CONSULTING CIVIL AND STRUCTURAL ENGINEERS

FORMER HOWARD KENT DEVELOPMENT SHOREHAM-BY-SEA

PART RESPONSE TO PLANNING CONDITION 11 – PILING WORKS AND CONTAMINATION AWDM/1962/22

21 NOVEMBER 2024

Ref: 16050/05/HOP/RPT/02

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Prepared by	Checked by	Approved by	Revision
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1.0 INTRODUCTION

1.1.1 HOP Consulting Limited (HOP) have been requested to respond, in part, to Condition 11 pertinent to the replacement of the existing river wall for the proposed development at the former Howard Kent site, Shoreham by Sea ref: AWDM/1962/22

1.1.2 Planning Permission has been granted for the following proposal:

1.1.3 *The development proposed is a mixed-use re-development comprised of townhouses, mixed-use apartment block, commercial development, riverside walk, landscaping, and parking. Mixed-use redevelopment comprised of three blocks of residential dwelling (4 to 8 storeys) and mixed-use business centre (office, storage and café used) – Incorporating riverside walk, landscaping and ancillary car and cycle parking.*

2.0 DETAIL OF PLANNING CONDITION 11

2.1 The wording of Planning Condition No. 11 is as follows:

Piling Works and Contamination: With the exception of any Enabling Works, development shall not commence until details of any foundation design and method using piling or penetrative methods have been submitted and approved in writing by the Local Planning Authority including information to show that there is no resultant unacceptable risk to the water environment, including groundwater and the River Adur. The development shall be carried out in accordance with the approved details.

3.0 INFORMATION PRODUCED PURSUANT TO CONDITION DISCHARGE

3.1.1 Various piling works and penetrative methods are proposed throughout the site. The management of the contamination risk for the sheet piling works considered below.

3.2 CFA Piling Works to the Landside Structures

3.2.1 Considered by others.

3.3 Works to Replace the River Wall

3.3.1 As part of the development, the marine works entail the construction of a new 118m long river wall upgrade and promenade walkway along the frontage of the scheme, generally following the alignment of the existing river wall and will include a new concrete capping beam.

3.3.2 A survey of the existing wall carried out by HOP observed low thickness readings of remaining steelwork for the existing wall, and it is deemed to have deteriorated to an extent that it is unstable and is not suitable for reuse over a 100-year design life.

3.3.3 The existing Howard Kent site comprises of a historic quay wall that forms part of the Shoreham Port Western Harbour Arm. The existing quay wall is approximately 118m in length. Approximately 68m of this is a linear raked steel sheet piled (SSP) quay wall frontage, the remaining length being a shallower return wall.

3.3.4 It is proposed to replace the existing wall for the entire length. The broad scheme shown in Figure 1 is to be adopted for the works.

