARANCE AT CROSSOVERS TO ACCOMMODATE BEDDING TO BOTH PIPES, APPROX. 300MM. IF CROSSOVER IS NEAR THE ROCKER THEN THE CLEARANCE NEEDED MAY NEED TO BE INCREASED.

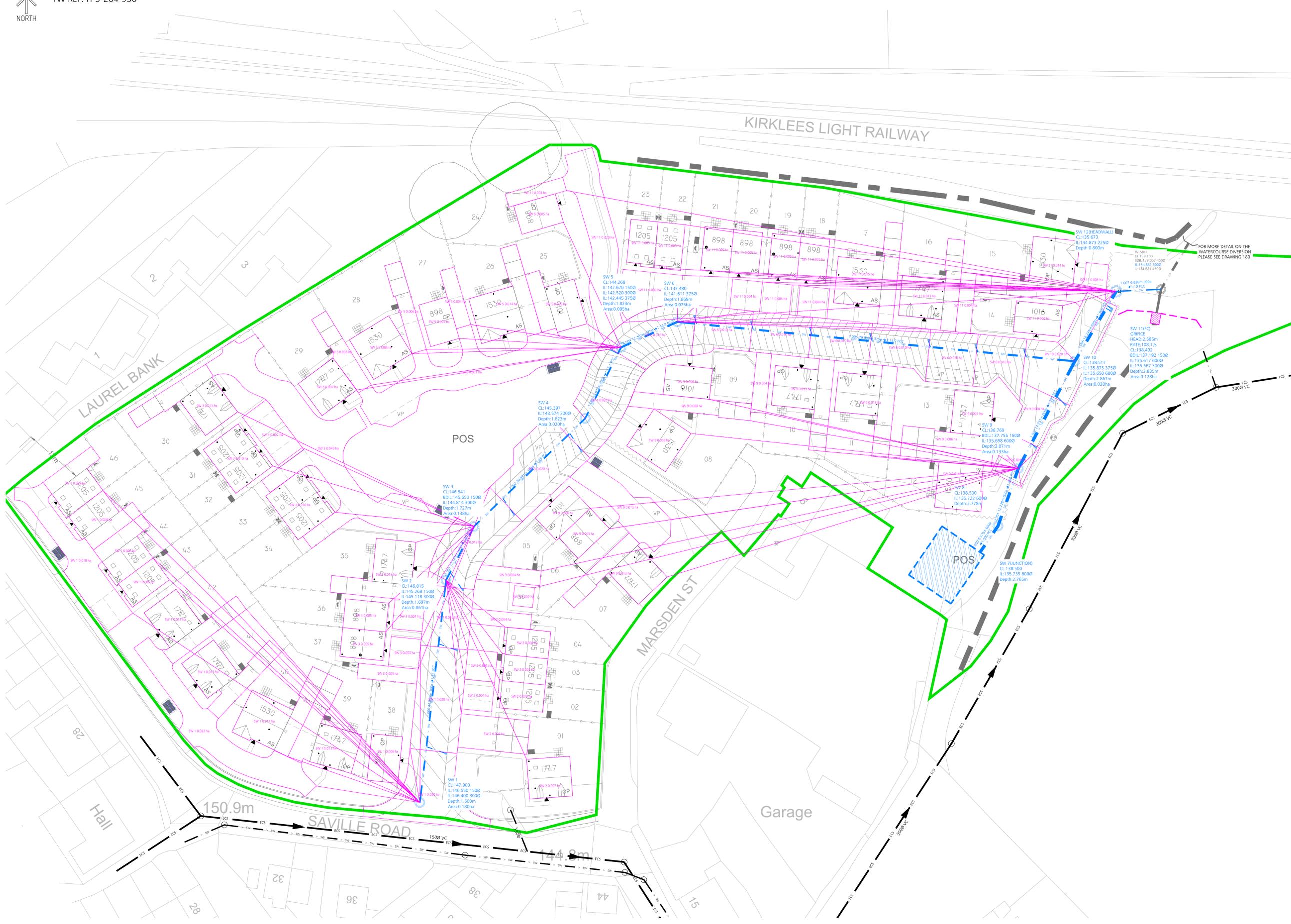
Date	Revision	By	Chkd	Ref
05.04.23	UPDATED TO SUIT S104 COMMENTS	MDI	PD	P4
31.03.23	UPDATED TO SUIT YW & LLFA COMMENTS	MDI	PD	P3
27.01.23	UPDATED FOR TECH SUBMISSION	MDI	PD	P2
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**PROPOSED IMPERMEABLE AREA
PLAN**

Scale	1:250	Page	A0	Drawn	MDI	Check	PD
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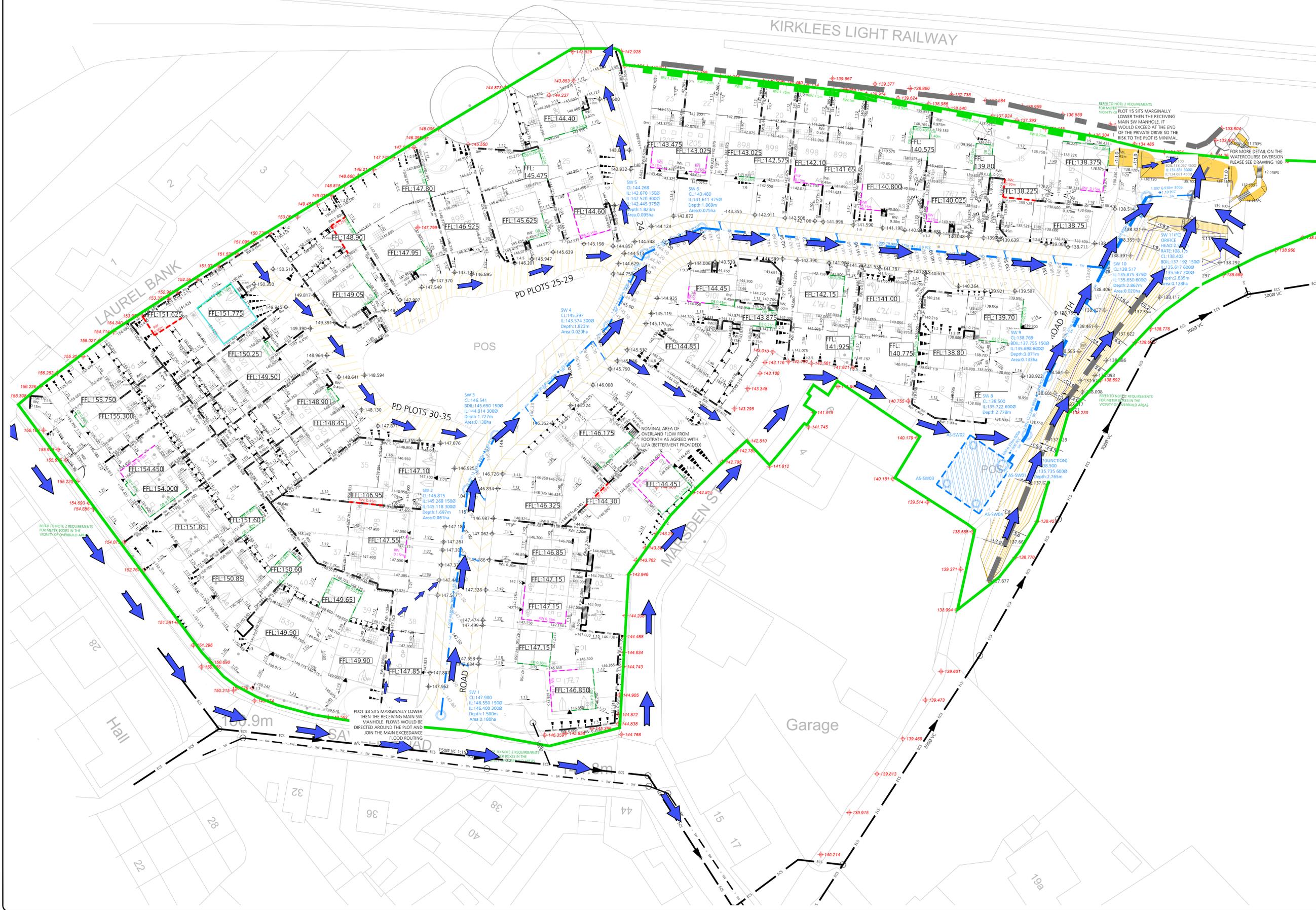
DESIGNERS HAZARD IDENTIFICATION
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ABNORMAL HAZARD REFERENCE

