COWSHED – BLACK MOSS FARM

Operation & Maintenance Manual for SuDS Assets

Elmridge Lane, Preston, PR3 2NY

CSH-BML-XX-XX-RP-C-0502

Wednesday, 28th February 2024

BarnsleyMarshall

BarnsleyMarshall Limited
4 & 5 Prior Wharf,
Harris Business Park,
Stoke Prior,
Worcester,
B60 4FG
Tel 01905 330 550
Web barnsleymarshall.co.uk

BarnsleyMarshall

Contents Amendment Record

This report has been issued and amended as follows:

Revision	Description	Issued by	Checked by	Date
P01	First Issue for Planning Approval	K. Dean	A. Mavhunga	2023-07-25
P02	Slurry Tank Drainage Added	K. Dean	A Mavhunga	2023-08-17
P03	Updated to suit revised layout	N. Johns	A Mavhunga	2024-02-06
P04	Drainage details updated	I. Withana	A Mavhunga	2024-02-28

Barnsley Marshall Limited have prepared this report in accordance with the instructions of their client, FI Construction Limited, for their sole and specific use. Any other persons who use any information contained herein do so at their own risk.

Contents

Appendices

1. Introduction

1.1 Project Background

Barnsley Marshall Ltd was appointed by FI Construction Limited to provide a SuDS Drainage Strategy Layout for the proposed construction of a cowshed at Elmridge Lane, Preston, PR3 2NY.

This report provides recommended maintenance regimes for SuDS assets proposed as part of the surface water drainage for the development based on government and local authority guidance with regard to maintenance.

The report is based on currently available and preliminary discussions.

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Barnsley Marshall shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Barnsley Marshall.

1.2 Scope of O&M Manual

This manual is intended to give an overview of the operation and maintenance for the range of SuDS features included with the drainage strategy ***CSH-BML-XX-XX-RP-C-0501*** and should be read in conjunction with this document. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in conjunction (and as a priority) to this document unless specifically noted otherwise due to project constraints.

The recommended maintenance regimes and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation of the proposed asset, and thereafter adjusted to suit the site requirements.

The drainage system for the proposed development should be added to the farms overall Accident and Emergency Plan to prevent pollution, to help deal with any incidents if they occur. The Environment Agency is to be immediately informed if any surface water pollution event occurs. Any water that is directly contaminated by livestock excreta is **not** to discharge into the SuDS system.

2. Flow Control Units

2.1 Location and Description

The location and details of the flow control units is indicated on the SuDS Drainage Strategy Layout drawings and construction details, refer to ***Appendix A***. The flow control devices are specified as Hydro-brakes or similar approved and are a proprietary product; therefore, the manufacturer's recommendations should also be taken into consideration.

2.2 Operation

The Hydro-brakes are intended to be the main Surface Water Control Devices from the site, limiting the outflow from the development to a combined maximum of 5.0 l/s for all storm events up to and including the 100-year + 40% CC storm event. When storms exceed the 100-year + 40% CC storm event, the flow control chambers will allow additional outflow from the site via the overflow pipe, and the Hydro-brakes will be discharging greater than a combined 5.0 l/s. The flow control chamber and Hydro-brakes should be inspected every time after such an excessive storm.

2.3 Inspection and Maintenance Regime

Regular inspection and maintenance are important for the effective operation of the flow control unit.

Being part of private drainage, whole life cycle maintenance of the Hydro-brake chamber shall be the responsibility of FI Construction Limited. The responsible officer is John Lohan whose details are as below:

- jlohan@fi-construction.com
- *Canal Mill, Botany Brow, Chorley, Lancashire, PR6 9AF*

Table 2.1 gives the recommended maintenance regime for the asset.

Table 2.1: Recommended Maintenance Regime for Flow Control Chamber and Hydro-brake

Maintenance Schedule	Required Action		Frequency
Monitoring (to be undertaken more regularly within the first year of operation and adjusted as required)	Inspect inlets for blockages, and clear if required. If faults persist jetting and CCTV survey may be required.		Monthly and after large storms.
Regular maintenance/inspection	Inspect and identify any areas that are not operating correctly. If required, take remedial action.		Six-monthly
	Remove sediment and debris from flow control chambers.		Annually (or as required after heavy rainfall events).
Remedial actions	Repair/rehabilitation of inlets.		As required.

3. Storage Ponds and Swale

3.1 Location and Description

The proposed storage ponds and swale are shown on the Drainage Strategy Layout drawing in ***Appendix A***. The grass seeding, flowers, shrubs, and plants within the pond area will be recommended by a Landscape Architect.

3.2 Operation

Run-off from each rain event is retained and treated in the two ponds. The retention time promotes pollutant removal through sedimentation and the opportunity for biological uptake mechanisms to reduce nutrient concentrations. This helps prevent pollutants from entering the groundwater or watercourses downstream. The flora (planted grass/lawn/reeds) within the pond/swale absorb the pollutants via photosynthesis and reduce the concentrations in the runoff. Solid-bound pollutants are also retained via sedimentation. The planted flora will require periodic replacement to get rid of the accumulated adsorbed pollutants.

3.3 Inspection and Maintenance Regime

Regular inspection and maintenance are important for the effective operation of the storage pond.

Being part of private drainage, whole life cycle maintenance of the Storage Pond and Swale shall be the responsibility of FI Construction Limited. The responsible officer is John Lohan whose details are as below:

- jlohan@fi-construction.com
- *Canal Mill, Botany Brow, Chorley, Lancashire, PR6 9AF*

Table 3.1 gives the recommended maintenance regime for the asset.

Table 3.1: Recommended Maintenance Regime for Storage Ponds and Swale

Regular Maintenance	
Monthly	• Litter and debris removal • Mulching (where required) • Inspect/check all inlets, outlets, surface and overflow (where required) to ensure that they are in good condition, free from blockages and operating as designed. • Take action where required.
Six Monthly	• Remove nuisance and invasive vegetation
Annually	• Pruning and trimming of trees • Inspect and document the presence of wildlife • Check for poor vegetation growth due to lack of sunlight or dropping of leaf litter, and cut back adjacent vegetation where required
As Required	• Repair erosion or other damage by re-mulching or re-seeding • Re-seed areas of poor vegetation growth. Alter plant types to better suit conditions, if required • Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface (typically every 60-month period) • Remove build-up of sediment, reinstate design levels (typically every 60-month period) • Remove and dispose of oils or petrol residues using safe standard practices
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, a number of actions may be required following such events.	
Following all significant storm events	• Inspect and carry out essential recovery works to return the feature to full working order.

4. Filter Drains

4.1 Location and Description

The location of the Filter Drains is indicated on the SuDS Drainage Strategy Layout drawing in ***Appendix A***. The proposed filter drains will have SHW Type B filter material (20-40mm stone) and be topped with 150mm top soil and lawn seeding to provide a pleasant aesthetic finish.

4.2 Operation

The proposed Filter Drains will allow Stormwater run-off to soakaway into a porous pipe at the bottom of the trench. The trench is filled with stone filter material. This stone fill collects particles and helps prevent pollutants from entering the groundwater or watercourses downstream.

4.3 Inspection and Maintenance Regime

Regular inspection and maintenance are important for the effective operation of the Filter Drains.

Being part of private drainage, whole life cycle maintenance of Filter Drains shall be the responsibility of FI Construction Limited. The responsible officer is John Lohan whose details are as below:

- jlohan@fi-construction.com
- *Canal Mill, Botany Brow, Chorley, Lancashire, PR6 9AF*

Table 4.1 gives the recommended maintenance regime for the asset.

