Feasibility/Options Report

Public Footpath ZF5 Faversham Reach

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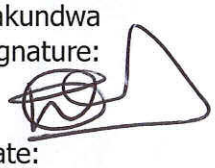
Rev. 01 Executive summary Section 1.1 Section 1.3 Section 2.3 Section 2.6 Section 2.8 Section 6.2	Name: Wellington Takundwa Signature:  Date: 5 Nov 2015	Name: Chris Shelbourn Signature: C J. Shelbourn Date: 9th Nov. 2015	Name: Chris Shelbourn Signature: C J. Shelbourn Date: 9th Nov. 2015
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Executive Summary

Amey was commissioned by Kent County Council Public Rights of Way to undertake a feasibility study of an obstructed public footpath ZF5 at Faversham Reach, Kent. The route of the footpath is currently obstructed by quayside developments. Three ramps will be required along the proposed route overcoming an existing height difference of 1 to 2m either ends of the footpath. The options considered are as follows:

- Do-nothing
- Solid construction
- Metal platform option
- Concrete platform option
- Cantilever reinforced concrete slab

In developing the options, ground investigation and ecological scoping were undertaken and reports of these are in Appendices C and D.

Solid construction has been recommended because it provides the most cost-effective long term solution for all the locations. Drawings showing each proposed option are in Appendix B.

Contents

1 Introduction 1
1.1 Client brief 1
1.2 Aims of the Feasibility 1
1.3 Background 1
1.4 Location Plan 2
1.5 Photographs of the existing structure 3

2 Design Considerations 5
2.1 General 5
2.2 Details of existing structural elements 5
2.3 Land Ownership 5
2.4 Land Use 5
2.5 Public Footpath Closures 6
2.6 Equality Act 2010 6
2.7 Statutory Undertakers Apparatus 6
2.8 Traffic Impact Assessment 6
2.9 Design Criteria 7

3 Options 8
3.1 General 8
3.2 Do-Nothing 8
3.3 Location B-C 8
3.4 Location H-I 12
3.5 Location L-M 14

4 Environmental Considerations 16
4.1 Emissions and Waste 16
4.2 Air Quality 16
4.3 Archaeology and Cultural Heritage 16
4.4 Landscape 17
4.5 Ecology and Nature Conservation 17
4.6 Geology and Soils 18
4.7 Material Use 18
4.8 Noise and Vibration 18
4.9 Drainage and Water Environment 18

5 Geotechnical Considerations 20
5.1 Background and Geotechnical Information 20
5.2 Preliminary Geotechnical Advice 21
5.3 Geotechnical Investigation 21

6 Operation and Maintenance 23
6.1 Operation of Footpath 23
6.2 Inspection and Maintenance 23

7 Stakeholders 24
7.1 Stakeholder Consultation 24

8 Discussions 25
8.1 Cost Comparison 25

9 Conclusions and Recommendations 28

Appendix A Photographs
Appendix B Options Drawings
Appendix C Geotechnical Report
Appendix D Ecology Report
Appendix E Bibliography

1 Introduction

1.1 Client brief

Kent County Council Public Rights of Way commissioned Amey Consulting to carry out a feasibility study of a proposal to resolve a long standing obstruction to Public Footpath ZF5 at Faversham Reach in Kent. The feasibility study involves finding solutions to make the route continuous either by diverting the existing public footpath to a new creek-side alignment or constructing ramps at two locations. The third location requires solutions to provide access beside the slipway.

The commission included a topographic survey, environmental scoping and ground investigation.

1.2 Aims of the Feasibility

The aim of this study is to provide a recommendation for a ramp option for 3 no. locations of the existing public footpath which is cost effective, buildable and has the least impact on the surrounding environment.

The report will provide capital costs for constructing the proposed options. There is no whole life costing required as part of the commission.

This report will also consider environmental impacts for the proposed scheme.

1.3 Background

The existing public footpath ZF5 is located adjacent to Faversham Creek turning inland towards Ham Farm via Faversham Reach at Faversham, Kent. The footpath has been obstructed to the public by residential development since at least 1997.

For the purposes of this report reference points of the public footpath ZF5 have been called A to M from the west end as indicated in the location plan in Appendix B.

There are no as-built records of the structure. However, previous reports indicate that the footpath has been constructed over time next to the various businesses and residential properties surrounding the Creek.

Construction of the existing solid footpath consists of compacted fill, paved by bricks and retained by anchored steel sheet piles. The anchored steel sheet piles have a reinforced concrete capping beam. There is a piled timber sleeper quay in front of the steel sheet piles on section K-L.

Swale Borough Council commissioned East Kent Engineering Partnership to carry out a visual condition assessment in January 2015 and their measured length of section K to L was approximately 159m long consisting of:

- 72m steel sheet piles with reinforced concrete capping
- 87m timber sleepers and timber piles with reinforced concrete capping.

1.4 Location Plan

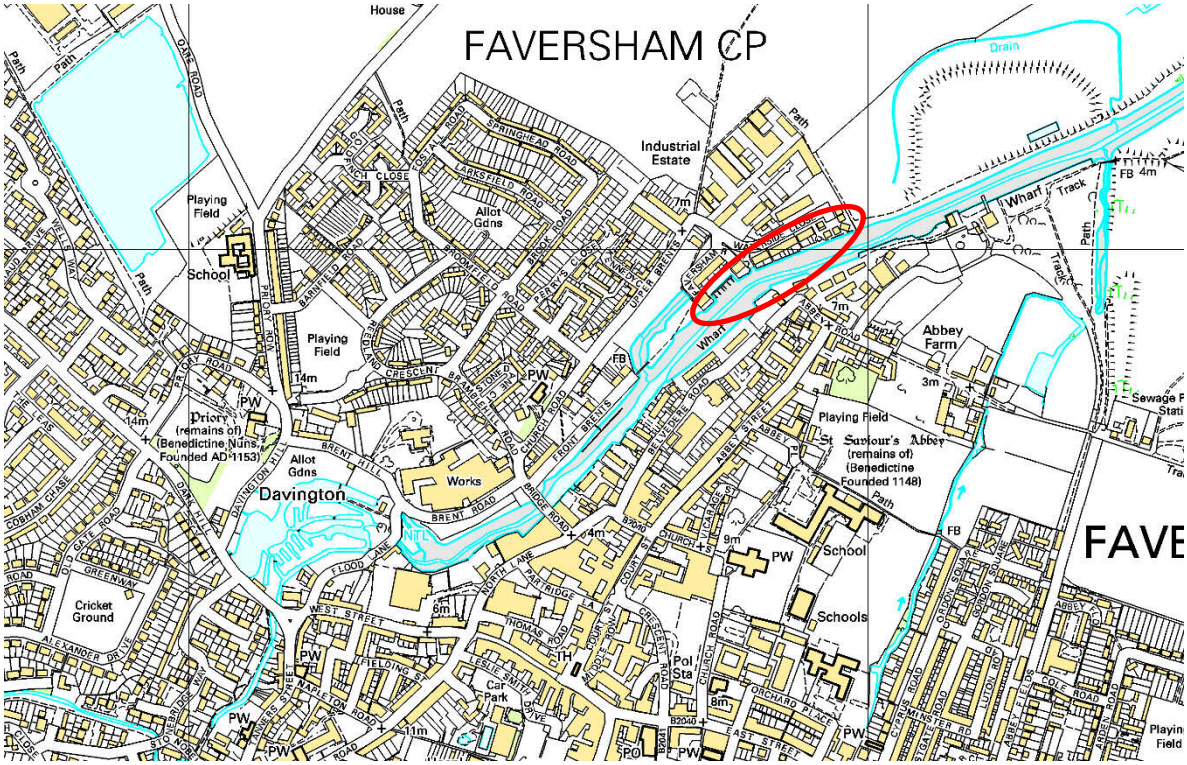
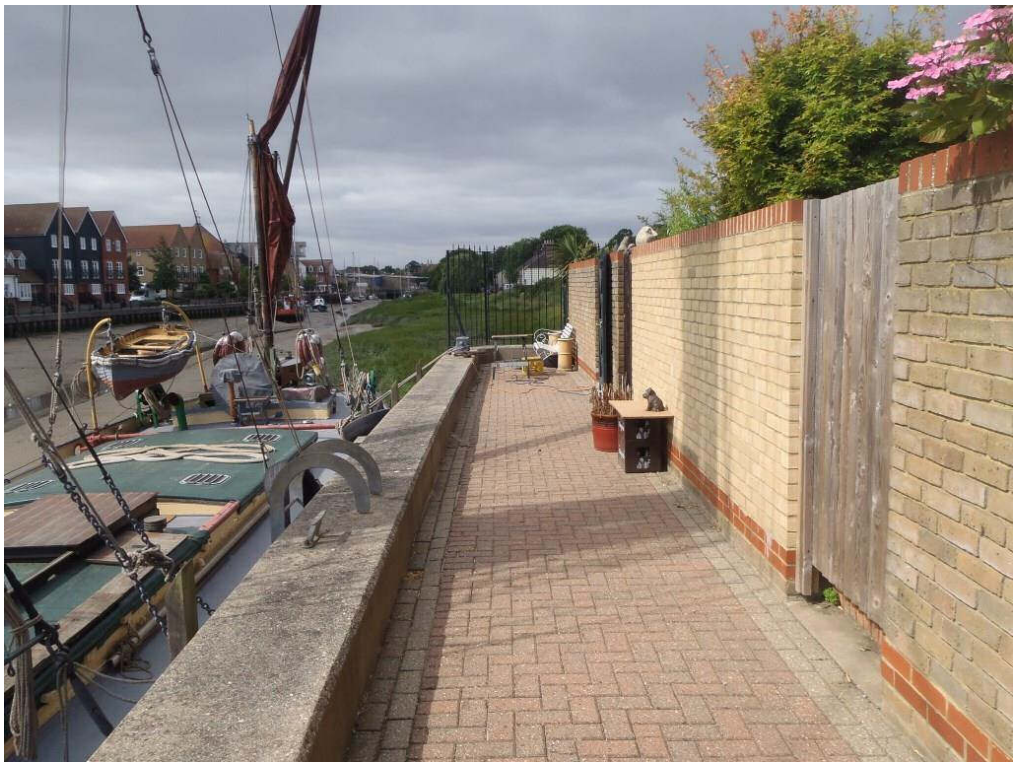