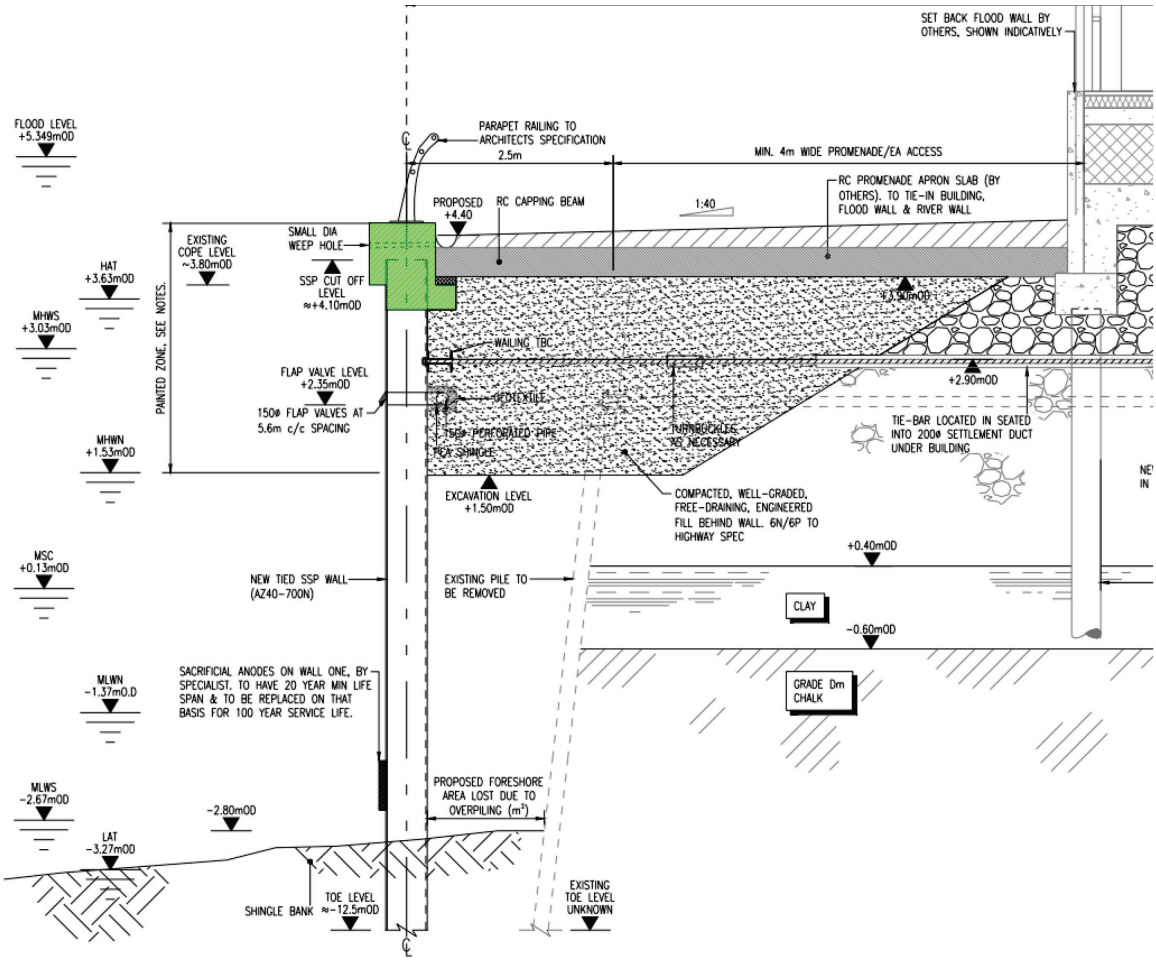


Figure 1 – Concept showing new Steel Sheet Piled (SSP) wall, walings, tie-bars and SSP anchor wall (in the over-piled wall section "Wall 1").

3.3.5 The proposals include a Steel Sheet Piled (SSP) new river wall frontage, with waling & tie-bar connections back to an embedded SSP anchor-wall. All new loading is applied to the SSP wall which retains the site. Restraining forces are spread to the set-back anchor-wall which provides additional resistance.

3.3.6 At "Wall 1" to the West of the site adjoining Kingston Wharf Development, a continuous over-piled SSP wall will be installed at approximately 2.5m offset into the river. This approach avoids the need to remove historic raked piling which is in very poor condition. Whilst this does cause some encroachment into the river, this is protected by the natural shingle bank directly to the East. In terms of navigational risk this has been agreed with Shoreham Port and is seen as a reasonably practical approach to minimise the risk of not being able to extract dilapidated historic piling.

3.3.7 The over piling of Wall 1 significantly reduces the risk of releasing existing fill materials and possible contaminants into the river. Therefore, Wall 1 over piling is deemed to pose little risk to the water environment.

3.3.8 Along the rest of the site to the East at "Wall 2, 3 and 4", the continuous SSP wall will be "under-piled" and constructed behind the existing pile line approximately 1m offset behind.

At Wall 2, this will be tied back to an anchor wall in a similar way to Wall 1, by using the tie-bar anchorage system. Walls 3 and 4 will be cantilever walls requiring no anchorage.

3.3.9 In all situations, the existing river wall effectively becomes structurally redundant. It will be left in place and cut down below ground level.

3.3.10 See Appendix A for HOP drawings 16050-HOP-05-XX-DR-S-0001, 0003 and 0004 detailing the new river wall and anchorage construction.