Table 4.1: Recommended Maintenance Regime for Filter Drains

Regular Maintenance	
Monthly	• Litter and debris removal • Mow grasses (where required to promote lateral runoff inflow) and remove resultant clippings (during growing season only) • Remove nuisance and invasive vegetation (for 12 months following installation) • Inspect/check all inlets, outlets, surface and overflows (where required) to ensure that they are in good condition, free from blockages and operating as designed. Take action where required
Six Monthly	• Not applicable
Annually	• Remove nuisance and invasive vegetation • Inspect and document the presence of wildlife
As Required	• Repair erosion or other damage by replacing filter material • Re-level uneven surfaces and reinstate design levels (typically every 60-month period) • Remove and replace top 300 – 500mm of gravel, clean and replace where required (typically every 60-month period) • Remove and dispose of oils or petrol residues using safe standard practices
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, a number of actions may be required following such events	
Following all significant storm events	• Inspect and carry out essential recovery works to return the feature to full working order

APPENDICES

Appendix A

SuDS Drainage Proposals

Future Development

Rodding Eye located inside catcpit S13.

Cut off Filter Drain

Suds Feature 01
Filter Drain

Concrete Slab Gullies				
Gully ID	X (Eastings)	Y (Northings)	Cover	Invert
GY01	360126.402	440364.036	105.025	104.575
GY02	360128.155	440362.284	105.025	104.575

S02 S03 S04 S13 S01 S05 S06 S07 S08 S09 S10 S11 S12 S14 S15 S16 S30 S31

S2.000 DN225 SFT @1:41.3
S2.001 DN225 SFT @1:68.2
S3.002 DN225 SFT @1:14.1
S1.000 DN225 SFT @1:294.4
S1.001 DN300 SFT @1:426.5
S3.000 DN225 SFT @1:294.4
S3.001 DN300 SFT @1:230.5
S4.000 DN225 SFT @1:294.4
S4.001 DN225 SFT @1:294.4
S5.000 DN225 SWS @1:130.8
S5.001 DN225 SFT @1:111.6
S5.002 DN225 SFT @1:61.0
S5.003 DN225 SWS @1:437
S1.002 DN300 SWS @ 1:426.5
S1.003 DN225 SWS @ 1:130.8
S1.004 DN450 SWS @ 1:101.7

105.700 105.930 105.625 105.175 105.763 105.225 105.250 105.176 106.500 105.225 105.300 105.270 105.225 105.375 105.350 105.400 106.350 105.200 105.300 105.550

Proposed Cow Shed 01
FFL:105.350

Proposed Cow Shed 02
FFL:105.350

Concrete Apron

GY01 105.025
GY02

Existing Building

For manhole Filter Drain details in section refer to drawing CSH-BML-XX-XX-DR-C-0502

Cut off Filter Drain

Notes:

1. The contractor is to check all information provided prior to commencing the works and seek clarification from the engineer in respect to any ambiguities found.
2. Pipe materials shall be as follows:
   Surface Water:
   -150ø to 225ø - Polypipe Polysewer PVCu pipes
   -300ø and above - Polypipe Rigisewer PVCu pipes
   Foul Water:
   -All pipe materials shall be clayware Class 120 to BS EN 295
3. All drainage under trafficked areas must be backfilled with an approved graded granular material.
4. All chamber covers and gully tops shall be kite marked and comply with the strength / group requirements of BS EN 124.
5. Cover levels for chambers within landscaped areas shall be adjusted to match surrounding finished levels.
6. All new rainwater down pipes are to discharge into roddable connections.
7. All pipes to be benched within the chambers soffit to soffit.
8. Drainage chambers within areas paved with paving flags and block setts shall all have recessed covers.
9. Final position of all RWP's and SVP's to be confirmed.

Safety, Health & Environmental Information:

In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below,

INDICATES A RESIDUAL RISK AS A WARNING

INDICATES A RESIDUAL RISK FOR INFORMATION

and described below:

Construction/Maintenance/Cleaning/Demolition

Refer to Drawing:

General Notes:

1. Do not scale from this drawing.
2. All dimensions are in millimetres (mm), all levels in metres (m) unless noted otherwise.
3. Discrepancies or omissions are to be reported to the Engineer prior to work commencing.
4. Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.
5. The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.
6. The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.
7. This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.

Greenfield Runoff Rates

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.450
Area (ha)	0.916	Urban	0.000
SAAR (mm)	1057	Region Number	Region 10

Results l/s

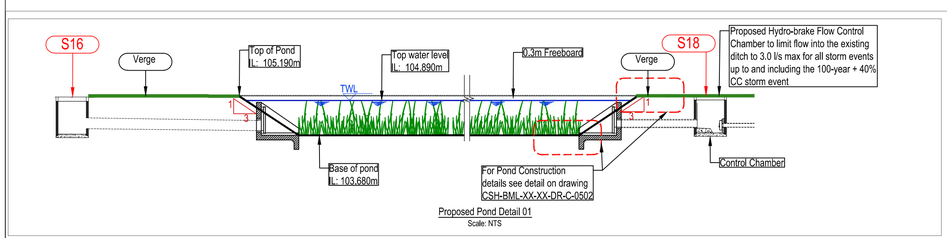
QBAR Rural 6.5
QBAR Urban 6.5

Q100 years 13.6

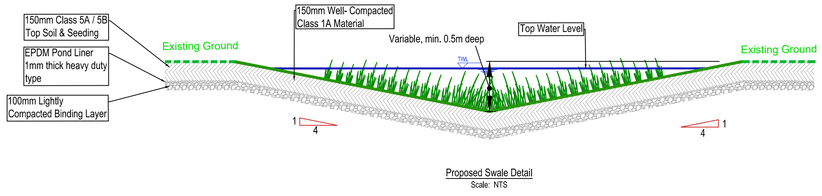
Q1 year 5.7
Q30 years 11.0
Q100 years 13.6

Drainage Key:

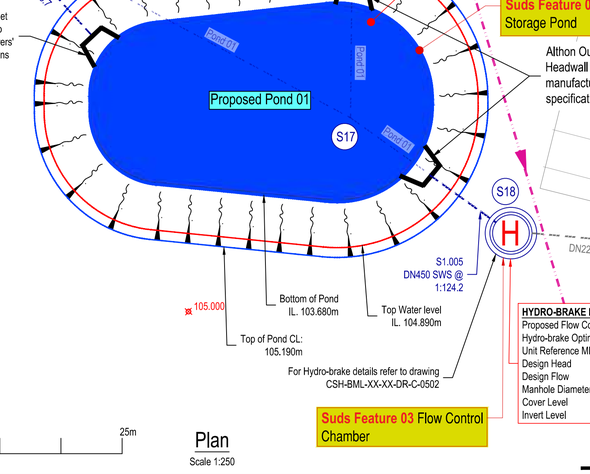
DNXXX SWS @ 1:XXX.X	Proposed Stormwater Sewer
DNXXX SFT @ 1:XXX	Proposed Filter Drain
DNXXX DWS @ 1:XXX	Proposed Dirty Water Sewer
S0X	Proposed Stormwater Manhole
S0X	Proposed Ridgistorm Separate Catchpit
S0X	Proposed Stormwater Hydro-brake
	DN150 Gully / RWP Connector
RWP	Proposed Rain Water Pipe
	Proposed Rodding Eye
FFL:XX.XXX	Proposed Finish Floor Level
P	Proposed Pumping Station. Refer to drawing CSH-BML-XX-XX-DR-C-0503 for details.
DNXXX COMB	Proposed Rising Main
DNXXX DWS GYXX	Proposed Inspection Chamber with Grilled Cover. For details Refer to drawing CSH-BML-XX-XX-DR-C-0503
XX.XXX	Design Levels



