

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 1 of 20	

Rhuddlan Marsh Embankment

Proposed Works

NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works

Revision History

Edition	Description	Prepared		Checked		Approved	
		By	Date	By	Date	By	Date
B01.1	IDC Issue	MD	18/10/2023	DAO	18/10/2023	TJE	18/10/2023
B01	First Issue	MD	30/11/2023	DAO	30/11/2023	CFG	30/11/2023
B02	Updated design	JL	05/09/2024	DAO	05/09/2024	DAO	05/09/2024

Document: 23047W-FRM-G-001- B02

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 2 of 20	

Project Title	Rhuddlan Marsh Embankment		
Project Nr	-		
Remit / Technical Work Scope (TWS) Nr	-	Revision & date -	
Requirements documents reference Nr	-	Revision & date -	
CR-T reference Nr	-	Revision & date -	
Other design and check certificates associated with this submission	N/A		

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 3 of 20	

PART 1: DETAILS

1.1 Brief Description of Existing Conditions

An inspection (Undertaken by Crouch Waterfall on 29 June 2023) covered the condition of each staircase and outlined:

- Severe surface corrosion to the bottom flight of stairs, exposing existing steel reinforcement bars.
- Excessive expansion at movement joint between lower flight and intermediate landing.
- Exposed reinforcement bars at bottom risers causing trip hazard and risk of injury to users.

There is no historical significance to any of these staircases.

1.2 Proposed Works and Scope of Design

As set out in the Contracts Requirement Technical (CR-T) & Requirements documents, this combined submission relates to the Design of the following altered or new asset(s).

Asset No 1

Description	Staircase 1 – Millers Caravan		
Location	Rhuddlan Marsh Embankment, Sandbank Rd, Towyn, Abergele LL22 9LB		
Coordinates (OSGB36 Datum)	E: 296696, N: 379701 Latitude: 53.304147, Longitude: -3.5517002		
ELR	CNH3	Mileage	211m 79ch
Asset Nr	-	OS grid ref	SH 96696 79701
Permanent Works	-	Design Check Category	CAT I

Asset No 2

Description	Staircase 2 – Knightlys Fun Park		
Location	Rhuddlan Marsh Embankment, Sandbank Rd, Towyn, Abergele LL22 9LB		
Coordinates (OSGB36 Datum)	E: 297050, N: 379872 Latitude: 53.305753, Longitude: -3.5464455		
ELR	CNH3	Mileage	211m 55ch
Asset Nr	-	OS grid ref	SH 97050 79872
Permanent Works	-	Design Check Category	CAT I

NR/L2/CIV/003/Form G Issue 4, Sept 2024

PROJECT TITLE Rhuddlan Marsh Embankment

ELR and Mileage

CNH3 (211 miles 44ch)

NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works

Document reference 23047W-FRM-G-001

Revision

B02

Date 05/09/2024

Page 4 of 20

Asset No 3

Description	Staircase 3 – Golden Sands		
Location	Rhuddlan Marsh Embankment, Sandbank Rd, Towyn, Abergele LL22 9LB		
Coordinates (OSGB36 Datum)	E: 297486, N:380126 Latitude: 53.308120, Longitude: -3.5399871		
ELR	CNH3	Mileage	211m 32ch
Asset Nr	-	OS grid ref	SH 97486 80126
Permanent Works	-	Design Check Category	CAT I



Figure 1 – Location plan of the Staircases (sourced from Google Maps)

Scope of Works

The scope of works covered by this Form G design submission comprises the removal of the existing staircase units at all three Staircase locations and the replacement of them with like-for-like sections. The existing sub-structure is to be retained and new handrails installed.

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 5 of 20	

1.3 Construction Methodology

The proposed pre-cast units are to be constructed from C35 concrete to the exposure classification of XS3. The stringers to the pre-cast units are to be 250mm wide x 480mm tall, cast to a gradient of 18°, and contain 2 “L” shaped 10mm diameter reinforcement bars. A 55mm minimum cover must be provided to the upward orientated “L” shaped reinforcement bar whilst a 75mm minimum cover must be provided to the downward orientated “L” shaped reinforcement bar. The projection of the bars into the step casting should be long enough so that it can be tied to two longitudinal bars of the A393 mesh. Both reinforcement bars must have a cover of 55mm minimum from the external faces of the stringer.

