

PARKSIDE SPORTS & COMMUNITY CENTRE
HOYLAND COMMON, BARNSELY
FLOOD RISK ASSESMENT & DRAINAGE STRATEGY
BARNSELY MBC
AUGUST 2023

S H A U N T O N G E
E N G I N E E R I N G

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DEVELOPMENT OFF PARKSIDE ROAD, HOYLAND COMMON, BARNSELEY

DRAINAGE STRATEGY

THE SITE:

The site is located off Parkside Road, Hoyland common, Barnsley and occupies an area of approximately 1.62 hectares (Club house, parking and sports pitch)

The site has undergone a scheme of earthworks with the topography falling approx 7.3m from north to south.

A location plan is shown in Appendix A

A copy of the topographical survey is shown in Appendix B

PROPOSED DEVELOPMENT:

Barnsley MBC are seeking to develop the site with a new community centre/club house, all weather sports pitch and associated parking. The associated earthworks, land drainage and detention basin have already been constructed as part of the Phase 1 works.

A site layout plan is shown in Appendix C

FLOOD ZONE LOCATION:

The Environment Agency flood map shows the site lies within flood zone 1. The site has therefore a “low probability” of flooding, where the annual risk of fluvial flooding is less than 0.1%.

A copy of the Environment Agency flood zone information can be seen in Appendix D.

OTHER SOURCES OF FLOODING:

Reservoirs – There are no reservoirs within the vicinity of the site.

Surface Water – The information held on the Environment Agency website confirms the site is not at risk of surface water flooding.

Public Sewers – There are no know flooding issues with public sewers within the vicinity of the site.

Groundwater – Flooding from groundwater is most common in areas where the underlying bed rock is chalk, but it can also happen in locations with sand and gravel in low lying areas. The risk of groundwater flooding at this site is very low.

DRAINAGE CONSIDERATIONS:

A copy of the Phase 1 drainage works can be seen in Appendix E.

Onsite drainage will be designed with separate systems for foul and surface water.

EXISTING PUBLIC SEWERS

There are surface water and combined public sewers crossing the north eastern corner of the development.

A copy of the public sewer record can be seen in Appendix F.

SURFACE WATER

Current best practise requires that a hierarchical approach to surface water disposal is undertaken. These being in order of preference:-

1. Infiltration based systems
2. Watercourses
3. Public sewer

Infiltration based systems: Infiltration testing has not been carried out on this site, but due to the site being re-engineered, infiltration methods of drainage will not be an option.

Watercourses: There is a watercourse approx 200m to the east of the site.

Public Sewer: There are no surface water sewers within the immediate area with capacity to take this development.

FOUL WATER

A foul drainage spur has been provided to the southern boundary to cater specifically for this site.

DRAINAGE PROPOSALS:

SURFACE WATER

Infiltration methods of drainage will not be an option due to the re-engineered nature of the underlying soils.

The existing detention basin has been sized to cater for “greenfield run off” from the Parkside development. The basin outfall’s to a watercourse adjacent to Stead Lane to the east of the site.

The allowable discharge rate from each developable area will be as follows:-

Community centre and parking areas – 2.63 l/s

All weather sports pitch – 5.09 l/s

Please refer to Appendix G for greenfield run off calculations.

An attenuation tank and flow control manhole will be required for each area. Alternativley the attenuation can be combined to a single tank and flow control restricted to 7.72 l/s.

The attenuation tanks should be sized to cater for the 1:100+40% climate change event. Attenuation requirements are shown on the drainage strategy plan with calculations within Appendix H.

An oil interceptor will be required for the car parking area in line with current regulations.

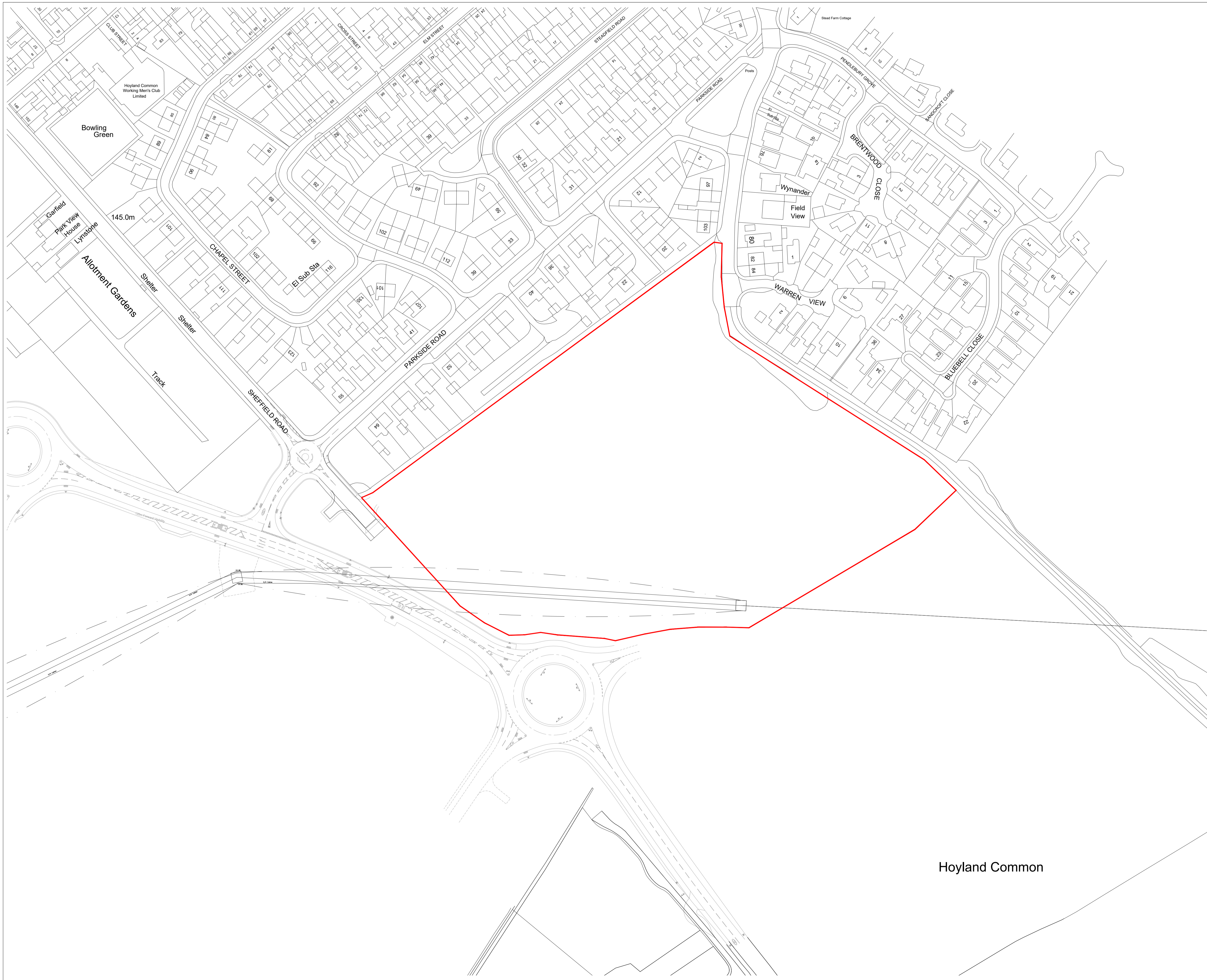
Future maintenance of the surface water drainage system will be by Barnsley MBC.

