Lower Thames Crossing

Working on behalf of highways england

Lower Thames Crossing
Task Force Update

Matt Palmer, Gary Hodge & Clare Donnelly

18th January 2021

Agenda

- Introduction from Thurrock and Matt Palmer
- Approach to the Hatch Report
- LTC Approach to Design and Quality
- Previous DCO Application Proposals :
  - North Portal & Surrounding Area
  - Tilbury Viaduct
  - Mardyke and Orsett Fenn Viaducts

Lower Thames Crossing

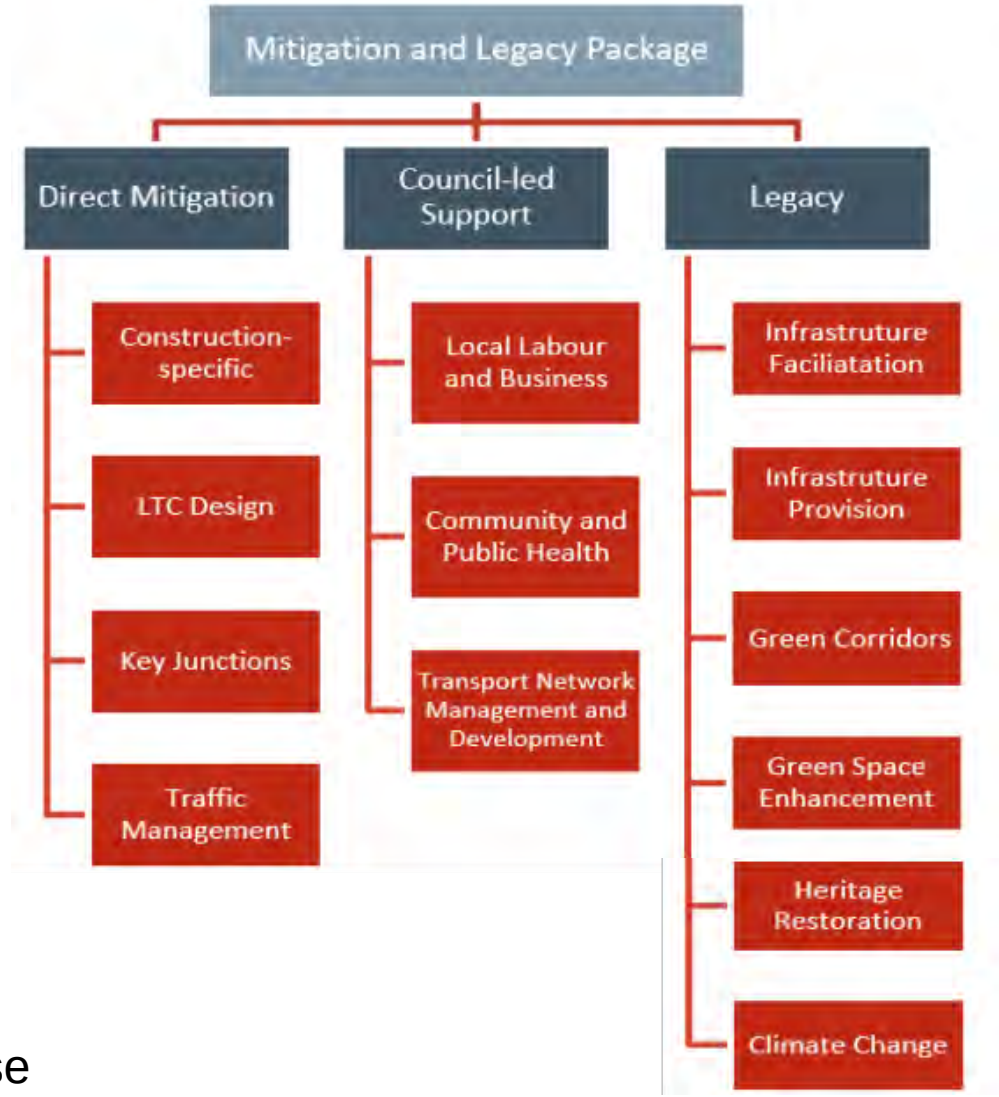
Working on behalf of highways england

Approach to the Hatch Report

HATCH Report

- Good basis for collaboration going forward
- 57 measures in total
- 27 of these measures are already part of our emerging resubmission

Package	Contract	Legacy	DCO	Other	Total
Direct Mitigation		2	8	13	23
Council Led Support	1	7	1	3	12
Legacy		5	3	14	22
Total	1	14	12	30	57



- Other key measures under consideration include:

1. Sustainable public transport to construction sites (M7)
2. Council-led community and public health team (CLS8)
3. Bridge over Tilbury Loop railway (L7)
4. Improve internet / 5G connections (L10)
5. Complete and improve PROW network (L14)

- Currently working with Thurrock Council Officers to pick up these measures in Statements of Common Ground (SoCG) and possibly add to the DCO submission.

Lower Thames Crossing

Working on behalf of highways england

LTC Approach to Design and Quality

Working closely with Thurrock Council to get a better scheme

1. Design Narrative:
Described the Project context and possible approaches to the adopted layout through the design

2. Iterative Design Process:
Designs developed with stakeholders and between design disciplines

3. Project Design Report:
Describes the Design that was submitted for DCO and the process and factors that shaped it's development

4. Design Principles:
Defines the design commitments to be secured through the DCO - *in the next stage of detailed design*

Layers of Preliminary Design Commitments

Non-DCO Commitments

DCO Commitments

Level of refinement and detail

Contract Terms:
Secured by:
LTC Construction Contracts
Illustrated in:
Design Guide

These documents add more detail to the DCO Commitments to assist the contractor in pricing the works appropriately and developing detailed designs

Additional Commitments:

Secured by: *Design Principles*
Illustrated in: *Project Design Report*

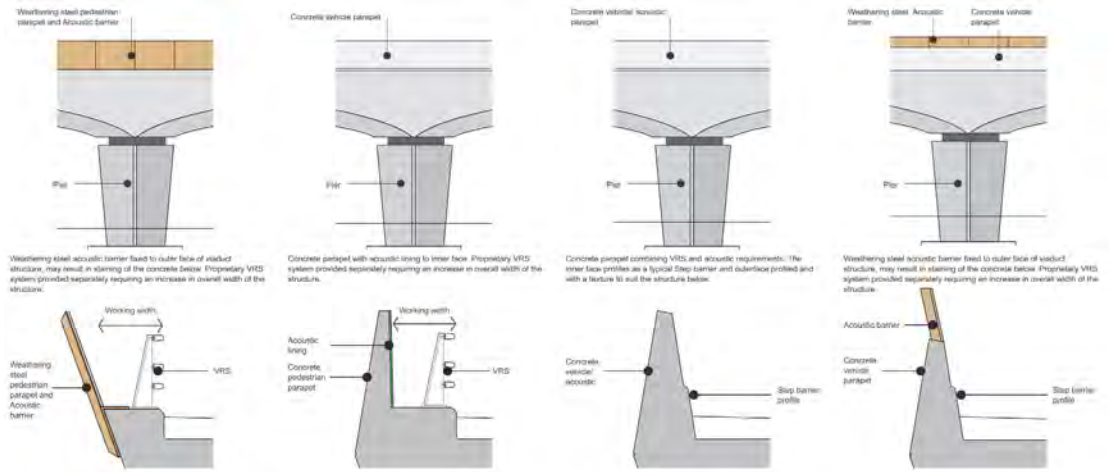
Design Principles layer additional general (ie project-wide) and specific commitments *on top of* the baseline design (eg for a specific material pallet) to be developed further at detailed design.

Baseline Design:

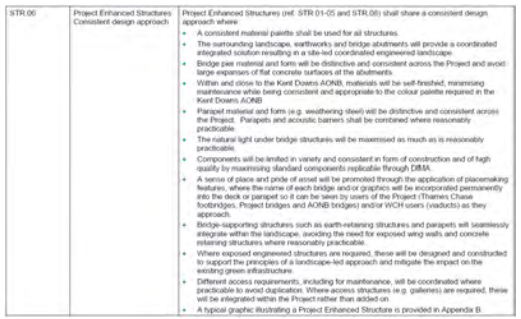
Secured by: *Book of Plans*

Illustrated in*: Structures Plans and Environmental Statement*

These formed the basis for the environmental assessment and set the basic parameters for the structures (eg height & location). They are illustrated in Landscape and Visual Impact Assessment

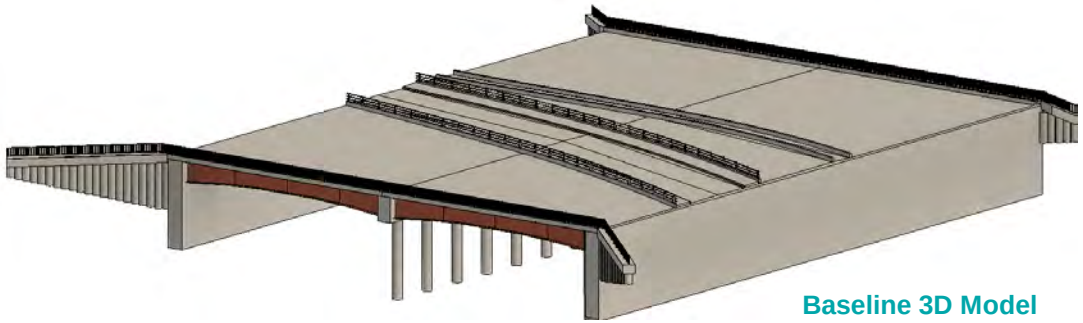


Design Guide



Design Principles

Project Design Report



Baseline 3D Model

Examples of design Issues still under discussion

- Further structures to be enhanced
- Design quality control measures
- Possibility of Design Codes being part of the DCO resubmission
- Further approvals
- Width and design of certain structures
- North Portal design and wider landscape integration
- Tilbury Viaduct design
- Open Space provision around the A13 Junction