The step must contain two layers of A393 reinforcement mesh with a cover 55mm minimum from the bottom of the casting and to the front and rear faces. The step is to be 1900mm wide x 600 deep, to give an overall width of 2400mm for the entire unit.

One line of longitudinal bars is to be cast into the stringer at 200mm centres with a minimum cover of 150mm from the external face of the stringer. These bars must be 16mm diameter and have a length of 300mm, 150mm embedment into both the existing concrete plinth and the staircase units.

1.4 Temporary Works

For any temporary works undertaken, the following is to be considered:

- Lift platform/Crane pad
- Suitable temporary access (*if required*)

Contractor to design any temporary works as required. The contractor is to provide all necessary work package plans and risk assessments to the Network Rail engineer for approval prior to undertaking any works.

1.5 Design Criteria and design Statement

1.5.1 General

This Form G submission covers the proposal to deconstruct the existing reinforced concrete staircase and install a like-for-like solution to maintain access to the shoreline.

3no staircases are situated across the shoreline, Northside of the Holyhead-Chester rail line adjacent the Towyn caravan park, in Towyn, North Wales. The staircases provide direct access to the shorefront.

The first staircase is located adjacent to Millers Caravan Park (Staircase 1). Approx 390m north east from Staircase 1 the central staircase (Staircase 2) is located adjacent Knightly's Fun Park, with the final staircase another 500m north east which is adjacent to Golden Sands holiday park (Staircase 3)(*Figure 1*).

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 6 of 20	

Once the staircase units are placed on the concrete plinth, a Key Klamp handrail can be installed and complete to installation of the proposed staircase. Fixings to be confirmed at AFC stage.

1.5.2 Geotechnical Design and consideration

No location specific ground investigation information is available.

From NR/L3/CIV/020 Issue 1:

“Normally, the existing substructures would be considered adequate for retention without the need for modification or for structural/geotechnical analysis where all the following conditions are satisfied:

- 1. The existing substructure is in a satisfactory condition, and shows no signs of significant distress or undue settlement.*
- 2. The effects of permanent loading on the existing substructure and soils will not be significantly increased as a result of the new construction.*
- 3. The effects of transient loading on the existing substructure and soils will not be significantly increased as a result of the new construction.*
- 4. The stability of the existing substructure against overturning and sliding will not be compromised by the new construction.*
- 5. There are no particular geotechnical considerations that give cause for concern.”*

For this structure:

1. The existing substructure appears suitable, though condition of the concrete is to be confirmed following removal of the existing units.
2. It is envisaged that the additional permanent loading will not significantly increase as a result of the new construction.
3. As the structure is maintaining the same functionality as previous, the effects of transient loading is not deemed to be significantly increased.
4. The load application and magnitude will be as per the existing arrangement therefore, stability is assumed to be satisfied.
5. It should be considered that construction is taking place along the shoreline. Therefore, it is essential that the works are carefully planned to accommodate this and are carried out at times of low tide, to prevent any disturbances.

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 7 of 20	

1.5.3 Design Criteria

Design Life

Unless otherwise agreed with Network Rail, the design working life for the works covered within this submission shall be as follows:

- 120 years for a new structure
- 60 years for additional structural elements.
- Unaltered superstructure elements: remaining residual design life.

Operational requirements

Vertical Clearances

Not applicable.

Horizontal Clearances

Not applicable.

Loading requirements

Live load of 5kN/m² in accordance with BS EN 1991-1-1:2002.

Dead Loading

Density of 78.5 kN/m³ assumed for the steelwork.

Density of 25 kN/m³ assumed for reinforced concrete.

Fire resistance and escape times

Not applicable.

Diversity and Inclusion requirements arising from a DIA

Not applicable.

Station pedestrian capacity assessment

Not applicable.

Environmental requirements

All proprietary materials used are designed in accordance with the relevant British Standards, Euro Standards etc. and are approved for use on Network Rail infrastructure.

