

Appendix A.2 – Environment Agency Correspondence

Ms Kirsty Thomas
Herrington Consulting Ltd.
Barham Business Park (Unit 6)
Elham Valley Road
Barham
Canterbury
CT4 6DQ

Our ref: KT/2020/127776/01-L01
Your ref: 2813/KT
Date: 13 January 2021

Dear Ms Thomas

ENVPAC/1/KSL/00360

Custom House, The Terrace, Gravesend, DA12 2DE

Thank you for consulting us on the above pre-application. We have reviewed the submitted pre-application letter, dated 4 December 2020. We would like to offer the following advice.

The application site lies partially within Flood Zone 3, which is considered to be 'High Risk'. Under the National Planning Policy Framework (NPPF) the development is classified as 'more vulnerable'.

As stated within your letter, a Flood Risk Assessment (FRA) will be required to be submitted alongside any planning application.

The Thames Estuary 2100 (TE2100) defence level at this location is 6.90 metres Above Ordnance Datum (AOD) for the epoch from 2040 to 2070 and 8.00m AOD for the epoch from 2070 to 2170. Please be aware that we are currently re-modelling the flood levels for the Thames Estuary as part of the 10 year review of the Thames Estuary 2100 Plan. However, the results from this study will not be available for a number of months.

The applicant will need to demonstrate how the site will be protected for the lifetime of the development. This should include demonstration that the existing defence crest level meets the requirement for 2040, as well as how the defences will be upgraded to achieve the defence level of 6.90m AOD by 2040 (if required) and 8.0m AOD by 2070. We are happy to discuss this further if you have any questions.

Page 17 of the submitted letter states that "the open space to the north of the outbuildings are constrained by the flood wall anchors which project back into the property." We note that an extension is proposed towards the north of the site and we would like to understand how close this would be to the anchors as it is currently unclear from the information provided at present.

We note from our records that there is a flood gate within this site. Please confirm if this is the case so we can provide further advice.

We would advise that finished floor levels should be situated to a minimum of 300mm above the 1 in 200 year plus climate change breach flood level for residential non-sleeping accommodation and a minimum of 600mm above the 1 in 200 year plus climate change breach flood level for sleeping accommodation. Due to the proximity of the site to the river we would also advise the applicant to consider the in-channel level as well as the breach level. The finished floor levels proposed on page 2 of the submitted letter follow the principles of the above guidance. However, the letter also states that “as the proposals comprise the conversion of existing buildings, which lie within a listed curtilage and are constrained by the existing ceiling height and need for accessible access, the opportunity to raise floors to the levels stated is severely limited.”

Firstly, we would ask the applicant to include the finished floor levels on any floor plans they submit so we can be clear what the finished floor levels will be across the site, on the ground and first floor. Secondly, if the current ground floor finished floor levels are already below the breach level then the applicant should look at options such as having accommodation split over two storeys. If the first floor was 600mm above the 1 in 200 year plus climate change breach flood level this would allow internal safe refuge for the occupants of the dwelling and could be considered. Please be aware that if a future planning application included any self-contained flats with finished floor levels entirely below the breach level we would raise an objection to this.

We are pleased with the recommendation to incorporate flood resilience into the design where possible. Information on flood resilience can be found on the following link http://www.planningportal.gov.uk/uploads/br/flood_performance.pdf.

We are pleased with the recommendation that occupants register with the Environment Agency's flood warning service, 'FloodLine', so that they may prepare themselves in case of a flood event. This can be done by calling 0345 988 1188 to register.

The FRA should also consider safe dry access and egress. Please be aware that we do not normally comment on or approve the adequacy of flood emergency response procedures, as we do not carry out these roles during a flood. Our involvement with this development during an emergency will be limited to delivering flood warnings to occupants/users covered by our flood warning network. Any evacuation plan should provide suitable access and egress from the site and would need to be approved by the Local Planning Authority's Emergency Planning Department.

Landscaping close to the Thames should aim for a biodiversity net gain by providing ecologically beneficial landscaping such as native species, and flowering plants for pollinators.

If any flood defences require alteration or raising, we would need to see an improved interface between the river and the terrestrial environment. So where it is feasible to provide estuary edge habitats or other beneficial features we do require these for the benefit of the Thames.

The Estuary Edges website is available with ideas for how to improve habitats, and provide enhancements: <https://www.estuaryedges.co.uk/>

Please do not hesitate to contact us should you require any further information.

Yours sincerely

Ms Laura Edwards

Planning Advisor

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Our ref: KT/2020/127776/02-L01
Your ref: 2813/KT
Date: 17 February 2021

Dear Ms Thomas

Custom House, The Terrace, Gravesend, DA12 2DE

We have reviewed the Herrington Consulting Limited letter dated 20 January 2021, and offer the following advice.

The application site lies partially within Flood Zone 3, which is 'High Risk'. Under the National Planning Policy Framework (NPPF) residential development is generally classified as 'More Vulnerable' but self-contained basement dwellings are classified as 'Highly Vulnerable'.

Flood Defence

The proposal is for a change of use to residential. This would increase the flood risk vulnerability of the development and significantly increase the dependence on the flood defence wall and the flood gate. The extent of any extensions or external building alterations is currently unclear.

Whether proposals include elements within 16 metres of the flood defence walls or not we expect the applicant to demonstrate how the site and its residents will be safe in flood risk terms for the development lifetime. The lifetime of residential development is taken to be 100-years. This should include how the defences will remain structurally sound and how they will be upgraded for climate change induced sea level rise in line with the Thames Estuary 2100 Plan.

This requires the applicant to either construct replacement flood defences with a 100-year design life, or provide a suitable structural survey, including intrusive investigation, to demonstrate that the residual life of any elements of the flood defences that are to be retained is in line with the 100-year development lifetime, along with a suitable scheme of remedial works where that is not the case.

Given the age of the existing flood wall, it appears less likely that the structure can be shown to have a remaining life of 100-years.

If the applicant chooses to undertake a river wall survey, including intrusive investigation, we would suggest that we are first consulted over the scope of the

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proposed survey to reduce the risk of abortive work.

The applicant also needs to demonstrate how the flood defence crest level will be raised to 8 metres Above Ordnance Datum in order to protect the site for its lifetime, taking account of sea level rise. That could be achieved by raising the defences now as part of the development, or proving how it can be raised, along with a robust funding strategy to undertake the needed defence raising.

The northern extent of the buildings abutting the eastern boundary are only about 4.5 metres from the visible part of the flood defence structure. That proximity may affect the ability to raise or renew the tidal defences.

We also expect applicants to show how a replacement flood defence could be formed with the development in place without needing to encroach towards the river, even when a new defence is formed as part of a development. This can be called a contingency or future proofing option. Again the extent of any northern building extension is currently uncertain.

Services in the northern part of the site could hinder future flood defence works. Please can you provide any details of existing and proposed services that are available.

It is important to prevent flood defence structures being compromised during construction work. Ground anchors running landward from their origin soon reach a depth where they are difficult to locate. This creates a legacy problem as the installation of deep foundations may risk damaging existing ground anchors. Where there is uncertainty over the location of ground anchors we need to take a precautionary approach. On page 13 of the letter dated 04 December 2020, it states that, *'The open space to the north of the outbuildings are constrained by the flood wall anchors which project back into the property.'* At present we have no information on the nature and depth of any foundations proposed for any building extensions. Please provide details of the location, nature and depth of any proposed new foundations and also the worst case location of all ground anchors, in terms of the potential for a clash.

