

4th September 2024

13508 – Havant Phase 2: - Response to Lead Local Flood Authority comments

Application Summary: -

Reference: APP/22/00172

The County Council has reviewed the following documents relating to the above application:

- Flood Risk Assessment & Drainage Strategy Report rev 1

The Flood Risk Assessment identifies that the site currently discharges into an existing 375mm diameter connection into the private surface water sewer network and that this connection would be retained at a restricted rate of 19.1l/s.

The proposed discharge rate appears reasonable, but evidence should be included to demonstrate previously agreed details and connection points as approved during the outline application stage.

At outline planning stage for the redevelopment of Langstone Park, the masterplan of the development was split into Zones, the proposed development area was previously known as Zone 3B. The approved Flood Risk Assessment indicates that the 375mm dia pipe taking Zone 3, can take a maximum flow of 132 l/s.

This flow rate was split between Zone 3A (76.56 l/s) and Zone 3B (55.44 l/s).

During Phase 1 (previously known as Zone 3A) planning stage, the discharge rates to Zones 3A and 3B was revised 112.9 l/s and 19.1 l/s respectively. This was reflected within the approved Phase 1 Flood Risk Assessment.

Permeable paving and cellular storage is proposed but it is not clear whether this is to be tanked. The potential for groundwater ingress needs to be assessed given the depth of these features and a suitable clearance to the water table needs to be provided. This will also require an assessment to ensure sufficient water treatment is provided.

The proposed drainage scheme for Phase 2 includes Tanked permeable paving within the car parking and cellular attenuation tanks. Due to the high- water table, cover slabs have been proposed over the attenuation tanks.

The proposed drainage plan is appended to this note.

At present there does not appear to be any water treatment beyond isolated areas of permeable paving. This needs to be reviewed and assessed in line with the Ciria SuDS manual simple index approach.

The Simple Index Approach has been applied to check the sufficiency of the proposed SuDS components in mitigating water quality risks.

Using the service yard/parking areas as the highest pollution hazard, the land use hazard indices were compared with the combined pollution mitigation indices to determine whether the proposed components are sufficient to manage each pollutant category type.

The Suds components proposed for this development are sufficient in providing pollution risk mitigation.

The Simple Index Approach summary can be found appended to this note.

The maintenance strategy is insufficient. This needs to be detailed for each different drainage feature.

A SuDS maintenance plan has been prepared to demonstrate the required maintenance and frequency requirements for the proposed SuDS features to ensure water quality is maintained throughout the lifespan of the development.

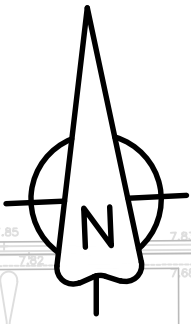
SuDS maintenance plan can be found appended to this note.

Exceedance flow plans need to be provided to address the pre and post development scenario to show where water would flow and pond during extreme events.

Exceedance Flow plans can be found appended to this note.

B5000

B6000



Notes

A1

- Topographical Survey carried out by Greenhatch, Drawing No.:
 - 38869_T - Topographical Survey Plan (Dated Jan 2023).
- Proposed Site Layout taken from PRC, Drawing No.:
 - 11629_PL004 - Proposed Site Plan (Dated JAN 2024).
- Do not scale from this drawing. All dimensions must be checked & verified on-site. If in doubt ask.
- The Contractor is to check & verify all dimensions & levels before any work is started on-site.
- Existing site survey works have been carried out by others & no guarantee can be given by Baynham Meikle for their accuracy.
- Any discrepancies noted on-site are to be reported to Baynham Meikle immediately.
- This drawing is to be read in conjunction with all relevant Architects', Engineers' and other Specialists' drawings & specifications.
- For existing ground conditions, refer to Site Investigation reports.
- The drainage installation is to be compliant with Building Regs. (Part H).
- All adoptable drainage works shall comply with "Water UK - Design and Construction Guide".
- The following pipe strengths shall be adopted (unless noted otherwise):
 - Pipes up to and including 150mm Ø to be PVC-U to BS-EN 1329, or Clayware to BS-EN 295 Class 160.
 - Pipes 150mm Ø up to and including 225mm Ø to be Clayware to BS-EN 295 Class 160.
 - Pipes 300mm Ø to be Clay to BS-EN 295 Class 160 or Concrete to BS 5911 Class M.
 - Pipes over 300mm Ø to be Concrete to BS 5911 Class M.
- All pipe runs to be laid with flexible joints.
- All pipes entering and exiting manholes are to be connected to pipe soffits level unless noted otherwise.
- Pipe Bedding and surround to be as follows:

Location:	Cover to Soffit:		Pipe Bedding:
	Clay / Conc	Flexible	
Roads.	>1.2m	>0.9m	Class S
	<1.2m	<0.9m	Class Z
Hard and Soft Landscaping.	>0.6m		Class S
	<0.6m		Class Z

- The following Conc. mixes are to be used (in accordance with BS 8500):

Location:	Mix Reference:
Concrete Surround to Pipes	ST4
Concrete Base and Surround to Manholes	ST4

- All precast-concrete products (i.e. pipes, manhole rings, etc.) shall be of suitable Concrete mix to cater for Class 2 Sulphates.
- Pre-formed channels are to be used in manholes where applicable.
- Granolithic Concrete benching to be steel trowelled to a dense smooth face neatly shaped and finished to all branch connections and laid in accordance with the Specification.
- All connections to be turned in direction of flow using pipe bends.
- Manhole covers and frames to be Ductile Iron Medium Duty grade B125 rectangular to BS-EN 124 positions outside vehicular-trafficked areas, and Heavy Duty grade D400 in vehicular-trafficked areas.
- Manhole covers and frames to be Ductile Iron Medium Duty grade A15 covers in Soft Landscaping.
- First flexible joint in pipes adjacent to a manhole shall be a maximum of 600mm from inside face of manhole, connecting to rocker pipe.
- The length of Rocker Pipe is as follows:

Pipe Diameter:	Length of Rocker Pipe:
150mm - 600mm	600mm
675mm - 750mm	1000mm
825mm & Over	1250mm

- Manholes with outgoing pipes greater than 600mm Ø shall be fitted with guard bars, safety chains or other safety devices.
- The Principle Contractor shall be responsible for checking the existing line and invert levels of any connection points for both the Foul and Surface Water systems, prior to undertaking installation of any new drainage works. Any deviation to the levels and positions indicated on the drawing should be brought to the attention of the Engineer.
- All invert levels specified are outgoing (except Backdrop connections).
- All Foul connections to be 150mm Ø laid at a minimum gradient of 1/40 unless noted otherwise. Surface Water pipe sizes are as indicated.
- Foul pipes to be externally vented (SVP) at head of run.
- For location of internal SVP, SS, etc., refer to Architect's latest layouts.
- Internal Foul drainage connections / positions and setting-out information to be confirmed by the M&E Consultant / Architect.

P03	20/03/2024	Updated To Suit Latest Site Layout	R.B.	A.B.
T02	08/03/2024	Updated To Suit Latest Site Layout	R.B.	A.B.
T01	23/02/2024	Tender Issue	R.B.	A.B.
P02	05/12/2023	Planning Issue	R.B.	A.B.
P01	17/11/2023	For information	R.B.	A.B.
Rev	Date	Description	By	Chkd

Revision Schedule

Drawing Status				
For Planning				
Project Title				
Langstone Technology Park				
Phase 2				
Havant				
Drawing Title				
Proposed Drainage Plan				
Drawing Number				
13508_121				
Revision				
P03				
BM Ref	Scale @ A1	Drawn by	Checked by	Project Eng
13508	1 : 500	R.B.	A.B.	G.L.
BAYNHAM MEIKLE				
Consulting Civil & Structural Engineers				
0121 434 4100				
admin@baynhammeikle.co.uk				
www.baynhammeikle.co.uk				



CHECK: For the plan to be in scale, the above scale bar must measure correct, i.e. 100mm when printed.