Fire strategy

Not applicable.

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 8 of 20	

1.6 Standards used in the Design

1.6.1 Date of standards freeze

July 2023.

1.6.2 List of Design standards

1.6.2.1 Eurocodes

Reference	Title
BS EN 1990: 2002	Basis of Structural Design
BS EN 1991-1-1:2002	Densities, self-weight and imposed loads
BS EN 1992-1-1: 2004	Design of concrete structures. General rules and rules for buildings.

1.6.2.2 Eurocodes - Supplementary documents

Reference	Title
-	-

1.6.2.3 Supplementary Info - British Standards

Reference	Title
BS 8539:2012+A1:2021	Code of practice for the selection and installation of post-installed anchors in concrete and masonry.

1.6.2.4 Bridges and Structures, Standards (BD Series)

Reference	Title
-	-

1.6.2.5 Interim Advice Notes

Reference	Title
-	-

1.6.2.6 Other Relevant Documents:

Reference	Title
BS 476	Fire tests on building materials and structures

1.6.2.7 Current Versions of Building Regulations:

Approved Document	Subject	Comments
-	-	-

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 9 of 20	

1.6.2.8 Other Applicable Standards and Publications:

Publisher	Title or Criteria
Health and Safety Executive	HSG 153/2 - Railway Safety Principles and Guidance Part 2A – Guidance on the Infrastructure
Health and Safety Executive	The Work at Height Regulations 2005 (WAHR)
Health and Safety Executive	The Health and Safety at Work Act (1974)
Health and Safety Executive	The Construction (Design and Management) Regulations (2015)

1.6.2.9 Railway Group Standards:

Reference	Title
GE/RT 8073	Requirements for Applications of Standard Vehicle Gauges

1.6.2.10 Network Rail Standards:

Reference	Title
NR/CAT/STP/001 Issue 111	Catalogue of Network Rail Standards
NR/CS/CIV/044 Issue 1	Managing Structures Work
NR/GN/ENV/004 Issue 1	Waste Management Manual
NR/L1/CIV/032	The Management of Structures
NR/L1/FIR/100 Issue 6	Fire Safety Policy
NR/L2/AMG/1030 Issue 1	Working Safely in the Vicinity of Buried Services
NR/L2/AMG/1040 Issue 1	Buried Services Data Feedback
NR/L2/CIV/003 Issue 5	Engineering and Architectural Assurance of Building and Civil Engineering Works
NR/L2/CIV/003/F1990 Issue 3	Technical Design Requirements for BS EN 1990: Eurocode Basis of Structural Design
NR/L2/CIV/003/F1991 Issue 3	Technical Design Requirements for BS EN 1991: Eurocode 1 Actions on Structures
NR/L2/CIV/003/F1992 Issue 3	Technical Design Requirements for BS EN 1992: Eurocode 2 Design of Concrete Structures
NR/L2/CIV/003/F1997 Issue 3	Technical Design Requirements for BS EN 1997: Eurocode 7 – Geotechnical Design
NR/L2/CIV/177 Issue 1	Monitoring track over or adjacent to building and civil engineering works
NR/L2/ENV/015 Issue 8	Environment and Social Minimum Requirements for Projects – Design and Construction

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 10 of 20	

NR/L2/INI/02009 Issue 1	Engineering Management of Projects- Module 01 - Roles, Responsibilities and Accountabilities
NR/L2/OHS/0047 Issue 6	Application of the Construction, Design & Management Regulations
NR/L2/OHS/019 /01 Issue 1	Safety of People at work on or near the line – Module 01 Planning and working during incident response
NR/L2/OHS/019 /02 Issue 1	Safety of People at work on or near the line – Module 02 Planning and working in a possession
NR/L2/OHS/019 /03 Issue 1	Safety of People at work on or near the line – Module 03 Planning and working using protection arrangements
NR/L2/OHS/019 /04 Issue 1	Safety of People at work on or near the line – Module 04 Planning and working using warning arrangements
NR/L3/CIV/151 Issue 6	Engineering Assurance of Standard Designs and Details for Building and Civil Engineering Works
NR/L3/INI/CP0044 Issue 5	Planning and managing construction work,
RT/ENGP/06 Issue 2	Buildings, Stations and Depots Engineering Policy
NR/L3/CIV/040 Issue 1	Specification for the Use of Protective Coatings and Systems
NR/L3/CIV/071 Issue 4	Geotechnical Design

1.6.2.11 Network Rail Model Clauses

NR/L3/CIV/140/....	Title	Applies
10	General	✓
80	Structural Concrete	✓

1.6.3 Standard designs and details

Not applicable.