- THIS DRAWING IS BASED FROM:
 - TOPO SURVEY - 2456001 (MAR 21)
 - ARCHITECT LAYOUT - 2156.01 K (12/01/23)
- DO NOT SCALE FROM THIS DRAWING AS IT MAY NOT BE REPRODUCED TO SCALE.
- THIS DRAWING IS TO BE REPRODUCED IN COLOUR.
- PLEASE REPORT ANY DISCREPANCIES TO DUDLEYS CONSULTING ENGINEERS PRIOR TO CONSTRUCTION.

KEY

- +31.940 EXISTING TOPO SURVEY LEVELS
- +8.925 EXISTING TOPO SURVEY LEVELS
- FINISHED FLOOR LEVEL
- EMBANKMENT SLOPE
- 1:4 TRADITIONAL BRICK RETAINING WALL (WITH WEEPHOLES)
- 0.8:1 OVERBUILD RETAINING WALL DETAIL
- INDICATES THAT EXTERNAL G.L. IS THE SAME AS THE F.F.L. - DETAIL TO BE CONFIRMED BY ARCHITECT
- WATERCOURSE DIVERSION
- (ROOT LOCK - GEORGROWN) OR (FLEX MSE) RETENTION TBC
- FLOOD EXCEEDANCE ROUTING
- PROPOSED S104 SEWER



Date	Revision	By	Chkd	Ref
12.05.23	UPDATED TO SUIT S104 COMMENTS	MDI	PD	P4
25.04.23	UPDATED TO SUIT S104 COMMENTS	MDI	PD	P3
27.01.23	UPDATED FOR TECH SUBMISSION	MDI	PD	P2
11.01.22	PRELIMINARY ISSUE	YB	PD	P1

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Title
FLOOD EXCEEDANCE
 LAYOUT

Date	Scale	Page	AO	Drawn	Check	PD
NOV 21	1:250	150	AO	KB	KB	PD
21374				150		P4



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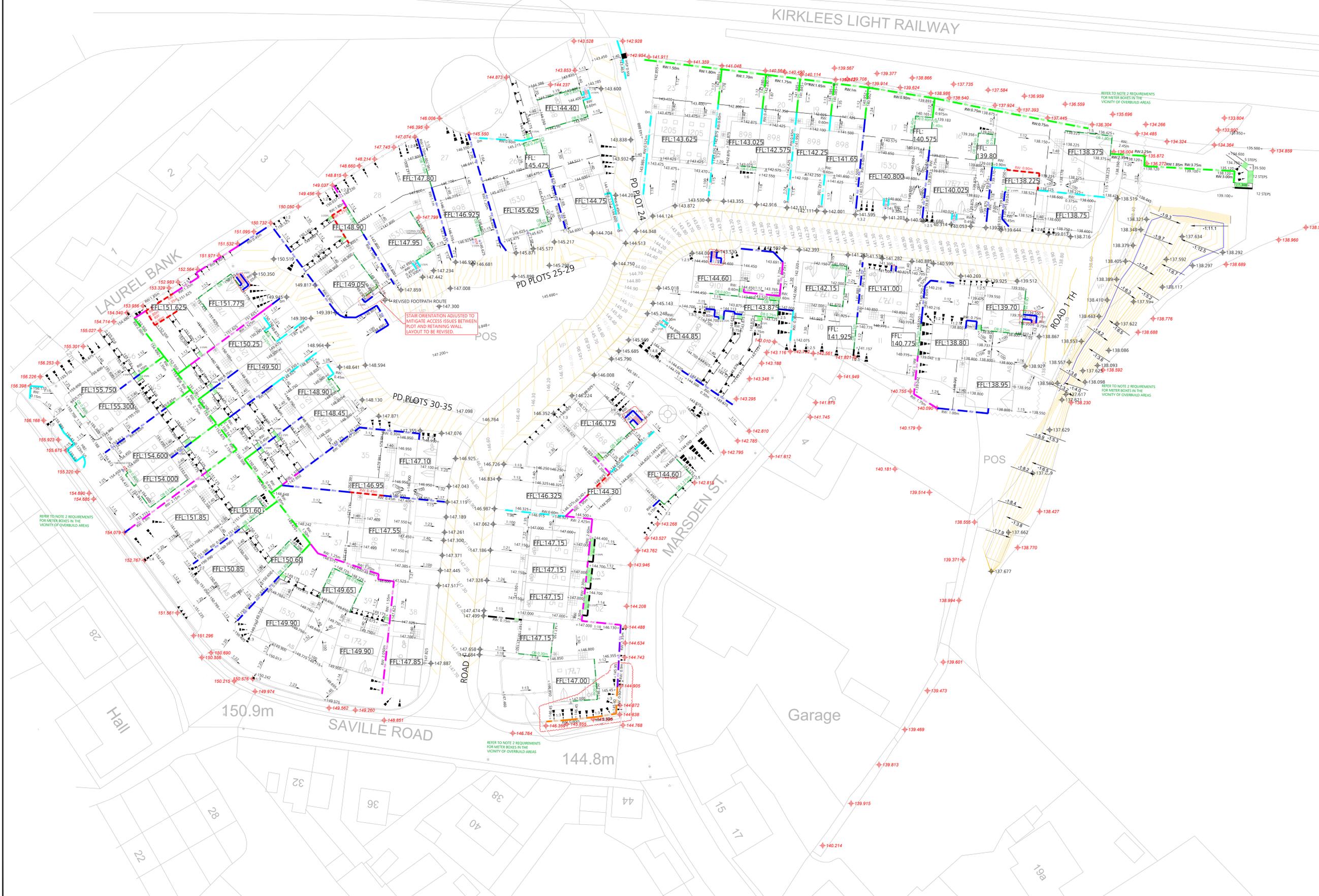
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- THIS DRAWING SHOULD NOT BE USED FOR SETTING OUT PURPOSES. FOR RETAINING WALLS AND LEVEL LANDINGS.
- STEPPED APPROACHES DESIGNED AS PER NHBC BUILDING REGULATIONS GUIDANCE NOTE PART M, DIAGRAM 4 - STEPPED APPROACH.