Proposed Pond Detail 01
Scale: NTS



Proposed Swale Detail
Scale: NTS



PROPOSED STORAGE POND 01
Approx 519.3m3
Pond - Side Slopes : 1 in 3
Top of Pond : 105.190m
Top Water Level : 104.890m
Base of Pond : 103.680m

Suds Feature 02
Storage Pond

Existing Building

- 1-year + 0% CC - 2.9l/s
- 30-year + 35% CC - 2.9l/s
- 100-year + 40% CC - 3.2l/s

Existing Pipe

S1.006 DN225 SWS @ 1:124.2

For Drainage Details from Proposed Slurry Tanks, refer to drawing CSH-BML-XX-XX-DR-C-0508

For Drainage details showing outfall at existing ditch, refer to Insert A

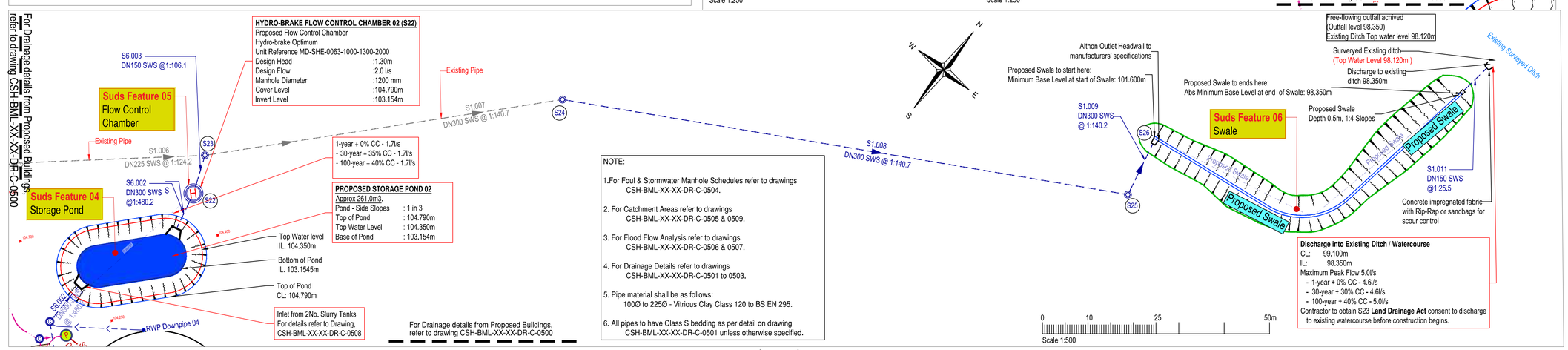
HYDRO-BRAKE FLOW CONTROL CHAMBER (S18)
Proposed Flow Control Chamber
Hydro-brake Optimum
Unit Reference MD-SHE-0097-3000-1200-3000
Design Head :1.20m
Design Flow :3.0 l/s
Manhole Diameter :1200 mm
Cover Level :105.068m
Invert Level :103.680m

Suds Feature 03 Flow Control Chamber

Suds Feature 04
Storage Pond

0 5 10 25m
Scale 1:250

Plan
Scale 1:250



NOTE:

1.For Foul & Stormwater Manhole Schedules refer to drawings CSH-BML-XX-XX-DR-C-0504.

2. For Catchment Areas refer to drawings CSH-BML-XX-XX-DR-C-0505 & 0509.

3. For Flood Flow Analysis refer to drawings CSH-BML-XX-XX-DR-C-0506 & 0507.

4. For Drainage Details refer to drawings CSH-BML-XX-XX-DR-C-0501 to 0503.

5. Pipe material shall be as follows:
100Ø to 225Ø - Vitrious Clay Class 120 to BS EN 295.

6. All pipes to have Class S bedding as per detail on drawing CSH-BML-XX-XX-DR-C-0501 unless otherwise specified.

0 10 25 50m
Scale 1:500

Insert A
Scale 1:500

Rev	By / Chk'd	Date	Description
P06	IW/AM	28/02/2024	Drainage details updated
P05	DH/AM	06/02/2024	Additional Drainage Information added
P04	DH/AM	26/01/2024	Additional Drainage Information added
P03	DH/AM	10/08/23	Additional Drainage Information added
P02	DH/AM	21/07/23	Preliminary Issue
P01	RA/GM	05/04/23	For Discussion

PRELIMINARY DRAWING
This drawing is not to be used for construction

Client
FI REAL ESTATE MANAGEMENT

BarnsleyMarshall Limited
1 Birch Court
Blackpole East
Worcester
WR3 8SG
Tel: 01905 330550
Email: design@barnsleymarshall.co.uk
Web: www.barnsleymarshall.co.uk

Project
Cow Shed
Elmridge Lane, Preston,
PR3 2NY

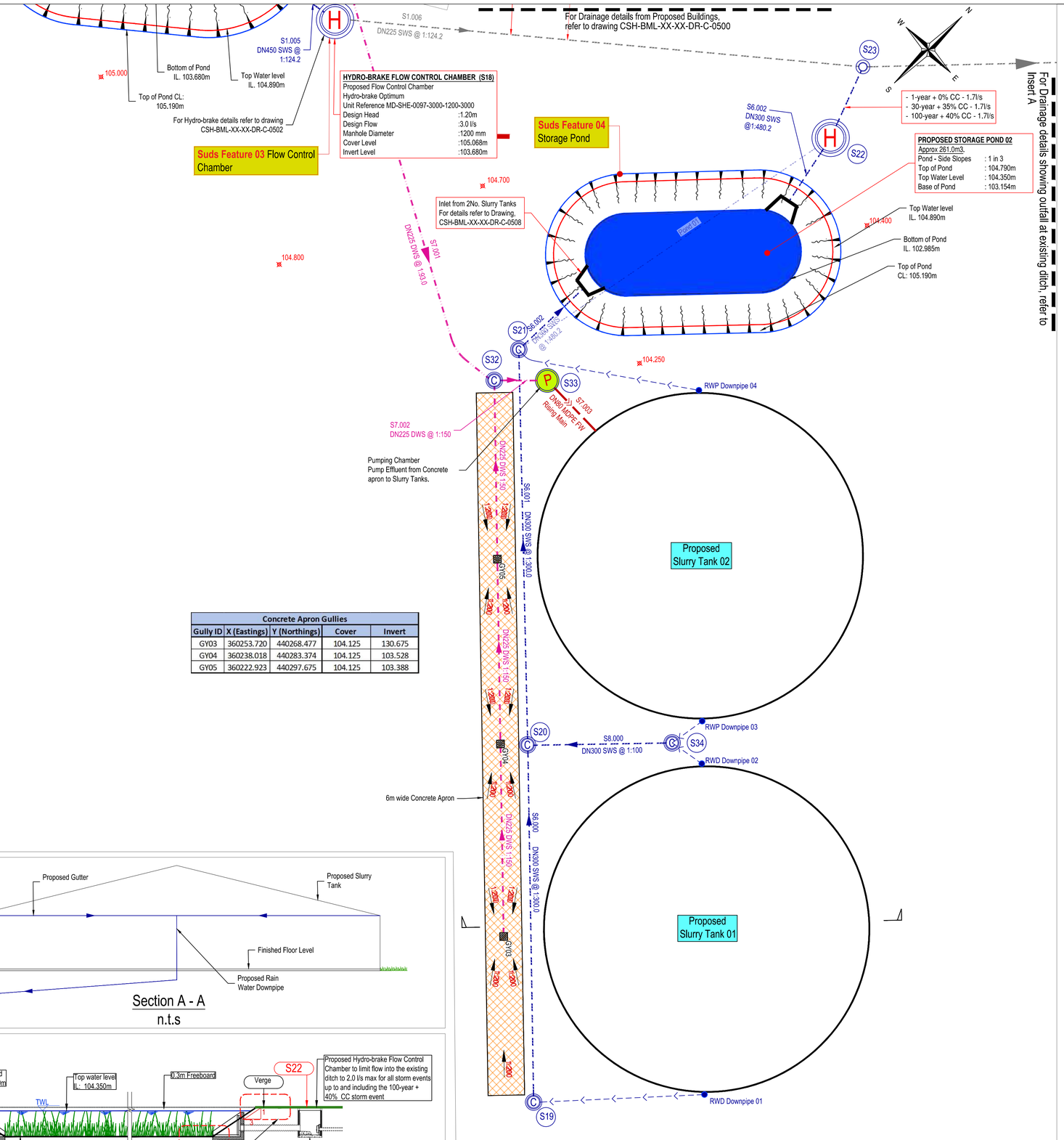
Drawing
Proposed Surface Water Drainage Plan Layout 01
Main Site