Flood gates are weak points in the line of the flood defences. We therefore seek to have existing flood gates removed and replaced with a section of fixed flood defence wall wherever possible as part of re-developments. You have stated that the flood gate will be retained. Please provide information about what the flood gate will need to be opened for post development, and the ongoing arrangements for its management and operation.

Sleeping Accommodation

Although it may not be possible for each dwelling to have safe access and egress during the 1 in 200-year modelled breach flood levels factored for climate change, every dwelling must have all sleeping accommodation set no lower than 600mm above the 1 in 200 year plus climate change breach flood level. This is to provide its own temporary safe refuge and reduce the risk to people who are sleeping.

It is not clear how the above requirement can be met for the single story elements including the northern most part of the workshop building.

We would oppose any basement dwelling where there is any threshold or water entry level at or below the modelled breach flood level. We would also oppose the dwellings being dependent on flood doors or any other active / movable flood exclusion features. Please can you provide details and photos to show the presence or absence of pathways or openings into the buildings that could allow floodwater to enter below the modelled breach flood level.

Please can you also provide the revised floor plan drawings, with all post-development floor levels. We can then confirm if the proposals are acceptable.

The buildings that are proposed to be converted are historic and close to the tidal defences. In the unlikely but high consequence event of a failure of the tidal defences the buildings could be subjected to high water velocities and deep flood water. How does the applicant propose to establish whether the structures would remain intact and able to provide temporary safe refuge to residents in the event of a breach flood event at the site?

Flood Warning Service

Lastly, we wanted to highlight something in your previous letter, dated 4 December 2020, that we hadn't expanded on before. On page 3, you state that, *'The Thames catchment is also served by a well-established flood warning system, and it is expected that there could be at least 12 hours warning of conditions which may result in a failure of the defences.'*

Although we are we are pleased with the recommendation that occupants register with the Environment Agency's flood warning service, 'FloodLine', so that they may prepare themselves in case of a flood event. If a defence failure occurred near the site there could be little or zero warning. Therefore, we recommend that this statement is clarified within the subsequent Flood Risk Assessment.

Please do not hesitate to contact us should you require any further information.

Yours sincerely

Ms Laura Edwards
Planning Advisor

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Our ref: KT/2020/127776/03-L01
Your ref: 2813/KT
Date: 30 April 2021

Dear Ms Thomas

Custom House, The Terrace, Gravesend, DA12 2DE

Thank you for consulting us on the scope of your investigation works. We have reviewed the email dated 9 April, and offer the following advice.

Flood Defences

As mentioned previously, we expect the applicant to demonstrate how the site and its residents will be safe in flood risk terms for the development lifetime. The lifetime of residential development is taken to be 100-years. This should include how the defences will remain structurally sound and how they will be upgraded for climate change induced sea level rise in line with the Thames Estuary 2100 Plan.

This requires the applicant to either construct replacement flood defences with a 100-year design life. Alternatively to provide a suitable structural survey, including intrusive investigation, to demonstrate that the residual life of any elements of the flood defences that are to be retained is in line with the 100-year development lifetime. Along with a suitable scheme of remedial works where that is not the case.

Given the age of the existing flood wall, it appears less likely that the structure can be shown to have a remaining life of 100-years.

The applicant also needs to demonstrate how the flood defence crest level will be raised to 8m Above Ordnance Datum in order to protect the site for its lifetime, taking account of sea level rise. That could be achieved by raising the defences now as part of the development, or proving how it can be raised in the future without undue cost and difficulty, along with a robust funding strategy to undertake the needed defence raising.

Where a flood defence or future defence raising is being designed the applicant needs to consider the reasonable worst case ground water levels.

The current investigation works proposed are not sufficient to provide a representative sample of the condition of the flood defences across the site.

We would advise that the scope of the investigation works is revised to include an increased number of investigation locations and consideration for the eastern section of flood defence.

In addition, we would advise that trial pits are undertaken at landward and riverward locations.

Please see attached our guidance for applying for a Flood Risk Activity Permit. It is likely that some of these works will require a Flood Risk Activity Permit. **Please could the applicant submit a method statement so that we can confirm exactly what the permitting requirements will be.** The method statement would also be beneficial so we can understand more about the nature of the investigation works proposed e.g. the depth of trial pits.

Please could the applicant confirm if they have undertaken a visual assessment of the flood defences at this location? If this has been undertaken and there is a summary report it would be useful for us to have sight of this. If this has yet to be done a visual assessment can be undertaken without a Flood Risk Activity Permit and could be useful to undertake in the interim to understand potential priority areas for further site investigations.

In addition to checking the sheet pile thickness on the defence to the west of the site we would also advise that you undertake anchor testing.

The applicant should also be aware there are some tide flaps running through the flood defence to the west of the site that will need to be considered with respect to climate change.

Aerial views shows that there is a concrete platform in front of the flood defence. The applicant will need to determine the interdependency between the flood defence and this concrete structure. **We would expect the applicant to undertake investigations to prove whether failure of the subordinate structure will impact the strength and stability of the flood defence.** Where the flood defence is found to be dependent on the subordinate structure, the subordinate structure must be treated as part of the overall flood defence in all related assessments.

Ground Anchors

As mentioned in previous correspondence, we would like to understand more about the ground anchors and services at this site. Our previous comments regarding these points for reference are below.

It is important to prevent flood defence structures being compromised during construction work. Ground anchors running landward from their origin soon reach a depth where they are difficult to locate. This creates a legacy problem as the installation of deep foundations may risk damaging existing ground anchors. Where

there is uncertainty over the location of ground anchors we need to take a precautionary approach. On page 13 of the letter dated 04/12/2020, it states that, *'The open space to the north of the outbuildings are constrained by the flood wall anchors which project back into the property.'* At present we have no information on the nature and depth of any foundations proposed for any building extensions. Please provide details of the location, nature and depth of any proposed new foundations and also the worst case location of all ground anchors, in terms of the potential for a clash.

Services in the northern part of the site could hinder future flood defence works. Please can you provide any details of existing and proposed services that are available.

Conclusion

Lastly, if the applicant revises the scope of their investigations we would appreciate being consulted. We will endeavour to provide as much advice as possible in regards to the scope of the investigation works but, ultimately the responsibility is with the applicant to ensure the site investigations will be sufficient to allow the applicant to robustly demonstrate the condition and remaining lifetime of the flood defences.

Please do not hesitate to contact us should you require any further information.

Yours sincerely

Ms Laura Edwards

Planning Advisor

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Our ref: KT/2020/127776/04-L01
Your ref: 2813/KT
Date: 17 June 2021

Dear Ms Thomas

Custom House, the Terrace, Gravesend, DA12 2DE

Thank for the additional information. We have reviewed the submitted report ('Custom House River Wall Structural Inspection report, project reference: A7752, dated 26 May 2021, revision: P2). **The current investigation works proposed are not sufficient to provide representative sample of the condition of the flood defences across the site.**

Anchor Testing

Although trial pits to locate and inspect the anchor visually from the landward side of the flood defence has been detailed in the application, there is no proposal to undertake ground anchor testing. This is important to help determine the condition of the ground anchors. This could include, but is not limited to:

- An assessment of all anchor head assemblies.
- Identification of the lifted anchor strands and identification of the mechanism and precise location of failure.
- List off tests and determining a correlation of the anchor heads with strand failures or with other influences.

