



8302 Elevated Composite Boardwalk

REVISION 7/08/2025

8302.1 Introduction

This Supplementary Specification refers to the design, supply and installation, or where specified, the installation only of elevated composite boardwalk and viewing platform components to the Disability Discrimination Act (DDA)

8302.1.1 Definition of Terms The following terms apply specifically to this specification;

| Term | Definition |
|---|---|
| Construction and Installation procedure | For the purpose of this Specification to mean all works procedures and activities associated with procurement, supply, installation and construction of boardwalk components, including a pile installation plan/s and associated lift plans. |
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8302.2 Referenced Documents

Throughout this specification referenced documents shall be taken as being the current version. This supplementary specification shall be read in conjunction with the following:

- MRS01 “Introduction to Specifications”;
- MRTS01 “Introduction to Technical Specifications”;
- MRS03 & MRTS03 “Drainage Structures, Retaining Structures and Embankment Slope Protections”
- MRS04 & MRTS04 “General Earthworks”;
- MRS05 & MRTS05 “Unbound Pavements”



- MRS50 & MRTS50 *“Specific Quality System Requirements”*
- MRS70 & MRTS70 *“Concrete”*
- MRS63A & MRTS63A *“Piles for Ancillary Structures”*
- MRS68 & MRTS68 *“Dynamic Testing of Piles”*
- MRC Supplementary Specification *“8925 Foundations to Structures”*
- MRC Supplementary Specification Annexure *“8925_1 Foundations to Structures Annexure”*
- Australian Standard AS2700 *“Colour Standards for General Purposes”*
- *Professional Engineers Act 2002;*
- Building Code of Australia (Current Version)
- Australian Standard AS1428 (Series) – *“Design for Access and Mobility”*
- AS/NZS 1170.1 - Structural design actions - Permanent, imposed and other actions
- AS/NZS 1170.2 - Structural design actions - Wind actions
- AS 3959 - Construction of buildings in bushfire-prone areas
- AS 1530 (Series) - Methods for fire tests on building materials, components and structures
- ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials,
- ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position
- AustRoads - *“Guide to Road Design Pt 6A – Pedestrian & Cycle Paths”*
- Australian Standard AS1657:2018 for handrails/ guardrails
- AS2159 – Piling (Design and Installation)
- AS 4586 - The Slip Resistance Classification in New Pedestrian Surface Materials.
- AS 4663 - Slip resistance measurement of existing pedestrian surfaces
- SA HB 198:2014 handbook – Guide to the specification and testing of slip resistance of pedestrian surfaces
- Queensland Building Regulation Form 15 *“Compliance certificate for building design or specification”*;
- Queensland Building Regulation Form 16 *“Inspection certificate”*;
- Queensland Department of Housing and Public Works *“Guidelines for the assessment of competent persons”*;
- MRC *“D20 Drawings and Documentation Guidelines”*;
- Geotechnical Report prepared for the project design and construction;
- The design report prepared for the proposed installation; and
- The project Drawings and specifications

8302.3 Description of Work

Work items incorporated by this supplementary specification are identified in Section 8302.6 and 8302.7 with individual activities/tasks for measurement and payment sourced from the Bill of Quantities and listed in MRC Supplementary Specification Annexure 8302_1.

8302.4 Quality Systems Requirements

The Contractor shall produce and maintain a quality system compliant with MRTS50 - as a bare minimum



to address the requirements of Clause 8302.4 of this Specification. The quality plan shall be submitted to the Superintendent for approval minimum 4 weeks prior to works commencing.

MILESTONE

8302.4.1 Standard Test Methods (Testing Regime)

The following minimum testing regime applies to this specification:

Unless otherwise stated the manufacturer and supplier certification of the composite boardwalk materials and the Engineering Certification (RPEQ signatory) of the design shall form the basis of the requirements for design compliance.

At completion of works all decking surfaces shall be tested for slip resistance in accordance with;

- AS 4586 - The Slip Resistance Classification in New Pedestrian Surface Materials.
- AS 4663 - Slip Resistance Measurement of Existing Pedestrian Surfaces
- SA HB 198:2014 Handbook – Guide to the Specification and Testing of Slip Resistance of Pedestrian Surfaces

As required, all driven piles shall be tested in accordance with AS2159 – Piling (Design and Installation) in the presence of the Geotechnical Engineer as detailed in the geotechnical report, design drawings and documentation.

