# The Lake Lothing (Lowestoft) Third Crossing Order 201[*]

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Lake Lothing THIRD CROSSING

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## Document 7.5: Design Report

# Appendix 5

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Author: Suffolk County Council

# Lake Lothing Third Crossing Outline Strengthened Earthwork Appraisal Form for South Approach Embankment and Abutment 1 Embankment

**CH 0+392 to 0+596**

January 2018

*Produced for*
Suffolk County Council

Prepared by
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# Document Control Sheet

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|---|---|
| Project Title | Lake Lothing Third Crossing (LL3X) |
| Report Title | Lake Lothing Third Crossing<br>Outline Strengthened Earthwork Appraisal Form for South Approach Embankment and Abutment 1 Embankment<br><br>CH 0+392 to 0+596 |
| Document No. | 62240712-WSP-HGT-LL3X-CD-CE-0001 |
| Status | ISSUED FOR DCO SUBMISSION |
| Control Date | January 2018 |

Record of Issue

| Issue | Status | Author | Date | Check | Date | Authorised | Date |
|---|---|---|---|---|---|---|---|
| 0 | FOR DCO SUBMISSION | A. Ameli | December 2017 | D. Lee | January 2018 | A. Chmoulian | January 2018 |
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Distribution

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# 1 Scheme Details

## 1.1 Name of Scheme

Lake Lothing Third Crossing

## 1.2 Type of Highway

Over: Single carriageway 2-lane A class all-purpose road carried by approach viaducts and bascule bridge over Lake Lothing.

Under: None

## 1.3 Permitted Traffic Speed

Over: 30 mph.

Under: Not applicable

## 1.4 Nature of scheme/scheme element

Lake Lothing in Lowestoft, Suffolk, is currently crossed by two road bridges, A47 Bascule Bridge carrying the A12 across the passage between the inner and outer harbours and the Mutford Bridge carrying the A1117 at Oulton Broad. Both crossings open to allow shipping to access the port causing significant traffic disruption. The proposed LL3X is a new road crossing over Lake Lothing, improving connectivity between both sides of the lake as well as relieving congestion in and around the town centre. The proposed bridge will comprise a central bascule river span, approach viaducts to both sides and a portal frame structure for access to Nexen building.

The main obstacles crossed by the LL3X are the Lake Lothing and the East Suffolk Railway Line.

# 2 Strengthened Earthwork Type, Purpose and Location

## 2.1 Generic Type of Strengthened Earthwork

Two vertical reinforced earth embankments with prefabricated concrete facing to be constructed. Details of the Reinforced Embankments considered in this document are summarised below:

| Reinforced Embankment Location | Chainage (m) | Max Height | Avg. Height |
|---|---|---|---|
| South Approach Embankment | Ch. 0+425 to 0+596 | 7.3 m | 3.2 m |
| South Abutment 1 Embankment | Ch. 0+392 to 0+403 | 8.7 m | 8.2 m |

## 2.2 Purpose of Strengthened Earthwork

The Third Crossing scheme consists of a viaduct to span the lake in a south to north orientation. The south approach embankment will connect to the existing road network along “Waveney Drive” at a new roundabout. Due to space constraints, a strengthened earthwork solution is required to contain the embankment within the site boundaries.

## 2.3 Intended Location(s) for Use

Reinforced embankment:

- South Approach Embankment Ch. 0+425 to 0+596 (171 m)
- Connection embankment between South Abutment 1 and the Road Access Portal Frame Ch. 0+392 0+403 (11 m)

# 3 Outline of Existing Ground and Groundwater Conditions

## 3.1 Ground Investigation Data

At the time of writing this report a ground investigation was being undertaking to supplement the historic investigations completed along the central bridge option alignment. However, only limited draft data had been made available from this investigation. Due to unpublished nature of the draft data received only the available historical ground investigation data has been taken into account.

The historic ground investigation data, adopted from the Highway Agency geotechnical Data Management System (HAGDMS) and British Geological Society (BGS) database, cover a period from 1909 to 1985. The boreholes recovered and used within this report are listed as follows;

- The East Anglian Ice Company Limited – September 1909.
  EA1
- Ground Engineering Ltd, dated 1991/1992;
  BH32 to BHC42
- Terresearch, dated 1962.
  BH34
- Alan Everett, dated May 1983.
  BH2 and BH6

## 3.2 Existing Ground Conditions

Ground condition have been adopted from the draft WSP Ground Investigation Report (GIR) Ref: 62240712-WSP-HGT-LL3X-RP-CE-0001. Available ground investigation have proven the geology to consist of five principal soil types. Although depths and local variations are likely to occur, the geology detailed below is the anticipated. The exact ground conditions shall be taken from the relevant borehole logs and should be used for detailed design.

Made Ground:

The Made Ground encountered generally consists of reworked clay and silty sands with flint gravel. In some bore holes the construction rubble including brick, concrete, wood, etc, were encountered as well as inorganic domestic waste. Some buried concrete elements of abandoned structures or buried concrete slabs are present locally. Made ground was encountered underlying areas of concrete and hardstanding at elevations ranging from 2.77 to 4.47 mAOD (0 to 1 mbgl), with thicknesses ranging between 0.90 m to 4.35 m. Base levels of the Made Ground range from 3.07 to -1.52 mAOD (1.4 to 4.35 mbgl), increasing in thickness towards the North in the direction of the lake.

Peat:

To the south of the scheme, Peat only was encountered in BH56A at 2.80 mBGL (0.24 mAOD) with a thickness of 0.40m, underlying Made Ground. This deposit comprised black fibrous peat with some pockets of grey brown silty fine sand.

Cohesive Alluvium:

Both Granular and Cohesive Alluvial deposits have been encountered predominantly within the north of the scheme, however, in the south Cohesive Alluvium was encountered in BH56A at -0.16 to -2.66 mAOD (3.20 to 5.70 mbgl) underlying a layer of Peat. Alluvium was not encountered in any other historic boreholes within the south of the scheme. The Cohesive Alluvium comprised soft black very sandy organic clay poorly laminated with some fine to medium angular flint gravel.

Granular Glaciofluvial Deposit:

The Granular Glaciofluvial was encountered in all boreholes located south of the crossing. This deposit predominantly comprised medium dense to dense silty sand with variable fine to coarse gravel, with occasional cohesive content as well as thin bands of gravel and clay. Granular Glaciofluvial deposit was encountered at top elevations ranging between 2.69 to -16.17 mAOD (0.45 to 19.00 mbgl) and base elevation ranging between 0.72 to -19.30mOD (3.00 to 21.80 mbgl) with thickness between 1.15 to 12.80 m.

Cohesive Glaciofluvial Deposit:

The Cohesive Glaciofluvial has been encountered in the majority of boreholes south of the crossing. Cohesive deposits comprise grey thinly to thickly laminated silty clay with interlamination of fine to coarse sand. Cohesive Glaciofluvial deposit was encountered at elevations ranging between 3.07 to -19.03 mAOD (1.4 to 21.8 mbgl). The base level of the cohesive deposits varied from 1.97 to -22.03 mAOD (2.5 to 24.8 mbgl) with thickness of 0.2 to 5 m.

Crag Formation:

The Crag Group was encountered in boreholes BH39 to BH42 and BH56A, at elevations ranging from -20.72 to -22.03 mAOD (23.55 to 24.8 mbgl), the base of the strata was not reached in the deepest boreholes terminating at depth from -22.04 to -27.23 mAOD (25 to 30mbgl). The Crag Group comprised fine to medium grained shelly Sand with some silty clayey layers. The base of the Crag group was not reached in any of the boreholes stated above, but local Water well drilling undertaken in 1909 proved the base at circa 73.15m bgl.

The ground profile is summarised in the below table:

| Stratum | Top of Stratum (Range) | | Base of Stratum (Range) | | Thickness (Range) | Average Thickness |
|---|---|---|---|---|---|---|
| | Elevation (m AOD) | Depth (m bgl) | Elevation (m AOD) | Depth (m bgl) | (m) | (m) |
| Made Ground | +4.47 to +2.77 | 0 to 1 | +3.07 to -1.52 | 1.4 to 4.35 | 0.9 to 4.35 | 2.69 |
| Peat | +0.24 | 2.8 | -0.16 | 2.4 | 0.4 | 0.4 |
| Cohesive Alluvium | -0.16 | 3.2 | -2.66 | 5.7 | 2.5 | 2.5 |
| Glaciofluvial Deposits (Granular) | +2.69 to -16.17 | 0.45 to 19.0 | +0.72 to -19.03 | 3.0 to 21.8 | 1.15 to 12.8 | 5.11 |
| Glaciofluvial Deposits (Cohesive) | +3.07 to -19.03 | 1.4 to 21.8 | +1.97 to -22.03 | 2.5 to 24.8 | 0.2 to 5.0 | 1.36 |
| Crag Group | -20.72 to -22.03 | 23.55 to 24.8 | -22.04 to -27.23 | 25.0 to 30 | 1.15 to 6.45* | - |

*Thickness is measured down to the base of borehole

## 3.3 Existing Groundwater Conditions

There is no available Groundwater monitoring data at present, however, water strikes and rising groundwater levels during borehole drilling were recorded during the investigations. Available data south of the lake shows water strike levels from 0.59mAOD to -7.28mAOD (2.3 to 10.2 mbgl), and raising to a level of 0.47mAOD to -0.94mAOD (2.1 to 3.9 mbgl). The recording of the groundwater strike at -7.28mAOD is lower in elevation than the adjacent river level by approximately 7m. This is considered anomalous and not representative of the groundwater profile. The average raised groundwater level in the southbound is 0.05 mAOD (2.92 mbgl).

For the purpose of design the Groundwater level has been taken as Mean Sea Level (MSL), at 0.11mOD.

## 3.4 Soil and Groundwater Chemistry

There is currently no available chemical test data either for soil or for groundwater.

## 3.5 Existing Geotechnical Problems and Risks

Settlement of soft soil located beneath the proposed embankment, within the Made Ground and Alluvial Deposits may cause differential settlement and/or instability within the reinforced embankment.

The highways furniture that will be present at the top of the reinforced earthwork, which will comprise the following:

- Street lighting
- Vehicle restraint system
- Carriageway drainage system
- Inspection access

Deep-founded highways furniture including the street lighting shall be positioned between the reinforcement straps at their proposed locations before placement and compaction of the fill material. All locations of these foundations are to be clearly marked and maintained to enable easy installation of the deep founded highways furniture.

Diversion of the existing services at the base of the reinforced earth embankment include:

- Anglian Water: surface water and foul water sewers to be diverted.
- BT Openreach: copper and fibre optic communication networks to be diverted.
- Cadent Gas: Intermediate Pressure (IP) main to be abandoned. Low Pressure (LP) supplies to be diverted. Any work in the vicinity of a live IP main must be carefully managed in conjunction with Cadent Gas as it is a high risk asset.
- Essex & Suffolk Water: potable water supplies to be diverted.
- UK Power Networks: 11kV and 33kV circuits to be diverted.
- Virgin Media: National Network fibre optic cable to be realigned (slewed) Mechanical excavation cannot be carried out within 600mm of this cable.

The reinforced earth design will allow for temporary excavation required for construction and maintenance of these services, which should include that any excavations greater than 0.5m depth must be backfilled and compacted and that the exclusion envelop is 0.5m offset from the reinforced earth wall and 45° from a point at 0.5m depth (and/or any other input) to be provided for in the design, without adverse effect to the reinforced earth embankment.

# 4 Proposed Strengthened Earthwork

## 4.1 Description of Strengthened Earthwork

A Mechanically Stabilised Embankment (MSE) system is to be constructed with modular facing elements to enclose the earthwork, which will be anchored into the embankment with steel or polymer straps. The Embankment is to be constructed using selected granular fill class 6I/6J, to provide sufficient adhesion with straps in order to create adequate resistance against destabilising loads.

## 4.2 Foundation Preparation, including any Measures to deal with Geotechnical Problems

Top soil and soft material with cu <50 kPa should be removed at the surface level and replaced with selected granular fill class 6N. On-site testing of the formation to determine if it is suitable as founding material will be required.

Where Cohesive Alluvium and/or Peat is encountered below the proposed embankment at depth, ground improvement with stone columns, with minimum replacement ratio of 25%, should be carried out. Geotextile separator layer is to be placed over the top of area where ground improvement has been carried out, to minimise the risk of long term instability.

## 4.3 Materials to be used in Construction

Imported selected granular fill class 6I/6J in accordance with Table 6/1 of the Series 600 Earthworks Specification is to be used in the construction of the reinforced section of the embankment.

The reinforcement for the MSE will be non-corrosive steel or a polymer straps. The facing element will be prefabricated concrete panels. Shape and finishing quality of the panels must be approved by project architect.

The required strength of the reinforcement straps will be calculated as the design strength value multiplied by appropriate partial factors for manufacturing tolerance, design life, environmental damage, and installation damage. Appropriate CE marking and BBA Roads and Bridges approved geo-synthetic reinforcement will be required.

## 4.4 Drainage Measures

Details of the carriageway drainage system will be included in the detailed design stage. The reinforced earth walls will be designed to avoid the need for drainage at the toe of the wall.

## 4.5 Arrangements for Highway Furniture and Buried Services and Landscaping

Details of the highways furniture will be included in the detailed design stage.

The VRS, buried services and top level carriageway drainage shall be founded above the polymer straps of the reinforced earth retaining wall.

Deep foundations for street lighting, etc., shall be founded between the straps.

The existing services affecting the reinforced earth wall will be diverted.

## 4.6 Inspection and Maintenance

Not applicable to buried reinforcement. Facing and drainage system inspections can be carried out from the carriageway or the base of the wall, using the standard inspection regime currently undertaken by the Highways Agency.

## 4.7 Interface with Structures

Any interface of vertical and horizontal structure elements with strap/textile will be included in detail design. Wall panel arrangement and their adjustment with the road alignment gradient will be included in detail design as well.

Access to the abutments will be via a 1500mm wide abutment inspection gallery via a permanent staircase, interface with the abutment gallery and staircase are outside of the Reinforce Earth structure and will be included in the detailed design.

The south abutment fill will be retained by reinforced earth structures parallel to the carriageway. The reinforced earth structure will butt against the abutment.

Details are to be specified during detailed design in consultation with the Contractor.

# 5 Design Methods

## 5.1 Internal Stability

The structure is to be designed in accordance with the methodology outlined in BS8006-1:2010 Strengthened /reinforced soils and other fills. Checks will be made for both the ultimate limit and serviceability limit states of the following:

- Tensile strength of reinforcement required.
- Pull out strength of reinforcement.

## 5.2 External/Global Stability

Reinforced earth slopes will be designed in accordance with BS8006-1:2010. Checks will be made for:

- Global Stability.
- Bearing and tilt failure.
- Forward sliding.

Slopes will be assessed using Bishop's simplified method.

# 6 Design/Assessment Criteria

## 6.1 List of Relevant Documents

### *6.1.1 Factual reports*

| | Report Title and Synopsis | Year |
|---|---|---|
| 1 | Ground Engineering – A12 Lowestoft Relief Road Main Ground Investigation Factual Report Ref: No. B12408<br><br>Factual Report including 146 boreholes and 58 Trial Pits undertaken during the period 07/05/1991 to 11/7/1991 for the A12 Lowestoft Relief Road | January 1992 |

### *6.1.2 Interpretative reports*

| | Report Title and Synopsis | Year |
|---|---|---|
| 1 | Geotechnical Feasibility Report Lake Lothing Third Crossing – Draft issued Report Ref: 1069948/GFR/001<br><br>Report review the available site investigation data and provide a ground conditions review, ground model and geotechnical parameters. | February 2016 |
| 2 | ABP scoping Document – 1069948 – ABPSD – 001 – DRAFT<br><br>The tidal water levels have adopted. | November 2016 |
| 3 | DRAFT - Geotechnical Investigation Report (GIR) – Draft v0.3 – Report Ref: 1069948-MOU-HGT-LL_C13-RP-CE-0001<br><br>47 exploratory boreholes carried out across the proposal crossing III site. 15 of them are located at the location of the proposed reinforced embankment for the south approach. Report contains GI data and subsequent laboratory testing results. | NA |

### *6.1.3 Other Documents*

BS8004 (2015) Code of Practice for Foundations

BD74/00 Implementation of BS8004

BS8006-1:2010 Code of Practice for Strengthened/ Reinforced Soils and Other Fills

BD 2/12 Highway Structures: Approval Procedures and General Design

## 6.2 Ultimate Limit State Design Criteria

As described in BS8006-1:2010

## 6.3 Serviceability Design Criteria

As described in BS8006-1:2010

## 6.4 Characteristic Parameters for Soils and Materials

The following design parameters represent moderately conservative values and have been based on the available information taken from the past ground investigations.

| Material | φ' (°) | c' (kN/m$^2$) | $c_u$ (kN/m$^2$) | γ(kN/m$^3$) | Avg Atterberg limits (PL/LL/PI) |
|---|---|---|---|---|---|
| Made Ground | 28 | 0 | - | 20 | (18/32/13) |
| Cohesive Alluvium | 20 | 0 | 8 | 17 | (25/54/32) |
| Glaciofluvial Deposits (Granular) | 34 | 0 | - | 17.5 | - |
| Glaciofluvial Deposits (Cohesive) | 25 | 0 | 5-5*z (z – depth bgl) | 20 | (19/39/21) |
| Crag Group | 34 | 0 | - | 18.5 | - |
| Class 6I Embankment Fill | 38 | 0 | - | 20 | - |
| Class 6J Embankment Fill | 35 | 0 | - | 20 | - |

Material characteristic parameters will be provided by detailed design and after consultation with contractor.

The cohesive alluvium encountered below the embankment is to be improved with stone columns with minimum replacement ratio of 25%.

## 6.5 Design of Groundwater Conditions

Groundwater is found to be below the level of the embankment toe.

## 6.6 Live Loadings

***Loading Relating to General Order Traffic***

Load models LM1 and LM2 shall be as outlined in BS EN 1991-2, the appropriate UK National Annex and Table 7 of BS 8002-2015, as reproduced.

Load model LM3 designed for SV80, SV100, SV196 with accompanying Load Model 1 shall be modelled in accordance with Table 7 of BS 8002-2015.

| Category of traffic areas | | Imposed load, qk kPa |
|---|---|---|
| Footways, cycle tracks, and footbridges | | 5 |
| Normal vehicle traffic | ≥1 m from rear face of structure | 10 |
| | ≥0.5 m but <1 m from rear face of structure | 20 |
| Special vehicle traffic (vehicles conforming to STGO[A)] [LM3 SV models] or SO[B)] Regulations) | ≥1 m from rear face of structure | 20 |
| | ≥0.5 m but <1 m from rear face of structure | 30 |
| [A)] Special Types General Order (see BS EN 1991-2).<br>[B)] Special Order (see BS EN 1991-2) | | |

## 6.7 Description/Diagram of Idealised Soil Structure Model used in Analysis

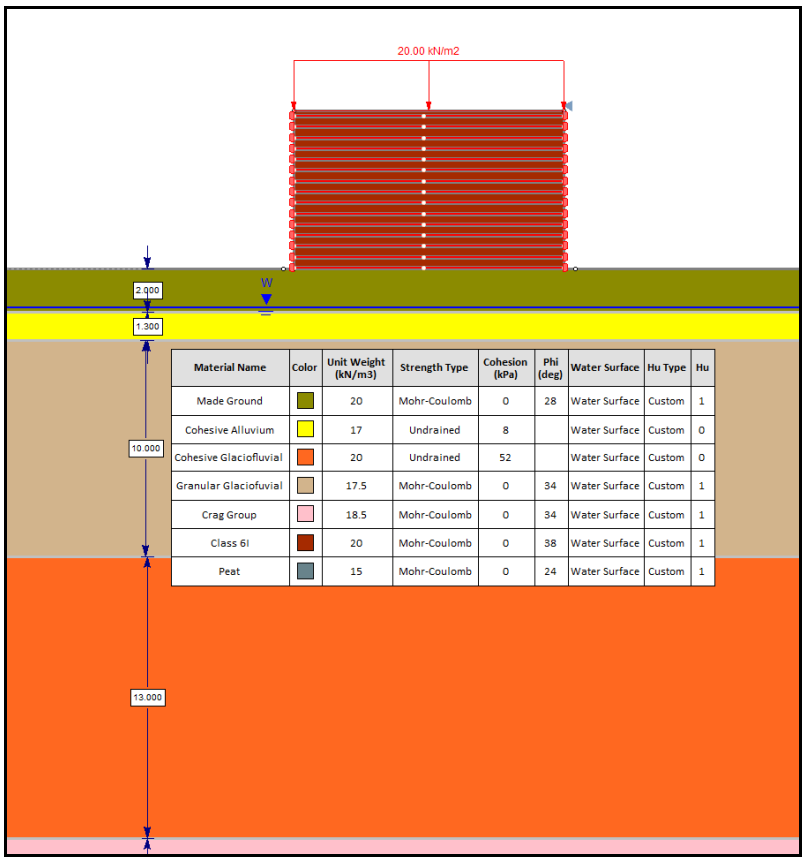



**Fig. 1 Design Diagram of Reinforced Earth Retaining Wall**

## 6.8 Precautions against Chemical Attack to Materials

The reinforced section of the embankment will be constructed using class 6I/6J material. The specification for each type of material is presented in Table 6/1 of the Series 600 Earthworks Specification. The ground investigation in this section of the earthworks did not show the presence of contaminants that would adversely affect the reinforced earth.

All imported material shall be assessed for chemical suitability in accordance with Appendix 6/2 of the Series 600 Earthworks Specification.

## 6.9 Proposed Departures from Design Standards

None.

# 7 Checking

Category 3 design check to be carried out. [BD2/12- 3.4.4(e)]

# 8 Drawings and Documents

## 8.1 List of drawings and documents accompanying submission

A list of the drawings and documents accompanying this submission are included in Appendix C of this report.

# 9 The Above Design and Construction Proposals Are Submitted for Review

Signed: _____

Name: Alexander Chmoulian

Position Held: Technical Director

Engineering Qualifications CEng, FICE

Name of Organisation: WSP

Date _____

# 10 The Above SEAF Is Rejected/Agreed Subject to the Amendments and Conditions Shown Below

Signed: _____

Name: _____

Position Held: _____

Engineering Qualifications _____

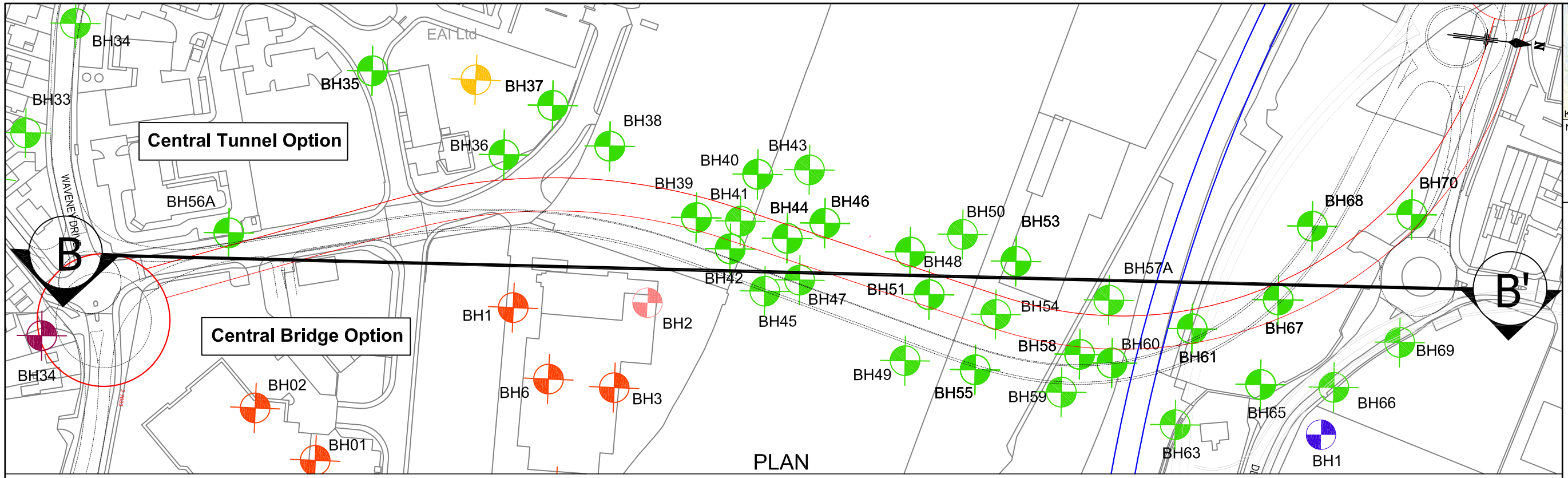
TAA: Suffolk County Council

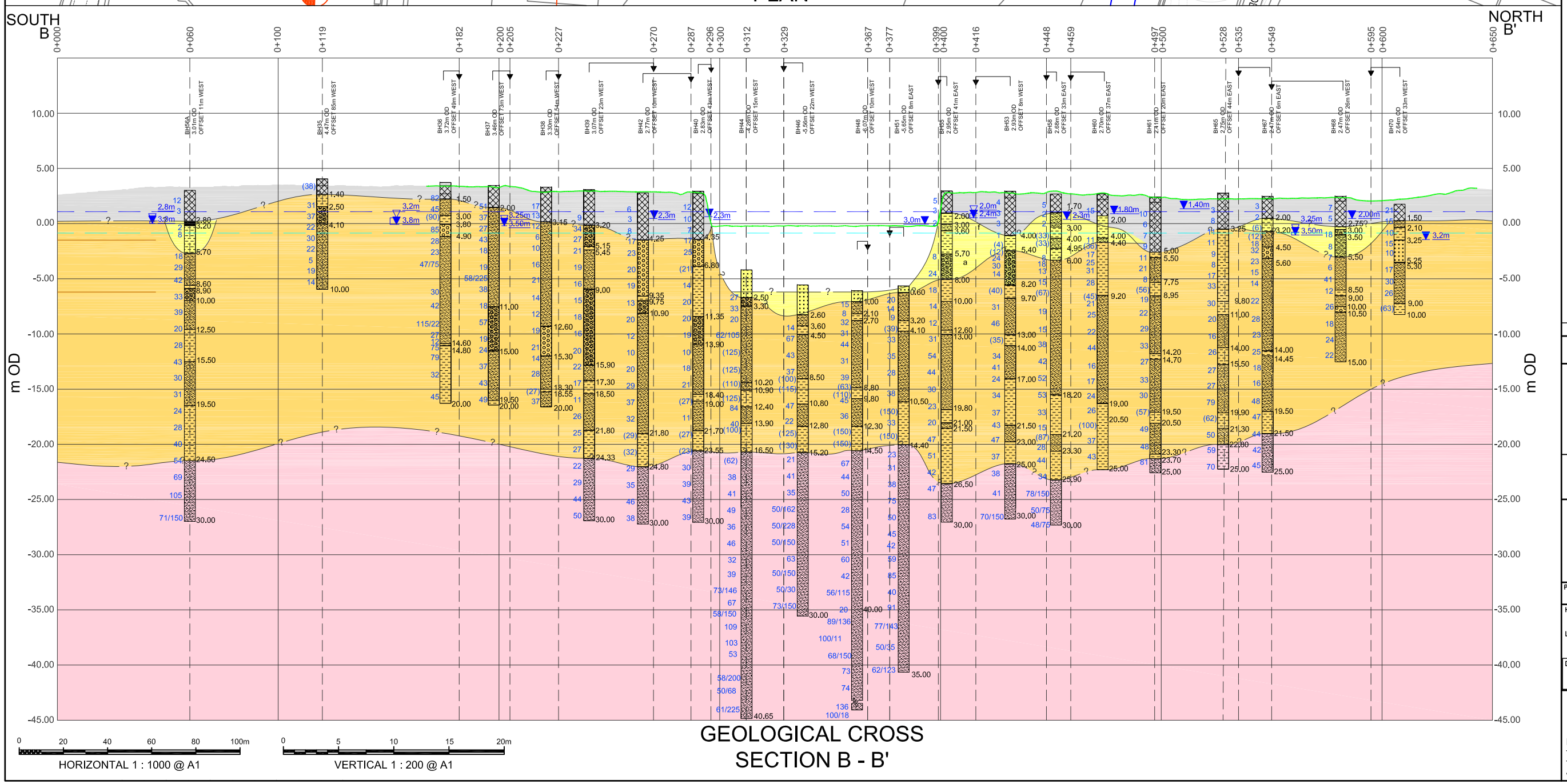
Date _____

## Appendix A - Soils Information

See background geotechnical reports in Section 6.

The relevant boreholes relating to these earthworks are summarised in Section 3.




GEOLOGICAL CROSS SECTION B - B'


NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2. DO NOT SCALE FROM THIS DRAWING
3. REFER TO DRAWING NO. 1069948/002/001 FOR KEY

| Version | Description | By | Chkd | Appd | Date |
|---|---|---|---|---|---|

DRAFT

Suffolk County Council

# LAKE LOTHING THIRD CROSSING

## PLAN AND GEOLOGICAL CROSS SECTION B–B' CENTRAL OPTION

| Project number | Brief number | Scale @ A1 |
|---|---|---|
| 1069948 | | AS SHOWN |

| HA PIN | Originator | Volume |
|---|---|---|
| 1069948 | | HGT |
| **Location** | **Type** | **Role** |
| LOWESTOFT | | GE |

| Drawing No. | Version |
|---|---|
| 1069948/002/005 | A |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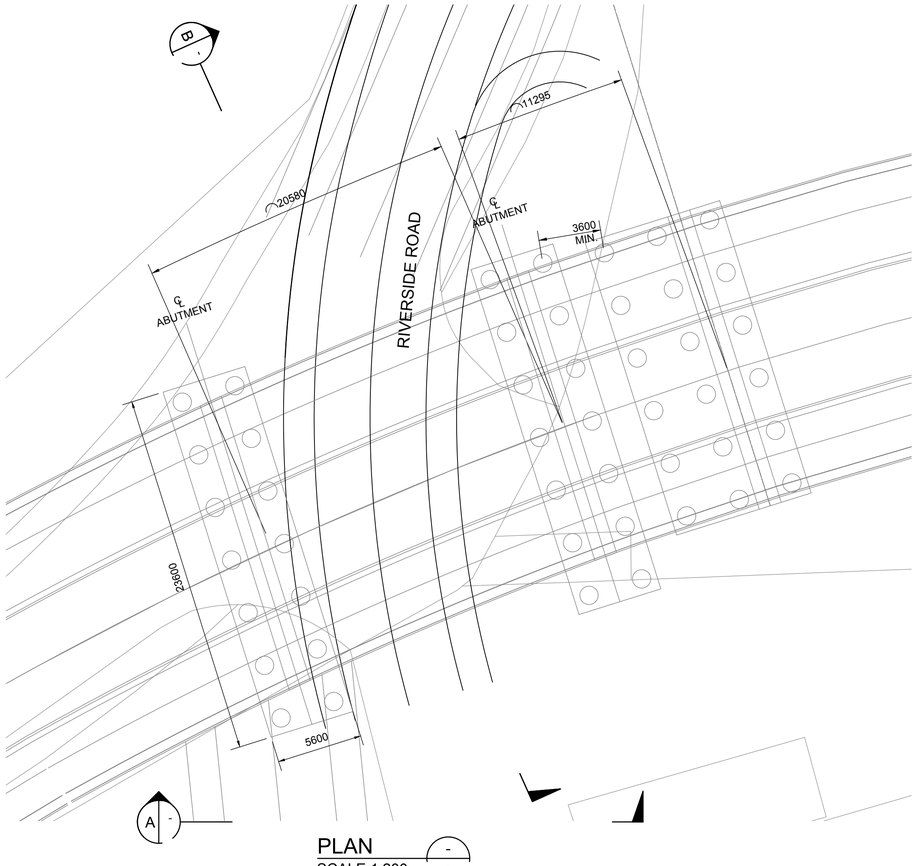
# Appendix B - Relevant Correspondence, Documents and Certificates from Consultation with Relevant Authorities

| Authority | Special Conditions |
|---|---|
| Suffolk County Council | No requirements |
| BT | No requirements |
| Transco | No requirements |
| EDF Energy | No requirements |
| NTL | No requirements |
| Southern Water | No requirements |
| English Nature | No requirements |
| English Heritage | No requirements |
| British Horse Society | No requirements |
| Sustrans | No requirements |
| Virgin Media | No requirements |

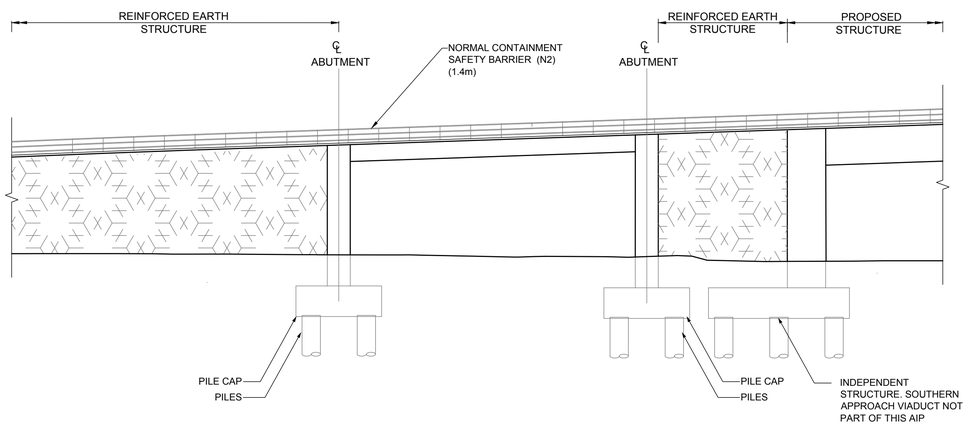
## Appendix C - Drawings and Documents

| | |
|---|---|
| **1069948/002/005 Rev A** | **PLAN AND GEOLOGICAL CROSS-SECTION B-B'. CENTRAL OPTION** |
| **1069948-WSP-SGN-LL-C19-DR-CB-0013-P01** | **GENERAL ARRANGEMENT. RIVERSIDE ROAD ACCESS PORTAL FRAME** |
| **1069948-WSP-SGN-LL-C19-DR-CB-0026-P01** | **LL3X APPROACH SPANS AND BASCULE BRIDGE ACCESS AND MAINTENANCE DETAILS** |

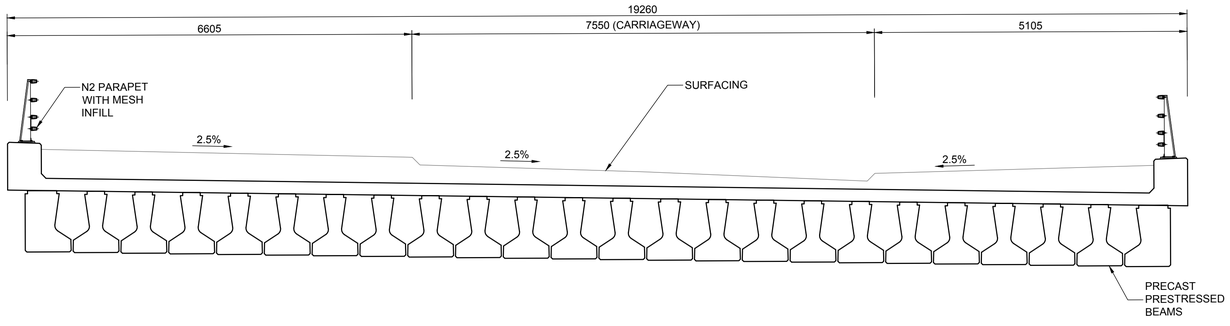
**DRAFT AND CONFIDENTIAL**



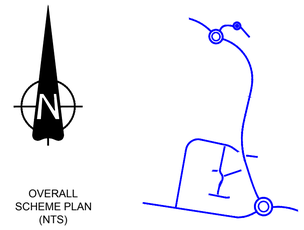

PLAN
SCALE 1:200 B -




ELEVATION A -
SCALE 1:200




SECTION B -
SCALE 1:50



OVERALL SCHEME PLAN (NTS)

**LEGEND**

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



| | | | | |
|---|---|---|---|---|
| P01 | EL | FQ | MN | 03/10/2017 |

FIRST ISSUE

| REVISION | DRAWN | CHECKED | APPROVED | DATE |
|---|---|---|---|---|

DESCRIPTION

Suffolk County Council

PROJECT TITLE
Lake Lothing THIRD CROSSING

DRAWING TITLE
GENERAL ARRANGEMENT: RIVERSIDE ROAD ACCESS PORTAL FRAME

DRAWING STATUS
SUITABILITY

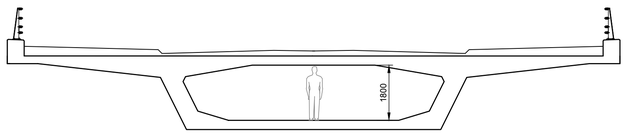
| DRAWN | CHECKED | APPROVED | AUTHORISED | SUITABILITY |
|---|---|---|---|---|
| EL | RR | FQ | MN | S0 |

| SCALE @ A1 SIZE | DATE | REVISION |
|---|---|---|
| AS SHOWN | 03/10/2017 | P01 |

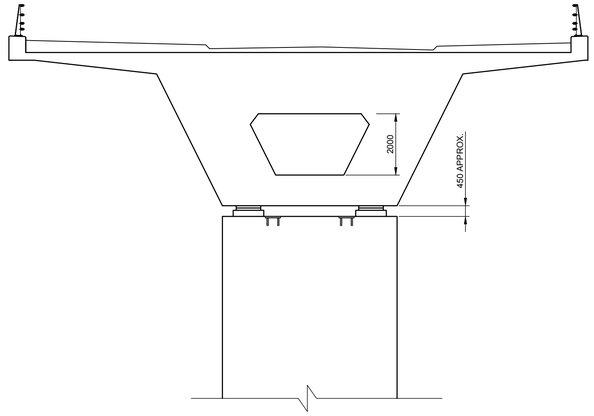
DRAWING NUMBER

| Project | Originator | Volume | Location | Type | Role | Number |
|---|---|---|---|---|---|---|
| 1069948 | WSP-SGN-LL | C19 | DR | CB | | 0013 |

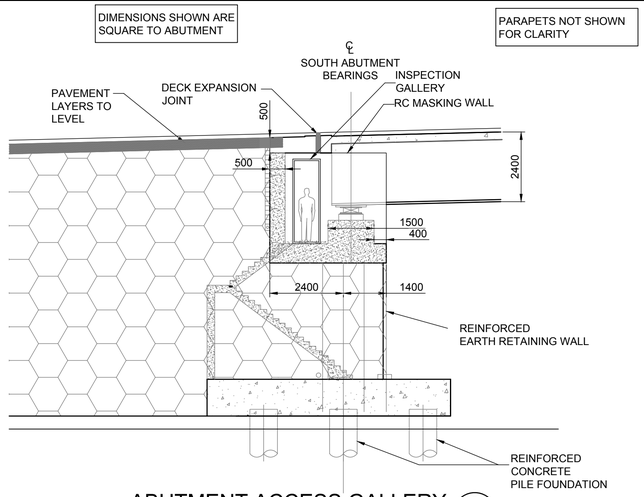
**DRAFT AND CONFIDENTIAL**



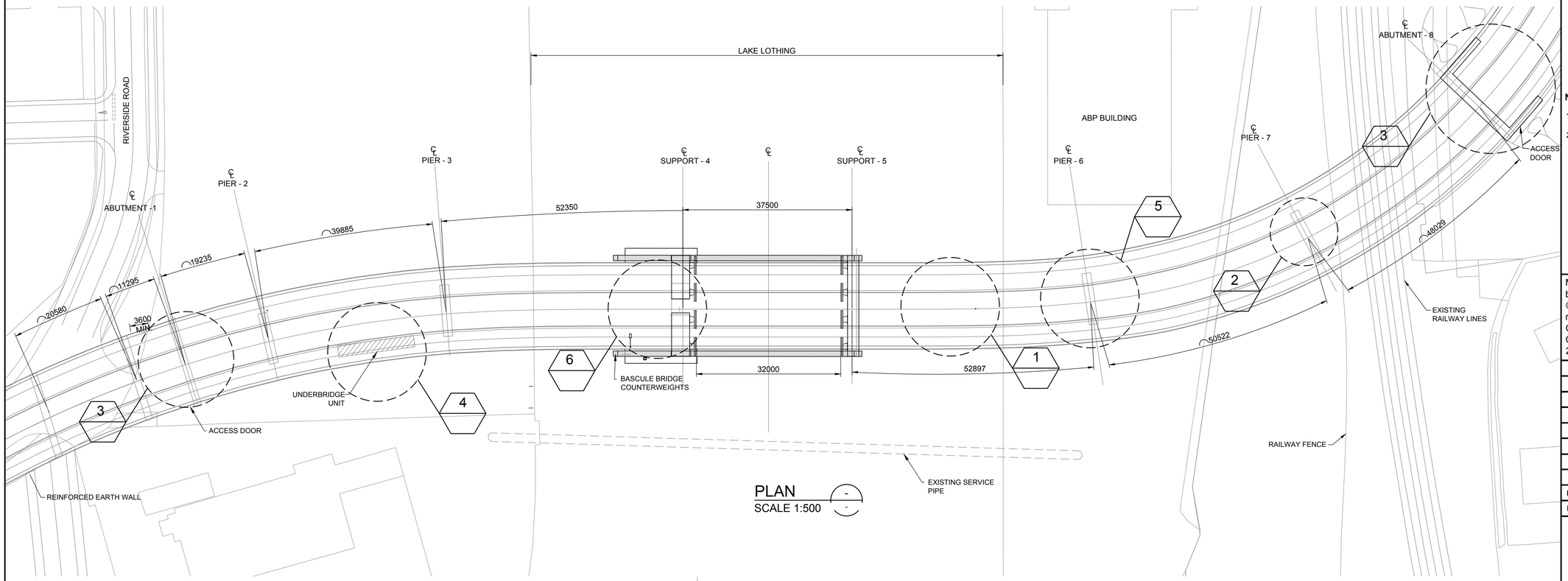

TYPICAL DETAIL
OF DECK INSPECTION (1)
SCALE 1:100



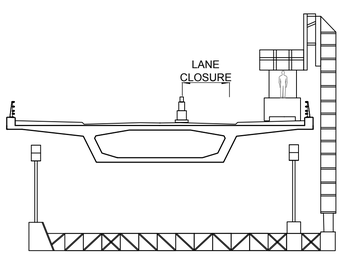

TYPICAL DETAIL OF JACKING POINTS
FOR BEARING REPLACEMENT (2)
SCALE 1:100



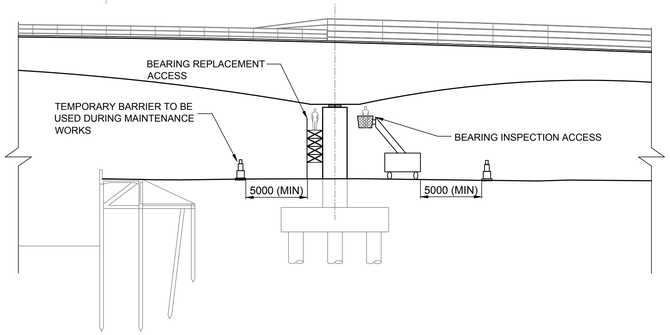

ABUTMENT ACCESS GALLERY (3)
SCALE 1:100



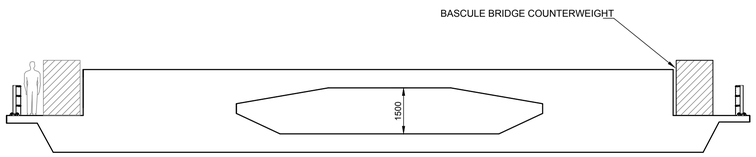

PLAN
SCALE 1:500



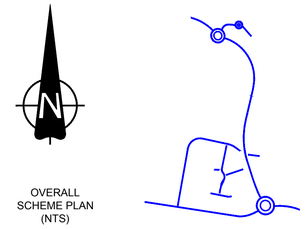

UNDERBRIDGE UNIT DECK
SOFIT INSPECTION (4)
SCALE 1:200




INSPECTION AND MAINTENANCE
OF PIERS AND BEARINGS (5)
SCALE 1:250




INSPECTION OF SECTION
SUPPORTING BASCULE BRIDGE (6)
SCALE 1:100




OVERALL
SCHEME PLAN
(NTS)

**LEGEND**

**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. PIER SHAPE IS INDICATIVE AND IN DEVELOPMENT PROCESS



| REVISION | DRAWN | CHECKED | APPROVED | DATE |
|---|---|---|---|---|
| P01 | EL | FQ | MN | 05/10/2017 |
| FIRST ISSUE | | | | |

DESCRIPTION

Suffolk County Council

PROJECT TITLE
Lake Lothing THIRD CROSSING

DRAWING TITLE
LL3X APPROACH SPANS AND BASCULE BRIDGE ACCESS AND MAINTENANCE DETAILS

DRAWING STATUS
SUITABILITY

| DRAWN | CHECKED | APPROVED | AUTHORISED | SUITABILITY |
|---|---|---|---|---|
| EL | RR | FQ | MN | S0 |

| SCALE @ A1 SIZE | DATE | REVISION |
|---|---|---|
| AS SHOWN | 05/10/2017 | P01 |

DRAWING NUMBER

| Project | Originator | Volume | | |
|---|---|---|---|---|
| 1069948-WSP-SGN-LL_C19-DR-CB-0026 | | | | |
| Location | Type | Role | Number | |