Lower Thames Crossing

Working on behalf of highways england

Proposals from the Previous DCO Application in Thurrock

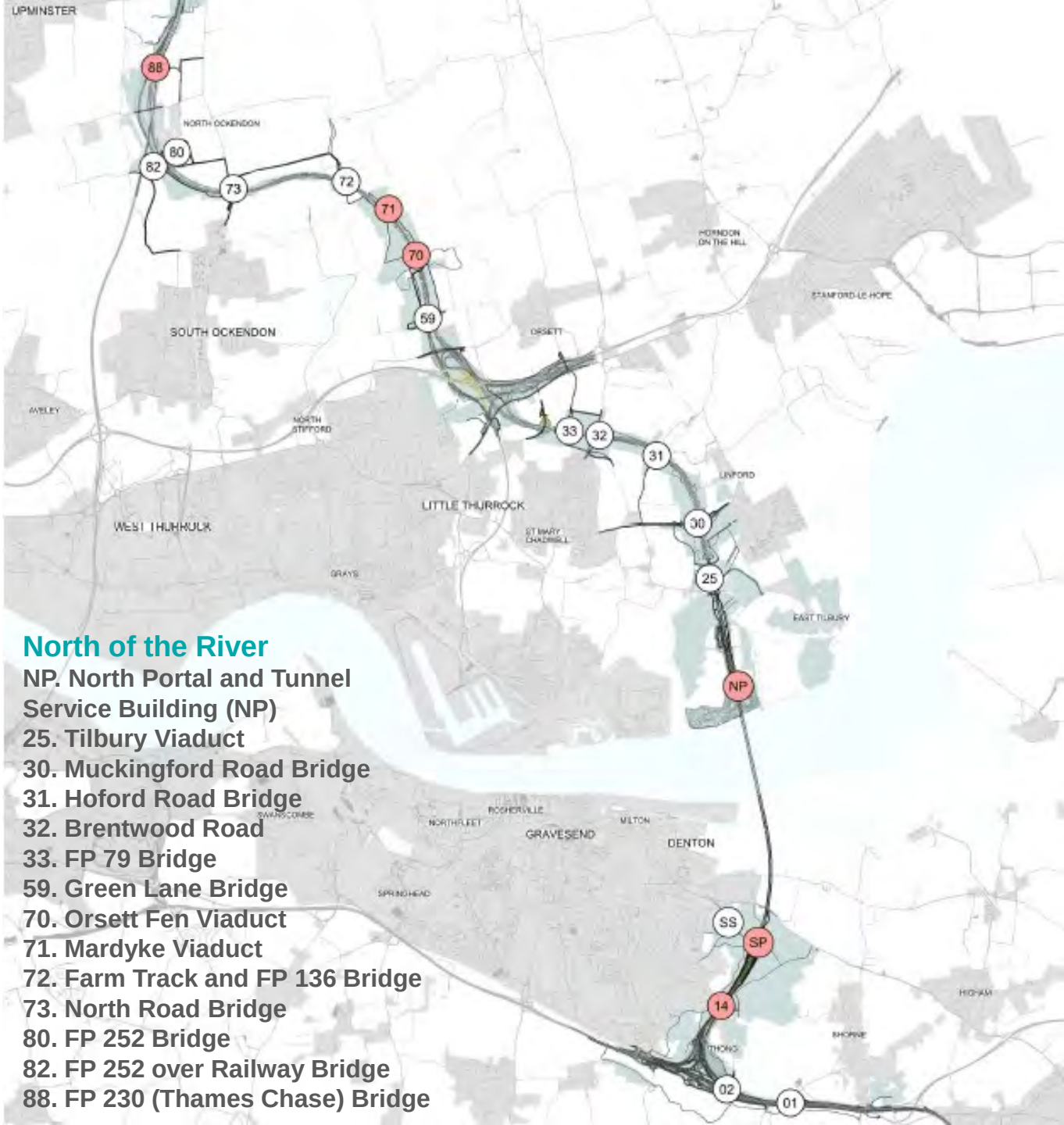
Good Design on *All* Structures

Table 3.4 Project-wide design principles: Structures

Clause no.	Design principle name	Design principle
STR.01	General structures	The design is to be led by the existing landscape, incorporating, and integrating the structures and buildings, so they appear as fully and seamlessly integrated components within the landscape. Therefore, the Project shall aim to achieve high-quality structures along the Project route, incorporating Design for Manufacture and Assembly (e.g. prefabricated components) and integration of architecture and structural designs. The goal of the design shall be to have structures that are not overbearing or obtrusive in the landscape, thereby reducing impact on the local character and environment.
STR.07	Bridge structures	All bridges not subject to the requirements of Project Enhanced Structures shall share a consistent design approach with the Project Enhanced Structures in the following respects: • A consistent material palette shall be used for all structures. • The surrounding landscape, earthworks and bridge abutments will provide a coordinated integrated solution resulting in a site-led coordinated engineered landscape. • The natural light under bridge structures will be maximised as much as is reasonably practicable. • Components will be limited in variety and consistent in form of construction and of high quality by maximising standard components replicable through DfMA. • Parapets and acoustic barriers shall be combined where reasonably practicable. • Bridge-supporting structures such as earth-retaining structures and parapets will seamlessly integrate within the landscape, avoiding the need for exposed wing walls and concrete retaining structures where reasonably practicable. • Where exposed engineered structures are required, these will be designed and constructed to support the principles of a landscape-led approach and mitigate the impact on the existing green infrastructure. • Different access requirements, including for maintenance, will be coordinated where practicable to avoid duplication. Where access structures (e.g. galleries) are required, these will be integrated within the Project rather than added on.

Project Structures in Thurrock: Integration and Analysis

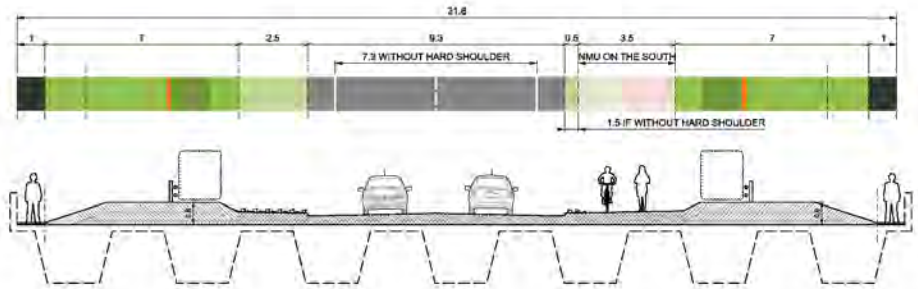
- The design team initially reviewed *all* bridges over the LTC alignment (not junction structures) to assess how well they fit with their environment.
- This process showed that some focus would be required on specific structures to improve their integration where this represented good value for money.
- Before we decided which structures to prioritise, we sought the guidance of Highways England's Design Review Panel
- "Enhanced structures" – which include the portals – were selected and are highlighted in red
- In addition to these enhanced structures there remain four green bridges proposed in Thurrock at Hoford Road, Green Lane, Muckingford Road and North Road.
- All of this is subject to ongoing engagement with Thurrock officers



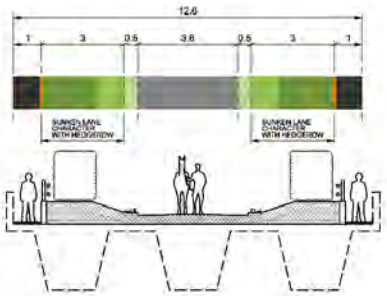
North of the River

NP. North Portal and Tunnel Service Building (NP)
25. Tilbury Viaduct
30. Muckingford Road Bridge
31. Hoford Road Bridge
32. Brentwood Road
33. FP 79 Bridge
59. Green Lane Bridge
70. Orsett Fen Viaduct
71. Mardyke Viaduct
72. Farm Track and FP 136 Bridge
73. North Road Bridge
80. FP 252 Bridge
82. FP 252 over Railway Bridge
88. FP 230 (Thames Chase) Bridge

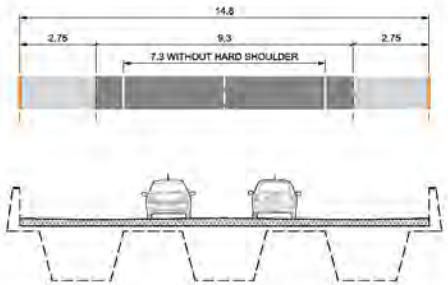
Project Structures in Thurrock: Integration and Analysis



