

## Sea Wall Maintenance Strategy

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Custom House, The Terrace,  
Gravesend, Kent, DA12 2BW

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Revision A

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**Commercial Property**



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# 1. Project Overview

## 1.1. **Purpose**

The purpose of this report is to fulfill the requirements of Condition 10 in the planning conditions, which mandates submitting a long-term monitoring and maintenance plan for the flood defense structures within six months of the project's start.

## 1.2. **Site Location and Background**

The project is located in central Gravesend, Kent, at OS coordinates 565199 174363. Covering an area of approximately 0.4 hectares, the site is dominated by the Grade II Listed Custom House, a historically significant building that was previously used as office space and has been unoccupied since 2018. Situated near the Thames, the site holds architectural and heritage importance, requiring a considered approach to redevelopment.

## 1.3. **Redevelopment Vision**

The redevelopment plan proposes a conversion of the Custom House and its associated structures into a residential precinct featuring 27 units. The design aims to create a cohesive living environment, integrating essential amenities and landscaping that enhances both functionality and aesthetics. This approach seeks to preserve the historical characteristics of the Custom House while providing modern, desirable living spaces that meet contemporary standards.

## 1.4. **Main Sea Wall Structure (Main Wall)**

The site's primary coastal defence is a steel sheet piled wall encased in concrete, designated as the "Main Wall." This structure includes a reinforced concrete capping beam, which enhances stability and resilience against tidal forces. As the primary line of defence, the Main Wall is essential for protecting the development from coastal erosion and marine exposure, ensuring the safety and longevity of the site.

### 1.5. **Secondary Sea Wall Structure (Return Wall)**

Along the north-western boundary of the site, a secondary structure, referred to as the "Return Wall," provides additional protection. This section comprises cantilevered steel sheet piling with a reinforced concrete capping beam, adding stability at the site's edge and acting as a supplementary barrier against tidal and erosion forces.

## 2. Maintenance and Monitoring Strategy

The following strategy has been developed to ensure the longevity and structural integrity of both the Main Wall and the Return Wall. This plan addresses routine inspections, detailed assessments, corrective actions, and long-term reviews, providing a comprehensive approach to maintain the walls in optimal condition over their design life.

### 2.1. **Visual Inspections**

- Frequency: Annually
- Purpose: To identify any surface-level signs of corrosion, structural distress, or deterioration that could indicate early-stage degradation.
- Actions:
  - Conduct a detailed visual assessment of the wall surface, noting any rust, cracking, deformation, or displacement in the sheet piles or concrete.
  - Check for erosion or scouring at the base of the wall, which may compromise stability over time.
  - Document findings in a formal inspection report, including photographs and descriptions of any issues.
  - Record all inspection results in a maintenance log to track changes over time and inform future assessments.

- Immediately flag any areas requiring urgent repair, such as significant rust or physical damage that may indicate advanced degradation.

## 2.2. **Intrusive Surveys**

- Frequency: Initial survey at 3 years post-construction, followed by surveys every 10 years.
- Purpose: To obtain detailed data on the internal condition of the steel sheet piles, including corrosion progression, remaining material thickness, and overall structural integrity.
- Actions:
  - Conduct ultrasonic thickness measurements to assess remaining material, comparing results with original wall specifications.
  - Carry out corrosion rate analyses to estimate the timeline for future material loss, supporting long-term planning for repair or replacement.
  - Inspect any protective coatings or cathodic protection systems for effectiveness and wear, recommending reapplication if needed.
  - Document all survey findings and adjust the structural integrity assessment as required.
  - Trigger for Corrective Maintenance: Schedule corrective action if wall thickness has reduced by more than 4mm from the original specification, indicating an accelerated degradation rate.

## 2.3. **Corrective Maintenance**

- Trigger: Initiated based on findings from annual visual inspections or decadal intrusive surveys.
- Purpose: To address any significant damage or corrosion identified during inspections or surveys, maintaining the wall's structural performance and extending its service life.
- Actions:
  - Repair or replace any compromised sections of sheet piling, particularly where material thickness has fallen below acceptable thresholds.

- Reapply or restore protective coatings to areas showing signs of wear, reinforcing protection against corrosion.
- Address any erosion or scouring at the base of the wall by restoring affected areas and reinforcing with additional erosion control measures if necessary.
- Where immediate threats are identified, implement temporary reinforcements to prevent further deterioration until permanent repairs can be carried out.

#### 2.4. **Long-Term Monitoring and Planning**

- Frequency: Every 25 years
- Purpose: To review the cumulative performance of the sea wall over time, identifying any trends or emerging needs for significant repairs, upgrades, or replacements.
- Actions:
  - Perform a comprehensive structural review, combining both visual and intrusive inspections to evaluate the overall condition of the Main and Return Walls.
  - Assess long-term data on wall performance and degradation, adjusting the maintenance and monitoring plan if new trends or risks are identified.
  - Prepare a refurbishment plan, if necessary, based on findings, to ensure that the wall meets its expected design life of 100 years.
  - Incorporate advancements in protective technologies or materials into the maintenance plan, responding to changes in environmental conditions or best practices in coastal defence.