FOUL

A foul connection can be made to the 150mm diameter foul spur to the south of the site.

Onsite foul drainage will be maintained by Barnsley MBC.

A drainage strategy drawing can be found in Appendix I.

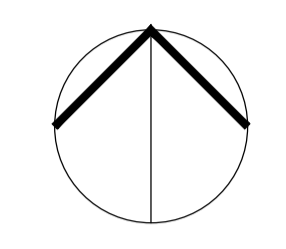


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DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DOCUMENTS INCLUDING BUT NOT LIMITED TO DRAWINGS, SPECIFICATIONS, SCHEDULES

0m 10 20 30 60m
1:1000

NOTES
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P1	First Issue	26/04/23	BST
Rev	Notes	Date	Issued By



SERVICE
B.E.S.T

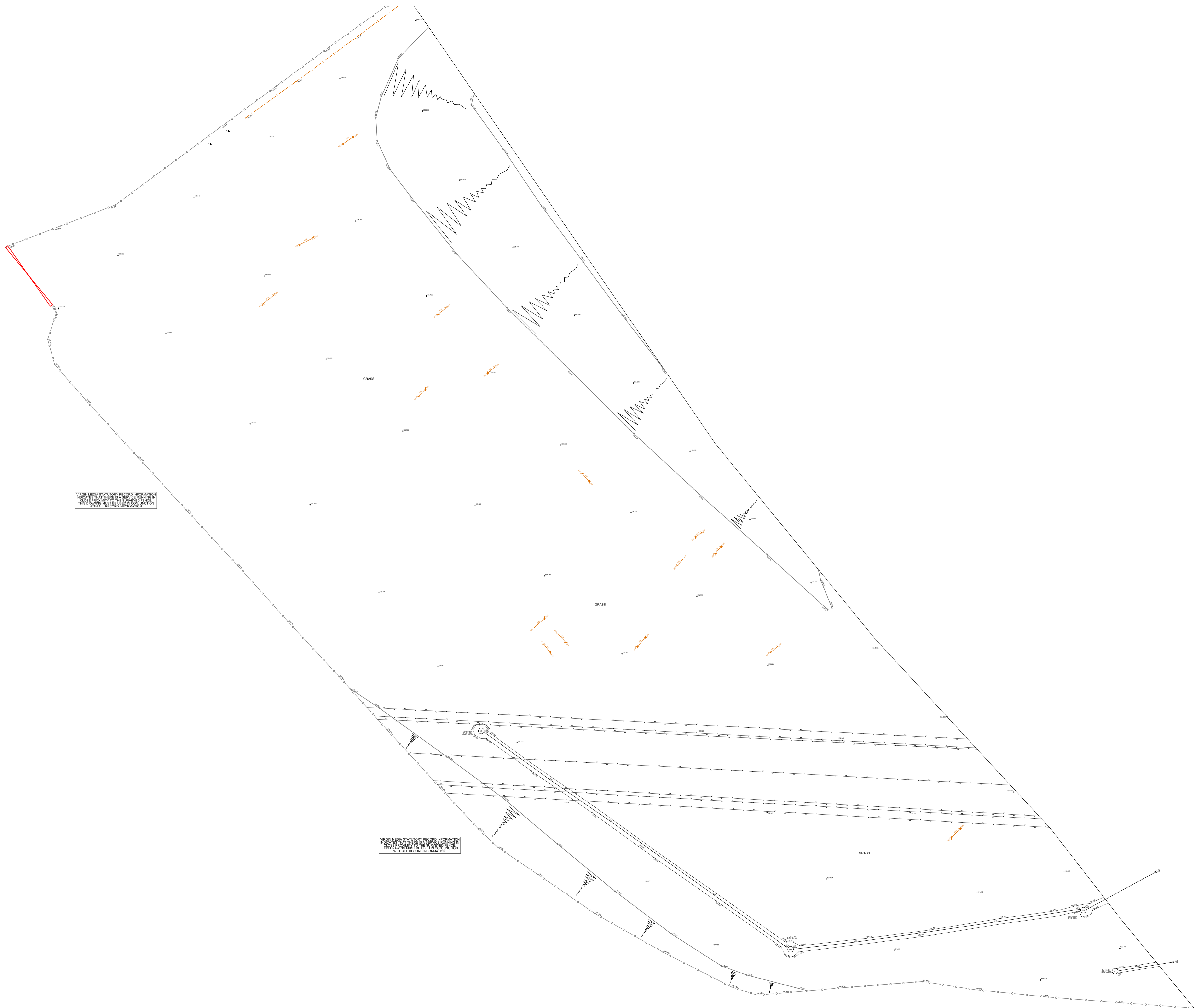
PROJECT
Parkside Sports & Community Centre

TITLE
Site Location Plan

PROJECT REF	DRAWING REFERENCE	REV
SCALE	DISCIPLINE	SHEET SIZE
PURPOSE OF ISSUE	Drawn	Checked

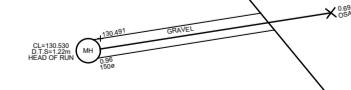
001
P1
1:1000
ARCHITECTURE
A1
PRELIMINARY
BST