1.7 Variations to standards (with justification)

Not applicable.

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 11 of 20	

1.8 Other relevant information

Details of existing parts/elements of structures/services to be retained and incorporated into the Design.

The concrete plinth, supporting the existing Staircases are to be retained for the proposed units. The plinth will be braced with the proposed staircase via 16mm diameter dowel bars, drilled into the concrete surface.

Unusual features

No unusual features within the structure.

Novel or unusual use of materials and/or structural components

Not applicable.

Details of capacity assessments (for example, pedestrian modelling)

Not applicable.

Designers' Risk Assessments

Refer to Appendix B for the Designer's Risk Assessment.

IDC

Refer to Appendix C.

Indicative description of the construction sequence

- Locate lifting equipment in a safe and agreed positions as necessary.
- Disconnect corroded steel balustrades from existing concrete staircase.
- Detach the existing staircase units from concrete plinths.
- Remove existing concrete units and dispose.
- Check suitability of existing sub-strata (existing concrete plinth).
- Drill dowel bars into existing concrete plinth, ready for installation of new staircase.
- Lift new staircase units into position onto existing plinth, using dowel bars as guidance.
- Provide polyurethane sealant at joint between new staircase and existing plinth. Allow time to set.
- Install new steel balustrades onto new staircase.

Indicative sequence repeated for Staircases 1, 2 and 3.

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 12 of 20	

Specification of workmanship and materials

All materials used for the works are to comply with the following Network Rail documents:

- Model Specification for Civil Engineering Works ref. NR/L2/CIV/140 Issue 12.
- Relevant model clauses referred to in Model Clauses for Civil Engineering Works ref. NR/L2/CIV/140 Issue 12.

Materials which are considered as required are as follows:

- Concrete C35.
- Mesh reinforcement.

1.9 Requirements for operation, inspection, maintenance, repair, renewal or removal including special access arrangements.

Any inspection and maintenance works required can be undertaken outside of line blocks / ROR possessions, though tidal conditions must be considered.

1.10 Detailed Design Drawings and Models

- 23047W-DRG-000- Specification and notes
- 23047W-DRG-003- Existing General Arrangement Plan Millers Caravan Park
- 23047W-DRG-004- Existing General Arrangement Plan Knightly's Fun Park
- 23047W-DRG-005- Existing General Arrangement Plan Golden Sands
- 23047W-DRG-006- Existing General Arrangement Plan Proposed Details

1.11 Accompanying drawings and other documents

- 23047W-RAR-001-B02 – Designers Risk Assessment
- IDC Certificate

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 13 of 20	

1.12 Matters that have been considered in the Design.

The matters that do not apply to the Works to meet the particular CR-T and Requirements documents are to be struck out by the approved CRE appointed for the Design phase