By/Chk'd DH/AM Date 05/04/2023

Drawing No. CSH-BML-XX-XX-DR-C-0500
Revision P06
BML Job No. 1000-05
Status -

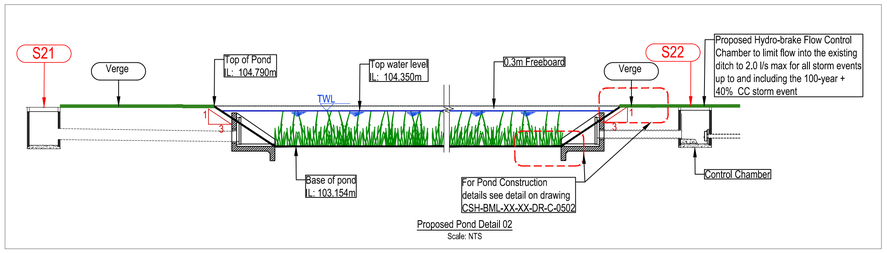
Drawing Scale at A1: DH/AM

CAD Filename: Y:\Projects\1000-05 Cow Shed\Information - Working\DWG\CSH-BML-XX-XX-DRC-0500-2004-0508.PDS - Drainage Plan Layout 01.dwg



Concrete Apron Gullies				
Gully ID	X (Eastings)	Y (Northings)	Cover	Invert
GY03	360253.720	440268.477	104.125	130.675
GY04	360238.018	440283.374	104.125	103.528
GY05	360222.923	440297.675	104.125	103.388

Section A - A
n.t.s



Proposed Pond Detail 02
Scale: NTS

Plan
Scale 1:250

Notes:

1. The contractor is to check all information provided prior to commencing the works and seek clarification from the engineer in respect to any ambiguities found.
2. Pipe materials shall be as follows:
   Surface Water:
   -150ø to 225ø - Polypipe Polysewer PVCu pipes
   -300ø and above - Polypipe Rigisewer PVCu pipes
   Foul Water:
   -All pipe materials shall be clayware Class 120 to BS EN 295
3. All drainage under trafficked areas must be backfilled with an approved graded granular material.
4. All chamber covers and gully tops shall be kite marked and comply with the strength / group requirements of BS EN 124.
5. Cover levels for chambers within landscaped areas shall be adjusted to match surrounding finished levels.
6. All new rainwater down pipes are to discharge into roddable connections.
7. All pipes to be benched within the chambers soffit to soffit.
8. Drainage chambers within areas paved with paving flags and block setts shall all have recessed covers.
9. Final position of all RWP's and SVP's to be confirmed.

Greenfield Runoff Rates

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.450
Area (ha)	0.916	Urban	0.000
SAAR (mm)	1057	Region Number	Region 10

Results l/s

QBAR Rural	6.5
QBAR Urban	6.5
Q100 years	13.6
Q1 year	5.7
Q30 years	11.0
Q100 years	13.6

NOTE:

1.For Foul & Stormwater Manhole Schedules refer to drawings CSH-BML-XX-XX-DR-C-0504.

2. For Catchment Areas refer to drawings CSH-BML-XX-XX-DR-C-0505 & 0509.

3. For Flood Flow Analysis refer to drawings CSH-BML-XX-XX-DR-C-0506 & 0507.

4. For Drainage Details refer to drawings CSH-BML-XX-XX-DR-C-0501 to 0503.

5. Pipe material shall be as follows: 100Ø to 225Ø - Vitrious Clay Class 120 to BS EN 295.

6. All pipes to have Class S bedding as per detail on drawing CSH-BML-XX-XX-DR-C-0501 unless otherwise specified.

0 5 10 25m
Scale 1:250

Safety, Health & Environmental Information:

In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below,

INDICATES A RESIDUAL RISK AS A WARNING

INDICATES A RESIDUAL RISK FOR INFORMATION

and described below:

Construction/Maintenance/Cleaning/Demolition

Refer to Drawing:

General Notes:

1. Do not scale from this drawing.
2. All dimensions are in millimetres (mm), all levels in metres (m) unless noted otherwise.
3. Discrepancies or omissions are to be reported to the Engineer prior to work commencing.
4. Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.
5. The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.
6. The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.
7. This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.

Drainage Key:

DNXXX SWS @ 1:XXX.X	Proposed Stormwater Sewer
DNXXX SFT @ 1:XXX	Proposed Filter Drain
DNXXX DWS @ 1:XXX	Proposed Dirty Water Sewer
SXX	Proposed Stormwater Manhole
SXX	Proposed Ridgistorm Separate Catchpit
SXX	Proposed Stormwater Hydro-brake
	DN150 Gully / RWP Connector
RWP	Proposed Rain Water Pipe
	Proposed Rodding Eye
FFL XX.XXX	Proposed Finish Floor Level
P	Proposed Pumping Station. Refer to drawing CSH-BML-XX-XX-DR-C-0503 for details.
DNXXX COMB	Proposed Rising Main
DNXXX DWS GYXX	Proposed Inspection Chamber with Grilled Cover. For details Refer to drawing CSH-BML-XX-XX-DR-C-0503
XX.XXX	Design Levels

Rev	By / Chk'd	Date	Description
P04	IW/AM	28/02/2024	Drainage details updated
P03	DH/AM	06/02/2024	Drainage Details updated
P02	DH/AM	26/01/2024	Drainage Details updated
P01	DH/AM	15/08/2023	Preliminary Issue

PRELIMINARY DRAWING
This drawing is not to be used for construction

Client
FI REAL ESTATE MANAGEMENT

BarnsleyMarshall Limited
1 Birch Court
Blackpole East
Worcester
WR3 8SG

Tel: 01905 330550
Email: design@barnsleymarshall.co.uk
Web: www.barnsleymarshall.co.uk