Inspection of Masonry

Section 5.6.4 of the inspection report recommends the removal of some bricks from the wall to check the core make-up. We require further clarification of the extent of the brick inspection namely:

- How many bricks will be removed.
- The location of the removed bricks.

The number and location of removed bricks should be sufficient to provide an understanding of the condition of the masonry across the full extent.

Existing and Proposed Services

We have not seen any information regarding existing and proposed services or any proposed method for determining the location of existing services within 16 metres of the flood defences. Services in the northern part of the site could hinder future flood defence works.

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Method of Compaction

Please provide further clarification of the proposed method of compaction. Appendix C provides a method statement for proposed activities which states that excavations will be backfilled, using the arisings, before being compacted with an excavator bucket. Any compaction should be to Highways specification or similar. Additionally, please confirm that no trial pits will be left open overnight.

Flood Risk Activity Permit

Please note that that all works, both permanent and temporary, within 16 metres of the Thames defences will require a Flood Risk Activity Permit.

Please do not hesitate to contact us should you require any further information.

Yours sincerely

Ms Laura Edwards

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Our ref: KT/2020/127776/05-L01
Your ref: 2813/KT
Date: 28 July 2021

Dear Ms Thomas

The proposals for development are not fixed, however, it is intended that the Grade II Listed Customs House building and outbuildings will be converted to accommodate 29no. self-contained flats with associated parking, amenity and landscaping.

Custom House, The Terrace, Gravesend, DA12 2DE

Thank you for your previous response to our concerns. However, we still require clarification for the following points.

Inspection of Masonry

We are pleased to hear that a supervising engineer will be on site. We request plans are supplied to us that detail where bricks are moved, in addition to the final test results.

Existing and Proposed Services

Please can you clarify if the proposed services survey will be intrusive or desktop based. We would seek assurance that there is a clear working space for future flood defences.

Method of Compaction

Although it is understood that the make-up of the hard standing is not currently known, please can you confirm that compaction will be to a Highways specification or similar. Additionally, please clarify that no trenches are to be left open overnight.

Please note that that all works, both permanent and temporary, within 16 metres of the Thames defences will require a Flood Risk Activity Permit.

Please contact me should you wish to discuss the above.

Yours sincerely

Sophie Page

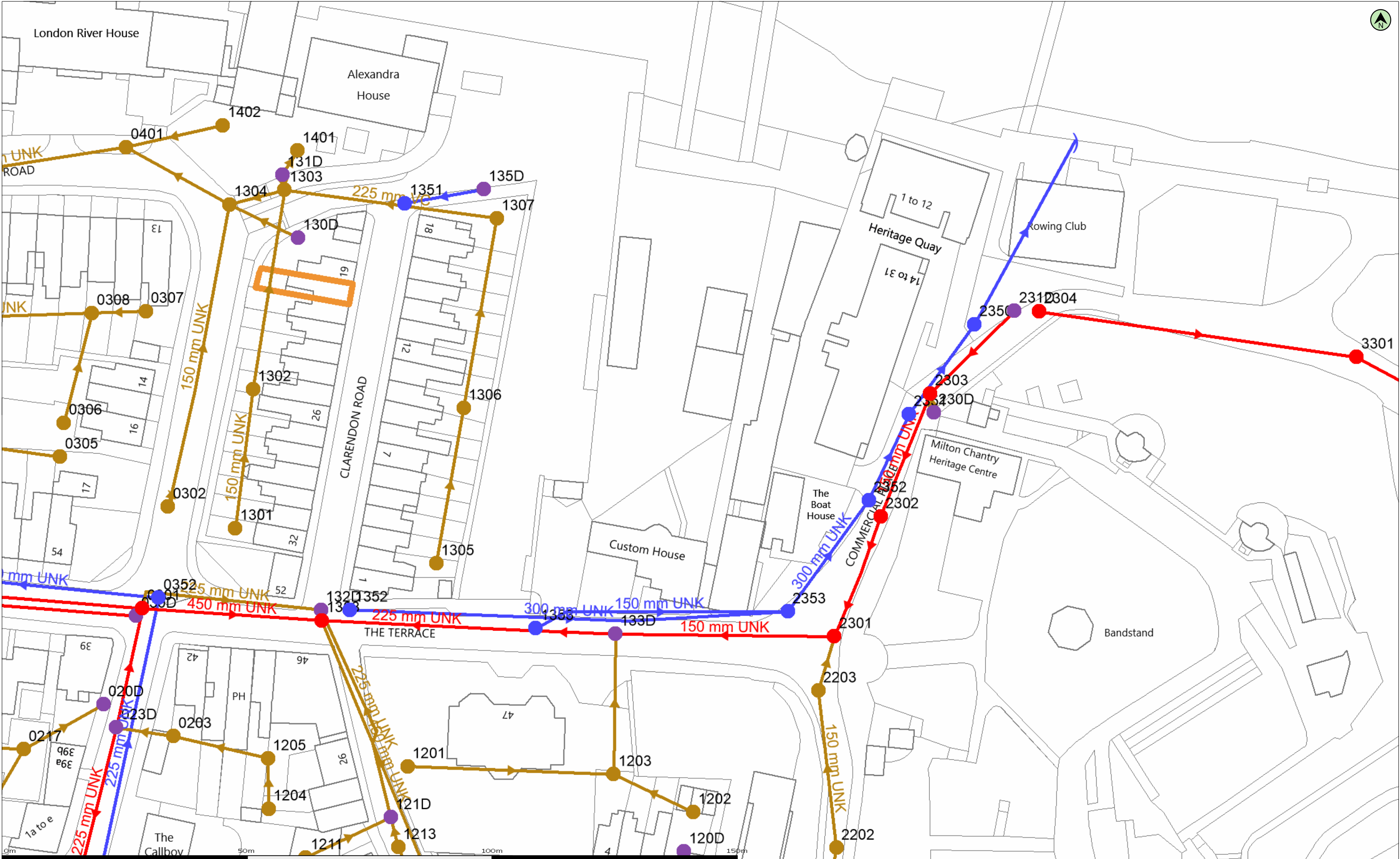
Mrs Sophie Page

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Appendix A.3 – Southern Water Asset Location Data

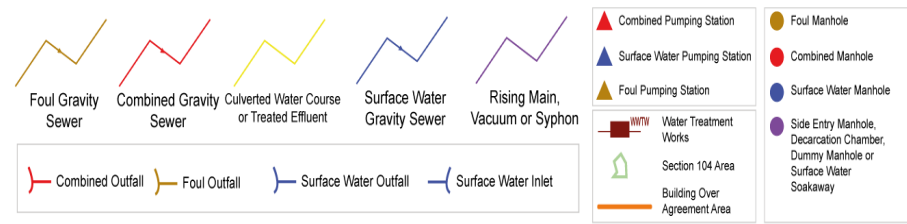


(c) Crown copyright and database rights 2020 Ordnance Survey 100031673 Date: 15/07/20 Scale: 1:500 Map Centre: 565198,174345 Data updated: 15/06/20 Our Ref: 416424 - 1 Wastewater Plan A2

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site. This plan is produced by Southern Water Services Ltd (c) Crown copyright and database rights 2020 Ordnance Survey 100031673. This map is to be used for the purposes of viewing the location of Southern Water plant only. Any other uses of the map data or further copies is not permitted.