3.4 Measures to be Taken Behind the Existing Wall to Minimise and Manage Risk of Contamination

3.4.1 A Combined Geotechnical and Ground Contamination Risk Assessment has been completed by Ashdown Site Investigation (Ref: P16596) dated 7/6/24. An excerpt of the Executive Summary is as follows:

The preliminary contamination risk assessment identified potential pollutant linkages relating to proposed end users of the site.

The ground investigation recorded the underlying made ground to contain concentrations of lead and PAH compounds that are considered to pose an unacceptable risk to end users of the site. In addition, the concentrations of petroleum hydrocarbons and BTEX compounds recorded will likely require the use of barrier pipe for new water supply runs.

3.4.2 A Remediation Strategy has been completed by Ashdown Site Investigation (Ref: C16692) dated 12/7/24. The remediation strategy covers mitigation for protecting human health, which includes soft landscaping requirements, protection of services and protection of workers. Regarding protecting controlled waters, the assessment states:

The risk assessment did not identify any unacceptable risks to controlled waters beneath the site and therefore no specific remedial works are considered necessary in this regard.

3.4.3 Notwithstanding this, all works in and around the riverside/ marine environment will be carried out in accordance with the Environment Agency (EA) pollution prevention guidance note PPG5. Any contaminated material identified on site will be dealt with in accordance with the Remediation Strategy.

3.4.4 Any contamination is thought to be in the upper made ground on site. The sequencing of the new wall installation requires excavation down to +1.50mOD before under-piling, so that the new wall (and old) remains stable in the temporary case. This also provides mitigation against contamination, by removing the made ground materials.

3.4.5 Likewise, the landside anchor wall requires excavation down to +2.00mOD before piling, to allow pile head access.

3.4.6 This reduced dig is likely below the level of any potential contamination and therefore, the removal of the non-hazardous material prior to installing the SSP removes the risk of down drag or creating contamination pathways to the river or underlying chalk aquifer.

3.4.7 This strategy has been developed with initial consultation with the EA and Shoreham Port. Please note that the proposals will be submitted shortly to the EA using the Flood Related Activity Permit (FRAP) procedure.

3.4.8 Within a parallel application, the details will also be submitted to the Marine Management Organisation (MMO) for licencing and to the Harbour Authority for a Works License.