SUMMARY TABLE		DESIGN CONDITIONS			
		1	2	3	4
Land Use Type Pollution Hazard Level Pollution Hazard Indices TSS Metals Hydrocarbons	Standard commercial yard or delivery area Medium 0.7 0.6 0.7	This classification is not appropriate for haulage yards, lorry parks, waste management areas, or chemical storage/handling zones			
SuDS components proposed					
Component 1	Pervious pavement (where the pavement is not designed as an infiltration component)	SuDS components can only be assumed to deliver these indices if they follow design guidance with respect to hydraulics and treatment set out in the relevant technical component chapters of the SuDS Manual. See also checklists in Appendix B Detailed assessment of performance of designed component in reducing inflow concentrations of each pollutant type required as evidence of adopted indices. Enter indices approved by the environmental regulator in appropriate 'User Defined Indices' row below	SEPA only considers proprietary treatment systems as appropriate in exceptional circumstances where other types of SuDS component are not practicable. Proprietary treatment systems may also be considered appropriate for existing sites that are causing pollution where there is a requirement to retrofit treatment. WAT-RM-08 (SEPA, 2014) also provides a flow chart with a summary of checks on suitability of a proprietary system	See Chapter 15 Proprietary treatment systems for approaches to demonstrate product performance. Note: a British Water/Environment Agency assessment Code of Practice is currently under development that will allow manufacturers to complete an agreed test protocol for systems intended to treat contaminated surface water runoff. Full details can be found at: http://www.britishwater.co.uk/Publications/codes-of-practise.aspx .	
Component 2	Full Retention Separator				
Component 3	None				
SuDS Pollution Mitigation Indices TSS Metals Hydrocarbons	>0.95 >0.95 0.9				
Groundwater protection type Groundwater protection Pollution Mitigation Indices TSS Metals Hydrocarbons	None 0 0 0				
Combined Pollution Mitigation Indices TSS Metals Hydrocarbons Acceptability of Pollution Mitigation TSS Metals Hydrocarbons	>0.95 >0.95 >0.95 Sufficient Sufficient Sufficient	0.9 Reference to local planning documents should also be made to identify any additional protection required for sites due to habitat conservation (see Chapter 7 The SuDS design process). The implications of developments on or within close proximity to an area with an environmental designation, such as a Site of Special Scientific Interest (SSSI), should be considered via consultation with relevant conservation bodies such as Natural England			

Havant Phase 2

Langstone Technology
Park

SUDS Maintenance Plan

Project Ref: **AB/13508**

Issue: First Issue

February 2024

Client

XLB Limited

SUSTAINABLE DRAINAGE AND LANDSCAPE MANAGEMENT PLAN FOR HAVANT PHASE 2.

An introduction to sustainable drainage systems or SuDS

- SuDS are a new environmentally friendly approach to managing rainfall that use landscape features to deal with surface water. SuDS aim to:
 - Control the flow, volume and frequency of water leaving a development area
 - Prevent pollution by intercepting silt and cleaning runoff from hard surfaces
 - Provide attractive surroundings for the community
 - Create opportunities for wildlife

1 SuDS Drainage Strategy

The proposed SuDS are designed to prevent flooding and control the flow of surface water using attractive landscape features.

It is proposed that drainage strategy incorporates cellular storage within service yard areas. This feature is the primary source of surface water storage for the site.

In addition to the cellular, storage is also provided by the use of porous car parking.

2 SuDS Management

The proposed SuDS measures, have been designed with easy maintenance in mind. Maintenance will generally fall into one of the three following categories:

- **Regular day to day care** - litter collection, grass cutting and checking the inlets and outlets where water enters or leaves a SuDS feature
- **Occasional tasks** - managing vegetation and removing any silt that builds up in the SuDS features also after flooding events.
- **Remedial work** - repairing damage where necessary

3 SuDS Maintenance – Summary

		Frequency	Unit Rate	Total
	REGULAR MAINTENANCE			
1.	LITTER MANAGEMENT			
1.1	Pick up all litter in SuDs and Landscape areas and removed from	12 visits monthly		
2	GRASS MAINTENANCE – all cutting to wildlife piles			
2.1	Mow all grass verges, paths and amenity at 35-60mm with 75mm max. Leaving grass in situ	As required or monthly		
4	HARD SERVICES			
4.1	Sweep all paving regularly. Sweep and suction brush. Permeable paving in autumn after leaf fall	1 visit		
	OCCASIONAL TASKS			
6	SILT MANAGEMENT			
6.1	Remove / clear out silt from silt collection traps in linear drainage channels	As required / after flood event.		
7	REMEDIAL WORK			
7.1	Inspect SuDs system regularly to check for damage or failure.	As required / after flood event.		

SuDS Features:

SuDS techniques include attenuation structures which assist in managing discharge of water from the site.

Cellular Tanks / Soakaways are used to manage and control surface runoff. Also, they are used to store surface water on site under the ground to slow discharge before it is discharge offsite.

Permeable surfaces as permeable asphalt, gravel or free draining soils that allow rain to percolate through the surface into underlying drainage layers. They must be protected from silt, sand, compost, mulch, etc.

Inspection Chambers and rodding eyes are used on bends or where pipes come together. They allow cleaning of the system if necessary.

