DOCKFIELD ROAD SHIPLEY

Drainage Strategy

DOCKFIELD ROAD SHIPLEY

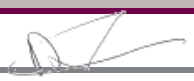
06 January 2020

rpsgroup.com

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
A	First issue	M A Spiers	D DeRosa	D DeRosa	06/01/2021

Approval for issue

D DeRosa  6 January 2021

Prepared by:

RPS

Martin Spiers

Principal Consultant

Suite 2, Metis, 3 Scotland Street
Sheffield, South Yorkshire S3 7AT

T +44 114 272 7301

E martin.spiers@rpsgroup.com

Prepared for:

Chris Wright Road Planing Ltd

Jez Wright

Centenary Rd, Baildon,
Shipley BD17 7QB

T 01274 530045

E jez@cwrp.co.uk

Contents

Appendices

1 BACKGROUND

1.1 Terms of reference

RPS was commissioned by Chris Wright Road Planing Ltd to produce a drainage strategy and design for the site at Dockfield Road, Shipley, BD17 7AD.

1.2 Methodology

The drainage design is required to satisfy the requirements of Building Regulations Approved Document H - Drainage and Waste Disposal (2015 edition) and the Department for Environment, Food and Rural Affairs Non-statutory technical standards for sustainable drainage systems.

Reference has also been made to the “Leeds City Region Sustainable Drainage Systems Guidance” (West Yorkshire Combined Authority, 2020).

Further reference has been made to the guidance “Rainfall runoff management for developments” (Kellagher, 2013), the UKSUDS website, and CIRIA report C753 - The SuDS Manual (Woods Ballard, 2015)

At this stage, proposals have been taken to outline design stage to enable an overall understanding of the requirements. Further development of the proposals will take place in the detailed design phase.

2 BACKGROUND

2.1 Site location

The proposed site is located to the east of central Shipley. The overall area of the site is approximately 1.2 hectare, bounded by the Leeds – Liverpool Canal to the south, Bradford Beck to the west, the River Aire to the north and existing buildings to the east.

Dockfield Road bisects the site with a subway running beneath the road connecting the two portions.

A topographical survey of the portion of the site affected by the proposed development has been carried out and is provided in Appendix A.

Levels within the site vary between 67.3m AOD on the eastern edge adjacent to Dockfield Road and 61.5m AOD on the bank of the River Aire. The general fall is from southeast to northwest, while the canal is significantly higher, with the towpath at around 69.3m AOD.

Current proposals are to use both parts of the site for the storage of materials and vehicles and storage of equipment in temporary structures.

2.2 Existing drainage

Yorkshire Water sewer records show a 1110mm brick “O” shaped overflow sewer and a 1350mm diameter combined sewer crossing the site to the north of Dockfield Road. It is understood that a chamber on the overflow sewer screens spill flows from a combined sewer overflow on Otley Road to the west of the site, with screenings being pumped back to the combined sewer through twin 200mm diameter mains. A further combined sewer - of unknown but presumably smaller size – runs close to the eastern edge of the site from Dockfield Road to join the main combined sewer near the north eastern corner. The overflow sewer discharges to the River Aire just to the east of the site boundary.

It is understood that the main sewers are around 3.5m deep to invert. It is understood that ducts run from the screenings chamber to a control cabinet on the north side of Dockfield Road, and that the screenings return rising mains may also be shallower than the sewers.

The Leeds -Liverpool canal is at a higher level than the site, with the canal crossing over the Bradford Beck on Aqueduct 55.

The Bradford Beck joins the River Aire near the north-west corner of the site. Just upstream of the confluence there is a weir on the River Aire. There is also a weir on the Bradford Beck just north of the aqueduct.

2.3 Proposed development

The site is effectively split into two parts by Dockfield Road. Current proposals are that both parts will be used for vehicle and material storage, with the erection of a number of temporary structures to store materials.

The northern part of the site measures approximately 0.55 hectare. Three storage buildings are proposed towards the western edge, with the majority of the remainder of the site used for vehicle storage and existing vegetation retained along the bank of the River Aire. Improvements to the vehicular access from Dockfield Road are also proposed.

The southern part of the site measures approximately 0.68 hectare. Two storage buildings are proposed near to the southern boundary, with the majority of the remainder of the site used for vehicle storage. Improvements to the vehicular access from Dockfield Road are also proposed.

3 POLICY

3.1 Bradford City Council

Bradford City Council's Core Strategy Development Plan Document was adopted in 2017. Policy EN7: Flood Risk states that:

A. The Council will manage flood risk pro-actively and in assessing proposals for development will:
1. Integrate sequential testing into all levels of plan-making
2. Require space for the storage of flood water within Zones 2 and 3a
3. Ensure that any new development in areas of flood risk is appropriately resilient and resistant
4. Safeguard potential to increase flood storage provision and improve defences within the Rivers Aire and Wharfe corridors
5. Manage and reduce the impacts of flooding within the beck corridors, in a manner that enhances their value for wildlife
6. Adopt a holistic approach to flood risk in the Bradford Beck corridor in order to deliver sustainable regeneration in LDDs and in master planning work
7. Require that all sources of flooding are addressed, that development proposals will only be acceptable where they do not increase flood risk elsewhere and that any need for improvements in drainage infrastructure is taken into account
8. Seek to minimise run-off from new development; for Greenfield sites run off should be no greater than the existing Greenfield overall rates
9. Require developers to assess the feasibility of implementing and maintaining SUDS in a manner that is integral to site design, achieves high water quality standards and maximises habitat value
10. Use flood risk data to inform decisions made about Green Infrastructure.
Only support the use of culverting for ordinary water courses, and additional flood defence works that could have adverse impacts on the environment, in exceptional circumstances.
B. The Council will not permit development in areas shown as functional floodplain in the Bradford SFRA, with the exception of water compatible uses and essential infrastructure.

The site is located within the Shipley and Canal Road Corridor. Policy SCRC/CC1: Flood Risk and Water Management states that:

C. All major development proposals and public realm improvements will be expected to consider the use of Sustainable Urban Drainage Schemes (SUDS) where practicable, particularly where there are known surface water flooding issues or where wildlife habitat connectivity and green infrastructure could be enhanced.

The explanatory text includes:

4.6.14 All development proposals and public realm improvements should assess the feasibility of implementing the use SUDS. Sustainable drainage techniques should be considered as a first choice, other drainage methods should only be used where it can be shown that sustainable drainage methods are not feasible in that location. Proposals should include SUDS that maximise benefits for water quality and storage, green infrastructure and ecology.

4.6.15 The approach to SUDs should consider ponds, dry basins and swales within developments to reduce runoff rates and improve water quality, amenity and biodiversity. Streets could also incorporate nonstandard (and permeable) materials and generous high quality landscaping (including street trees) to assist in such a strategy. In addition, source control measures to reduce runoff at source such as green and brown roofs, permeable paving and rainwater harvesting will be supported, where feasible. Key opportunities are identified in the SCRC Ecological Assessment and Green Infrastructure Study.