4.0 CONCLUSIONS

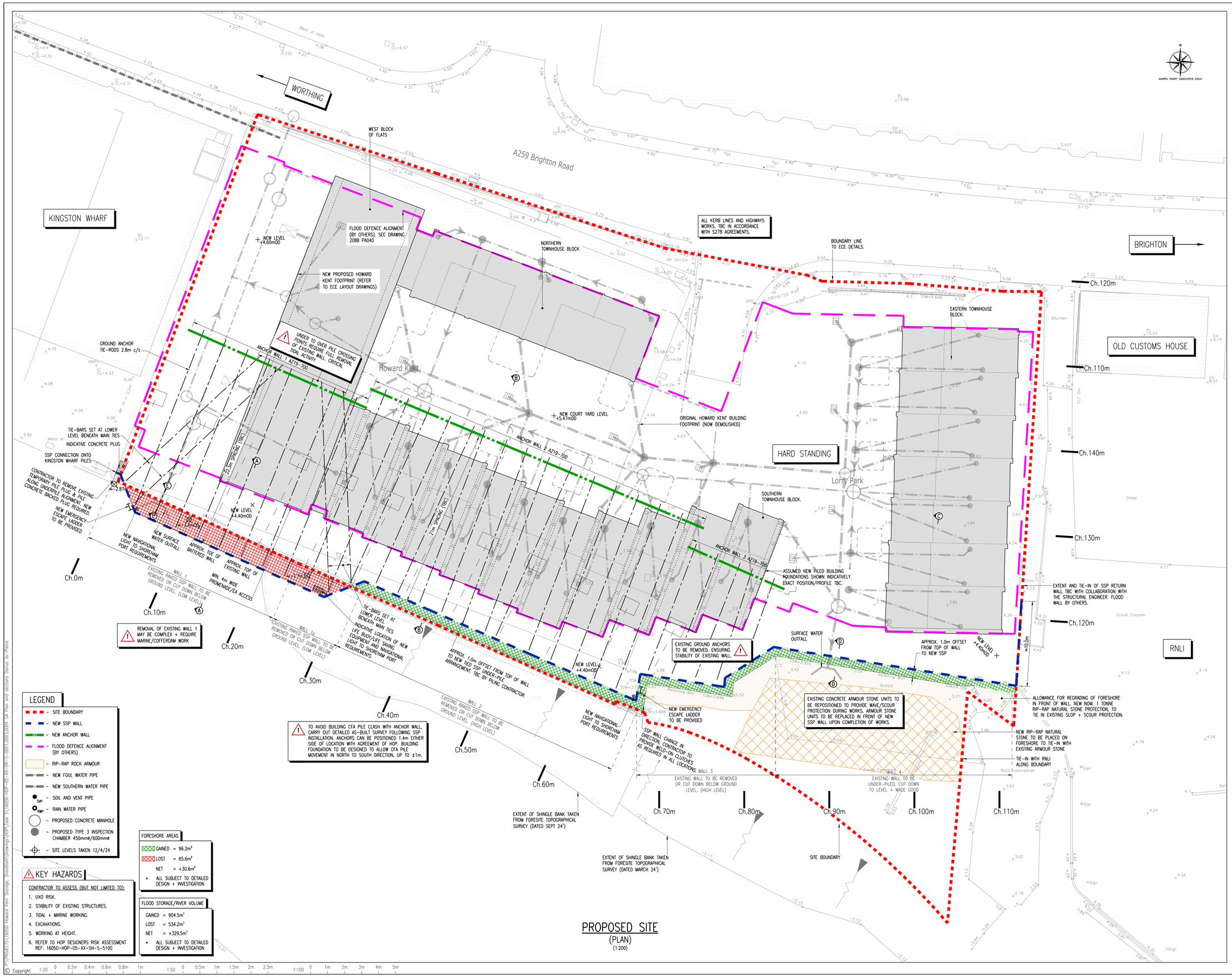
4.1 The appended drawings describe and clarify the requested details of the steel sheet piling replacement works for the existing river wall at the Howard Kent development and is considered to satisfy the requirements of the respective Planning Condition No. 11.

4.2 The licensable river wall works have now been submitted for approval by the MMO. The EA and Shoreham Port will be major consultees for this license and separate applications will also be made to these bodies for approval.

4.3 We trust that the above demonstrates that the river wall works have been designed in an appropriate way to manage contamination risks.

4.4 For any questions and clarifications, please do not hesitate to contact the authors of this report.

APPENDIX A - DRAWINGS



LEGEND

- SITE BOUNDARY
- NEW SSP WALL
- NEW ANCHOR WALL
- FLOOD DEFENCE ALIGNMENT (BY OTHERS)
- RIP-RAP ROCK ARMOUR
- NEW FOUL WATER PIPE
- NEW SOUTHERN WATER PIPE
- SVP – SOIL AND VENT PIPE
- RWP – RAIN WATER PIPE
- PROPOSED CONCRETE MANHOLE
- PROPOSED TYPE 3 INSPECTION CHAMBER 450mmø/600mmø
- SITE LEVELS TAKEN 12/4/24

⚠ KEY HAZARDS

CONTRACTOR TO ASSESS (BUT NOT LIMITED TO):

1. UXO RISK.
2. STABILITY OF EXISTING STRUCTURES.
3. TIDAL + MARINE WORKING.
4. EXCAVATIONS.
5. WORKING AT HEIGHT.
6. REFER TO HOP DESIGNERS RISK ASSESSMENT REF: 16050-HOP-05-XX-SH-S-5100

FORESHORE AREAS

- GAINED = 96.2m²
- LOST = 65.6m²
- NET = +30.6m²
- ALL SUBJECT TO DETAILED DESIGN + INVESTIGATION

FLOOD STORAGE/RIVER VOLUME

- GAINED = 904.5m³
- LOST = 534.2m³
- NET = +329.5m³
- ALL SUBJECT TO DETAILED DESIGN + INVESTIGATION

PROPOSED SITE
(PLAN)
(1:200)