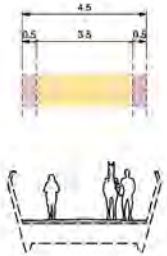
MUCKINGFORD ROAD



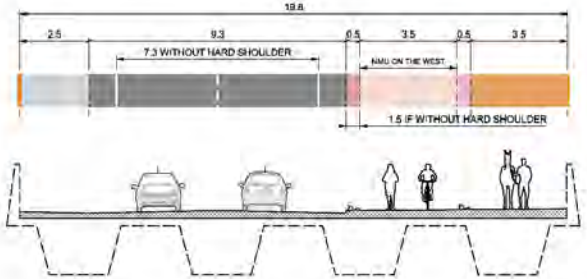
HOFORD ROAD



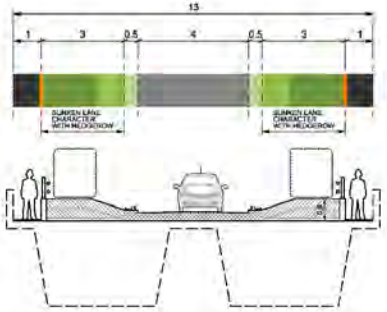
BRENTWOOD ROAD



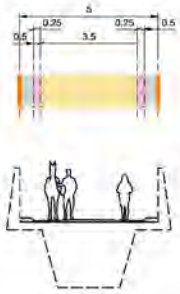
FARM TRACK & FP79



RECTORY ROAD



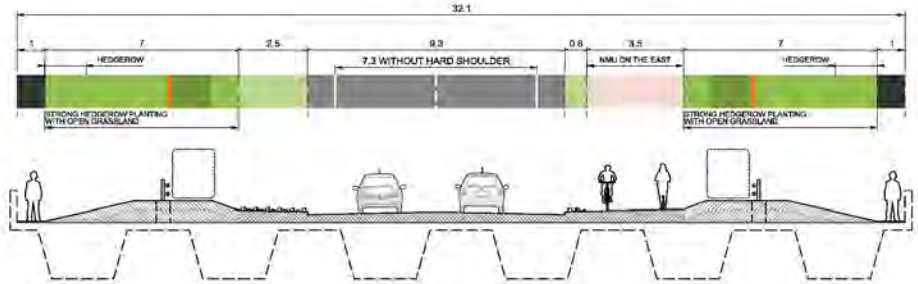
GREEN LANE



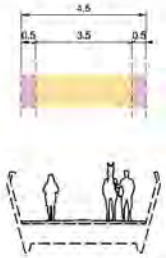
FARM TRACK & FP136

KEY

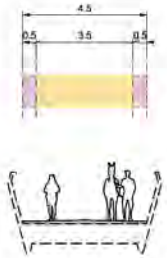
- SHY DISTANCE
- GREEN
- VERGE
- GREEN VERGE (LOW PLANTING AND GRASS OR GRASSCRETE)
- SEPARATION
- MAINTENANCE WALKWAY
- PEDESTRIAN, BICYCLE & BRIDLEWAY
- PEDESTRIAN & BICYCLE
- PEDESTRIAN
- BRIDLEWAY
- ROAD
- VEHICLE RESTRAINT SYSTEM



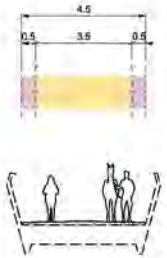
NORTH ROAD



FP252 (151)



FP252 (151) OVER RAIL



FP230 (THAMES CHASE)