4.6.16 All drainage systems discharging to a waterway must include appropriate anti-pollution measures that can be easily accessed and maintained, and be in accordance with Policy SCRC/NBE2 Waterway Environments.

Leeds City Region

The West Yorkshire Combined Authority, representing the metropolitan boroughs of Bradford, Calderdale, Kirklees, Leeds and Wakefield, the district councils of Craven, Harrogate, and Selby, the City of York Council and North Yorkshire County Council published SuDS guidance in 2020.

Design standards are given in section 9.0, of which two relate directly to drainage design

Minimum Flow Control Diameter

9.5 Flow control diameters are not to be less than 75mm unless specifically designed not to block.

Brownfield Existing Peak Discharge

9.6 If the existing brownfield discharge cannot be calculated, it can be derived by using 140l/s/ha of connected impermeable area, provided the existing drainage is still functional.

3.2 National Planning Policy Framework

The National Planning Policy Framework sets out national policy. Chapter 14- 14. Meeting the challenge of climate change, flooding and coastal change – contains a number of paragraphs particularly relevant.

Paragraph 165.

Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

(a) take account of advice from the lead local flood authority;

(b) have appropriate proposed minimum operational standards;

(c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and

(d) where possible, provide multifunctional benefits.

3.2.1 Climate Change

Further guidance on climate change is provided separately. Guidance on climate change allowances for Flood risk assessments was published by the Environment Agency in 2016 and updated in July 2020.

Table 1. Peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper end	10%	20%	40%
Central	5%	10%	20%

It is expected that the development will have a 50-year design life, the "2050s" scenarios are therefore appropriate. The design will be checked against a 10% and 20% increase in storm intensity.

4 DRAINAGE STRATEGY

4.1 Foul drainage

It is not anticipated that any foul drainage will be generated by the development.

4.2 Surface water disposal hierarchy

Government guidance is that generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable:

1) into the ground (infiltration);

2) to a surface water body;

3) to a surface water sewer, highway drain, or another drainage system;

4) to a combined sewer.

We are aware that the southern part of the site was formerly the site of a gas works and that parts of the site may be contaminated.

The Soilscapes viewer from the Cranfield Soil and AgriFood Institute indicates loamy and clayey floodplain soils with naturally high groundwater over the majority of the site, with the potential for freely draining slightly acid loamy soils in the south-east. British Geological Survey mapping shows that the majority of the site as alluvium (clay, silt, sand and gravel) with till in the southeast, overlying Millstone Grit bedrock.

It is expected that infiltration will be ruled out by ground contamination and the soil characteristics, but this is required to be demonstrated by the ground investigation. Surface water would then be discharged to either the River Aire of Bradford Beck.

The site is effectively split in two by Dockfield Road and is therefore proposed to be drained by two separate outfalls. The northern site is 0.55 hectare and the southern 0.68 hectare.

4.3 River levels

Flood model results for the River Aire were provided by the Environment Agency for both defenced and undefended scenarios. Nodes relevant to this study have been extracted and river levels tabulated below.

Figure 1. River Aire modelled node locations

Table 2. River Aire modelled river levels. defended scenario

Location	Water level (m AOD)					
	10% (10yr)	4% (25yr)	2% (50yr)	1.3% (75yr)	1% (100yr)	0.5% (200yr)l
02672002329A Downstream of weir	62.34	62.7	63.01	63.16	63.28	63.56
02672002329B Narrowing of river	62.34	62.7	63.01	63.16	63.28	63.56
02672002184 Downstream of site	61.96	62.33	62.64	62.79	62.91	63.18

Table 3. River Aire modelled river levels. undefended scenario

Location	Water level (m AOD)					
	10% (10yr)	4% (25yr)	2% (50yr)	1.3% (75yr)	1% (100yr)	0.5% (200yr)
02672002329A Downstream of weir	62.43	62.75	63	63.13	63.24	63.52
02672002329B Narrowing of river	62.43	62.75	63	63.13	63.24	63.52
02672002184 Downstream of site	62.04	62.38	62.63	62.76	62.87	63.14

Table 4. River Aire modelled river levels, 2025 climate change scenario

Location	Water level (m AOD)					
	10% (10yr)	4% (25yr)	2% (50yr)	1.3% (75yr)	1% (100yr)	0.5% (200yr)
02672002329A Downstream of weir	62.44	62.84	63.15	63.31	63.43	63.7
02672002329B Narrowing of river	62.44	62.84	63.15	63.31	63.43	63.7
02672002184 Downstream of site	62.06	62.47	62.78	62.94	63.05	63.32

Flood model results for the Bradford Beck were downloaded from the Council's Open Data repository[1]. Results are available for 5%, 1% and 0.1% probability events with and without a 30% climate change adjustment, in the form of water levels and depths in a triangular mesh covering the majority of the site and the neighbouring watercourses

Maximum levels adjacent to the site up- and down-stream of the weir on the Bradford Beck were queried from the data as follows:

Table 5. Bradford Beck modelled river levels.

Location	Water level (m AOD)					
	Without climate change			With climate change		
	5% (20yr)	1% (100yr)	0.1% (1000yr)	5% (20yr)	1% (100yr)	0.1% (1000yr)
Downstream of weir	No data	62.726	63.776	No data	63.039	64.608
Upstream of weir	No data	64.845	65.460	No data	64.996	66.046

The topographic survey includes surveyed levels, which have been taken as representative of normal conditions. These are as follows:

Table 6. Surveyed normal river levels.

Location	Surveyed river level	Top of bank level
Bradford Beck downstream of aqueduct	60.24	62.4
Bradford Beck upstream of Dockfield Road	60.20	61.9
River Aire downstream of confluence	59.80	61.6
River Aire at downstream extent of site	59.32	62.2

[1] https. //spatialdata(-)cbmdc.hub.arcgis.com/search?owner=spatialopendata accessed 18th November 2020

5 STORM WATER MANAGEMENT

5.1 Pre-existing runoff

Large parts of the existing site are covered with loose concrete and tarmac, with smaller areas covered by concrete slabs. Runoff from the existing site has been estimated using the Modified Rational Method, as shown in Appendix C, assuming that this surface acts as impermeable.

Table 7. Estimated pre-development runoff rates

Return period	Estimated Runoff (l/s)	
	North	South
1	25.5	38.2
2	31.0	46.4
30	85.1	127.3
100	113.9	170.4

5.2 Post-development runoff and attenuation requirements

Policy requires a reduction in peak runoff for brownfield sites of 30%.

Table 8. Allowable post-development runoff rates

Return period	Runoff (l/s)	
	North	South
1	17.9	26.7
2	21.7	32.5
30	59.6	89.1
100	79.7	119.3

Attenuation requirements have been estimated by applying the lowest rate above as a limit, i.e 17.9l/s for the North site and 26.7l/s for the South site

Table 9. Initial estimates of attenuation requirements

Return period	Estimated attenuation volume required (m^3)	
	North	South
1	16	8
2	26	15
30	118	94
100	183	152
+20%	236	201
+40%	291	251

5.3 SuDS Hierarchy

Sustainable Drainage Systems (SUDS) should be incorporated in the design where possible in order to minimise the impact of the construction of the new impermeable areas on the surrounding areas and the watercourses, as well as potential water quality, aesthetic and biodiversity benefits.