1:20 0 0.2m 0.4m 0.6m 0.8m 1m
1:50 0 0.5m 1m 1.5m 2m 2.5m
1:100 0 1m 2m 3m 4m 5m
1:200 0 2m 4m 6m 8m 10m

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P:\PROJECTS\16050 Howard Kent Storage, Shoreham\Drawings\HOP\Issue 3\16050-HOP-05-XX-DR-S-0001.00013.0004 GA Plan and sections Issue 3.rvt

Project/Task No. 16050/05 Scale: AS SHOWN ORIGINAL DRAWING SIZE A1

1. GENERAL

(i) This drawing is not to be scaled, work to figured dimensions only, confirmed on site.

(ii) This drawing is to be read in conjunction with all relevant architectural drawings, detailed specifications where applicable and all associated drawings in this series.

(iii) Any discrepancy on this drawing is to be reported immediately to HOP for clarification.

(iv) The contractor is responsible for all temporary works and for the stability of the works in progress.

(v) Topographical plan based on Foresite Geomatics dwg No. 24512-01 dated March 2024.

2. MARINE WORKING

(i) All levels to metres above Ordnance Datum (mOD).

(ii) Local Chart Datum (CD) 0.00mCD is approximately equivalent to Lowest Astronomical Tide (LAT) −3.27mOD

(iii) Tide levels are based on Admiralty tides as follows:
- Highest Astronomical Tide (HAT) +3.63mOD
- Mean High Water Springs (MHWS) +3.03mOD
- Mean Low Water Springs (MLWS) −2.67mOD
- Lowest Astronomical Tide (LAT) −3.27mOD

(iv) Contractor to note risks associated with marine environment and tidal working.

(v) Tide times to be checked prior to commencing any tidal working. Contractor to plan work cut off times in advance, based on tidal and weather predictions and ensure any plant and equipment unsuitable for submerging are removed prior to before the cut off time.

(vi) Tidal predictions do not take into account possible changing pressure and weather events, therefore actual tide levels may be greater than the predicted level.

3. MARINE ENVIRONMENT

(i) All works shall be completed with reference to the Environment Agency Pollution Prevention guidance, PPG5. It is understood that this guidance document is now withdrawn; however this still represents 'Best Practice'.

(ii) All works shall be completed with reference to CIRIA C744 Coastal and Marine Environmental Site Guide.

4. MARINE STATUTORY AUTHORITIES

(i) All works are subject to EA, MMO and local authority approval and licensing. The contractor shall allow for compliance with licence conditions and liasing with statutory authorities.

5. DESIGN DEVELOPMENT

(i) Refer to HOP inspection of existing structures dated 12/04/24.

(ii) The soil parameters are taken from LEAP PHASE II site investigation report, dated 30th September 2024.

(iii) Incomplete record drawings available from Shoreham Port.

(iv) RIBA stage 3 design only, subject to detailed design.

(v) Foreshore levels taken from Foresite Geomatics sea wall survey drawing 24092-01 dated September 2024. And based on HOP site inspection on 12/04/24.

(vi) CFA pile clash risk to be managed by the contractor.

(vii) Refer to HOP risk assessment for key H&S risks.

Description	By	Aprvd.	Date	Rev.
ISSUED FOR TENDER	DJP	TJB	15.11.24	P5
ISSUED FOR INFORMATION	DJP	TJB	20.09.24	P4
ISSUED FOR INFORMATION	DJP	TJB	22.08.24	P3
ISSUED FOR INFORMATION	DJP	TJB	16.08.24	P2
ISSUED FOR INFORMATION	DJP	TJB	28.06.24	P1

