St Andrew Harbour Trust

St Andrews Harbour North West Slipway

Feasibility Study into the Reinstatement of the North West Slipway & Harbour Wall

July 2024

FAIRHURST

FAIRHURST

CONTROL SHEET

CLIENT: **St Andrews Harbour Trust**

PROJECT TITLE: **St Andrews Harbour North West Slipway**

REPORT TITLE: **Feasibility study into the Reinstatement of the North West**

PROJECT REFERENCE: **159462**

DOCUMENT NUMBER: **159462-DOC-01**

Original Issue	**Issue 1 DRAFT**	**Name**	**Signature**	**Date**
	Prepared by	A Kram	[Redacted]	July 24
	Checked by	G Park	[Redacted]	July 24
	Approved by	A Kram	[Redacted]	July 24

	Issue	**Date**	**Status**	**Description**	**Signature**	
Update Record	2				Prepared By	
					Checked	
					Approved	
	3				Prepared By	
					Checked	
					Approved	
	4				Prepared By	
					Checked	
					Approved	

Contents

1.0 Introduction

1.1. Commission and Background

Fairhurst were commissioned by St Andrews Harbour Trust (The "*Client*") to undertake inspection, survey, feasibility assessment & concept design, including consultation with stakeholders, for a replacement North West slipway and damaged harbour wall at St Andrews Harbour and breakwater located at NGR "NO 51620 16666". The commission of Fairhurst services relate to an event in 2023 which caused damage to the slipway and harbour wall, which is outlined below.

In October 2023, a significant storm (Storm Babet, an intense extratropical cyclone from 18th to 21st October which were identified by the UK Met office as 'Red Warning' for eastern Scotland) caused significant damage to the harbour wall and slipway with subsequent coastal erosion via wave action and then resulting loss of the slipway and historical masonry harbour wall immediately behind with associated backfill being eroded approx. 1.5-6.5m from the original front line of the wall via undercutting via wave action and impact from entrained loose masonry. A section of the north west slipway, including seaward facing wall, measuring 15.5m in length and a section of the rear wall measuring around 12.5m in length were lost Fife Council provided emergency response, backfilling the void with a geotextile liner and large sub angular igneous rock armour/boulders.

A Site location plan is shown on Drawing 159462/9001 and is included in **Appendix 1**, along with Drawing 159462/9002 indicating the site extents.

1.2. Feasibility and Stages

Fairhurst were commissioned to provide feasibility assessment of the proposed repairs, which is a multifaceted process of review, consultation and design. The stages of the feasibility are outlined below;

- A desk-based review of the information collated by the St Andrews Harbour Trust
- Site Inspection, visit and detailed photographic record
- 3D laser scanning, topographical surveying and creation of 3D cross sections of the failure area
- Consultation with Fife Council
- Consultation with Historical Environment Scotland
- Meeting with representatives of St Andrews Harbour Trust
- Feasibility assessment and Options Appraisal and Workshop
- Preliminary Design of feasible options and provision of drawings and cross sections
- Consultation with Heritage Specialist Architect
- Provision of a written report
- Provision of a presentation to St Andrews harbour Trust

1.3. Report Objectives

This report provides a summary of the findings of each stage of feasibility assessment or reference to other documents, culminating in a conclusion and recommendation for the concept design of historical harbour wall and slipway replacement.

2.0 Site Location & Description

The site address is as follows:

St Andrews Harbour
The Pends
St Andrews
Fife
KY16 9RG

The existing damaged masonry wall and remnants of the former North West slipway is located within the north western area of the historical harbour in the town of St Andrews, Fife located at National Grid Reference NO 51620 16666.

The harbour wall and slipway are bound to the North by The North Sea with the intertidal foreshore located to the North of the site with exposed undulating rockhead being present for approximately 175m at low tide. East of the site is the remainder of the masonry breakwater of the St Andrews harbour extending for approximately 270m east of the slipway. West of the site is the exposed shoreline adjacent to the St Andrews Cathedral. To the south of the site is tarmac surfaced public access roads and pavements, car parking and private housing and the inner harbour and Kinness Burn.

The harbour at St Andrews is a particularly well-preserved example of a vernacular structure that is substantially unspoilt by modernisation thus preserving much of its pre-industrial authenticity.

The harbour is the result of progressive sequence of structural development from the 16th to 20th centuries. Historical records suggest that St Andrews harbour developed from timber structures in mediaeval times to one of stone, reputably quarried from the ruins of the Cathedral and the Castle from the 16th Century onwards

The harbour, and indeed the North West slipway is an "*A*" listed building and as such has several constraints likely to be imposed by Fife Council Planning and Historic Environment Scotland.

There does not appear to be published datum levels available for St Andrews Harbour, however the proximity to the Tay Estuary (~7miles), make the River Tay datum's applicable which are as follows. These levels are also utilised by the harbour master;

Highest Astronomical Tide (HAT):	+6.07mCD	/	+3.17mOD
Mean High Water Springs (MHWS):	+5.60mCD	/	+2.70mOD
Mean High Water Neaps (MHWN):	+4.50mCD	/	+1.60mOD
Admiralty Chart Datum (ACD):	+2.90mCD	/	+0.00mOD
Mean Low Water Neaps (MLWN):	+2.10mCD	/	-0.80mOD
Mean Low Water Springs (MLWS):	+0.70mCD	/	-2.20mOD
Lowest Astronomical Tide (LAT):	-0.01mCD	/	-2.89mOD

3.0 Desk Based Review

The following information was provided and reviewed by Fairhurst in forming a background understanding of the harbour and harbour wall and associated slipway;

- CIRIA, Seawall Design, (1992)
- St Andrews Harbour – North West Roadway Sea Defence Works (Archaeological watching brief); Scottish Institute of Maritime Studies, University of St Andrews (2004)
- North West Slipway Damage, Main Pier, St Andrews Harbour, Archaeological Report, (2007)
- St Andrews Harbour, Condition Report, ARC Architects/David Narro and Ralph Ogg, (2017)
- The Heritage and refurbishment of Grade II Listed Piers at Whitby Harbour, North Yorkshire ICE Maritime Engineering (2020)
- Monitoring of Damage and Erosion of the North West Slipway, St Andrews Harbour Trust, (2020)
- RovArch, Main Pier St Andrews, Survey Report Storm Damage (October 2023)
- Rovarch, The Life and Death of St Andrews Harbour NW Slipway, A Historical Archaeological Study (2024)
- Canmore Database Entries for St Andrews Harbour (online accessed July 2024)
- Nature Scot Website and Scotland's Environment (confirming formal designations) (online accessed July 2024)
- Fife Council Planning Website (online accessed July 2024)
- Fife Council Road Adoptions Website (online accessed July 2024)
- Public Utilities Information (online accessed July 2024)
- SEPA Flood Mapping (Online accessed July 2024)
- BGS Geoindex for geological information (Online accessed July 2024)
- Eurocode Design Codes for Geotechnical assessment, Masonry, Steel and Concrete

4.0 Site Constraints

4.1. Planning & Historical Monument Status

St Andrews harbour (of which the North West Slipway is part thereof) is a Grade A-listed structure, included in the Statutory List of Buildings of Special Architectural or Historical Interest. This is HB Number LB40596. St Andrews harbour is one of the few surviving examples of a 17th century stone-built harbour. It is of national significance and a critical component of the St Andrews Conservation Area. The surrounding area to the west is of international historical importance and comprises the remains of St Marys Church and Cathedral and Priory.

4.2. Adopted Roads

Fife Council website provides mapping indicating the extent of adopted roads within the local authority area. This is presented in **Figure 1** below showing that the adopted road forms part of the eroded and damaged area and that the harbour wall and slipway appear to support the adopted road and therefore, Fife Council may have involvement and some form of responsibility for maintenance/repair.

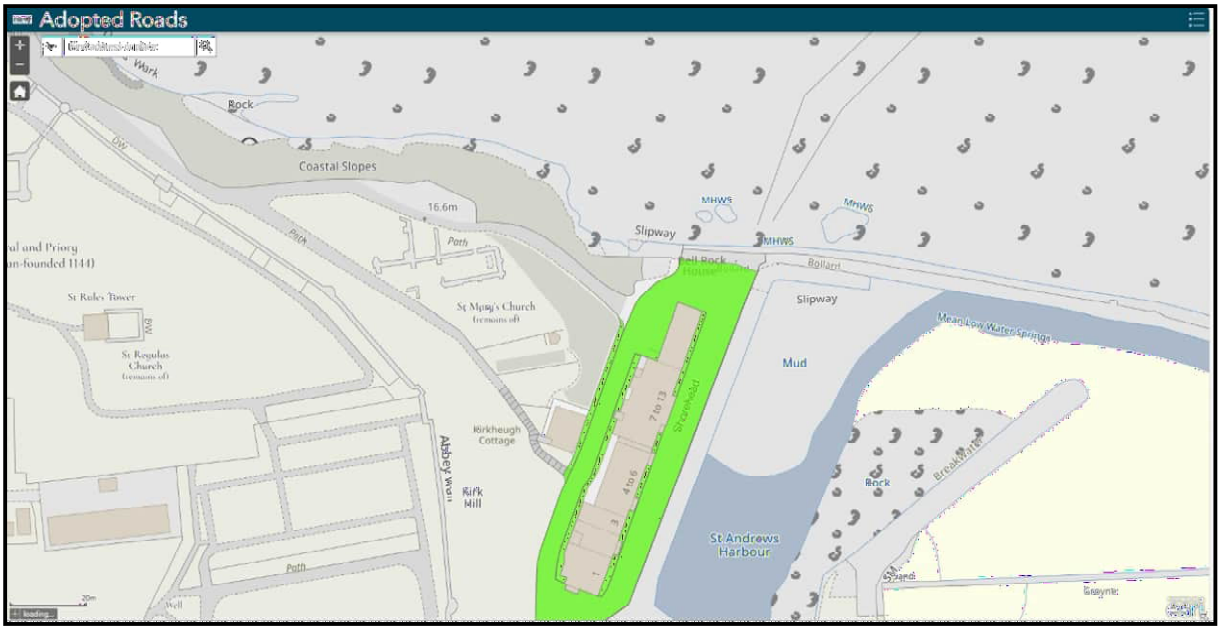


Figure 1: Fife Council Mapping Showing the Extent of Adopted Roads

4.3. Physical Accessibility

The physical accessibility to the area is limited for plant, supplies and equipment to transport via Shorehead (Narrow Road) with close by private housing, Balfour Place (narrow road) and Abbey Walk (A917) with a moderately tight turn for low loader, crane, or long rigid body vehicles. There is limited turning area at the bell rock house area. The standoff zone around the damaged roadway adjacent to the slipway is likely to be considerable for heavy plant and advance temporary works are likely to be required in order to stabilise this area prior to increased loadings for construction traffic.

Access to the seafront is limited to the slipway entrance and no other obvious plant or personnel access is possible.

4.4. Vibration

Vibration for compaction, piling or indeed traffic movement will require to be controlled and vibration limited or eliminated below structural damage thresholds as St Andrews harbour (of which the North West Slipway is part thereof) is a Grade A-listed structure, included in the Statutory List of Buildings of Special Architectural or Historical Interest. St Andrews harbour is one of the few surviving examples of a 17th Century stone-built harbour. It is of national significance and a critical component of the St Andrews Conservation Area. The surrounding area to the west is of international historical importance and comprises the remains of St Marys Church and Cathedral and Priory and slopes adjacent to the foregoing are unstable.

Furthermore, offshore and nearshore ecology are likely to be sensitive to vibration and controls may be placed by Fife Council by any planning permissions or permit associated with the permission or listed building consent, which may have to be part of agreements reached or part of an EIA screening or application to support the project. This will be determined by Fife Council.

4.5. Buried Utilities/Public Utilities

A public utilities search was undertaken for the area. The public utilities information is included in **Appendix 2**. It should be noted that pipelines and outfalls associated with Scottish Water infrastructure are present to the immediate east of the slipway area. The infrastructure is likely to be pressurised foul drainage, and will have a standoff zone and likely be a constraint to the working area during the repair of the north west slipway and harbour wall.

4.6. Wave and Tidal Range

River Tay datum's applicable which are as follows:

Highest Astronomical Tide (HAT):	+6.07mCD	/	+3.17mOD
Mean High Water Springs (MHWS):	+5.60mCD	/	+2.70mOD
Mean High Water Neaps (MHWN):	+4.50mCD	/	+1.60mOD
Admiralty Chart Datum (ACD):	+2.90mCD	/	+0.00mOD
Mean Low Water Neaps (MLWN):	+2.10mCD	/	-0.80mOD
Mean Low Water Springs (MLWS):	+0.70mCD	/	-2.20mOD
Lowest Astronomical Tide (LAT):	-0.01mCD	/	-2.89mOD

Predominant waves are from the north and north east, impacting on upon the slipway and harbour wall in the aforementioned direction. No formal wave action study has been undertaken on the harbour, however, there is a history of storm damage and increasing intensity of storm action and deterioration over time.

4.7. Ground Conditions

Ground conditions have been established through consultation with the British Geological Survey 1:50,000 scale mapping for superficial drift mapping and bedrock geology layers. A record of recorded exploratory ground investigations for the area was also consulted and

non-confidential records within 100m of the site were reviewed and included in **Appendix 3**. A summary of the findings are set out below;

4.7.1.BGS 1: 50;000 Bedrock Geology Mapping

The solid geology is recorded as the Sandy Craig Formation of Sedimentary Rock Cycles of the Strathclyde Group Type. The Lithological description of the deposits are Mudstone and Siltstone with thin beds of non-marine limestone and dolomite; sandstone is subordinate and the pattern of sedimentation both upward coarsening and upward fining cycles of non-marine origin. On the seaward side of the harbour wall and slipway, there is thin layering of coarse sand atop exposed weathered bedrock at surface, where bedding planes are exposed and varying in spacing.