WARNING: BAC pipes are constructed of Bonded Asbestos Cement.

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement.



flood@herringtonconsulting.co.uk	
2813/KB	



Appendix A.4 – Surface Water Management Calculations

Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	40	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	4.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	200.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.048	4.00	7.600	1200	565172.609	174327.320	1.350
Tank A	0.016	4.00	6.700	1200	565188.702	174338.897	1.700
3	0.041	4.00	5.440	1200	565203.077	174333.000	1.425
4	0.018	4.00	5.300	1200	565206.000	174348.982	1.500
Tank B	0.044	4.00	5.600	1200	565191.160	174361.517	1.880
6	0.039	4.00	4.100	1200	565195.251	174395.400	0.525
Tank C	0.033	4.00	4.450	1200	565193.643	174382.921	1.300
7	0.013	4.00	4.800	1200	565209.001	174365.068	1.425
Tank D	0.024	4.00	4.450	1200	565204.235	174381.431	1.400
9	0.019	4.00	4.460	1200	565212.862	174386.006	1.425
10			4.100	1200	565212.825	174388.776	1.450
OUT			4.140	1200	565217.335	174408.352	1.557

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	1	Tank A	19.825	0.600	6.250	5.350	0.900	22.0	150	4.15	198.4
1.001	Tank A	Tank B	22.753	0.600	5.000	4.175	0.825	27.6	225	4.30	198.4
2.000	3	4	16.247	0.600	4.015	3.875	0.140	116.1	225	4.22	198.4
2.001	4	Tank B	19.426	0.600	3.800	3.720	0.080	242.8	300	4.55	198.4
1.002	Tank B	Tank C	21.548	0.600	3.720	3.552	0.168	128.3	225	4.43	198.4
3.000	6	Tank C	12.582	0.600	3.575	3.400	0.175	71.9	225	4.14	198.4
1.003	Tank C	Tank D	10.696	0.600	3.150	3.097	0.053	200.0	300	4.59	198.4
4.000	7	Tank D	17.043	0.600	3.375	3.091	0.284	60.0	225	4.17	198.4
1.004	Tank D	10	11.302	0.600	3.050	2.700	0.350	32.3	225	4.67	198.4
5.000	9	10	2.770	0.600	3.035	2.650	0.385	7.2	225	4.01	198.4

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	2.155	38.1	36.0	1.200	1.200	0.048	0.0	116	2.443
1.001	2.501	99.4	47.6	1.475	1.200	0.063	0.0	109	2.473
2.000	1.213	48.2	30.5	1.200	1.200	0.041	0.0	130	1.280
2.001	1.004	71.0	43.7	1.200	1.580	0.058	0.0	170	1.054
1.002	1.153	45.8	124.6	1.655	0.673	0.166	0.0	225	1.174
3.000	1.544	61.4	29.6	0.300	0.825	0.039	0.0	110	1.531
1.003	1.108	78.3	179.2	1.000	1.053	0.238	0.0	300	1.122
4.000	1.691	67.2	10.1	1.200	1.134	0.013	0.0	58	1.222
1.004	2.310	91.8	207.1	1.175	1.175	0.275	0.0	225	2.352
5.000	4.908	195.2	14.2	1.200	1.225	0.019	0.0	41	2.891

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)
1.005	10	OUT	20.089	0.600	2.650	2.583	0.067	300.0	225	5.12	196.9

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)
1.005	0.750	29.8	219.7	1.225	1.332	0.294	0.0	225	0.763

Pipeline Schedule

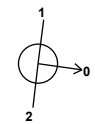
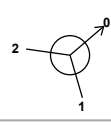
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	19.825	22.0	150	Circular	7.600	6.250	1.200	6.700	5.350	1.200
1.001	22.753	27.6	225	Circular	6.700	5.000	1.475	5.600	4.175	1.200
2.000	16.247	116.1	225	Circular	5.440	4.015	1.200	5.300	3.875	1.200
2.001	19.426	242.8	300	Circular	5.300	3.800	1.200	5.600	3.720	1.580
1.002	21.548	128.3	225	Circular	5.600	3.720	1.655	4.450	3.552	0.673
3.000	12.582	71.9	225	Circular	4.100	3.575	0.300	4.450	3.400	0.825
1.003	10.696	200.0	300	Circular	4.450	3.150	1.000	4.450	3.097	1.053
4.000	17.043	60.0	225	Circular	4.800	3.375	1.200	4.450	3.091	1.134
1.004	11.302	32.3	225	Circular	4.450	3.050	1.175	4.100	2.700	1.175
5.000	2.770	7.2	225	Circular	4.460	3.035	1.200	4.100	2.650	1.225
1.005	20.089	300.0	225	Circular	4.100	2.650	1.225	4.140	2.583	1.332

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1200	Manhole	Adoptable	Tank A	1200	Manhole	Adoptable
1.001	Tank A	1200	Manhole	Adoptable	Tank B	1200	Manhole	Adoptable
2.000	3	1200	Manhole	Adoptable	4	1200	Manhole	Adoptable
2.001	4	1200	Manhole	Adoptable	Tank B	1200	Manhole	Adoptable
1.002	Tank B	1200	Manhole	Adoptable	Tank C	1200	Manhole	Adoptable
3.000	6	1200	Manhole	Adoptable	Tank C	1200	Manhole	Adoptable
1.003	Tank C	1200	Manhole	Adoptable	Tank D	1200	Manhole	Adoptable
4.000	7	1200	Manhole	Adoptable	Tank D	1200	Manhole	Adoptable
1.004	Tank D	1200	Manhole	Adoptable	10	1200	Manhole	Adoptable
5.000	9	1200	Manhole	Adoptable	10	1200	Manhole	Adoptable
1.005	10	1200	Manhole	Adoptable	OUT	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	565172.609	174327.320	7.600	1.350	1200		0	1.000	6.250	150
Tank A	565188.702	174338.897	6.700	1.700	1200		1	1.000	5.350	150
							0	1.001	5.000	225
3	565203.077	174333.000	5.440	1.425	1200		0	2.000	4.015	225

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
4	565206.000	174348.982	5.300	1.500	1200		1	2.000	3.875	225
Tank B	565191.160	174361.517	5.600	1.880	1200		1	2.001	3.800	300
						2	1.001	4.175	225	
						0	1.002	3.720	225	
6	565195.251	174395.400	4.100	0.525	1200		0	3.000	3.575	225
Tank C	565193.643	174382.921	4.450	1.300	1200		1	3.000	3.400	225
						2	1.002	3.552	225	
						0	1.003	3.150	300	
7	565209.001	174365.068	4.800	1.425	1200		0	4.000	3.375	225
Tank D	565204.235	174381.431	4.450	1.400	1200		1	4.000	3.091	225
						2	1.003	3.097	300	
						0	1.004	3.050	225	
9	565212.862	174386.006	4.460	1.425	1200		0	5.000	3.035	225
10	565212.825	174388.776	4.100	1.450	1200		1	5.000	2.650	225
						2	1.004	2.700	225	
						0	1.005	2.650	225	
OUT	565217.335	174408.352	4.140	1.557	1200		1	1.005	2.583	225