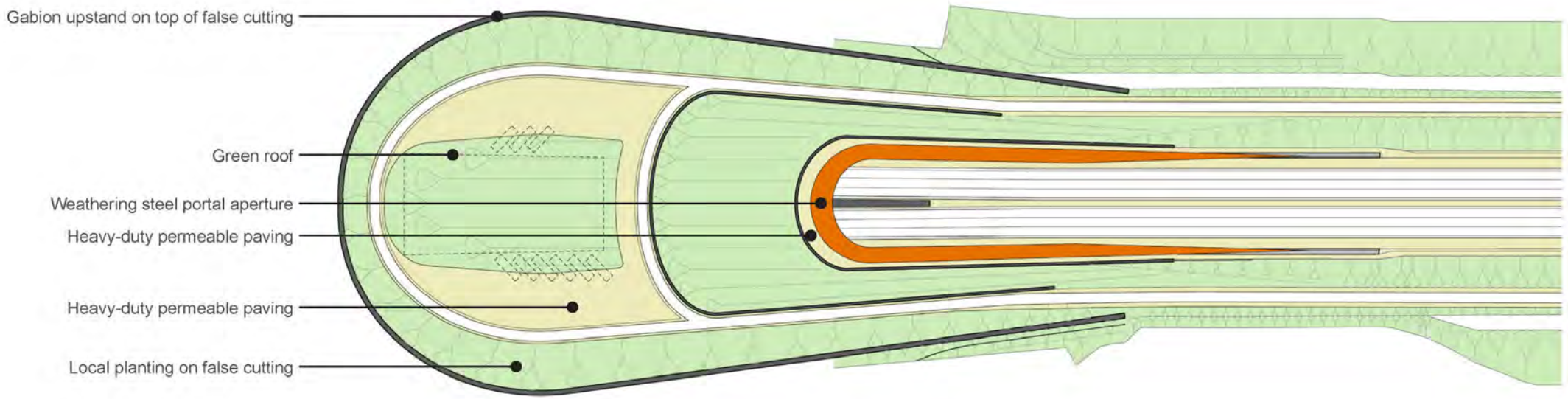
Lower Thames Crossing

Working on behalf of highways england

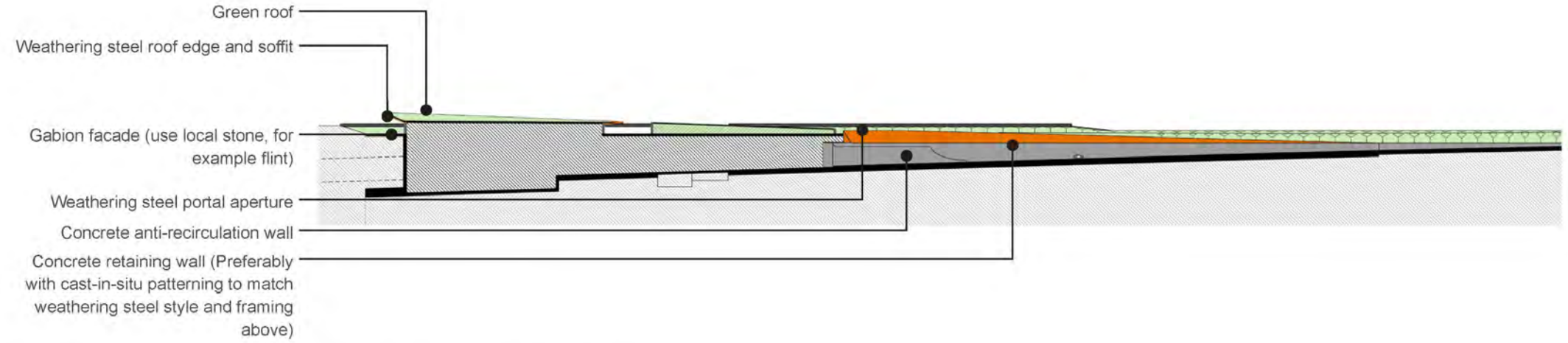
The North Portal

Portals – North and South

North Portal

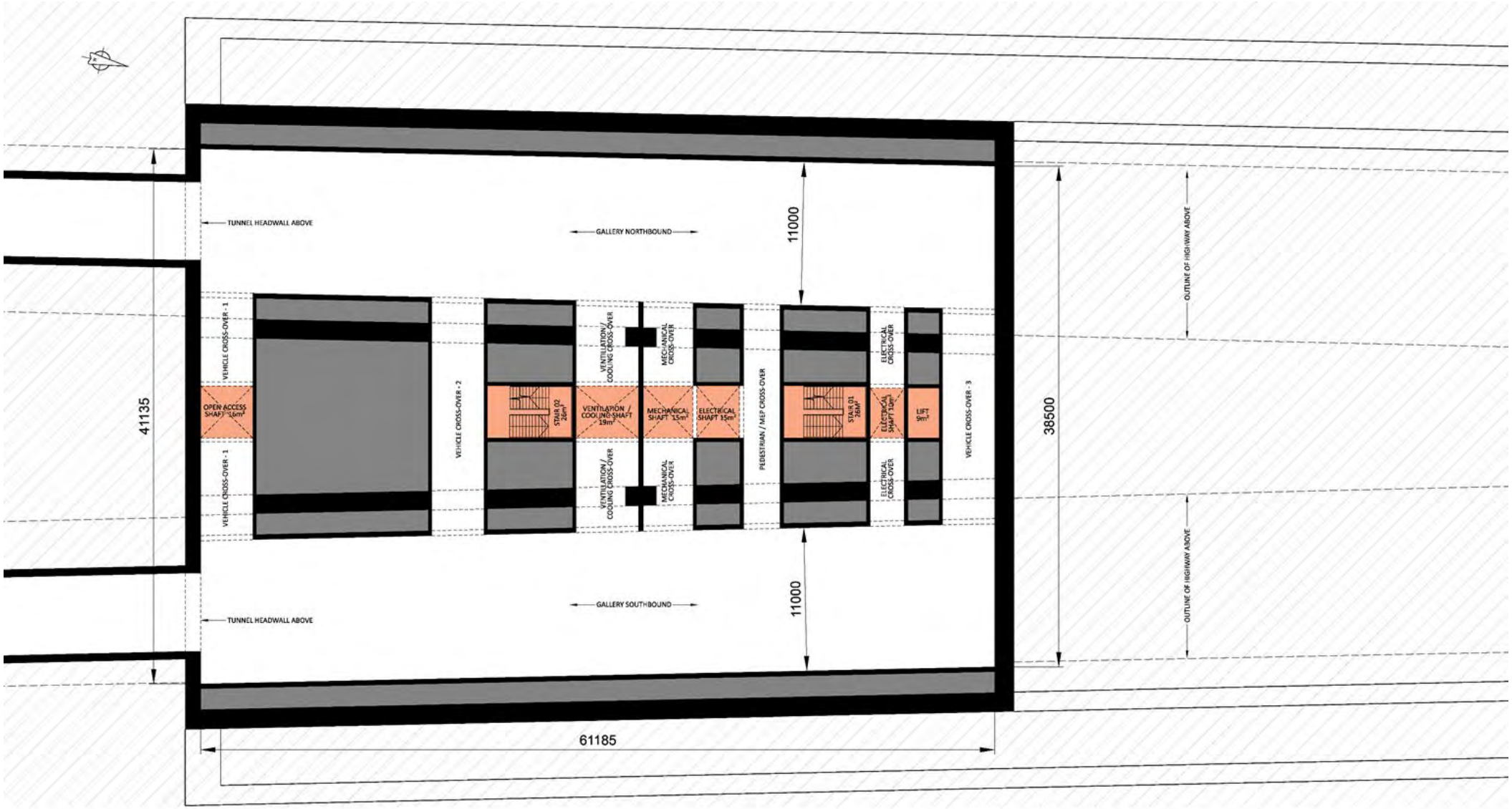


ILLUSTRATIVE PLAN VIEW – NORTH PORTAL AND TUNNEL SERVICE BUILDING



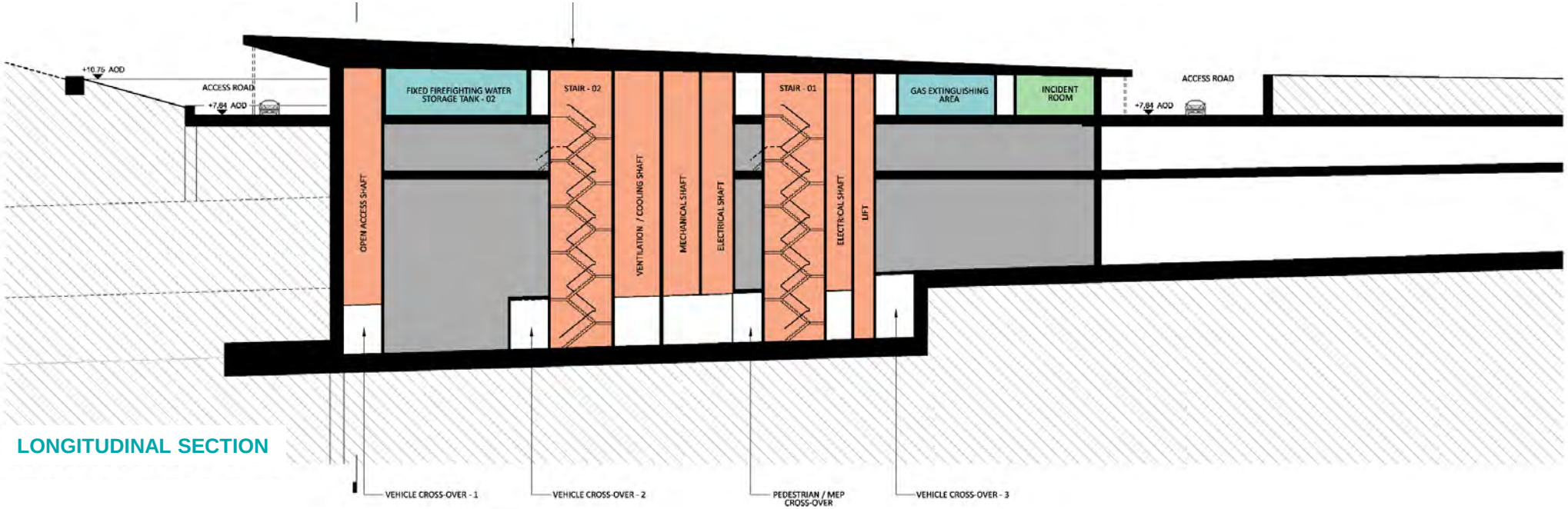
ILLUSTRATIVE LONGITUDINAL SECTION – NORTH PORTAL AND TUNNEL SERVICE BUILDING

North Portal: Plan at Gallery Level

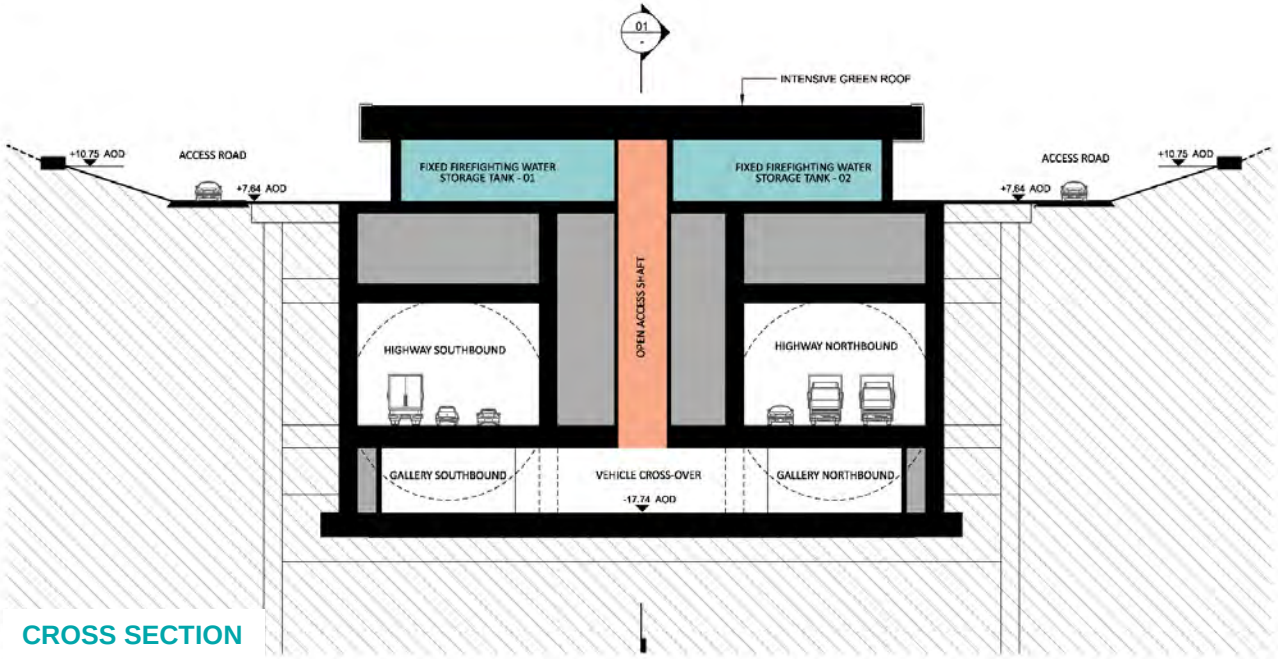


North Portal: Plan at Ground Level

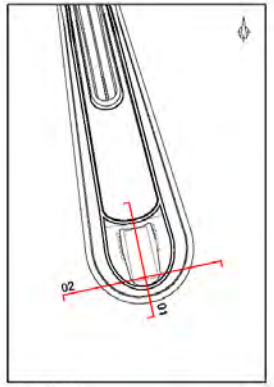