1. So far as is reasonably practicable, the Asset affected will be safe in use when used in accordance with its intended purpose.
2. Hazards are managed in accordance with requirements of the CDM Regulations and CSM regulations. Residual risks are documented in a Risk Register. Risks to both (a) health and safety during construction, maintenance, use, railway operations and (b) occupational health and safety, are as low as reasonably practicable or better.
3. The provisions for examination, maintenance and eventual renewal/removal are satisfactory.
4. The overall Design concept and the appearance of the infrastructure are appropriate for their purpose, location and site conditions.
5. Where the proposal includes the strengthening, partial renewal or removal of structures, the stability of the whole structure and all its parts/elements at all stages of the Works are addressed, including the long-term adequacy of the remaining parts/elements of the structure and supporting soil.
6. The effects of the proposals on existing infrastructure are adequately considered.
7. Arrangements for liaison and consultation with external bodies (such as Local Authorities, statutory undertakers, the British Transport Police, the Environmental Regulators and landowners) are satisfactory and the likely effects of the proposals on external organisations are addressed. Required Permissions/Approvals have been obtained to support the proposals.
8. The impact of the proposals on services and service routes is adequately investigated and appropriate mitigation measures have been agreed with the appropriate Authority and incorporated into the Design.
9. The effects on other rail engineering disciplines including track, gauging, signalling (including signal sighting), telecommunications, electrification, lighting, and other operational electrical and mechanical equipment have been satisfactorily considered and no interfaces have been identified which would negate the use of this Form G to NR/L2/CIV/003 clause 12.2.
- ~~10. Mining related risks have been assessed in the development of the proposed design and are considered to be acceptable, in accordance with NR/L2/CIV/191/MOD05.~~

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 14 of 20	

11. The requirements/recommendations of Railway Group Standards and RIS, Network Rail standards and Department for Transport Design Standards for Accessible Railway Stations have been addressed and proposed variations from these standards are identified and justified.
- ~~12. The requirements of the Building Regulations are met and any planning conditions are met.~~
13. The proposed Design loadings are appropriate, and any non-standard accidental loadings are correctly identified.
14. The requirements of **NR/L2/CIV/003/F1990** to **NR/L2/CIV/003/F1994** and **NR/L2/CIV/003/F1997** have been considered and the selected options/choice recorded in this design.
15. The proposed Design standards and methods of Design are suitable.
16. The GIR/GDR information presented in or referred to in this combined design submission Form G is appropriate for the detailed design and assumptions have been verified or measures for verification of assumptions have been incorporated in the detailed design.
- ~~17. A Geotechnical Design Report, which meets the requirements of BS EN 1997 and NR/L3/CIV/071 is available. This Report justifies the selection of the Geotechnical Design parameters and outlines any further work required for implementation.~~
- ~~18. A plan of geotechnical related construction supervision and monitoring (including details of items to be checked during construction or requiring maintenance or monitoring) have been incorporated in the detailed design and meet the requirements of BS EN 1997.~~
- ~~19. The Design complies with structure clearance and platform stepping distance requirements.~~
20. Important Design matters not covered by standards are identified.
21. The proposals are economical and sustainable.
22. The proposed works will not compromise the structural robustness of any existing structures.
23. The proposals have considered requirements for environmental and sustainable development. The design has adequately considered the results and actions required from the Environmental and Social Appraisal and the Environmental and Social Management Plan, where required by **NR/L2/ENV/015**.
24. The selection of post-installed anchors in concrete and masonry meets the requirements of BS 8539.

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 15 of 20	

25. All materials specified in the design of structures are compatible with the intended application and environment. This includes, but is not limited to:
 - fixing metallic structures to masonry with studs bonded with resin, grout or other chemical bonding products.
 - fixing design is to current standards and guidance.
 - design and installation comply with manufacturer's requirements, are compatible with substrate and includes appropriate verification testing.
 - building fabric design and associated fixings are appropriate for the security risk and associated requirements.
 - suitable and sufficient investigation, as far as reasonably practical, has been carried out to determine that materials to be used will be compatible.
 - Coatings are in accordance with NR standards and suitable for design life required by NR/L2/CIV/003/F1990
26. Design calculations have been completed where applicable and checked in accordance with the Design Check Category.
27. The provision of this design on this FormG meets with the requirements of **NR/L2/CIV/003** clause 12.2.
28. A completed IDC certificate has been provided with this design to comply with NR/L2/RSE/02009 clause 15.3.
29. A Designer's Risk Assessment has been provided with this design.
30. The Permanent Works designer has outlined their proposed construction methodology and envisaged temporary works requirements in order to facilitate construction of the Permanent Works.
31. The Permanent Works designer has outlined their proposed construction methodology and envisaged temporary works requirements to comply with the Diversity Impact Assessment (DIA), e.g., provision of temporary structures such as accessible temporary footbridges.
32. The provision of new assets has taken account of the effects on existing assets, such as effects on cuttings, embankments, other structures or GSM-R.
- ~~33. The design has adequately considered pedestrian flow, fire risk, means of escape and security requirements.~~
34. A specification of workmanship and materials has been provided with the detailed design submission.
- ~~35. Where the requirements of NR/L2/CIV/074 require design for overhead line foundations to be given AiP to clause 12 of NR/L2/CIV/003, the detailed design accords~~