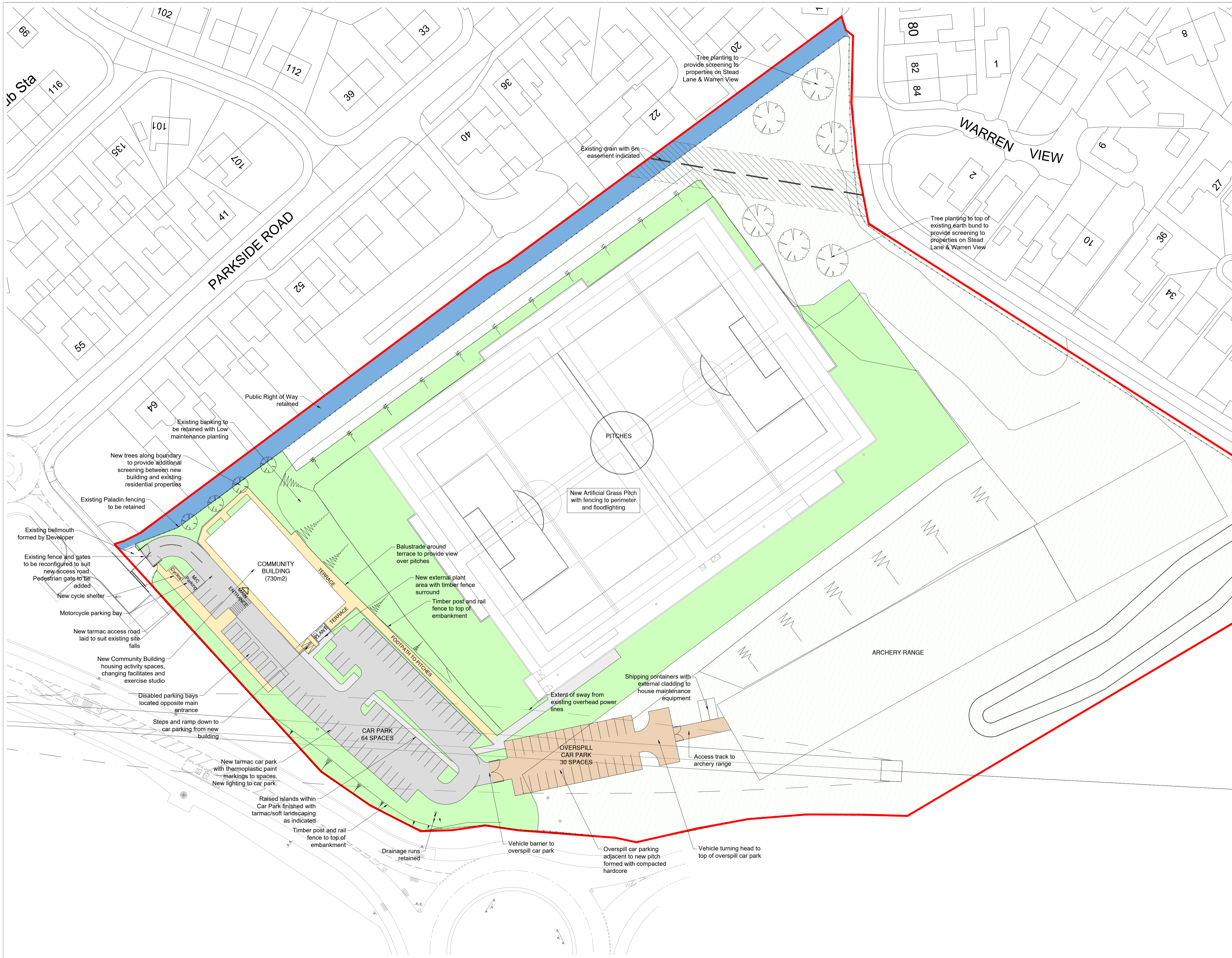
Hoyland Common



VRON MEDIA STATUTORY RECORD INFORMATION
INDICATES THAT THERE IS A SERVICE RUNNING IN
CLOSE PROXIMITY TO THE SURVEYED FENCE.
THIS SERVICE MUST BE USED IN CONJUNCTION
WITH ALL RECORD INFORMATION.

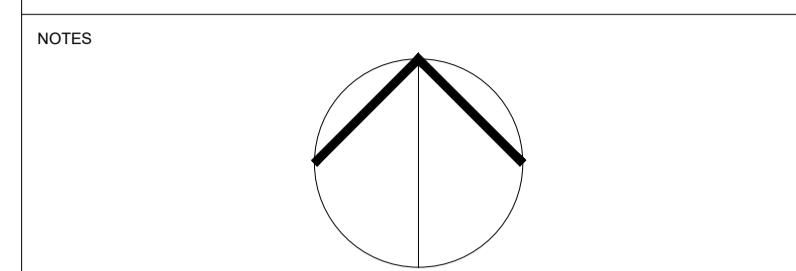
VRON MEDIA STATUTORY RECORD INFORMATION
INDICATES THAT THERE IS A SERVICE RUNNING IN
CLOSE PROXIMITY TO THE SURVEYED FENCE.
THIS SERVICE MUST BE USED IN CONJUNCTION
WITH ALL RECORD INFORMATION.





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DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER PROJECT DOCUMENTS INCLUDING BUT NOT LIMITED TO DRAWINGS, SPECIFICATIONS, SCHEDULES



- Landscaping Key**
- Soft Landscaping
 - Tarmac to Roads
 - Tarmac Paths
 - Hardcore to overspill car park
 - Paving to Paths & Terrace
 - Extent of landscaping provided by developer
 - New trees

Rev	Notes	Date	Issued By
P9	External Plant relocated. Car park layout amended to create walkway along central island. Motorcycle parking added. Cycle parking added. Steps/Ramp amended to car park. Landscape hatching added. Notes updated.	21/07/23	BST
P8	Overspill layout reconfigured.	09/02/23	BST
P7	Layout updated in line with topo survey information. Pitch layout added from Football Foundation. Overspill car parking added.	16/01/23	BST
P6	Building footprint amended to 730m2.	29/06/22	BST
P5	Building footprint amended to 700m2. Parking increased to 68 spaces. Terrace added. Mover storage added. Steps/ramp removed.	14/04/22	BST
P4	Building arrangement amended to suit single storey first phase build working with slope of site.	21/01/22	BST
P3	Tiered seating omitted. Steps and ramped access introduced down to pitch level. Building name amended.	20/01/22	BST
P2	Building footprint reduced to suit existing provision. Future phase extensions indicated. Disabled parking spaces relocated and no. additional standard spaces added. Car park notes updated.	18/01/22	BST
P1	First Issue	06/12/21	BST



SERVICE
B.E.S.T

PROJECT
Parkside Sports & Community Centre

TITLE
Proposed Site Layout

PROJECT REF	DRAWING REFERENCE	REV
1:500	012	P9
SCALE	DISCIPLINE	SHEET SIZE
1:500	ARCHITECTURE	A1
PURPOSE OF ISSUE	Drawn	Checked
INFORMATION	Drawn	BST
	Checked	

Flood map for planning

Your reference
<Unspecified>

Location (easting/northing)
436015/399807

Created
1 Aug 2023 9:37

Your selected location is in flood zone 1, an area with a low probability of flooding.