4.7.2.BGS 1: 50,000 Superficial Geology Mapping

The deposits are described as raised marine deposits of Devensian age consisting of clay, silt, sand and gravels. On the seaward side of the harbour wall and slipway, there is thin layering of coarse sand atop exposed weathered bedrock, where bedding planes are exposed and varying in spacing.

The superficial geology was visually exposed as a result of the damaged area. The aerial images and site inspection undertaken prior to the Fife council shows the superficial geology behind the wall. This shows sequences of tan and brown to dark brown layers of predominantly granular backfill to the base of the former slipway behind the wall consisting a granular sandy made ground consisting brick and sandstone fragments at the rear of the wall with evidence of behind the wall drainage and a linear feature running east to west which appears to be a terracotta/clay pipe present towards the base of the existing harbour wall. In addition, a secondary linear feature was recorded which included what appeared to be a brick chamber (possibly a manhole or catchpit) also recorded at the far west of the eroded area. Further to this, buried anthropogenic features were also observed.

4.7.3.Boreholes and Trial Pits

The closest recorded boreholes from the Association of Geological Specialist and the BGS datasets are located 279m west and 370m south of the site. This was for a large structure on Gregory Place, St Andrews and for the A918 Shore Road Bridge in St respectively.

The boreholes for the large structure were drilled in 1976 and two boreholes were drilled using shell and auger drilling.

The boreholes for the bridge were drilled in 1971 and in total five boreholes were drilled using shell and auger drilling.

The borehole records for the large structure are available for ground investigation at Gregory Place, 279m west of the North West Slipway. The borehole records show that fill comprising loose fine to coarse gravel with brick fragments and sandstone fragment present in a dark grey clayey silty sand is present to 2.10mbgl with loose becoming medium dense fine to coarse silty sand with gravel to 4.15mbgl, underlain by presumed weathered Sandstone. The log is presented in **Appendix 4.**

The borehole for the bridge records show that made ground (loose sand and rubble) is present to 1.0m below ground level, where grey soft silty laminated clay and traces of peat are present to a depth of 3.43mbgl. Soft dark grey sandy clay containing gravel is present to 4.27mbgl, thereafter a stiff dark brown sandy boulder clay is present to 9.98mbgl, thereafter, soft grey weathered Sandstone is present at approximately 10mbgl, however, this was not cored and proven to a greater depth than 11.81mbgl. The other four borehole logs are broadly similar in geological sequence and stratifications and depths to presumed rockhead. Groundwater was encountered 5.41 and 3.66 resting level (presumed mbgl but not specified). The logs are presented in **Appendix 5**.

4.8. Planning and Listed Building Consent

When considering the replacement and repair of the north west slipway and harbour wall, there are a number of potential outcomes relating to planning permission, building warrant, adopted road support, listed building consent and Environmental Impact Assessment (EIA).

Fife Council will be the lead authority on any planning application or permissions and likely will consult with other stakeholders during any formal planning application. The stakeholders are considered to be (note that this list is estimated and non-exhaustive) Neighbouring properties and landowners, Historic Scotland, Marine Scotland, SEPA, Fife Council Building Control, Fife Council Roads and Transportation, Other Fife Council, Buried Utilities and Public Utilities providers and Nature Scot. Clarity is required on the role of Transport Scotland with regard to your charter, if indeed they would require consultation or indeed if you act as a proxy for and on their behalf.

Due to the proximity to major Scottish Water drainage infrastructure, Scottish Water may require separate consultation.

4.9. Environmental Impact Assessment

Harbour and marine works in such close proximity to the water environment and ecology can have impacts upon the environment. As a result, it may be a requirement of Fife Council and Nature Scot that EIA Screening is provided in the first instance. This may require ecologist input to understand the full implications of the planned works on any ecology on the foreshore or in the water environment.

4.10. Flood Risk

SEPA flood mapping was consulted for a preliminary assessment of Flood Risk at the site for both Surface Water, River and Coastal flooding. The results are shown below in **Figure 2**, where the site is at risk of all three types of flood risk.

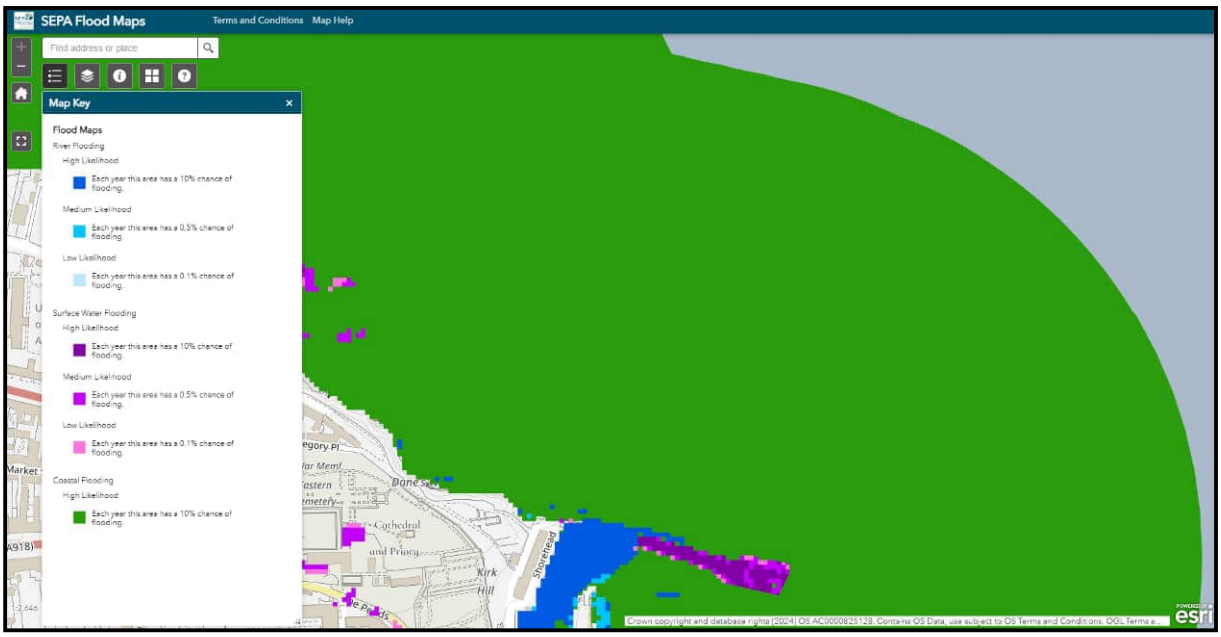


Figure 2: SEPA Flood Risk Mapping for the St Andrews Harbour Area (Courtesy of SEPA)

4.11. Site Designations

Nature Scotland Mapping was accessed to ascertain if any special environmental designations have been applied to the site or its immediate surroundings. From a review of all mapping layers the site was not within or immediately bound by any SSSI, RAMSAR, SAC, or further protections.

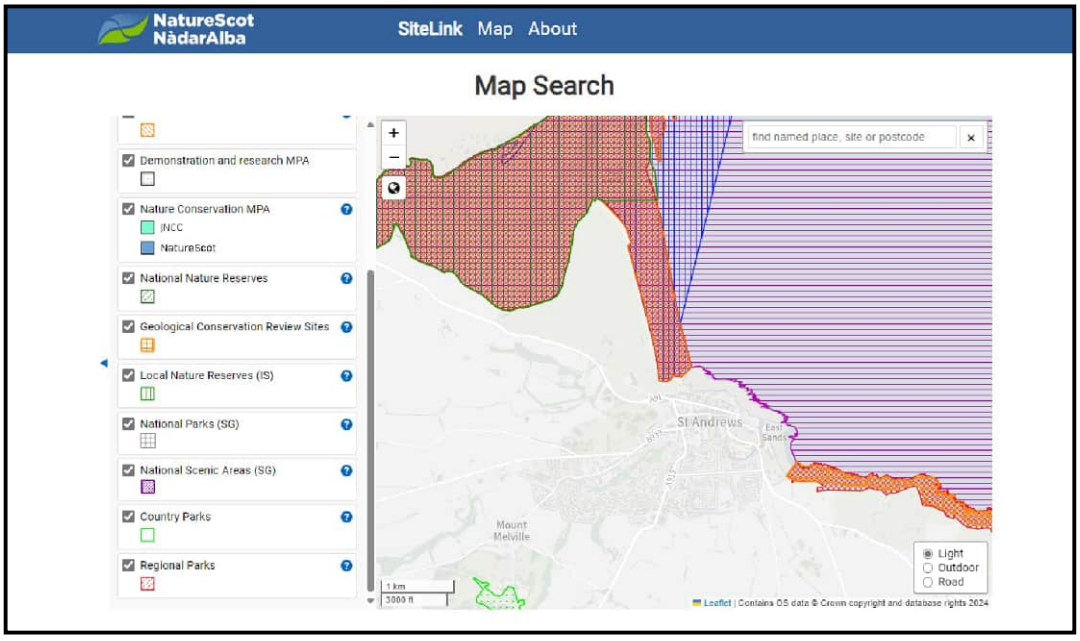


Figure 3: Nature Scot Mapping for the St Andrews Harbour Area (Courtesy of Nature Scot)

5.0 Timeline of North West Slipway Deterioration

The timeline of deterioration of the North West Slipway is well documented within St Andrews Harbour Trust Reporting 'Monitoring of Damage and Erosion of the North West Slipway, St Andrews Harbour – October 2020 included in **Appendix 6**.

Between 2003 to 2020 monitoring has taken place showing the gradual deterioration of the slipway, with significant damage occurring in 2003 and a monitored decline in condition thereafter, with full loss in 2023.

The St Andrews Harbour Trust Reporting *'Monitoring of Damage and Erosion of the North West Slipway, St Andrews Harbour*' – October 2020. report states;

"Ongoing monitoring of the north-west slipway by St Andrews Harbour Trust and Fife Council's Archaeological Unit since 2002 has revealed an alarming rate of active structural deterioration caused by impact damage. Loose stone dumped around the base of the structure is being cast against the ramp during storm events. As a result, the outer bonded fabric is being removed and the inner rubble core is being exposed to wave action. This is an active and ongoing process which is becoming worse over time. It was warned in 2020 that left unchecked it will result in the ever-increasing loss of historic harbour fabric, ultimately leading to the loss of the slipway/ramp.

The loose stone causing the problem is not natural. It is alien material that was brought in and dumped near the ramp in the 1970s as part of a North East District Fife Council funded programme of coastal cliff stabilisation. The loose rock was dumped to create a rock armour defence (was also used for plant and machinery access) along the base of the eroding cliff face, the intention being to dissipate wave impact and so protect the cliff-face stabilisation works. However, time has shown this rock armour defence to have been ineffective. The rock was quickly scattered by wave action. The loose stone now serves only to scour the area and to be catapulted against the ramp during storms.

The rock armour failed within only a few years of its installation and as early as the 1980s, the problem of loose stone being cast against the ramp became apparent. Indeed, by 2002, the ramp was exhibiting alarming erosion damage.

This problem was addressed by the Harbour Trustees in 2003 when the Trust commissioned works to have the loose, scattered rock collected by digger and deposited in front of the sea-damaged ramp to form a rock armour defence.

It is now clear that this engineering approach has failed. The rock was quickly scattered by storm action and now, to an even greater extent than before, the loose rock is being regularly catapulted against the ramp during storm events."

6.0 Aerial Photography Inspection

Source of Data; Rovarch and Civil Air Support (CAS) imagery and Neil Cunningham Dobson

Aerial Photograph Dates: Aerial Photographs obtained on 15th November 2023

Rovarch Findings: The most obvious damage to the main pier was the loss of the adjoining NW slipway, the cliff and roadway/parking areas. This damage has exposed the western end and face of the north main pier seawall. Fife Council carried out temporary coastal protection works by installing a rock armour barrier.

7.0 Site Inspection

Part of the Fairhurst commission was to undertake a visual inspection of the former north west slipway and harbour wall structure. In addition, the fife council emergency backfill area and adjacent slope located at St Andrews Harbour, Fife, on the East coast of Scotland was also to be inspected. The slipway was recently utilised for access to the foreshore of small pleasure craft and people whilst the topside has been previously utilised for public access and community events.

This inspection and options appraisal has been instigated as part of the scheme to reinstate to the North West Slipway and Harbour Wall.

The aim of this inspection, was to visually assess the condition of the existing structure, and identify the possible physical attributes of the existing structures and ground condition to feed into the options appraisal for reinstatement.

This condition report is informed solely by the visible condition of the storm damaged area as observed on site from the foreshore at low level, and Shorehead at high level.

Following the visual inspection, a detailed 3D laser scan was undertaken to assist in producing a detailed topographical plan and location of existing features and inform proposed design solutions.

7.1. Methodology

This section of report is based principally upon the findings of the visual inspection undertaken by Fairhurst on 23rd April 2024, the findings of which are set out within the subsequent sections of this report. The weather during the inspection was sunshine but with cool temperatures and a moderate north-easterly breeze. The inspection was undertaken from the foreshore as well as the topside surface.

The waterside inspection of the structure was timed to coincide with the forecasted low tide. The timing of this was undertaken to maximise the time period over which the full elevation of the structure would be visible for inspection.