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 16 of 20	

36. The design has considered all effects on the existing fire strategy, where applicable, including temporary conditions, with proposals agreed with the NR fire specialist, where applicable.
37. Designer has utilised the contents of the Standard Designs and Details, e.g. the Standard Design Catalogue Index, NR/L3/CIV/151/01, utilised in accordance with NR/L3/CIV/151, and/or lineside standards NR/GN/OTK/5000 and NR/GN/OTK/5300

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 17 of 20	

PART 2: DESIGNER'S SUBMISSION

I confirm:

1. that the criteria specified in NR/L2/CIV/003 have been considered and:
 - (a) this combined design submission FormG, incorporating Approval in Principle Design, Statement of Design Intent and Design and Check certificate, is submitted on behalf of
Crouch Waterfall, The Barn, Elms Farm, Hobb Lane, Warrington, WA4 5LS
2. that reasonable professional skill and care have been used with the objective of checking that the Design:
 - (a) unless identified in 1.4, (i) the Design will comply with all relevant standards and will be delivered in accordance with the CR-T/Requirements documents and (ii) the deliverables identified within the CR-T/Requirements documents have been completed and submitted in support of this submission.
 - (b) complies with the design standards, codes and methods stated in **PART 1**.
 - (c) is accurately described by the drawings, models, schedules, performance, materials and workmanship specifications, list of matters that have been considered in the design and other documents in **PART 1**, that have been prepared for issue as Approved for Construction (AFC) pending the completion of **PART 5**, **PART 5A** and **PART 6** of this form
 - (d) incorporates any feedback from Network Rail on any pre-submission design development work

Signed	 	Title Associate
Name (print) Dave O'Riordan	Date 05/09/2024	
To be signed by the Contractor's Responsible Engineer.		

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 18 of 20	

PART 3: CHECK

I certify that reasonable professional skill and care have been used in checking the Design identified in **PART 1** of this submission, with the objective of checking that the Design

- (a) complies with the Design standards, codes and methods and other requirements stated in **PART 1** of this submission.
- (c) was checked as stated in **PART 1** and has been carried out with the level of independence specified in **NR/L2/CIV/003**

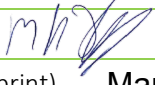
Signed	  Digitally signed by Dave O'Riordan DN: cn=Dave O'Riordan, c=GB, o=Crouch Waterfall, email=Dave.Oriordan@CrouchWaterfall.co.uk Reason: I have reviewed this document Location: Crouch Waterfall, Warrington Date: 2024.09.05 13:33:18 +0100	Title Associate
Name (print) Dave O'Riordan	Date 05/09/2024	
To be signed by the Checker		

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 19 of 20	

PART 4: CONSTRUCTION ORGANISATION'S ACKNOWLEDGEMENT OF COMBINED SUBMISSION BY A SUB-CONTRACT DESIGNER

The organisation named in **PART 2** is engaged as a sub-contractor to the organisation stated below. I acknowledge this combined submission to Network Rail in support of our contract obligation for the provision of this design on behalf of *MPH Construction, Queens Lane, Bromfield House, Bromfield Industrial Estate, Mold, Flintshire, CH7 1XB.*

I confirm that, unless stated in **PART 2**, the submission complies with the CR-T.

Signed 	Title CRE Construction
Name (print) Mark Shone	Date 10/10/2024
To be signed by the Contractor's Responsible Engineer appointed for the Construction phase	

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 20 of 20	

PART 5: PROJECT ENGINEER'S COMMENTS AND ACCEPTANCE ON BEHALF OF NETWORK RAIL

I have considered the combined design submission and confirm that the information specified in **NR/L2/CIV/003** and the CR-T/Requirements document is included in this submission. My comments on the submission are in the associated closed out DRN.