KEY

- +31.940 PROPOSED LEVELS
- 8.909 EXISTING TOPO SURVEY LEVELS
- FFL 38.000 FINISHED FLOOR LEVEL
- 1:4 EMBANKMENT SLOPE
- TRADITIONAL BRICK RETAINING WALL (WITH WEEPHOLES)
- OVERBUILD RETAINING WALL DETAIL
- TANKING (SPECIFIED BY OTHERS)
- FLAG ON EDGE RETAINING WALL
- MASS MASONRY RETAINING WALL, STONE CLAD
- MASS MASONRY RETAINING WALL, DRY STONE CLAD
- REINFORCED CAVITY WALL, DRY STONE CLAD
- REINFORCED CAVITY WALL, STONE CLAD
- REINFORCED CAVITY WALL, DRY STONE CLAD
- FLEXI-MISE RETAINING WALL
- MINIMUM LEVEL LANDING IN ACCORDANCE WITH NHBC GUIDANCE. REFER TO NOTE 6
- EXTERNAL STEPS (280mm GOING WITH 25mm OVERHANG). SET OUT AS 25mm ON PLAN. REFER TO NOTE 6
- EXTERNAL STEPS (220mm GOING) - PRIVATE I.E. NOT PRINCIPLE ACCESS



27.11.24	PLOT 01 HATCH ERROR CORRECTED	RB	DH1	F
17.10.24	PLOT 01 BOUNDARY LEVELS CHANGED Q14	PD	DL	E
29.10.24	PLOT 01 UPDATED. STEPS REVIEWED	JL	MDI	D
13.05.24	RETAINING WALLS UPDATED	KB	DH	C
08.04.24	PLOTS 4 & 22 FFLS UPDATED	MDI	PD	B
14.03.24	CONSTRUCTION ISSUE	MDI	PD	A
Date	Revision	By	Chkd	Ref

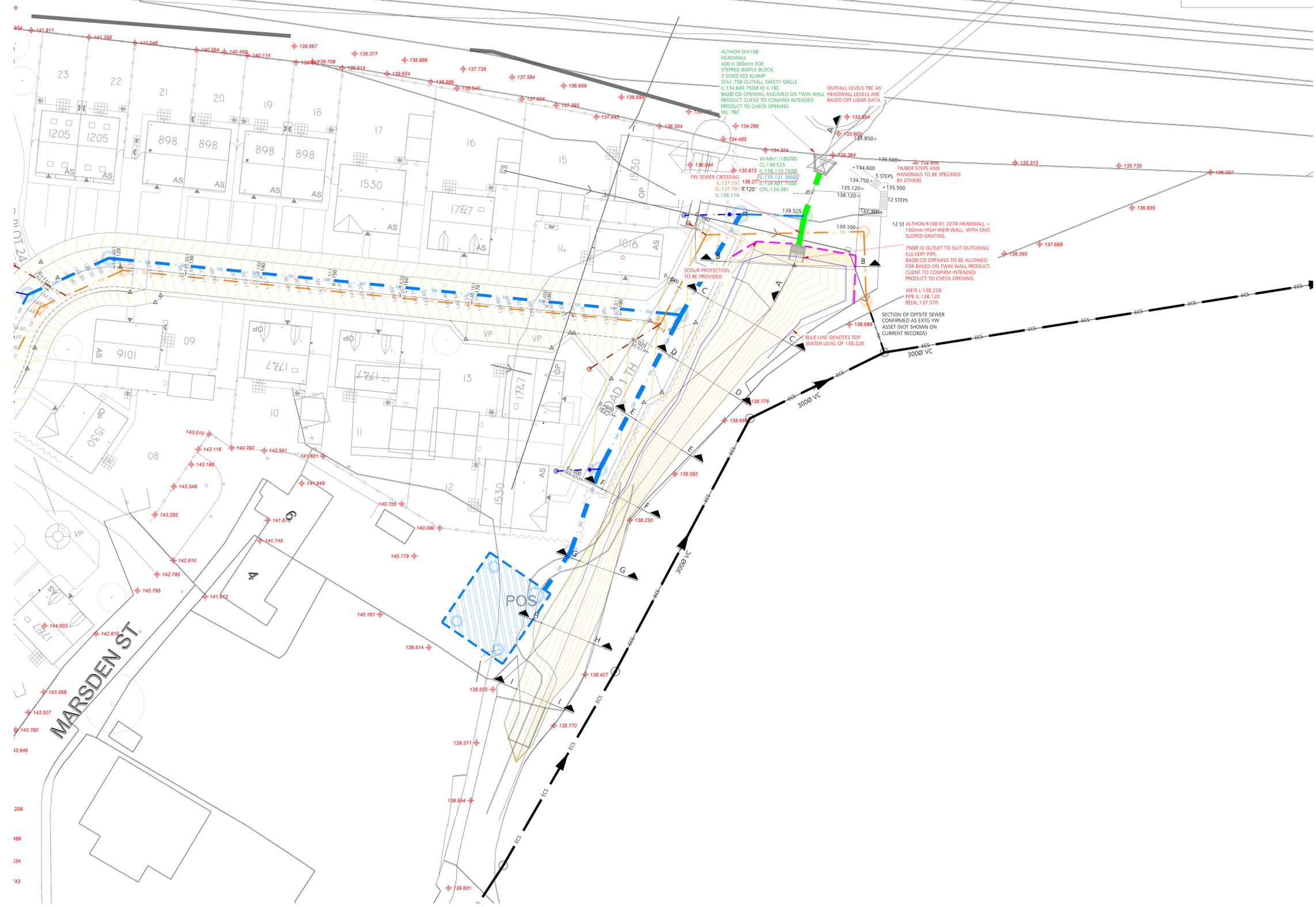
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Project
**LOVELL HOMES
SAVILLE ROAD, SKELMANTHORPE
HD8 9EF**
Title
EXTERNAL LEVELS PLAN

Scale	1:250	Drawn	SDR	Check	PD
Date	NOV 21	Status	CONSTRUCTION		
Job No.	21374	Draw No.	155	Rev.	F



KIRKLEES LIGHT RAILWAY



DO NOT SCALE

DESIGNERS HAZARD IDENTIFICATION
 IT IS ASSUMED THAT ALL WORKS WILL BE UNDERTAKEN BY A COMPETENT CONTRACTOR WORKING WHERE APPROPRIATE TO AN APPROVED METHOD STATEMENT. IN ADDITION TO THE HAZARDS TYPICALLY ASSOCIATED WITH THE TYPES OF CONSTRUCTION ESTIMATED ON THIS DRAWING, ANY KNOWN ABNORMAL HAZARDS SPECIFIC TO THIS DRAWING HAVE BEEN IDENTIFIED.



- NOTES
- DO NOT SCALE FROM THIS DRAWING.
 - THIS DRAWING IS TO BE REPRODUCED IN COLOUR.
 - IF ANY DISCREPANCIES ARE FOUND IN THIS DRAWING, PLEASE REPORT TO DUDLEYS CONSULTING ENGINEERS.
 - THIS DRAWING HAS BEEN ORIENTATED TO OS BRITISH NATIONAL GRID EPSG:27700 OSGB39. EXISTING SURVEY STATIONS ARE SHOWN ON THE TOPOGRAPHICAL SURVEY.
 - THIS DRAWING IS TO BE READ IN CONJUNCTION WITH RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND THE FOLLOWING SPECIFICATIONS:
 5.1. ENGSPEC 06 - ROAD, PAVING AND CAR PARKING AREAS
 5.2. ENGSPEC 17 - DRAINAGE WORK
 5.3. ENGSPEC 24 - SPECIFICATION FOR HIGHWAY DRAINAGE
 - THIS DRAWING IS BASED ON THE FOLLOWING INFORMATION:
 6.1. 24550011 - TOPOGRAPHICAL SURVEY BY STAMFORD GEOMATICS DATED MARCH 2021
 6.2. SKEL29 03 22 WETLAND SURVEY BY LOVELL HOMES
 6.3. 2195 01 N- SITE LAYOUT PLAN BY STEN ARCHITECTURE DATED SEPTEMBER 2021
 - ALL WORK TO BE UNDERTAKEN IN ACCORDANCE WITH THE CURRENT EDITION OF THE BUILDING REGULATIONS, SEWERAGE SECTOR CODES OF PRACTICE, AND THE RELEVANT LOCAL HIGHWAY AUTHORITY STANDARDS.