Overflows can be below ground through gratings and chambers or over grass weirs in the open. They must be kept clear at all times to protect areas from flooding.

Flood routes (exceedance routes) allow water volumes exceeding the capacity of the SUDS system to escape from the site without causing damage to property. This route must be clear of obstructions at all times.

Green Roofs comprise a multi-layered system that covers the roof of a building or podium structure with vegetation cover, over a drainage layer. They are designed to intercept and retain precipitation, reducing the volume of run-off and attenuation peak flows.

Sustainable Drainage Maintenance Specification

1.0 GENERAL REQUIREMENTS

Maintenance activities comprise: • Regular Maintenance • Occasional Task • Remedial Work	Frequency
Generally Litter Collect all litter or other debris and remove from site at each site visit	Monthly

- **Avoid** use of weed killers and pesticides to prevent chemical pollution
- **Avoid** de-icing agents wherever possible to allow bio-remediation of pollutants in permeable surfaces.
- **Protect** all permeable, porous and infiltration surfaces from silt, sand, mulch and other fine particles.

Exclusions:

- Maintenance of rainwater harvesting chambers, pumps, etc.

2.0 INLETS, OUTLETS, CONTROLS, AND INSPECTION CHAMBERS

- **Inlets and outlets structures** may be surface structures or conveyance pipes with guards or headwalls. They must be free from obstruction at all times.
- **SuDS flow control structures** can be protected orifices, slots weirs or other controls at or near the surface to be accessible and easy to maintain. They may be in baskets, in small chambers or in the open.
- **Inspection Chambers** and rodding eyes are used on bends or where pipes come together and allow cleaning of the system if necessary. They should be designed out of the system where possible.

INLETS, OUTLETS, CONTROLS AND INSPECTION CHAMBERS	
Regular Maintenance	Frequency
Inlets, outlets and surface control structures Inspect surface structures removing obstructions and silt as necessary. Check there is no physical damage. Strim vegetation 1m min. surround to structures and keep hard aprons free from silt and debris	Monthly Monthly
Inspection chambers and below ground control chambers	

Remove cover and inspect ensuring water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn	Annually
Occasional Maintenance	
Check topsoil levels are 20mm above edges of baskets and chambers to avoid mower damage	As necessary
Remedial work	Frequency
Unpack stone in basket features and unblock or repair and repack stone as design detail as necessary.	As required
Repair physical damage if necessary.	As required

3.0 OVERFLOWS AND FLOOD ROUTES

- **Overflows** are overland across weirs, through gratings or within chambers and must be kept clear at all times to protect areas from flooding. They allow onward flow when part of the SuDS system is blocked.
- **Flood routes (exceedance routes)** allow water volumes that exceed the capacity of the SuDS system to pass through or round the site without causing damage to property. These routes must be clear of obstructions at all times.

OVERFLOWS AND FLOOD ROUTES	
Regular Maintenance	Frequency
Overflows. Jet pipes leading from overflow structures annually and check by running water through the overflow. Check free flow at next SUDS feature – inlet to basin or chamber.	Annually
Overflows. Remove any accumulated grass cuttings or other debris on top of grass weirs or stone filled baskets overflows.	Monthly
Flood Routes. Make visual inspection. Check route is not blocked by new fences, walls, soil or other rubbish. Remove as necessary.	Monthly
Remedial	Frequency
Overflows. If overflow is not clear then dismantle structure and reassemble to design detail.	As required

4.0 Cellular Storage

Cellular Storage	
Regular Maintenance	Frequency
Inspect inlets, outlets and control structures and remove obstructions and silt as necessary.	Monthly
Remove cover and inspect ensuring water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn	Annually
Occasional Maintenance	
Remove silt from catchpits and cellular storage	As necessary
Remedial work	Frequency
Repair inlet/outlet, if necessary, removal of silt build up	As required
Repair physical damage if necessary.	As required

5.0 PERMEABLE SURFACES

- **Permeable surfaces** including permeable block paving, porous asphalt, gravel or free draining soils that allow rain to percolate through the surface into underlying drainage layers. They must be protected from silt, sand, compost, mulch, etc. Permeable block paving can be cleaned by suction brushing.