Various SuDS measures are laid out in Table 10 and their suitability for this site discussed in Table 11. Due to the nature of the site and the development, opportunities to include many SuDS features are limited.

To provide protection to water quality within the Bradford Beck and River Aire, flows from both the northern and southern sites will be passed through a suitably designed proprietary device prior to discharge.

5.4 Operation

The operation of the proposed drainage layouts for the two parts of the site is briefly described below.

5.4.1 North site

Temporary buildings in the north part of the site are located on a concrete slab sloping with the surrounding ground, to the west. The slab and buildings are drained by a number of channel drains cast into the slab. Runoff from the access ramp and the remainder of the vehicle parking/material storage area outside the slab is intercepted by channel drains.

These drain into a conventional network along the north side of the slab and to sub-surface geocellular storage between the western edge of the slab and the western boundary of the site.

A flow control is specified to regulate discharges to 17.9l/s; this is located in manhole CN downstream of the attenuation. A proprietary treatment device is located in manhole TN between the flow control and the outfall to the Bradford Beck.

The outfall level is specified above normal river level, however a flap valve will be installed to prevent backflow from the river in higher events.

5.4.2 South site

Temporary buildings in the north part of the site are located on a concrete slab sloping with the surrounding ground, to the north-west. The slab and buildings are drained by a number of channel drains cast into the slab. Runoff from the access ramp and the area between that and the buildings is intercepted by a channel drain across the northern edge of the slab. Further channel drains intercept runoff from other parts of the site.

These are linked by conventional pipework. Attenuation is provided in sub-surface geocellular storage in the north-west of the site.

A flow control is specified to regulate discharges to 27.9l/s, this is located in manhole CS downstream of the attenuation. A proprietary treatment device is located in manhole TS between the flow control and the outfall to the Bradford Beck.

The outfall level is specified above normal river level, however a flap valve will be installed to prevent backflow from the river in higher events.

5.5 Maintenance

A Drainage Maintenance and Management Plan covering all aspects of the drainage strategy can be found in Appendix D.

Table 10. SuDS Components

SUDS technique	Interception	Peak flow control: low	Peak flow control: high	Volume reduction	Volume control	Gross sediment	Fine sediment	Hydrocarbons & PAHs	Metals	Nutrients
Rainwater harvesting	Y	Y	S	Y	N	N	N	N	N	N
Pervious pavement	Y	Y	Y	Y	Y	Y	Y	Y	Y	Var
Filter strips	Y	N	N	N	N	Y	N	Y	Y	VAR
Swales	Y	Y	S	Y*	N	Y	Y(+)	Y	Y	Y(-)
Trenches	Y	Y	S	Y*	N	N	N	Y	Y	Y(-)
Detention basins	Y	Y	Y	N	Y	Y	Y(+)	Y	Y	Var
Ponds	N	Y	Y	N	Y	N(~)	Y	Limited	Y	Var
Wetlands	N	Y	S	N	Y	N(~)	Y	Limited	Y	Y
Green roofs	Y	Y	N	N	N	N	N	Y	N	N
Bioretention systems	Y	Y	S	Y*	N	N(~)	Y	Y	Y	Y
Proprietary treatment	N	N	N	N	N	Y	Y	Y(!)	Y(!)	Y(!)
Subsurface storage	N	Y	Y	N	Y	N(~)	N	N	N	N
Subsurface conveyance	N	N	N	N	Y	N(~)	N	N	N	N

Notes:

S:	Not normally with standard designs, but possible where space is available and designs mitigate impact of high flowrates.
Y*:	Where infiltration is facilitated by the design
N(~)	Gross sediment retention is possible, but not recommended due to negative maintenance and performance implications.
Y(+)	Where designs minimise the risk of fine sediment mobilisation during larger events.
Y(!)	Where designs specifically promote the trapping and breakdown of oils and PAH based constituents.
Var	The nutrient removal performance is variable, and can be negative in some situations.
Y(-)	Good nutrient removal performance where subsurface biofiltration systems with a permanently saturated zone included within the design

Table 11. SuDS component feasibility

SUDS technique	Constraints	Feasibility
Rainwater harvesting		No foul water use envisaged
Pervious pavement	Ideally requires a level site. Permeable paving with infiltration into the ground requires suitable ground conditions, however there are options of lined, non-infiltration systems with an outflow into the drainage system.	Limited feasibility – Lined permeable paving may be suitable for use in some areas but is unsuitable for heavy vehicular traffic
Filter strips Swales Trenches	Normally used to treat polluted runoff from car parks or roads. Not as effective at runoff attenuation as other SUDS techniques	Limited feasibility due to the land take and impact on existing trees.
Detention basins Ponds Wetlands	Basins and ponds enhance flood storage capacity by providing temporary storage for storm water through the creation of landscape features within a site (which can provide opportunities for the creation of wildlife habitats).	Not feasible – due amount of space available, suitable side slopes can not be accommodated.
Green roofs	different levels of attenuation intensity etc; flat roofs are ideal; weight can be a structural constraint.	Not feasible – due to the design of the buildings.
Bioretention systems	shallow landscaped depressions which are typically under drained and rely on engineered soils, enhanced vegetation and filtration to remove pollution and reduce runoff downstream. They are aimed at managing and treating runoff from frequent rainfall events.	Not feasible – due amount of space available and would require imported soil
Proprietary treatment		Feasible
Subsurface storage Subsurface conveyance	Installed below ground (trafficked or non-trafficked areas) provide sufficient storage.	Feasible

6 CONCULSION

The proposed development is divided into two sites by Dockfield Road. It is proposed to drain these separately into the River Aire and Bradford Beck.

Discharge rates to both watercourses will be limited to provide betterment compared to the pre-development rates.

Assessment of appropriate SuDS techniques shows that swales can be used to collect runoff from the parking areas and provide treatment. Additional attenuation is proposed in geocellular storage.

The surface water drainage system will be designed to cope with the 1 in 100 year storms with allowances for climate change in accordance with local and national guidance.

No foul flows are expected from the development.

7 REFERENCES

defra Sustainable Drainage Systems - Non-statutory technical standards for sustainable drainage systems [Report]. - London : Department for Environment, Food and Rural Affairs, 2015.

Environment Agency Flood risk assessments: climate change allowances [Online] // Gov.uk. - Environment Agency, 22 07 2020. - 29 09 2020. - https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.

Gov.uk Check your long term flood risk [Online] // Learn more about this area's flood risk. - flood-warning-information.service.gov.uk/long-term-flood-risk/map?easting=436756&northing=435696&map=RiversOrSea.

HR Wallingford Surface water storage volume estimation [Online] // UKSUDS.com. - http://www.uksuds.com/drainage-calculation-tools/surface-water-storage.