TENDER DRAWING
NOT FOR CONSTRUCTION

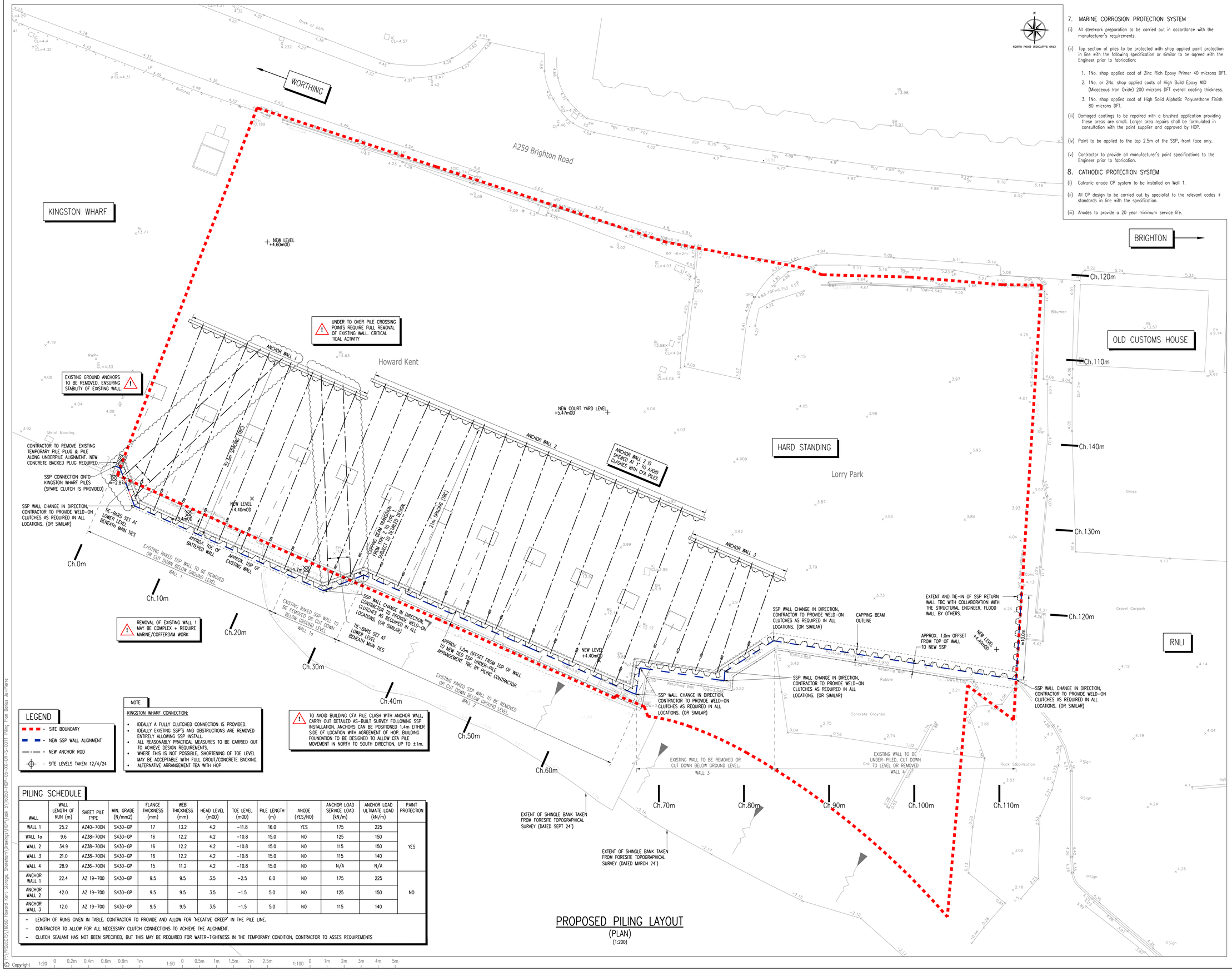
Title: GENERAL ARRANGEMENT, MARINE WORKS

Project: FORMER HOWARD KENT SITE SHOREHAM-BY-SEA

Client: CAYUGA DEVELOPMENT LTD.