Project
Cow Shed
Elmridge Lane, Preston,
PR3 2NY

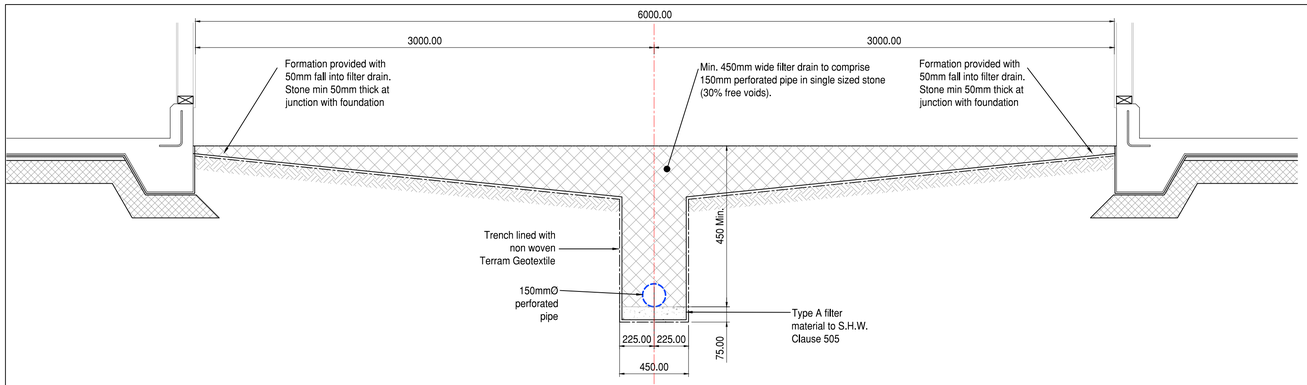
Drawing
Proposed Surface Water Drainage Plan Layout 02 Slurry Tanks

By/Chk'd	DH/AM	Date	05/04/2023

Drawing No.	Revision
CSH-BML-XX-XX-DR-C-0508	P04
BML Job No.	Status
1000-05	-

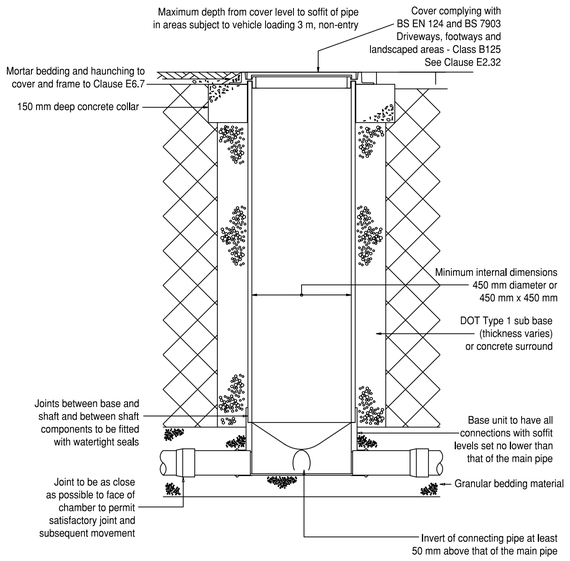
Drawing Scale at A1: As Shown

CAD Filename: Y:\Projects\1000-05 Cow Shed\Information - Working\DWG\CSH-BML-XX-XX-DR-C-0500-0504-0508 P05 - Drainage Plan Layout 01.dwg



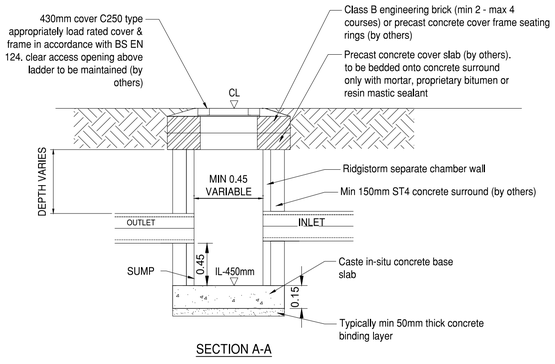
Typical Section Thro' Filter Drain (Section A-A)

Scale 1:20

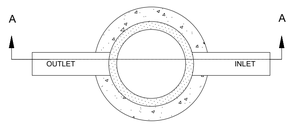


Typical Inspection Chamber Detail (Flecible Material Detail)

NTS



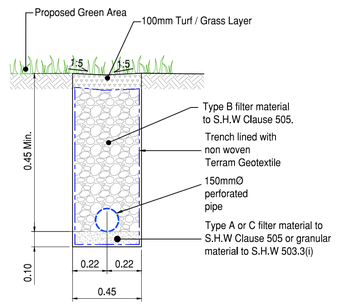
SECTION A-A



PLAN

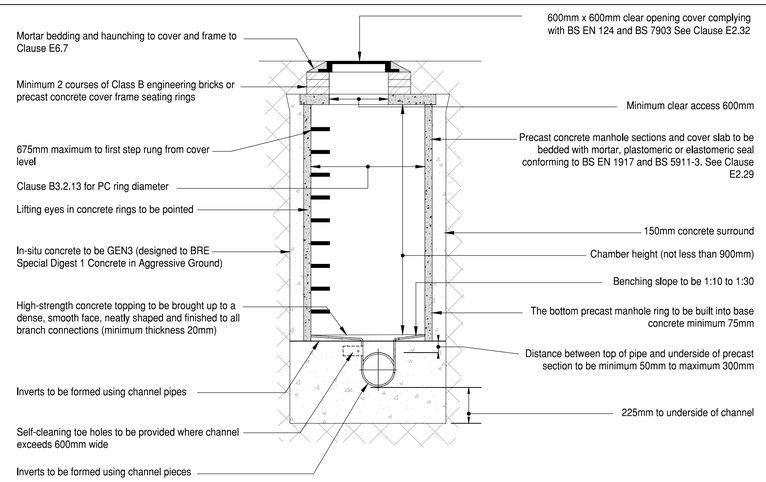
Rigistorm Separate Catchpit

NTS



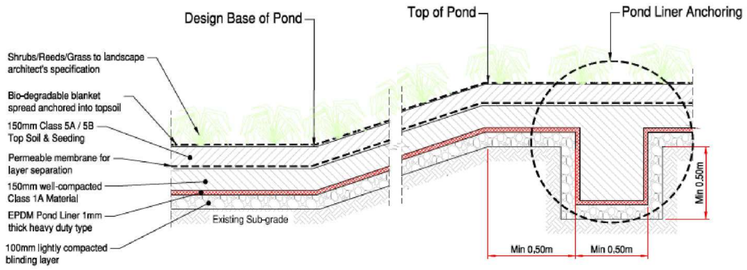
Typical Filter Drain Detail

Scale 1:20



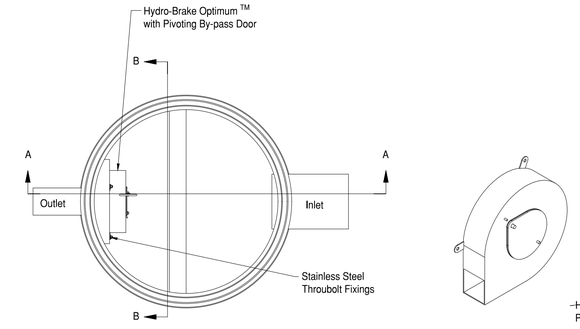
Typical Manhole Detail (Max depth from cover to soffit of pipe 3.0m)

Scale 1:20

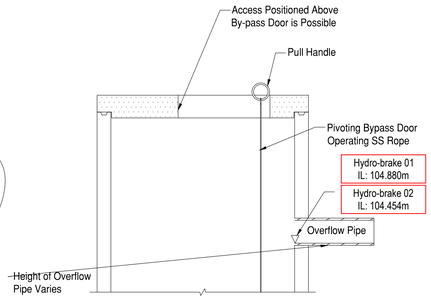


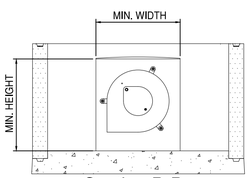
Pond/Swale Construction Build Up (to be confirmed by Landscape Architects)