You will need to do a flood risk assessment if your site is **any of the following**:

- bigger than 1 hectare (ha)
- In an area with critical drainage problems as notified by the Environment Agency
- identified as being at increased flood risk in future by the local authority's strategic flood risk assessment
- at risk from other sources of flooding (such as surface water or reservoirs) and its development would increase the vulnerability of its use (such as constructing an office on an undeveloped site or converting a shop to a dwelling)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence **which** sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>

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Key:

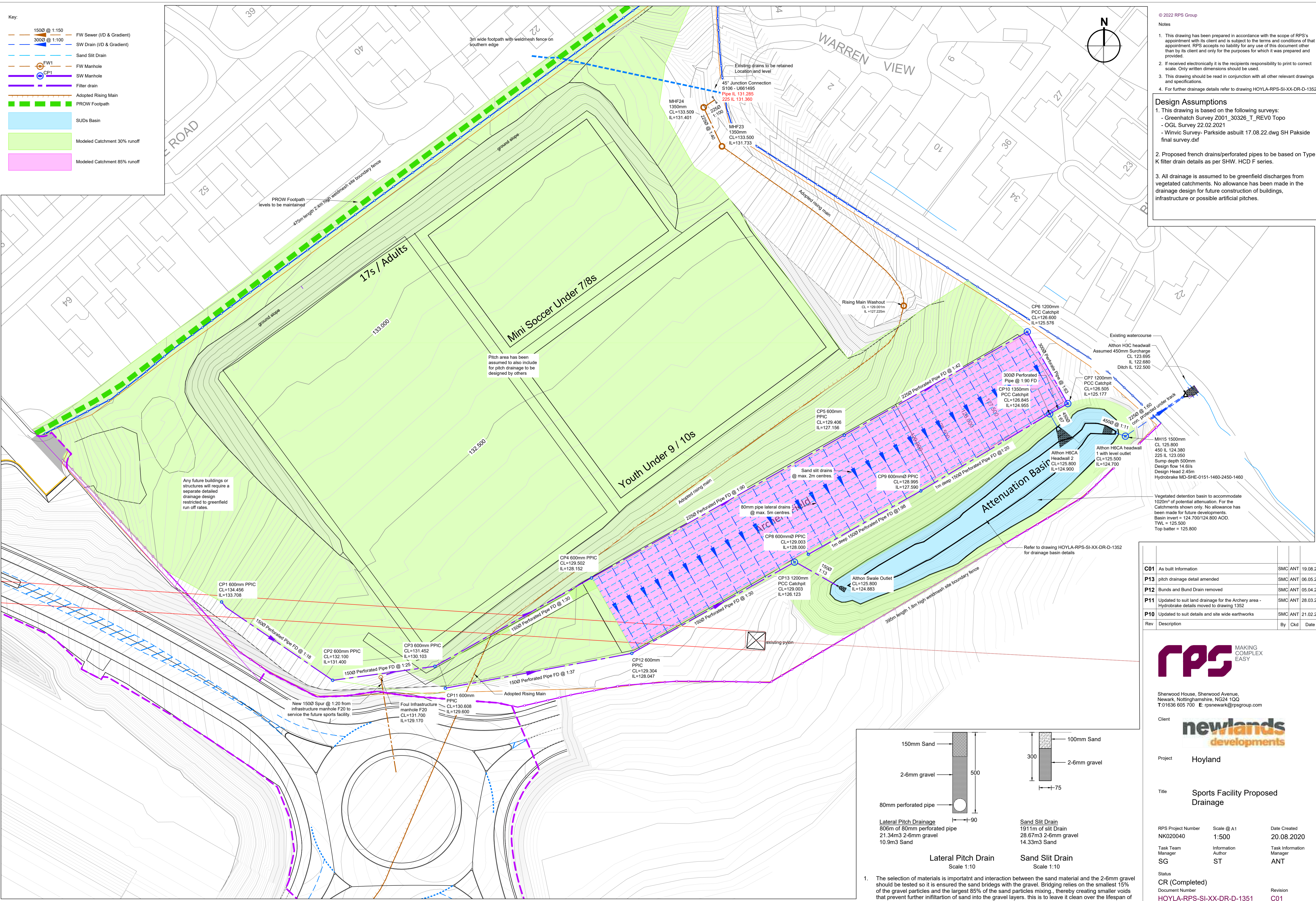
- 1500 @ 1:150 FW Sewer (ID & Gradient)
- 3000 @ 1:100 SW Drain (ID & Gradient)
- Sand Silt Drain
- FW1 FW Manhole
- CP1 SW Manhole
- Filter drain
- Adopted Rising Main
- PROW Footpath
- SUDs Basin
- Modeled Catchment 30% runoff
- Modeled Catchment 85% runoff

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Notes

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- If received electronically it is the recipient's responsibility to print to correct scale. Only written dimensions should be used.
- This drawing should be read in conjunction with all other relevant drawings and specifications.
- For further drainage details refer to drawing HOYLA-RPS-SI-XX-DR-D-1352.

Design Assumptions

- This drawing is based on the following surveys:
 - Greenhatch Survey Z001_30326_T_REV0 Topo
 - OGL Survey 22.02.2021
 - Winvic Survey- Parkside asbuilt 17.08.22.dwg SH Parkside final survey.dxf
- Proposed french drains/perforated pipes to be based on Type K filter drain details as per SHW, HCD F series.
- All drainage is assumed to be greenfield discharges from vegetated catchments. No allowance has been made in the drainage design for future construction of buildings, infrastructure or possible artificial pitches.



10m SCALE 1:500

Vegetated detention basin to accommodate 1020m³ of potential attenuation. For the Catchments shown only. No allowance has been made for future developments. Basin invert = 124.700/124.800 AOD. TWL = 125.500 Top batter = 125.800

Rev	Description	By	Ckd	Date
C01	As built Information	SMC	ANT	19.08.22
P13	pitch drainage detail amended	SMC	ANT	06.05.22
P12	Bunds and Bund Drain removed	SMC	ANT	05.04.22
P11	Updated to suit land drainage for the Archery area - Hydrobrake details moved to drawing 1352	SMC	ANT	28.03.22
P10	Updated to suit details and site wide earthworks	SMC	ANT	21.02.22



Sherwood House, Sherwood Avenue, Newark, Nottinghamshire, NG24 1QQ
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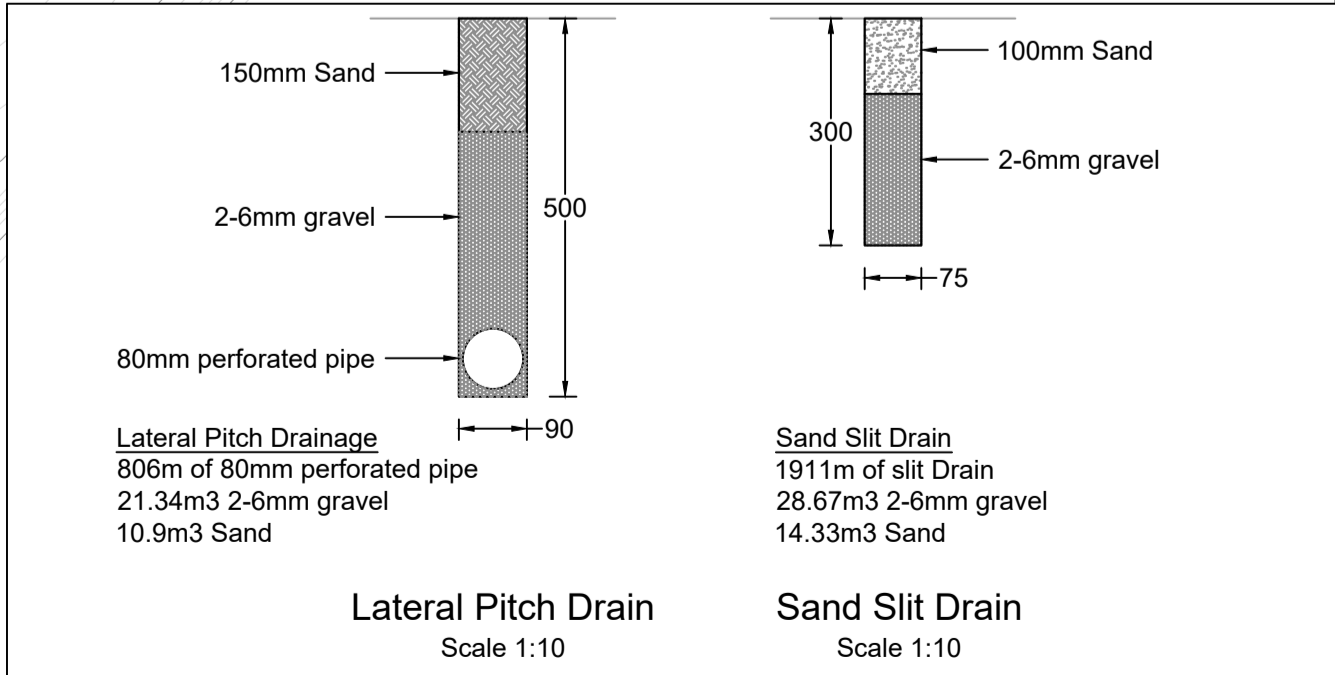