KEY

+31.940	PROPOSED LEVELS
+8.909	EXISTING TOPO SURVEY LEVELS
FIN-30.000	FINISHED FLOOR LEVEL
(Blue dashed line)	PROPOSED SW SEWER
(Orange dashed line)	PROPOSED FW SEWER
(Black dashed line)	PROPOSED CULVERT
(Pink dashed line)	PROPOSED V NOTCH WEIR

20.12.24	W-MH INCOMING INVERT LEVEL	MDJ	PD	C
19.07.24	UPDATED TO SUIT COMMENTS	MDJ	PD	B
14.03.24	UPDATED TO SUIT NEW HEADWALL SPECIFICATION	MDJ	PD	A
14.03.24	CONSTRUCTION ISSUE	MDJ	PD	A
Date	Revision	By	Chkd	Ref

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Project
**LOVELL HOMES
 SAVILLE ROAD, SKELMANTHORPE
 HD8 9EF**

Title
WETLAND AREA LAYOUT

Scale	1:200	Sheet	A0	Drawn	MDJ	Check	PD
Date	JUN 22	Status	CONSTRUCTION				
Job No.	21374	Drp. No.	180	Rev.	C		



Design Settings

Rainfall Methodology	FSR	M5-60 (mm)	19.000	Maximum Time of Concentration (mins)	30.00	Minimum Backdrop Height (m)	0.200
Return Period (years)	2	Ratio-R	0.300	Maximum Rainfall (mm/hr)	75.0	Preferred Cover Depth (m)	1.200
Additional Flow (%)	0	CV	0.750	Minimum Velocity (m/s)	1.00	Include Intermediate Ground	✓
FSR Region	England and Wales	Time of Entry (mins)	4.00	Connection Type	Level Soffits	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.180	4.00	147.900	1200	423349.019	410877.291	1.500
2	0.061	4.00	146.815	1200	423354.257	410921.841	1.697
3	0.138	4.00	146.541	1200	423359.883	410932.604	1.727
4	0.020	4.00	145.397	1200	423382.106	410954.204	1.823
5	0.095	4.00	144.268	1200	423389.293	410968.430	1.823
6	0.075	4.00	143.480	1200	423400.559	410973.530	1.869
7		4.00	138.500		423461.189	410927.404	2.765
8			138.500	1500	423464.786	410932.669	2.778
9	0.133	4.00	138.769	1500	423468.859	410944.199	3.071
10	0.020	4.00	138.517	1500	423480.156	410965.635	2.867
11	0.128	4.00	138.402	1800	423488.473	410979.647	2.835
W-MH1			139.100	1500	423497.295	410979.379	3.969

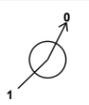
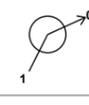
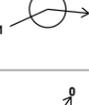
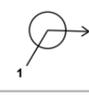
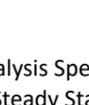
Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	44.857	0.600	146.400	145.118	1.282	35.0	300	4.28	60.9
1.001	2	3	12.145	0.600	145.118	144.814	0.304	40.0	300	4.36	60.5
1.002	3	4	30.991	0.600	144.814	143.574	1.240	25.0	300	4.53	59.7
1.003	4	5	15.938	0.600	143.574	142.520	1.054	15.1	300	4.59	59.4
1.004	5	6	12.367	0.600	142.445	141.611	0.834	14.8	375	4.63	59.2
1.005	6	10	79.988	0.600	141.611	135.875	5.736	13.9	375	4.91	58.0
2.000	7	8	6.376	0.600	135.735	135.722	0.013	500.0	600	4.10	61.9
2.001	8	9	12.228	0.600	135.722	135.698	0.024	500.0	600	4.29	60.9
2.002	9	10	24.231	0.600	135.698	135.650	0.048	500.0	600	4.66	59.1
1.006	10	11	16.294	0.600	135.650	135.617	0.033	500.0	600	5.16	56.9
1.007	11	W-MH1	8.869	0.600	135.567	135.131	0.436	20.3	300	5.20	50.0

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	423349.019	410877.291	147.900	1.500	1200				
						0	1.000	146.400	300
2	423354.257	410921.841	146.815	1.697	1200				
						1	1.000	145.118	300
						0	1.001	145.118	300
3	423359.883	410932.604	146.541	1.727	1200				
						1	1.001	144.814	300
						0	1.002	144.814	300

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
4	423382.106	410954.204	145.397	1.823	1200		1.002	143.574	300
5	423389.293	410968.430	144.268	1.823	1200		1.003	142.520	300
6	423400.559	410973.530	143.480	1.869	1200		1.004	141.611	375
7	423461.189	410927.404	138.500	2.765			0	141.611	375
8	423464.786	410932.669	138.500	2.778	1500		2.000	135.735	600
9	423468.859	410944.199	138.769	3.071	1500		2.000	135.722	600
10	423480.156	410965.635	138.517	2.867	1500		2.001	135.698	600
11	423488.473	410979.647	138.402	2.835	1800		2.002	135.650	600
W-MH1	423497.295	410979.379	139.100	3.969	1500		1.005	135.617	600
							0	135.567	300
							1	135.131	300

Simulation Settings

Rainfall Methodology	FSR	Ratio-R	0.300	Analysis Speed	Detailed	Additional Storage (m³/ha)	0.0
FSR Region	England and Wales	Summer CV	1.000	Skip Steady State	x	Check Discharge Rate(s)	x
M5-60 (mm)	20.000	Winter CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	30	0	0	0	100	40	0	0

Node 11 Online Orifice Control

Flap Valve	x	Invert Level (m)	135.567	Design Flow (l/s)	108.1	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Design Depth (m)	2.585	Diameter (m)	0.181		

Node 7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr) 0.00000 | Side Inf Coefficient (m/hr) 0.00000 | Safety Factor 2.0 | Porosity 0.95 | Invert Level (m) 135.735 | Time to half empty (mins) 41

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	121.7	0.0	2.000	121.7	0.0	2.001	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 98.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	146.496	0.095	42.0	0.1080	0.0000	OK
15 minute summer	2	10	145.246	0.128	56.3	0.1445	0.0000	OK
15 minute summer	3	10	144.953	0.139	88.7	0.1569	0.0000	OK
15 minute summer	4	10	143.703	0.129	93.3	0.1458	0.0000	OK
15 minute summer	5	10	142.578	0.133	115.6	0.1509	0.0000	OK
15 minute summer	6	10	141.737	0.125	133.2	0.1419	0.0000	OK
60 minute summer	7	41	136.065	0.330	79.5	38.1169	0.0000	OK
60 minute summer	8	41	136.064	0.342	83.4	0.6046	0.0000	OK
60 minute summer	9	40	136.063	0.365	86.4	0.6457	0.0000	OK
15 minute summer	10	11	136.072	0.422	137.7	0.7456	0.0000	OK
15 minute summer	11	10	136.074	0.507	50.7	1.2908	0.0000	SURCHARGED
15 minute summer	W-MH1	1	135.131	0.000	44.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	42.0	1.767	0.223	1.0731	
15 minute summer	2	1.001	3	56.3	1.864	0.319	0.3668	
15 minute summer	3	1.002	4	88.7	2.920	0.398	0.9417	
15 minute summer	4	1.003	5	93.3	3.441	0.325	0.4323	
15 minute summer	5	1.004	6	115.6	3.431	0.222	0.4168	
15 minute summer	6	1.005	10	133.0	3.481	0.247	3.6117	
60 minute summer	7	2.000	8	-79.5	-1.397	-0.260	1.0348	
60 minute summer	8	2.001	9	-83.4	-0.785	-0.272	2.1130	
60 minute summer	9	2.002	10	-65.9	0.479	-0.215	4.6782	
15 minute summer	10	1.006	11	39.9	0.543	0.130	3.5957	
15 minute summer	11	Orifice	W-MH1	44.1				76.3