Simulation Settings

Rainfall Methodology	FEH-13	Analysis Speed	Normal	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Skip Steady State	x	Check Discharge Rate(s)	x
Winter CV	0.840	Drain Down Time (mins)	240	Check Discharge Volume	x

Storm Durations

15	60	180	360	600	960	2160	10080
30	120	240	480	720	1440	2880	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	40	0	0
30	40	10	0
100	40	10	0

Node Tank A Online Orifice Control

Flap Valve	x	Invert Level (m)	5.000	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.020		

Node Tank B Online Orifice Control

Flap Valve	x	Invert Level (m)	3.720	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.030		

Node Tank D Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	3.050	Depth (m)	0.900
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	64	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	5.000	Number Required	1
Porosity	0.95	Pit Length (m)	10.000		

Node Tank A Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	5.000	Depth (m)	1.200
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	4.000	Number Required	1
Porosity	0.95	Pit Length (m)	11.000		

Node Tank C Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	3.150	Depth (m)	0.800
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	64	Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	6.500	Number Required	1
Porosity	0.95	Pit Length (m)	18.000		

Node Tank B Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	3.720	Depth (m)	1.300
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	6.500	Number Required	1
Porosity	0.95	Pit Length (m)	10.000		

Results for 2 year +40% CC Critical Storm Duration. Lowest mass balance: 98.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	6.304	0.054	10.0	0.0994	0.0000	OK
360 minute winter	Tank A	288	5.294	0.294	2.1	12.6776	0.0000	SURCHARGED
15 minute summer	3	10	4.081	0.066	8.5	0.1126	0.0000	OK
360 minute winter	4	328	4.035	0.235	2.0	0.3203	0.0000	OK
360 minute winter	Tank B	328	4.035	0.315	3.5	19.9319	0.0000	SURCHARGED
15 minute winter	6	10	3.633	0.058	8.2	0.1522	0.0000	OK
360 minute winter	Tank C	376	3.409	0.259	3.4	29.1838	0.0000	OK
360 minute winter	7	376	3.409	0.034	0.5	0.0445	0.0000	OK
360 minute winter	Tank D	376	3.409	0.359	23.7	17.5664	0.0000	SURCHARGED
360 minute winter	9	376	3.409	0.374	0.8	0.5218	0.0000	SURCHARGED
360 minute winter	10	376	3.409	0.759	37.5	0.8579	0.0000	SURCHARGED
30 minute summer	OUT	240	5.633	3.050	8.4	0.0000	0.0000	OK

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 winter	1	1.000	Tank A	10.0	1.785	0.263	0.1111	
360 minute winter	Tank A	Orifice	Tank B	0.4				
15 minute summer	3	2.000	4	8.5	0.899	0.176	0.1537	
360 minute winter	4	2.001	Tank B	1.7	0.396	0.024	1.2582	
360 minute winter	Tank B	Orifice	Tank C	1.0				
15 minute winter	6	3.000	Tank C	8.2	1.051	0.134	0.0982	
360 minute winter	Tank C	1.003	Tank D	23.7	0.751	0.303	0.7221	
360 minute winter	7	4.000	Tank D	0.5	0.380	0.007	0.3705	
360 minute winter	Tank D	1.004	10	37.1	0.933	0.404	0.4495	
360 minute winter	9	5.000	10	1.3	0.328	0.007	0.1102	
360 minute winter	10	1.005	OUT	37.9	0.953	1.272	0.7990	57.5

Results for 30 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 98.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	6.363	0.113	31.9	0.2165	0.0000	OK
360 minute winter	Tank A	344	5.831	0.831	5.4	35.8567	0.0000	SURCHARGED
360 minute winter	3	352	4.640	0.625	3.5	1.0973	0.0000	SURCHARGED
360 minute winter	4	352	4.640	0.840	4.7	1.1657	0.0000	SURCHARGED
360 minute winter	Tank B	352	4.640	0.920	8.9	58.3186	0.0000	SURCHARGED
360 minute winter	6	360	3.786	0.211	3.4	0.5874	0.0000	OK
360 minute winter	Tank C	360	3.786	0.636	8.2	71.8095	0.0000	SURCHARGED
360 minute winter	7	360	3.786	0.411	1.2	0.5505	0.0000	SURCHARGED
360 minute winter	Tank D	360	3.786	0.736	34.5	36.0804	0.0000	SURCHARGED
360 minute winter	9	360	3.786	0.751	1.6	1.0684	0.0000	SURCHARGED
360 minute winter	10	360	3.786	1.136	50.1	1.2850	0.0000	SURCHARGED
360 minute summer	OUT	240	5.633	3.050	49.4	0.0000	0.0000	OK

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 winter	1	1.000	Tank A	31.9	2.321	0.838	0.2723	
360 minute winter	Tank A	Orifice	Tank B	0.8				
360 minute winter	3	2.000	4	3.2	0.546	0.066	0.6462	
360 minute winter	4	2.001	Tank B	4.5	0.525	0.064	1.3680	
360 minute winter	Tank B	Orifice	Tank C	1.8				
360 minute winter	6	3.000	Tank C	3.4	0.821	0.055	0.4940	
360 minute winter	Tank C	1.003	Tank D	33.7	0.781	0.430	0.7532	
360 minute winter	7	4.000	Tank D	1.1	0.426	0.017	0.6778	
360 minute winter	Tank D	1.004	10	49.6	1.246	0.540	0.4495	
360 minute winter	9	5.000	10	2.9	0.349	0.015	0.1102	
360 minute winter	10	1.005	OUT	50.5	1.269	1.693	0.7990	134.5

Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 98.84%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	11	6.572	0.322	41.9	0.6147	0.0000	SURCHARGED
480 minute winter	Tank A	456	6.197	1.197	6.0	51.6189	0.0000	SURCHARGED
360 minute winter	3	352	5.212	1.197	4.8	2.1017	0.0000	FLOOD RISK
360 minute winter	4	352	5.211	1.411	6.6	1.9587	0.0000	FLOOD RISK
360 minute winter	Tank B	352	5.211	1.491	12.3	82.7641	0.0000	SURCHARGED
360 minute winter	6	336	4.100	0.525	4.7	1.4590	2.1750	FLOOD
360 minute winter	Tank C	344	4.100	0.950	11.2	90.5832	0.0000	SURCHARGED
360 minute winter	7	344	4.100	0.725	1.6	0.9708	0.0000	SURCHARGED
360 minute winter	Tank D	344	4.100	1.050	36.7	44.3510	0.0000	SURCHARGED
360 minute winter	9	336	4.100	1.065	2.2	1.5146	0.0000	SURCHARGED
360 minute winter	10	336	4.100	1.450	52.8	1.6400	1.5665	FLOOD
15 minute summer	OUT	240	5.633	3.050	53.0	0.0000	0.0000	OK

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 winter	1	1.000	Tank A	38.3	2.314	1.005	0.3490	
480 minute winter	Tank A	Orifice	Tank B	0.9				
360 minute winter	3	2.000	4	4.5	0.545	0.093	0.6462	
360 minute winter	4	2.001	Tank B	6.4	0.538	0.090	1.3680	
360 minute winter	Tank B	Orifice	Tank C	2.1				
360 minute winter	6	3.000	Tank C	4.7	0.877	0.077	0.5004	
360 minute winter	Tank C	1.003	Tank D	35.7	0.848	0.456	0.7532	
360 minute winter	7	4.000	Tank D	1.4	0.459	0.021	0.6778	
360 minute winter	Tank D	1.004	10	52.3	1.315	0.569	0.4495	
360 minute winter	9	5.000	10	2.8	0.341	0.014	0.1102	
360 minute winter	10	1.005	OUT	53.2	1.339	1.787	0.7990	177.2