North Portal: Sections



LONGITUDINAL SECTION

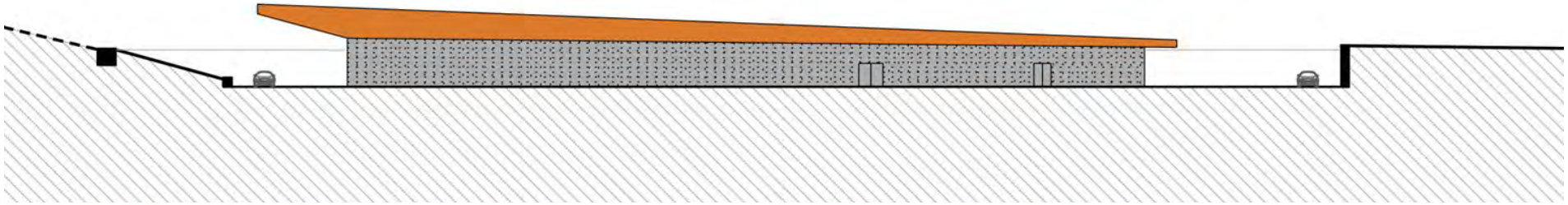


CROSS SECTION



KEY PLAN

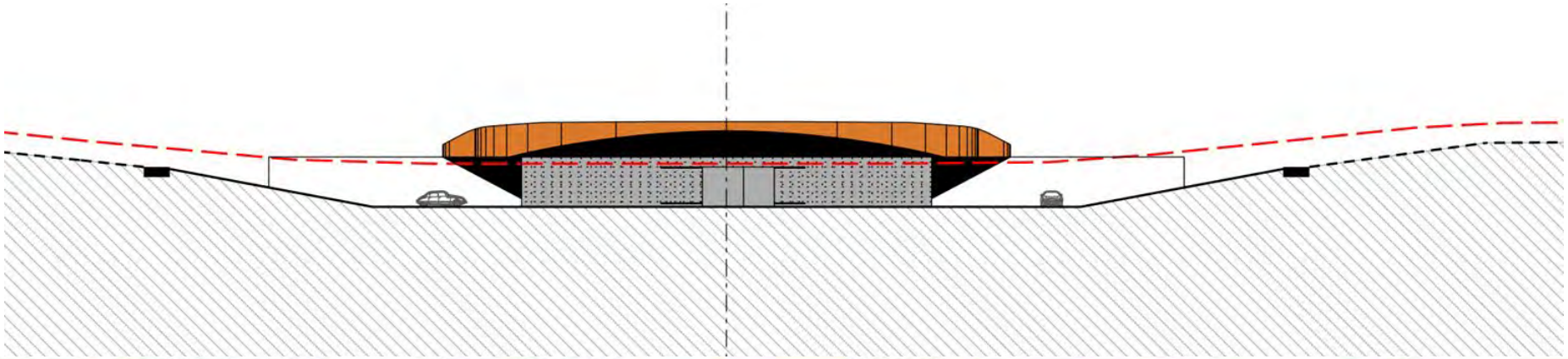
North Portal: Elevations

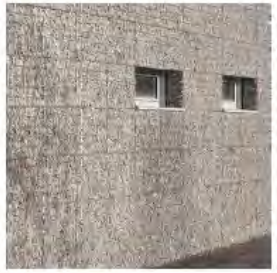














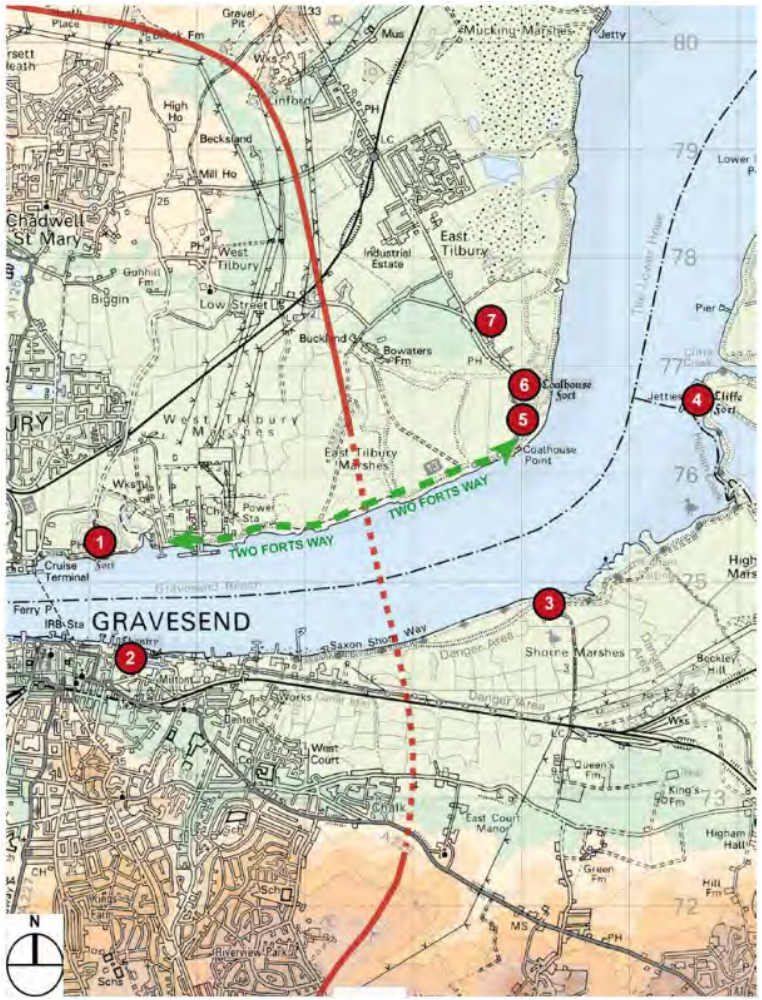

Landscape Integration and Tilbury Fields

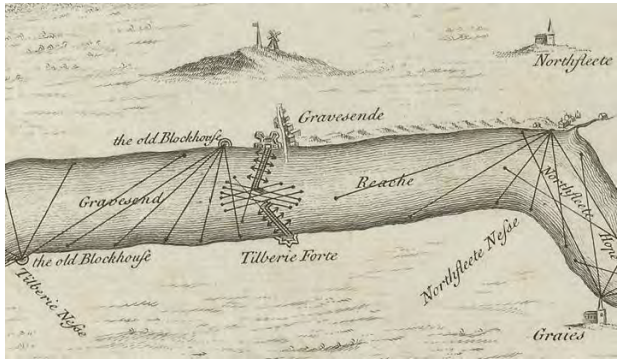
Key

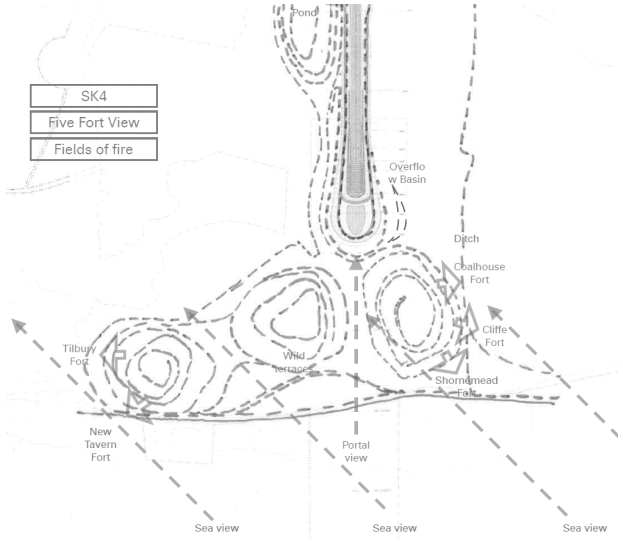
1. Portal
2. Tilbury Viaduct
3. Tunnel Service Building
4. Tilbury Fields
5. Water vole habitat
6. Jetty (to be retained)
7. Woodland planting
8. Portal access roads
9. Main River culvert