Kellagher R Rainfall runoff management for developments [Report]. - Bristol : Environment Agency, 2013.

Walton I L W Containment Systems for the Prevention of Pollution [Report]. - London : CIRIA, 2014.

West Yorkshire Combined Authority Leeds City Region Sustainable Drainage Systems Guidance [Report]. - [s.l.] : West Yorkshire Combined Authority, 2020.

Woods Ballard B, Wilson, S, Udale-Clarke, H, Illman, S, Scott, T, Ashley, R, Kellagher, R The SuDS Manual (C753F) [Report]. - London : CIRIA, 2015.

Appendix A

Existing site drawings

SEE DRAWING - 002

Station	Easting	Northing	Level
S1	415202.482	437866.674	66.272
S2	415172.690	437853.708	63.019
S3	415158.970	437897.236	62.571
S5	415177.842	437927.846	63.877
S6	415192.975	437907.899	65.886

Existing Site Full

1 : 500

Construction staff and operatives must ensure the principle contractor has provided thorough and accurate information on all health and safety aspects relating to the designs identified on this drawing include the review of:

- Designers/contractors risk assessments
- Method statement
- Permit to work
- Pre construction information

The designers note that the following health and safety risk relating to this drawing have not been eliminated during the design process:

ref	residual risk

	revision	date	by	chk

☐ preliminary ☐ comment ☐ construction
☐ planning ☐ tender ☐ record

Pearson Bridge Associates

9 AVONDALE ROAD, SHIPLEY, WEST YORKSHIRE BD18 4QR

Tel: 07793021718
Email: design@pearsonbridge.co.uk

Registered in England No: 10324560

CHRIS WRIGHT ROAD PLANING

drawn by	checked by	date	scale @ A2
DRP	DRP	09/25/20	As indicated

LAND AT DOCKFIELD RD SHIPLEY

EXISTING FULL SITE

project number	drawing number	revision
CW-001	03	

file reference: D:\Jezz Wright - Dockfield Land\Survey\Site.rvt

Station	Easting	Northing	Level
S1	415202.462	437866.674	66.272
S2	415172.669	437853.768	63.019
S3	415158.970	437897.236	62.571
S5	415177.872	437925.646	63.697
S6	415192.975	437907.899	65.886

Existing Site North

1 : 200

	revision	date	by	chk

☐ preliminary ☐ comment ☐ construction
☐ planning ☐ tender ☐ record

Pearson Bridge Associates

9 AVONDALE ROAD, SHIPLEY, WEST YORKSHIRE BD18 4QR

Tel: 07793021718
Email: design@pearsonbridge.co.uk

Registered in England No: 10324560

CHRIS WRIGHT ROAD PLANING

drawn by	checked by	date	scale @ A1
DRP	DRP	09/25/20	1 : 200

LAND AT DOCKFIELD RD SHIPLEY

EXISTING NORTH SITE

project number	drawing number	revision
CW-001	04	

file reference: D:\Jezz Wright - Dockfield Land\SurveySite.rvt

Existing Site South

1 : 200

Station	Easting	Northing	Level
S1	415202.462	437866.674	66.272
S2	415172.669	437853.768	63.019
3 S3	415158.970	437897.236	62.571
S5	415177.872	437925.646	63.697
S6	415192.975	437907.899	65.886

revision	date	by	chk

☐ preliminary ☐ comment ☐ construction
☐ planning ☐ tender ☐ record

Pearson Bridge Associates

9 AVONDALE ROAD, SHIPLEY, WEST YORKSHIRE BD18 4QR

Tel: 07793021718
Email: design@pearsonbridge.co.uk

Registered in England No: 10324560

CHRIS WRIGHT ROAD PLANING

drawn by	checked by	date	scale @ A1
DRP	DRP	09/25/20	1 : 200

LAND AT DOCKFIELD RD SHIPLEY

EXISTING SOUTH SITE

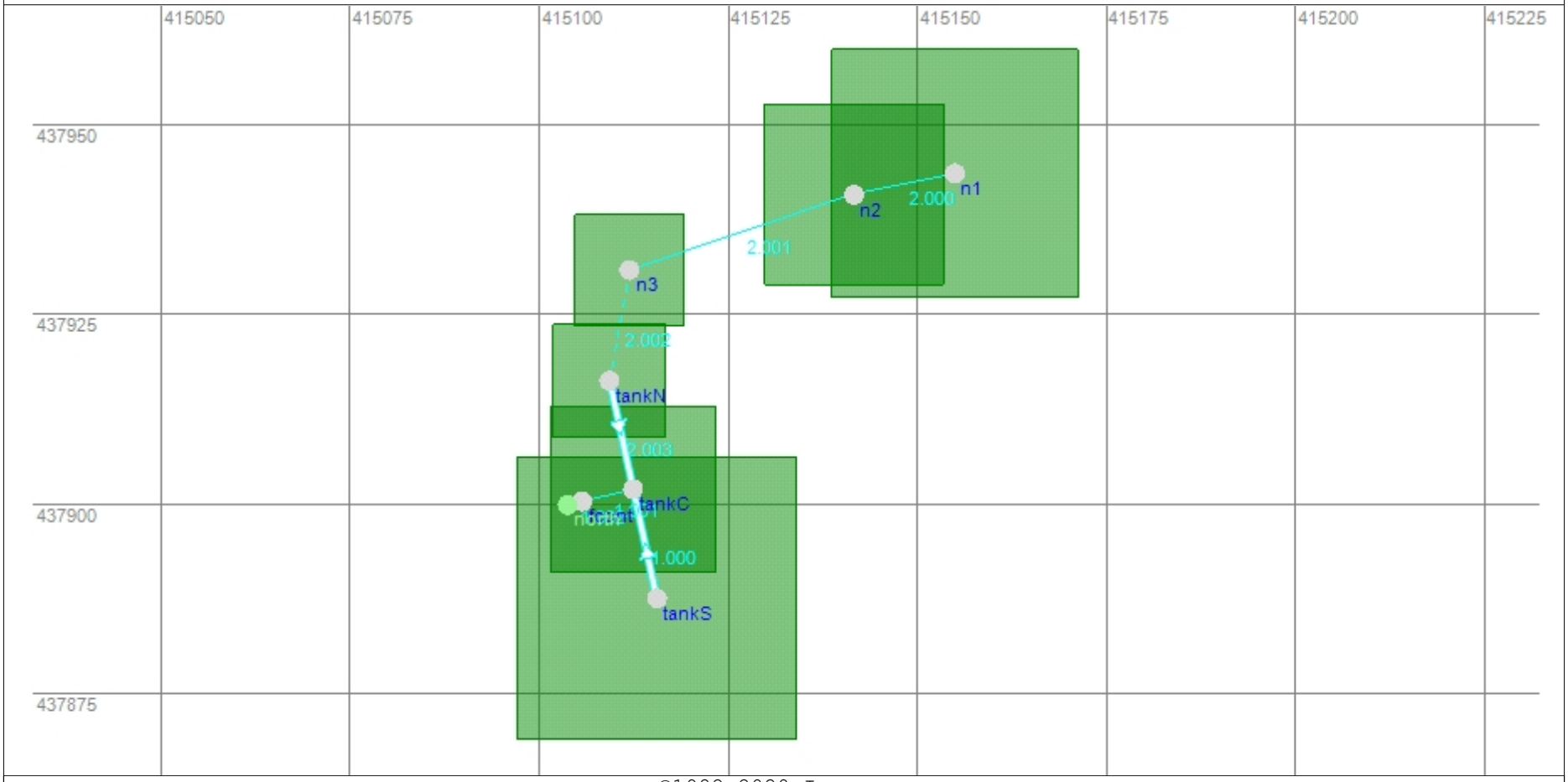
project number	drawing number	revision
CW-001	05	