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Drawing No. 16050-HOP-05-XX-DR-S-0001
Status D2
Rev. P5



LEGEND

- SITE BOUNDARY
- NEW SSP WALL ALIGNMENT
- NEW ANCHOR ROD
- SITE LEVELS TAKEN 12/4/24

NOTE

KINGSTON WHARF CONNECTION:

- IDEALLY A FULLY CLUTCHED CONNECTION IS PROVIDED.
- IDEALLY EXISTING SSP'S AND OBSTRUCTIONS ARE REMOVED ENTIRELY ALLOWING SSP INSTALL.
- ALL REASONABLY PRACTICAL MEASURES TO BE CARRIED OUT TO ACHIEVE DESIGN REQUIREMENTS.
- WHERE THIS IS NOT POSSIBLE, SHORTENING OF TOE LEVEL MAY BE ACCEPTABLE WITH FULL GROUT/CONCRETE BACKING.
- ALTERNATIVE ARRANGEMENT TBA WITH HOP

PILING SCHEDULE

WALL	WALL LENGTH OF RUN (m)	SHEET PILE TYPE	MIN. GRADE (N/mm2)	FLANGE THICKNESS (mm)	WEB THICKNESS (mm)	HEAD LEVEL (m0D)	TOE LEVEL (m0D)	PILE LENGTH (m)	ANODE (YES/NO)	ANCHOR LOAD SERVICE LOAD (kN/m)	ANCHOR LOAD ULTIMATE LOAD (kN/m)	PAINT PROTECTION
WALL 1	25.2	AZ40-700N	S430-GP	17	13.2	4.2	-11.8	16.0	YES	175	225	YES
WALL 1a	9.6	AZ38-700N	S430-GP	16	12.2	4.2	-10.8	15.0	NO	125	150	
WALL 2	34.9	AZ38-700N	S430-GP	16	12.2	4.2	-10.8	15.0	NO	115	150	
WALL 3	21.0	AZ38-700N	S430-GP	16	12.2	4.2	-10.8	15.0	NO	115	140	
WALL 4	28.9	AZ36-700N	S430-GP	15	11.2	4.2	-10.8	15.0	NO	N/A	N/A	
ANCHOR WALL 1	22.4	AZ 19-700	S430-GP	9.5	9.5	3.5	-2.5	6.0	NO	175	225	NO
ANCHOR WALL 2	42.0	AZ 19-700	S430-GP	9.5	9.5	3.5	-1.5	5.0	NO	125	150	
ANCHOR WALL 3	12.0	AZ 19-700	S430-GP	9.5	9.5	3.5	-1.5	5.0	NO	115	140	

- LENGTH OF RUNS GIVEN IN TABLE. CONTRACTOR TO PROVIDE AND ALLOW FOR 'NEGATIVE CREEP' IN THE PILE LINE.
- CONTRACTOR TO ALLOW FOR ALL NECESSARY CLUTCH CONNECTIONS TO ACHIEVE THE ALIGNMENT.
- CLUTCH SEALANT HAS NOT BEEN SPECIFIED, BUT THIS MAY BE REQUIRED FOR WATER-TIGHTNESS IN THE TEMPORARY CONDITION, CONTRACTOR TO ASSES REQUIREMENTS

PROPOSED PILING LAYOUT
(PLAN)
(1:200)

7. MARINE CORROSION PROTECTION SYSTEM

(i) All steelwork preparation to be carried out in accordance with the manufacturer's requirements.

(ii) Top section of piles to be protected with shop applied paint protection in line with the following specification or similar to be agreed with the Engineer prior to fabrication:

1. 1No. shop applied coat of Zinc Rich Epoxy Primer 40 microns DFT.
2. 1No. or 2No. shop applied coats of High Build Epoxy MIO (Micaceous Iron Oxide) 200 microns DFT overall coating thickness.
3. 1No. shop applied coat of High Solid Aliphatic Polyurethane Finish 80 microns DFT.

(iii) Damaged coatings to be repaired with a brushed application providing these areas are small. Larger area repairs shall be formulated in consultation with the paint supplier and approved by HOP.

(iv) Paint to be applied to the top 2.5m of the SSP, front face only.

(v) Contractor to provide all manufacturer's paint specifications to the Engineer prior to fabrication.

8. CATHODIC PROTECTION SYSTEM

(i) Galvanic anode CP system to be installed on Wall 1.

(ii) All CP design to be carried out by specialist to the relevant codes + standards in line with the specification.