Results for 30 year Critical Storm Duration. Lowest mass balance: 98.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	146.535	0.135	79.5	0.1524	0.0000	OK
15 minute summer	2	10	145.315	0.197	106.6	0.2232	0.0000	OK
15 minute summer	3	10	145.026	0.211	167.9	0.2392	0.0000	OK
15 minute summer	4	10	143.771	0.197	176.6	0.2227	0.0000	OK
15 minute summer	5	10	142.645	0.200	218.9	0.2260	0.0000	OK
15 minute summer	6	10	141.789	0.178	252.1	0.2012	0.0000	OK
60 minute summer	7	42	136.612	0.877	172.9	101.4350	0.0000	SURCHARGED
60 minute summer	8	42	136.612	0.890	180.1	1.5727	0.0000	SURCHARGED
60 minute summer	9	42	136.611	0.913	185.6	1.6140	0.0000	SURCHARGED
60 minute summer	10	42	136.610	0.960	175.6	1.6968	0.0000	SURCHARGED
60 minute summer	11	42	136.608	1.041	66.8	2.6493	0.0000	SURCHARGED
15 minute summer	W-MH1	1	135.131	0.000	58.8	0.0000	0.0000	OK

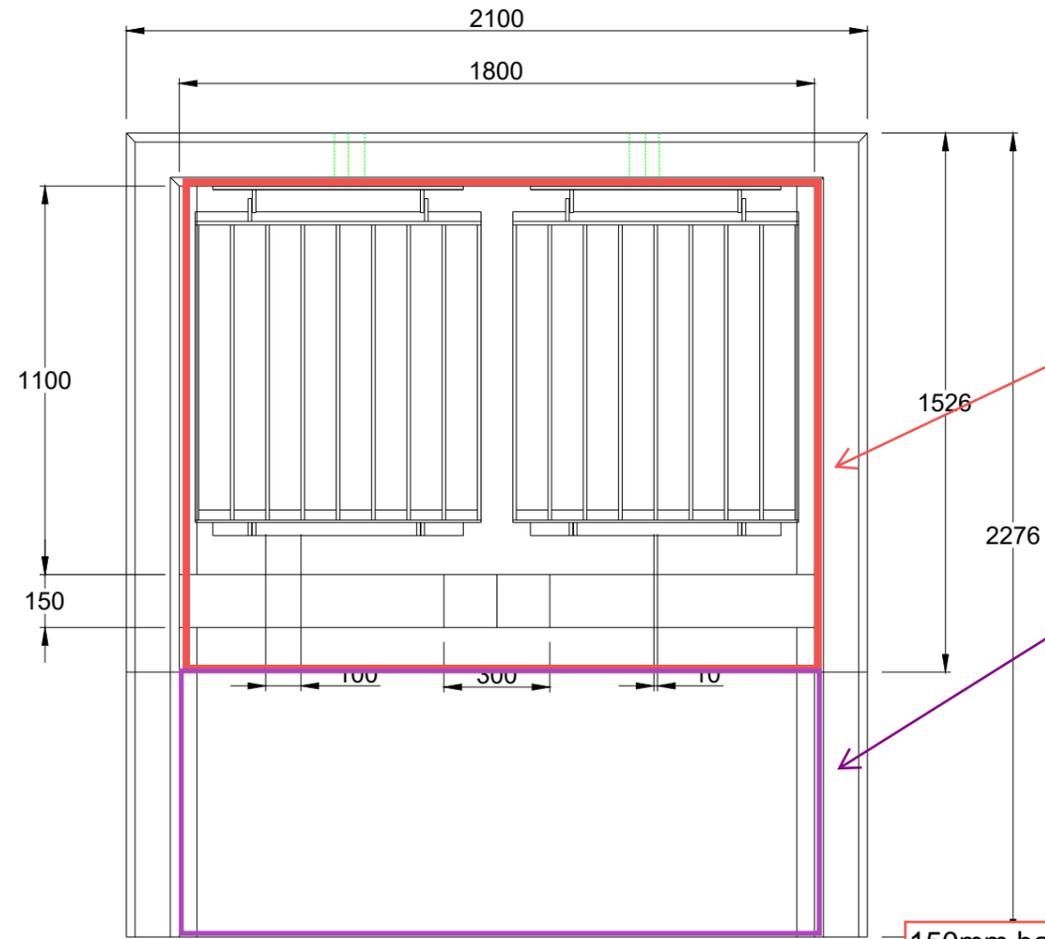
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	79.6	2.006	0.422	1.7898	
15 minute summer	2	1.001	3	106.6	2.085	0.605	0.6207	
15 minute summer	3	1.002	4	167.9	3.288	0.753	1.5822	
15 minute summer	4	1.003	5	176.7	3.934	0.615	0.7151	
15 minute summer	5	1.004	6	218.9	3.939	0.419	0.6873	
15 minute summer	6	1.005	10	252.0	3.628	0.468	6.4696	
60 minute summer	7	2.000	8	-172.9	-1.048	-0.565	1.7960	
60 minute summer	8	2.001	9	-180.1	-0.765	-0.589	3.4443	
60 minute summer	9	2.002	10	-146.7	-0.553	-0.479	6.8253	
60 minute summer	10	1.006	11	59.2	0.545	0.193	4.5896	
60 minute summer	11	Orifice	W-MH1	66.7				262.6

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 98.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	147.513	1.113	144.0	1.2591	0.0000	SURCHARGED
15 minute summer	2	11	146.810	1.692	180.6	1.9135	0.0000	FLOOD RISK
15 minute summer	3	11	146.374	1.560	275.5	1.7648	0.0000	FLOOD RISK
15 minute summer	4	11	144.236	0.662	279.1	0.7484	0.0000	SURCHARGED
15 minute summer	5	10	142.727	0.282	344.6	0.3185	0.0000	OK
15 minute summer	6	10	141.848	0.237	403.7	0.2680	0.0000	OK
60 minute summer	7	43	137.970	2.235	346.3	231.2878	0.0000	SURCHARGED
60 minute summer	8	43	137.976	2.254	351.6	3.9834	0.0000	SURCHARGED
60 minute summer	9	43	137.991	2.293	357.0	4.0512	0.0000	SURCHARGED
60 minute summer	10	43	137.964	2.314	322.8	4.0882	0.0000	SURCHARGED
60 minute summer	11	43	137.961	2.394	113.7	6.0917	0.0000	SURCHARGED
15 minute summer	W-MH1	1	135.131	0.000	84.8	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	131.7	2.108	0.699	3.1588	
15 minute summer	2	1.001	3	167.8	2.383	0.952	0.8552	
15 minute summer	3	1.002	4	263.3	3.740	1.180	2.1824	
15 minute summer	4	1.003	5	276.1	4.088	0.961	1.0281	
15 minute summer	5	1.004	6	343.5	4.250	0.658	1.0029	
15 minute summer	6	1.005	10	400.6	3.947	0.744	7.3463	
60 minute summer	7	2.000	8	-346.3	-1.230	-1.132	1.7960	
60 minute summer	8	2.001	9	-351.6	-1.249	-1.149	3.4443	
60 minute summer	9	2.002	10	-283.1	-1.005	-0.925	6.8253	
60 minute summer	10	1.006	11	96.6	0.545	0.316	4.5896	
60 minute summer	11	Orifice	W-MH1	103.8				484.4

Opening in back wall cast to suit the outside diameter of the pipe at invert height required.



Note: Isometric drawing is for reference only, details may not accurately represent actual design - please see detailed views for technical information

Denotes top landing section of landing, capable of withstanding someone standing on it for maintenance.