Tilbury Fields: Inspiration

Portals & Associated Landscape







1. Tilbury Fort

2. New Tavern Fort

3. Shornemead Fort

4. Cliffe Fort

5. Coalhouse Fort Wing Battery

6. Coalhouse Fort

7. East Tilbury Battery

Tilbury Fields: Plan and Placemaking

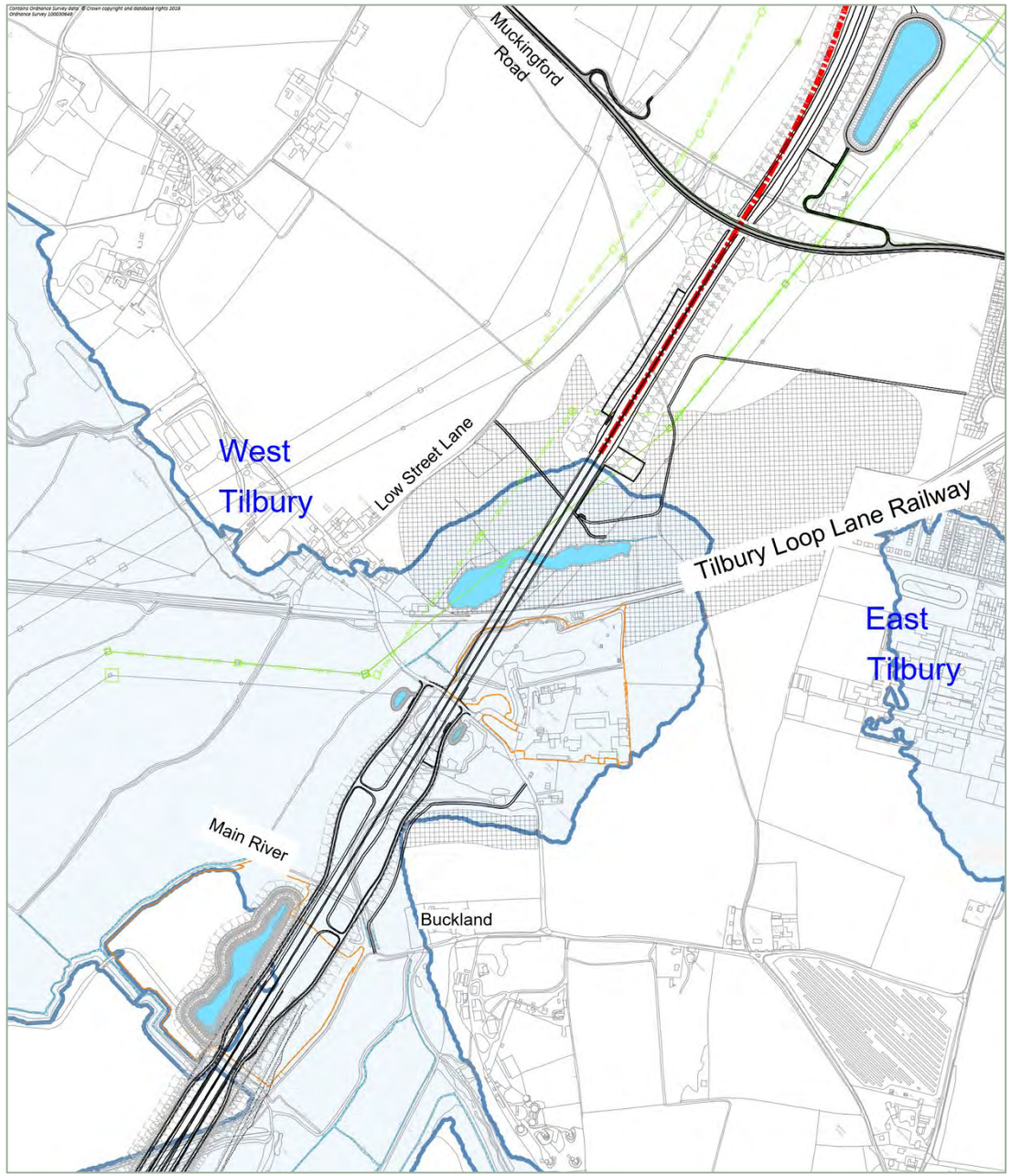
Portals & Associated Landscape

Lower Thames Crossing

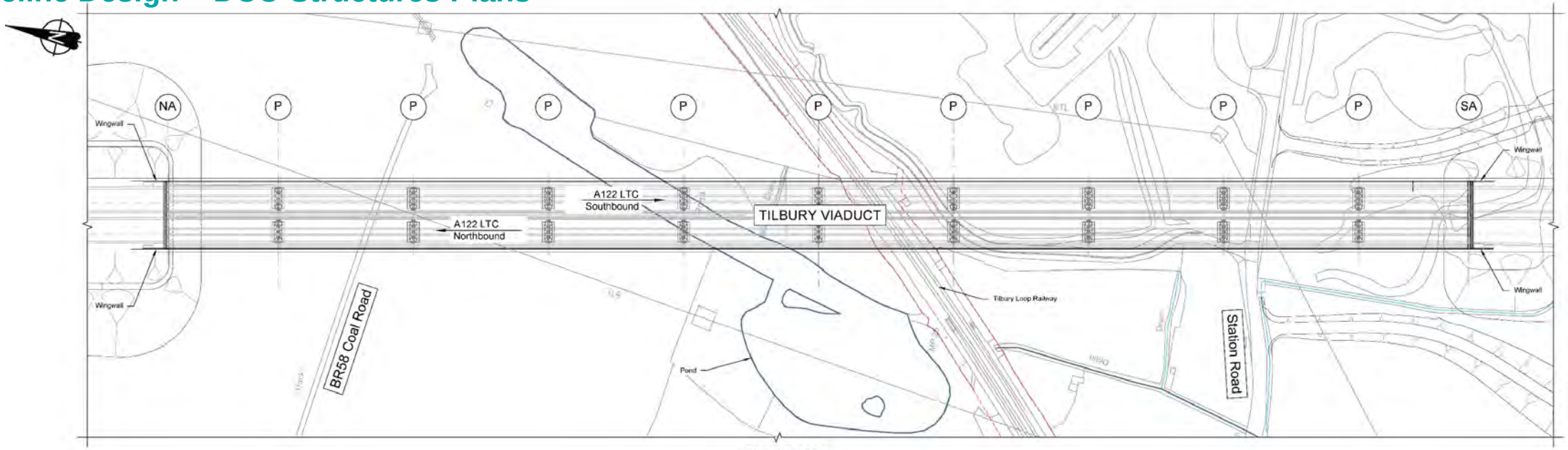
Working on behalf of highways england

The Tilbury Viaduct

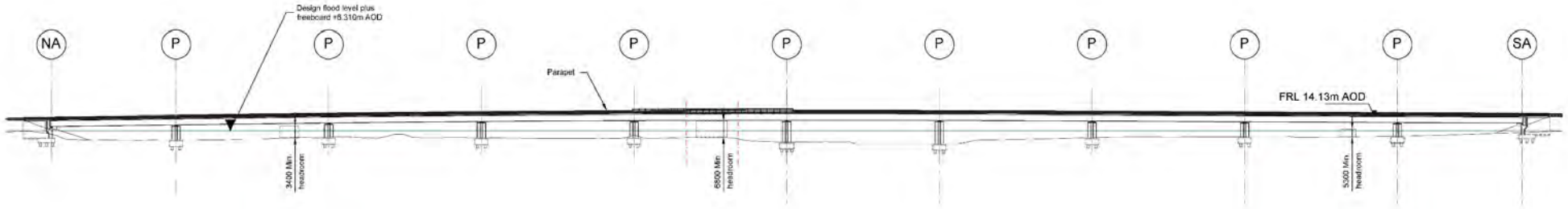
Tilbury Viaduct



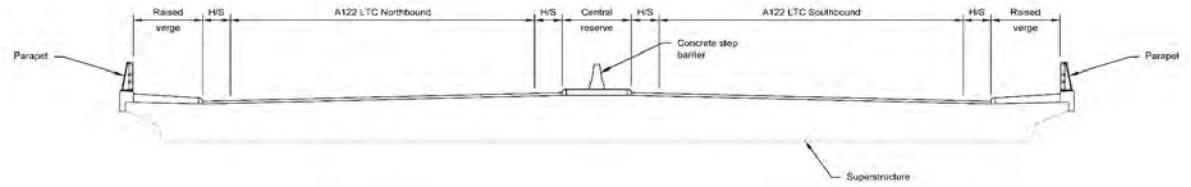
Baseline Design – DCO Structures Plans



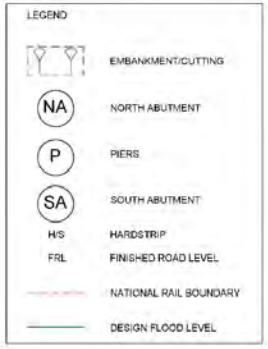
PLAN 1:1000



ELEVATION 1:1000



TYPICAL SECTION 1:100



Tilbury Viaduct: Aerial View

Tilbury Viaduct: View from Station Road - Existing

Tilbury Viaduct: View from Station Road - Proposed

Tilbury Viaduct from adjacent field

Lower Thames Crossing

Working on behalf of highways england

Mardyke and Orsett Fen Viaducts

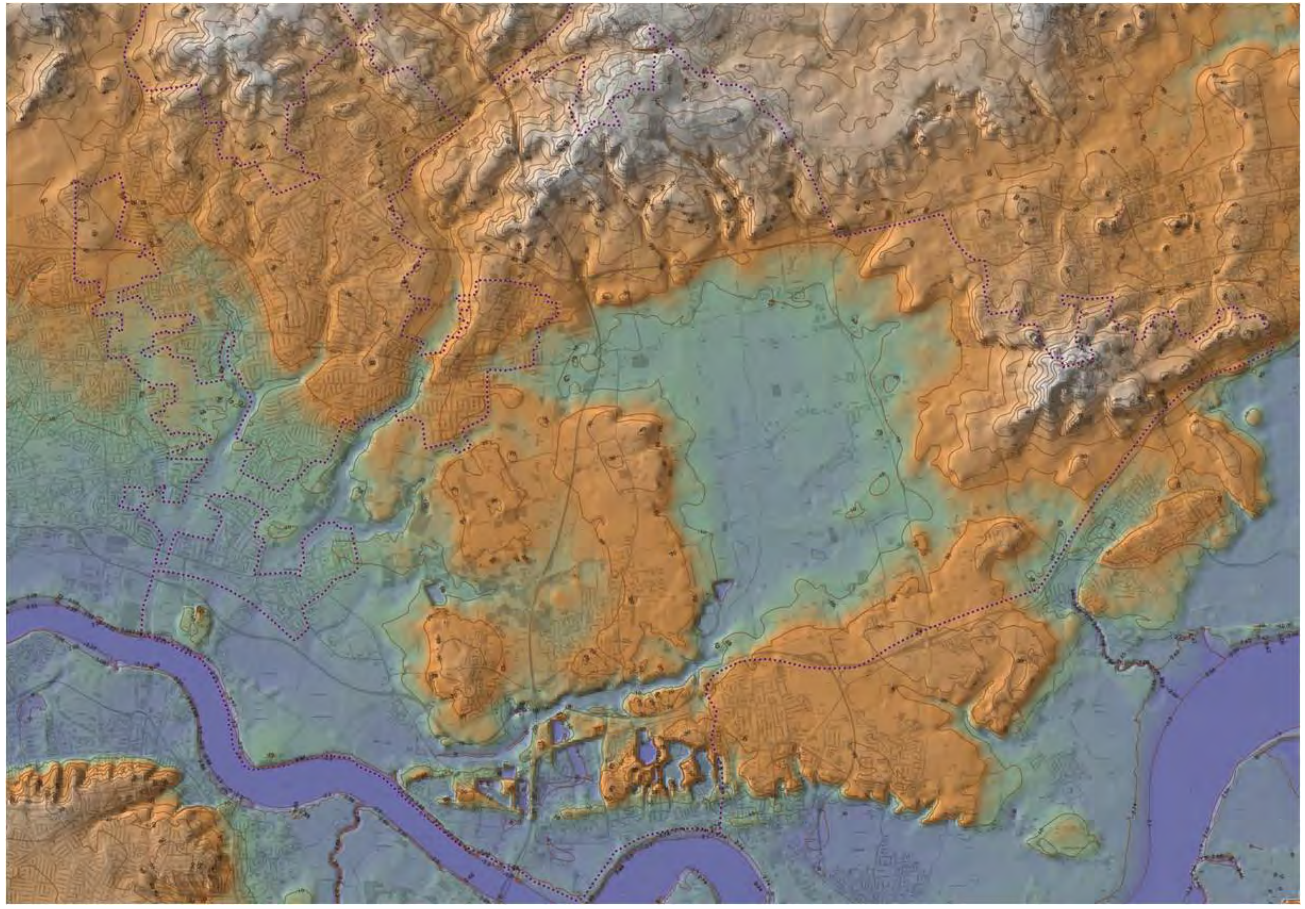
The Nature of the Existing Landscape

6.2 Mardyke Area