Bored piles shall have the following testing carried out;

- Integrity testing in accordance with AS2159 & MRTS63A.
- Pile dynamic load testing in accordance with AS2159 & MRTS68.
- Static load testing in accordance with AS2159;
- Concrete works in accordance with MRTS 70;

The completed boardwalk or viewing platform structure installation shall be certified for compliance with the design parameters in accordance with:

- AS/NZS 1170.1 – Structural design actions – Permanent, imposed and other actions
- AS/NZS 1170.2 – Structural design actions – Wind actions

Civil works activities associated with the installation shall be tested as per the relevant MRTS specifications MRTS03, MRTS04, MRTS05, and MRTS70 unless otherwise approved by the Superintendent.

All constructed components shall be surveyed as they are constructed to ensure compliance with the required tolerances of the Design Drawings and Manufacturer.

8302.4.2 Hold Points, Witness Points and Milestones

The following table represents the minimum inspection requirements for this specification;

| Activity | Inspection Type | When | Reference |
|---|-----------------|---|-----------------|
| Program of Works and other required documents as per 8302.5 | Milestone | 4 Weeks prior to works commencing | 8302.5 |
| Contractors' personnel | Hold Point | After initial submission, 10 days prior to specific works activities commencing | 8302.5.3 |
| Boardwalk Design | | | 8302.5.2 |



| Activity | Inspection Type | When | Reference |
|---|--------------------------------|---|--------------------------|
| Pre-design scope requirements | Hold Point | Prior to designer commencing design works | |
| Submission of preliminary design | Hold Point | Prior to approval for Certification of design | |
| Submission of certified design and documentation | Hold Point | After preliminary review of design and documentation by Superintendent | |
| Supply and deliver (free on ground onsite) composite boardwalk materials | | | 8302.6.2.1 |
| Inspection of all components for damage and compliance to design drawings and documentation | Hold Point | At time of delivery during unloading and storing | |
| Supply and installation of boardwalk foundations, Type A [description], Provisional Quantity, if ordered | | | 8302.6.2.3 |
| Supply and installation of boardwalk foundations, Type B, [description], Provisional Quantity, if ordered | | | |
| Supply and installation of strip footing, [height]mm, [concrete class], Provisional Quantity, if ordered | | | 8302.6.2.4 |
| Supply and install of concrete cast in situ abutments, [size], [number of], [concrete class], to boardwalk, Provisional Quantity | | | 8302.6.2.5 |
| As required by MRC Supplementary Specification 8925 | Witness Points and Hold points | Carry out all work operations incorporated in this item | 8925.6 and 8925.7 |
| Cast in Place Piles for Non-Bridge Applications | | | 8302.6.2.6 |
| As required by Specification MRTS 63A | Witness Points and Hold points | Carry out all inspections and requirements of this Specification | |
| Bore hole location and boring rig set up | Hold Point | Prior to boring at each bore hole commencing | |
| Site Supervision of all boring activities | Hold Point | Verification and compliance of bored holes | |
| Bored hole compliance | Hold Point | Prior to proceeding with reinforcing installation and concrete pouring of piles | |



| Activity | Inspection Type | When | Reference |
|--|-----------------|---|-------------------|
| Disposal of excess excavated soil | Witness Point | During boring activities | |
| Compliance and Certification of Piles | Hold Point | Prior to proceeding with boardwalk construction | |
| Supply and installation of driven piles, [steel]/[concrete], [nominal size or diameter], [length per each], [reinforcement to precast concrete piles], Provisional Quantity, if ordered | | | 8302.6.2.7 |
| Inspection of piles at delivery | Hold Point | At time of delivery during unloading at site | |
| Site access works | Witness Point | Prior to equipment being mobilised to site and pile locations | |
| Inspection of pile driving platform/s for stability | Hold Point | Prior to pile driver being positioned into place | |
| Inspection of pile/s for damage within the driving rig and platform stability | Hold Point | Prior to commencement of pile driving | |
| Inspection of pile location prior to driving | Hold Point | Prior to driving to verify location as per plans | |
| Monitoring of pile driving | Witness Point | At commencement and during pile driving operations | |
| Survey and inspection of pile driving | Witness Point | During pile driving operations | |
| Check and inspect pile in place as per design drawings | Hold Point | At completion of each pile driving prior to the rig being moved | |
| Testing of in place pile (if required) | Hold Point | During and after each pile driving operation is complete | |
| Inspection of pile by Geotechnical Engineer | Hold Point | After pile driving operation and after rectification of any issues raised | |
| During pile driving operations enforce clear zone around pile, rig and hammer | Witness Point | Once rig is in place until pile has been driven and rig has been disassembled or moved. | |
| Monitoring of driven piles for movement | Witness Point | During ongoing pile driving operations | |
| Certification of installation of piles to design requirements | Hold Point | After all pile driving operations have been completed | |