NTS



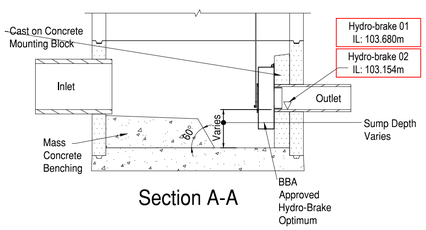
Plan





Section B-B
(View on Mounting Block)

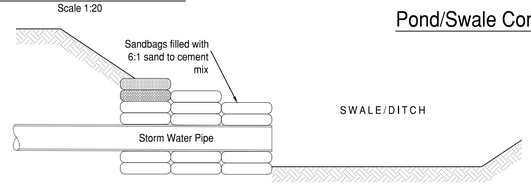
Note - A Pre-formed Hydro-Brake© Chamber base is Available from Hydro International with Hydro-Brake Optimum TM Pre-fitted



Section A-A

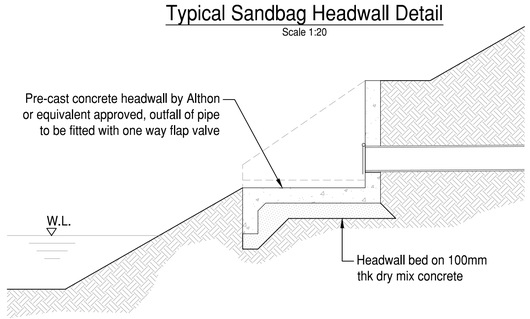
Typical Hydrobrake Chamber Detail With Overflow Pipe

Scale 1:20



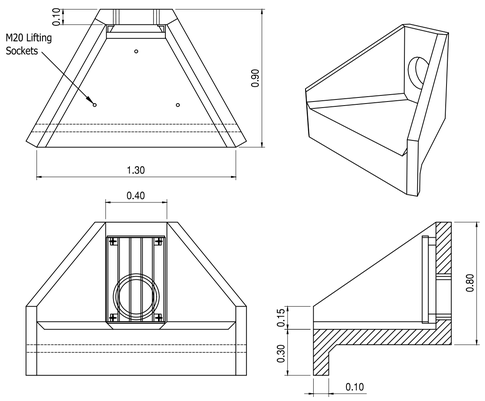
Typical Sandbag Headwall Detail

Scale 1:20



Typical Concrete Headwall Detail

Scale 1:20



Headwall Outlet - Athlon H3C Headwall (Up to DN300)

Scale 1:20

Safety, Health & Environmental Information:

In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below,

INDICATES A RESIDUAL RISK AS A WARNING

INDICATES A RESIDUAL RISK FOR INFORMATION

and described below:

Construction/Maintenance/Cleaning/Demolition

Refer to Drawing:

General Notes:

1. Do not scale from this drawing.

2. All dimensions are in millimetres (mm), all levels in metres (m) unless noted otherwise.

3. Discrepancies or omissions are to be reported to the Engineer prior to work commencing.

4. Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.

5. The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.

6. The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.

7. This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.

8.For drainage plans refer to drawing:
- RCF-BML-ERD-ZZ-DR-C-0550 Combined Drainage Layout

PRELIMINARY DRAWING
This drawing is not to be used for construction

Rev	By	Chk'd	Date	Description
P04	DH	AM	26/01/2024	Drainage Details Updated
P03	DH	AM	15/08/23	Details Updated
P02	DH	AM	2/07/23	Details Updated
P01	RA	GM	13/04/23	Preliminary

Client

FI REAL ESTATE MANAGEMENT

BarnsleyMarshall Limited
1 Birch Court
Blackpole East
Worcester
WR3 8SG
Tel: 01905 330550
Email: design@barnsleymarshall.co.uk

BarnsleyMarshall

Project

Cow Shed
Elmridge Lane, Preston,
PR3 2NY

Drawing

Drainage Details 02

Drawn by — Date

Checked by RA/GM — Date 05/04/2023

Drawing No. CSH-BML-XX-XX-DR-C-0502 — Revision P04

BML Job No. 1000-05 — -

Drawing Scale at A1: NTS

CAD Filename:

Pumping Station / Chamber Notes:

1. The package pumping station should be visually inspected on site by the Contractor for any cracks or damage prior to installation.

2. The contractor is responsible for ensuring the stability of all excavations and any necessary health and safety requirements.

3. The excavation is to remain dry throughout the construction sequence until the concrete has cured. The contractor is responsible for the design and installation of any temporary works relating to ground water issues.

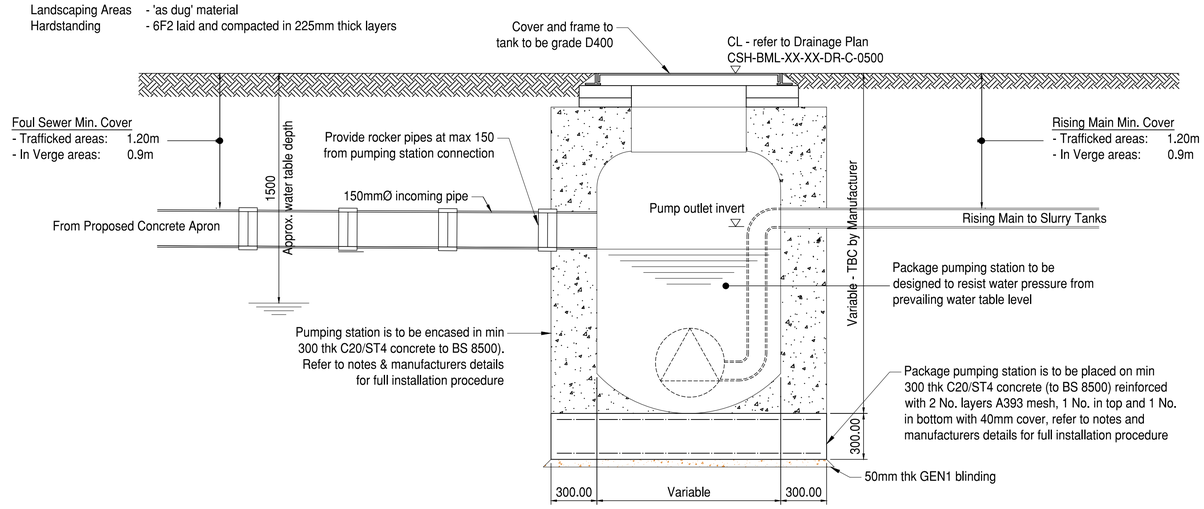
4. The contractor is to ensure that the station has water fill and concrete encasement provided in lifts strictly in accordance with the manufacturers installation guidance.