PERMEABLE AND POROUS SURFACES	
Regular Maintenance	Frequency
Cleaning Brush regularly and remove sweeping from all hard surface	Monthly
Occasional Tasks	Frequency
Permeable Tasks Brush and vacuum surface once and year to prevent still blockage and enhance design life	Annually
Remedial Work	Frequency
Monitor effectiveness of permeable pavement and when water does not infiltrate immediately advise client of possible need for reinstatement of top layers or specialist cleaning. Recent experience suggest jet washing and suction cleaning will substantially reinstate pavement to 90% efficiently	As required
After Flood Event	Frequency
Brush and vacuum surface to remove silt / debris. If water still does not infiltrate immediately advise client of possible need of reinstatement of top layers or specialist cleaning. Check perforated pipework and outlet sumps.	After the flooding has subsided and is safe to undertake.

6.0 GREEN ROOFS

The amount of maintenance required will depend on the type of green roof installed.

GREEN ROOF	
Regular Inspection	Frequency
Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural ability	Annually and after severe storms
Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
Inspect drains inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular Maintenance	Frequency
Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
During establishment (ie year one), replace dead plants as required.	Monthly (but usually responsibility of manufacturer)
Post establishment, replace dead plants as required (where >5% of coverage)	Annually (in autumn)
Remove fallen leaves and debris from deciduous plant foliage.	Six monthly or as required
Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clippings should be removed and not allowed to accumulate.	Six monthly or as required
Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
Remedial Actions	Frequency
If erosion channels are evident, these should be established with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled.	As required.
If drain inlet has settled, cracked or moved, investigate and repair as appropriate.	As required.

7.0 MANHOLES AND INSPECTION CHAMBERS

- **Manholes and Inspection Chambers** and rodding eyes are used on bends or where pipes come together and allow cleaning of the system if necessary. They should be designed out of the system where possible.

INLETS, OUTLETS, CONTROLS AND INSPECTION CHAMBERS	
Regular Maintenance	Frequency
Manholes and Inspection chambers and below ground control chambers	
Remove cover and inspect ensuring water is flowing freely and that the exit route for water is obstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn.	Annually
Occasional Maintenance	Frequency
Check topsoil levels are 20mm above edges of baskets and chambers to avoid mower damage	As necessary
Remedial Work	Frequency
Unpack stone in basket features and unblock or repair and repack stone as design detail as necessary. Repair physical damage if necessary	As required

8.0 SPILLAGE – EMERGENCY ACTION

Most spillages on development sites are of compounds that do not pose a serious risk to the environment if they enter the drainage in a slow and controlled manner with time available for natural breakdown in a treatment system. Therefore, small spillages of oil, milk or other known organic substances should be removed where possible using soak mats as recommended by the Environment Agency with residual spillage allowed to bio-remediate in the drainage system.

In the event of a serious spillage, either by volume or of unknown or toxic compounds, then isolate the spillage with soil, turf or fabric and block outlet pipes from chamber(s) downstream of the spillage with a bung(s). (A bung for blocking pipes may be made by wrapping soil or turf in a plastic sheet or close woven fabric.)

Contact the Environment Agency immediately.

9.0 QUERIES REGARDING A DESIGN FEATURE.

In the event of a concern or failure of a SuDs design feature contact The Baynham Meikle Partnership.

8 Meadow Road, Edgbaston, Birmingham B17 8BU

Tel: (0121) 434 4100

Email admin@bm-p.co.uk

10.0 RESPONSIBILITIES

The new on-site drainage will not be adopted, it is to remain in private ownership. The Tenant will be responsible for the maintenance and operations requirements of the SuDS features.



Notes

1. Topographical Survey carried out by Greenhatch. Drawing No.: 38869.T - Topographical Survey Plan (Dated Jan 2023).

2. Proposed Site Layout taken from PRC, Drawing No.: 11629/003 - Proposed Site Plan (Dated October 2023).

3. Do not scale from this drawing. All dimensions must be checked & verified on-site. If in doubt ask.

Rev

Date

Description

By

Chk

For Planning

Langstone Technology Park

Drawing Title

Existing Exceedance Plan

Drawing Number

13508-130

Revision

P01

RM Ref

Scale @ A0

Drawn by

Checked by

Project Eng

13508

1:250

R.B.

A.B.

G.L.