### 3. Maintenance Schedule

| <b><u>Activity</u></b> | <b><u>Frequency</u></b> | <b><u>Actions</u></b>                                                                                                    |
|------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Visual Inspection      | Annually                | Assess for surface corrosion, cracking, or displacement. Document findings and address any immediate concerns.           |
| Intrusive Survey       | Every 10 years          | Conduct ultrasonic testing, corrosion analysis, and material assessments. Document and schedule interventions as needed. |

|                        |                |                                                                                                                     |
|------------------------|----------------|---------------------------------------------------------------------------------------------------------------------|
| Corrective Maintenance | As required    | Execute repairs or replacements for deteriorated sections. Reapply coatings and address erosion issues as detected. |
| Long-Term Planning     | Every 25 years | Comprehensive review to plan for major refurbishments or upgrades based on wall performance and condition.          |

This targeted maintenance strategy is designed to ensure the structural integrity of the Main and Return Walls, addressing immediate issues as they arise while preparing for long-term maintenance needs. By maintaining rigorous inspection and monitoring intervals, the strategy aims to extend the wall's functional lifespan and protect the redevelopment site in line with project specifications.



## 4. Adkins Consultants Terms and Conditions

### Terms and Conditions

#### 1. Additional Services

In the event of additional services being required, the fees will be adjusted by prior agreement between us.

#### 2. Diligence and Care

Adkins Consultants will exercise reasonable care, skill and diligence in the performance of the Services.

#### 3. Disbursements and Expenses

Disbursements and expenses are not included in our quoted fees unless stated to the contrary in our fee proposal.

#### 4. Document Formats

The proposed fees allow for a digital copy usually in PDF format.

Hard copies of documents may be subject to a fee dependent on the type of document. Our printing costs are available upon request.

#### 5. Copyright

Adkins Consultants retain copyright in any document and works they produce; in all cases the copyright will remain vested in Adkins Consultants. The Client, subject to payment of fees and disbursements due under the Agreement, will have a license to copy and use all such documents for any purpose related to the project in question. They will not have a license to use these documents for any other project and no liability will be held by Adkins Consultants.

#### 6. Value Added Tax

All quotations are subject to the addition of VAT at the current rate.

#### 7. Liability

7.1 None of our employees, partners or consultants individually has a contract with you or owes you a duty of care or personal responsibility. You agree that you will not bring any claim against any such individuals personally in connection with our services."

7.2 The liability of Adkins Consultants Ltd to the client, (or any third party claiming through the client) shall in no circumstance (except in case of death or personal injury) exceed the lesser of:

- (a) The amount that can be recovered from our professional indemnity insurance
- (b) We will have proportionate liability and this will be limited to 25% (twenty five percent) of any loss.

(c) The diminution in value of the property concerned.

7.3 Adkins Consultants shall have no liability to the Client (or to any third party claiming through the Client) whether in contract or in tort (including but not limited to negligence) or for breach of statutory duty or otherwise for any claim arising in connection with:-

- (a) pollution, contamination, terrorism, asbestos or any related risk or
- (b) designs or reports prepared by other professionals and specialist sub-contractors/suppliers.

7.4 The limitation period, before which any claim must commence, is six years.

7.5 If you suffer loss as a result of our breach of contract or negligence, our liability shall be limited to a just and equitable proportion of your loss having regard to the extent of responsibility of any other party. Our liability shall not increase by reason of a shortfall in recovery from any other party.

#### 8. Payments

Payment shall be received in full before Adkins Consultants will release any work, save for clients with an account with Adkins Consultants.

8.1 Where such an account is available our invoices will be issued monthly for the work completed in that month or upon completion of the work, whichever occurs soonest. Payment shall become due on submission of the invoice and the final date of payment shall be 7 days after the invoice date. We reserve the right to charge interest at the statutory rate on any overdue amounts. Please note that all invoices not settled within our payment terms will be referred to our debt recovery agents, and will be subject to a surcharge of 15% plus VAT in lieu of our recovery charges.

8.2 If you do not have an account with Adkins Consultants Ltd, then payment is required prior to the release of information, unless agreed otherwise in the quotation, which would be unusual.

8.3 Please note that all invoices not settled within our payment terms will be referred to our debt recovery agents, and will be subject to a surcharge of 15% plus VAT in lieu of our recovery charges.

#### 9. CDM Regulations

Under the current CDM Regulations 2015 it is held to be our responsibility to inform you that the aforementioned regulations may be applicable to your project.

We have attached an information sheet for your benefit and should you have any queries in connection with this, please contact us.

#### 10. Changes in Terms and Conditions

Terms and conditions are liable to change without notice. Amended versions will supersede any printed or electronic versions held in the clients' possession. You can find an up-to-date copy of this Terms and Conditions Statement on our website.

#### 11. Terms and Conditions further information

Unless otherwise agreed in writing by the Company these Conditions will override any terms and conditions stipulated or referred to by the Customer in his order or pre-contract negotiations.

#### 12. Cancellations

Adkins Consultants will only accept cancellations at the discretion of Adkins Consultants unless they are within the cooling-off period of 14 days. Acceptance of the cancellation will only be binding on the company if it is sent in writing. Any cost or expenses incurred by the company up to the date of cancellation and all loss and damage resulting from the cancellation will be paid by the customer to the company, including within the cooling-off period if Adkins Consultants have started works during this time, which is a likely course of events given Adkins Consultant's desire to dispatch customer's instructions at a speedy rate.

#### 13. Exclusions

In dispute of any assertion that anything is excluded, all warranties, conditions and other terms, implied, statutory or otherwise, are expressly excluded excepting so far as they are contained in these conditions or otherwise expressly agreed by Adkins Consultants Ltd in writing. If any legislation makes it unlawful to exclude any term from the Contract this clause will naturally not apply to such.

#### 14. Resolutions of Disputes

14.1 The parties will endeavour to resolve any dispute amicably. Each of them shall in good faith consider any proposal by the other that a dispute be referred to mediation.

14.2 Disputes shall be finally resolved by the English Courts.

#### 15. Governing Law

The Agreement shall be solely within the jurisdiction of and governed by English Courts.

## Appendices

### Appendix 1\_Photographs