Client: **Hoyland**

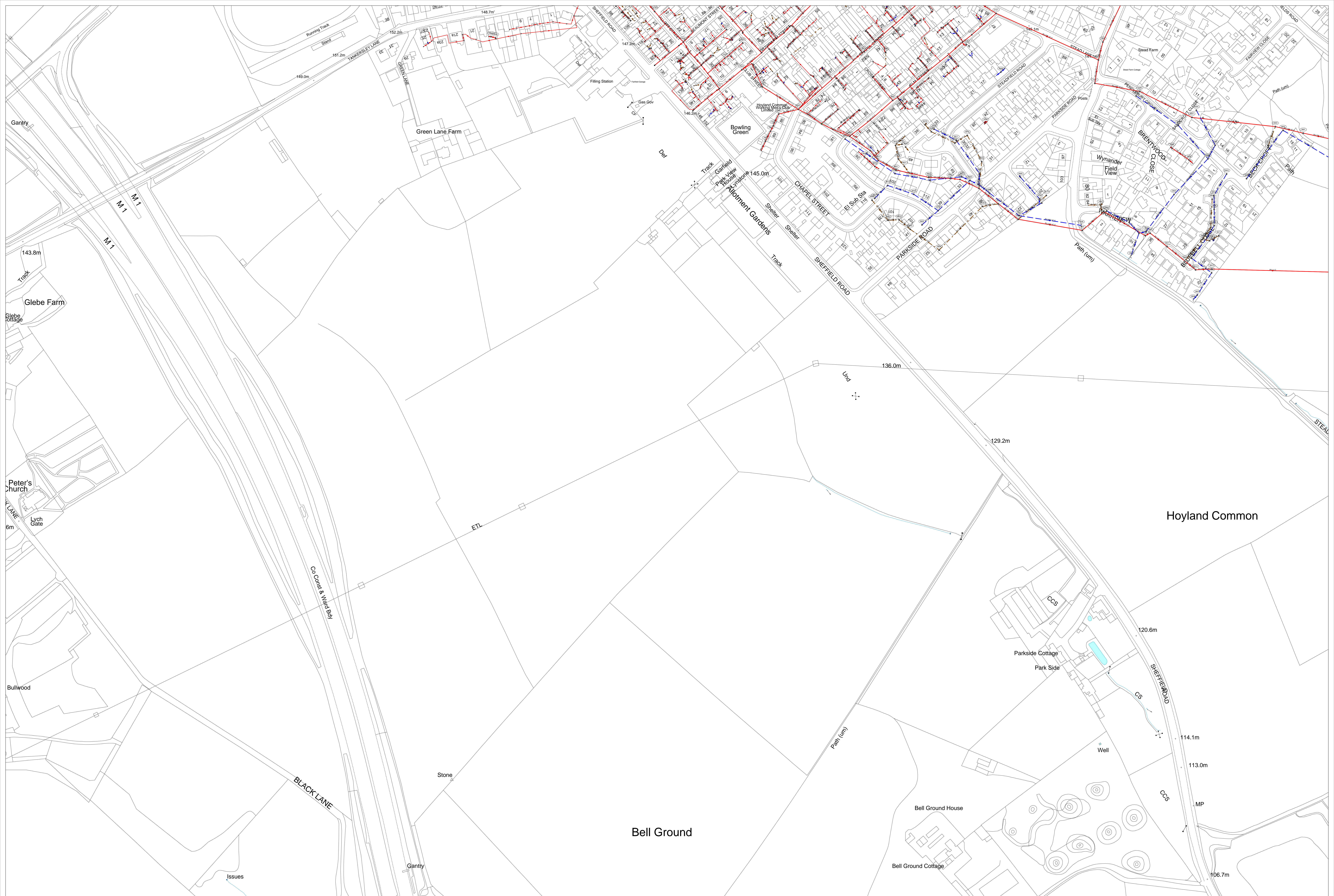
Title: **Sports Facility Proposed Drainage**

RPS Project Number	Scale @ A1	Date Created
NK020040	1:500	20.08.2020
Task Team Manager	Information Author	Task Information Manager
SG	ST	ANT

Status	Document Number	Revision
CR (Completed)	HOYLA-RPS-SI-XX-DR-D-1351	C01
Project Code - Originator - Zone - Level - Type - Role - Drawing Number		
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- The selection of materials is important and interaction between the sand material and the 2-6mm gravel should be tested so it is ensured the sand bridges with the gravel. Bridging relies on the smallest 15% of the gravel particles and the largest 85% of the sand particles mixing, thereby creating smaller voids that prevent further infiltration of sand into the gravel layers. This is to leave it clean over the lifespan of the system.
- Installation should ensure that connection points are cleaned to allow good contact between the slits and lateral drainage backfill.