BAYNHAM

MEIKLE

Consulting Civil & Structural Engineers

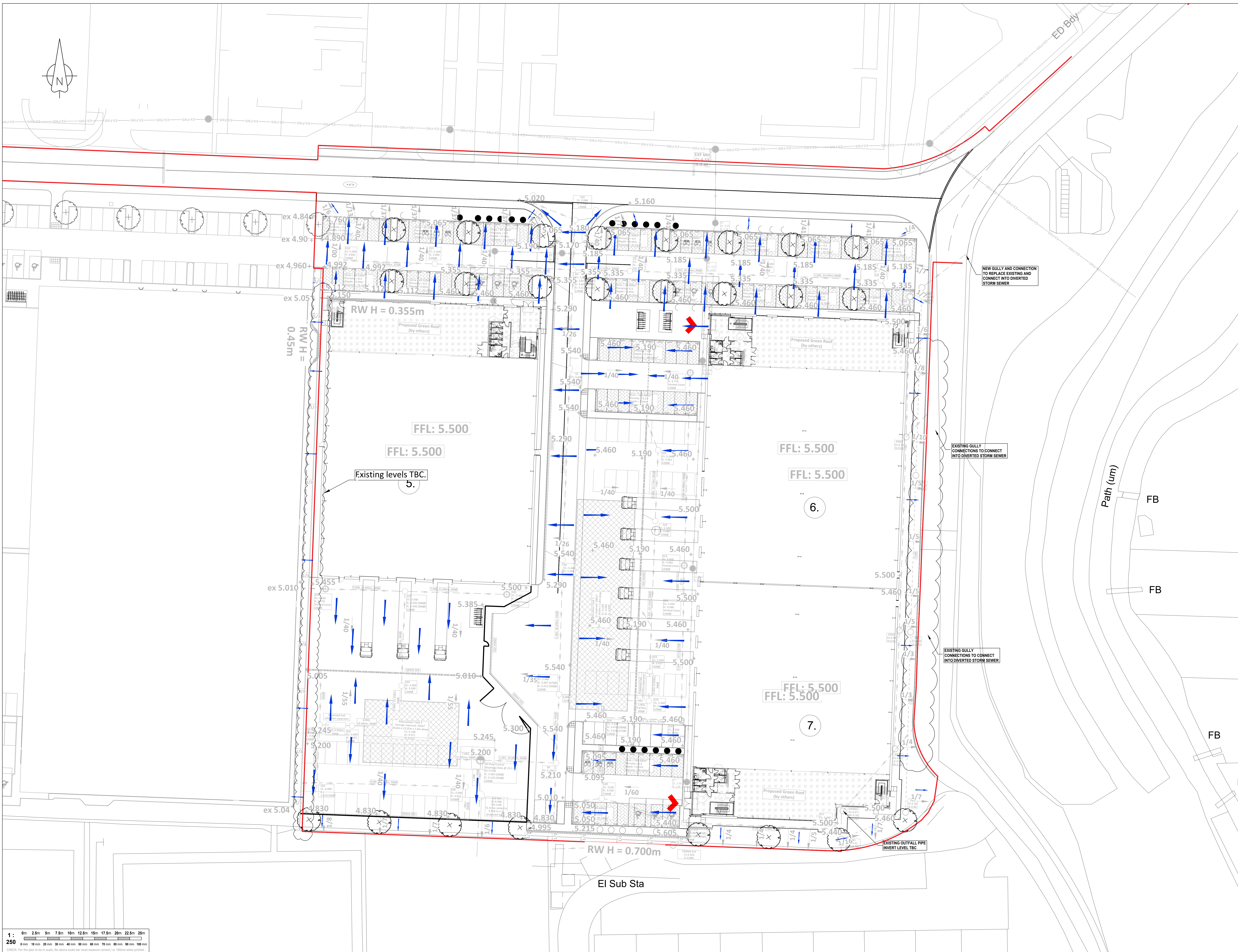
021 434 4800

admin@baynhammeikle.co.uk

www.baynhammeikle.co.uk

Notes

- Topographical Survey carried out by Greenhatch. Drawing No.:
 - 38869 T - Topographical Survey Plan (Dated Jan 2023).
- Proposed Site Layout taken from PRC. Drawing No.:
 - 11629/003 - Proposed Site Plan (Dated October 2023).
- Do not scale from this drawing. All dimensions must be checked & verified on-site. If in doubt ask.



P01	05/02/2024	For Information		A.B.	A.B.
Rev	Date	Description		By	Chk
		Revision Schedule			

For Planning

Langstone Technology Park

Proposed Exceedance Plan

Drawing Number
13508-128

Revision
P01

RM Ref	Scale @ A0	Drawn by	Checked by	Project Eng
13508	1 : 250	R.B.	A.B.	G.L.

BAYNHAM MEIKLE
Consulting Civil & Structural Engineers

020 434 4300
admin@baynhammeikle.co.uk
www.baynhammeikle.co.uk