| Activity | Inspection Type | When | Reference |
|---|--------------------------------|---|-----------------------|
| Pre-boring location inspected | Hold Point | Prior to boring commencing | |
| Supervision of boring activity and compliance of pilot holes | Hold Point | During boring operations | |
| Pilot holes are compliant and within tolerances | Hold Point | At the completion of boring each pilot hole | |
| Certification to geotechnical report of bored holes | Hold Point | At the completion of boring pilot holes | |
| Splicing carried out as per manufacturers requirements | Witness Point | During the splicing of each pile | |
| Curing of sealants and paints as per manufacturer or supplier's requirements | Hold Point | For joint or protrusion including any cut ends/surfaces | |
| Trimming method determined and agreed upon | Hold Point | Prior to trimming pile heads | |
| Final certification issued RPEQ Consultant and submitted by Contractor | Hold Point | Post installation for acceptance by Superintendent prior to demobilising pile driving rig. | |
| Supply and installation Installation of elevated composite boardwalk | | | 8302.6.2.3 |
| As required by relevant task items | Witness Points and Hold points | Carry out all work operations incorporated in items: 8302.02, 8302.03, 8302.04, 8302.05, 8302.06, 8302.07 (as required), 8302.08, and 8302.09 | 8302_1 Clause3 |
| Supply and installation of boardwalk, excluding foundations / piles / abutments | | | 8302.6.2.8 |
| Delivery of all boardwalk Components | Hold Point | When components are delivered to site | |
| Inspect footings/foundations for compliance to manufacturers specification | Hold Point | Prior to commencing installing boardwalk | |
| Installation of boardwalk componentry to manufacturers requirements | Witness Point | During installation operations | |
| Installation of balustrading, railings, kick boards to design drawings and manufacturers requirements | Witness Point | During installation operations | |



| Activity | Inspection Type | When | Reference |
|--|-----------------|--|---------------|
| Interface of boardwalk to pathway treatment | Witness Point | During boardwalk installation prior to completion of works | |
| Protection and curing with sealants and paints as per manufacturer or supplier's requirements | Hold Point | For joints or protrusion including any cut ends/surfaces that have been modified on site | |
| Installation of electrical as per design drawings (as required) | Hold Point | At completion of installation | |
| Installation of water reticulation services as per design drawings (as required) | Hold Point | At completion of installation | |
| Inspection of works by RPEQ Consultant and Council for installation verification to design drawings and manufacturers requirements | Witness Point | During installation and at completion | |
| Slip resistance testing of surfaces | Hold Point | At completion of installation of all decking and pedestrian surfaces | |
| POST CONSTRUCTION | | | 8302.7 |
| Submission of Certification and Form 16 including verifying documentation | Hold Point | Prior to request for "On Maintenance" inspection | 8302.7.1 |
| Submission of As Constructed Detail | Hold Point | At completion of works 4 weeks prior to requesting practical completion inspection. | 8302.7.2 |
| Inspection of boardwalk and associated structures | Hold Point | "On Maintenance" inspection | 8302.7.3 |
| Level 2 bridge inspection | Hold Point | Inspection no more than 8 weeks prior to end of "On Maintenance" period | 8302.7.4 |
| L2 bridge inspection report submission including defect rectification evidence | Hold Point | 4 weeks prior to the end of "On Maintenance" period | 8302.7.4 |



8302.4.3 Construction Tolerances

Unless otherwise approved by the Superintendent the following construction tolerances shall apply to this Specification;

- Drainage tolerances in accordance with MRTS03 Drainage Structures, Retaining Structures and Embankment Slope Protections;
- Earthworks tolerances in accordance with MRTS04 Earthworks General;
- Pavement tolerances in accordance with MRTS05 Unbound Pavement;
- Pile installation tolerances shall be in accordance with MRTS 63A;
- Installation tolerances as specified within the design drawings and documents;
- Manufacturers tolerances for the materials and structure type being constructed (provided it does not conflict with the Engineering certification).

Tolerances specific to the project are detailed on the design drawings and are included in Clause 2 of MRC Supplementary Specification Annexure 8302_1.

8302.5 Preliminary

Samples and certificates of compliance with the material requirements must be submitted for approval a minimum 4 weeks prior to ordering of materials. The council takes no responsibility for ordered materials which have not been approved for use.

MILESTONE

The Contractor is to submit or ensure the following documentation is in place 4 weeks prior to delivery or a prestart is conducted:

- Engineering and design report/s and certification,
- Construction and installation procedure,
- Quality Plan addressing requirements of 8302.4,
- Workplace Health and Safety Plan,
- Traffic Management Plan as required for the site,
- Contractor's personnel experience, qualification, skills and training (10 days prior to undertaking work on site),
- Material Safety and Technical Data sheets for nominated products and materials,
- Approval from State Assessment and Referral Agency (SARA) as required.

MILESTONE

Other requirements unique to the project will be listed in the MRC Supplementary Specification Annexure 8302_1 Elevated composite Boardwalk

MILESTONE

Any variation to materials or construction details from design drawings or manufacturers requirements must be approved by the Certifying Engineer and the Superintendent prior to any alternative works commencing. All costs associated with recertification shall be at the expense of the Contractor.

8302.5.1 Materials

8302.5.1.1 General

Supply of materials to site is the responsibility of the Contractor at their cost, where items are Principal



supplied the nominated storage site shall be obtained from MRC Supplementary Specification Annexure 8302_1 Elevated Composite Boardwalk Section 3 and shall be the point of supply.

Composite materials used for decking shall have a slip-resistant finish and be compliant with AS4586, 4663, and SA HB 198. All other materials used as decking/surfacing or interfaces shall also comply with these Australian Standards for slip resistance.

Modification of Composite materials shall be carried out as per manufacturers procedure/s and supplied Material Safety Data Sheet (MSDS). The Contractor shall be responsible for the work procedure of modifying the material/s including sealing of exposed/cut ends and holes.

Concrete, grout, sealants, membranes, and reinforcing steel shall comply with the relevant MRTS Specification, Australian Standard, or Manufacturers Specification.

Any materials delivered to site damaged or outside the manufacturer’s expiry date shall not be used and shall be returned to the manufacturer.

8302.5.1.2 Fire Resistance Requirements of Composite Materials

The design of the boardwalk shall consider its location and take into account Safety in Design for the materials proposed, the following shall apply;

- a) The design shall specify composite materials which when tested for Flame Spread and Smoke Development can be certified as Class “A” under ASTM E84, refer to the following table;

| | Class A | Class B | Class C |
|-----------------------|---------|---------|---------|
| Flame Spread Index | 0-25 | 26-75 | 76-200 |
| Smoke-developed Index | 0-450 | 0-450 | 0-450 |

The FRP material shall also be certified to comply with the HB (Horizontal burning) Classification of the burning rate or self-extinguishing behaviour requirements of ASTM D-635;

1. HB (Horizontal Burning) Classification:
 - Self-extinguishing: If the material does not burn to the 100 mm mark or extinguishes before reaching it.
 - Burning rate ≤ 40 mm/min: For specimens 3.0 to 13 mm thick.
 - Burning rate ≤ 75 mm/min: For specimens less than 3.0 mm thick.
 2. Non-Classified:
 - If the material burns faster than the above rates or burns to the 100 mm mark without extinguishing, it is not classified under HB and deemed non complying.
- b) Where the Fire Resistance Standard is required to be varied due to specific project location (bush fire hazard) or other project requirements the designer shall through the Safety in Design consider the site requirements for inclusion in the design drawings and Annexure 8302_1 Section 2.2. Typically this requirement where applies will require compliance with BAL 40 requirements in compliance with AS 3959 “Construction of buildings in bushfire-prone areas”.

The Contractor shall submit pre-construction certification of the FRP material/s 4 weeks prior to works commencing. Testing shall be carried out such that there is no impact on the timing of procuring the products. This is the contractors responsibility to ensure materials are certified prior to procurement and delivery.

MILESTONE

8302.5.1.3 Fire Resistance Requirements of Other Materials (Non FRP)



Fire resistance of other materials used in the assembly and construction of boardwalks shall be based on the period of structural adequacy (PSA) of the components/members, and shall be as specified in AS/NZS 2327, AS 4100 and AS/NZS 4600 and comply with NCC Volume 1 Specification C1 for all members, componentry, and fixings. It should be noted the period of structural adequacy shall match as a minimum the composite materials fire resistance requirements.

8302.5.1.4 Ultraviolet (UV) Protection of Composite Material Members

The aim is to prolong the useful life of the structure through limiting loss of mechanical properties, surface degradation, and fibre blooming from exposure to UV light. The composite members must be protected and unless specified otherwise in the Contract documents, the protective system must include the following at a minimum:

- a) A UV stabiliser added to the resin mix;
- b) A suitable pigment be added to the exterior layer; and
- c) Physical barrier comprising of paint or gel coat applied in accordance with the manufacturer's instructions.

Any additives to the resin system that influence processing or curing, such as fillers, promoters, accelerators, inhibitors, UV agents, fire retardants, and pigments must be compatible with the fibre and resin system.

The designer must specify the asset life in the design drawings and documents and require the manufacturer to submit their technical notes including manufacturing testing results to meet this requirement including inspection and maintenance regimes (reapplying protective coating systems) to be compliant with the designated asset life expectancy. It is expected the boardwalk components would have a minimum useful life of 100 years in compliance with AS5100.

All testing shall be carried out on the full range A, B, and C type UV light.

Four weeks prior to works commencing the manufacturer shall submit a compatible protective materials coating system for the proposed composite members based on the above requirement, this system shall detail material type/name and application process, any minimum thicknesses, curing times and processes, any testing of the applied layers to enable verification of its UV protection effectiveness, and any materials safety data requirements needed for their use. The submission shall also include future maintenance applications required and timing.

MILESTONE

8302.5.1.5 Handrails/Railings

All handrails and/or railings incorporated into the pedestrian bridge shall comply with the design drawings and documents and the requirements of Clauses 8302.5.1.3 and 8302.5.1.4, composite material shall comply with Clause 8302.5.1.2 as well.

All railings/handrails are required to comply with the Disability Discrimination Act (DDA) shall be colour contrasted to the surrounding deck and environment, refer to Planning Scheme Policy – Landscape and List of Furniture and Materials Clause 6.05, and Annexure 8302_1 Elevated Composite Boardwalk Section 5.1.

Unless stated elsewhere within the Design Drawings or Annexure 8302_1 the following colour shall apply, Dulux Australia Dark Blue Grey B53/ #4f6571 Hex Colour Code;

Australian Standard AS2700 B53 Dark Grey Blue / #4f6571 Hex Color Code



The hexadecimal color code #4f6571 is a medium dark shade of cyan-blue. In the RGB color model #4f6571 is comprised of 30.98% red, 39.61% green and 44.31% blue. In the HSL color space #4f6571 has a hue of 201° (degrees), 18% saturation and 38% lightness. This color has an approximate wavelength of 483.34 nm.



8302.5.2 Item 8302.01 - Boardwalk design

Work operations incorporated in this item will include:

a) Liaison with the Principal/Superintendent during the preliminary design;

At predesign stage the designer shall confirm any requirements from the Principal, such as, but not limited to;

- I. Alignment, design assumptions, DDA compliance, structural loading requirements, environmental considerations, colours, materials, and finishes. Any colours nominated as part of the project technical specifications shall be coded as per AS2700 "Colour Standards for General Purposes";
- II. Interface with pathways/bikeways – safe tapering of rail systems or pathway/bikeway;
- III. Structural loadings – wind/flood;
- IV. Use – Pedestrian only or a dual use shared structure (pedestrian and bicycle use);
- V. Supply of components (Pre-assembled, partially pre-assembled, kit form, full on-site assembly);
- VI. Environmental and structural requirements (geotechnical ground conditions, salt environment, site location and restrictions, maintenance vehicular use);
- VII. Legislative requirements;
- VIII. Ultraviolet light protection requirements and maintenance schedule for continual UV protection for maximum useful life;
- IX. Fire resistance requirement of the boardwalk and components;
- X. Safety in Design (Risk Matrix);
- XI. Lighting and electrical components (lighting poles and standards, conduits and wiring, attachment to structure, alterations to footings);
- XII. Railings and handrails, type and colour requirement/s;
- XIII. Connections to pathway approaches;
- XIV. Water reticulation (service and tap/s, attachment to structure);
- XV. Open space furniture (benches, tables, shelters).

HOLD POINT

b) Elevated composite boardwalk requirements

Engineered design of the structure/s, footings, abutments, piles and foundations shall be in accordance with the Principals requirements, all relevant Australian Standards, the project geotechnical report as required and the composite boardwalk manufacturer's specifications and requirements.

At completion of construction, inspection and maintenance of a structure will be an ongoing process through the life of the asset. Safe access locations for the inspection of the elevated boardwalk components and placement of maintenance equipment shall be incorporated into the design of the structure and shown on construction drawings. Safe access provision can include, but are not limited to, inspection landings, reinforced grass areas for heavy equipment, and safety harness connection points.

c) Submission of a preliminary documentation

The designer shall submit a preliminary set of drawings and technical specifications to the Superintendent for Principal review and approval prior to finalising the detailed design and RPEQ certification;

**HOLD POINT**

All detailed design plans and other relevant design deliverables shall be produced and formatted in accordance with MRC “D20 Drawing and Documentation Guidelines” with the inclusion of a Bill of Quantities;

d) Preparation, Certification and Submission of design deliverables

Upon review of the preliminary documentation by the Principal the designer shall prepare and obtain certification of project-specific technical specifications for inclusion with the design deliverables;

The designer shall also ensure preparation and then obtain certification of Form 15 for the structures design; and

Once certification of the design has been obtained the Designer shall Submit the certified Form 15, RPEQ certified drawings and any other relevant design deliverables/documentation to the Superintendent.

HOLD POINT**8302.5.3 Contractor’s Personnel**

The Contractor shall provide documented evidence for the Superintendent’s approval to demonstrate the experience, qualification, skills and training of proposed personnel, sub-contractors and suppliers a minimum 4 weeks prior to works commencing and then at least 10 working days prior to the relevant personnel, sub-contractors and suppliers undertaking works on the project as works are scheduled to commence.

HOLD POINT**8302.5.4 Handling and Storage of Material on Site**

All materials (including proprietary products) delivered to site must be stored in accordance with the manufacturer’s requirements and have distinct tags identifying each component, this includes any precast piles. The identification system and tagged components must compliment the design drawings identification for each component and location.

8302.5.5 General Workplace Health and Safety Requirements

As a condition of this document, it is required that the Contractor and its workers (including all sub-contractors etc., and their workers) engaged to perform a service or work on site must at all times ensure (so far as reasonably practicable) the health and safety of all persons who are, or may be, affected by work under this specification or the services provided.

8302.5.6 Legislative Compliance

Without limiting the Contractor’s other obligations, the Contractor must comply with all Acts, Regulations, Standards and Codes of Practice about work health and safety matters that are applicable to the scope of work undertaken or services being provided.

8302.5.7 Council Work Health Safety Contractor Requirements

As a minimum, the Contractor must ensure they and their workers (including all contractor’s sub-contractors etc.) comply with the following work health and safety requirements:

- Undertake Council contractor and site inductions prior to commencing work.
- Ensure all workers are competent, and provide proof of competencies, licenses, and training on request.
- Have an approved safe system of work (including risk assessment) for the tasks and ensure the work is completed according to this safe system of work.



- Provide adequate supervision for all high-risk construction tasks.
- All incidents and near misses are to be reported to their Council representative within 60 minutes.
- Participate in contractor pre-start meetings, safety interactions, site meetings and site inspections.
- Review information provided by Council such as site-specific hazards, risks and interaction issues and implement controls to, so far as reasonably practicable, eliminate, or if that is not possible, mitigate the risk.
- Supply safe plant and equipment with pre-start checks, maintenance/ service records and manufacturer's manual.
- For all hazardous chemicals, ensure current Safety Data Sheets (SDS) are available and that appropriate controls (including as required under SDS requirements) are implemented.

8302.5.8 Permits for Work

Where required and unless Council has already obtained approval the Contractor must ensure applicable permits for the various work activities are completed and approval issued by the statutory body for those works, all requirements for submission, completion, and obtaining permits shall be at the Contractors cost.

8302.5.9 Safe Systems of Work / Risk Assessment

The Contractor must prepare and submit a safe method of work (risk assessment) and relevant controls 4 weeks prior to commencement of work.

MILESTONE

The completed risk assessment is to be provided to MRC for review and approval prior to works commencing. Safe Work Method Statements (SWMS) are required for all high-risk construction activities and Job Safety Analysis (JSA) or similar risk assessments are required for other tasks. The risk assessment (whether SWMS, JSA or other) must be reviewed and signed by the workers prior to undertaking the work.

MILESTONE

The Contractor shall implement a Safety Management System (SMS) that includes sections addressing the project scope.

8302.6 Construction

This section lays out the works operations with more detail based on specific requirements of this supplementary specification. Some activities may appear to include items which are stated within other specifications, the purpose is to reinforce that requirement specific to this supplementary specification.

Specific construction requirements associated with these works is detailed in MRC Supplementary Specifications 8302_1 Elevated Composite Boardwalk Annexure Section 5

8302.6.1 Works Scope

The scope of works (including associated activities) covered under this specification is as follows:

- Item 8302.01 - Boardwalk design
- Item 8302.02 - Supply and deliver (free on ground onsite) composite boardwalk materials
- Item 8302.03 - Supply and installation | Installation of elevated composite boardwalk
- Item 8302.04 - Supply and installation of boardwalk foundations, Type A [description], Provisional Quantity, if ordered
- Item 8302.05 - Supply and installation of boardwalk foundations, Type B, [description],



Provisional Quantity, if ordered

- Item 8302.06 - Supply and installation of strip footing, [height]mm, [concrete class], Provisional Quantity, if ordered
- MRS63A – Items 70501 to 70516 Cast in Place Piles for Non-Bridge Applications
- Item 8302.07 - Supply and installation of driven piles, [steel]/[concrete], [nominal size or diameter], [length per each], [reinforcement to precast concrete piles], Provisional Quantity, if ordered
- Item 8302.08 - Supply and install of concrete cast in situ abutments, [size], [number of], [concrete class], to boardwalk, Provisional Quantity
- Item 8302.09 - Supply and installation of boardwalk, excluding foundations / piles / abutments
- Item 8302.10 - RPEQ certified construction of foundations / piles / footings and elevated composite boardwalk, including Form 12

8302.6.2 Work Operations

Work operations incorporated in this item are those included in Clause 2.1.5 of MRS01 “Introduction to Standard Specifications’ and the following work scope activities and associated sub activities;

8302.6.2.1 Item 8302.02 - Supply and deliver (free on ground onsite) composite boardwalk materials

Work operations incorporated in this item will include:

a) Supply, delivery and placement on ground of all composite boardwalk materials

Procurement of the composite boardwalk materials shall include all materials, including but not limited to; piles, posts, joists, bearers, decking, fixings, handrails, balustrades, protective coatings, sealants, specialized tools, and glues as required by the design plans to enable construction and installation of the structure/s.

Where kit form delivery of components is proposed the materials shall be prefabricated, numbered and/or tagged according to the design drawings, and delivered, unloaded, and stored as specified free to the nominated site.

During unloading and storage prior to use the Contractor shall ensure no components are damaged or stored incorrectly, it is the right of the Superintendent to reject materials that have been damaged or stored incorrectly as documented by the manufacturer's requirements.

The level of prefabrication of the components and delivery shall be nominated in the design plans. Pre-assembled or partial pre-assembled components will require greater site area for storage, it is preferred if this delivery method is used the Contractor arranges to lift into place these components the day of delivery. If for any reason lift in place cannot occur on the day proposed the Contractor shall be responsible for all costs associated with storage, installation occurring at another planned date including demurrage costs, and lifting (crane) hire costs.

The installation Contractor and Superintendent shall ensure at delivery time all components are inspected for damage prior to unloading and the correct components and quantities (according to the Bill of Quantities and delivery docket) are delivered and stored safely in a locked site compound as required by the manufacturer.

HOLD POINT

8302.6.2.2 Item 8302.03 - Supply and installation | Installation of elevated composite boardwalk

Work operations incorporated in this item will include:

- a) 8302.02 - Supply to Site
- b) 8302.04 – Supply and Install Foundations Type “A” (As Required)



- c) 8302.05 – Supply and Install Foundations Type "B" (As Required)
- d) 8302.06 – Supply and Install Strip Footings (As Required)
- e) 8302.07 – Supply and Install Piles (As Required)
- f) 8302.08 - Supply and Install Cast In situ concrete Abutments
- g) 8302.09 – Supply and Install Boardwalk

The requirements of 8302.10 – RPEQ Certification is also a requirement

The requirements and compliance of these individual activities listed apply to this Items work operations.

8302.6.2.3 Item 8302.04 Supply and installation of boardwalk foundations, Type A [description], Provisional Quantity, if ordered

Item 8302.05 Supply and installation of boardwalk foundations, Type B, [description], Provisional Quantity, if ordered

8302.6.2.4 Item 8302.06 Supply and installation of strip footing, [height]mm, [concrete class], Provisional Quantity, if ordered

8302.6.2.5 Item 8302.08 Supply and install of concrete cast in situ abutments, [size], [number of], [concrete class], to boardwalk, Provisional Quantity

Work operations incorporated in these items are detailed in MRC Supplementary Specification 8925. The type of foundation shall be as described in the design drawings and documents and further identified in 8302_1 Elevated Composite Boardwalk Annexure through the task number.

8302.6.2.6 Items 70501 to 70516 Cast in Place Piles for Non-Bridge Applications

Work operations incorporated in this item will include:

Work operations incorporated in these items are detailed in specification Piles for Ancillary Structures MRTS63A and MRS63A. The pile dimensions, location, and depth shall be as described in the design drawings and documents and further identified in 8302_1 Elevated Composite Boardwalk Annexure through the task number.