5. The contractor must ensure that no distortions to the tank occur.

6. After completion of concrete encasement to the tank and turret has cured, the excavation is to be back filled as follows:

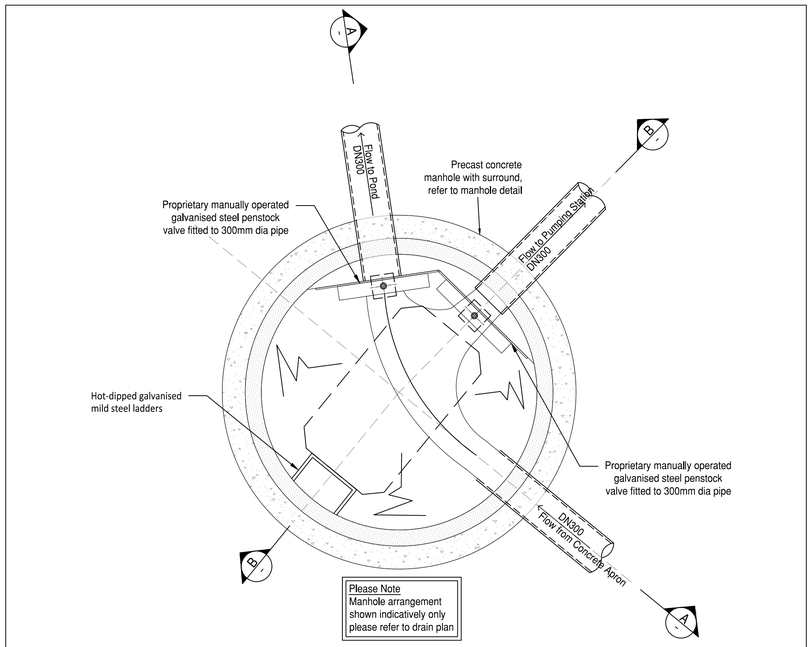
Landscaping Areas - 'as dug' material
Hardstanding - 6F2 laid and compacted in 225mm thick layers

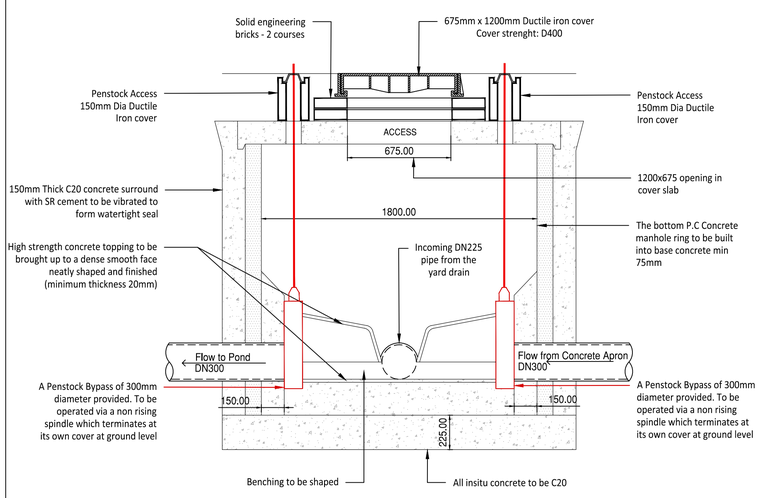
Health and Safety Note:
Contractor to Provide all necessary temporary shoring to trench, and to take special note of prevailing ground conditions and high water table



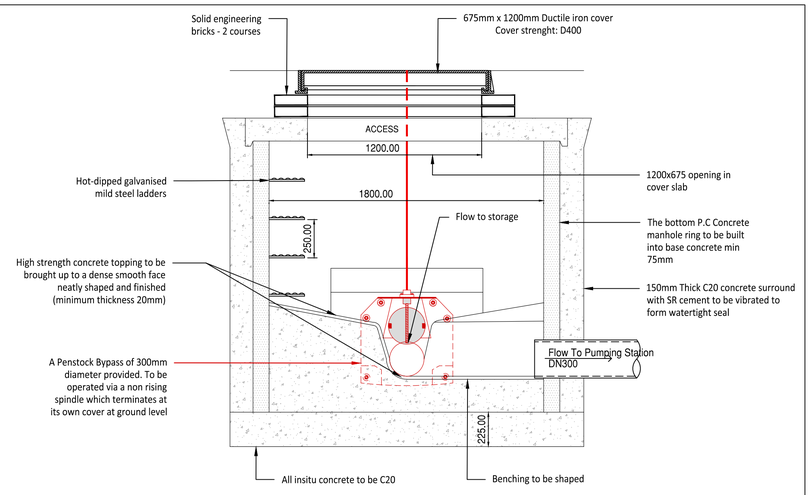
Typical Section through Pumping Station with Wet Well

Scale 1:25





Section B-B



Section A-A

Diversion Chamber

Scale 1:20

Safety, Health & Environmental Information:
In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below,

INDICATES A RESIDUAL RISK AS A WARNING

INDICATES A RESIDUAL RISK FOR INFORMATION

and described below:

Construction/Maintenance/Cleaning/Demolition
Refer to Drawing:

General Notes:

1. Do not scale from this drawing.

2. All dimensions are in millimetres (mm), all levels in metres (m) unless noted otherwise.

3. Discrepancies or omissions are to be reported to the Engineer prior to work commencing.

4. Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.

5. The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.

6. The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.

7. This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.

8.For drainage plans refer to drawing:
- RCF-BML-ERD-ZZ-DR-C-0550 Combined Drainage Layout

PRELIMINARY DRAWING
This drawing is not to be used for construction

Rev	By	Chk'd	Date	Description
P01	DH	AM	17/08/23	Preliminary Issue

Client
FI REAL ESTATE MANAGEMENT

BarnsleyMarshall Limited
1 Birch Court
Blackpole East
Worcester
WR3 8SG
Tel: 01905 330550
Email: design@barnsleymarshall.co.uk

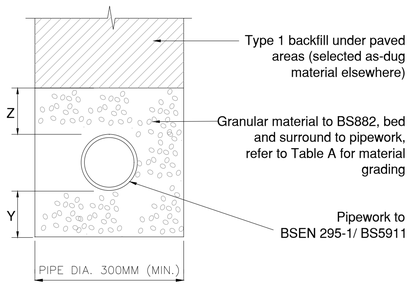
BarnsleyMarshall

Project
Cow Shed
Elmridge Lane, Preston,
PR3 2NY

Drawing
Drainage Details 03

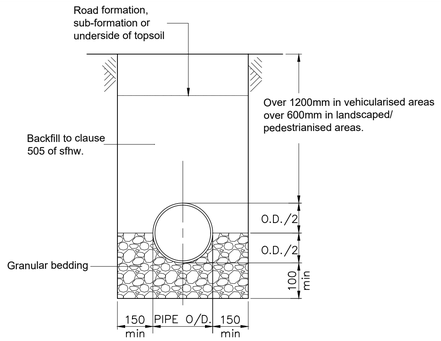
Drawn by		Date	
Checked by	RA/GM	Date	05/04/2023

Drawing No. CSH-BML-XX-XX-DR-C-0503
Revision P01
BML Job No. 1000-05
-
Drawing Scale at A1: NTS
CAD Filename:



CLASS S PIPE BEDDING DETAIL

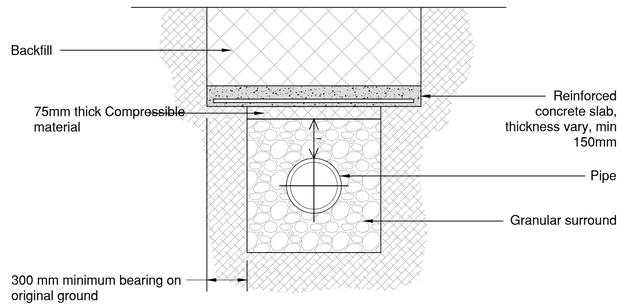
Granular Pipe Bedding Details for Flexible Pipes



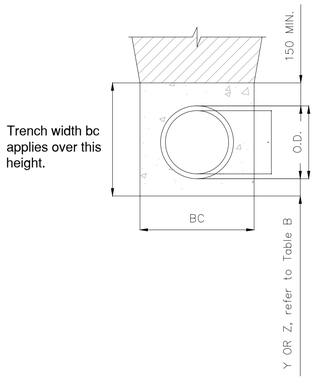
CLASS B BEDDING
(Bedding factor 1.9)

Granular Pipe Bedding Details for Rigid Pipes

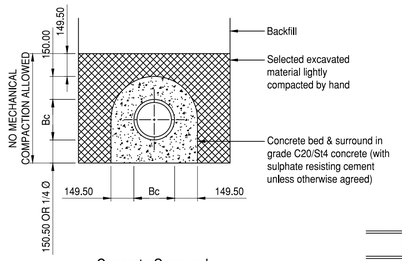
Bedding beneath and at the sides of the pipe to be well compacted the first 300mm of fill above the crown of the pipe is to be lightly tamped by hand. Mechanical compaction may be used only above this level. Geotextiles may be used where directed or approved by the engineer to contain bedding material in certain soils e.g. running sand in very wet conditions, where directed or approved by the engineer a temporary land drain may be laid within the granular bed.