Appendix A.5 – Indicative Drainage Layout

House

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GENERAL NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALISTS DRAWINGS AND THE SPECIFICATION.
2. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE RELEVANT BRITISH STANDARDS, EUROPEAN NORMS, CODES OF PRACTICE AND BUILDING PRACTICE.
3. ALL DIMENSIONS ARE TO BE CHECKED BY THE CONTRACTOR PRIOR TO STARTING THE WORKS ON SITE. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
4. ALL DRAINAGE SYSTEMS WILL NEED TO BE INSTALLED AND DESIGNED FOR SUITABLE LOADING REQUIREMENTS.
5. THE CONTRACTOR SHALL OBTAIN PRIOR APPROVAL AND ALL NECESSARY LICENCES FROM THE HIGHWAY AUTHORITY AND/OR SEWERAGE UNDERTAKER BEFORE CARRYING OUT ANY WORKS.

KEY:

- CL: XX.XX
IL: XX.XX
- EXISTING SURFACE WATER SEWER
- EXISTING SURFACE WATER CHAMBER
- SURFACE WATER DRAIN
- SURFACE WATER MANHOLE
- FLOW CONTROL DEVICE
- GEOCELLULAR STORAGE

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Rev	Description	Author	Checked	Date
P3	SWMS update following EA comments	EC	SMB	03/11/21
P2	Layout update	EC	SMB	15/06/21
P1	First issue	EC	SMB	28/04/21

CLIENT
MILE PROPERTY GROUP

PROJECT
SWMS - The Terrace, Gravesend

SCALE 1:200	PROJ REF 2813	ORIGINATOR EC	CHECKED BY SMB
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DWG REF INDICATIVE DRAINAGE LAYOUT	DWG No. HC-2813-501
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SCALE 1 : 200 @ A1
10 m 0 10 m

CLARENDON ROAD

Milton Chantry
Heritage Centre

EXCLUSION ZONE FOR FUTURE
MAINTENANCE, UPGRADE AND
RAISING OF FLOOD DEFENSES

EXISTING FRENCH DRAIN AND
SLOT DRAIN TO BE
MAINTAINED OR REPLACED BY
NEW SLOT DRAINS

EXISTING
OUTFALL

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CL: 4.80
IL: 3.38

MH 4
CL: 5.30
IL: 3.80

MH 3
CL: 5.44
IL: 4.02

MH 2
CL: 5.70
IL: 5.00

MH 1
CL: 7.60
IL: 6.25

MH 10 (Existing)
CL: 4.10
IL: 2.65

MH 9
CL: 4.46
IL: 3.04

MH 8
CL: 4.45
IL: 3.05

MH 7
CL: 4.58
IL: 3.20

MH 6
CL: 4.80
IL: 3.38

MH 4
CL: 5.30
IL: 3.80

MH 3
CL: 5.44
IL: 4.02

MH 2
CL: 5.70
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MH 10 (Existing)
CL: 4.10
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MH 9
CL: 4.46
IL: 3.04

MH 8
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MH 7
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CL: 4.46
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MH 8
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MH 7
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MH 4
CL: 5.30
IL: 3.80

MH 3
CL: 5.44
IL: 4.02

MH 2
CL: 5.70
IL: 5.00

MH 1

Appendix A.6 – Maintenance Schedules

Operation and Maintenance Schedule – Geo-Cellular Storage System

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months then annually
	Remove debris and sediment from the catchment surface, wherever it presents a risk to the performance of the drainage system,	Monthly, or as required based on inspection frequencies.
	Remove sediment from pre-treatment structures (e.g. sediment traps) and from internal forebays	Annually or as required based on inspection frequencies
Remedial Actions	Repair; inlets, outlets, overflow pipes, and vent mechanisms	As required, based on inspections
	Replace tank or geotextile if significant damage is observed or geotextile is torn.	As required
Monitoring	Inspect and check all inlets, outlets, vents, and overflows to ensure that they are in good condition and operating as designed.	Following installation, and annually hereafter
	Survey inside of tank, and at any sediment trap mechanisms, for sediment build-up and remove sediment if necessary. Use inspections to develop a regular maintenance and inspection procedure for sediment removal.	Every 5 years, or as required if inspections show high siltation rates.

General Operation and Maintenance Table for Geo-Cellular Storage Systems

Appendix A.7 – CCTV Survey



247 DRAINAGEUK LTD
 1 BLACHINGTON ROAD
 HOVE
 Tel: 01273 257 352
 Fax:
 Email: info@247drainageuk.com

Project-information

Project name :
Custom House

Project Number :

Contact :

Date :
15/10/2021

Client: **Mile Property Group**
 Contact Name:
 Department:
 Road:
 Town:
 County:
 Telephone:
 Fax:
 Mobile:
 E-mail:

Site: **Custom House**
 Contact Name:
 Department:
 Road: **The Terrace**
 Town: **Gravesend**
 County: **Kent, DA12 2BW**
 Telephone:
 Fax:
 Mobile:
 E-mail:

Contractor **247 DRAINAGEUK LTD**
 Contact Name:
 Department:
 Road: **1 BLACHINGTON ROAD**
 Town: **HOVE**
 County:
 Telephone: **01273 257 352**
 Fax:
 Mobile:
 E-mail: **info@247drainageuk.com**

Defect Grade Description

Project Name :
Custom House

Project number :

Contact :

Date :
15/10/2021

1:

Brick: No Structural Defects
Pipe: No Structural Defects

Acceptable Structural Condition

2:

Brick: Minor cracking, Surface mortar loss, Spalling slight, wear slight
Pipe: Circumfrential crack, Moderate joint defects, Spalling slight, Wear slight

Minor collapse risk in short term but potential for further deterioration

3:

Brick: Total mortorloss without other defects, single brick displaced, Deformation up to 5%, Spalling medium, Wear medium
Pipe: Fractures with deformation up tp 5%, Longitudinal cracking or mulitlpe cracking, Minor loss of level, More severe joint

! Collapse unlikely in near future but future deterioration likely !

4:

Brick: Total mortorloss with deformation greater than 10%, Deformation up to 10% and fractured, Displaced/hanging brickwork, Small number of missing bricks
Pipe: Broken, Deformation up to 10% and broken,, Fractured with deformation 5 - 10%, Multipl

!! Collapse likely in foreseeable future !!

5:

Brick: Already Collapsed, Missing invert, Deformation over 10% and fractured, Displaced/hanging brickwork and deformation over 10%, Extensive missing bricks
Pipe: Already collapsed, Deformation over 10% and broken, Extensive areas of fabric missin

!!! Collapsed or collapse imminent !!!