7.2. Visual Inspection of Structure

The inspection findings are summarised within the following section of the report. A photographic record of the inspection is incorporated within **Appendix 7**, and should be referenced in conjunction with the following sub-sections to this report.

The following description of the existing structure should be read in conjunction with the inspection images enclosed within **Appendix 7** and aerial images taken prior to storm damage within **Section 6:**

The north west slipway was a paved slipway with large setts that formerly descended to the tidal rocks; its marginal slabs were hollowed to a shallow gutter. The slipway previously

measured 3.50m (12ft) wide and 16.50m (54ft) long and sloped from east to west. It led to a 19th century rock-cut wagon way that heads off across the rock skerries towards St Andrews castle.

Significant damage to the harbour wall and slipway with subsequent coastal erosion via wave action and then resulting loss of the slipway and historical masonry harbour wall immediately behind with associated backfill being eroded approx. 1.5-6.5m from the original front line of the wall via undercutting via wave action and impact from entrained loose masonry. A section of the north west slipway, including seaward facing wall, measuring 15.5m in length and a section of the rear wall measuring around 12.5m in length were lost

The original wall and slipway construction appears to be comprised from placed stones founded upon the prevailing exposed and stripped Mudstone/Sandstone/Limestone sequenced rockhead, both bound and unbound within an apparent lean or lime mix with various OPC and reinforced concrete repairs, forming a ramp, with a staggered and battered retaining wall behind which extend from foreshore levels, up to the upper level of the harbour wall which is located at an approximate elevation of 5.23m AOD which forms the current adopted road.

The slipway and associated harbour wall have been completely destroyed and only remnants of the historical structure are present with embedded mortar stones on the original line of the slipway. The remaining edge of the harbour wall at the head of the former slipway is present with the batter of the harbour wall being approximately Eleven degrees to vertical. From observations of the visible internal sections of the structure and slipway, it appears the core of the wall and former slipway was infilled with rubble, stone and sand/granular fill with drainage channels present behind the wall. Approximately 8-10m section of the western harbour wall is still present. The wall at its base comprises placed stones founded upon the prevailing exposed and stripped Mudstone/Sandstone/Limestone sequenced rockhead, rising in both bound and unbound bed joints, filled using lean or lime mix mortar, or OPC. Reinforced concrete repairs and partially keyed into the adjacent natural cliff face with a mix of concrete and unbound stone. The harbour wallhead appears to retain the toe of a slope from the abbey/cathedral site consisting of topsoil, grass and a geotextile, which may be showing signs of slippage.

Further to the west, there are exposed sandstone cliff faces, from visual survey they appear to be subject to coastal erosion, bed displacement and joint erosion. From visual survey, repairs have been made to the exposed rockface

The foreshore has a thick layer of sandstone and mudstone boulders present varying but approx. 0.5-1.0m deep. The boulders are considered to be the former slipway and harbour wall and emplaced boulders introduced historically.

Black to grey igneous rock armour has been placed in the void left by the coastal erosion, by fife council. These are noted to be subject to tidal movement. A more detailed inspection was impaired by the placement of black geotextile and presence of emergency boulder backfill at the time of inspection.

8.0 3D Laser Scanning and Topographical Survey

8.1. Summary of Services and Output

Douglas Land Surveys were commissioned by Fairhurst on behalf of The St Andrews Harbour Trust to undertake 3D laser scanning and topographical survey of the 'failed section' of slipway and harbour wall. The objective was to obtain accurate dimensions, sizes and angles to enable the preparation of accurate conceptual designs for the purposes of feasibility survey. The Topographical Survey and extracts from the 3D Laser Scan are included in **Appendix 8**

9.0 Engineering Options Appraisal for Slipway and Harbour Wall Design

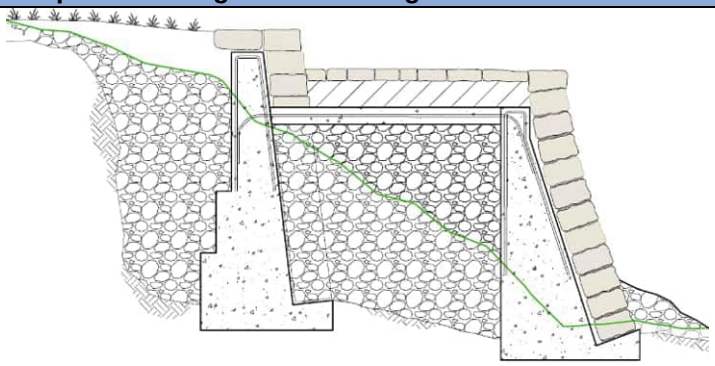
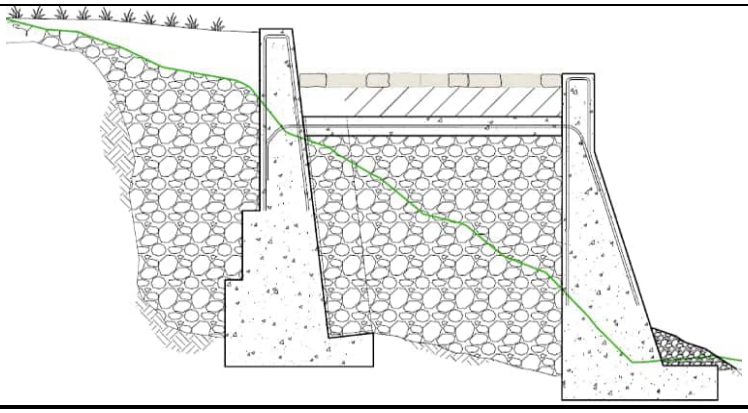
9.1. Design Parameters

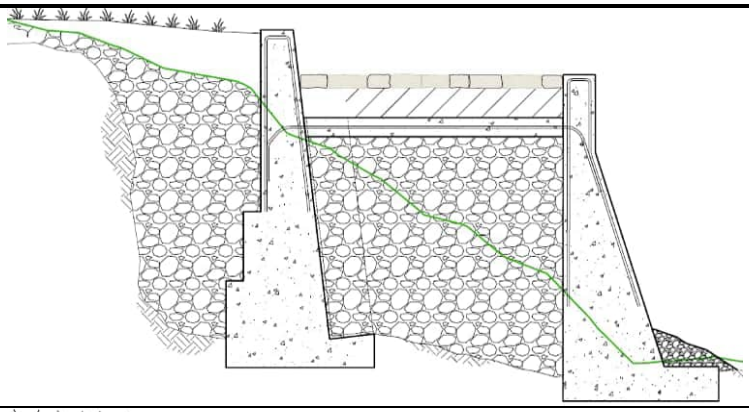
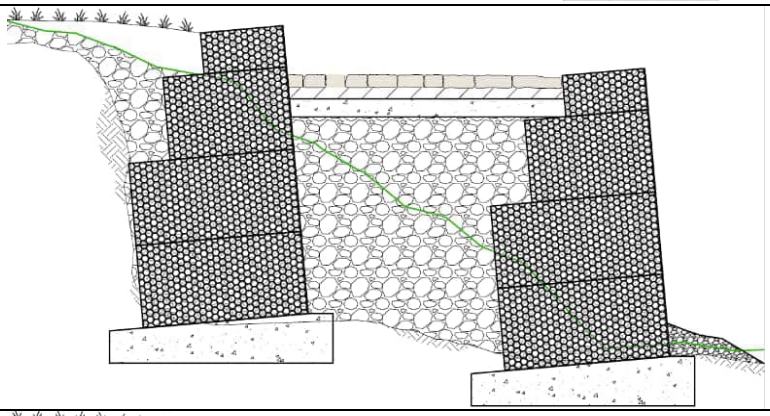
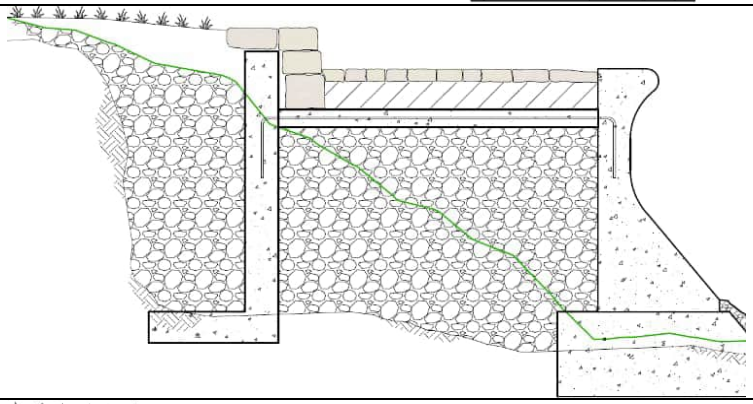
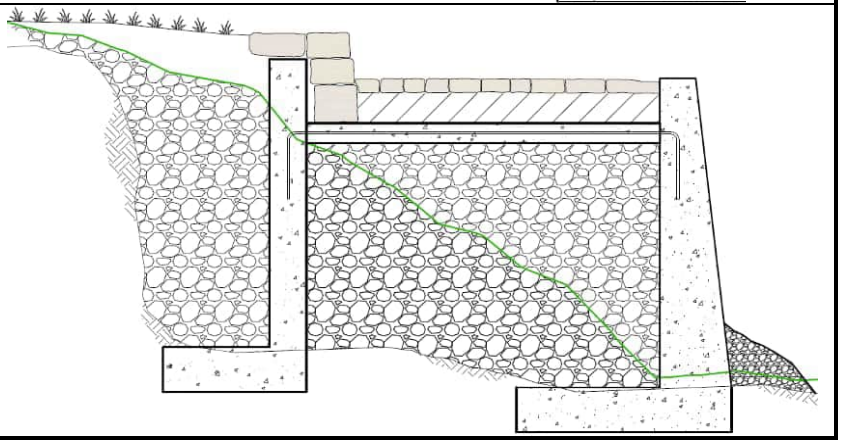
A summary of minimum engineering design parameters used to develop seawall concept design options. Vertical seawall concept options (rigid structures) have given preliminary consideration to footing type, scour protection and basic wall configuration, with design failure of materials and structural components to be determined in accordance with Eurocode standards during detailed design stages. Previous studies of the area of interest and empirical knowledge from similar design locations have also been used to inform the development of proposed concept designs. Design conditions for the final structure would also consider stakeholder feedback including listed status and ecology, anticipated costs and maintenance return period to help determine an accepted level of risk and budget for the client to consider.

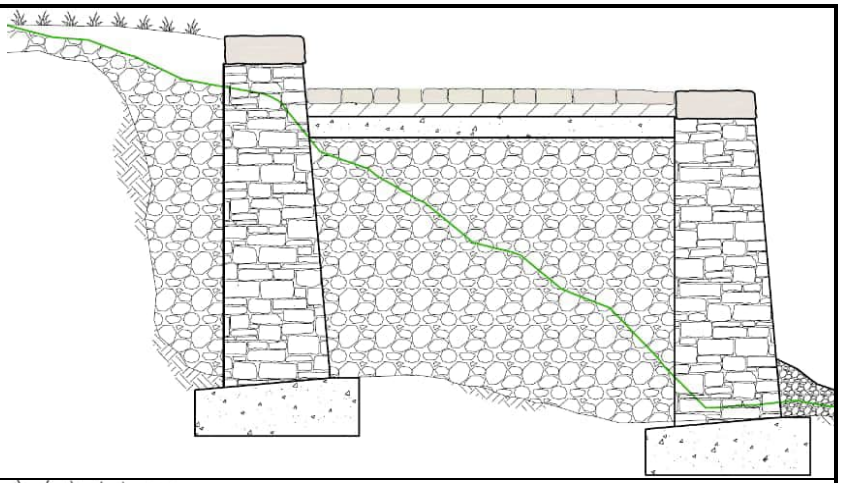
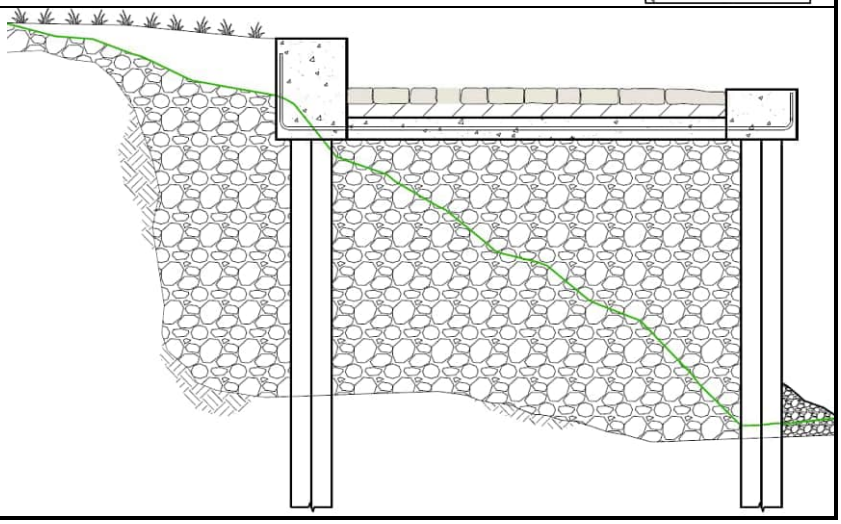
9.2. Options

Options available for slipway and harbour wall replacement design were informed from CIRIA Seawall Design (1992) and empirical knowledge from similar design locations. The options assessed are summarised below in **Table 1**:

Table 1: Engineering Options Available for Slipway and Harbour Wall Replacement

Seawall and Slipway Option	Simplified Arrangement/Drawing
Option 1: In-situ Concrete Wall with Masonry Cladding- Rock Key Formed	
Option 2: In-situ Concrete Wall with Patterned Concrete - Rock Key Formed	