Calculated by:

Site name:

Site location:

Site Details

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	<input type="text" value="4"/>	<input type="text" value="4"/>
HOST class:	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>
SPR/SPRHOST:	<input type="text" value="0.47"/>	<input type="text" value="0.47"/>

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	<input type="text" value="689"/>	<input type="text" value="689"/>
Hydrological region:	<input type="text" value="3"/>	<input type="text" value="3"/>
Growth curve factor 1 year:	<input type="text" value="0.86"/>	<input type="text" value="0.86"/>
Growth curve factor 30 years:	<input type="text" value="1.75"/>	<input type="text" value="1.75"/>
Growth curve factor 100 years:	<input type="text" value="2.08"/>	<input type="text" value="2.08"/>
Growth curve factor 200 years:	<input type="text" value="2.37"/>	<input type="text" value="2.37"/>

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

Default Edited

Q_{BAR} (l/s):	5.09	5.09
1 in 1 year (l/s):	4.38	4.38
1 in 30 years (l/s):	8.92	8.92
1 in 100 year (l/s):	10.6	10.6
1 in 200 years (l/s):	12.07	12.07

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Calculated by:

Site name:

Site location:

Site Details

Latitude:

Longitude:

Reference:

Date:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Runoff estimation approach

Site characteristics

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Notes

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Soil characteristics

	Default	Edited
SOIL type:	<input type="text" value="4"/>	<input type="text" value="4"/>
HOST class:	<input type="text" value="N/A"/>	<input type="text" value="N/A"/>
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Hydrological characteristics

	Default	Edited
SAAR (mm):	<input type="text" value="689"/>	<input type="text" value="689"/>
Hydrological region:	<input type="text" value="3"/>	<input type="text" value="3"/>
Growth curve factor 1 year:	<input type="text" value="0.86"/>	<input type="text" value="0.86"/>
Growth curve factor 30 years:	<input type="text" value="1.75"/>	<input type="text" value="1.75"/>
Growth curve factor 100 years:	<input type="text" value="2.08"/>	<input type="text" value="2.08"/>
Growth curve factor 200 years:	<input type="text" value="2.37"/>	<input type="text" value="2.37"/>

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates	Default	Edited

Q_{BAR} (l/s):	2.63	2.63
1 in 1 year (l/s):	2.26	2.26
1 in 30 years (l/s):	4.6	4.6
1 in 100 year (l/s):	5.47	5.47
1 in 200 years (l/s):	6.23	6.23

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11 Broomhead Road
Wombell
Barnsley S73 0SA



Date 31/07/2023 15:32
File Storage calc All weather...

Designed by shaun
Checked by

CADS Source Control 2020.1.3

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 1293 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m ³)	Status
15 min Summer	8.328	0.328	0.0	5.1	5.1	249.8	O K
30 min Summer	8.438	0.438	0.0	5.1	5.1	333.2	O K
60 min Summer	8.555	0.555	0.0	5.1	5.1	422.1	O K
120 min Summer	8.674	0.674	0.0	5.1	5.1	512.9	O K
180 min Summer	8.739	0.739	0.0	5.1	5.1	562.3	O K
240 min Summer	8.779	0.779	0.0	5.1	5.1	593.0	O K
360 min Summer	8.829	0.829	0.0	5.1	5.1	630.5	O K
480 min Summer	8.857	0.857	0.0	5.1	5.1	652.5	O K
600 min Summer	8.874	0.874	0.0	5.1	5.1	664.8	O K
720 min Summer	8.882	0.882	0.0	5.1	5.1	670.9	O K
960 min Summer	8.882	0.882	0.0	5.1	5.1	671.5	O K
1440 min Summer	8.863	0.863	0.0	5.1	5.1	656.3	O K
2160 min Summer	8.826	0.826	0.0	5.1	5.1	628.2	O K
2880 min Summer	8.786	0.786	0.0	5.1	5.1	598.0	O K
4320 min Summer	8.704	0.704	0.0	5.1	5.1	535.6	O K
5760 min Summer	8.613	0.613	0.0	5.1	5.1	466.5	O K
7200 min Summer	8.525	0.525	0.0	5.1	5.1	399.3	O K
8640 min Summer	8.451	0.451	0.0	5.1	5.1	342.8	O K
10080 min Summer	8.386	0.386	0.0	5.1	5.1	294.1	O K
15 min Winter	8.368	0.368	0.0	5.1	5.1	280.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	125.254	0.0	235.8	19
30 min Summer	84.003	0.0	314.9	34
60 min Summer	53.779	0.0	425.7	64
120 min Summer	33.258	0.0	525.9	124
180 min Summer	24.745	0.0	585.6	184
240 min Summer	19.923	0.0	627.0	242
360 min Summer	14.625	0.0	685.8	362
480 min Summer	11.743	0.0	727.1	482
600 min Summer	9.896	0.0	754.8	602
720 min Summer	8.600	0.0	769.2	720
960 min Summer	6.886	0.0	764.8	960
1440 min Summer	5.024	0.0	730.1	1198
2160 min Summer	3.658	0.0	1057.0	1580
2880 min Summer	2.917	0.0	1121.7	1992
4320 min Summer	2.116	0.0	1208.9	2812
5760 min Summer	1.683	0.0	1304.9	3632
7200 min Summer	1.409	0.0	1364.4	4392
8640 min Summer	1.218	0.0	1414.4	5104
10080 min Summer	1.078	0.0	1456.8	5840
15 min Winter	125.254	0.0	264.2	19

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Wombell
Barnsley S73 0SA



Date 31/07/2023 15:32
File Storage calc All weather...

Designed by shaun
Checked by

CADS Source Control 2020.1.3

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ (l/s)	Max Outflow Volume (m³)	Status
30 min Winter	8.491	0.491	0.0	5.1	5.1	373.8	O K
60 min Winter	8.623	0.623	0.0	5.1	5.1	474.2	O K
120 min Winter	8.758	0.758	0.0	5.1	5.1	576.9	O K
180 min Winter	8.832	0.832	0.0	5.1	5.1	633.0	O K
240 min Winter	8.878	0.878	0.0	5.1	5.1	668.4	O K
360 min Winter	8.937	0.937	0.0	5.1	5.1	712.8	O K
480 min Winter	8.972	0.972	0.0	5.1	5.1	739.9	O K
600 min Winter	8.994	0.994	0.0	5.1	5.1	756.4	O K
720 min Winter	9.007	1.007	0.0	5.1	5.1	766.0	O K
960 min Winter	9.018	1.018	0.0	5.1	5.1	772.1	O K
1440 min Winter	8.995	0.995	0.0	5.1	5.1	756.9	O K
2160 min Winter	8.946	0.946	0.0	5.1	5.1	719.8	O K
2880 min Winter	8.892	0.892	0.0	5.1	5.1	678.7	O K
4320 min Winter	8.774	0.774	0.0	5.1	5.1	589.2	O K
5760 min Winter	8.646	0.646	0.0	5.1	5.1	491.2	O K
7200 min Winter	8.502	0.502	0.0	5.1	5.1	382.2	O K
8640 min Winter	8.393	0.393	0.0	5.1	5.1	298.8	O K
10080 min Winter	8.305	0.305	0.0	5.1	5.1	232.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	84.003	0.0	349.8	33
60 min Winter	53.779	0.0	476.7	64
120 min Winter	33.258	0.0	587.8	122
180 min Winter	24.745	0.0	653.2	180
240 min Winter	19.923	0.0	697.6	240
360 min Winter	14.625	0.0	756.5	356
480 min Winter	11.743	0.0	787.6	472
600 min Winter	9.896	0.0	793.2	588
720 min Winter	8.600	0.0	789.0	700
960 min Winter	6.886	0.0	775.8	924
1440 min Winter	5.024	0.0	746.5	1342
2160 min Winter	3.658	0.0	1183.0	1668
2880 min Winter	2.917	0.0	1254.3	2136
4320 min Winter	2.116	0.0	1334.6	3068
5760 min Winter	1.683	0.0	1461.7	3984
7200 min Winter	1.409	0.0	1528.5	4680
8640 min Winter	1.218	0.0	1584.9	5360
10080 min Winter	1.078	0.0	1633.1	6048

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File Storage calc All weather...