Place:



247 DRAINAGEUK LTD
1 BLACHINGTON ROAD
Street : HOVE
Tel: 01273 257 352
Fax:
Email: info@247drainageuk.com

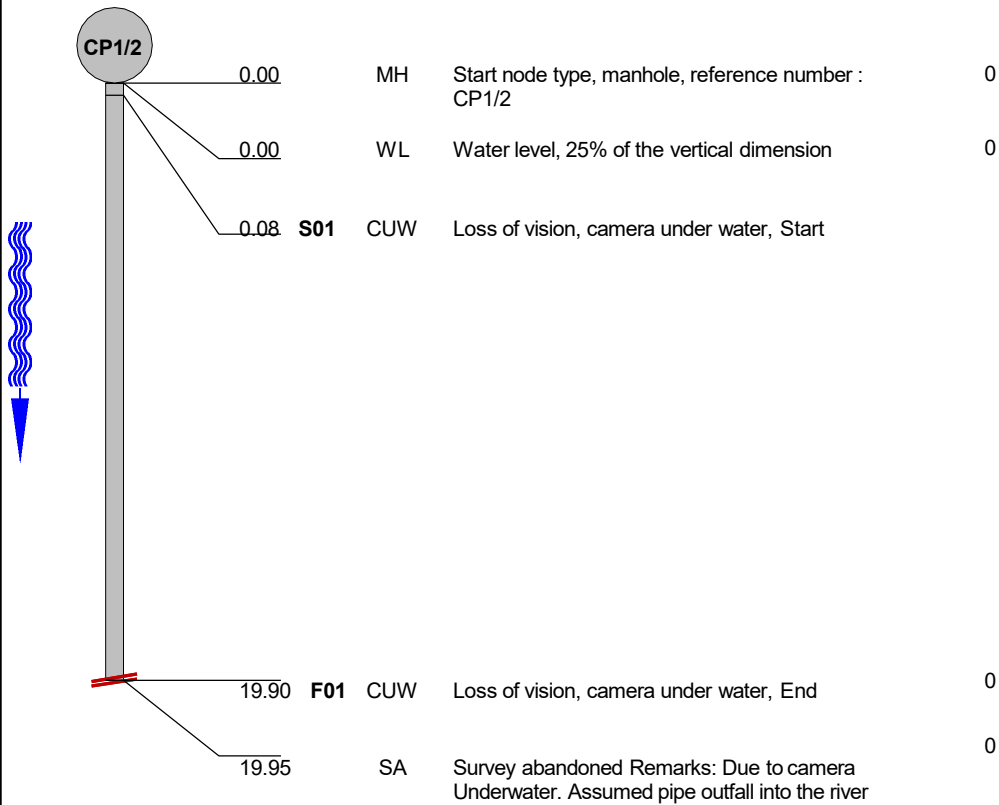
Inspection report

Date : 06/10/2021	Job number :	Weather : no rain or snow	Operator : JF PD	Section number : 1	PLR SUFFIX: X
Weather no rain or snow	Vehicle :	Camera : Push Rod	Preset :	Cleaned :	Operator : JF PD

Place : Road : Location Inspection	Gravesend Custom House, The Terrace Other (state in comments) CP1/2 (D/S) Outlet	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	CP1/2 3.2 Outlet
Direction Use: Year laid : Purpose : Total length :	Surface water Z Sample survey to determine asset condition 19.95 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 225 mm Vitrified clay	

Comment :

1:50 Position Code Observation Grade
Depth: 3.2



STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	0	0	0	1	0	0	0	0	1

Place :



247 DRAINAGEUK LTD
1 BLACHINGTON ROAD
HOVE
Tel: 01273 257 352
Fax:
Email: info@247drainageuk.com

ΣØ / Main sections and Site map

Project name :
Custom House

Project number :

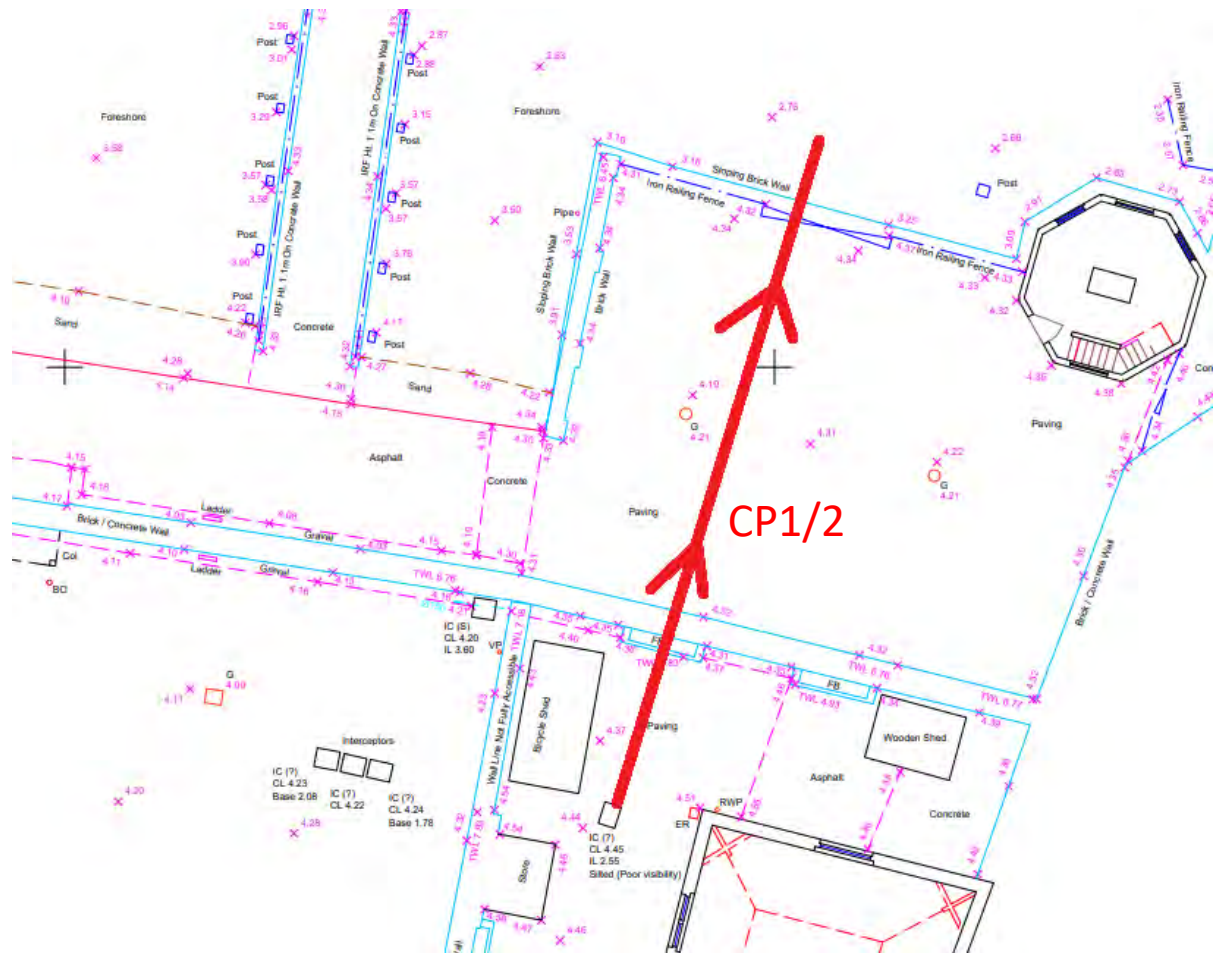
Contact :

Date :
15/10/2021

Nr.	US MH	DS MH	Date	Road	Tape No.	Material	m	(m)
1	CP1/2	Outlet	06/10/2021	Custom House, The Terrace		Vitrified clay	19.95	19.95