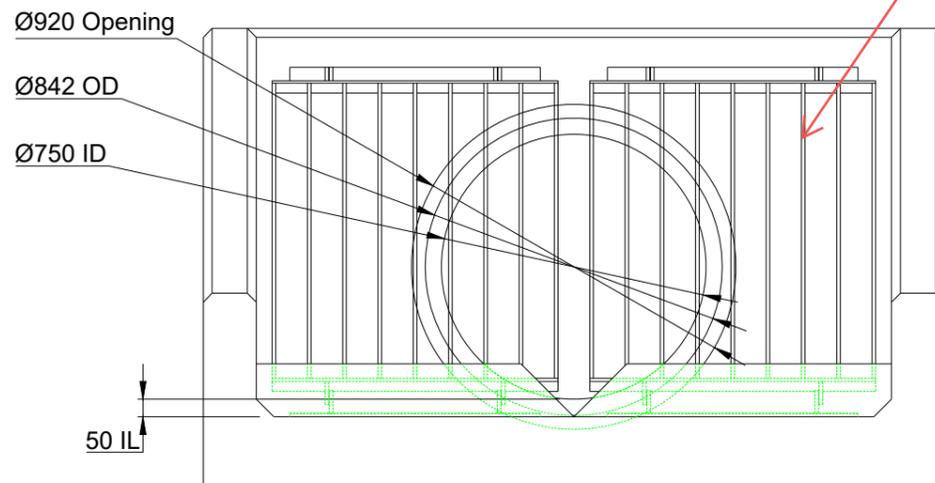
Front section of trash grill.

150mm bar spacing to be incorporated at front

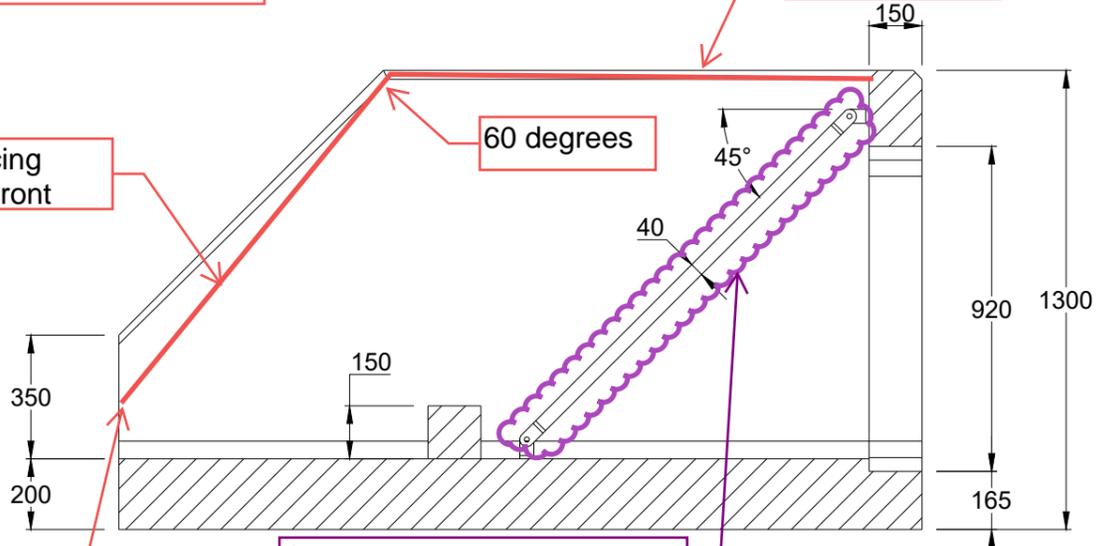
75mm bar spacing on top

Bar spacing 150mm front

60 degrees



Terminates here to leave 150mm gap between bottom of grill and top of apron



Can this section be reused and adapted to be the front section of trash screen.

DO NOT SCALE DRAWING



NOTES:

- All dimensions in mm
- All measurements ± 1mm

Specification Information

- Opening in back wall cast to suit outside diameter of the pipework
- Invert level of pipe can be set to your specification

Headwall Installation

Units should be bedded on minimum 150mm thick well compacted Class 6N or 6K* well graded granular material with a 50mm topping of fine material (Class 6L*) to ensure units are level and stable.
*Manual of contract documents for Highway Works: Volume (MCHW1) specification for Highway Works, Series 600 (Nov 09).

Handling

- A. Weight of concrete is based on 2.4 tonne/m³+5% is recommended for sizing lifting equipment.
- B. All lifting points shall be used as specified below
- C. Unit to be lifted as per lifting diagram

Concrete

- A. Mix ref: Self-compacting DC4/DS4 Mix
- B. Lifting strength based on 2 cubes = 20N/mm²
- C. Characteristic 28 day cube strength = 50N/mm²
- D. Concrete provides Design Chemical Class 4 (DC4) to special Digest 1, Table F2.

Reinforcement

- A. Reinforcement to BS EN 13369
- B. Scheduling, dimensioning, bending & cutting to BS8666
- C. Cage to be machine tied with steel wire

Manufacture

- A. Manufacture to BS EN 15258:2008 precast concrete products - Retaining wall elements, Factory Production Control certificate number: 0086-CPR-650448 & BS EN 13369
- B. Tolerances to BS EN 13369 clause 4.3.1.1
- C. Finishing:

Class	Top	Sides	Base	Rear of back wall
	A	A	A	Self - Levelled
- D. Marking: Units shall be indelibly marked to show:
 - Mould reference code
 - De-mould date
 - Job reference number & unique product number
 - Unit weight (kg)

Design

- A. Concrete design to EC2
 - B. Althon have designed the concrete units only, the site conditions should be assessed for suitability by the scheme designer
 - C. Units are designed to withstand a vertical live load surcharge of 10kN/m²
 - D. Weight of soil = 18kN/m³
 - E. Angle of internal friction = 30 Deg.
 - F. Design Life: >120 years
- *For products installed in aggressive environments, bitumen coating can be requested at additional cost

Min Cover	Cover Block Size (mm)	Min Cover Size (mm)	Max Cover Size (mm)
All Faces	55	50	63

Exposure Classification	Exposure induced by Carbonation	Corrosion induced by Chloride	Freeze/thaw	Chemical attack
All Faces	XC3/4	XD3	XF4	XA3

Fabrication Specification

- A. Manufacture IAW EN 1090-2 EXC CLASS 1
- B. Material grade is to be: BS EN 10025 S275
- C. Welding carried out IAW EN 1090-2 PARA 7.5.4 - 7.5.18
- D. All fillet and butt welds to have a minimum throat thickness of 6mm & joints to be fully welded where possible.
- E. Ensure vertical flats are fully welded both sides where possible.
- F. All sharp edges and burrs are to be removed.
- G. Remove all weld splatter.
- H. Holes by punching are permitted with reaming.
- I. Galvanising is carried out after fabrication to BS EN ISO 1461

Handrail Specification

- A. Kee Klamp®, Galvanised Size 8 Fittings
- B. Size 8 48.3mm OD 3.2mm Wall Thickness Galvanised Medium Duty Tube to BS EN 10255
- C. 360N/m Design Load as stated in BS 8118, BS 6180, BS 6399 & BS 7818, Civil Engineering Specification for the Water Industry (CESWI) 7th Edition Clause 2.60 Handrails & Balusters & The Engineering Equipment and Materials Users' Association (EEMUA) Publication 105 7th Edition Factory Stairways, Ladders and Handrails
- D. Other design loads available on request
- E. GRP/FRP Handrails also available

REV NO	DATE	DESCRIPTION



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DRAWING TITLE / PROJECT:

R18B 01 2270 Headwall
GMS Sloped Grating
V Notch Weir Wall

CLIENT: Dudleys

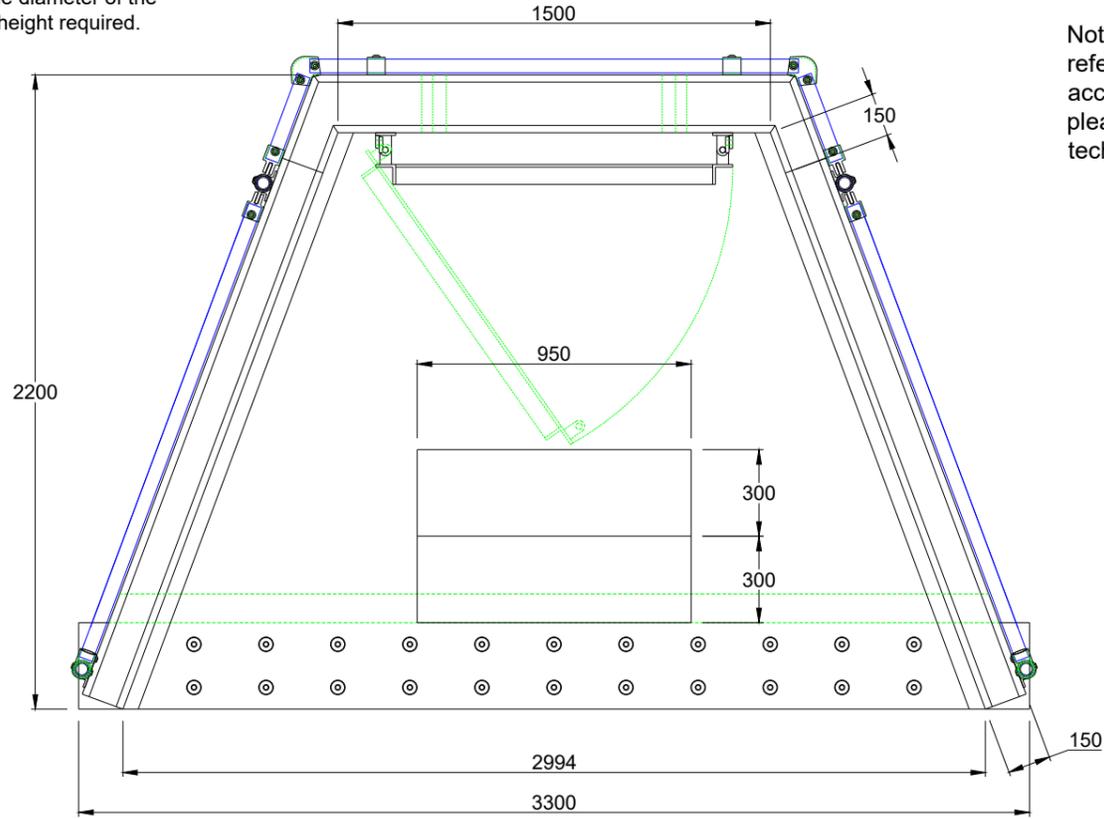
SCALE:	PAPER:	SHEET NO:	DATE:
NTS	A3	01 OF 02	17.07.2024

HEADWALL WEIGHT:	TOE WEIGHT:
4365kg & Water Cushion TBC	N/A

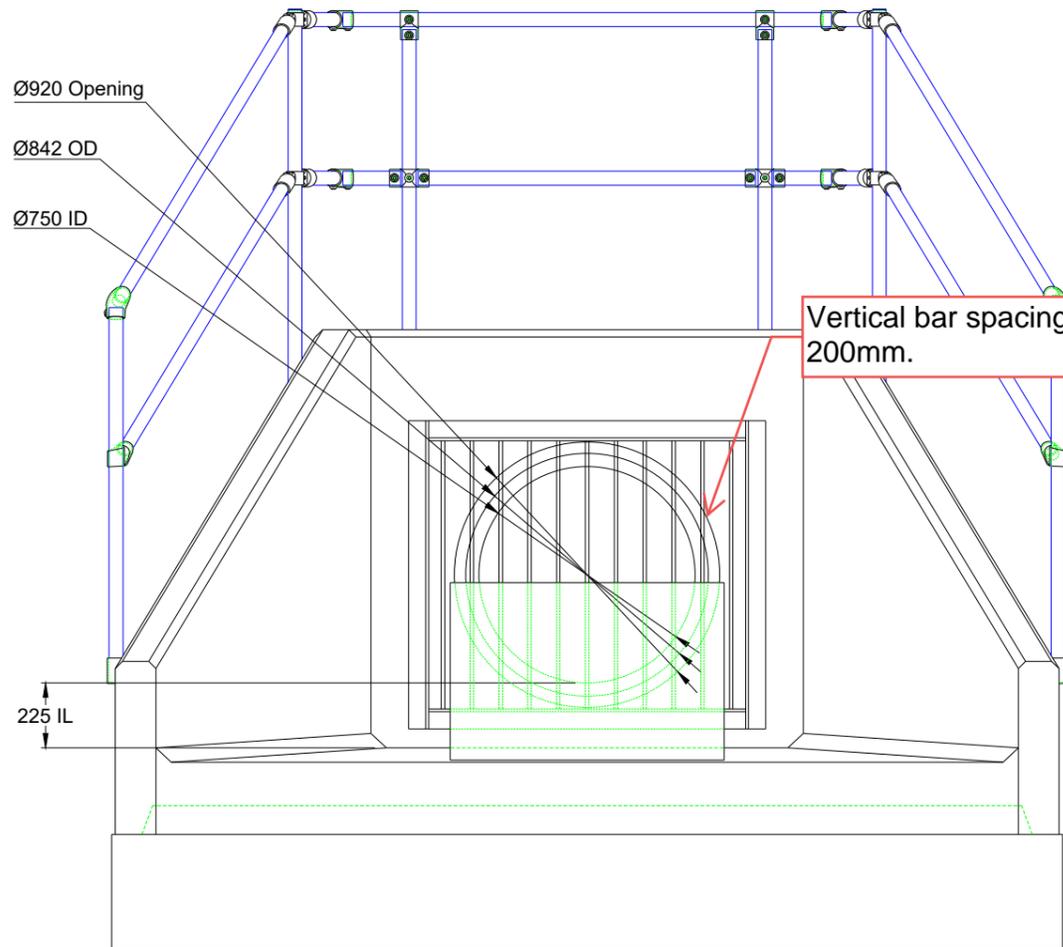
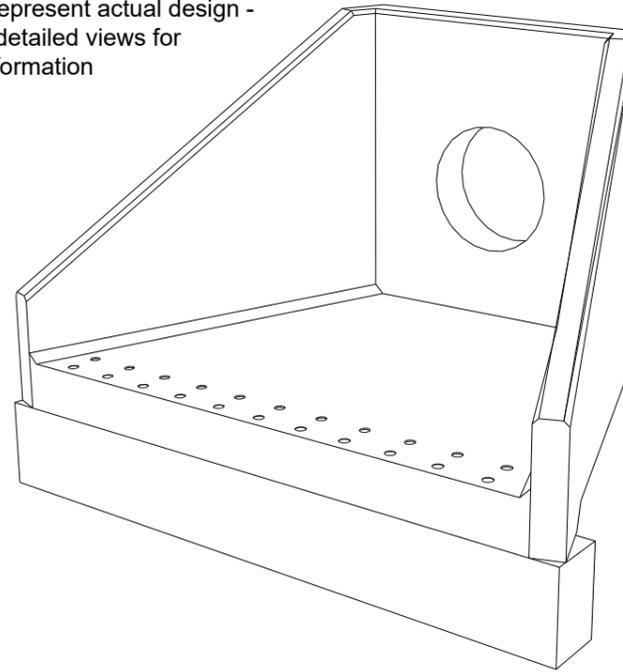
MISC WEIGHT:	GRATING WEIGHT:	DRAWN BY:
N/A	TBC	JW