Option 2A: In-situ Concrete Wall with Fair Faced Concrete - Rock Key Formed	
Option 3: Gabion Basket Wall	
Option 4: Precast Concrete Curved Wall to Seaward Elevation	
Option 5: Precast Concrete Wall	

Option 6: Masonry Wall – like for like replacement with - Rock Key Formed	
Option 7: Piled Wall (Sheet/Secant/Kingpost)	

9.3. Options Assessment

Options were qualitatively assessed against key criteria (Technical Feasibility, Cost, Longevity, Likely Acceptability to Stakeholders including planning, Constructability) and informed by site specific information gathered during the preparation of this report. The options assessment is noted in **Table 2**:

Table 2: Engineering Options Assessment for Slipway and Harbour Wall Replacement

Seawall and Slipway Option	Technical Feasibility	Construction Cost	Robustness (high/medium /low) & Longevity (Short/Medium/Long)	Acceptability to Stakeholders	Constructability (simple/normal/complex)
Option 1: In-situ Concrete Wall with Masonry Cladding- Rock Key Formed	Feasible	££	High - Long	Highly acceptable	Normal verging complex for adherence of masonry to In-situ Concrete and protection of concrete wall during tidal cycle
Option 2: In-situ Concrete Wall with Patterned Concrete - Rock Key Formed	Feasible	££	High - Long	Low acceptability	Normal verging complex for protection of concrete wall during tidal cycle
Option 2A: In-situ Concrete Wall with Fair Faced Concrete - Rock Key Formed	Feasible	££	High - Long	Moderate to Highly acceptable	Normal verging complex for protection of concrete wall during tidal cycle
Option 3: Gabion Basket Wall	Feasible	£	Low- Short	Low acceptability	Simple
Option 4: Precast Concrete Curved Wall	Feasible	££	High - medium	Low acceptability	Complex (crane access) and requirement to model difference in coastal erosion
Option 5: Precast Concrete Wall	Feasible	££	High - medium	Low acceptability	Complex (crane access)
Option 6: Masonry Wall – like for like replacement with - Rock Key Formed	Feasible	£££	High - medium	Highly acceptable	Complex
Option 7: Piled Wall (Sheet/Secant/Kingpost)	Not feasible (shallow rock with frequent discontinuities)		High - Long	Low acceptability	Complex

10.0 Consultations with Fife Council Planning & Built Heritage

10.1. Meeting With Fife Council Planning

A teams meeting was held with Fife Council planning via Microsoft teams on the 23rd of July 2024 with Fife Council representative Chris Smith- Lead Officer for Fife Council Planning Services and Hector Martin- Built Heritage Officer for Fife Council. A detailed and accepted note of the meeting is noted below. Fife Council were generally very supportive of the options assessment undertaken and considered that a number of the potential options proposed were likely to be acceptable to the council.

10.2. Notes from Meeting

Attendees:

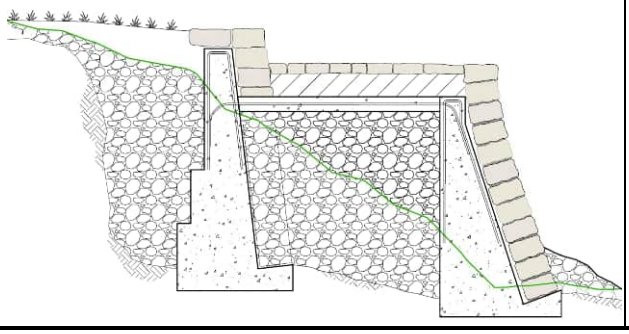
Bill Laver- St Andrews Harbour Trust
Chris Smith- Lead Officer- Planning- Fife Council
Hector Martin- Built Heritage Officer- Fife Council (until 1230)
Gavin Park- Project Engineer- Fairhurst Group LLP
Andrew Kram- Partner- Fairhurst Group LLP

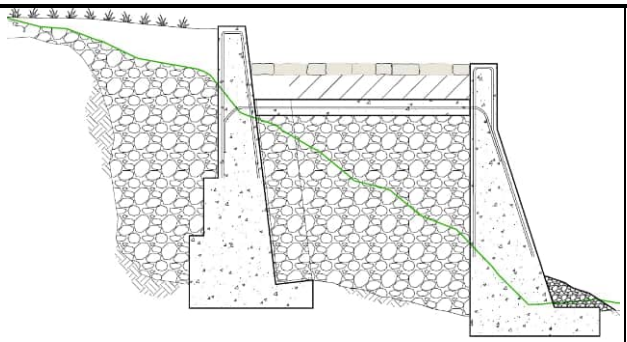
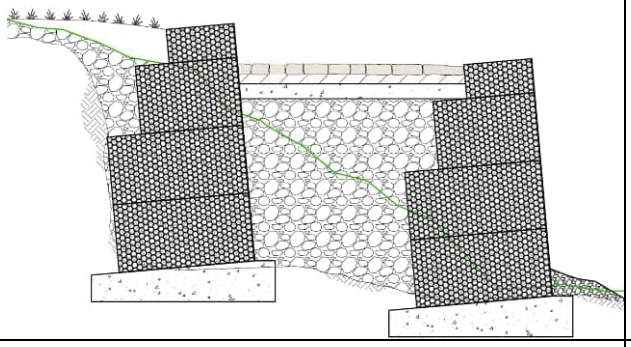
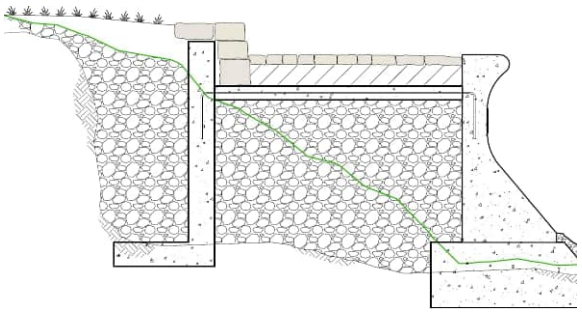
Teams Meeting- 1200 – 1300 23/07/24

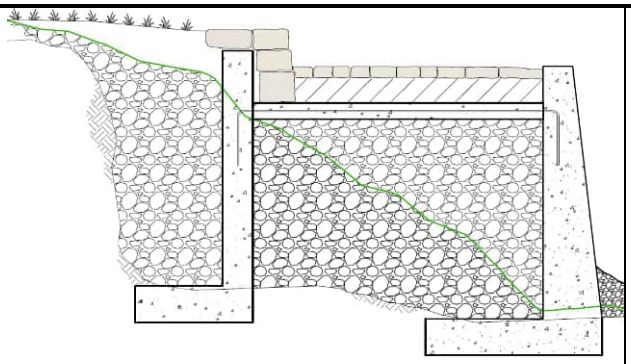
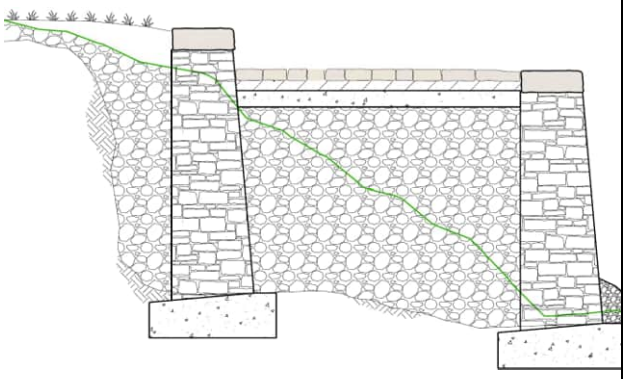
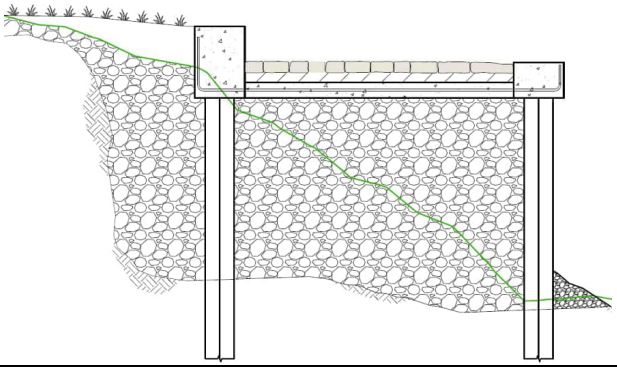
Outline Agenda and Points Discussed

1: Feasibility of some of our options from a planning/Historic Scotland perspective

Fairhurst presented aerial photographs and background to damage to the North West Slipway and timeline. Fairhurst presented the site constraints (physical and built environment listing and designations) and also potential options considered by Fairhurst within the feasibility reporting. Feedback was provided by Fife council officers relating to each option;

Option 1: In-situ Concrete Wall with Masonry Cladding- Rock Key Formed		Fife Council Comment- Fife council likely to be supportive but would need detail to ascertain how rock cladding would be fixed to the concrete. Fife council would need to see how any option ties in to existing wall and coastline.

Option 2: In-situ Concrete Wall with Patterned Concrete - Rock Key Formed		Fife Council Comment – Fife Council did not support the use of patterned concrete and would prefer plain faced concrete, and paraphrasing; don't disguise new for old, just be honest with the design. Fife council would need to see how any option ties in to existing wall and coastline.
Option 3: Gabion Basket Wall		Fife Council Comment – not likely to be supported
Option 4: Precast Concrete Curved Wall		Fife Council Comment- may be supported but would need to justify any erosional difference to coastline up and down stream. Fife council would need to see how any option ties in to existing wall and coastline. Fife Council Built Heritage - Limited in how supportable this would be from a heritage legislation/policy/guidance standpoint due to significant change in appearance of walling profile.
Option 5: Precast Concrete Wall		Fife Council Comment- may be supported but would need to justify any erosional difference to coastline up and down stream. Fife council would need to see how any

		option ties into existing wall and coastline. Fife Council Built Heritage - Similar to option 2 in taking an honest architectural approach. HM understood there are significant challenges to this with build-out and craning challenges at the site and as such it was dismissed.
Option 6: Masonry Wall – like for like replacement with - Rock Key Formed		Fife Council Comment- likely to be supportive but would need detail to ascertain how rock cladding would be fixed to the concrete. Fife council would need to see how any option ties into existing wall and coastline. Fife Council Built Heritage - Not clear on the Rock Key aspect of this and what this constitutes/ would look like. Concern also with viability long-term in differential construction methods where the masonry wall meets the concrete foundation. As such, is less supportable as an option.
Option 7: Piled Wall (Sheet/Secant/Kingpost)		Fife Council Comment- not likely to be supported

2: Likely planning/listed building consents required (option dependant)
Fife council have stated that all options likely to require full planning and listed building consent. Fife Council have stated they would be the liaison with Marine Scotland and Nature Scott and Historic Environment Scotland. Fife Council supported the options assessment and encouraged its presentation in any planning application to assist with justifying.

3: Building Warrant (is one required)
To be confirmed but likely to be required.

4: EIA Screening (is this required)
Fife Council have indicated that EIA screening would be required in any planning application. They do not consider based upon the information presented that a full EIA would be required.

5: Fife Council adopted road support taken from Harbour Wall
Fife Council indicated that this should be raised with local elected officials.

11.0 Feasibility Assessment Workshop

A Feasibility Assessment Workshop was held at the Dundee office of Fairhurst, on the 4th June 2024, at 10am.

The following attendees were present:

- Bill Laver – Representing St Andrews Harbour Trust.
- Andrew Kram – Partner, Fairhurst *(in part).*
- Gavin Park – Project Engineer, Civil Engineering, Fairhurst.
- Mark Baruffati – Project Engineer, Structures, Fairhurst.

11.1. Purpose of Workshop

The purpose of the workshop was to allow Fairhurst to table some initial options, and discuss these in an open forum. Options discussed comprised:

1. Reinforced Concrete Wall with Masonry Cladding to the exposed faces.
2. Reinforced Concrete Wall with patterned formwork to represent stonework.
3. Gabion Basket type wall.
4. Precast Concrete units with a curved form to deflect wave action.
5. Precast Concrete units, with patterned exposed face to represent stonework.
6. Solid Masonry Wall
7. Piled Retaining Wall Solution

Option 1: Reinforced Concrete Wall with Masonry Cladding to the exposed faces.
This was the first option tabled, as it is seen by Fairhurst as being the most appropriate for providing a long-term robust solution, and at the same time most likely to meet with the approval of regulatory authorities. Subject to detailed design, Option 1 would consist of a reinforced concrete wall to the seaward face of the slipway, which would be clad using either reclaimed sandstone, or sandstone sourced from elsewhere. A similar R.C Wall would be required along the land side edge of the slipway, constructed in the same manner. A reinforced concrete tie-slab would be introduced below the slipway, in order to tie each of the vertical walls together and act as a diaphragm type structure which will enhance long-term structural robustness. Finally, the slipway surface would be reinstated using reclaimed sandstone setts from the foreshore, or new sandstone setts sourced from elsewhere.

Once completed, Option 1 would, in effect, replicate the pre-storm damaged slipway.

Option 2: Reinforced Concrete Wall with patterned formwork to represent stonework.
Option 2 would provide a similarly robust structural solution to that being proposed for Option 1. However, rather than cladding the seaward facing elevations with sandstone, a patterned formwork would be introduced. The pattern would replicate stonework coursing; however, the finish would be grey concrete. This alternative finish, albeit on the Seward faces of the

wall which are not overly visible to the public, may not be an acceptable finish to the regulatory authorities.

The slipway itself would be reinstated in a similar manner to Option 1.

Option 3: Gabion Basket type wall.
The option to consider a Gabion Basket wall had been initially considered due to the potential for costs to be significantly less than that of other options. However, upon further consideration this option has been ruled out on the grounds of:

- Long-term stability of the structure.
- Reduced design life afforded by gabion baskets.
- Appearance is not in keeping with the surrounding area.

Option 4: Precast Concrete units with a curved form to deflect wave action.
Option 4 was included in order to consider long term intervention against wave action. The curved nature of the new precast system helps to dissipate wave energy, and improves the lifespan of the sea wall. However, given the significant change in appearance, and the potential for any change in the wave action to cause damage to existing adjacent structures, Option 4 has been very quickly ruled out.

Option 5: Precast Concrete units, with patterned exposed face to represent stonework.
Option 5 would provide a similar end solution to that indicated in Option 2, however would be achieved by using precast concrete wall panels rather than in-situ R.C Walls. Whilst the major benefit of using a precast solution is the speed of installation, there would always be a requirement for a suitably sized crane to be positioned on Shorehead in order to lift the precast panels into their final positions. Whilst the provision of a crane cannot be totally ruled out, there would be a requirement to close Shorehead for a period of time, and any additional loadings on existing harbour structures would need to be carefully considered.

As with Option 2, achieving approval from the regulatory authorities may prove difficult due to materials being used and the final appearance of the wall.

The slipway itself would be reinstated in a similar manner to Option 1.

Option 6: Solid Masonry Wall
Option 6 would in effect see the slipway and supporting walls simply reconstructed in a very similar manner to that which existed pre-storm damage.

Whilst this option is more than likely going to be acceptable to the regulatory authorities, there are potential issues with long term durability and maintenance issues.

Option 7: Piled Retaining Wall Solution
Any type of piled retaining wall solution will require the piles to embedded into rock to a sufficient depth. The depth of embedment can vary depending on the pile type, however as a rule-of-thumb, the length of pile should be 2/3^{rds} socket depth into rock, to 1/3rd exposed pile. Therefore, if the retaining wall height was 2.0m, then the rock socket for the pile should be at least 4.0m. Given that rockhead is at the surface of the foreshore, and is considerably hard

and durable, any piled solution would have to be of a cored type, which may be cost prohibitive. Furthermore, the visual appearance of the finished structure would not be in keeping with the adjacent surroundings.

11.2. Summary

It was agreed that the feasibility study should look to expand further on all of the above options, however should be more focused on options 1 & 2, which are seen to be the most obvious solutions which would provide a robust, long-term reinstatement, and minimise any visual impact.

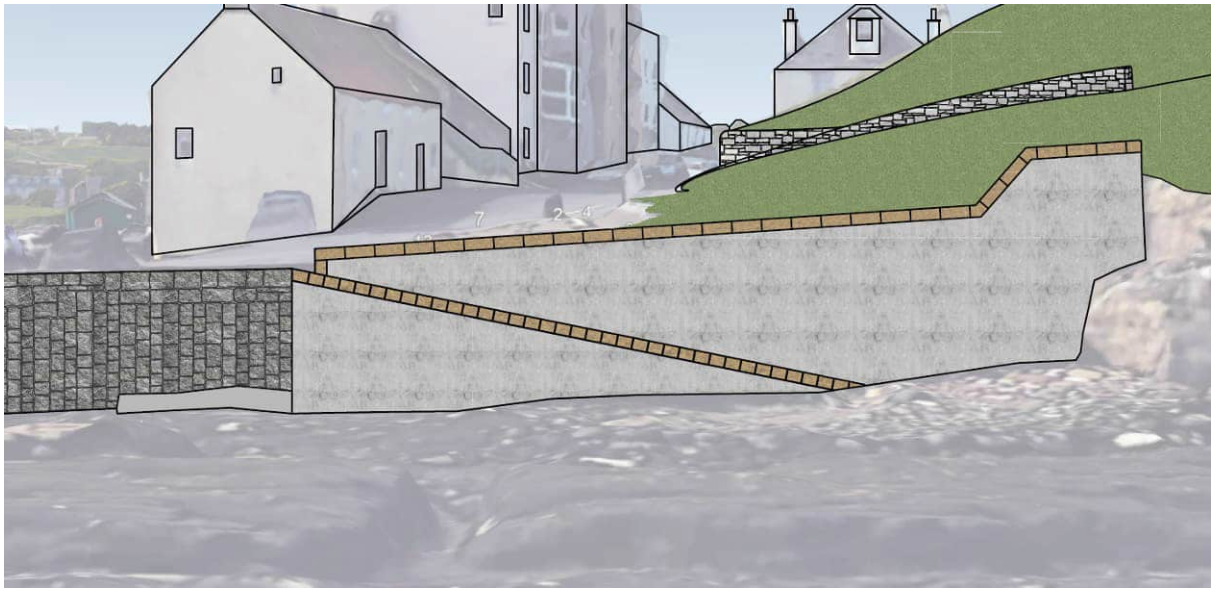
Furthermore, Fairhurst are to arrange a meeting with Fife Council Planning team at the earliest opportunity, in order to seek some pre-application feedback.

12.0 Conclusions and Recommendations

- Fairhurst have undertaken a desk-based review of all historic reporting on the North West Slipway.
- Fairhurst have carried out a visual inspection of the storm damaged area around the North West Slipway.
- A Laser Scan and Topographic Survey have been obtained of the area in question in order to inform design solutions.
- Various options have been considered, with Option 1 and 2 being considered as the most likely to receive a favourable response from Fife Council Planning, and any other consultee required through the Planning process.
- Initial meeting held with Fife Council planning representatives, with relatively positive feedback on Option 1 and option 2.
- Fife Council have indicated that EIA screening would be required in any planning application. However, they do not consider, based upon the information presented, that a full EIA would be required.
- Fairhurst would recommend that Options 1 and 2 are taken forward to a more detailed assessment and form the basis of further discussions with Fife Council as Planning Authority, along with other interested regulators in order to achieve buy-in to the project.
- It is further recommended that both Options 1 and 2 are detailed sufficiently in order that a cost analysis can be undertaken in order to inform the St Andrews Harbour Trust of likely costs associated with the works.
- Options 1 and 2 each provide the same degree of structural stability, robustness, and long-term durability, which will extend the life of the reinstated North West Slipway.
- No assessment has been undertaken in regard to Wave Action Modelling, as it is not considered relevant unless the shape of the sea wall was being changed which may change the way wave energy impacts on adjacent structures.
- The following images show basic elevations for both Options 1, and Option 2

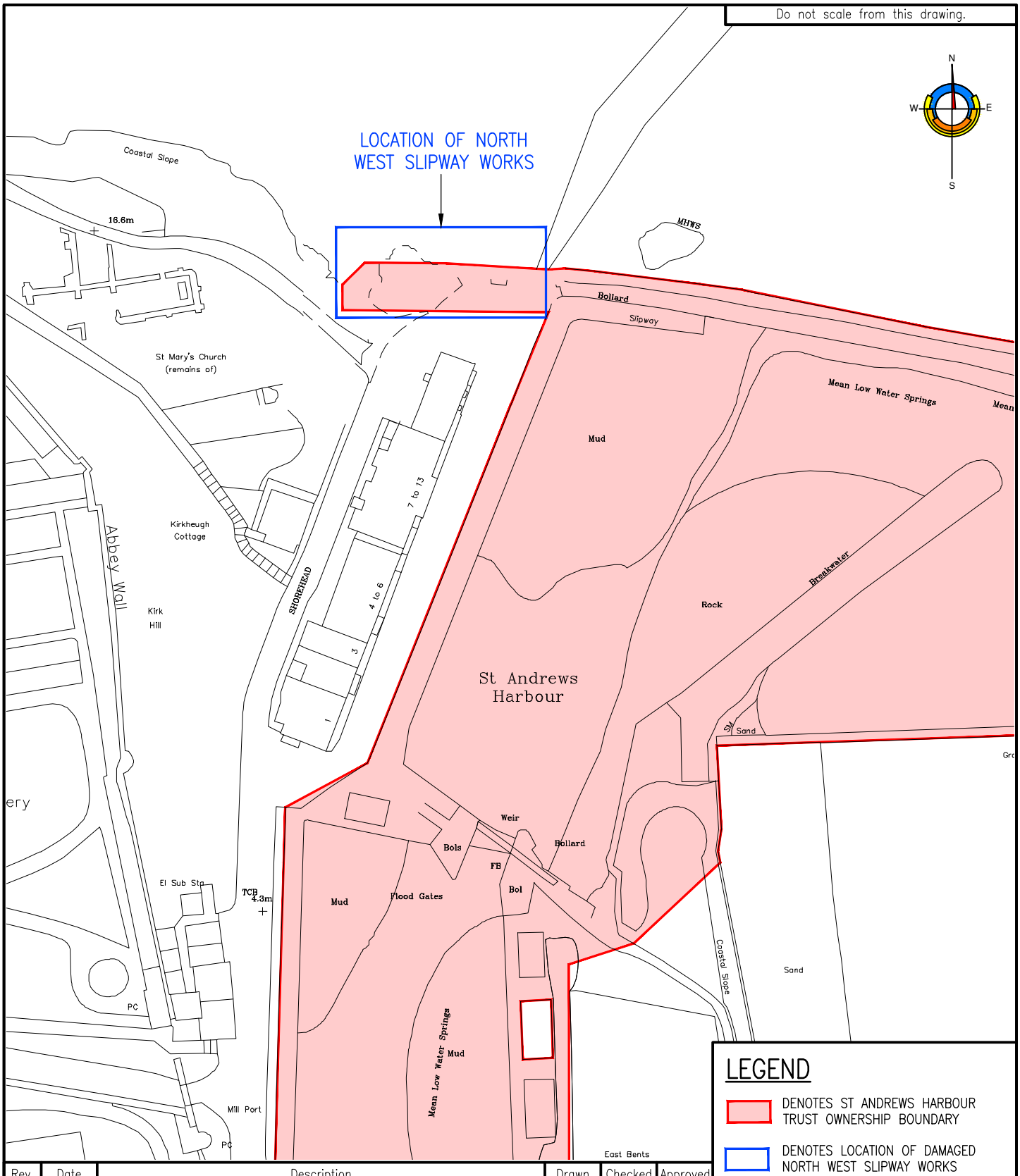
- Indicative Elevation for Option 1

- Indicative Elevation for Option 2



Appendix 1 – Drawings

Do not scale from this drawing.



LEGEND

DENOTES ST ANDREWS HARBOUR TRUST OWNERSHIP BOUNDARY

DENOTES LOCATION OF DAMAGED NORTH WEST SLIPWAY WORKS

Rev.	Date	Description	Drawn	Checked	Approved

ST ANDREWS HARBOUR TRUST
A TRUST PORT AUTHORITY

Project Title:

FEASIBILITY STUDY FOR REINSTATEMENT OF STORM DAMAGED SLIPWAY AT ST ANDREWS HARBOUR

Drawing Title:

SITE LOCATION PLAN

FAIRHURST

Westerton of Craigie,
Southampton Road, DUNDEE, DD4 7PN
Tel: 01382 453300 Fax: 0844 381 4412

Scale at A4:	Status:	
1:1000	For Information	
Drawn:	**Checked:**	**Approved:**
MR	GAV	AK
Date:	**Date:**	**Date:**
17/07/2024	19/07/2024	19/07/2024

Drawing No.: 159462/9001

Revision: –

Slope

St Mary's Church
(remains of)

Kirkheugh
Cottage

SHOREHEAD

1

3

4 to 6

7 to 13

MHWS

Bollard

Slipway

SWEPT PATH FOR LARGE REFUSE VEHICLE INDICATING AREA OF SHOREHEAD WHICH MUST REMAIN OPEN TO PUBLIC

Mud

Mean Low Water Springs

Mean Low Wate

St Andrews
Harbour

Weir

Bols

FB

Bollard

AERIAL VIEW OF DAMAGED SLIPWAY SHOWING INDICATIVE WORK EXTENTS BOUNDARY

NOT TO SCALE

N

W

E

S

Do not scale from this drawing.

SAFETY HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARD/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING RISKS AND INFORMATION.

RISKS LISTED HERE ARE NOT EXHAUSTIVE. REFER TO DESIGN ASSESSMENT FORM NO.

CONSTRUCTION

DEMOLITION

FOR INFORMATION RELATING TO USE, CLEANING, AND MAINTENANCE SEE THE HEALTH AND SAFETY FILE

IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

LEGEND

DENOTES ST ANDREWS HARBOUR TRUST OWNERSHIP BOUNDARY

DENOTES EXTENTS OF WORKING AREA INCLUDING MAXIMUM AVAILABLE EXTENT OF COMPOUND

Rev.	Date	Description	Drwn.	Chkd.	Appd.

Client:

ST ANDREWS HARBOUR TRUST
A TRUST PORT AUTHORITY

FAIRHURST
Westerton of Craigie
Southampton Road
DUNDEE
DD4 7PN
Tel: 01382 453 300
E: dundee@fairhurst.co.uk

Project Title:
FEASIBILITY STUDY FOR REINSTATEMENT OF STORM DAMAGED SLIPWAY AT ST ANDREWS HARBOUR

Drawing Title:
SITE EXTENTS

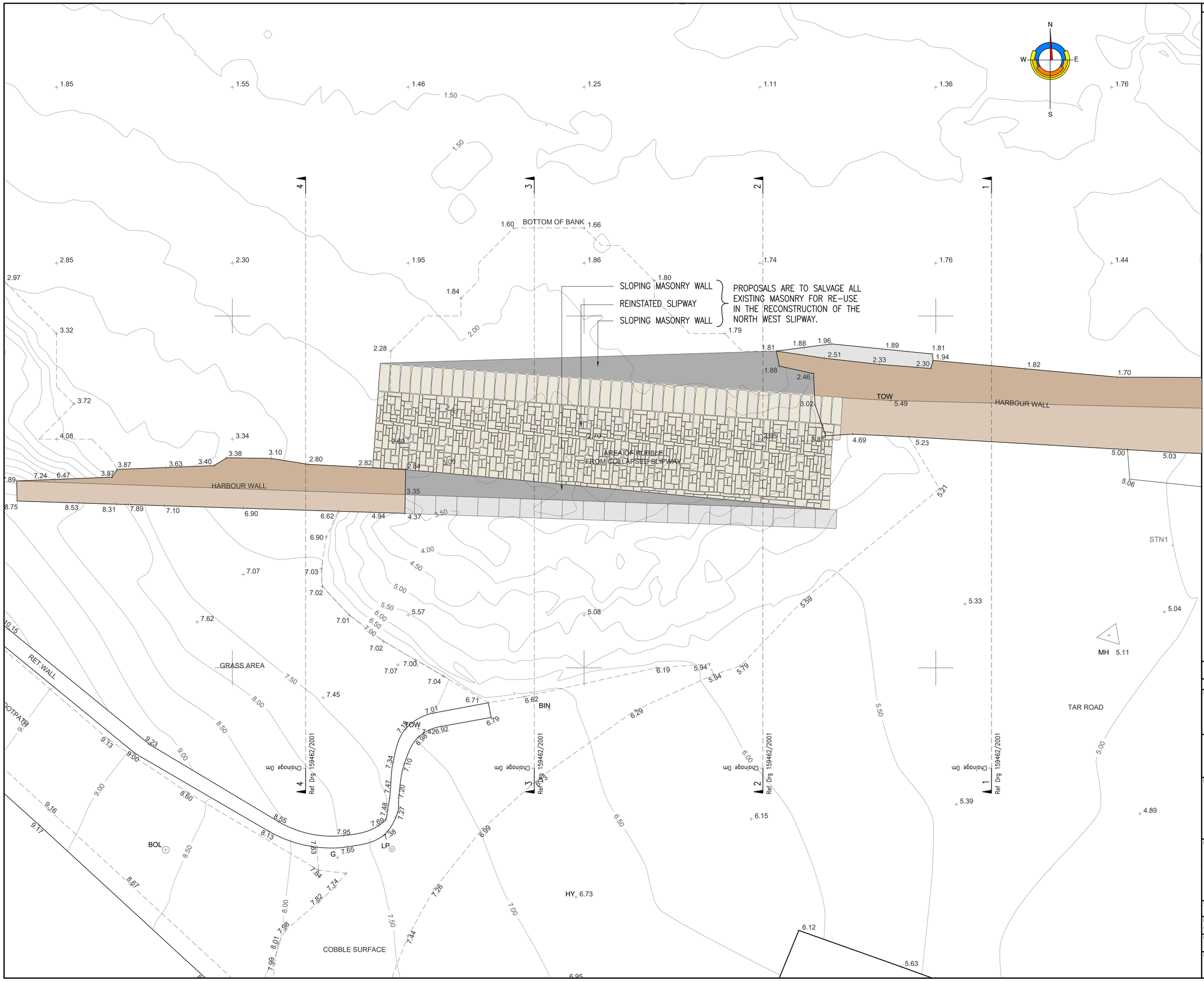
Scale at A1:	Status:	
1:250	For Information	
Drawn:	Checked:	Approved:
MR	GAV	AK
Date:	Date:	Date:
17/07/24	19/07/2024	19/07/2024

Drawing No.: 159462/9002

Revision: –

Do not scale from this drawing.

CONTROL STATIONS				
Station No.	Description	Easting	Northing	Level
STN1	HILTI	351636.725	716663.477	5.090
STN2	HILTI	351597.984	716664.353	10.959
STN3	HILTI	351577.901	716672.626	15.007



DRAFT ISSUE FOR DISCUSSION

Rev.	Date	Description	Drwn.	Chkd.	Appd.
–	03.06.24	DRAFT ISSUE FOR DISCUSSION	GAV	AK	AK

Client:

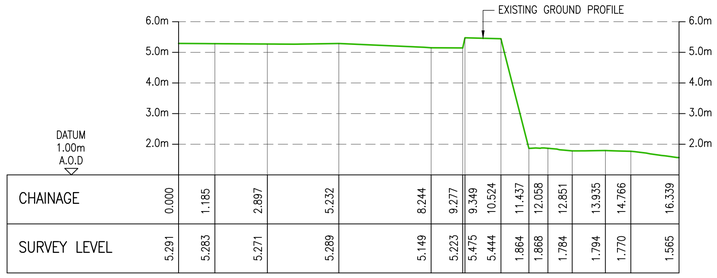
ST ANDREWS HARBOUR TRUST
A Trust Port Authority

FAIRHURST
Westerton of Craigie
Southampton Road
DUNDEE
DD4 7PN
Tel: 01382 453 300
E: dundee@fairhurst.co.uk

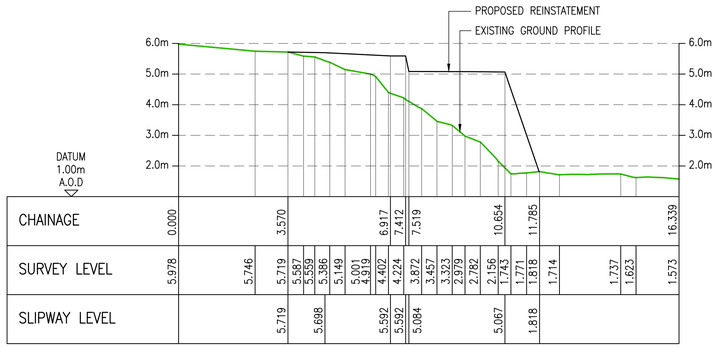
Project Title:
FEASIBILITY STUDY FOR REINSTATEMENT OF STORM DAMAGED SLIPWAY AT ST ANDREWS HARBOUR

Drawing Title:
SLIPWAY REINSTATEMENT GENERAL ARRANGEMENT

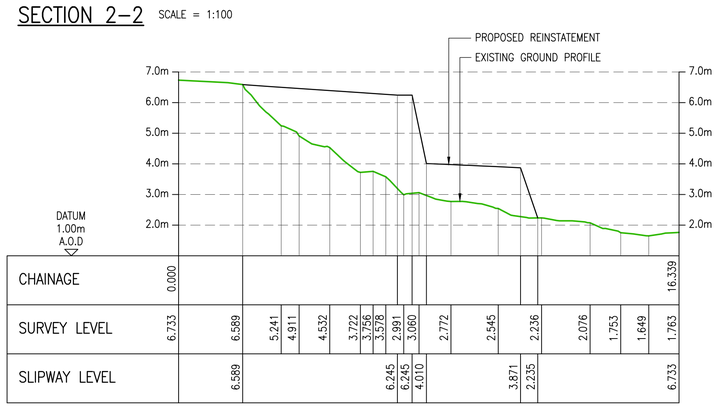
Scale at A1:	Status:		
1:50	For Information		
Drawn:	Checked:	Approved:	
GAV			
Date:	Date:	Date:	
31/05/24			
Drawing No.:			Revision:
159462/2000			–



SECTION 1–1 SCALE = 1:100



SECTION 2–2 SCALE = 1:100



SECTION 3–3 SCALE = 1:100

SECTION 4–4 SCALE = 1:100

Do not scale from this drawing.

DRAFT ISSUE
FOR DISCUSSION

Rev.	Date	Description	Drwn.	Chkd.	Appd.
–	03.06.24	DRAFT ISSUE FOR DISCUSSION	CAV	AK	AK

Client:
St Andrews Harbour Trust
A Trust Port Authority

FAIRHURST
Westerton of Craigie
Southampton Road
DUNDEE
DD4 7PN
Tel: 01382 453 300
E: dundee@fairhurst.co.uk

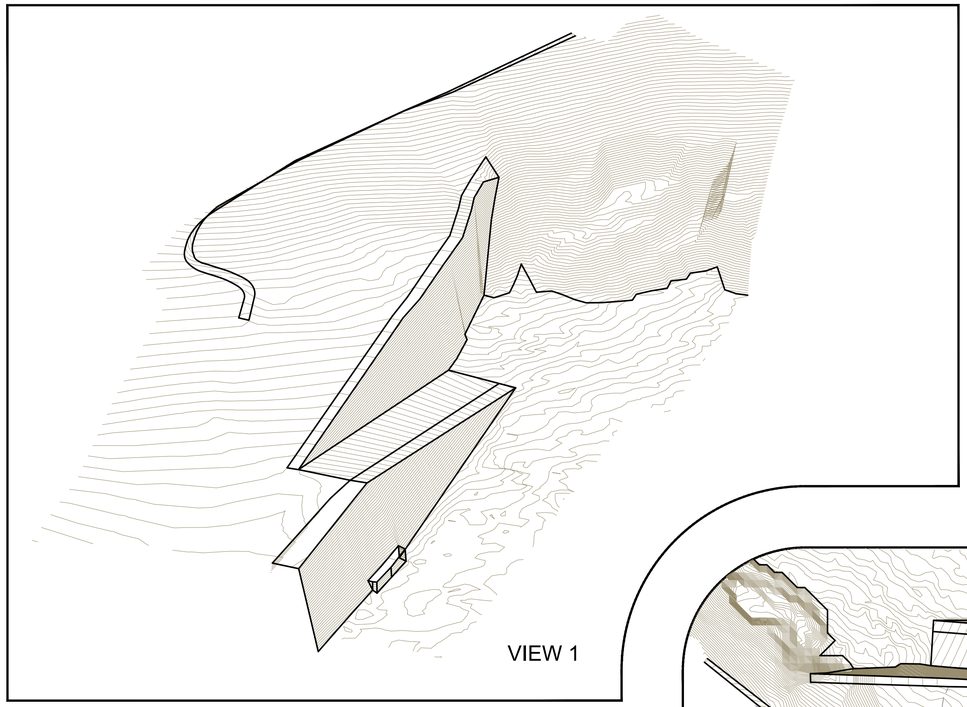
Project Title:
FEASIBILITY STUDY FOR REINSTATEMENT OF STORM DAMAGED SLIPWAY AT ST ANDREWS HARBOUR

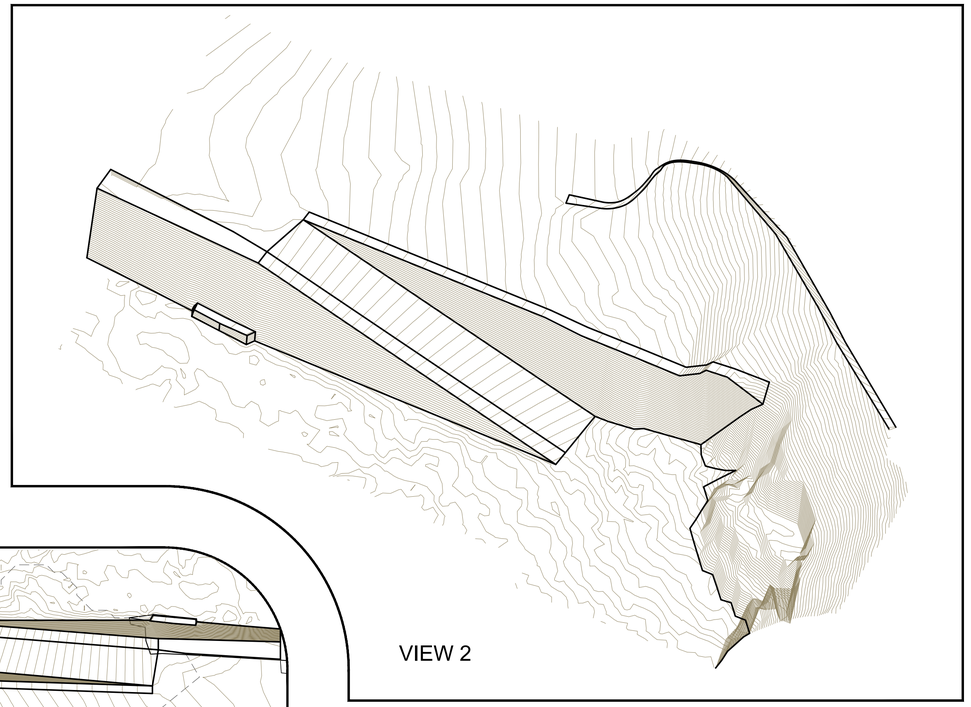
Drawing Title:
SLIPWAY REINSTATEMENT CROSS SECTIONS

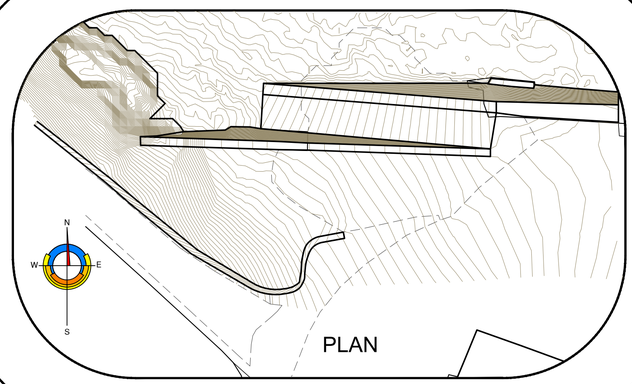
Scale at A1:	Status:		
1:100	For Information		
Drawn:	Checked:	Approved:	
CAV			
Date:	Date:	Date:	
31/05/24			

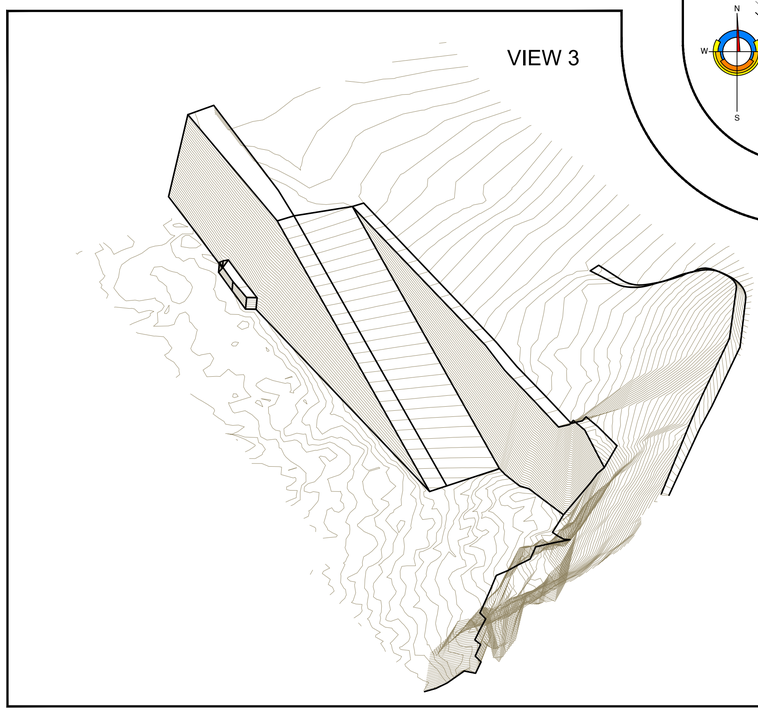
Drawing No.: 159462/2001 Revision: –

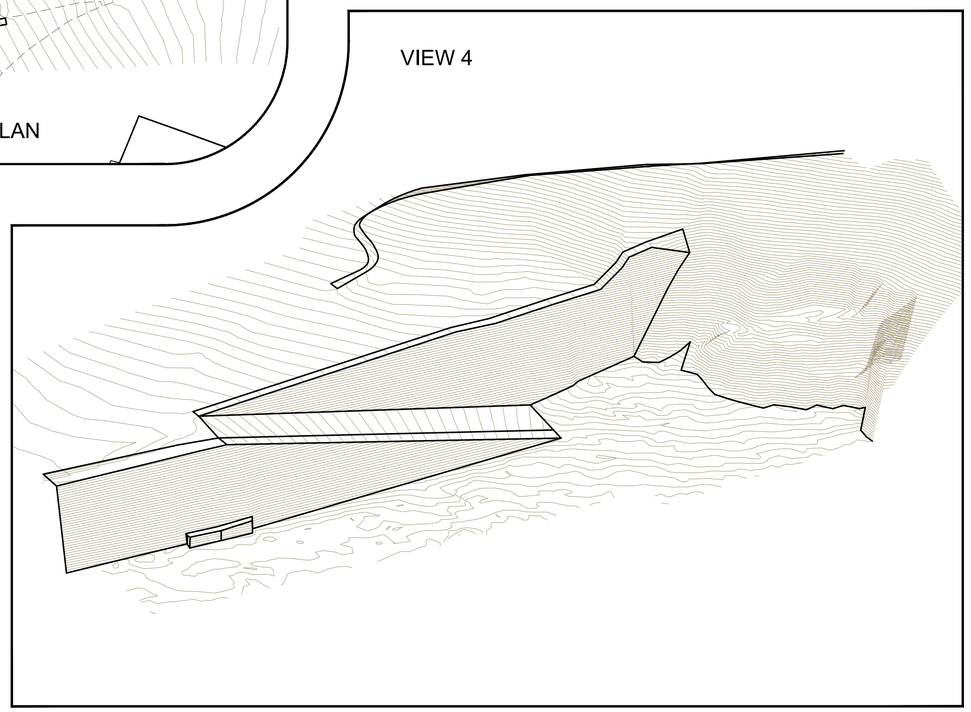
Do not scale from this drawing.











DRAFT ISSUE
FOR DISCUSSION

Rev.	Date	Description	Drwn.	Chkd.	Appd.
–	03.06.24	DRAFT ISSUE FOR DISCUSSION	GAV	AK	AK

Client:
St Andrews Harbour Trust
A Trust Port Authority

FAIRHURST
Westerton of Craigie
Southampton Road
DUNDEE
DD4 7PN
Tel: 01382 453 300
E: dundee@fairhurst.co.uk

Project Title:
FEASIBILITY STUDY FOR REINSTATEMENT OF STORM DAMAGED SLIPWAY AT ST ANDREWS HARBOUR

Drawing Title:
3D MODEL INDICATING SLIPWAY REINSTATEMENT

Scale at A1:	Status:		
Diagrammatic	For Information		
Drawn:	Checked:	Approved:	
GAV			
Date:	Date:	Date:	
31/05/24			

Drawing No.: 159462/2004
Revision: –

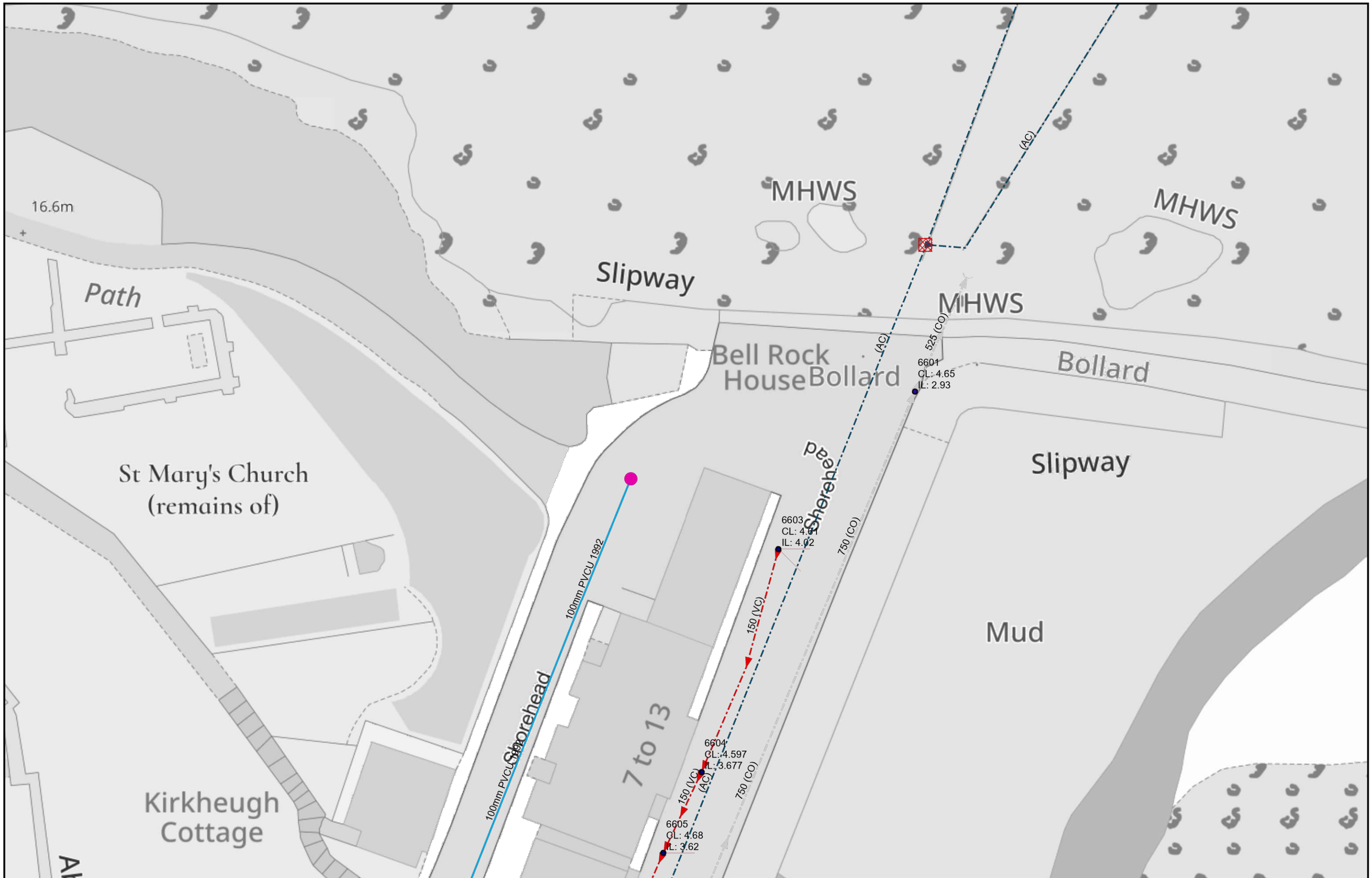
Appendix 2 – Existing Public Utility Records

Scottish Water

Telecom

Gas

Electricity



Warning! Damaging a large diameter trunk main (12"/300mm and above) can result in loss of life and major water supply and water quality problems. If you're planning any extension work in the vicinity of any large diameter mains shown on our maps, you must contact Scottish Water to arrange a site visit 08000 778 778 WELL IN ADVANCE OF THE WORKS.

Plotted By: gavin.park@fairhurst.co.uk

N

The representation of physical assets and the boundaries of areas in which Scottish Water and others have an interest does not necessarily imply their true positions. For further details contact the appropriate District office.

Date: 17/07/2024

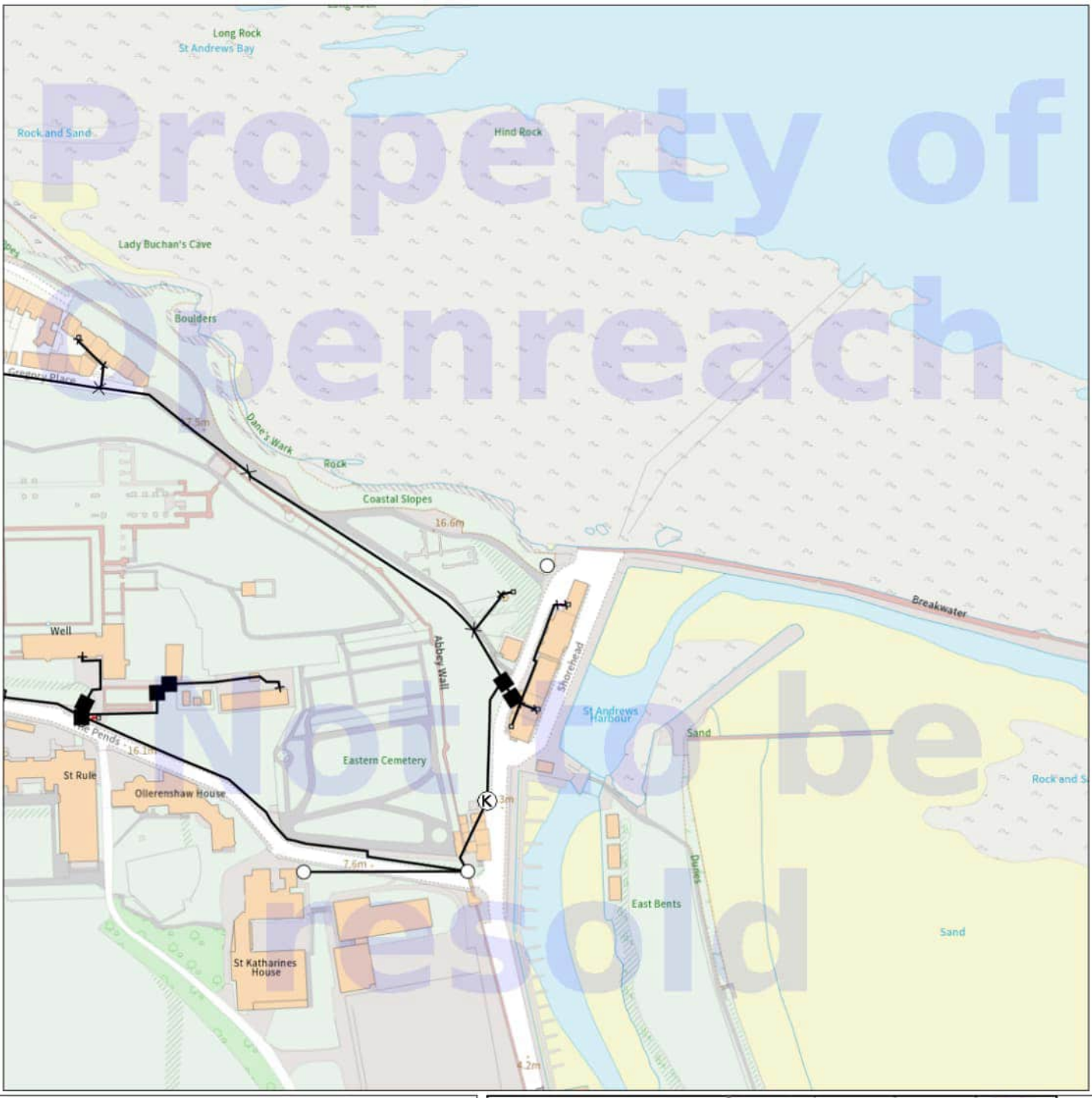
Shorehead - St Andrews

0 1.5 3 6 Meters

SCALE: 1:331

Scottish Water
Trusted to serve Scotland
The Bridge
6 Buchanan Gate
Stepps
Glasgow
G33 6FB
Tel No: 08000 778 778

Maps on Demand Plant Information Reply



IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made newar to BT apparatus which may exist at various depths and may deviate from the marked route.

openreach

CLICK BEFORE YOU DIG

FOR PROFESSIONAL FREE ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS INCLUDING LOCATE AND MARKING SERVICE

email nnhc@openreach.co.uk

ADVANCE NOTICE REQUIRED
(Office hours: Monday - Friday 08.00 to 17.00)
www.openreach.co.uk/cbyd

Accidents happen

If you do damage any Openreach equipment please let us know by calling 0800 023 2023 (opt 1 + opt 1) and we can get it fixed ASAP

KEY TO BT SYMBOLS	Planned	Live
PCP		
Pole		
Box		
Manhole		
Cabinet		

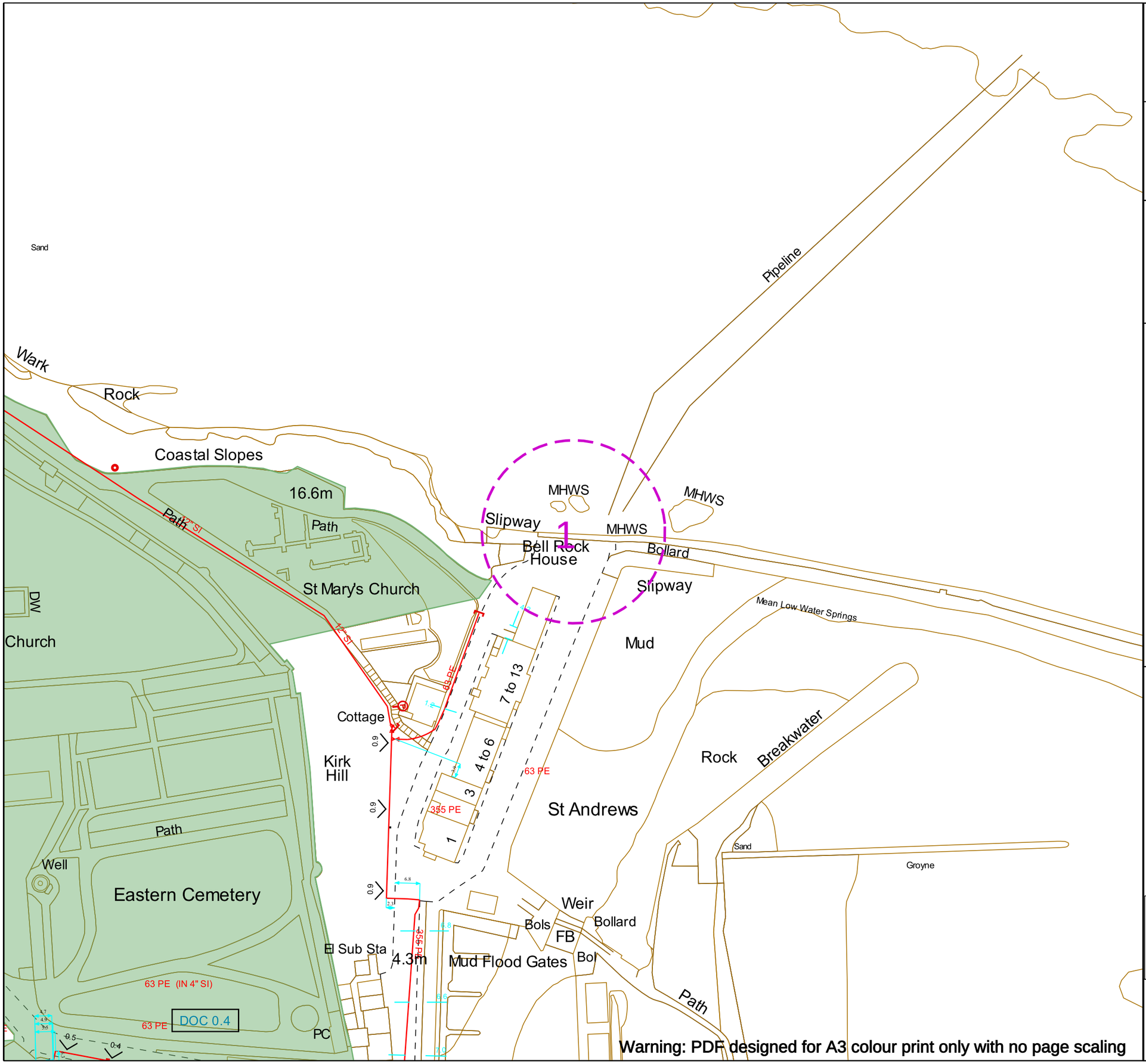
Change Of State	+	Hatchings	
Split Coupling	×	Built	
Duct Tee	▲	Planned	
Building		Inferred	
Kiosk	K	Duct	

Other proposed plant is shown using dashed lines.
BT Symbols not listed above may be disregarded.
Existing BT Plant may not be recorded.
Information valid at time of preparation. Maps are only valid for 90 days after the date of publication.

	Pending Add	In Place	Pending Remove	Not In Use
Power Cable				
Power Duct				N/A

BT Ref : FWZ16146I
Map Reference : (centre) NO5161216667
Easting/Northing : (centre) 351612,716667
Scale : 1:500
Issued : 16/07/2024 16:14:46

WARNING: IF PLANNED WORKS FALL INSIDE HATCHED AREA IT IS ESSENTIAL BEFORE PROCEEDING THAT YOU CONTACT THE NATIONAL NOTICE HANDLING CENTRE. PLEASE SEND E-MAIL TO: nnhc@openreach.co.uk



Warning: PDF designed for A3 colour print only with no page scaling

SGN
Your gas. Our network.

Contact Us
SGN Safety Admin Team:
0800 912 1722
Email:
plantlocation@sgn.co.uk

Date Requested: 16/07/2024
Job Reference: 34082448
Site Location: 351637 716668
Requested by: Miss Madisenne Rotchell

Your Scheme/Reference: 159462

Scale: 1:1000 (When plotted at A3)

This plan shows the location of those pipes owned by Scotia Gas Networks (SGN) by virtue of being a licensed Gas Transporter (GT). Gas pipes owned by other GTs or third parties may also be present in this area but are not shown on this plan. Information with regard to such pipes should be obtained from the relevant owners. No warranties are given with regard to the accuracy of the information shown on this plan. Service pipes, valves, siphons, sub-connections etc. are not shown but their presence should be anticipated. You should be aware that a small percentage of our pipes/assets may be undergoing review and will temporarily be highlighted in yellow. If your proposed works are close to one of these pipes, you should contact the SGN Safety Admin Team on 0800 912 1722 for advice. No liability of any kind whatsoever is accepted by SGN or its agents, servants or sub-contractors for any error or omission contained herein. Safe digging practices, in accordance with HS (G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that plant location information is provided to all persons (whether direct labour or sub-contractors) working for you on or near gas apparatus. Information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

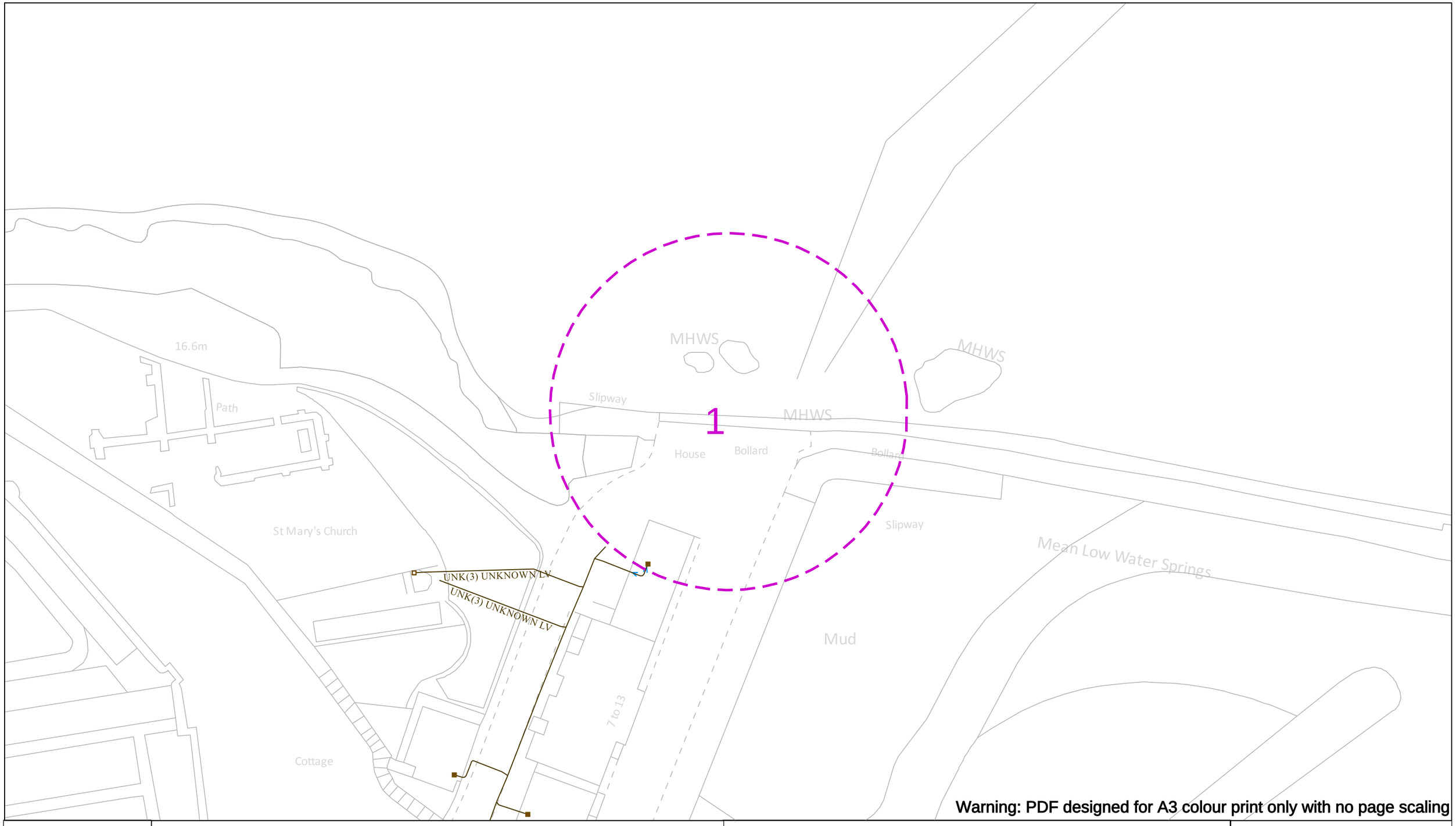
Report damage immediately – KEEP EVERYONE AWAY FROM THE AREA
0800 111 999

Low Pressure Mains
Medium Pressure Mains
Intermediate Pressure Mains
High Pressure Mains
LAs
GTs
SSSIs

Some Examples Of Plant Items
Valve | Syphon | Depth of Cover | Diameter Change | Material Change

Digsite: Line: Area:

Linesearch beforeUdig



Warning: PDF designed for A3 colour print only with no page scaling

Date Requested: 16/07/2024
Job Reference: 34082448
Site Location: 351637 716668
Requested by:
Miss Madisenne Rotchell
Your Scheme/Reference:
159462

Scale: 1:500 (When plotted at A3)

IMPORTANT NOTICES

- This information shown on this plan is indicative only and its accuracy cannot be guaranteed.
- The plan only shows assets owned by SP Energy Networks.
- Positions and depths of cables may have altered since being recorded. A line on a plan may represent more than one cable. Normally electric cables are laid at depths between 450mm and 1m but depths may have changed if land surface levels have since altered.
- The plan may not show, or may inaccurately show, individual property services and services to street lighting installations. Underground services may be found in roads, footpaths and on sites. Always assume that they are present for each property, lamp column and street sign etc and treat any services found anywhere as live.
- You must use safe digging practices in accordance with HS(G)47 to establish the actual position of mains cables, services and other apparatus before any mechanical excavation is used.
- Where overhead lines cross your site, you must comply with the requirements of Health & Safety Executive guidance as laid down in GS6, Avoidance of Danger from Overhead Electric Lines.
- Any works that fall within **5m** of any 132kv or Transmission cables, or within **15m** of any 132kV or Transmission OHL's, please contact our General Enquiries Team **0845 273 4444 / 0330 10 10 444** for further safety advice.
- In the event of an emergency or for further assistance contact **0800-092-9290 (Central & Southern Scotland) or 0800-001-5400 (Merseyside, Cheshire & North Wales) or by dialling 105**
- It is your responsibility to ensure this information is provided to all persons working near our plant.

100m

Underground Cables
In Use
Out of Use
Assumed Route
Warning - Shallow Cables

Overhead Line
LV
HV (6kV/6.6kV)
HV (22kV/11kV)
EHV (33kV)
Trans (132kV/275kV/400kV)
Non Power Cable
Duct

Dig Sites
Area:
Line:

SP ENERGY NETWORKS

Appendix 3 – Existing Ground Conditions