Pipe size: CIRCULAR 225

Site map showing approximate location of CP1/2



Place :



247 DRAINAGEUK LTD
 1 BLACHINGTON ROAD
 HOVE
 Tel: 01273 257 352
 Fax:
 Email: info@247drainageuk.com

Service / Operational Defects (SRM 4)

Project name :
Custom House

Project Number :

Contact :

Date :
15/10/2021

No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Peak HWG	Peak Score	Grade	Mean Score	Total Score
1	CP1/2X	D	S	C 225	06/10/2021	VC	19.95	19.95	-	0	1	0	0

Place :



247 DRAINAGEUK LTD
 1 BLACHINGTON ROAD
 HOVE
 Tel: 01273 257 352
 Fax:
 Email: info@247drainageuk.com

Structural Defects (SRM 4)

Project name :
Custom House

Project Number :

Contact :

Date :
15/10/2021

No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Peak HWG	Peak Score	Grade	Mean Score	Total Score
1	CP1/2X	D	S	C 225	06/10/2021	VC	19.95	19.95	-	0	1	0	0

Appendix A.8 – Meeting Minutes (20th October 2021)

Minutes



Meeting Date: Wednesday 20th October

Meeting Location: Microsoft Teams

Project: The Terrace, Gravesend

Attendance:

David Sankar (DS) – Environment Agency (EA)

Katie Boon (KB) – Environment Agency

Sophie Page (SP) – Environment Agency

Harry Washington-Smith (HWS) – Environment Agency

Michael Keckes (MK) – Mile Property Group (MPG)

Toby Vaughan (TV) – Herrington Consulting (HC)

Elena Corchon (EC) – Herrington Consulting

Introductions:

TV asks everyone to introduce themselves and provides a brief summary of the purpose of the meeting, which was to discuss the objection letter received from the EA on 18th August 2021 and to seek agreement in principle from the EA regarding the approach to be adopted.

Objection 1: Raising of Tidal Defences

TV summaries first EA objection. TV states that the intrusive flood defence condition survey has now been completed and report drafted. The report concludes that the residual life of the defences is 100yr + and that there are options available to raise the flood wall in line with the 2040 - 2070, and following that 2070 - 2115, requirements.

MK confirms works were completed a few weeks ago and draft report is finished. Will be issued once it has been signed off. Reiterated that the conclusions of the report are that the existing structure has residual life 100yr+ subject to some remedial works. MK also noted that the three options for raising the wall are included within the survey report.

HWS asked if anchor testing was carried out. MK confirmed that there are no anchors within the development site. The only anchor noted is outside the ownership (on Port of London Authority land) as specified in the report, and therefore anchor testing will not be required. MK asked if EA require any further information. KB stated that the EA would need to review the survey report before confirming if the EA require any further information.

TV asked when the defence wall had to be raised to meet the required levels for the 2040-2070 epoch. KB answered that the wall would have to be raised by the year 2040 (i.e. at 6.9m AODN by 2040) and it would need to be demonstrated how this would be done. KB also mentioned that the 2070 – 2115 requirements (8m AODN) would need to be achieved in the future. TV asked if the 10 year review of the TE2100 would have any implications on the site, as it was mentioned in the initial pre-app. KB and HWS confirmed the report was due for issue in 2022, but

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wouldn't affect the required defence levels. KB stated the report may affect when the 2040 defence levels are required to be in place, but not currently known for certain.

KB asked if MK is looking to implement the raising now or in the future. MK confirmed that the works would be carried out in the future. KB stated that the EA requests such information to ensure that there is sufficient space for defences to be upgraded. MK reiterated that the options are in the report to be reviewed, they are not detailed design but happy for a condition to be placed that this is carried out in the future. MK mentioned that a fund would likely be in place for future leaseholder/freeholders to contribute to the works. MK stated that the main points of the objection were the residual life was sufficient and the wall could be raised, these concerns are answered in the report. EA to review report.

MK clarifies that MPG will send the survey report and asks if, as long as the two points (residual life and raising) are answered, the EA will be happy with that and will require further design as a condition. KB responded that the EA will need to look at it to ensure that it is buildable and have enough space. EA to confirm following review of report.

KB states will also need to make sure there is enough working space without having to reroute any services. MK confirmed that a mixture of desktop and intrusive service investigations had been carried out and the services are shown in the survey report. HWS will need to look at the report before confirming if anything else is required.

Objection 2: Proximity to Thames Tidal Defences

EC provided details of the redesigned drainage system. The originally proposed single storage tank directly adjacent to the defences has been replaced by a series of smaller tanks, at least 10m from the wall. EC asked if this is acceptable to the EA. KB & HWS responded that they will respond after seeing the survey report, and the proposals to raise the wall.

EC confirmed that an existing outfall had been located on site, had been cleaned and surveyed and was considered suitable to utilise. KB agreed that using the existing outfall would be the preferred option, provided it has adequate capacity.

EC asked what information the EA require for the access steps over the defences to be acceptable. MK added that the flood gate would be decommissioned and therefore access will be required over the wall. MK also added that the steps would be removed to allow the defence to be raised in the future and reinstated after the works are completed. MK asked, considering the above, would this be acceptable, and what would be required to be submitted. KB confirmed that steps are present elsewhere and are preferable to a flood gate. KB suggested that as long as the steps do not obscure the defences (to prevent inspection) and are removable, should be acceptable in principle, although further information would be required. MK stated that MPG will provide details of the steps and confirmation that they will be movable to allow raising.

MK confirmed that the survey report concludes the riverside hardstanding structure is independent of the flood wall. MK clarified that the works to the hardstanding are not intrusive, and it is simply envisaged to clean and undertake remedial works to this area.

EC asked the EAs requirements in relation to parking and vegetation adjacent to the defences. KB stated that parking is generally fine as it's a flat space and the EA can still access defences, but will need to review a landscaping plan to comment on vegetation.

TV asked if the private garden in the northeast corner of the site adjacent to the defences is acceptable, provided the EA has access to the gardens for inspection of the wall. KB said that looking at layout, the EA won't allow hedges that close to the wall as they will prevent visual inspection, ideally these should be offset. In regard to the garden, KB stated that it would be acceptable provided that the residents are aware that if they do any works on the garden they will require a permit. MK responded that a clause will be included stating the EA will have access to specific areas for inspection and maintenance of the wall and permits will be required for works in that area.

MK asks what offset would be required for the proposals to be accepted. KB will check and come back as they will need to have enough space to work on the wall. KB mentioned that it is preferable for any planting to be movable (i.e. potted) and that will be acceptable providing at least 1m easement is in place. This applies around the whole wall.

MK asked if the cycle storage in the north west corner is acceptable if there is 1m easement from wall. KB confirmed that is ok, so long as no permanent structure is erected. MK asked how often inspections are carried out. KB responded it would likely be twice yearly in this location.

Any other business:

HWS asked if any works are proposed to the two piers. MK explained that these are under the ownership of the previous site owner still and not in MPG control.

Meeting ends.

Actions

MK to provide finalised defence condition survey report, details of steps, landscaping plan and CCTV survey.

HC to provide updated drainage strategy showing relocated storage tanks and use of existing outfall.

EA to review documentation when received and confirm if any further information required.

Following EA acceptance, MK to provide information to the planning officer.