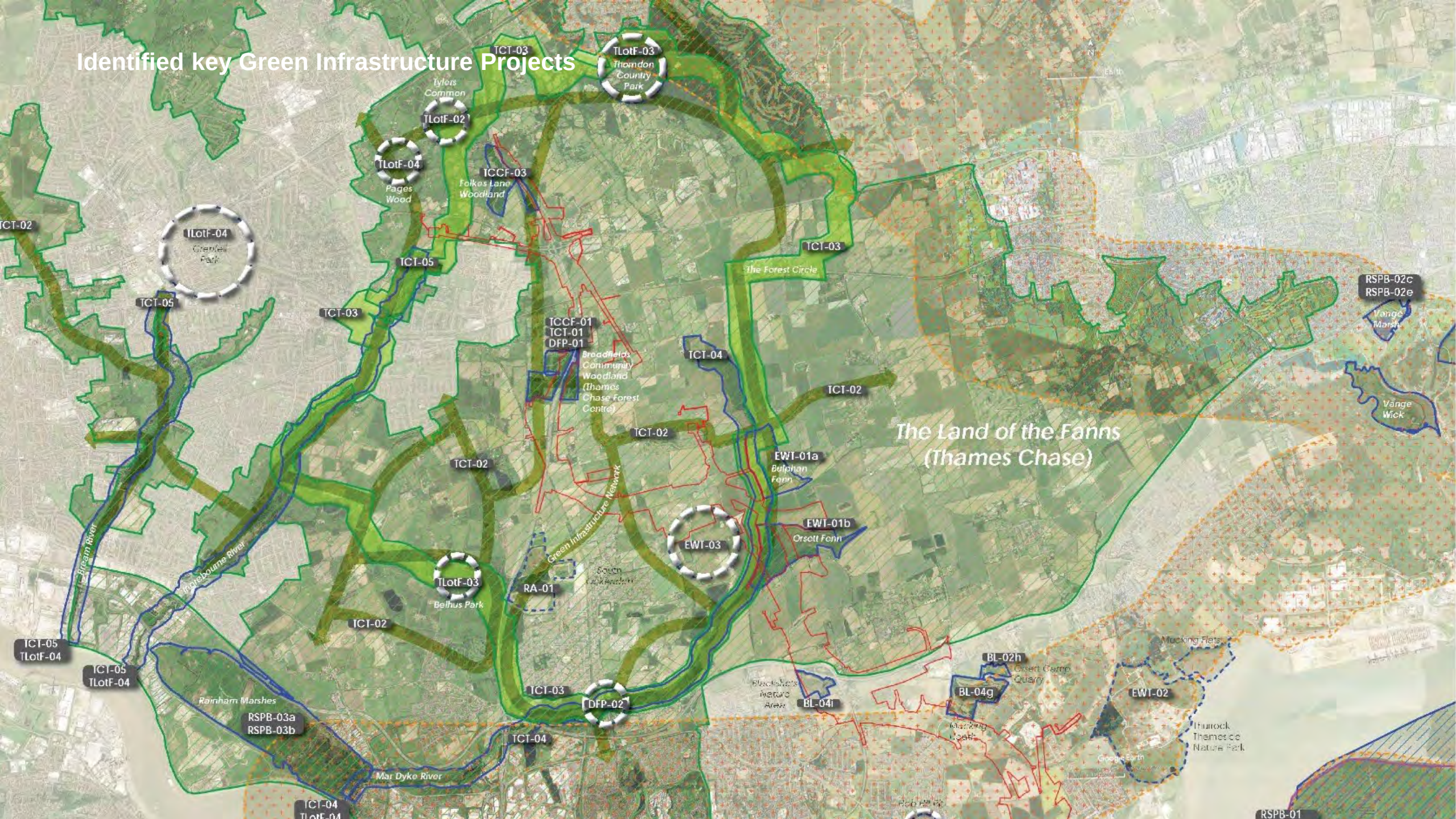
6.3 Mardyke Area

6.5 Mardyke open land

6.6 Mardyke open land

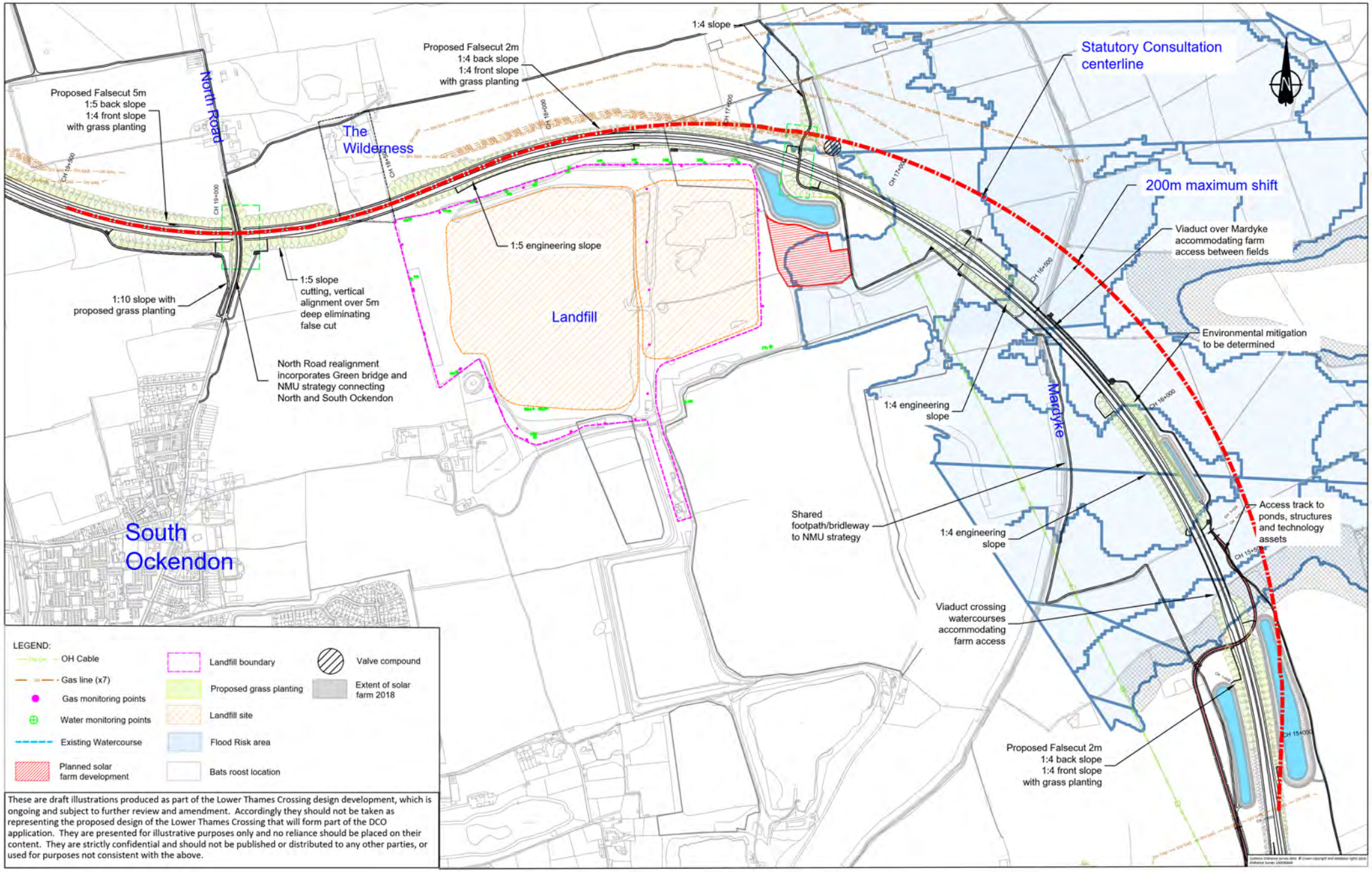


Identified key Green Infrastructure Projects



Ockendon Link Alignment

Changes between Statutory and Supplementary Consultation



Approach to Landscape

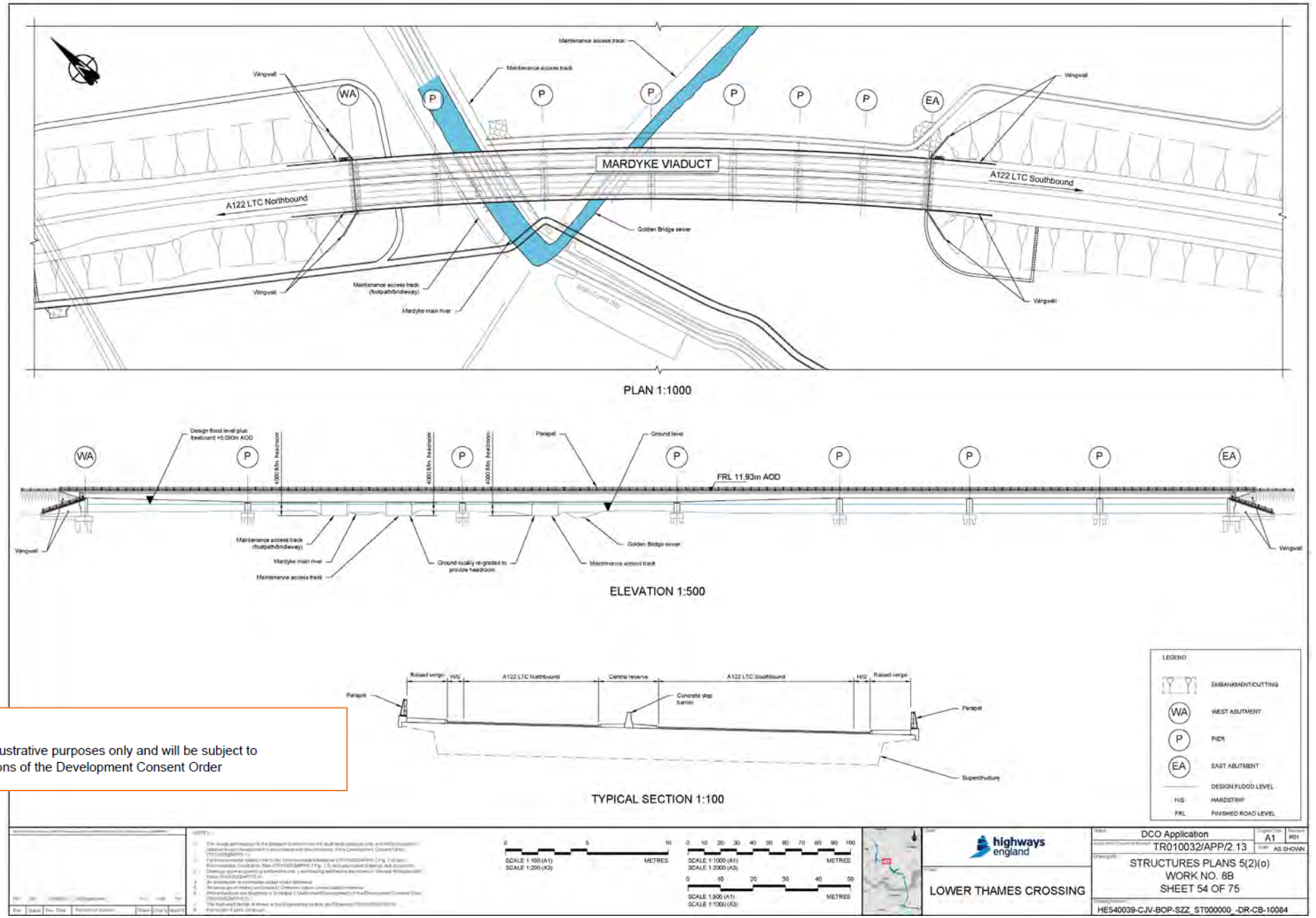
- Flood levels require LTC to be raised above ground level
- No “screening” earthworks can be provided in the flood zone
- New earthworks will create new skyline horizons and foreshorten views.
- landscape designed to strengthen historic fenland character to create a more visually engaging space in the foreground - lessening the impact of the road and engineered banks.
- Pockets of wooded wetland also break up the road alignment, provide ecologically valuable habitat and mask level changes

Wetland restoration “the great fen” - Cambridgeshire

Key

1. Mardyke Viaduct
2. Orsett Fen Viaduct
3. Wetland Creation area
4. Green Lane Green Bridge
5. Woodland blocks
6. New PRoW
7. Linear drainage basins