DRAWING No: ALT170724-202-01

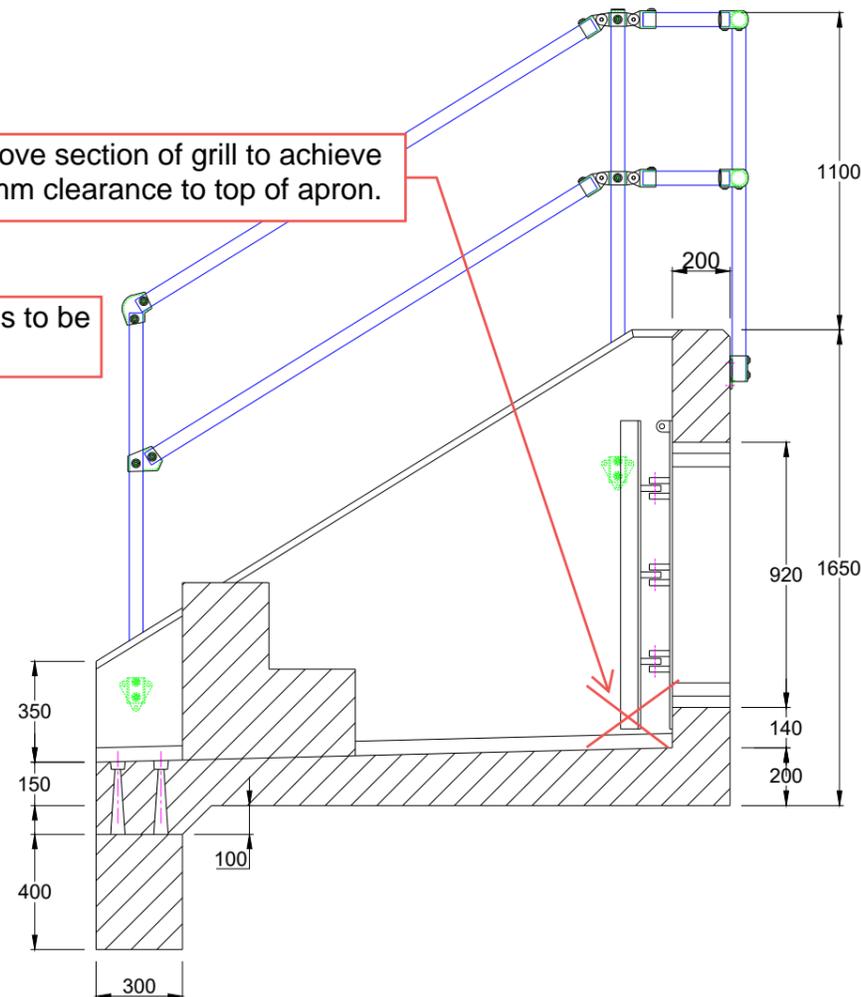
Opening in back wall cast to suit the outside diameter of the pipe at invert height required.



Note: Isometric drawing is for reference only, details may not accurately represent actual design - please see detailed views for technical information



Remove section of grill to achieve 150mm clearance to top of apron.



DO NOT SCALE DRAWING

NOTES:

- All dimensions in mm
- All measurements ± 1mm

Specification Information

- Opening in back wall cast to suit outside diameter of the pipework
- Invert level of pipe can be set to your specification

Headwall Installation

Units should be bedded on minimum 150mm thick well compacted Class 6N or 6K* well graded granular material with a 50mm topping of fine material (Class 6L*) to ensure units are level and stable.

*Manual of contract documents for Highway Works: Volume (MCHW1) specification for Highway Works, Series 600 (Nov 09).

Handling

- A. Weight of concrete is based on 2.4 tonne/m³+5% is recommended for sizing lifting equipment.
- B. All lifting points shall be used as specified below
- C. Unit to be lifted as per lifting diagram

Concrete

- A. Mix ref: Self-compacting DC4/DS4 Mix
- B. Lifting strength based on 2 cubes = 20N/mm²
- C. Characteristic 28 day cube strength = 50N/mm²
- D. Concrete provides Design Chemical Class 4 (DC4) to special Digest 1, Table F2.

Reinforcement

- A. Reinforcement to BS EN 13369
- B. Scheduling, dimensioning, bending & cutting to BS8666
- C. Cage to be machine tied with steel wire

Manufacture

- A. Manufacture to BS EN 15258:2008 precast concrete products - Retaining wall elements, Factory Production Control certificate number: 0086-CPR-650448 & BS EN 13369
- B. Tolerances to BS EN 13369 clause 4.3.1.1
- C. Finishing:

Class	Top		Sides		Base		Rear of back wall	
	A	A	A	A	A	A	Self - Levelled	
D								

- D. Marking: Units shall be indelibly marked to show:

- Mould reference code
- De-mould date
- Job reference number & unique product number
- Unit weight (kg)

Design

- A. Concrete design to EC2
- B. Althon have designed the concrete units only, the site conditions should be assessed for suitability by the scheme designer
- C. Units are designed to withstand a vertical live load surcharge of 10kN/m²
- D. Weight of soil = 18kN/m³
- E. Angle of internal friction = 30 Deg.
- F. Design Life: >120 years

*For products installed in aggressive environments, bitumen coating can be requested at additional cost

Min Cover	Cover Block Size (mm)	Min Cover Size (mm)	Max Cover Size (mm)
All Faces	55	50	63

Exposure Classification	Exposure induced by Carbonation	Corrosion induced by Chloride	Freeze/thaw	Chemical attack
All Faces	XC3/4	XD3	XF4	XA3

Fabrication Specification

- A. Manufacture IAW EN 1090-2 EXC CLASS 1
- B. Material grade is to be: BS EN 10025 S275
- C. Welding carried out IAW EN 1090-2 PARA 7.5.4 - 7.5.18
- D. All fillet and butt welds to have a minimum throat thickness of 6mm & joints to be fully welded where possible.
- E. Ensure vertical flats are fully welded both sides where possible.
- F. All sharp edges and burrs are to be removed.
- G. Remove all weld splatter.
- H. Holes by punching are permitted with reaming.
- I. Galvanising is carried out after fabrication to BS EN ISO 1461

Handrail Specification

- A. Kee Klamp®, Galvanised Size 8 Fittings
- B. Size 8 48.3mm OD 3.2mm Wall Thickness Galvanised Medium Duty Tube to BS EN 10255
- C. 360N/m Design Load at stated in BS 8118, BS 6180, BS 6399 & BS 7818, Civil Engineering Specification for the Water Industry (CESWI) 7th Edition Clause 2.60 Handrails & Balusters & The Engineering Equipment and Materials Users' Association (EEMUA) Publication 105 7th Edition Factory Stairways, Ladders and Handrails
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DRAWING TITLE / PROJECT:

SFA15B Headwall
400 x 300mm Toe
Stepped Baffle Block, 3 Sided Kee Klamp
SFA1 750 Outfall Safety Grille

CLIENT:

Dudleys

SCALE:	PAPER:	SHEET NO:	DATE:
NTS	A3	02 OF 02	17.07.2024

HEADWALL WEIGHT:	TOE WEIGHT:
5814kg	950kg

MISC WEIGHT:	GRATING WEIGHT:	DRAWN BY:
Kee Klamp 120kg	110kg	JW

DRAWING No:
ALT170724-202-02