(iii) Anodes to provide a 20 year minimum service life.

1. GENERAL

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(iii) Any discrepancy on this drawing is to be reported immediately to HOP for clarification.

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- Mean High Water Springs (MHWS) +3.03m0D
- Mean Low Water Springs (MLWS) -2.67m0D
- Lowest Astronomical Tide (LAT) -3.27m0D

(iv) Contractor to note risks associated with marine environment and tidal working.

(v) Tide times to be checked prior to commencing any tidal working. Contractor to plan work cut off times in advance, based on tidal and weather predictions and ensure any plant and equipment unsuitable for submerging are removed prior to before the cut off time.

(vi) Tidal predictions do not take into account possible changing pressure and weather events, therefore actual tide levels may be greater than the predicted level.

3. MARINE ENVIRONMENT

(i) All works shall be completed with reference to the Environment Agency Pollution Prevention guidance, PPG5. It is understood that this guidance document is now withdrawn; however this still represents 'Best Practice'.

(ii) All works shall be completed with reference to CIRIA C744 Coastal and Marine Environmental Site Guide.

4. MARINE STATUTORY AUTHORITIES

(i) All works are subject to EA, MMO and local authority approval and licensing. The contractor shall allow for compliance with licence conditions and liasing with statutory authorities.

5. DESIGN DEVELOPMENT

(i) Refer to HOP inspection of existing structures dated 12/04/24.

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(iii) Incomplete record drawings available from Shoreham Port.

(iv) RIBA stage 3 design only, subject to detailed design.

(v) Foreshore levels taken from Foresite Geomatics sea wall survey drawing 24092-01 dated September 2024. And based on HOP site inspection on 12/04/24.

(vi) CFA pile clash risk to be managed by the contractor.

(vii) Refer to HOP risk assessment for key H&S risks.

6. PILE INSTALLATION

(i) Pile lengths, thicknesses, grades etc. as shown in the tables on this drawing.

(ii) Piling Contractor to drive piles levels in piling schedule in drawing 16050-HOP-05-XX-DR-S-0011 in order to achieve the Design Verification Load, to be agreed with the Engineer.

(iii) Any pile meeting toe requirements to be agreed with HOP. All reasonably practical measures should be taken to achieve toe level where possible.

(iv) Settlement Criteria on all bearing piles is 20mm total under specified Working Loading and 10mm differential settlement.

(v) For piles designed to resist lateral loading a minimum embedment level has been specified. If this is not achieved, a lateral load test may be required, to be agreed with HOP.

(vi) Pile driveability, hammer sizes, choice of pile shoes etc. to be assessed by the piling contractor.

(vii) All piles to be installed in accordance with the ICE Specification for Piling and Embedded Retaining Walls 3rd edition and BS 5228-2009 + A1:2014 (Part 1&2). The Contractor shall comply with all local authority documents and licence requirements relating to Noise and Vibration.

(viii) Nominal tolerance of pile head cut off level:
- Tubular Piles ±10mm
- Sheet Piles ±50mm
- H-Piles ±10mm
- Box Piles ±50mm

(ix) Nominal tolerance of pile head positions:
- Tubular Piles ±75mm
- Sheet Piles ±100mm
- H-Piles ±75mm
- Box Piles ±100mm

(x) Piles to be ordered by the contractor based on run length, taking into account negative creep.

1:200
0 2m 4m 6m 8m 10m

ISSUED FOR TENDER	DJP	TJB	15.11.24	P2
ISSUED FOR INFORMATION	DJP	TJB	22.10.24	P1
Description	By	Aprvd.	Date	Rev.

TENDER DRAWING
NOT FOR CONSTRUCTION

Title
PILING LAYOUT AND SCHEDULE

Project
FORMER HOWARD KENT SITE, SHOREHAM-BY-SEA

Client
CAYUGA DEVELOPMENT LTD.

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Drawing No. 16050-HOP-05-XX-DR-S-0011
Status D2
Rev. P2

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1:20 0 0.2m 0.4m 0.6m 0.8m 1m
1:50 0 0.5m 1m 1.5m 2m 2.5m
1:100 0 1m 2m 3m 4m 5m

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