I have reviewed the combined submission and confirm that, unless stated in **PART 1**, it complies with the Asset Manager's requirements for this project as set out in the Requirements documents and CR-T.

I accept that, so far as can reasonably be ascertained from the information submitted, the relevant procedures for the Design and Design Check as specified in **NR/L2/CIV/003** have been followed properly.

I have considered the Design Check statement provided in accordance with 12.2 of **NR/L2/CIV/003** and confirm that the stated method of checking was suitable and that all criteria for the use of this FormG have been satisfied.

I confirm that the Design has been checked in accordance with **NR/L2/CIV/003** with the design check categories agreed with the DPE as listed in Part 1;

Signed	Title
Name (print)	Date
To be signed by the Project Engineer (Building and Civil Engineering)	

Signed	Title
Name (print)	Date
To be signed by other responsible person (<i>if applicable</i>) (Project Engineer (Building Services) for example)	

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 21 of 20	

PART 5A: SUPPLEMENTARY NETWORK RAIL REVIEWER ENDORSEMENT

Security, Emergency and Contingency Review

My comments on the submission are given below. Provided that these comments are addressed, I hereby endorse this combined design submission FormG submission of the above proposals regarding the security arrangements of railway infrastructure.

Signed	Title
Name (print)	Date
To be signed by the competent security role holder assigned to the project	

Station Pedestrian Capacity and Evacuation Review

My comments on the combined submission are given below. Provided that these comments are addressed, I hereby endorse this combined design submission FormG of the above proposals regarding Station capacity and evacuation.

Signed	Title
Name (print)	Date
To be signed by the Network Rail Capacity Engineer	

Fire Safety Review

My comments on the combined submission are given below. Provided that these comments are addressed, I hereby endorse this combined design submission FormG of the above proposals regarding Fire Safety.

Signed	Title
Name (print)	Date
To be signed by the Network Rail Fire Engineer	

NR/L2/CIV/003/Form G Issue 4, Sept 2024			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23047W-FRM-G-001	Revision	B02
Date	05/09/2024	Page 22 of 20	

PART 6: ASSET MANAGER'S APPROVAL

I have considered the combined submission and confirm that the proposed—deviations to the Requirements documents / ~~CR-T~~ are acceptable subject to any comments listed below being addressed prior to proceeding to Approved for Construction (AFC) Design as defined in NR/L2/RSE/02009.

I have considered the combined design submission FormG and confirm that this is approved subject to the comments given below being addressed prior to proceeding to Approved for Construction (AFC) Design as defined in NR/L2/RSE/02009.

Signed	Title
Name (Print)	Date
To be signed by the Asset Manager (Structures)	

Signed	Title
Name (Print)	Date
To be signed by the Asset Manager (Geotechnical)	

Signed	Title
Name (Print)	Date
To be signed by the Asset Manager (Drainage)	

Signed	Title
Name (Print)	Date
To be signed by the Asset Manager (Buildings)	

NR/L2/CIV/003/FormG Issue 1, Dec 2021			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23126W-FRM-G-001	Revision	B01
Date	30/11/2023		

Appendix A – Drawings

NR/L2/CIV/003/FormG Issue 1, Dec 2021			
PROJECT TITLE	Rhuddlan Marsh Embankment	ELR and Mileage	CNH3 (211 miles 44ch)
NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works			
Document reference	23126W-FRM-G-001	Revision	B01
Date	30/11/2023		

Appendix B – Designer's Risk Assessment

NR/L2/CIV/003/FormG Issue 1, Dec 2021

PROJECT TITLE Rhuddlan Marsh Embankment

ELR and Mileage

CNH3 (211 miles 44ch)

NR/L2/CIV/003/FormG: Combined Certificate of Approval in Principle, Design and Check for Design Check Category I Permanent works

Document reference 23126W-FRM-G-001

Revision

B01

Date 30/11/2023

Appendix C – IDC Certificate