Figure 1: Location of existing footpath (red circle)

1.5 Photographs of the existing structure

Photograph 1: Location of point B-C looking north.



Photograph 2: View of point B-C looking west.

Photograph 3: Location of point L looking west.

Photograph 4: Location of point H-I looking east.

2 Design Considerations

2.1 General

A detailed structural inspection of the areas of interest has been undertaken as part of this study together with a topographic survey, environmental scoping and geotechnical investigation.

2.2 Details of existing structural elements

The steel sheet piles and concrete pile cap were found to be in good condition with general surface corrosion. The piles appear to have been covered by corrosion protection paint. The concrete capping beam was found to have cracking consistent with thermal and shrinkage effects. Minor spalling and impact damage were observed in places of the reinforced concrete capping beam.

2.3 Land Ownership

A land search has not been undertaken for the ramp options. It is understood that all land within the footprint of the existing footpath is a designated public right of way or owned by the Local Authority.

All the proposed ramp options are within the footprint of the proposed public right of way boundaries.

2.4 Land Use

The land at the east and west ends of the proposed footpath is currently undeveloped. At point L, the surrounding land is currently used as farmland for crops and grazing. The land at point C forms part of the protected area of marshland making up Faversham Village Green.

Land will be required for a site compound to accommodate a welfare unit and stores. This is proposed to be set up on the open land to the west of point L. Ownership of the land will need to be determined and the appropriate arrangements agreed before commencement of the works.

2.5 Public Footpath Closures

The existing footpath is currently obstructed; hence there will be no requirement for closures at points B-C and point L. However, there are no options for a diversionary route at the slipway (points H-I) and closure of the slipway will be required during construction.

Closure of the slipway to facilitate works will require significant local consultation before the project commences.

2.6 Equality Act 2010

Part 2 Clause 20 of the EA makes it unlawful to provide a physical feature that puts a disabled person at a substantial disadvantage in relation to a relevant matter in comparison with persons who are not disabled. In the context of this report that is taken specifically to reference users who are wheelchair bound, use mobility vehicles and/or have some sort of visual or hearing impairment.

Design of the ramps will accommodate wheelchair and mobility vehicle users. According to Section 3.2 of the Department for Transport (DfT) publication Inclusive Mobility, access ramps to structures should never exceed 8% (1:12.5 slope) as anything greater would be a significant impediment to wheelchair users, not only due to the effort required to push, but also due to the significant risk of toppling over.

Section 8.4.3 of Inclusive Mobility also recommends that an additional handrail (to that specified in BD 29/04) shall be included for children and people of reduced stature at a height between 550 and 650mm.

2.7 Statutory Undertakers Apparatus

Responses to notices have been received from all the statutory undertakers.

None are likely to be affected by any of the ramp options being considered.

2.8 Traffic Impact Assessment

Consultation with KCC's officer responsible for the Swale District will be undertaken to discuss the scope for the Traffic Impact Assessment (TIA) during the construction phase.

Existing usage of the slipway during peak periods should be assessed. This work is not required at this stage but will be required for the detailed design stage. This would allow an initial appraisal of the likely impacts of closing the slipway during construction.

2.9 Design Criteria

- All options minimum footpath width of 1.50m
- Turning circle for mobility vehicles 1.50m
- Maximum gradient of 1 in 12
- Design life 40 years
- Design for cantilevered footway loading (5kN/m^2)
- Concrete may be designed for sulphate class DS2 and AC2 exposure class
- Hand rail to match existing
- Finish to match existing

3 Options

3.1 General

All the options will include capital costs for the construction phase.

Tidal variations will have significant effect on the construction works, hence careful planning will be required to programme construction phases to avoid disruption to the works.

3.2 Do-Nothing

This option is not considered appropriate because the footpath will remain obstructed.

3.3 Location B-C

At this location the three options considered were solid construction, metal and concrete platform ramp options.

3.3.1 Option 1: Solid Construction

This solution involves constructing a solid footpath by backfilling and compacting approximately 2.0m towards the west and paving with brick to match the existing. The fill and brick paving will be retained by steel sheet piles also to match the existing. A section of the existing reinforced concrete capping beam will be demolished to enable connection between the existing and proposed footpath.

3.3.2 Drawings

Drawings showing details of the proposed structures are included in Appendix B.

3.3.3 Estimated capital costs

The estimated construction cost is detailed in the table below:

item	Cost £
Preliminaries (10%)	3616.58
Site Clearance	447.50
Safety Fencing	1150.00
Earthworks – General	9077.15
Kerbs, Footways & Paved Areas	1520.00
Piling	20970.00
Structures	3001.18
Contingencies (10%)	3978.24
Total	£43,760.65

3.3.4 Outline timescale for delivery

It is estimated that this option will take approximately 1 week to construct.

3.3.5 Advantages

- No excavation required
- Sacrificial steel design thereby negating painting maintenance of the piles
- Low maintenance
- Aesthetically pleasing solution to fit in with surrounding environment

3.3.6 Disadvantages

- Longer construction period than the platform options below
- In-situ construction of the reinforced concrete capping beam increases construction programme
- Greater ecological impact (displacement of fauna and flora).

3.3.7 Option 2: Metal Platform

This solution involves constructing the footpath using metal platform ramps on piled foundations. The metal platform ramps will comprise a 2.0m x 2.3m platform connected to the Public Rights of Way (PRoW) track by a sloping ramp. This ramp will have a maximum 1:12 slope in accordance with the requirement of the Department for Transport guidance on Inclusive Mobility.

3.3.8 Drawings

Drawings showing details of the proposed structures are included in Appendix B.

3.3.9 Estimated capital costs

The estimated construction cost is detailed in the table below:

item	Cost £
Preliminaries (10%)	2193.04
Site Clearance	447.50
Safety Fencing	1800.00
Earthworks – General	6650.00
Kerbs, Footways & Paved Areas	250.00
Piling	4550.00
Structures	8232.64
Contingencies (10%)	2412.32
Total	£26,535.47

3.3.10 Outline timescale for delivery

It is estimated that this option will take approximately 1 week to construct.