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.355	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.079

Time (mins) Area
From: To: (ha)

0 4 1.079

Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 8.000
 Infiltration Coefficient Base (m/hr) 0.00000
 Infiltration Coefficient Side (m/hr) 0.00000
 Safety Factor 2.0
 Porosity 0.95

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	801.0	801.0	1.100	0.0	997.0
1.000	801.0	997.0			

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0107-5100-1000-5100
 Design Head (m) 1.000
 Design Flow (l/s) 5.1
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 107
 Invert Level (m) 8.000
 Minimum Outlet Pipe Diameter (mm) 150
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	5.1
Flush-Flo™	0.297	5.1
Kick-Flo®	0.640	4.2
Mean Flow over Head Range	-	4.4

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.6	1.200	5.6	3.000	8.5	7.000	12.8
0.200	5.0	1.400	6.0	3.500	9.2	7.500	13.2
0.300	5.1	1.600	6.3	4.000	9.8	8.000	13.6
0.400	5.0	1.800	6.7	4.500	10.3	8.500	14.0
0.500	4.9	2.000	7.0	5.000	10.9	9.000	14.4
0.600	4.5	2.200	7.4	5.500	11.4	9.500	14.8
0.800	4.6	2.400	7.7	6.000	11.9		
1.000	5.1	2.600	8.0	6.500	12.3		

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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 731 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m ³)	Status
15 min Summer	8.356	0.356	0.0	2.6	2.6	81.2	O K
30 min Summer	8.473	0.473	0.0	2.6	2.6	107.9	O K
60 min Summer	8.596	0.596	0.0	2.6	2.6	135.9	O K
120 min Summer	8.715	0.715	0.0	2.6	2.6	163.1	O K
180 min Summer	8.774	0.774	0.0	2.6	2.6	176.5	O K
240 min Summer	8.806	0.806	0.0	2.6	2.6	183.8	O K
360 min Summer	8.837	0.837	0.0	2.6	2.6	190.7	O K
480 min Summer	8.846	0.846	0.0	2.6	2.6	192.8	O K
600 min Summer	8.842	0.842	0.0	2.6	2.6	191.9	O K
720 min Summer	8.834	0.834	0.0	2.6	2.6	190.1	O K
960 min Summer	8.815	0.815	0.0	2.6	2.6	185.9	O K
1440 min Summer	8.773	0.773	0.0	2.6	2.6	176.2	O K
2160 min Summer	8.706	0.706	0.0	2.6	2.6	160.9	O K
2880 min Summer	8.635	0.635	0.0	2.6	2.6	144.9	O K
4320 min Summer	8.486	0.486	0.0	2.6	2.6	110.8	O K
5760 min Summer	8.371	0.371	0.0	2.6	2.6	84.6	O K
7200 min Summer	8.284	0.284	0.0	2.6	2.6	64.8	O K
8640 min Summer	8.222	0.222	0.0	2.6	2.6	50.6	O K
10080 min Summer	8.178	0.178	0.0	2.5	2.5	40.5	O K
15 min Winter	8.400	0.400	0.0	2.6	2.6	91.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	125.254	0.0	81.4	19
30 min Summer	84.003	0.0	109.4	34
60 min Summer	53.779	0.0	141.9	64
120 min Summer	33.258	0.0	175.6	122
180 min Summer	24.745	0.0	196.0	182
240 min Summer	19.923	0.0	210.4	242
360 min Summer	14.625	0.0	231.7	362
480 min Summer	11.743	0.0	248.0	480
600 min Summer	9.896	0.0	261.1	594
720 min Summer	8.600	0.0	272.2	642
960 min Summer	6.886	0.0	290.3	762
1440 min Summer	5.024	0.0	316.6	1024
2160 min Summer	3.658	0.0	349.1	1448
2880 min Summer	2.917	0.0	371.1	1872
4320 min Summer	2.116	0.0	403.5	2596
5760 min Summer	1.683	0.0	428.8	3336
7200 min Summer	1.409	0.0	448.4	4032
8640 min Summer	1.218	0.0	465.1	4672
10080 min Summer	1.078	0.0	479.7	5344
15 min Winter	125.254	0.0	91.3	19

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ (l/s)	Max Outflow Volume (m³)	Status
30 min Winter	8.532	0.532	0.0	2.6	2.6	121.3	O K
60 min Winter	8.671	0.671	0.0	2.6	2.6	153.1	O K
120 min Winter	8.807	0.807	0.0	2.6	2.6	183.9	O K
180 min Winter	8.875	0.875	0.0	2.6	2.6	199.6	O K
240 min Winter	8.914	0.914	0.0	2.6	2.6	208.4	O K
360 min Winter	8.954	0.954	0.0	2.6	2.6	217.5	O K
480 min Winter	8.970	0.970	0.0	2.6	2.6	221.2	O K
600 min Winter	8.972	0.972	0.0	2.6	2.6	221.7	O K
720 min Winter	8.966	0.966	0.0	2.6	2.6	220.1	O K
960 min Winter	8.938	0.938	0.0	2.6	2.6	214.0	O K
1440 min Winter	8.885	0.885	0.0	2.6	2.6	201.7	O K
2160 min Winter	8.790	0.790	0.0	2.6	2.6	180.0	O K
2880 min Winter	8.688	0.688	0.0	2.6	2.6	156.9	O K
4320 min Winter	8.456	0.456	0.0	2.6	2.6	104.1	O K
5760 min Winter	8.296	0.296	0.0	2.6	2.6	67.4	O K
7200 min Winter	8.196	0.196	0.0	2.5	2.5	44.6	O K
8640 min Winter	8.137	0.137	0.0	2.4	2.4	31.3	O K
10080 min Winter	8.105	0.105	0.0	2.2	2.2	23.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
30 min Winter	84.003	0.0	122.5	33
60 min Winter	53.779	0.0	159.0	62
120 min Winter	33.258	0.0	196.7	122
180 min Winter	24.745	0.0	219.5	180
240 min Winter	19.923	0.0	235.7	238
360 min Winter	14.625	0.0	259.4	352
480 min Winter	11.743	0.0	277.6	466
600 min Winter	9.896	0.0	292.3	576
720 min Winter	8.600	0.0	304.7	684
960 min Winter	6.886	0.0	324.8	858
1440 min Winter	5.024	0.0	352.9	1096
2160 min Winter	3.658	0.0	391.0	1560
2880 min Winter	2.917	0.0	415.6	2020
4320 min Winter	2.116	0.0	452.1	2768
5760 min Winter	1.683	0.0	480.3	3456
7200 min Winter	1.409	0.0	502.3	4040
8640 min Winter	1.218	0.0	521.0	4672
10080 min Winter	1.078	0.0	537.5	5248