PROTECTION OF PIPES LAID AT SHALLOW DEPTHS

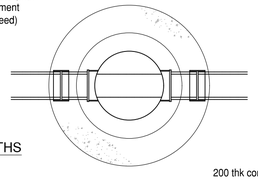


TYPICAL TRENCH SECTION

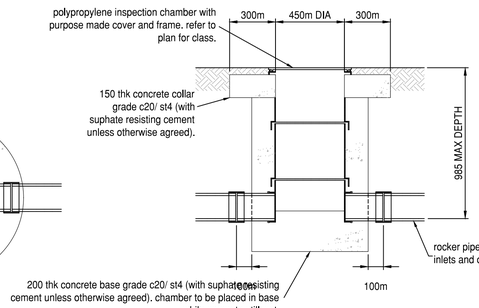


Concrete Surround Bedding

ALTERNATIVE PROTECTION OF PIPES LAID AT SHALLOW DEPTHS



PLAN

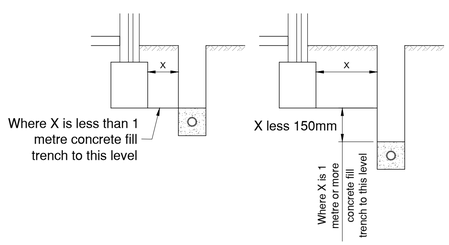


SECTION

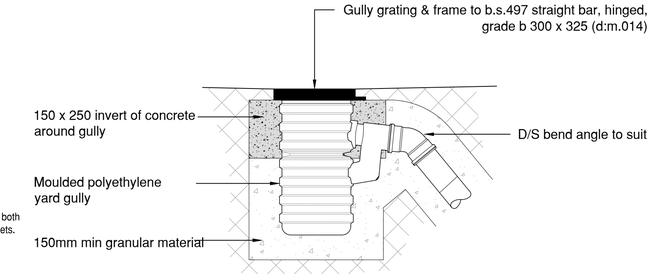
Polypropylene Manhole

Scale 1:20
Depth from ground level to invert of pipe up to 985mm

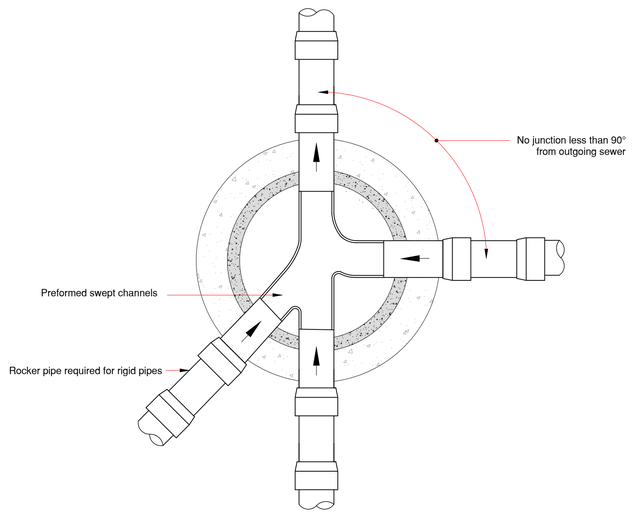
Rodding Eye Detail



TYPICAL DETAILS WHERE DRAINAGE TRENCH IS DEEPER THAN FOUNDATIONS



GULLY DETAIL - NON-KERBED AREAS



Sectional Plan

Rigid pipes built into manhole should have a flexible joint as close as feasible to the external face of the structure and the length of the next rocker pipe should be as shown.

Nominal diameter (mm)	Maximum effective length (m)
150 - 600	0.6
601 - 750	1.00
over 750	1.25

All pipes entering the bottom of the manhole to have soffits level.

Provision of Rocker Pipes at Manhole Locations for Rigid Pipes

	Aggregate size.	
Pipe dia. (mm)	Graded (mm)	Single sized (mm)
100	-	10
150	14 - 5	10 OR 14
225 - 300	14 - 5 OR 20 - 5	10,14 OR 20
375 - 525	14 - 5 OR 20 - 5	10,14 OR 20
EXCEEDING 525	14 - 5 OR 20 - 5 OR 40 - 5	10,14,20 OR 40

TABLE A
GRANULAR PIPE BEDDING MATERIAL TYPE 'S'

PIPE DIA.(MM)	WIDTH BC		Y		Z
	MAX.	MIN.	Y1 (UNIFORM SOIL)	Y2 (ROCK) *	MIN.
100	550	450	100	200	100
150	600	490	100	200	100
225	700	580	150	200	100
300	750	680	150	200	100
375	1050	950	150	200	100
450	1150	1030	150	200	150
525	1200	1120	150	200	150
600	1350	1240	150	200	150
675	1450	1330	150	200	225
750	1500	1400	150	200	225
825	1600	1490	150	225	225
900	2100	1900	150	225	225
975	2150	1950	175	250	300
1050	2250	2050	175	275	300
1200	2500	2250	200	300	300
OVER 1200	O.D. + 1000	O.D. + 800	I.D./6	I.D./4	400

TABLE B
TRENCH WIDTHS AND OTHER DIMENSIONS

Safety, Health & Environmental Information:

In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below,

INDICATES A RESIDUAL RISK AS A WARNING

INDICATES A RESIDUAL RISK FOR INFORMATION

and described below:

Construction/Maintenance/Cleaning/Demolition

Refer to Drawing:

General Notes:

1. Do not scale from this drawing.

2. All dimensions are in millimetres (mm), all levels in metres (m) unless noted otherwise.

3. Discrepancies or omissions are to be reported to the Engineer prior to work commencing.

4. Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.

5. The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.

6. The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.

7. This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.

8.For drainage plans refer to drawing:
- RCF-BML-ERD-ZZ-DR-C-0550 Combined Drainage Layout

Rev	By	Chk'd	Date	Description
P03	DH	AM	16/08/23	Details Updated
P02	DH	AM	21/07/23	Details Updated
P01	RA	GM	13/04/23	Preliminary

PRELIMINARY DRAWING
This drawing is not to be used for construction

Client
FI REAL ESTATE MANAGEMENT

BarnsleyMarshall Limited
1 Birch Court
Blackpole East
Worcester
WR3 8SG
Tel: 01905 330550
Email: design@barnsleymarshall.co.uk

BarnsleyMarshall

Project
Cow Shed
Elmridge Lane, Preston,
PR3 2NY

Drawing
Drainage Details 01

Drawn by		Date	
Checked by	RA/GM	Date	05/04/2023

Drawing No.: CSH-BML-XX-XX-DR-C-0501
Revision: P03
BML Job No.: 1000-05
-
Drawing Scale at A1: NTS
CAD Filename: