MERIDIAN

CIVIL ENGINEERING CONSULTANCY

FM CONWAY ASPHALT PLANT,
NORTH QUAY ROAD,
NEWHAVEN,
BN9 0DB

SURFACE WATER
DRAINAGE STRATEGY

AUGUST 2025

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Ref: MC0508 PDE FM Conway Newhaven SWDS

CONTENTS

APPENDICES

Client : FM Conway Ltd

Rev	Date	Prepared by	Checked by	Approved by
P01	25/10/24	GH	MN	MN
P02	18/08/25	GH	MN	MN

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1.0 INTRODUCTION

1.1 Meridian Civil Engineering Consultancy LTD (MCEC) has been instructed by PDE Consulting Ltd to prepare a Surface Water Drainage Strategy for the development at FM Conway Asphalt Plant, North Quay Road, Newhaven, BN9 0DB.

1.2 It is understood the proposed development is for the changes to the layout of the site which are currently approved in accordance with planning permission reference LW/840/CM, the changes including the relocation of the car park, the relocation of the lorry parking, the installation of an LPG storage facility and road planning recycling activities in the north of the site. All changes proposed have already been made.

1.3 MCEC have been instructed to review and model the existing drainage associated with the original planning application LW/789/CM(EIA) and recommend any additional mitigation works necessary.

1.4 A submission was made to East Sussex County Council pursuant to the discharge of Condition 11 attached to planning permission reference LW/789/CM(EIA). The drainage implemented on site reflects that which was submitted.

The Lead Local Flood Authority has commented on the submission under Condition 11 for LW/789/CM(EIA) and states:

Thank you for consulting us on the above application. We have reviewed the information submitted in support of the discharge of Condition 11 of planning application LW/789/CM(EIA)
and request that the applicant provides additional details on the proposed surface water management strategy so as to satisfy all requirements set out in our letter of 23 November 2017. The outstanding points have been reproduced below:

- Surface water runoff from the proposed development should be limited to 80 l/s for all rainfall events, including those with a 1 in 100 (plus climate change) annual probability of occurrence. Evidence of this (in the form hydraulic calculations) should be submitted with the detailed drainage drawings. The hydraulic calculations should take into account the connectivity of the different surface water drainage features.
- The detailed design should include how surface water flows exceeding the capacity of the surface water drainage features will be managed safely. This should include defining safe access and egress routes for use during flood events.
- The applicant should detail measures to manage flood risk, both on and off the site, during the construction phase. This may take the form of a standalone document or incorporated into the Construction Environment Management Plan for the development.

If you or the applicant/agent wishes to discuss any of the points raised in this letter, please contact the case officer on SUDS@eastsussex.gov.uk

1.5 The runoff is currently managed with runoff diverted to the River Ouse immediately to the west of site. The existing scheme utilises petrol interceptors to treat the run off from any contaminants before the water is diverted to the watercourse.

1.6 The existing drainage has been modelled according to a survey carried out by FM Conway. The existing drainage scheme contains three flow controls. The HB1 limits flow to 35l/s, HB2 limits flow to 25l/s and HB3 limits flow to 20l/s

1.7 The model shows inundation on site during the 1in30, 1in100 and 1in100+25%CC. Modelling shows that during the 1in30 event there will be 147.773m^3 of flooding on site. During the 1in100 event there will be approximately 313.26m^3 of flooding on the surface and during the 1in100+25%CC event there will be 529m^3 of flooding on site. Full calculations from Causeway Flow can be found in Appendix III.

1.8 Due to the presence of a flood defence wall running along the boundary of the site the excess runoff will need to be accommodated on site.

1.9 MCEC approximate a bund/ barrier around the site at a height of 3.6mAOD will provide 574.3m^3 of storage on site. This will accommodate the excess runoff during the 1in100+25%CC

event. A Site Surface Storage Assessment detailing the floodable area and the recommended bund/ barrier can be found in Appendix IV.

1.10 The recommendations in this report follows the principles of the previous strategy submitted for Discharge of condition 11 application which also utilised surface storage.

1.11 This report has been produced broadly in accordance with the National Planning Policy Framework (NPPF), the Ciria SuDS manual, East Sussex County Council LLFA guidance and Lewes District Council SFRA.

2.0 POLICY COMPLIANCE

2.1 The purpose of this assessment is to demonstrate that the development proposal outlined above can be satisfactorily accommodated without worsening flood risk for the area and without placing the development itself at risk of flooding, as per the:

- National Planning Policy Framework
- Ciria SuDS Manual
- Lewes District Council SFRA
- East Sussex County Council SUDS guidance

3.0 SITE LOCATION

3.1 The proposed development location is the FM Conway Asphalt Plant, North Quay Road, Newhaven, BN9 0DB.

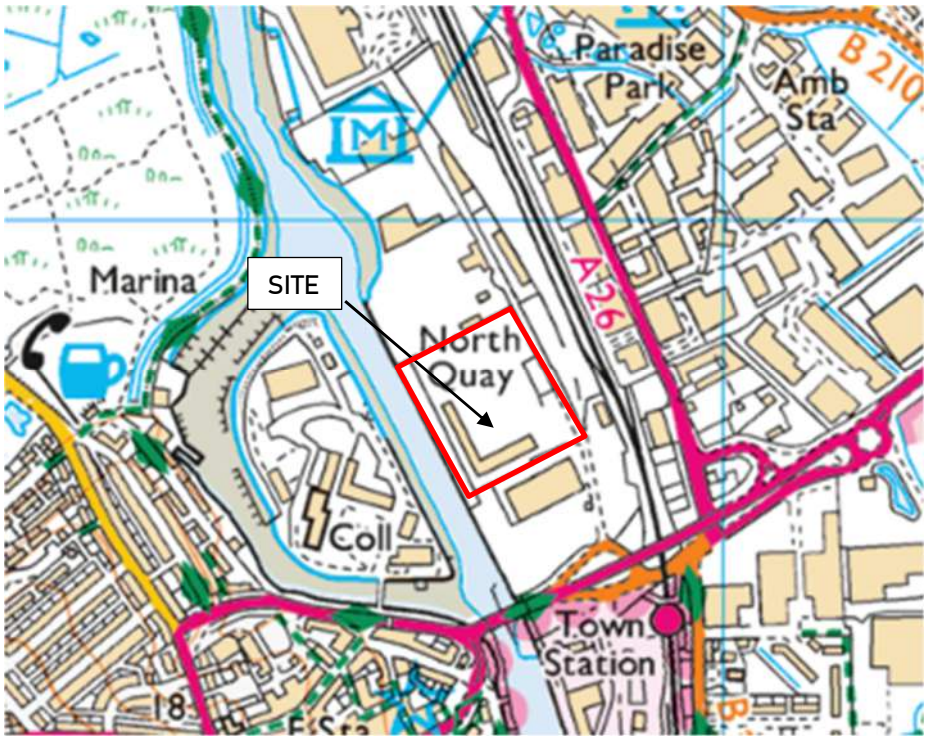

Figure 1 - Site location

3.2 It is understood the proposed development is for the changes to the layout of the site which are currently approved in accordance with planning permission reference LW/840/CM, the changes including the relocation of the car park, the relocation of the lorry parking, the installation of an LPG storage facility and road planning recycling activities in the north of the site. All changes which we are seeking have already been made.

4.0 GEOLOGY AND INFILTRATION POTENTIAL

4.1 According to the British Geological Survey (BGS) Geology Viewer, bedrock geology on site is of the Newhaven Chalk Formation. The site is also underlain by superficial deposits consisting of Alluvium.

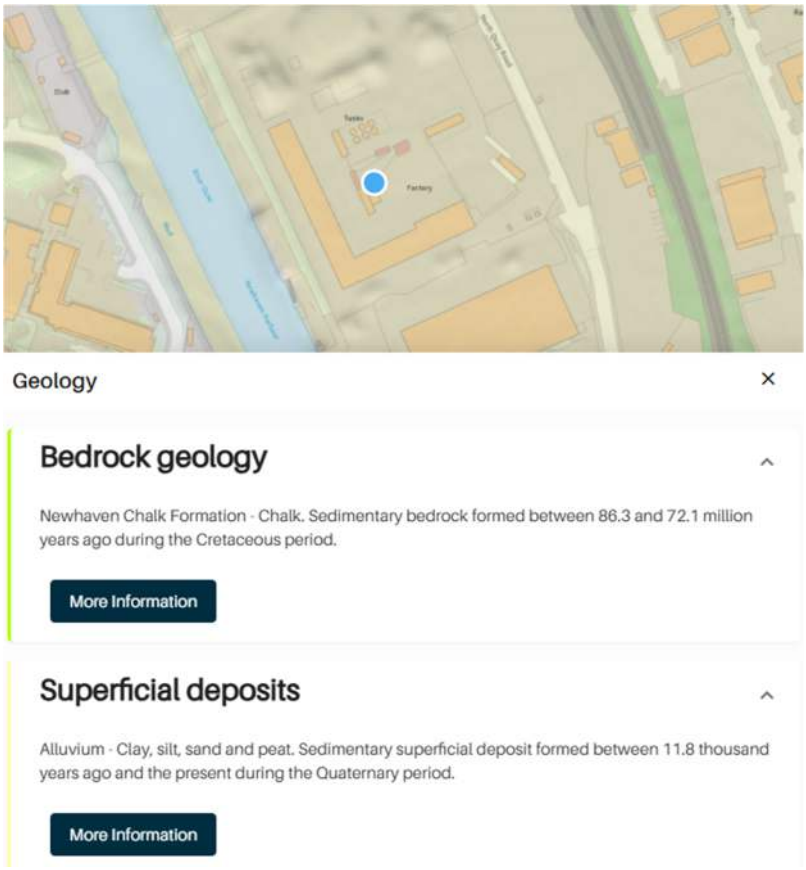

Figure 2 – BGS map extract

4.2 Infiltration is not deemed feasible as the site is in very close proximity to the River Ouse and it is deemed likely that groundwater would prevent infiltration.

5.0 SOURCES OF FLOODING

5.1 Tidal and Fluvial

5.1.1 The Environment Agency (EA) mapping for Flood Risk (Figure 3), shows the site to be located largely within Flood Zone 1 (Low risk of fluvial or tidal flooding indicating a less than 0.1% annual probability of flooding). A small area on the northern extent of the site is located in Flood Zone 3.

Figure 3 - EA Flood Map for planning Extract

5.1.2 This site is currently protected to a standard of protection of a 1 in 200 year flood event. This means that in any given year, there will be a 0.5% chance that this area will experience flooding from the sea or the River Ouse.

5.1.3 The Newhaven Flood Alleviation Scheme was completed in 2021 and is stated to provide a Standard of Protection for a 1 in 200 year return period event for the next 55 years and is designed to reduce the risk of flooding to existing residential and commercial properties, including Newhaven Port, industrial areas, road networks and the railway line. The scheme includes the provision of earth embankments, concrete walls and floodgates to the town of Newhaven, East Sussex

5.2 Surface Water

5.2.1 The Environment Agency (EA) mapping for Surface Water Flood Risk (Figure 4), shows the southern extent of the site to be at low risk of surface water flooding. (High risk indicating a greater than 3.3% annual probability of flooding).

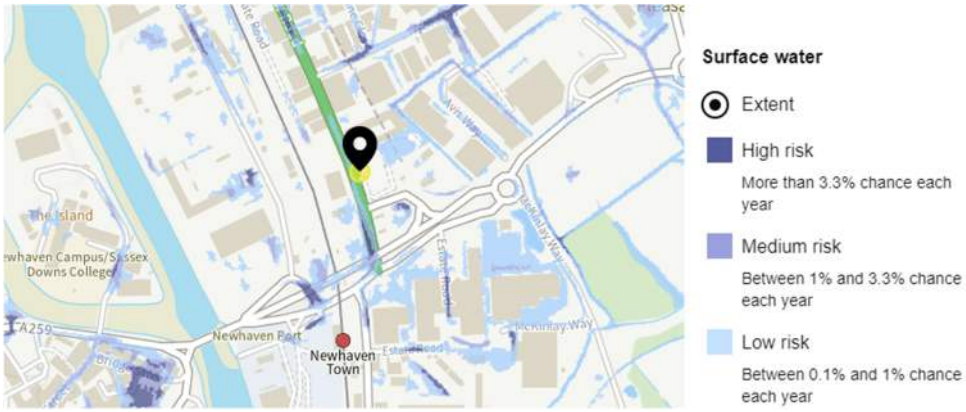

Figure 4 - EA Surface water Flood Map

6.0 CLIMATE CHANGE ALLOWANCES

6.1 Making an allowance for climate change in the design of surface water drainage systems will help to minimise vulnerability and provide resilience to flooding and coastal change in the future. Climate Change allowances vary across the UK subject to catchment conditions and are based on climate change projections and different scenarios of carbon dioxide (CO2) emissions to the atmosphere.

6.2 Climate change allowances were recently updated by the EA and the climate change allowances are now defined by River Catchment peak rainfall allowances and peak river flow allowances.

6.3 The data published on the DEFRA database shows the site located within the Adur and Ouse Management Catchment and for this commercial development (lifespan 60yrs) an upper end allowance of 25% should be applied to rainfall events as the climate change allowance within this region.

7.0 SUSTAINABLE URBAN DRAINAGE (SUDS) ASSESSMENT

7.1 In accordance with the SuDS management train approach, the use of various SuDS measures to reduce and control surface water flows have been considered in detail for the development.

7.2 The management of surface water has been considered in respect to the SuDS hierarchy below as detailed in the CIRIA 753 'The SUDS Manual', Section 3.2.3:

SUDS DRAINAGE HIERARCHY				
			Suitability	Comment
	1.	Store rainwater for later use	✓	It is understood there are dust suppression tanks on site which may be utilised as rainwater harvesting systems.
	2.	Use infiltration techniques, such as porous surfaces in non-clay areas	x	Infiltration not suitable as the site is in very close proximity to the River Ouse and it is deemed likely that groundwater would prevent infiltration.
	3.	Attenuate rainwater in ponds or open water features for gradual release	✓	While not technically a pond, surface storage is provided on site.
	4.	Attenuate rainwater by storing in tanks or sealed water features for gradual release	x	Unnecessary due to management further up hierarchy.
	5.	Discharge rainwater direct to a watercourse	x	Unnecessary due to management further up hierarchy.
	6.	Discharge rainwater to a surface water sewer/drain	x	Unnecessary due to management further up hierarchy
	7.	Discharge rainwater to Combined Sewer	x	Unnecessary due to management further up hierarchy

Table 1: SuDS Drainage Hierarchy

7.3 The total site area is 2.63ha and it is understood the impermeable area is 2.63ha.

7.4 The suitability of SuDS components has been assessed in order to provide a sustainable means of providing the required attenuation volumes. The following components have been assessed as follows in Table 2, below.

SUITABILITY OF SUDS		
SuDS Component	Comment	Suitability
Infiltrating SuDS	Unsuitable as the site is in very close proximity to the River Ouse and it is deemed likely that groundwater would prevent infiltration.	x
Permeable Pavement	Due to the proposed nature of the site involving large amounts of aggregates, silts, cements, which would result in very high maintenance burden to permeable pavements.	x
Green / Blue Roofs	Unsuitable as there are no roofs in the proposed plans.	x
Rainwater Harvesting	It is understood there are dust suppression tanks at the end of the covered storage bays are part of a rainwater harvesting system.	✓
Swales	Insufficient space to implement such conveyancing SuDS techniques	x
Rills and Channels	Unsuitable due to the nature of the site.	x
Bioretention Systems	There is no soft landscaping proposed.	✓
Retention Ponds and Wetlands	While not technically a pond, surface storage is provided on site	✓
Detention Basins	While not technically a detention basin, surface storage is provided on site.	✓
Geocellular Systems	Unnecessary due to management further up the hierarchy	x
Proprietary Treatment Systems	Unnecessary due to management further up the hierarchy	x
Filter Drains and Filter Strips	Unnecessary due to management further up the hierarchy	x

Table 2: Suitability of SuDS Components

8.0 SURFACE WATER DRAINAGE STRATEGY

8.1 The existing drainage has been modelled according to a survey carried out by FM Conway. The existing drainage scheme contains three flow controls. The HB1 limits flow to 35l/s, HB2 limits flow to 25l/s and HB3 limits flow to 20l/s.

SURFACE WATER DISCHARGE RATES SUMMARY						
	Area (ha)	Discharge Rates (l/s)				
		1 year	2 year/Q_{BAR}	30 year	100 year	100 year+25%
Greenfield Rates (site area)	2.64	6.76	7.96	18.3	25.39	
Existing Drainage (site area)	2.64		77.4	81.1	83.8	86

8.2 The model shows inundation on site during the 1in30, 1in100 and 1in100+25%CC. Modelling shows that during the 1in30yr event there would be 147.773m^3 of flooding on site. During the 1in100yr event there would be approximately 313.26m^3 of flooding on the surface and during the 1in100yr+25%CC event there would be 529m^3 of flooding on site. Full calculations from Causeway Flow can be found in Appendix III.

8.3 These volumes need to be accommodated on site.

8.4 MCEC approximate a bund/ barrier around the site at a height of 3.6mAOD will provide 574.3m^3 of storage on site. This will accommodate the excess runoff during the 1in100+25%CC event. A Site Surface Storage Assessment detailing the floodable area and the recommended bund/ barrier can be found in Appendix IV.

8.5 This follows the principles of the previous SWDS which also utilised surface storage.

9.0 WATER QUALITY

9.1 The primary risk to water quality is from the Asphalt Plant and the trafficked areas. This is treated through the use of petrol/oil interceptors.

9.2 The Pollution Hazard Indices are summarised in Table 4 – Summary of Pollution Hazard Indices for different Land Use below (based on Table 26.2 of The SuDS Manual):

POLLUTION HAZARD INDICES FOR DIFFERENT LAND USE CLASSIFICATIONS				
LAND USE	Pollution Hazard Level	Total Suspended Solids	Metals	Hydrocarbons
Non-residential car parking with frequent change	Medium	0.7	0.6	0.7
Sites with heavy pollution eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites, sites where chemicals and fuels other than domestic fuel oil are to be delivered, handled, stored, used or manufactured,industrial sites	High	0.8[2]	0.8[2]	0.9[2]
TOTAL POLLUTION HAZARD INDEX		**1.34**	**1.24**	**1.51**

Table 4: Summary of Pollution hazard Indices for different Land Use

9.3 Proprietary full retention oil interceptors are to be reused to manage runoff from non-permeable hard surface areas due to the commercial nature of the site for contaminant and sediment removal

10.0 SCHEDULE OF MAINTENANCE

10.1 All onsite SuDS and drainage systems will be privately maintained. The property owner/ occupier will be responsible for the management and maintenance of SuDS devices. A long-term maintenance regime should be agreed with the site owners before adoption.

10.2 In addition to a long-term maintenance regime, it is recommended that all drainage elements implemented on site should be inspected as per the table below. Typical key suds components operation and maintenance activities are provided below.

PROPOSED SCHEDULE OF MAINTENANCE FOR BELOW GROUND DRAINAGE				
Item	Visual Inspection	Cleanse / De-sludge	CCTV Survey	Comments
Surface Water Drainage System (pipework, chambers etc.)	1 years	As required	5 years	Cleansing to be carried out as necessary
Gullies/Channels	1 year	1 year	N/A	Cleansing to be carried out as necessary

Table 6: Schedule of Maintenance for Below Ground Drainage

11.0 CONCLUSION

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APPENDIX I Architects plans

Newhaven

Location Plan

Legend

Application Boundary

Other Land Under the Control of the Applicant

SCALE (km)

0 0.5 1

pde. consulting limited
chartered surveyors

PROJECT
Newhaven

DRAWING TITLE
Location Plan

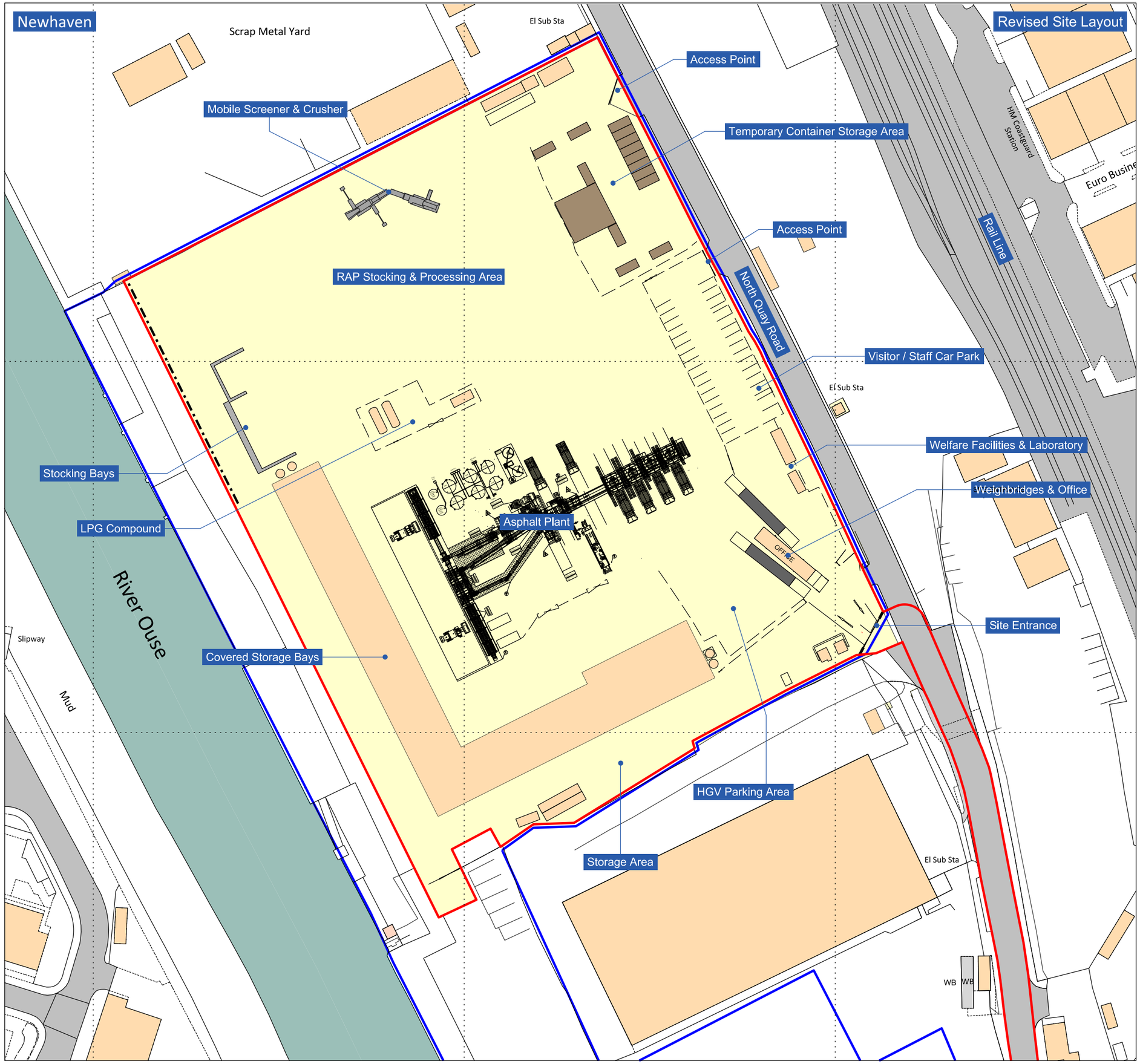
DATE
October 2024

SCALE
1:15,000 @ A3

DRAWING No.
KD.NHVN.3.D.001

DRAWING STATUS
FINAL

01284 764085 . www.pdeconsulting.co.uk



Legend

- Application Boundary
- Other Land Under the Control of the Applicant
- Buildings, Roads & Tracks
- River Ouse
- Existing Hardstanding
- Containers
- Acoustic Fence

SCALE (metres)

0 — 100

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PROJECT
Newhaven

DRAWING TITLE
Revised Site Layout

DATE
October 2024

SCALE
1:1,000 @ A3

DRAWING No.
KD.NHVN.3.D.002

DRAWING STATUS
FINAL

N

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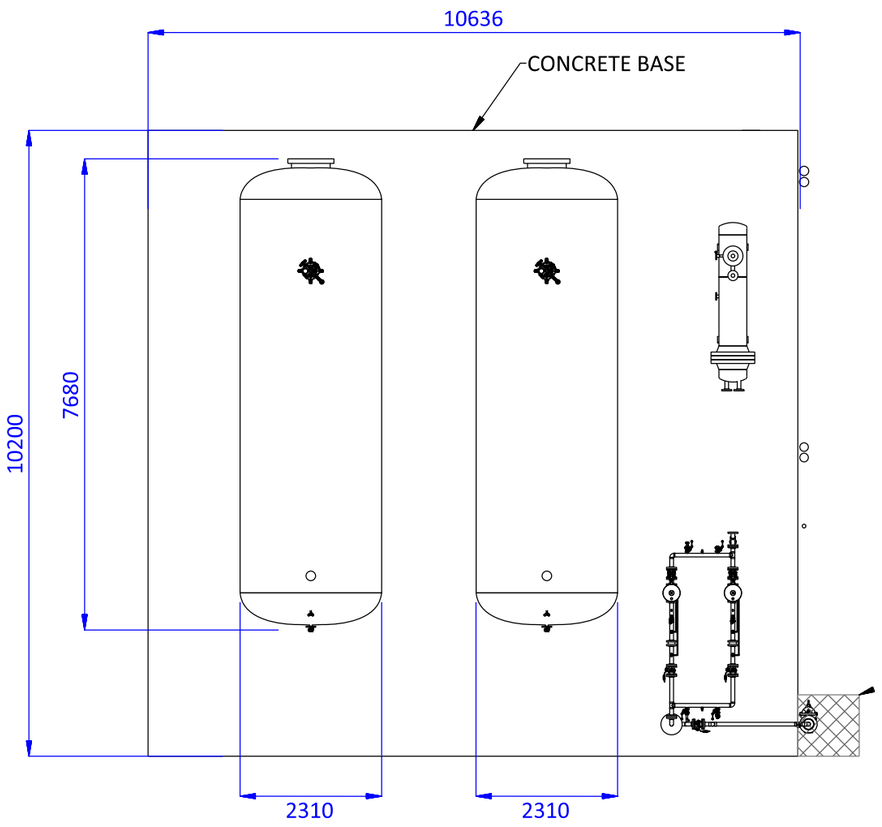
Newhaven

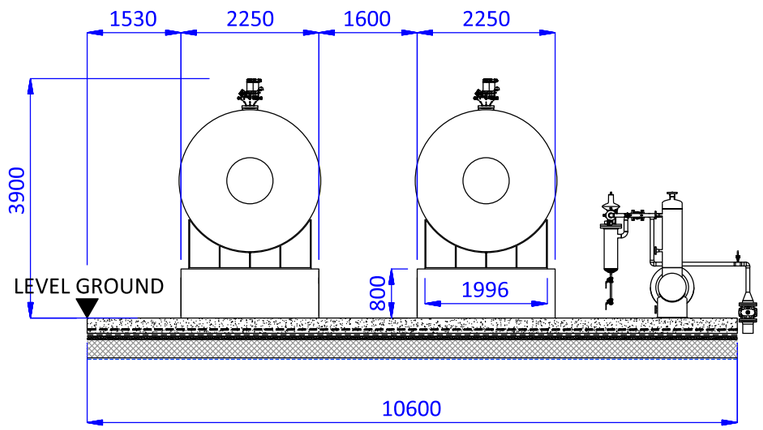
LPG Compound

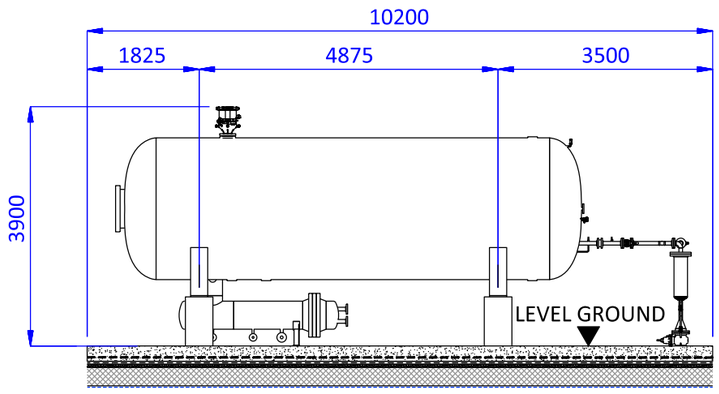
LPG Tanks

Layout



Elevations



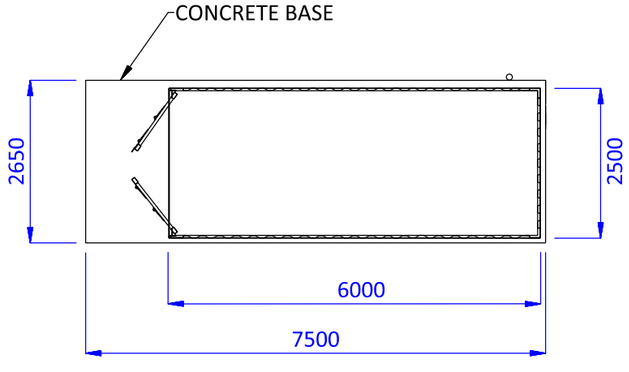


SCALE (metres)

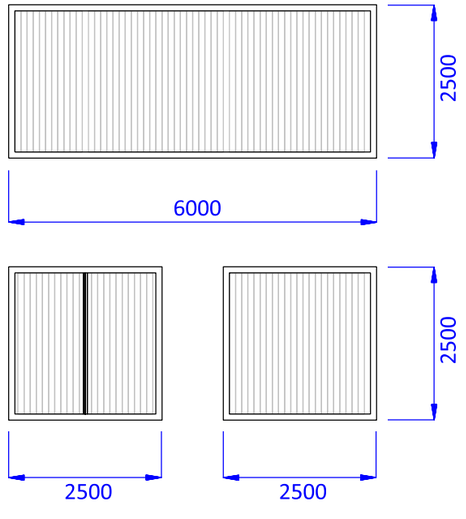
0 5

Control Cabin

Layout



Elevations



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PROJECT
Newhaven

DRAWING TITLE
LPG Compound

DATE
October 2024

SCALE
1:100 @ A3

DRAWING No.
KD.NHVN.3.D.003

DRAWING STATUS
FINAL

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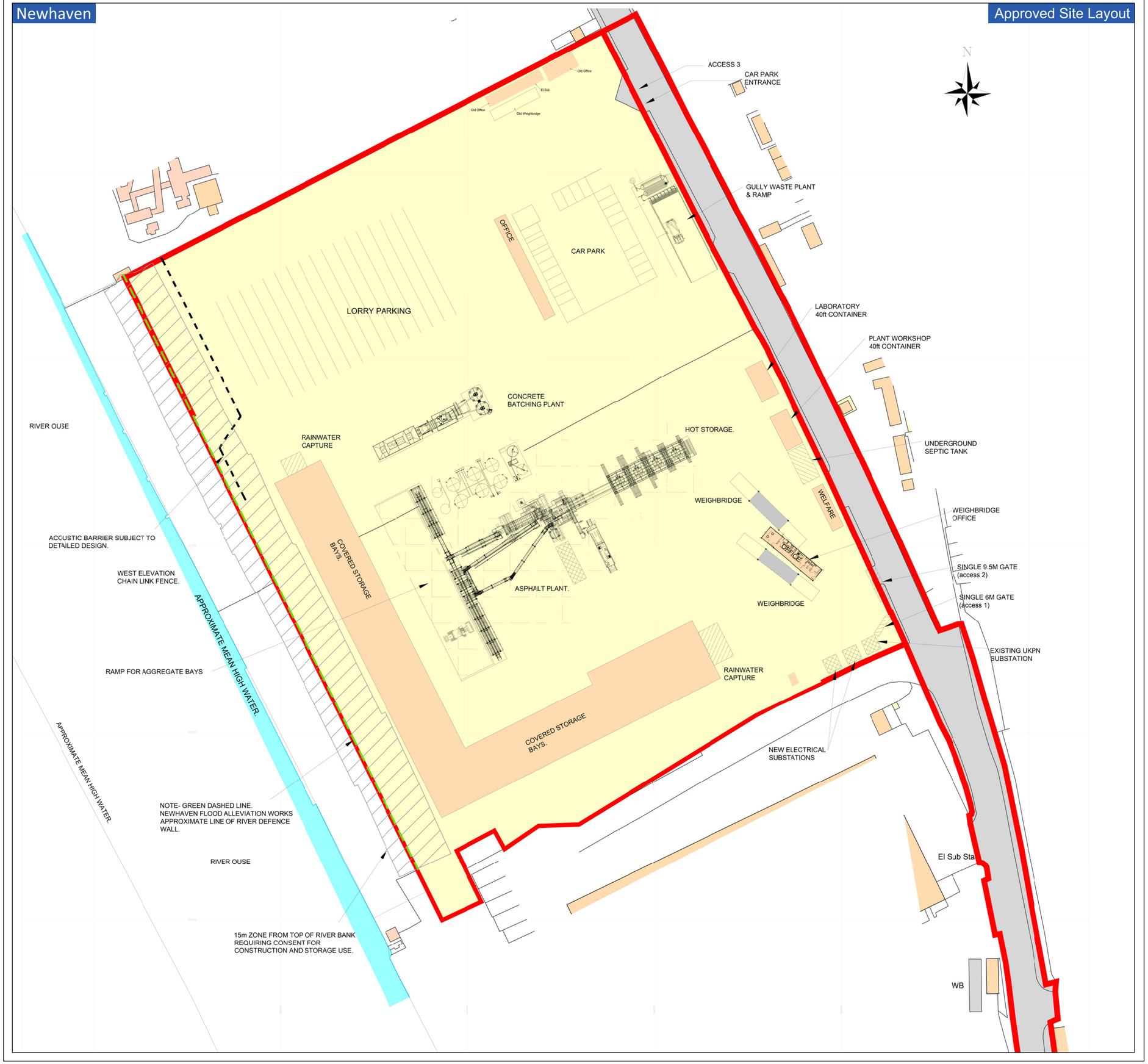
Newhaven

Approved Site Layout



Legend

Planning Permission Boundary

SCALE (metres)

0 — 100

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chartered surveyors

PROJECT
Newhaven

DRAWING TITLE
Approved Site Layout

DATE
October 2024

SCALE
1:1,000 @ A3

DRAWING No.
KD.NHVN.3.D.004

DRAWING STATUS
FINAL

N

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APPENDIX II Existing Drainage Layout

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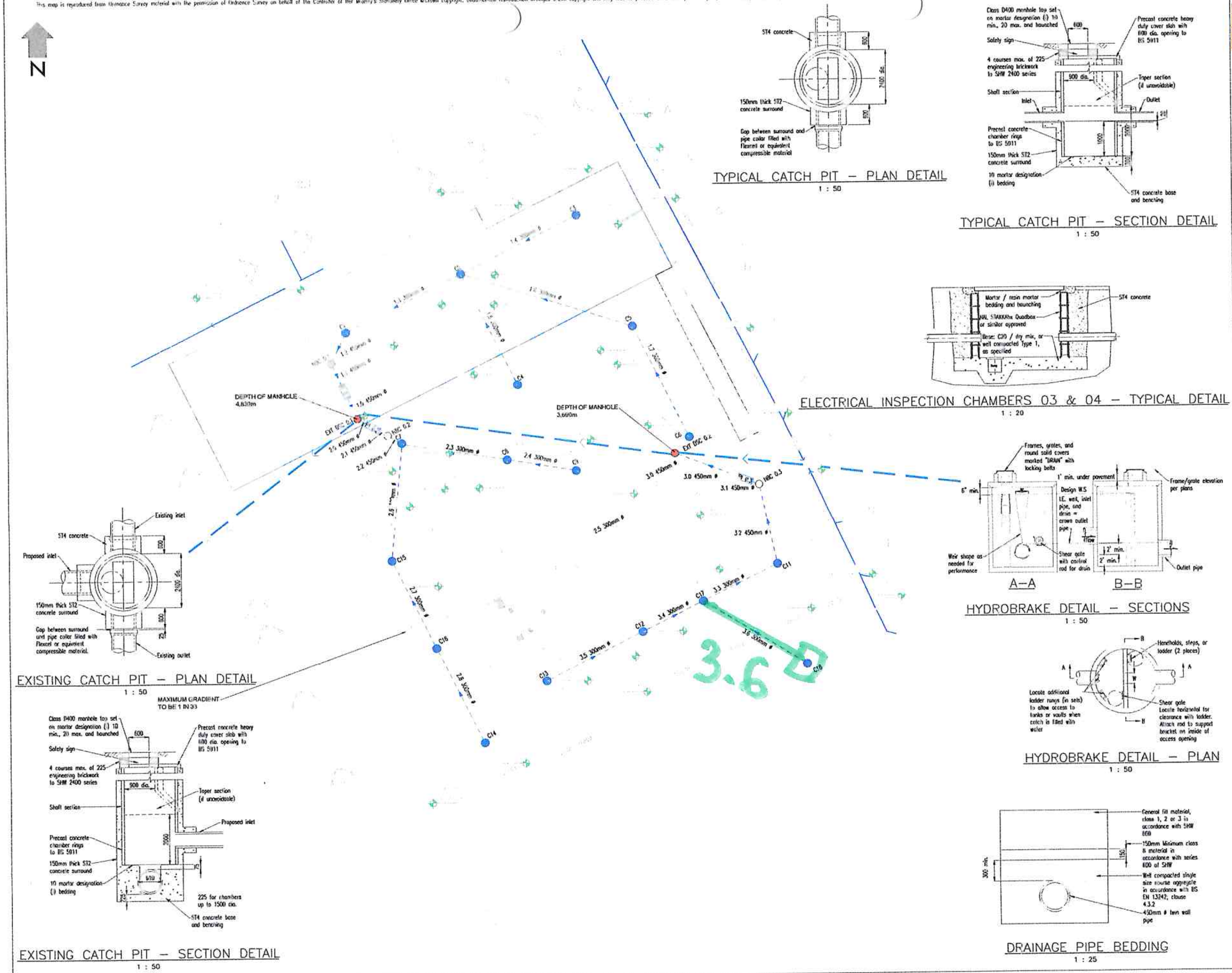

N
DEPTH OF MANHOLE 4.630m
DEPTH OF MANHOLE 3.660m
EXT DSC 0.1
EXT DSC 0.2
HBC 0.2
HBC 0.3
C1
C2
C3
C4
C5
C6
C7
C8
C11
C12
C13
C14
C15
C16
C17
C18
2.3 300mm ø
2.4 300mm ø
3.0 450mm ø
3.1 450mm ø
3.2 450mm ø
3.3 300mm ø
3.4 300mm ø
3.5 300mm ø
3.6 300mm ø
2.5 300mm ø
2.7 300mm ø
2.8 300mm ø
1.7 300mm ø
3.6
MAXIMUM GRADIENT TO BE 1 IN 33
TYPICAL CATCH PIT – PLAN DETAIL
1 : 50
ST4 concrete
150mm thick ST2 concrete surround
Gap between surround and pipe collar filled with Flexcel or equivalent compressible material
TYPICAL CATCH PIT – SECTION DETAIL
1 : 50
Class D400 manhole top set on mortar designation (i) 10 min., 20 max. and haunched
Safety sign
4 courses max. of 225 engineering brickwork to SHW 2400 series
Shaft section
Inlet
Precast concrete chamber rings to BS 5911
150mm thick ST2 concrete surround
10 mortar designation (i) bedding
Precast concrete heavy duty cover slab with 600 dia. opening to BS 5911
Taper section (if unavoidable)
Outlet
ST4 concrete base and benching
ELECTRICAL INSPECTION CHAMBERS 03 & 04 – TYPICAL DETAIL
1 : 20
Mortar / resin mortar bedding and haunching
ST4 concrete
Base: C20 / dry mix, or well compacted Type 1, as specified
HYDROBRAKE DETAIL – SECTIONS
1 : 50
A–A
B–B
Frames, grates, and round solid covers marked "DRAIN" with locking bolts
Frame/grate elevation per plans
Weir shape as needed for performance
Shear gate with control rod for drain
Outlet pipe
HYDROBRAKE DETAIL – PLAN
1 : 50
Handholds, steps, or ladder (2 places)
Shear gate
DRAINAGE PIPE BEDDING
1 : 25
General fill material, class 1, 2 or 3 in accordance with SHW 600
150mm Minimum class 6 material in accordance with series 600 of SHW
Well compacted single size course aggregate in accordance with BS EN 13242, clause 4.3.2
450mm ø twin wall pipe
300 min.
EXISTING CATCH PIT – PLAN DETAIL
1 : 50
Existing inlet
ST4 concrete
Proposed inlet
150mm thick ST2 concrete surround
Gap between surround and pipe collar filled with Flexcel or equivalent compressible material.
Existing outlet
EXISTING CATCH PIT – SECTION DETAIL
1 : 50
Class D400 manhole top set on mortar designation (i) 10 min., 20 max. and haunched
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Shaft section
Precast concrete chamber rings to BS 5911
150mm thick ST2 concrete surround
10 mortar designation (i) bedding
Precast concrete heavy duty cover slab with 600 dia. opening to BS 5911
Taper section (if unavoidable)
Proposed inlet
225 for chambers up to 1500 dia.
ST4 concrete base and benching

Residual Design Risks

In addition to the hazards/risks normally associated with the types of works proposed, note the following:

1. The presence of exposed and buried services within the works area. Refer to services information prior to carrying out drainage works.

Notes:

1. All dimensions are in mm unless otherwise stated.
2. All levels are in metres.
3. Do not scale from the drawing. Work only to given dimensions.
4. Drawing to be read in conjunction with the following:
   4.1. CSPVT-1028-500-001-A
5. All works to be undertaken in accordance with the "Specification for Highways Works" published by the Stationery Office as Volume 1 of the Manual Contract Documents of Highway Works.
6. All existing and new drainage pipes, chambers and gullies shall be cleaned in accordance with Clause 521.
7. The manufacturers instructions regarding use, installation and care of their products shall be strictly adhered to.
8. Location of all retained existing drainage to be confirmed once site clearance has been completed.
9. All longitudinal drainage pipework to achieve min 1 in 40 fall and maximum 1 in 33 fall.
10. Coefficient of friction, k=0.6

Chamber Covers, Gratings & Frames

Chamber covers and frames shall be cast iron and class D400 with a clear opening of 600mm diameter and minimum depth of frame 150mm. Gratings to be Davey Castings' D400 hinged-flat top 450x450mm opening or similar approved. Gratings shall be open to allow water through.

Manhole Cover Slabs

Concrete cover slabs to be heavy duty D400 class to BS EN 1917

KEY

- DENTON SEWER
- PROPOSED CATCH PIT
- PROPOSED DRAINAGE PIPE
- 1.0 PIPE REFERENCE
- PI PETROL INTERCEPTOR
- HBC HYDROBRAKE FLOW CONTROL CHAMBER
- EXISTING DENTON SEWER CATCH PIT
- DIRECTION OF FLOW

Rev	Date	Description	Drn	Chk	App
B	24/09/19	CIL LEVEL CHANGED	JH	WT	WT
A	17/09/19	LEVELS AMENDED	JH	WT	WT
-	17/07/19	ORIGINAL ISSUE	JH	WT	WT

This drawing has been specifically prepared to meet the requirements of the named client and may contain design and hazardous features which differ from conventional design standards.

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Client: CONWAY

Project: NEWHAVEN ASPHALT PLANT

Drawing Title: DRAINAGE GENERAL ARRANGEMENT AND DETAILS

Drawing Status: FOR CONSTRUCTION

Drawn	Designed	Date	Scale	Size
JH	JH	21/06/2019	1 : 500	A1

Drawing No. CSPVT1028-500-001-B | Rev B

PLOT DATE: 25/09/2019 16:46 | CAD REFERENCE: \\fmconway\dfs\PSVCS Projects\CS Structures\CSPVT1028- Newhaven Asphalt Plant Preliminary Design\7.0 Drawings\7.2 CAD Drawings\1.1 AutoCAD\CSPVT1028-500-001.dwg | Jared.Humphries

APPENDIX III Calculations

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
UPSTREAM		4.00	3.700	1500	275.860	-4.059	3.200
C13	0.199	4.00	3.400	2400	156.349	-61.536	1.724
C12	0.104	4.00	3.400	2400	184.160	-47.317	2.092
C11			3.400	2400	222.993	-28.080	2.634
HB3	0.097	4.00	3.400	1800	217.736	-4.864	2.900
EXMH2			3.400	4500	193.543	4.524	3.200
C6	0.118	4.00	3.400	2400	197.521	8.701	1.453
C5	0.114	4.00	3.400	2400	180.985	40.967	1.854
C3	0.107	4.00	3.400	2400	164.902	72.880	2.036
C4	0.166	4.00	3.400	2400	147.916	23.697	2.054
C2	0.137	4.00	3.400	2400	131.451	55.909	2.499
C1	0.067	4.00	3.400	2400	98.201	38.213	2.962
HB1	0.174	4.00	3.500	2100	94.089	29.247	3.160
C14	0.283	4.00	3.800	2400	138.592	-79.566	2.387
C16	0.138	4.00	3.800	2400	125.821	-51.926	2.761
C15	0.215	4.00	3.800	2400	112.792	-26.797	3.105
C9	0.055	4.00	3.400	2400	164.884	-1.100	2.508
C8	0.073	4.00	3.400	2400	145.411	2.586	2.751
C7	0.080	4.00	3.400	2400	114.097	6.164	3.125
HB2			3.430	1800	110.146	8.377	3.186
EXMH1	0.023	4.00	3.400	4500	101.389	13.304	3.410
OUTFALL			3.400		52.334	-24.393	3.514
C18	0.295	4.00	3.000	2400	231.657	-56.654	1.517
C17	0.172	4.00	3.400	2400	201.491	-38.830	2.400

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	C13	C12	31.235	0.600	1.676	1.308	0.368	84.9	300	4.30	50.0
1.001	C12	C17	19.297	0.600	1.308	1.000	0.308	62.7	300	4.47	50.0
2.000	C18	C17	35.038	0.600	1.483	1.075	0.408	85.9	300	4.34	50.0
1.002	C17	C11	24.040	0.600	1.055	0.786	0.269	89.4	375	4.68	50.0
1.003	C11	HB3	23.803	0.600	0.766	0.500	0.266	89.5	450	4.86	50.0
1.004	HB3	EXMH2	25.951	0.600	0.500	0.200	0.300	86.5	450	5.06	50.0
3.000	UPSTREAM	EXMH2	82.763	0.600	0.500	0.200	0.300	275.9	610	4.93	50.0
1.005	EXMH2	EXMH1	92.571	0.600	0.200	0.150	0.050	1851.4	610	7.80	50.0
4.000	C6	C5	36.256	0.600	1.947	1.566	0.381	95.2	300	4.37	50.0
4.001	C5	C2	51.740	0.600	1.546	0.921	0.625	82.8	300	4.87	50.0
5.000	C3	C2	37.510	0.600	1.364	0.901	0.463	81.0	300	4.36	50.0
6.000	C4	C2	36.177	0.600	1.346	0.921	0.425	85.1	300	4.35	50.0
4.002	C2	C1	37.666	0.600	0.901	0.438	0.463	81.4	300	5.23	50.0
4.003	C1	HB1	9.864	0.600	0.438	0.340	0.098	100.7	450	5.31	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	1.707	120.7	33.8	1.424	1.792	0.199	0.0	108	1.470
1.001	1.989	140.6	51.3	1.792	2.100	0.303	0.0	125	1.838
2.000	1.697	120.0	50.0	1.217	2.025	0.295	0.0	135	1.623
1.002	1.917	211.7	130.4	1.970	2.239	0.770	0.0	213	2.011
1.003	2.150	341.9	130.4	2.184	2.450	0.770	0.0	192	2.009
1.004	2.187	347.8	146.8	2.450	2.750	0.867	0.0	203	2.096
3.000	1.476	431.4	0.0	2.590	2.590	0.000	0.0	0	0.000
1.005	0.562	164.4	146.8	2.590	2.640	0.867	0.0	452	0.632
4.000	1.612	113.9	20.1	1.153	1.534	0.118	0.0	85	1.222
4.001	1.729	122.2	39.4	1.554	2.179	0.233	0.0	117	1.547
5.000	1.748	123.5	18.1	1.736	2.199	0.107	0.0	77	1.259
6.000	1.705	120.5	28.1	1.754	2.179	0.166	0.0	98	1.398
4.002	1.744	123.3	108.8	2.199	2.662	0.642	0.0	220	1.959
4.003	2.026	322.2	120.1	2.512	2.710	0.709	0.0	189	1.882

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
4.004	HB1	EXMH1	17.535	0.600	0.340	0.150	0.190	92.3	450	5.45	50.0
7.000	C14	C16	30.448	0.600	1.413	1.059	0.354	86.0	300	4.30	50.0
7.001	C16	C15	28.306	0.600	1.039	0.715	0.324	87.4	300	4.58	50.0
7.002	C15	C7	32.989	0.600	0.695	0.295	0.400	82.5	300	4.90	50.0
8.000	C9	C8	19.819	0.600	0.892	0.669	0.223	88.9	300	4.20	50.0
8.001	C8	C7	31.517	0.600	0.649	0.295	0.354	89.0	300	4.51	50.0
7.003	C7	HB2	4.529	0.600	0.275	0.244	0.031	146.1	450	4.94	50.0
7.004	HB2	EXMH1	10.048	0.600	0.244	0.150	0.094	106.9	450	5.03	50.0
1.006	EXMH1	OUTFALL	61.866	0.600	-0.010	-0.114	0.104	594.9	610	8.83	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
4.004	2.116	336.6	149.6	2.710	2.800	0.883	0.0	210	2.055
7.000	1.696	119.9	47.9	2.087	2.441	0.283	0.0	132	1.603
7.001	1.683	118.9	71.3	2.461	2.785	0.421	0.0	167	1.755
7.002	1.732	122.4	107.8	2.805	2.805	0.636	0.0	219	1.945
8.000	1.668	117.9	9.3	2.208	2.431	0.055	0.0	57	1.006
8.001	1.667	117.8	21.7	2.451	2.805	0.128	0.0	86	1.278
7.003	1.680	267.1	143.0	2.675	2.736	0.844	0.0	234	1.706
7.004	1.966	312.6	143.0	2.736	2.800	0.844	0.0	213	1.922
1.006	1.001	292.6	443.2	2.800	2.904	2.616	0.0	610	1.010

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Additional Storage (m³/ha)	0.0	Check Discharge Volume	x
Rainfall Events	Singular	Skip Steady State	x	Starting Level (m)			
Summer CV	0.750	Drain Down Time (mins)	1440	Check Discharge Rate(s)	x		

Storm Durations

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

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)	Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0	100	0	0	0
30	0	0	0	100	25	0	0

Node HB1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	0.340	Product Number	CTL-SHE-0222-3500-3160-3500
Design Depth (m)	3.160	Min Outlet Diameter (m)	0.300
Design Flow (l/s)	35.0	Min Node Diameter (mm)	2100

Node HB2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	7.004	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0187-2500-3186-2500
Invert Level (m)	0.244	Min Outlet Diameter (m)	0.225
Design Depth (m)	3.186	Min Node Diameter (mm)	1800
Design Flow (l/s)	25.0		

Node HB3 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	0.500	Product Number	CTL-SHE-0169-2000-2990-2000
Design Depth (m)	2.990	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	20.0	Min Node Diameter (mm)	1800

Results for 2 year Critical Storm Duration. Lowest mass balance: 98.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	UPSTREAM	1	0.500	0.000	0.0	0.0000	0.0000	OK
120 minute summer	C13	80	2.356	0.680	13.9	3.0762	0.0000	SURCHARGED
120 minute summer	C12	80	2.356	1.048	23.0	4.7414	0.0000	SURCHARGED
120 minute summer	C11	80	2.355	1.589	37.0	7.1868	0.0000	SURCHARGED
120 minute summer	HB3	80	2.354	1.854	30.2	4.7184	0.0000	SURCHARGED
480 minute summer	EXMH2	280	0.344	0.144	18.4	2.2975	0.0000	OK
15 minute summer	C6	10	2.027	0.080	17.3	0.3598	0.0000	OK
15 minute summer	C5	10	1.652	0.106	34.1	0.4817	0.0000	OK
30 minute summer	C3	23	1.596	0.232	13.7	1.0485	0.0000	OK
30 minute summer	C4	22	1.600	0.254	21.3	1.1493	0.0000	OK
30 minute summer	C2	23	1.592	0.691	80.1	3.1283	0.0000	SURCHARGED
30 minute summer	C1	22	1.573	1.135	66.0	5.1334	0.0000	SURCHARGED
30 minute summer	HB1	22	1.571	1.231	51.7	4.2651	0.0000	SURCHARGED
30 minute summer	C14	23	1.574	0.161	36.3	0.7305	0.0000	OK
30 minute summer	C16	23	1.567	0.528	53.4	2.3879	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	UPSTREAM	3.000	EXMH2	0.0	0.000	0.000	2.1681	
120 minute summer	C13	1.000	C12	13.7	0.980	0.114	2.1995	
120 minute summer	C12	1.001	C17	16.2	0.593	0.115	1.3589	
120 minute summer	C11	1.003	HB3	25.5	0.476	0.075	3.7714	
120 minute summer	HB3	Hydro-Brake®	EXMH2	18.4				
480 minute summer	EXMH2	1.005	EXMH1	18.4	0.488	0.112	3.5566	
15 minute summer	C6	4.000	C5	17.4	1.099	0.153	0.5749	
15 minute summer	C5	4.001	C2	33.6	1.074	0.275	2.3691	
30 minute summer	C3	5.000	C2	13.4	0.541	0.108	2.4162	
30 minute summer	C4	6.000	C2	20.9	0.869	0.173	2.4245	
30 minute summer	C2	4.002	C1	58.0	1.175	0.470	2.6524	
30 minute summer	C1	4.003	HB1	34.0	0.443	0.106	1.5629	
30 minute summer	HB1	Hydro-Brake®	EXMH1	35.0				
30 minute summer	C14	7.000	C16	35.7	1.398	0.298	1.6604	
30 minute summer	C16	7.001	C15	52.0	1.383	0.437	1.9933	

Results for 2 year Critical Storm Duration. Lowest mass balance: 98.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	C15	24	1.565	0.870	79.7	3.9360	0.0000	SURCHARGED
30 minute summer	C9	25	1.554	0.662	21.0	2.9937	0.0000	SURCHARGED
30 minute summer	C8	24	1.555	0.906	39.0	4.0998	0.0000	SURCHARGED
30 minute summer	C7	24	1.556	1.281	65.9	5.7953	0.0000	SURCHARGED
30 minute summer	HB2	24	1.556	1.312	32.9	3.3395	0.0000	SURCHARGED
120 minute summer	EXMH1	64	0.200	0.210	77.5	3.3448	0.0000	OK
120 minute summer	OUTFALL	64	0.062	0.176	77.6	0.0000	0.0000	OK
120 minute summer	C18	80	2.357	0.874	20.5	3.9550	0.0000	SURCHARGED
120 minute summer	C17	80	2.356	1.356	42.1	6.1342	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	C15	7.002	C7	49.7	0.982	0.406	2.3231	
30 minute summer	C9	8.000	C8	-14.4	0.788	-0.122	1.3956	
30 minute summer	C8	8.001	C7	-24.1	0.388	-0.205	2.2194	
30 minute summer	C7	7.003	HB2	32.9	0.594	0.123	0.7176	
30 minute summer	HB2	Hydro-Brake®	EXMH1	23.6				
120 minute summer	EXMH1	1.006	OUTFALL	77.6	0.981	0.265	4.8991	345.8
120 minute summer	C18	2.000	C17	18.7	1.004	0.156	2.4674	
120 minute summer	C17	1.002	C11	37.0	1.207	0.175	2.6515	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.31%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	UPSTREAM	1	0.500	0.000	0.0	0.0000	0.0000	OK
30 minute summer	C13	18	3.400	1.724	64.0	7.7994	4.4236	FLOOD
15 minute summer	C12	11	3.400	2.092	78.6	9.4642	0.5879	FLOOD
30 minute summer	C11	18	3.368	2.602	65.4	11.7719	0.0000	FLOOD RISK
30 minute summer	HB3	18	3.375	2.875	45.7	7.3172	0.0000	FLOOD RISK
60 minute summer	EXMH2	39	0.346	0.146	19.4	2.3162	0.0000	OK
30 minute summer	C6	20	3.400	1.453	79.2	6.5734	3.4810	FLOOD
60 minute summer	C5	36	3.400	1.854	65.0	8.3875	5.6992	FLOOD
30 minute summer	C3	20	3.400	2.036	44.9	9.2109	3.8590	FLOOD
60 minute summer	C4	36	3.400	2.054	38.3	9.2923	4.6702	FLOOD
60 minute summer	C2	36	3.400	2.499	78.5	11.3055	3.9548	FLOOD
30 minute summer	C1	20	3.400	2.962	52.9	13.4001	1.4802	FLOOD
60 minute summer	HB1	36	3.403	3.063	52.7	10.6110	0.0000	FLOOD RISK
30 minute summer	C14	21	3.800	2.387	89.6	10.7977	0.6842	FLOOD
30 minute summer	C16	20	3.750	2.711	91.9	12.2636	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	UPSTREAM	3.000	EXMH2	0.0	0.000	0.000	2.1684	
30 minute summer	C13	1.000	C12	34.1	1.112	0.283	2.1995	
15 minute summer	C12	1.001	C17	56.8	0.816	0.404	1.3589	
30 minute summer	C11	1.003	HB3	34.8	0.670	0.102	3.7714	
30 minute summer	HB3	Hydro-Brake®	EXMH2	19.6				
60 minute summer	EXMH2	1.005	EXMH1	18.7	0.491	0.114	3.5994	
30 minute summer	C6	4.000	C5	-41.7	1.174	-0.366	2.5531	
60 minute summer	C5	4.001	C2	36.8	0.954	0.301	3.6435	
30 minute summer	C3	5.000	C2	-18.3	0.498	-0.148	2.6414	
60 minute summer	C4	6.000	C2	21.8	0.781	0.181	2.5476	
60 minute summer	C2	4.002	C1	40.5	1.178	0.328	2.6524	
30 minute summer	C1	4.003	HB1	31.9	0.495	0.099	1.5629	
60 minute summer	HB1	Hydro-Brake®	EXMH1	34.9				
30 minute summer	C14	7.000	C16	50.2	1.393	0.419	2.1441	
30 minute summer	C16	7.001	C15	56.8	1.318	0.477	1.9933	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.31%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	C15	20	3.660	2.965	120.8	13.4127	0.0000	FLOOD RISK
60 minute summer	C9	35	3.400	2.508	26.3	11.3462	6.5644	FLOOD
60 minute summer	C8	35	3.400	2.751	39.6	12.4455	5.4498	FLOOD
60 minute summer	C7	35	3.400	3.125	97.0	14.1375	22.6888	FLOOD
30 minute summer	HB2	20	3.399	3.155	44.8	8.0298	0.0000	FLOOD RISK
60 minute summer	EXMH1	36	0.206	0.216	81.3	3.4277	0.0000	OK
60 minute summer	OUTFALL	37	0.066	0.180	81.2	0.0000	0.0000	OK
60 minute summer	C18	31	3.000	1.517	158.9	6.8629	81.6045	FLOOD
15 minute summer	C17	11	3.366	2.366	124.7	10.7051	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	C15	7.002	C7	88.7	1.260	0.725	2.3231	
60 minute summer	C9	8.000	C8	-13.6	0.652	-0.116	1.3956	
60 minute summer	C8	8.001	C7	-22.7	0.394	-0.193	2.2194	
60 minute summer	C7	7.003	HB2	35.3	0.662	0.132	0.7176	
30 minute summer	HB2	Hydro-Brake®	EXMH1	24.9				
60 minute summer	EXMH1	1.006	OUTFALL	81.2	0.995	0.278	5.0658	475.3
60 minute summer	C18	2.000	C17	-93.4	-1.326	-0.778	2.4674	
15 minute summer	C17	1.002	C11	68.2	1.515	0.322	2.6515	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.26%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	UPSTREAM	1	0.500	0.000	0.0	0.0000	0.0000	OK
30 minute summer	C13	17	3.400	1.724	79.5	7.7994	12.1930	FLOOD
30 minute summer	C12	17	3.400	2.092	61.0	9.4642	3.4983	FLOOD
15 minute summer	C11	10	3.400	2.634	84.8	11.9162	0.9513	FLOOD
15 minute summer	HB3	10	3.400	2.900	60.0	7.3805	1.1586	FLOOD
60 minute summer	EXMH2	38	0.347	0.147	19.6	2.3333	0.0000	OK
60 minute summer	C6	33	3.400	1.453	34.7	6.5734	11.6079	FLOOD
60 minute summer	C5	33	3.400	1.854	58.2	8.3875	15.0331	FLOOD
120 minute summer	C3	64	3.400	2.036	22.5	9.2109	11.1580	FLOOD
120 minute summer	C4	64	3.400	2.054	31.4	9.2923	13.9020	FLOOD
120 minute summer	C2	64	3.400	2.499	59.7	11.3055	10.0962	FLOOD
30 minute summer	C1	18	3.400	2.962	79.6	13.4001	9.7475	FLOOD
15 minute summer	HB1	11	3.420	3.080	77.4	10.6686	0.0000	FLOOD RISK
30 minute summer	C14	18	3.800	2.387	112.8	10.7988	12.7572	FLOOD
30 minute summer	C16	18	3.800	2.761	115.2	12.4908	3.3915	FLOOD

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	UPSTREAM	3.000	EXMH2	0.0	0.000	0.000	2.1684	
30 minute summer	C13	1.000	C12	37.5	1.060	0.311	2.1995	
30 minute summer	C12	1.001	C17	56.3	0.800	0.401	1.3589	
15 minute summer	C11	1.003	HB3	37.2	0.711	0.109	3.7714	
15 minute summer	HB3	Hydro-Brake®	EXMH2	19.7				
60 minute summer	EXMH2	1.005	EXMH1	19.1	0.494	0.116	3.6384	
60 minute summer	C6	4.000	C5	21.7	1.104	0.190	2.5531	
60 minute summer	C5	4.001	C2	33.9	0.936	0.277	3.6435	
120 minute summer	C3	5.000	C2	-10.5	0.447	-0.085	2.6414	
120 minute summer	C4	6.000	C2	15.5	0.745	0.129	2.5476	
120 minute summer	C2	4.002	C1	39.1	1.156	0.317	2.6524	
30 minute summer	C1	4.003	HB1	38.5	0.457	0.119	1.5629	
15 minute summer	HB1	Hydro-Brake®	EXMH1	35.0				
30 minute summer	C14	7.000	C16	60.2	1.372	0.503	2.1441	
30 minute summer	C16	7.001	C15	63.7	1.322	0.536	1.9933	

Results for 100 year Critical Storm Duration. Lowest mass balance: 99.26%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	C15	18	3.800	3.105	149.7	14.0470	0.9930	FLOOD
60 minute summer	C9	33	3.400	2.508	32.9	11.3462	10.8928	FLOOD
60 minute summer	C8	33	3.400	2.751	49.8	12.4455	9.8708	FLOOD
120 minute summer	C7	64	3.400	3.125	106.3	14.1375	50.6136	FLOOD
30 minute summer	HB2	18	3.403	3.159	46.9	8.0390	0.0000	FLOOD RISK
60 minute summer	EXMH1	34	0.209	0.219	84.1	3.4843	0.0000	OK
60 minute summer	OUTFALL	34	0.070	0.184	84.0	0.0000	0.0000	OK
120 minute summer	C18	58	3.000	1.517	136.6	6.8629	133.3883	FLOOD
15 minute summer	C17	10	3.393	2.393	144.4	10.8257	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	C15	7.002	C7	107.3	1.524	0.877	2.3231	
60 minute summer	C9	8.000	C8	-16.9	0.642	-0.143	1.3956	
60 minute summer	C8	8.001	C7	-28.4	-0.403	-0.241	2.2194	
120 minute summer	C7	7.003	HB2	34.8	0.652	0.130	0.7176	
30 minute summer	HB2	Hydro-Brake®	EXMH1	24.9				
60 minute summer	EXMH1	1.006	OUTFALL	84.0	1.003	0.287	5.1876	494.3
120 minute summer	C18	2.000	C17	-83.9	-1.191	-0.699	2.4674	
15 minute summer	C17	1.002	C11	84.8	1.430	0.400	2.6515	

Results for 100 year +25% CC Critical Storm Duration. Lowest mass balance: 99.14%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	UPSTREAM	1	0.500	0.000	0.0	0.0000	0.0000	OK
60 minute summer	C13	29	3.400	1.724	73.0	7.7994	24.1362	FLOOD
30 minute summer	C12	16	3.400	2.092	66.4	9.4642	9.1630	FLOOD
15 minute summer	C11	10	3.400	2.634	84.6	11.9162	3.9383	FLOOD
15 minute summer	HB3	10	3.400	2.900	70.3	7.3805	4.6620	FLOOD
60 minute summer	EXMH2	38	0.347	0.147	19.7	2.3442	0.0000	OK
180 minute summer	C6	92	3.400	1.453	29.4	6.5734	21.2365	FLOOD
60 minute summer	C5	31	3.400	1.854	62.6	8.3875	24.8674	FLOOD
60 minute summer	C3	31	3.400	2.036	40.7	9.2109	19.6024	FLOOD
60 minute summer	C4	31	3.400	2.054	60.7	9.2923	25.8391	FLOOD
60 minute summer	C2	31	3.400	2.499	65.9	11.3055	18.8527	FLOOD
60 minute summer	C1	31	3.400	2.962	67.6	13.4001	19.7419	FLOOD
15 minute summer	HB1	10	3.425	3.085	97.0	10.6855	0.0000	FLOOD RISK
60 minute summer	C14	31	3.800	2.387	103.7	10.7988	31.6460	FLOOD
30 minute summer	C16	17	3.800	2.761	129.4	12.4908	10.0121	FLOOD

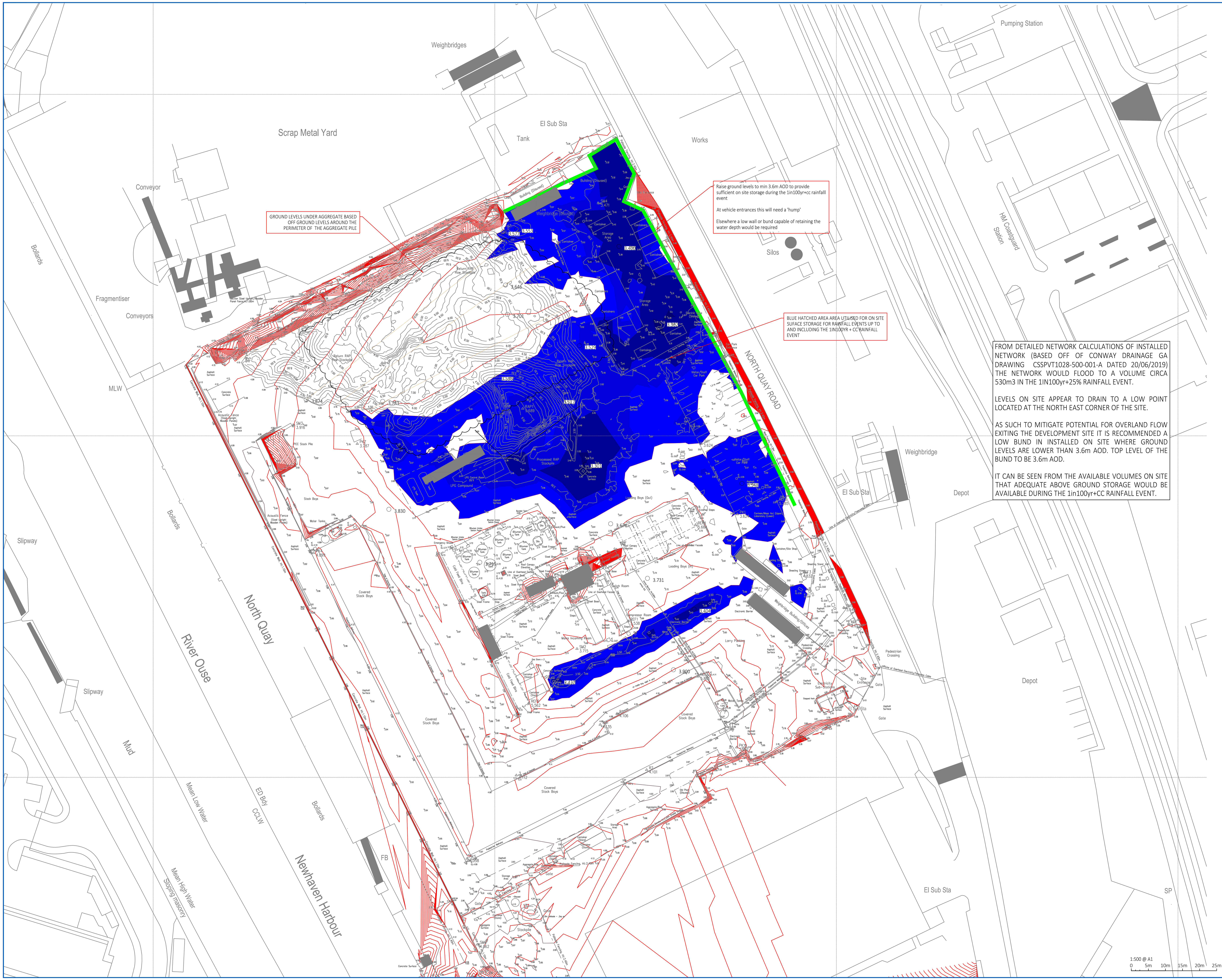
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	UPSTREAM	3.000	EXMH2	0.0	0.000	0.000	2.1684	
60 minute summer	C13	1.000	C12	37.7	0.961	0.312	2.1995	
30 minute summer	C12	1.001	C17	57.6	0.818	0.410	1.3589	
15 minute summer	C11	1.003	HB3	58.8	0.677	0.172	3.7714	
15 minute summer	HB3	Hydro-Brake®	EXMH2	19.7				
60 minute summer	EXMH2	1.005	EXMH1	19.3	0.496	0.117	3.6636	
180 minute summer	C6	4.000	C5	-14.3	0.985	-0.126	2.5531	
60 minute summer	C5	4.001	C2	29.8	0.909	0.243	3.6435	
60 minute summer	C3	5.000	C2	-10.9	0.428	-0.088	2.6414	
60 minute summer	C4	6.000	C2	17.4	0.775	0.145	2.5476	
60 minute summer	C2	4.002	C1	35.1	1.268	0.285	2.6524	
60 minute summer	C1	4.003	HB1	48.4	0.499	0.150	1.5629	
15 minute summer	HB1	Hydro-Brake®	EXMH1	35.0				
60 minute summer	C14	7.000	C16	48.3	1.226	0.403	2.1441	
30 minute summer	C16	7.001	C15	64.6	1.336	0.543	1.9933	

Results for 100 year +25% CC Critical Storm Duration. Lowest mass balance: 99.14%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	C15	10	3.800	3.105	190.8	14.0470	2.7958	FLOOD
120 minute summer	C9	60	3.400	2.508	20.4	11.3462	16.5187	FLOOD
120 minute summer	C8	60	3.400	2.751	30.2	12.4455	17.1175	FLOOD
240 minute summer	C7	120	3.400	3.125	99.6	14.1375	87.1884	FLOOD
600 minute summer	HB2	315	3.399	3.155	25.7	8.0297	0.0000	FLOOD RISK
30 minute summer	EXMH1	18	0.212	0.222	86.3	3.5339	0.0000	OK
60 minute summer	OUTFALL	33	0.072	0.186	86.2	0.0000	0.0000	OK
120 minute summer	C18	54	3.000	1.517	165.4	6.8629	200.2319	FLOOD
15 minute summer	C17	10	3.400	2.400	148.9	10.8576	0.0439	FLOOD

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	C15	7.002	C7	129.6	1.840	1.058	2.3231	
120 minute summer	C9	8.000	C8	-9.8	0.608	-0.083	1.3956	
120 minute summer	C8	8.001	C7	-16.2	0.406	-0.138	2.2194	
240 minute summer	C7	7.003	HB2	30.5	0.359	0.114	0.7176	
600 minute summer	HB2	Hydro-Brake®	EXMH1	24.9				
30 minute summer	EXMH1	1.006	OUTFALL	86.0	1.011	0.294	5.2781	378.5
120 minute summer	C18	2.000	C17	-95.6	-1.357	-0.797	2.4674	
15 minute summer	C17	1.002	C11	84.6	1.547	0.400	2.6515	

APPENDIX IV Site Surface Storage Assessment



FROM DETAILED NETWORK CALCULATIONS OF INSTALLED NETWORK (BASED OFF OF CONWAY DRAINAGE GA DRAWING CSSPVT1028-500-001-A DATED 20/06/2019) THE NETWORK WOULD FLOOD TO A VOLUME CIRCA 530m3 IN THE 1IN100yr+25% RAINFALL EVENT.

LEVELS ON SITE APPEAR TO DRAIN TO A LOW POINT LOCATED AT THE NORTH EAST CORNER OF THE SITE.

AS SUCH TO MITIGATE POTENTIAL FOR OVERLAND FLOW EXITING THE DEVELOPMENT SITE IT IS RECOMMENDED A LOW BUND IN INSTALLED ON SITE WHERE GROUND LEVELS ARE LOWER THAN 3.6m AOD. TOP LEVEL OF THE BUND TO BE 3.6m AOD.

IT CAN BE SEEN FROM THE AVAILABLE VOLUMES ON SITE THAT ADEQUATE ABOVE GROUND STORAGE WOULD BE AVAILABLE DURING THE 1in100yr+CC RAINFALL EVENT.

1. GENERAL
a. THIS DRAWING IS NOT TO BE SCALED, WORK TO FIGURED DIMENSIONS ONLY, CONFIRMED ON SITE.
b. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS, DETAILED SPECIFICATIONS WHERE APPLICABLE AND ALL ASSOCIATED DRAWINGS IN THIS SERIES.
c. ANY DISCREPANCY ON THIS DRAWING IS TO BE REPORTED IMMEDIATELY TO THE PARTNERSHIP FOR CLARIFICATION.
d. THE CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY WORKS AND FOR THE STABILITY OF THE WORKS IN PROGRESS.
e. CDM REGULATIONS 2015. ALL CURRENT DRAWINGS AND SPECIFICATIONS MUST BE READ IN CONJUNCTION WITH THE DESIGNER'S HAZARD RISK AND ENVIRONMENT ASSESSMENT RECORD. DESIGN HAS BEEN PRODUCED BASED ON INFORMATION PROVIDED BY THE CLIENT/PRINCIPLE DESIGNER AVAILABLE AT TIME OF ISSUE. CONTRACTOR TO REVIEW DRAWING AND SPECIFICATION IN CONTEXT WITH THE WIDER SITE AND SPECIFIC SITE INVESTIGATION, CONTAMINATION ASSESSMENT, ASBESTOS SURVEY, ENVIRONMENTAL SURVEY, UXO SURVEY AND ANY OTHER RELEVANT INFORMATION AND MANAGE RISKS RELATING TO THE WORKS OUTLINED IN THE DRAWINGS AND SPECIFICATION. PRINCIPLE CONTRACTOR TO MAKE DESIGNER AND CLIENT AWARE OF SITE SPECIFIC RISKS THAT MAY AFFECT THE DRAWING AND SPECIFICATION.
f. CDM REGULATIONS 2015. FOR GENERIC MAINTENANCE AND MANAGEMENT RISKS REFER TO CHAPTER 36 OF CIRIA 752 SUDS MANUAL. FOR PROPRIETARY SYSTEMS SEE MANUFACTURER'S MANAGEMENT AND MAINTENANCE DETAILS AND RISK ASSESSMENT WITH REGARDS TO MAINTENANCE OF PROPRIETARY SYSTEMS.