3.3.11 Advantages

- Minor excavation
- Prefabricated ramps provide a quicker construction method over piling
- Minor ecological impact (displacement of fauna and flora)
- Easily transported to site

- Low capital cost.

3.3.12 Disadvantages

- Painting maintenance
- Prone to additional settlement following construction
- Aesthetically does not blend with the current environment.

3.3.13 Option 3: Concrete Platform

This will be a variant of option 2 using concrete as the material of choice.

3.3.14 Drawings

Drawings showing details of the proposed structures are included in Appendix B.

3.3.15 Estimated capital costs

The estimated construction cost is detailed in the table below:

item	Cost £
Preliminaries (10%)	2193.04
Site Clearance	447.50
Safety Fencing	1800.00
Earthworks – General	6650.00
Kerbs, Footways & Paved Areas	250.00
Piling	4550.00
Structures	7120.64
Contingencies (10%)	2412.32
Total	£25,423.47

3.3.16 Outline timescale for delivery

It is estimated that this option will take approximately 1 week to construct.

3.3.17 Advantages and Disadvantages

The advantages and disadvantages are similar to those of the metal platform option with the only difference being that this option requires less maintenance.

3.4 Location H-I

At this location the two options considered were solid construction and cantilever reinforced concrete slab.

3.4.1 Option 1: Solid Construction

This solution will involve a similar construction technique the one described in option 1 of location B-C, with different dimensions. The other possible difference would be retention of the existing reinforced concrete capping beam.

3.4.2 Drawings

Drawings showing details of the proposed structures are included in Appendix B.

3.4.3 Estimated capital costs

The estimated construction cost is detailed in the table below:

item	Cost £
Preliminaries (10%)	3005.39
Site Clearance	275.00
Safety Fencing	1100.00
Earthworks – General	1822.00
Kerbs, Footways & Paved Areas	2710.00
Piling	19485.20
Structures	4661.71
Contingencies (10%)	3305.93
Total	£36,365.23

3.4.4 Outline timescale for delivery

It is estimated that this option will take approximately 1 week to construct.

3.4.5 Advantages and Disadvantages

The advantages and disadvantages are similar to those of the solid construction for location B-C.

3.4.6 Option 2: Cantilever reinforced concrete slab

This solution will involve constructing an in-situ reinforced concrete slab cantilevered from the existing capping beam and steel sheet pile retaining wall. Partial demolition of the capping beam at the north end to enable steel fixing and at the south and west ends steel starter bars will be drilled into the existing reinforced concrete capping beam to enable steel fixing of the proposed reinforced concrete slab. A short ramp with a maximum slope of 1:12 will be required on the west approach in order to compensate for the height difference between the existing and proposed finished level. An appropriate pedestrian guardrail system will be fixed onto the edge of the proposed cantilever slab to protect pedestrians. Installation of appropriate bollards is proposed underneath the proposed cantilever to deter errant vehicles.

3.4.7 Drawings

Drawings showing details of the proposed structures are included in Appendix B.

3.4.8 Estimated capital costs

The estimated construction cost is detailed in the table below:

Item	Cost £
Preliminaries	1723.17
Site Clearance	275.00
Safety Fencing	1100.00
Earthworks – General	302.00
Kerbs, Footways & Paved Areas	2390.00
Structures	12164.71
Contingencies (10%)	1895.49
Total	20,850.37

3.4.9 Outline timescale for delivery

It is estimated that this option will take approximately 2 weeks to construct.

3.4.10 Advantages

- Minor excavation

- Minor ecological impact (displacement of fauna and flora).

3.4.11 Disadvantages

- Requires more site investigation of the existing structural elements
- Difficult to install
- Longer construction period
- In-situ construction of reinforced concrete slab increases construction programme.

3.5 Location L-M

At this location only a solid construction was considered because of the condition of the existing footpath. This solution will involve a similar construction technique to the one described in option 1 for location B-C, with different dimensions.

3.5.1 Drawings

Drawings showing details of the proposed structures are included in Appendix B.

3.5.2 Estimated capital costs

The estimated construction cost is detailed below:

item	Cost £
Preliminaries (10%)	3768.53
Site Clearance	800.00
Safety Fencing	2100.00
Earthworks – General	6748.00
Kerbs, Footways & Paved Areas	150.00
Piling	25188.00
Structures	2699.32
Contingencies (10%)	4145.39
Total	£45,599.24

3.5.3 Outline timescale for delivery

It is estimated that this option will take approximately 1 week to construct.

3.5.4 Advantages and disadvantages

The advantages and disadvantages are similar to those of the solid construction for location B-C.

4 Environmental Considerations

An initial environmental and ecology scoping assessment has been undertaken as part of this feasibility.

The following sections are a brief summary of the scoping which will need to be addressed by the designer and contractor at the subsequent stages of the scheme.

4.1 Emissions and Waste

As it is likely that the overall cost of the works for the scheme will not exceed £300,000 a site waste management plan (SWMP) will not be required.

Material for disposal may be classed as inert waste. However additional contamination testing and a waste acceptance criteria test (WAC) are further recommended.

4.2 Air Quality

The site does not lie within an Air Quality Management Area (AQMA).

The works will take place near the Creek and the site is therefore impacted by exhaust emissions from construction plant and local residents could be affected.

4.3 Archaeology and Cultural Heritage

The footpath site lies within the Faversham designated conservation area and a search of the English Heritage website indicates that there are several Grade II listed buildings within 300m of the site. However, the search has not identified any Scheduled Ancient Monuments, Registered Parks and Gardens, Registered Battlefields and World Heritage Sites within the radius of the site.

Historically the ground at point L has been used for a warehouse and infrastructure associated with the ship building history of Faversham. This was demolished prior to the 1980s and a railway siding or tramway connecting with the creek edge used to run near the site. At point C there was no development of the site until the late 1990s when the houses of Waterside Close and retaining structures were built.

A further assessment will be required for the subsequent stages of scheme development. The local Conservation Officer should be contacted to determine whether consent is required as works lie within a designated conservation area.

4.4 Landscape

The site does not lie within an Area of Outstanding Natural Beauty (AONB).

The scheme will involve aesthetic changes and visual impact will be minimal because of the modest size of the ramps.

The site lies in an area covered by the Landscape Information System (K-LIS) and is characterised as Eastern Swale Marshes. The landscape character area has the following features:

- Remote, wild and exposed
- Broad skies, Pervasive influence of sea and sky
- Creeks, ditches and sea walls
- Grazing marsh, wild birds and grazing animals
- Creekside townscape and waterside buildings.

The site lies in a low lying area and with the small nature of the scheme it is predicted that landscape impacts will be minimal for all the options.

4.5 Ecology and Nature Conservation

There are no Special Areas of Conservation (SACs) within a 2km radius of the site. However, a Site of Special Scientific Interest (SSSI), Special Protection Area (SPA), Ramsar site and Higher Level Stewardship Scheme lie to the east of the site. The site also lies within a Marine Conservation Zone.

SPA and Ramsar sites are classed as Designated European Conservation Sites.

The Preliminary Ecological Report in Appendix E highlights further work required such as:

- An Assessment of Implications of/on European Sites
- Reptile survey during active season (April-September)
- Habitat Suitability assessment within 250m to determine presence of Great Crested Newt (mid-April and mid-May).

Environment Agency (EA) will need to be consulted at the subsequent design and construction stages of the scheme.

4.6 Geology and Soils

Preliminary contamination testing shows that any soil excavated may remain on site or be re-used within the scheme. Any surplus waste arising from the scheme will not need to be disposed of as hazardous waste. However, additional testing is recommended should disposal be necessary.

4.7 Material Use

No further assessment is envisaged, however, the following should be considered at the detailed design stage:

- Consideration of the presence of asbestos in the existing footpath
- All waste should be stored in accordance with regulations
- Sourcing local materials to minimise associated transportation costs
- Waste removal should be undertaken by licenced waste sub-contractors
- Consideration of whole life costs of materials as those requiring less maintenance are more durable.

4.8 Noise and Vibration

Noise receptors will be required within close proximity to these works as there are residential properties and business premises either side of the site.

The following mitigation measures need to be considered:

- Noise and vibration should be controlled and limited as reasonably practicable so that receptors are protected from excessive noise levels during construction.
- Working hours should be strictly followed
- Advance notice of works should be given to residential properties and local businesses
- Where local residents are affected by the works, timing and phasing of work during the construction phase should be considered.

4.9 Drainage and Water Environment

The site does not lie within a Groundwater Source Protected Zone (SPZ) and no wells used for public drinking supply are located near the site.

The Faversham Creek, a tributary of the Swale separates the mainland from the Isle of Sheppey and at low tide, the water recedes about 10m from locations C and L. The groundwater table coincides with the creek water level, making the unsaturated zone very thin.

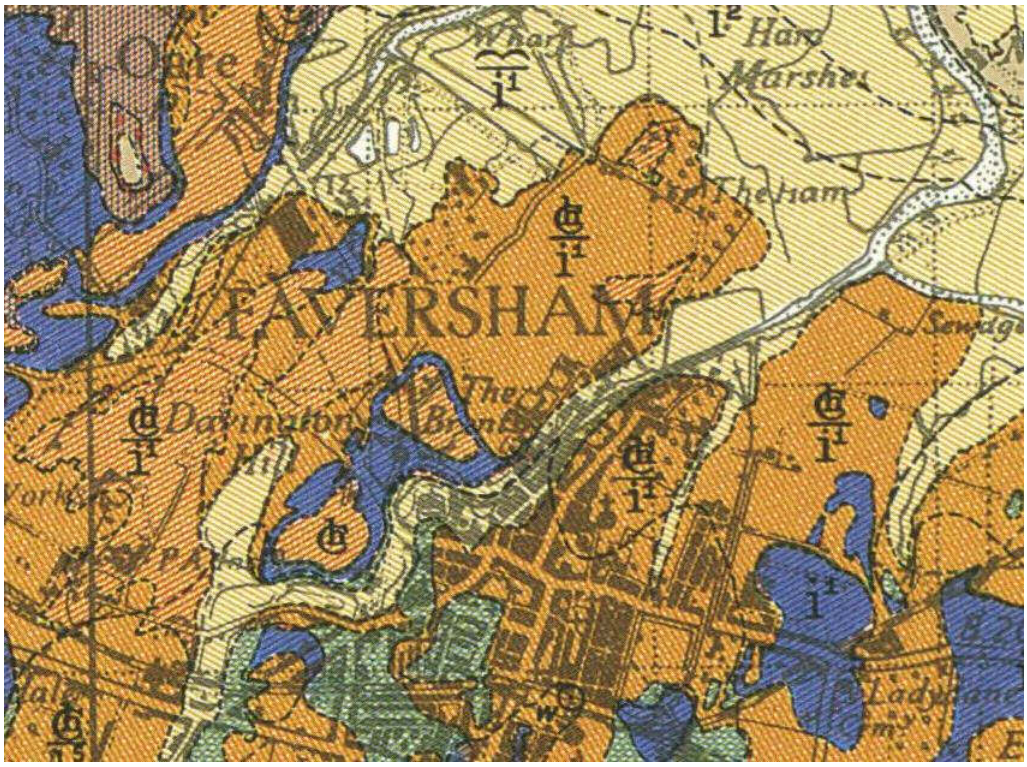
The site has a high risk of flooding and is located within a flood zone 3, indicating a 1% chance of flooding each year.

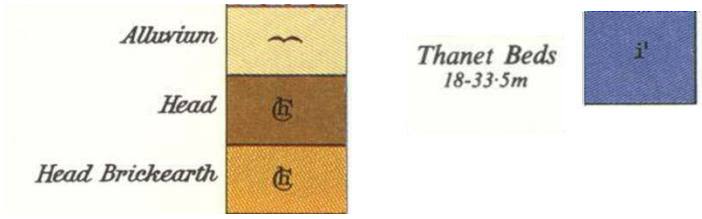
Consultations with the Environment Agency must be undertaken prior to construction because the EA website (EA, 2015) indicates the area directly to the southeast of point C has been granted indicative funding for a local flood protection capital scheme for 2015/16.

5 Geotechnical Considerations

5.1 Background and Geotechnical Information

No historical information is available for the public footpath. However, records have been obtained from the British Geological Survey (BGS) and the associated BGS memoir Geology of the country around Faversham. The records indicate that the site is underlain by alluvium and head brickearth over solid geology comprising Thanet Sand formation. An extract of the published geological map is shown below:





The geological map does not indicate the presence of made ground on site. However, a variable thickness of made ground can be expected due to previous cycles of development.

There are a number of historic and authorised landfill sites nearby. Ham Farm, 50m away from point L is designated an authorised landfill. The nearest historic landfill is located 500m to the north-west of the footpath.

5.2 Preliminary Geotechnical Advice

The underlying geology will be capable of supporting new piled structures through end-bearing and shaft resistance. The piles can be embedded in the Thanet Sand at 7m below ground level.

The bearing capacity of the piles may be determined using characteristic soil properties in the table below:

Stratum	**Depth Range**	**Undrained shear strength C_u**	**Effective angle of shearing resistance, Φ′**	**Effective cohesion, c′**	**Coefficient of active earth pressure (K_a)***	**Coefficient of passive earth (K_p)***	**Weight Density**
Made ground	0-1.5m	20kPa	28°	0kPa	0.361	2.770	19kN/m^3
Alluvium (clay)	1.5-7m	5kPa	24°	0kPa	0.422	2.371	15kN/m^3
Head brickearth and Thanet Sand	>7m	80kPa	32°	0kPa	0.249	4.028	19kN/m^3

An allowance for ongoing settlement of 15-20% of the height of fill should be accounted for when using engineered general fill.

5.3 Geotechnical Investigation

A geotechnical investigation has been undertaken in the vicinity of the footpath and has been reviewed for this report. The investigation comprised two dynamic probes and two window samples at locations C and L.

The following laboratory tests were undertaken on samples retrieved during the investigation:

- 7 no. natural moisture content tests
- 2 no. Atterberg limit tests (liquid and plastic limits)
- 2 no. Building Research Establishment (BRE) sulphate tests
- 2 no. general contamination suite tests.

The strata encountered during the dynamic probe is summarised in the table below:

Strata	Description	Thickness (m)	SPT / CPT values
Made ground	Silty sandy clay with gravelly flint, sandstone, brick, glass and wood	0.8 at point C 1.8 at point L	–
Alluvium	Soft, grey to dark grey clay with rare plant matter	5.0	4

The base of the alluvium was not encountered during the window samples, but can be estimated from the dynamic probing results as lying at between 4.5m and 5.5m below ground level. The dynamic probes suggest that there is 1m to 2m of low strength material below the very soft alluvium between 5m and 7m depth. This might be the head brickearth or weathered Thanet Sand.

The probe results also show a clear change in consistency at approximately 7m, which is believed to be definitely Thanet Sand at this depth.

Groundwater was found to be influenced by the tide, however, it will always be higher than the river level.

6 Operation and Maintenance

6.1 Operation of Footpath

It is understood that the operation of the footpath will be the responsibility of Kent County Council Public Rights of Way Department (PRoW).

6.2 Inspection and Maintenance

All the ramp and cantilever options will require General Inspections (GI) undertaken on a biennial basis.

The estimated costs of the inspections and maintenance have not been detailed in this report because Whole Life costing was not required as part of this commission.

Ownership of the current footpath will remain with the management companies and the new sections will be maintained by KCC.

7 Stakeholders

7.1 Stakeholder Consultation

Stakeholder liaison was excluded from the scope of this report. However, local residents have been consulted during the feasibility.

The effects of proposed work should be planned with full consideration of the impact on all stakeholders and reasonable measures to eliminate or mitigate effects should be taken.

It is recommended that a full public consultation exercise should be undertaken during the detailed design stage for the scheme.

The principal stakeholders identified at this stage include the following organisations and groups:

- Road users
- River users
- Swale District Council
- Faversham Town Council
- Other KCC departments
- Environment Agency
- Natural England
- Statutory Undertakers
- Brents Tavern Public House
- Brent Industrial Estate
- Emergency services (Fire and Rescue, Police and Ambulance)
- Waterside Close Residents Association
- Faversham Reach Residents Association
- Ham and Syndale Estate.

8 Discussions

The do-nothing option is not considered appropriate because the footpath will remain obstructed.

8.1 Cost Comparison

Cost comparisons have been undertaken for each location except for location L-M which has only one option. A scoring system of 1 to 10 with 1 being the least desirable and 10 being the most desirable has also been used to support each option by considering buildability, cost, durability and environmental impact.

8.1.1 Location B-C

	Buildability	**Cost**	**Environmental impact**	**Durability**	**Total Score**
Solid construction	10	6	7	10	33
Metal Platform	10	10	10	8	38
Concrete Platform	10	10	10	7	37

It can be seen from the table above that the metal platform provides the best solution when considering buildability, cost, durability and environmental impact.

Item	**Cost £**
Option 1: Solid construction	43,760.65
Option 2: Metal platform	26,535.47
Option 3: Concrete platform	25,423.47

The estimated cost summaries for options 2 and 3 for location B-C are very similar. The speed of construction combined with cost makes either a desirable option for location B-C because all the bespoke ramp units will be prefabricated off site, thereby saving on time and cost. This option has the least ecological impact on the environment because of minimal earthworks and permanent land take. However, these options are susceptible to settlement in the long term and option 2 requires greater maintenance in the future.

In the event of settlement occurring the connection between the existing and the proposed ramp will create a health and safety hazard.

Aesthetically, these options do not blend with the current environment.

As can be seen from the two tables above Option 1 has the highest capital costs and scores the lowest when considering buildability, cost, durability and environmental impact. However this option blends with the current environment is the most durable of the three options.

When considering all factors, either option 2 or 3 would therefore provide the best solution for location B-C.

8.1.2 Location H-I

	Buildability	**Cost**	**Environmental impact**	**Durability**	**Total Score**
Solid construction	10	6	8	10	34
Cantilever reinforced concrete slab	6	10	6	8	30

Item	**Cost £**
Option 1: Solid construction	36,365.23
Option 2: Cantilever reinforced concrete slab	20,850.37

At this location two options were considered and the estimated cost summaries showed a 42% difference between the options. Option 2 proved to the cheaper option because of the structural form and method of construction. However this option has the potential of promoting antisocial behaviour in the area under the cantilever slab. There is also a risk of pedestrians accidentally hitting their heads on the cantilevered slab. The current condition of the existing steel sheet pile wall and reinforced concrete capping beam in unknown and extensive testing will be required which in turn may increase the cost estimate. For aesthetic purposes this option does not blend with the existing environment.

8.1.3 Location L-M

Item	Cost £
Option 1: Solid construction	£45,599.24

The current structural arrangements and condition of the footpath at location L-M are poor and solid construction was considered the only sustainable and cost effective option. The approximate 1.8m height difference between the existing footpath and grassed area is retained by steel sheet piles installed vertically and horizontally. These appear to have been installed as a temporary measure. The area appears to be suffering from erosion and settlement as can be seen in photograph 10 in Appendix A.

The solid construction option is considered the best solution because it provides a long term solution to the erosion and settlement problems.

This option also enhances the aesthetics of the location because the proposed retaining wall will be tied into the existing quayside alignment.

9 Conclusions and Recommendations

In light of the above comments, the recommended option for the proposed Public Footpath ZF5 Ramps would be solid construction ramps for all 3 locations. The ramps will have a 1:12 slope in accordance with Section 3.2 of the DfT publication Inclusive Mobility. The likely overall construction budget estimate for the recommended option would be:

Location B-C	£43,760.65
Location H-I	£36,365.23
Location L-M	£45,599.24
Total Construction Cost	**£125,725.12**

However the total construction cost might be reduced due to savings in procuring the same contractor for all the works.

At location B-C options 2 or 3 would provide the best options when considering some of the factors for a construction scheme. However there is potential of lowering the construction costs for option 1 if solid construction is the chosen option for the other two locations. The solid construction option will have the minimal visual impact to the existing environment.

At location H-I option 2 has low capital costs compared to option 1, however extensive material testing will required at the detailed design stage which might increase capital costs.

There is only one option considered for location L-M because of the current structural arrangements and condition.

The geotechnical investigation undertaken as part of this commission indicates that the piles can be founded in the Thanet Sands which is 7.0m depth from the current topsoil. The soil parameters to be considered for the detailed design stage are in Section 5 above.

Construction of temporary access tracks for the pilling rig will be required for locations B-C and L-M.

The preliminary Ecological Report in Appendix E highlights the need for:

- An Assessment of Implication of/on European Sites

- Reptile survey during active season
- Habitat Suitability assessment to determine the presence of Great Crested Newt.

No statutory undertaker's apparatus were found during a search of the area.

Appendix A Photographs

Photograph 5: View looking south showing location B-C.

Photograph 6: View looking south showing location B-C and existing PRoW.

Photograph 7: View of location H-I looking west.

Photograph 8: View of location H-I looking west.

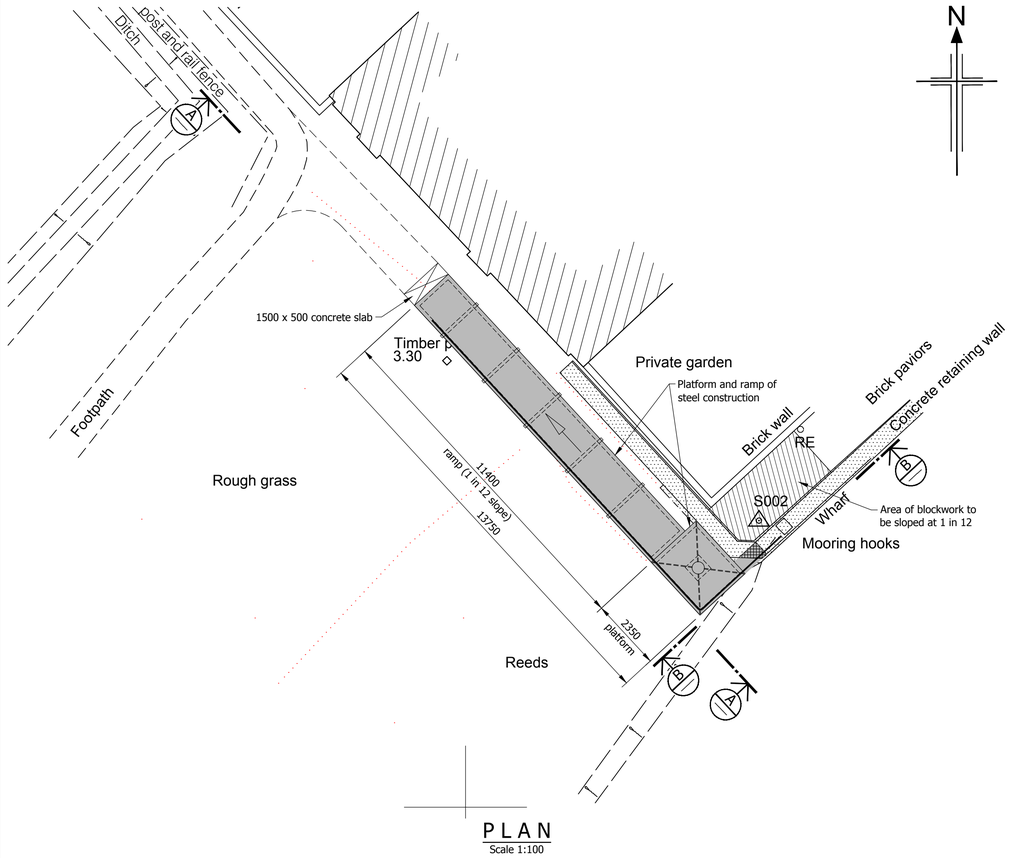
Photograph 9: View of location H-I looking west.

Photograph 10: View of location L-M looking west.

Photograph 11: View of location L-M looking west.

Appendix B Options Drawings

Drawing No.	Title
CO04300288/001	GENERAL ARRANGEMENT – RAMP H-I: OPTIONS 1, 2 AND 3
CO04300288/002	GENERAL ARRANGEMENT – RAMP H-I: OPTIONS 1 AND 2
CO04300288/003	GENERAL ARRANGEMENT – RAMP L-M: SOLID CONSTRUCTION



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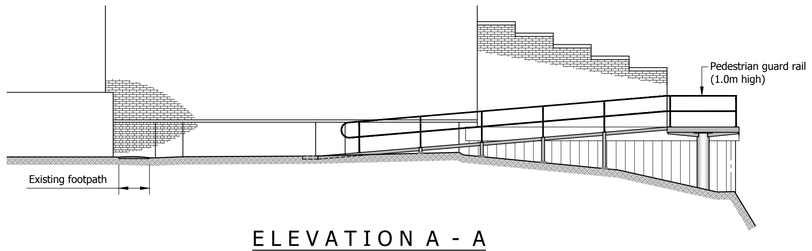

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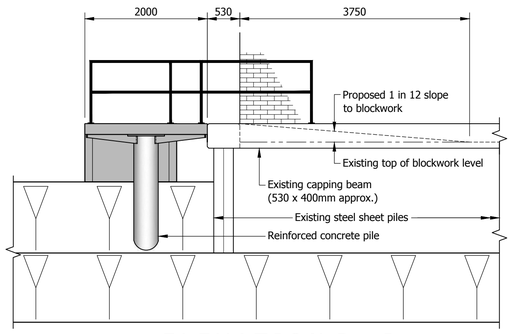

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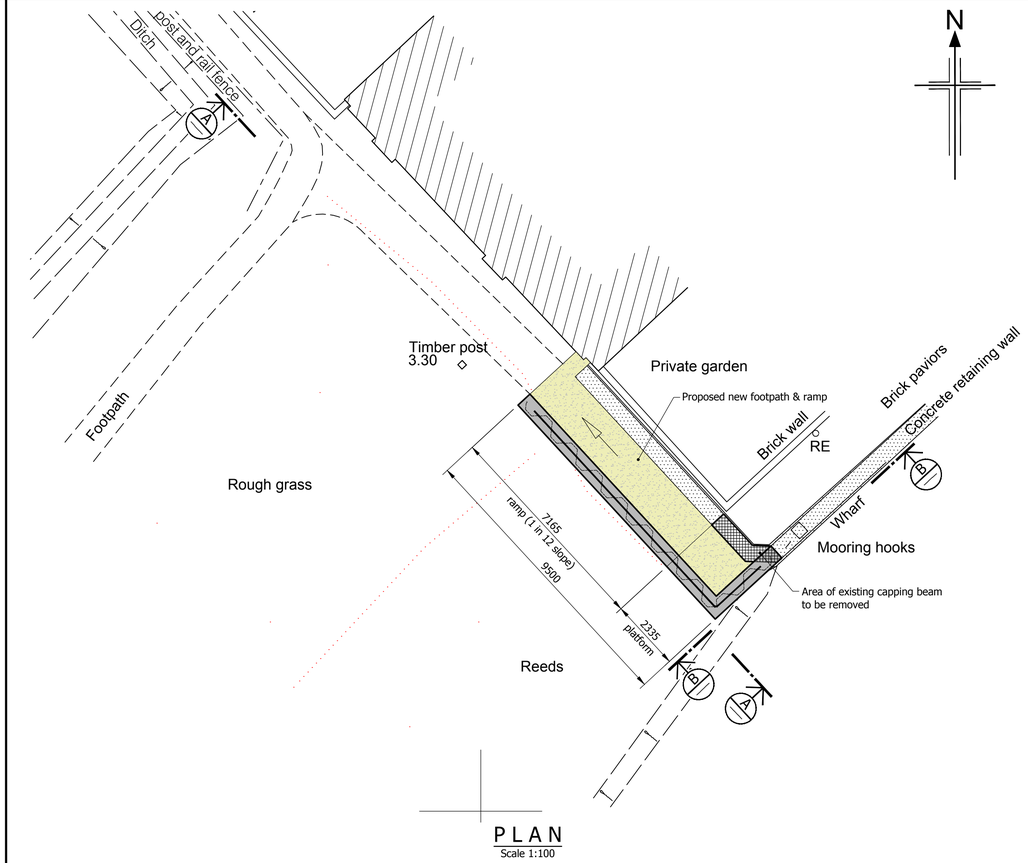
OPTION 1
Fabricated Steel/Reinforced Concrete Platform & Ramp



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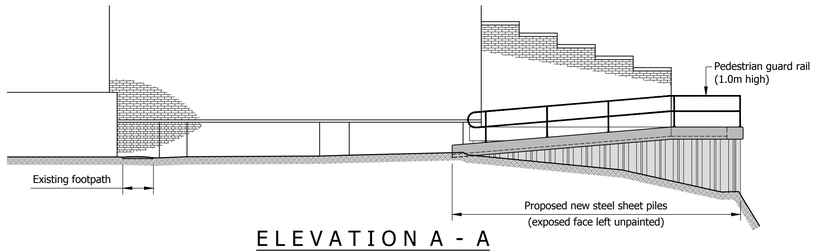

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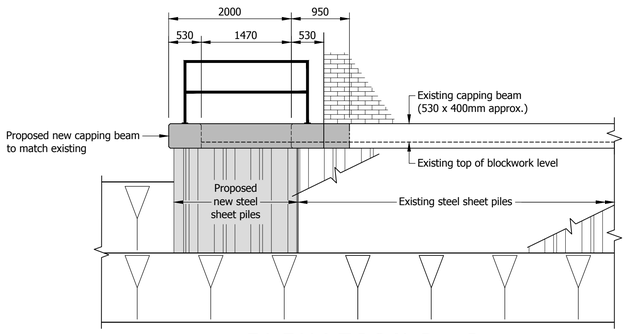
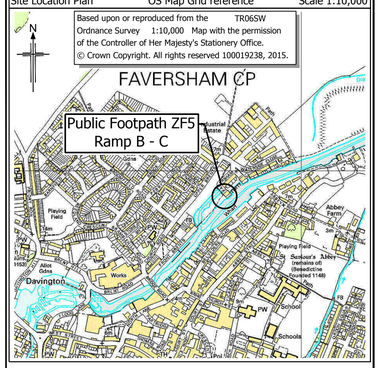


ELEVATION B - B
Scale 1:50

OPTION 2
Steel Sheet Piles with Capping Beam

NOTES
1. All measurements are in millimetres unless stated otherwise
2. All levels are in metres
3. Do not scale from this drawing. Use written dimensions only.

Site Location Plan — OS Map Grid reference TR06SW — Scale 1:10,000



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Design:	WT	For Comment	
Chkd:	DH	For Tender	
Appd:	WT	For Construction	
Date:	12/10/2015	As Constructed	
		Other	

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Project Name
Public Footpath ZF5
Faversham

Drawing Title
Structures
General Arrangement
Ramp B - C
Options 1 and 2

Original Drawing Size : A1	Dimensions : Millimetres
Scale : As Shown	Copyright © Amey

Drawing No 4300288/01
Rev P0

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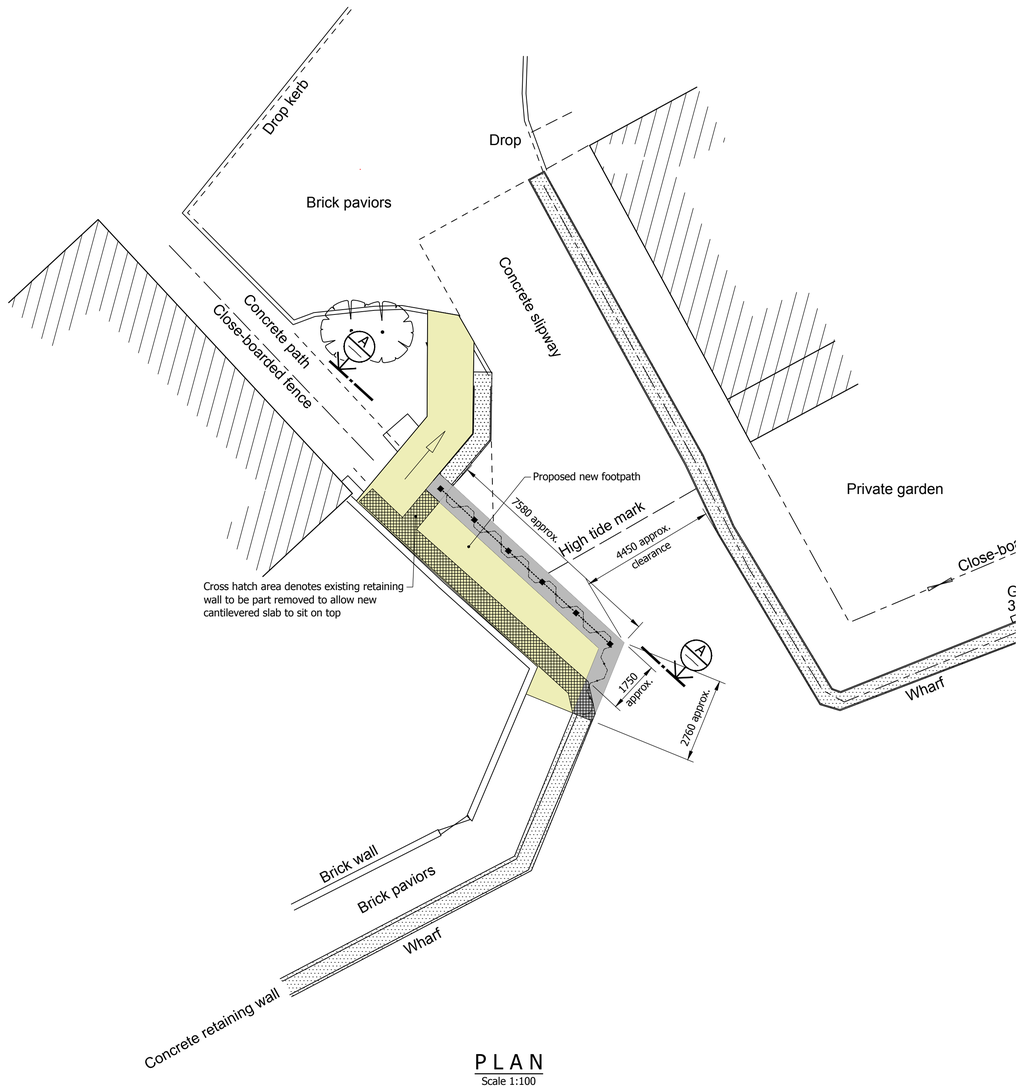

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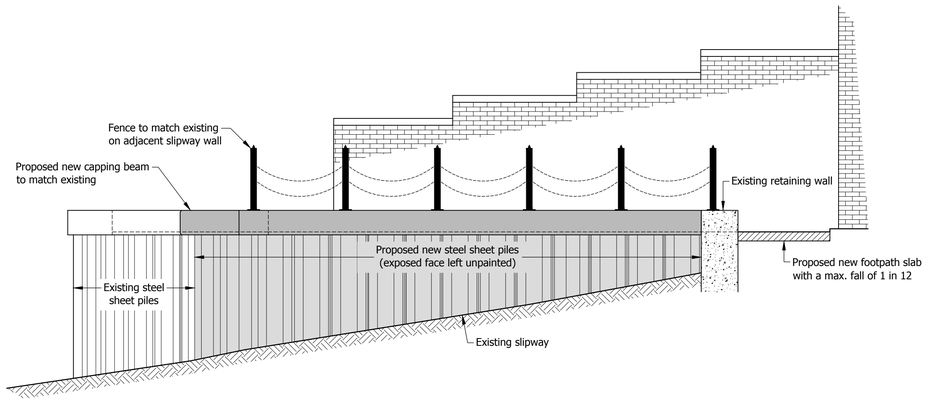

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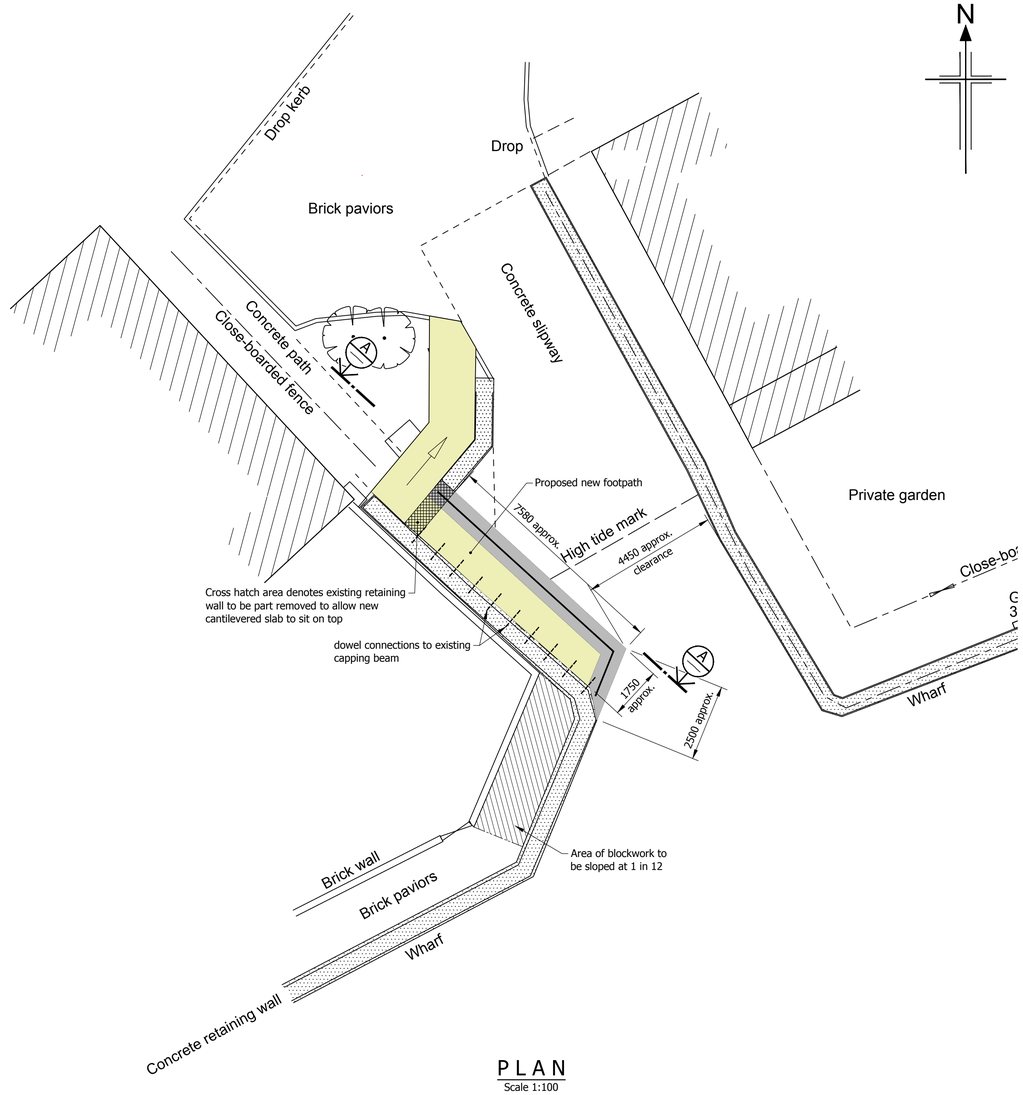
O P T I O N 1
Steel Sheet Piles with Capping Beam



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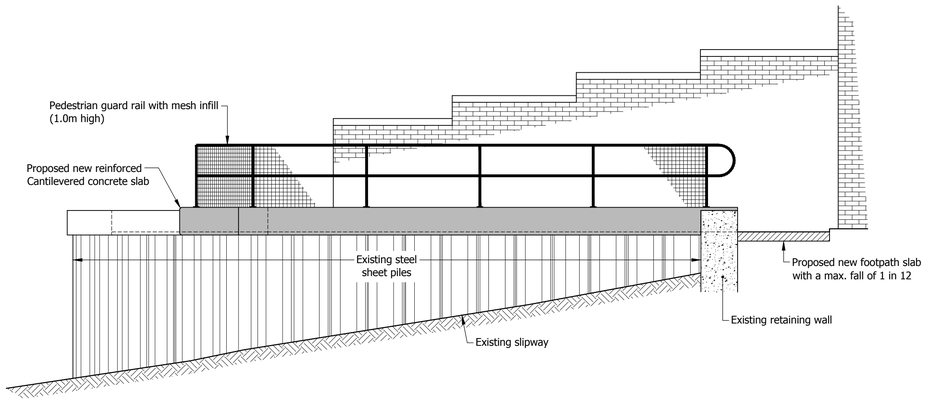

E L E V A T I O N A - A
Scale 1:50

O P T I O N 2
Cantilevered Reinforced Concrete Slab

N

NOTES
1. All measurements are in millimetres unless stated otherwise
2. All levels are in metres
3. Do not scale from this drawing. Use written dimensions only.

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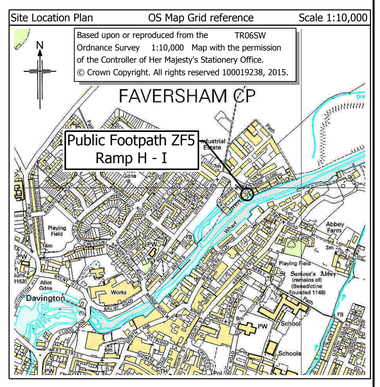

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Chkd:	DH	For Tender	
Appd:	WT	For Construction	
Date:	12/10/2015	As Constructed	
		Other	

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Client
Kent County Council
kent.gov.uk

Project Name
Public Footpath ZF5
Faversham

Drawing Title
Structures
General Arrangement
Ramp H - I
Options 1 & 2

Original Drawing Size : A1	Dimensions : Millimetres
Scale : As Shown	Copyright © Amey

Drawing No 4300288/02
Rev P0

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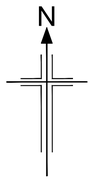

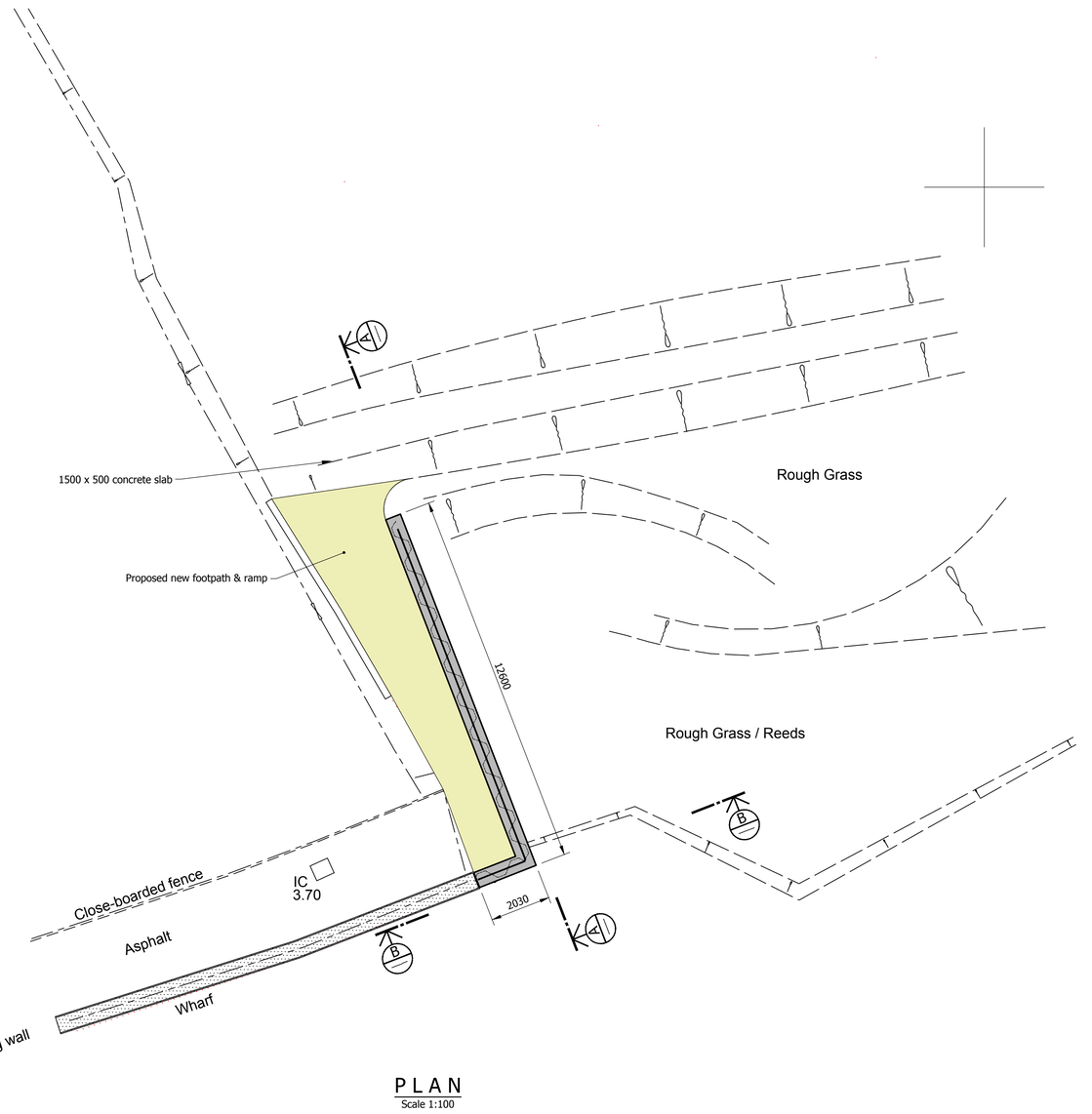

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3. Do not scale from this drawing. Use written dimensions only.

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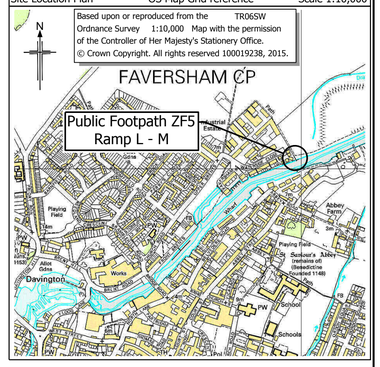

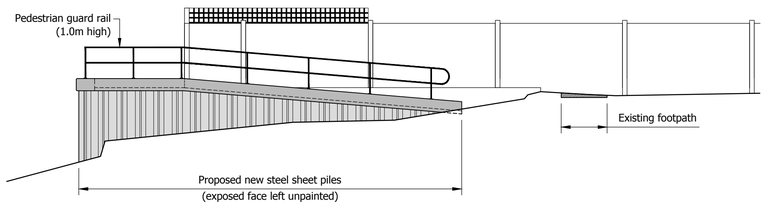

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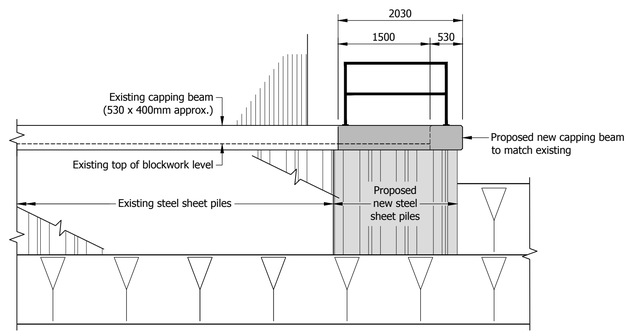

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Appd: TW		For Construction	
Date: 12/10/2015		As Constructed	
		Other	

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General Arrangement
Ramp L - M
Steel Sheet Piles with Capping Beam

Original Drawing Size : A1	Dimensions : Millimetres
Scale : As Shown	Copyright © Amey

Drawing No	Rev
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Appendix C Geotechnical Report

Appendix D Ecology Report

Appendix E Bibliography

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