Baseline Design – Structures Plans



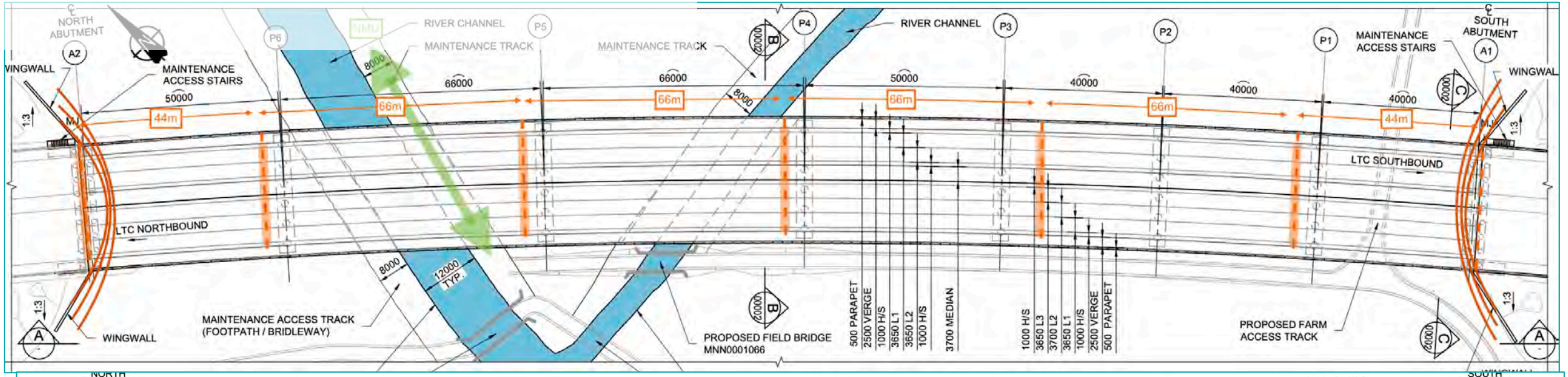
NOTES:

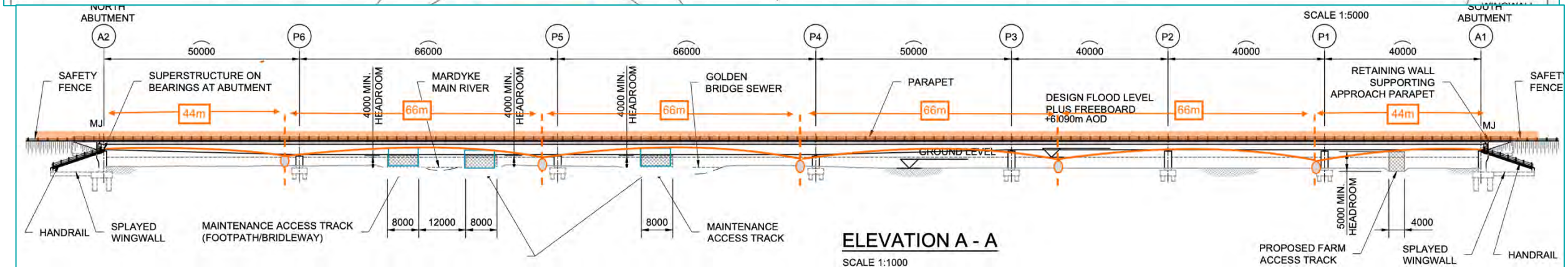
1. The design and location of the structure is shown here for illustrative purposes only and will be subject to detailed design development in accordance with the provisions of the Development Consent Order (TR010032/APP/3.1).

Baseline Design – Mardyke & Orsett Fen

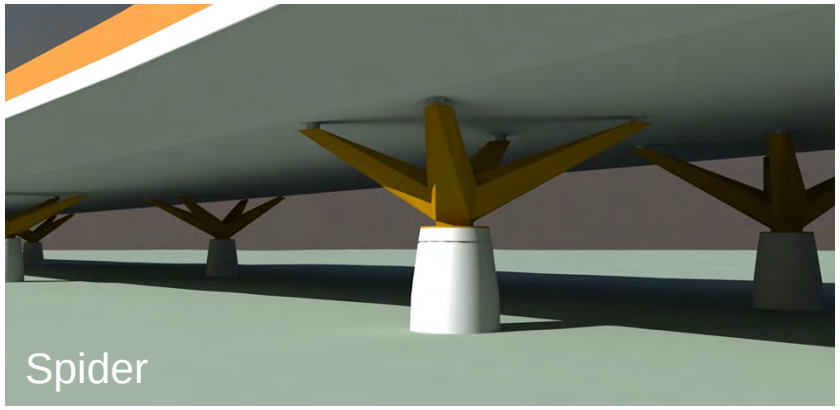
PROPOSED OPTION : 60m equal spans – 360m long viaduct

- One less pier and foundation arrangement
- Arched spans
- Gabion abutments
- No regraded lower ground in fenland etc
- Standard beam lengths

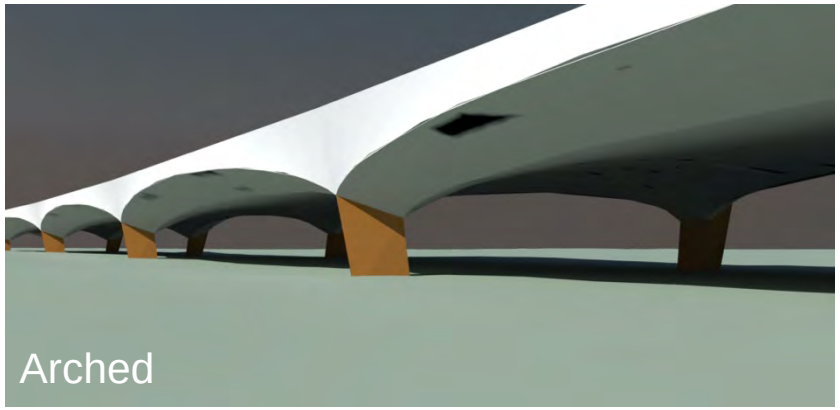




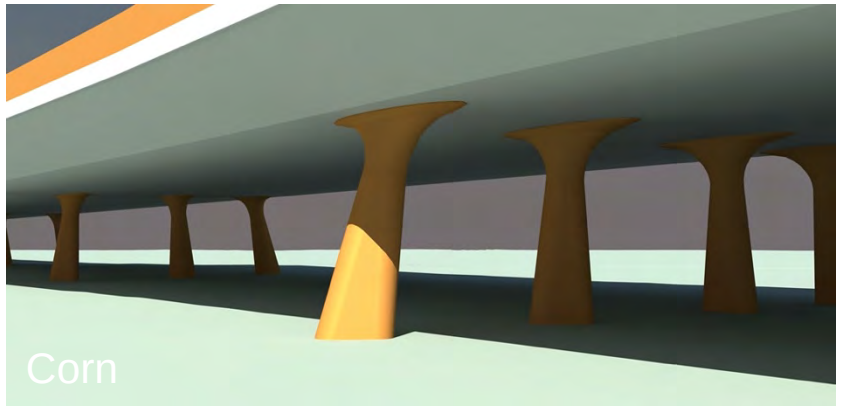
Pier & deck concepts developed which respond to feedback and design principles



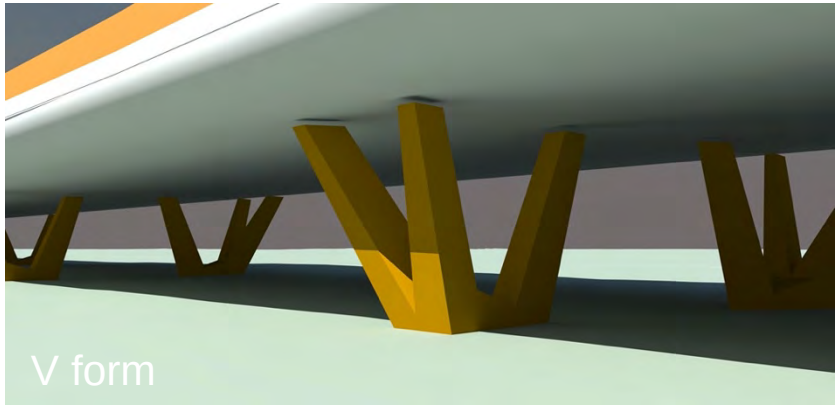
- Minimal visual impact at eye level
- Minimal footprint on fenland - reducing ground works
- Light touch deck



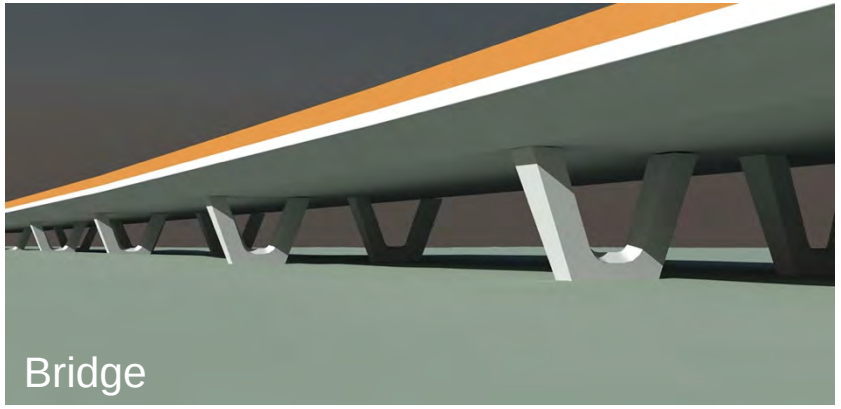
- Minimal visual impact at eye level
- Minimal footprint on fenland reducing ground works
- Longest spans



- Minimal visual impact at eye level
- Streamlined footprint on fenland
- Contextual farmland response



- Developed further following HEDP review
- Some commonality with architectural bridge piers
- Aims to reduce ground works



- Common form with architectural bridge piers
- Developed from engineer's solution for Tilbury
- Architectural refinement of an assumed approved solution

Materials

- DFMA opportunity to increase quality in detail and finish
- Material pallet to suit the project wide brand

Examples of design Issues still under discussion

- Further structures to be enhanced
- Design quality control measures
- Possibility of Design Codes being part of the DCO resubmission
- Further approvals
- Width and design of certain structures
- North Portal design and wider landscape integration
- Tilbury Viaduct design
- Open Space provision around the A13 Junction

Questions?