2. CONSTRUCTION NOTE
a. THE MAIN CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY WORKS, AND IS ALSO RESPONSIBLE FOR THE SAFE MAINTENANCE AND STABILITY OF EXISTING BUILDINGS AT ALL TIMES.
b. THE MAIN CONTRACTOR IS RESPONSIBLE FOR ALL OCCURRENCES OF GROUND WATER DURING THE CONSTRUCTION PERIOD.
c. ANY INFORMATION GIVEN REGARDING EXISTING UNDERGROUND SERVICES IS GIVEN IN GOOD FAITH AFTER CONSULTATION WITH THE RELEVANT AUTHORITY, HOWEVER ACCURACY IS NOT CERTAIN. THE MAIN CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL INFORMATION ON SITE PRIOR TO WORK COMMENCING AND TAKING DUE CARE AND ATTENTION WHILST UNDERTAKING THE WORKS.
d. THE CONTRACTOR MUST COMPLY WITH ALL CURRENT LEGISLATION RELATING TO HEALTH & SAFETY.
e. ALL PRODUCTS SPECIFIED SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS AND INSTRUCTIONS. IF THERE ARE DISCREPANCIES BETWEEN THAT INFORMATION AND THE DETAILS ON ANY MERIDIAN DRAWINGS, THE MANUFACTURERS INSTRUCTIONS MUST BE USED

3. BELOW GROUND DRAINAGE
a. UPVC-U PIPES TO BS 4660 : 2000 AND PLASTIC INSPECTION CHAMBERS AND FITTINGS TO BS EN 13598-1:2020. CLAY PIPES TO BS EN 295-1:2013. CONCRETE MANHOLE AND INSPECTION CHAMBERS TO BS EN 1917:2002
b. ALL ADOPTABLE DRAINAGE TO BE CONSTRUCTED IN ACCORDANCE WITH SEWERAGE SECTOR GUIDANCE App C - DESIGN AND CONSTRUCTION GUIDANCE AND THE RELEVANT COUNCIL DESIGN GUIDE.
c. ALL PRIVATE FOUL WATER SEWERS TO BE LAID AT 1 IN 40 AT THE HEAD OF PIPE RUNS AND 1 IN 80 ELSEWHERE UNLESS OTHERWISE STATED.
d. ALL PRIVATE FOUL SEWER PIPES TO BE 100mm DIAMETER FROM SOIL STACKS UNLESS OTHERWISE STATED ON THE DRAWING AND 150mm WHERE SERVING MORE THAN 9 PROPERTIES.
c. ALL PRIVATE SURFACE WATER SEWERS TO BE LAID AT 1 IN 100 UNLESS OTHERWISE STATED ON THE DRAWING.
d. ALL PRIVATE SURFACE WATER SEWER PIPES TO BE 100mm DIAMETER FROM DOWNPIPES AND 150mm DIAMETER ELSEWHERE UNLESS OTHERWISE STATED ON THE DRAWING.
e. ALLOW FOR RODDING ACCESS ABOVE GROUND WHERE RAINWATER DOWNPIPES OR SOIL STACKS DO NOT HAVE A DIRECT CONNECTION TO AN INSPECTION CHAMBER.
f. EXISTING SEWER PIPE TO BE RE-USED TO BE SURVEYED AND LEVELED PRIOR TO COMMENCEMENT OF THE DRAINAGE WORKS AND REFURBISHED IF NECESSARY.
g. CONNECTIONS TO AN ADOPTED SEWER ONLY TO BE MADE FOLLOWING APPROVAL FROM THE RELEVANT ADOPTING AUTHORITY.
h. ALL DRAINS, SEWER PIPES AND MANHOLES TO BE CLEANED AND TESTED FOR WATER TIGHTNESS ON COMPLETION OF CONSTRUCTION.

4. MANHOLE COVERS AND FRAMES
a. MANHOLE COVERS TO BE CLASS D400 IN HIGHWAYS, CLASS B125 IN FOOTWAYS AND VERGES, CLASS A15 IN NON-TRAFFICKED AREAS.
b. MANHOLE COVER AND FRAME TO BE BEDDED AND SURROUNDED IN 1:3 MORTAR.

Final Flood Storage with Flood Compensatory Storage Scheme
0.000m corresponds to the flood level.
Positive elevations show levels below flood level.

Number	From level	To level	Available Flood Volume (m3)	Colour
1	0.000	0.075	350.8	
2	0.075	0.150	154.8	
3	0.150	0.300	68.5	
4	0.300	0.450	0.2	

TOTAL VOLUME PROVIDED 574.3m3

REV:	DESCRIPTION:	BY:	DATE:
P2	SITE LEVELS UNDER STOCKPILE ALTERED	-	-
P1	BOUNDARY UPDATED	-	-

STATUS: PRELIMINARY

MERIDIAN
CIVIL ENGINEERING CONSULTANCY

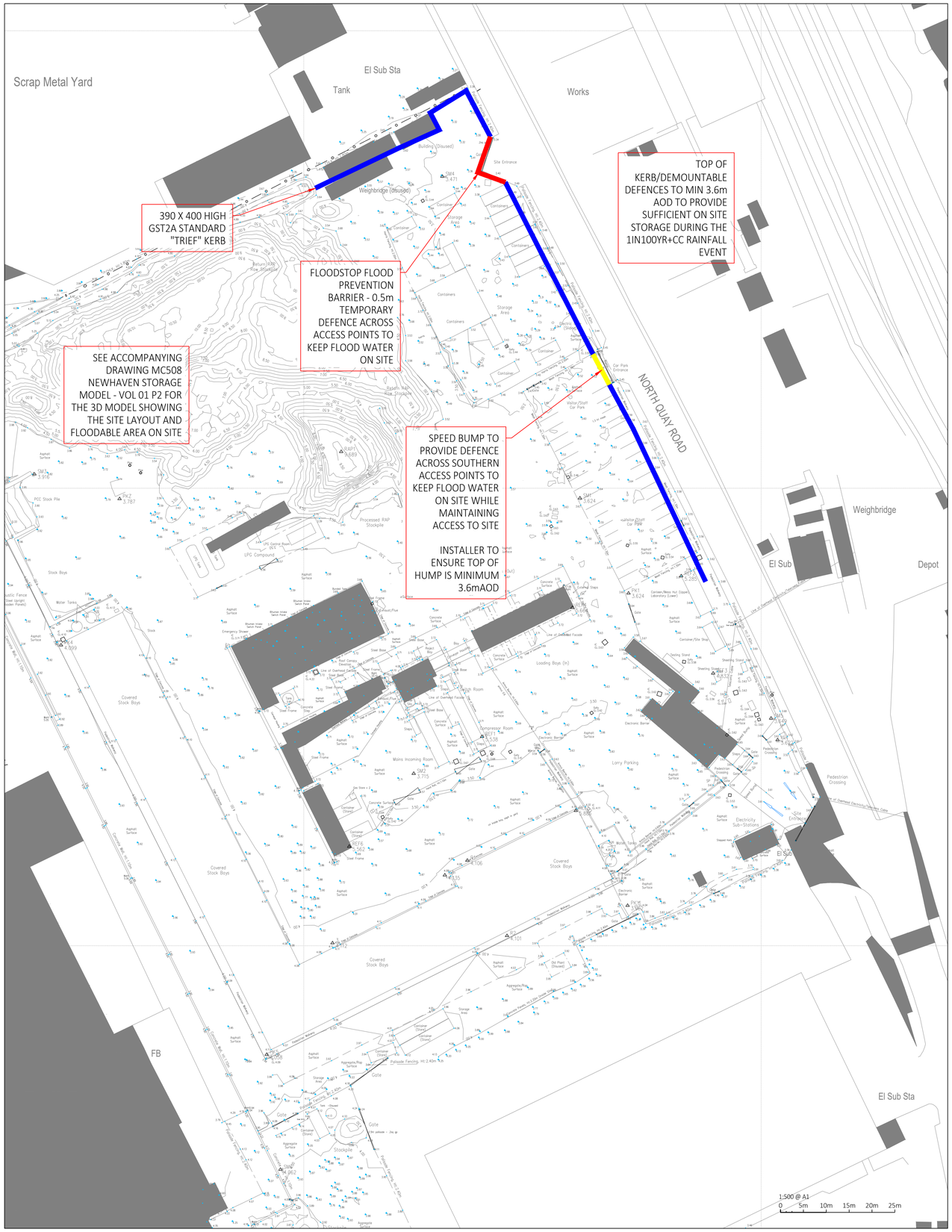
CLIENT: PDE CONSULTING

SITE: CONWAY DEPOT NEWHAVEN

TITLE: SITE SURFACE STORAGE ASSESSMENT

SCALE AT A1:	DATE:	DRAWN:	CHECKED:
1:500	24/10/24	MN	BB

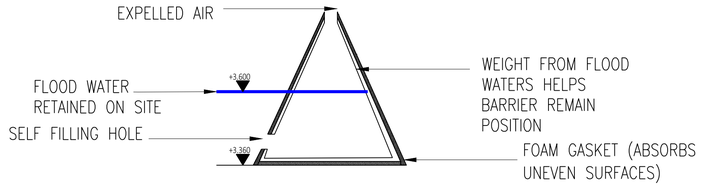
PROJECT NO:	DRAWING NO:	REVISION:
MC0508	VOL 01	P2



SITE LAYOUT WITH PROPOSED FLOOD DEFENCE LOCATIONS

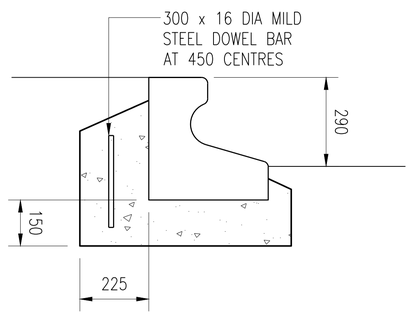
PERMANENT SPEED BUMP – 75mm.

(1:20)



FLOODSTOP FLOOD PREVENTION BARRIER – 500mm.

(1:20)



390 x 400 HIGH GST2A STANDARD "TRIEF" KERB.

(1:20)

CONSTRUCTION DETAILS FOR FLOOD DEFENCES

1. GENERAL
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LEGEND

- 390 X 400 HIGH GST2A STANDARD "TRIEF" KERB
- FLOODSTOP FLOOD PREVENTION BARRIER - 500m
- DEMOUNTABLE SPEED BUMP - 75mm

REV:	DESCRIPTION:	BY:	DATE:
02	Road hump detail edited	GH	18/08/25
01	Road hump added	GH	09/07/25

STATUS: status

MERIDIAN
CIVIL ENGINEERING CONSULTANCY

CLIENT: PDE CONSULTING

SITE: Conway Depot
Newhaven, BN9 0EH

TITLE: Proposed Flood Defences Types and Locations

SCALE AT A1:	DATE:	DRAWN:	CHECKED:
1:500	23/10/2024	GH	MN

PROJECT NO:	DRAWING NO:	REVISION:
MC0508	CIV01	02