file reference: D:\Jezz Wright - Dockfield Land\Survey\Site.rvt

Appendix B

Calculations

RPS Group		Page 1
Dearing House 1 Young Street Sheffield, S1 4UP		
Date 04/01/2021 17:13 File DockfieldNorth3.MDX	Designed by martin.spiers Checked by	
Innovyze	Network 2020.1	



STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes SFA+

FEH Rainfall Model

Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 415195 437730 SE 15195 37730
Data Type	Point
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	0.100
Min Vel for Auto Design only (m/s)	0.75
Min Slope for Optimisation (1:X)	1000

Designed with Level Soffits

Network Design Table for Storm

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	14.727	0.001	14727.0	0.137	5.00	0.0		0.050	→[↓]		Cellular Storage	
2.000	13.635	0.091	149.8	0.106	5.00	0.0	0.600		o	300	Pipe/Conduit	
2.001	31.332	0.209	150.0	0.056	0.00	0.0	0.600		o	300	Pipe/Conduit	
2.002	14.056#	0.094	150.0	0.021	0.00	0.0	0.600		o	300	Pipe/Conduit	
2.003	14.621	0.001	14621.0	0.022	0.00	0.0		0.050	→[↓]		Cellular Storage	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	8.17	60.600	0.137	0.0	0.0	0.0	0.08	262.0	18.6
2.000	50.00	5.18	61.600	0.106	0.0	0.0	0.0	1.28	90.6	14.4
2.001	50.00	5.58	61.509	0.162	0.0	0.0	0.0	1.28	90.6	21.9
2.002	50.00	5.77	61.300	0.183	0.0	0.0	0.0	1.28	90.6	24.8
2.003	50.00	8.90	60.600	0.205	0.0	0.0	0.0	0.08	262.8	27.8

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.001	6.901	0.016	431.3	0.048	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.002	2.024	0.005	404.8	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.001	50.00	9.06	60.599	0.390	0.0	0.0	0.0	0.75	53.1	52.8
1.002	50.00	9.10	60.583	0.390	0.0	0.0	0.0	0.78	54.8	52.8

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002	north	63.000	60.578	59.800	0	0

Online Controls for Storm

Hydro-Brake® Optimum Manhole: fcont, DS/PN: 1.002, Volume (m³): 0.8

Unit Reference	MD-SHE-0192-1790-0800-1790
Design Head (m)	0.800
Design Flow (l/s)	17.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	192
Invert Level (m)	60.583
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	17.9
Flush-Flo™	0.304	17.9
Kick-Flo®	0.599	15.6
Mean Flow over Head Range	-	14.7

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	6.7	1.200	21.7	3.000	33.7	7.000	50.8
0.200	17.3	1.400	23.4	3.500	36.3	7.500	52.5
0.300	17.9	1.600	24.9	4.000	38.7	8.000	54.2
0.400	17.7	1.800	26.4	4.500	41.0	8.500	55.5
0.500	17.1	2.000	27.7	5.000	43.1	9.000	57.1
0.600	15.6	2.200	29.0	5.500	45.2	9.500	58.7
0.800	17.9	2.400	30.3	6.000	47.1		
1.000	19.9	2.600	31.4	6.500	49.0		

Storage Structures for Storm

Cellular Storage Pipe: 1.000

Manning's N	0.050	Infiltration Coefficient Side (m/hr)	0.00000
Invert Level (m)	60.600	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	65.5	0.0	0.801	0.0	0.0
0.800	65.5	0.0			

Cellular Storage Pipe: 2.003

Manning's N	0.050	Infiltration Coefficient Side (m/hr)	0.00000
Invert Level (m)	60.600	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	65.0	0.0	0.801	0.0	0.0
0.800	65.0	0.0			

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location GB 436351 436640 SE 36351 36640	
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Sensitivity flows(s) (%)	0, +10, +20

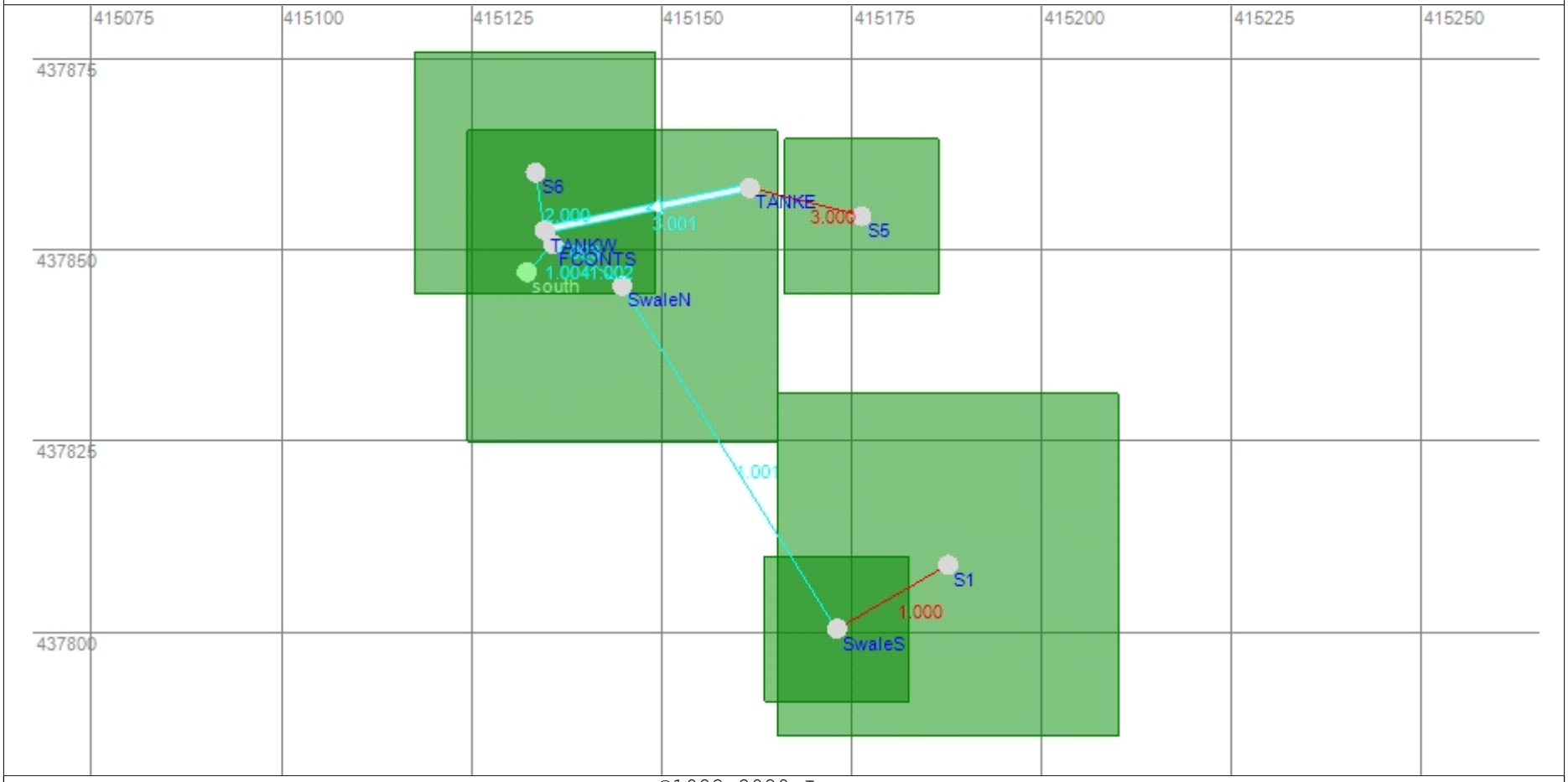
PN	US/MH Name	Storm	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	tankS	60 Winter	+20%	+0%/60 Winter				62.454
2.000	n1	15 Winter	+20%					61.900
2.001	n2	15 Winter	+20%					61.809
2.002	n3	15 Winter	+20%					61.600
2.003	tankN	60 Winter	+20%	+0%/60 Winter				62.454
1.001	tankC	60 Winter	+20%	+0%/15 Summer	+20%/60 Winter			62.454
1.002	fcont	60 Winter	+20%	+0%/15 Summer	+0%/30 Summer			62.450

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	tankS	1.053	0.000	0.06		19	38.9	FLOOD RISK	
2.000	n1	0.000	0.000	0.72			54.1	SURCHARGED*	
2.001	n2	0.000	0.000	0.91			82.8	SURCHARGED*	
2.002	n3	0.000	0.000	1.23			94.3	SURCHARGED*	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
2.003	tankN	1.053	0.000	0.09		22	60.0	FLOOD RISK	
1.001	tankC	1.555	3.817	1.05			42.0	FLOOD	1
1.002	fcont	1.567	0.737	0.61			32.8	FLOOD	9

RPS Group		Page 1
Dearing House 1 Young Street Sheffield, S1 4UP		
Date 04/01/2021 17:12 File DockfieldSouth4.MDX	Designed by martin.spiers Checked by	
Innovyze	Network 2020.1	



STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes SFA+

FEH Rainfall Model

Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 415195 437730 SE 15195 37730
Data Type	Point
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	150

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	16.855	0.200	84.3	0.201	5.00	0.0	0.600		o	225	Pipe/Conduit	
1.001	53.101	0.625	85.0	0.036	0.00	0.0		0.045	3 \=/	600	1:3 Swale	
1.002	12.516	1.000	12.5	0.166	0.00	0.0	0.600		o	225	Pipe/Conduit	
2.000	7.634	0.500	15.3	0.100	5.00	0.0	0.600		o	225	Pipe/Conduit	
3.000	15.191	0.940	16.2	0.041	5.00	0.0	0.600		o	100	Pipe/Conduit	
3.001	27.535	0.002	13767.3	0.000	0.00	0.0		0.050	→[↓]		Cellular Storage	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.20	62.900	0.201	0.0	0.0	0.0	1.43	56.7	27.2
1.001	50.00	6.88	62.700	0.237	0.0	0.0	0.0	0.53	82.7	32.1
1.002	50.00	6.94	62.000	0.403	0.0	0.0	0.0	3.72	147.9	54.6
2.000	50.00	5.04	61.674	0.100	0.0	0.0	0.0	3.37	133.8	13.5
3.000	50.00	5.13	62.140	0.041	0.0	0.0	0.0	1.93	15.2	5.6
3.001	50.00	10.64	60.500	0.041	0.0	0.0	0.0	0.08	451.1	5.6

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type	Auto Design
1.003	2.084	0.014	148.9	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	
1.004	5.000	0.033	150.0	0.000	0.00	0.0	0.600		o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.003	50.00	10.67	60.498	0.544	0.0	0.0	0.0	1.29	90.9	73.7
1.004	50.00	10.73	60.484	0.544	0.0	0.0	0.0	1.28	90.6	73.7

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.004	south	63.000	60.451	61.000	0	0

Storage Structures for Storm

Cellular Storage Pipe: 3.001

Manning's N	0.050	Infiltration Coefficient Side (m/hr)	0.00000
Invert Level (m)	60.500	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	196.0	0.0	0.801	0.0	0.0
0.800	196.0	0.0			

+0%% Sensitivity 100 year Return Period
Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	1
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location GB 436351 436640 SE 36351 36640	
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Sensitivity flows(s) (%)	0, +10, +20

WARNING: Half Drain Time has not been calculated as the structure is too full.

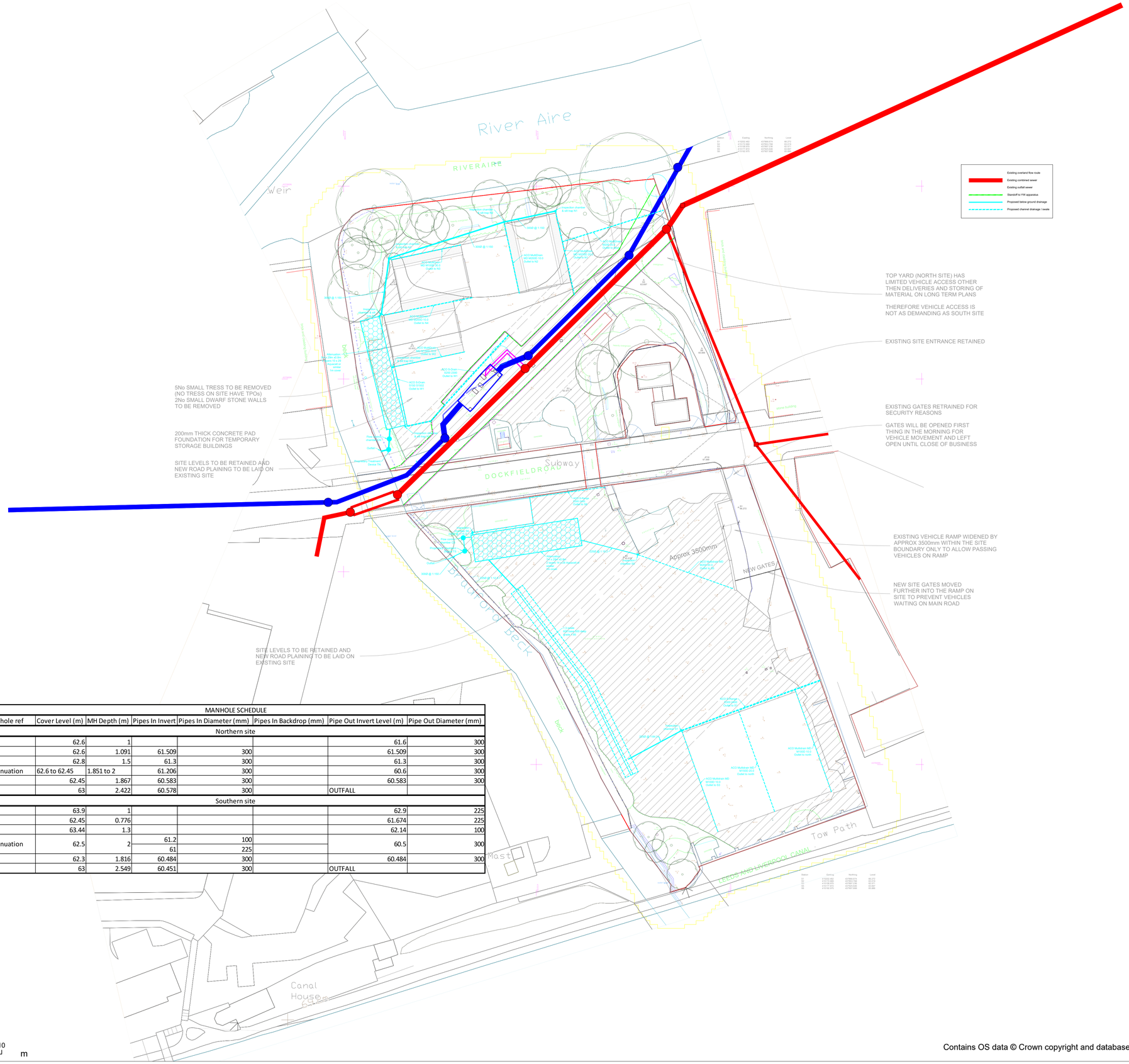
PN	US/MH Name	Storm	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S1	15 Summer	+0%					63.125
1.001	SwaleS	15 Winter	+0%					62.868
1.002	SwaleN	15 Winter	+0%	+0%/15 Winter				62.244
2.000	S6	15 Winter	+0%					61.781
3.000	S5	15 Winter	+0%	+0%/15 Summer				62.639
3.001	TANKE	60 Winter	+0%					61.047
1.003	TANKW	60 Winter	+0%	+0%/15 Summer				61.048
1.004	FCONTS	60 Winter	+0%	+0%/15 Summer				61.310

+0%% Sensitivity 100 year Return Period
Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S1	0.000	0.000	1.51			85.4	SURCHARGED*	
1.001	SwaleS	-0.332	0.000	0.09			100.6	OK	
1.002	SwaleN	0.019	0.000	1.01			129.0	FLOOD RISK	
2.000	S6	-0.118	0.000	0.46			45.5	OK	
3.000	S5	0.399	0.000	1.18			17.0	SURCHARGED	
3.001	TANKE	-0.254	0.000	-0.05			-56.5	OK	
1.003	TANKW	0.250	0.000	0.49			26.5	SURCHARGED	
1.004	FCONTS	0.526	0.000	0.44			26.5	SURCHARGED	

Appendix C

Proposal drawings



MANHOLE SCHEDULE

Manhole ref	Cover Level (m)	MH Depth (m)	Pipes In Invert	Pipes In Diameter (mm)	Pipes In Backdrop (mm)	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)
Northern site							
N1	62.6	1				61.6	300
N2	62.6	1.091	61.509	300		61.509	300
N3	62.8	1.5	61.3	300		61.3	300
Attenuation	62.6 to 62.45	1.851 to 2	61.206	300		60.6	300
CN	62.45	1.867	60.583	300		60.583	300
ON	63	2.422	60.578	300		OUTFALL	
Southern site							
S1	63.9	1				62.9	225
S6	62.45	0.776				61.674	225
S5	63.44	1.3				62.14	100
Attenuation	62.5	2	61.2	100		60.5	300
			61	225			
CS	62.3	1.816	60.484	300		60.484	300
OS	63	2.549	60.451	300		OUTFALL	

Notes
1. This drawing has been prepared in accordance with the scope of RPS's appointment with its client and is subject to the terms and conditions of that appointment. RPS accepts no liability for any use of this document other than by its client and only for the purposes for which it was prepared and provided.
2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.

Notes

Locations of existing drainage are plotted from the Yorkshire Water sewer records adjusted where possible to match the topographical survey

No depths or inverts are provided on Yorkshire Water records for this area

Existing levels should be confirmed on site

Rev	Description	Date	Initial	Checked
A	Drainage strategy issue	04/04/2021	MAS	
P01	Draft for comment	21/12/2020	MAS	

MAKING COMPLEX EASY

Dearing House, 1 Young Street, Sheffield S1 4UP
T: +44(0)144 272 7301

Client: Chris Wright Road Planing Ltd

Project: Dockfield Road Shipley

Title: Proposed drainage layout

Status: Strategy
Drawn By: MAS
PM/Checked by: .
Job Ref: CLE30275
Scale @ A1: 1:500
Date Created: Dec 2020
Figure Number: **CLE30275/05/110**
Rev: A

rpsgroup.com/uk

C:\Project\CLE30275 Dockfield Road Shipley\04-Calcs\DWG\110 - Drainage Layout_A.dwg

Appendix D

Drainage Maintenance and Management Plan

DRAINAGE MAINTENANCE AND MANAGEMENT PLAN

Introduction

The surface water drainage system proposed as part of the works is shown on RPS drawing CLE30275/05/110. Pipe sizes and gradients are designed to be self-cleansing albeit regular maintenance and inspections are required to ensure the long-term efficiency of the systems.

All works should be undertaken by suitably qualified personnel and waste should be treated and removed by an appropriately registered company.

Swales

A swale is proposed to collect runoff from the vehicle movement areas in the south site.

Maintenance schedule	Required action	Typical Frequency
Regular Maintenance	Remove litter and debris	Monthly or as required
	Cut grass to retain height within specified design range	Monthly (during growing season) or as required
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required
	Inspect inlets, outlets and overflows ofr blockage, and clear if required	Monthly
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly
	Inspect silt accumulation, establish appropriate silt removal frequency	Half yearly
Occasional maintenance	Re-seed areas of poor vegetation growth, alter plant types to better suit conditions if frequired	As required or if bare soil is exposed over 10% or more of the swale treatment area
Remedial actions	Repair erosion or other damage by re-turfing or re-seeding	As required
	Re-level uneven surfaces and reinstate design levels	
	Scarify and spike topsoil to break up silt deposits and prevent compaction	
	Remove build-up of sediment at top of filter strip	
	Remove and dispose of oil or petrol residues using safe standard practices	

Attenuation

Attenuation of flow is provided by an array of geocellular “crates”. The design will be arranged to provide access for CCTV along at least one axis of the units.

To prevent inflow of groundwater, the geocellular arrays are contained within an impermeable membrane.

Maintenance schedule	Required action	Typical Frequency
Regular Maintenance	Inspect and identify any areas which hare not operating correctly, and take remedial action if required	Monthly for three months, then annually.
	Remove debris from the catchment surface where this may cause a risk to performance	Monthly
	Remove sediment from pre-treatment structures including sump manholes	Annually or as required
	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment this will only be required rarely, e.g. every 25-50 years
Remedial actions	Repair/rehabilitate inlets, outlets and vents	Annually or as required
Monitoring	Inspect all inlets, outlets and vents to ensure they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Conventional drainage

Elements of conventional sub-surface are required to link swales and attenuation. These have been sized to provide self-cleaning velocities, however an accumulation of debris is possible over time.

Maintenance schedule	Required action	Typical Frequency
Regular Maintenance	Inspection of chambers for silt, debris and signs of blockages	Six monthly
	Inspection of manhole covers and gully grates for signs of damage	
Occasional maintenance	Cleaning and removal of sediments, obstructions etc. to restore hydraulic capacity	As required
Remedial actions	Local repair or local replacement of damaged pipes or other structures in order to maintain the functioning of the sewer	

To avoid damaging the pipe, PSI pressures need to be verified before jetting of plastic twin wall sewers. Cleaning of drainage systems may require the temporary sealing of the system and careful collection of the effluent for disposal off site.

Proprietary Treatment Devices

Appropriately sized proprietary treatment devices are required to mitigate the risk of pollution to the Bradford Beck and River Aire.

Maintenance schedule	Required action	Typical Frequency
Regular Maintenance	Inspection of chambers for silt, debris and signs of blockages Inspection of manhole covers and gully grates for signs of damage	Six monthly
Occasional maintenance	Cleaning and removal of sediments, using a standard vacuum tanker from the surface	Initially monthly to monitor sediment growth rate, but likely to be quarterly or less frequent.
Remedial actions	Repair or replacement of any damaged components to maintain effective operation of the unit.	

Appendix E

Correspondence

Martin Spiers

From: contact_us@yorkshirewater.co.uk
Sent: 16 December 2020 13:49
To: Martin Spiers
Subject: (Our Ref: LNSS-U048081) Response from Yorkshire Water

Categories: YWS, Client

CAUTION: This email originated from outside of RPS.

; contact_us
With reference to: U048081-5

Dockfield Road, Shipley, BD17 7AD - H4 Sewerage Enquiry U048081 Technical Sewerage to: martin.spiers 16/12/2020 13:48 Sent by: Tamara Vaughan1

Mr Martin Spiers RPS Environmental Management 1 Young Street S1 4UP martin.spiers@rpsgroup.com Your Ref: Our Ref: W016315Yorkshire Water Services Developer Services Sewerage Technical Team PO Box 52 Bradford BD3 7AY Tel: 0345 120 8482 Fax: For telephone enquiries ring: Tamara Vaughan on 03451 208482 Date: 16/12/2020

Dear Sir/Madam,

Dockfield Road, Shipley, BD17 7AD - H4 Sewerage Enquiry U048081

Thank you for your revised enquiry and remittance received at this office. This indicates the recorded position of the public sewers. We would make the following comments, in respect of the public sewer network, based on a 'desk top' study of your proposal:

The construction, extension or underpinning of a building over or within 3 (three) metres of any existing drain, sewer or disposal main recorded on the Statutory Sewer Map is generally controlled through the Building Regulations. This is Requirement H4 and it is accompanied by comprehensive Guidance for developers to follow.

Certain types of building works may be exempt from the Building Regulations. If this is the position with your proposal, then Yorkshire Water would raise no objection in principle to building over or near to a pipeline provided that you follow the guidance that accompanies Requirement H4 of the Building Regulations. In other words, to protect the pipeline and proposal, the work should be undertaken to the same standard as would have been required by H4.

In this instance, Yorkshire Water would raise no objection in principle to the proposals as shown on your enquiry. This matter should subsequently be controlled by the Building Inspector under Requirement H4 of the Building Regulations. This is subject to, amongst other things, the following important matters:

· There should be no public access points ie manholes, gullies, buried connections etc built over as part of the proposals.
· The pipeline should be protected at all times. This is to prevent damage from occurring during and after the works. Heavy materials, for example, should not be stored over the pipeline.
· The foundations should be designed and constructed so that no additional loading is placed on to the pipeline.
· Where the pipeline is to pass through foundation walls etc. the wall should adequately span the pipeline.

· Yorkshire Water must be given 21 days notice of any new connection to be made to a public sewer. An application form is available on request.
· Any work to the pipeline and/or any associated access point(s) must be done under the control of Yorkshire Water.
· The developer should be advised to telephone 0345 120 84 82 if there are any queries or should an application form for a new sewer connection be required.
· ANY WORK ON A PUBLIC SEWER OR DISPOSAL MAIN WITHOUT YORKSHIRE WATER'S APPROVAL WOULD BE UNLAWFUL.

Please note the grant of planning approval (if required) may contain a condition that is relevant to the above matter and the applicant may therefore be in breach of any conditional grant of planning approval.

The Building Inspector has a duty to consult us if you apply for Building Regulations. Meanwhile, we are obliged to inform you of the following important matters.

The pipe(s) is/are lawfully retained in its/their existing position(s) and the sewerage undertaker is entitled to have it/them remain so without any disturbance. The provisions of section 159 of the Water Industry Act 1991 provides that the sewerage undertaker may "inspect, maintain, adjust, repair or alter" the pipe(s). Those rights are given to enable the sewerage undertaker to perform its statutory duties. Any development of the land or any other action that unacceptably hindered the exercise of those rights would be unlawful.

The sewerage undertaker may sue in the courts for an injunction against any such development or action.

A developer may, where it is reasonable to do so, require a sewerage undertaker to alter or remove a pipe where it is necessary to enable that person to carry out a proposed improvement of land. This provision is contained in section 185 of the Water Industry Act 1991 that also requires the developer to pay the full cost of carrying out the necessary works.

If your proposal involves demolition works, your attention is drawn to the provisions of section 111 of the Water Industry Act 1991. It is unlawful to pass into any public sewer (or into any drain or sewer communicating with a public sewer) any matter likely to injure the public sewer network, interfere with the free flow of its contents or affect the treatment and disposal of its contents.

Contravention of the provisions of section 111 is a criminal offence.

You should remove any disused drains or sewers that communicate with the public sewer network and seal the point(s) of connection.

Please contact this office if any public sewer is likely to become totally redundant as a result of your demolition works. We will then look in to the prospect of formally closing that public sewer so that it can be abandoned. This may remove a potential restriction from any future development of the site.

It is the responsibility of the applicant/developer to determine the position of any apparatus that may be located within the proposal site.

Yours faithfully

Tamara Vaughan - Developer Services (sewerage)

(Our Ref: LNSS-U048081 / 37401899998580X)