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CADS Source Control 2020.1.3

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.355	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.354

Time (mins) Area
From: To: (ha)

0 4 0.354

Model Details

Storage is Online Cover Level (m) 10.000

Cellular Storage Structure

Invert Level (m) 8.000
 Infiltration Coefficient Base (m/hr) 0.00000
 Infiltration Coefficient Side (m/hr) 0.00000
 Safety Factor 2.0
 Porosity 0.95

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	240.0	240.0	1.100	0.0	302.0
1.000	240.0	302.0			

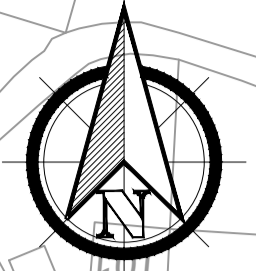
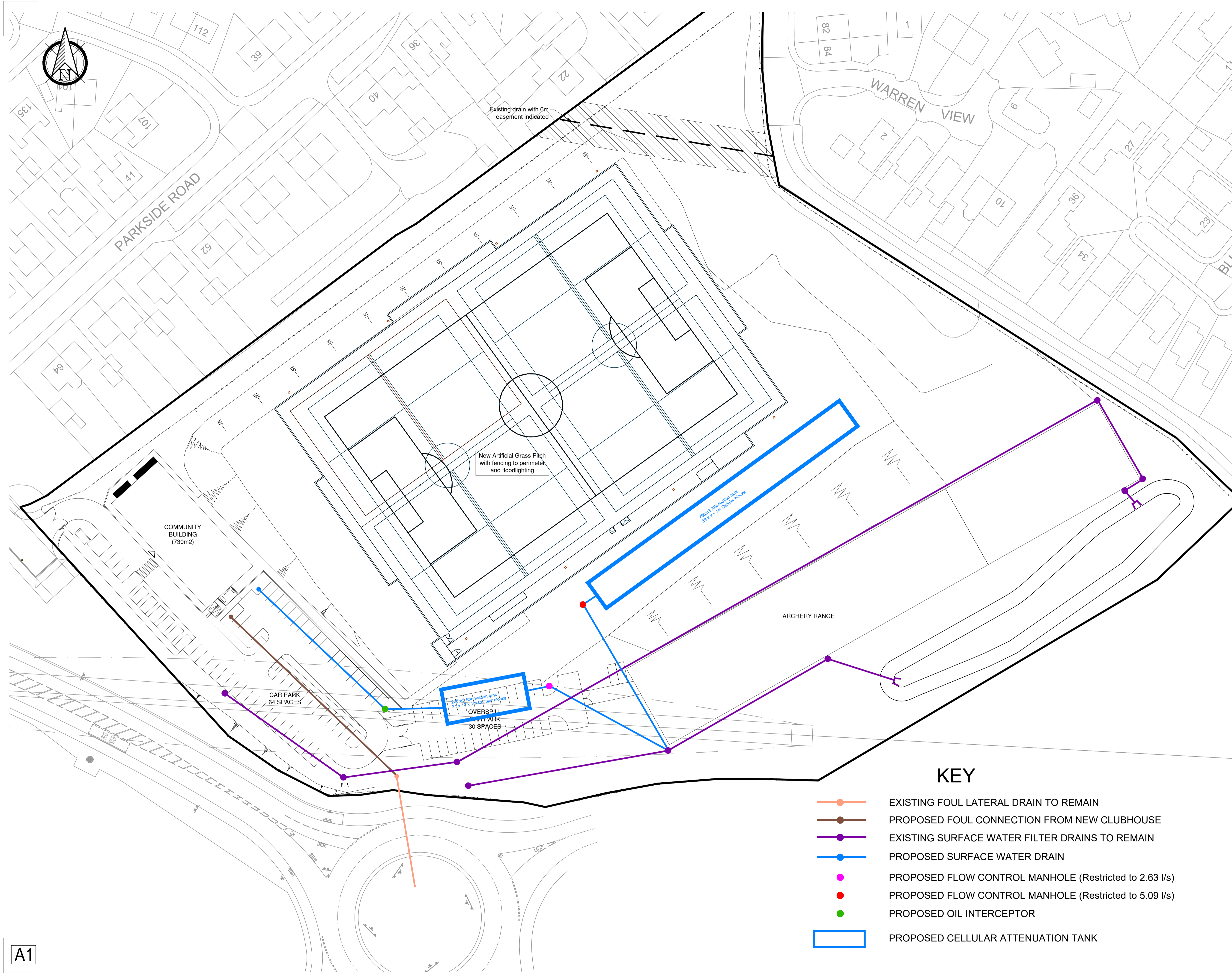
Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0077-2600-1000-2600
 Design Head (m) 1.000
 Design Flow (l/s) 2.6
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 77
 Invert Level (m) 8.000
 Minimum Outlet Pipe Diameter (mm) 100
 Suggested Manhole Diameter (mm) 1200









Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	2.6
Flush-Flo™	0.300	2.6
Kick-Flo®	0.622	2.1
Mean Flow over Head Range	-	2.3

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	2.2	1.200	2.8	3.000	4.3	7.000	6.4
0.200	2.5	1.400	3.0	3.500	4.6	7.500	6.6
0.300	2.6	1.600	3.2	4.000	4.9	8.000	6.8
0.400	2.6	1.800	3.4	4.500	5.2	8.500	7.0
0.500	2.5	2.000	3.6	5.000	5.5	9.000	7.2
0.600	2.2	2.200	3.7	5.500	5.7	9.500	7.4
0.800	2.3	2.400	3.9	6.000	6.0		
1.000	2.6	2.600	4.0	6.500	6.2		



KEY


-  EXISTING FOUL LATERAL DRAIN TO REMAIN
-  PROPOSED FOUL CONNECTION FROM NEW CLUBHOUSE
-  EXISTING SURFACE WATER FILTER DRAINS TO REMAIN
-  PROPOSED SURFACE WATER DRAIN
-  PROPOSED FLOW CONTROL MANHOLE (Restricted to 2.63 l/s)
-  PROPOSED FLOW CONTROL MANHOLE (Restricted to 5.09 l/s)
-  PROPOSED OIL INTERCEPTOR
-  PROPOSED CELLULAR ATTENUATION TANK

Rev	Details	Date	Drwn	Chk
Barnsley MBC				

Parkside
Hoyland Common, Barnsley
Drainage Strategy Plan

Dwg No. : STE-Parkside-DS
Date : 26-7-23
Scale : 1:500 Copyright © Shaun Tonge Engineering

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