All works shall be carried out in accordance with and comply with MTR 63A unless otherwise directed by the Superintendent, this includes all required testing and inspections.

HOLD POINT

Boring of uncased holes shall only be at the approval of the Superintendent and only where the shaft walls are self-supporting materials and not contain groundwater seepage into the bored hole. The geotechnical report shall be used as the basis for this decision, the Contractor shall allow for contingency plans for lining of the bore holes by ensuring the availability of casings to continue boring works.

Where liners have been installed and it is proposed to remove the liner/casing the Contractor shall detail this in their Construction and Installation Procedure and at the approval of the Superintendent.

The following shall apply to the withdrawal of installed casing/liners;

- Temporary casing/liner withdrawal shall occur whilst the concrete still fluid and has a slump close to that while concreting ensuring no concrete is lifted.
- During withdrawal of the casing/liner a sufficient head of concrete shall be maintained to prevent the entry of ground water. Concrete shall be placed continuously as the casing is extracted until the desire head of concrete is obtained and can be maintained.

Prior to commencing boring activities at each location the set-up of the rig and any supporting jig shall be checked to ensure the location is as required by the design drawings and within the tolerances of the manufacturer's requirements.

**HOLD POINT**

Where boring is proposed and the geotechnical report and design documentation requires, the Contractor shall ensure the Geotechnical Engineer is on site supervising the activity and verifies all bored holes comply.

HOLD POINT

The Contractor shall ensure all bored holes are compliant and within tolerances for location, vertical angle (rake), diameter and depth of the bored hole according to the geotechnical report, design drawings and documents prior to setting up reinforcing and pouring concrete.

HOLD POINT

Inspection of all bored holes (preferably with a 360 degree camera with a light source lowered into the pilot hole) shall be carried out by the Geotechnical Engineer and Superintendent to certify all works have been carried out and are compliant with the geotechnical Report, design drawing and documentation. Approval to proceed shall only be granted on compliance to the design requirements.

HOLD POINT

Excess excavated materials shall be disposed of by the Contractor as required by their Environmental plan at their cost or utilised as per Superintendents instructions. Material stockpiled shall ensure that all Environmental ESC measures are in place and maintained.

WITNESS POINT

The pile installation plan shall be documented in the Contractors Construction and Installation Procedure and as a minimum comply with Clause 8.5 of MRTS 63A. Under no circumstances shall this be varied by the Contractor without the prior written approval of the Geotechnical Engineer.

Compliance and Certification of the pile/s shall be carried out by the Geotechnical Engineer in accordance with the requirements of MRTS 63A, with all reports, test results, survey requirements submitted to the Superintendent prior to approval to proceed with the construction of the boardwalk.

HOLD POINT

8302.6.2.7 Item 8302.07 Supply and installation of driven piles, [steel]/[concrete], [nominal size or diameter], [length per each], [reinforcement to precast concrete piles], Provisional Quantity, if ordered

Work operations incorporated in this item will include:

a) Manufacture, supply, transport, unloading and storage at site of piles;

All piles shall be in compliance with the design drawings and documentation. Procurement of piles may have a long lead time, the Contractor shall allow for this in their construction plan.

The piles shall be manufactured to the requirements of the design drawings and any relevant Australian Standard, and shall be of the materials specified, the structural requirements for each pile for the specific location, and in individual lengths as required for each pile site.

All manufactured piles shall carry certification from the manufacturer attached to the pile including pile reference to the design drawings pile numbering system, and in the delivery documentation, and shall form the basis of predelivery product acceptance on site. Supply, transporting, and unloading at site is the Contractors responsibility unless otherwise noted in the design drawings and documentation. Transporting and unloading, placing on ground/storage shall be carried out in accordance with the manufacturer's requirements. Supply, transporting, and unloading at site is the Contractors responsibility unless otherwise noted in the design drawings and documentation. Transporting and unloading, placing on ground/storage shall be carried out in accordance with the manufacturer's requirements.



The contractor shall ensure the designated storage site is of sufficient area to unload and store the piles and when stored are in planned order of pile driving such that transferring to pile site does not require moving of other piles in storage.

All delivered piles shall be inspected for damage prior to unloading and checked for type and quantity against the delivery docket, procurement order, and bill of quantities. Any items which are damaged or not manufactured as required by the design drawings are not to be used and are to be returned to the supplier.

HOLD POINT

If materials are Principal supplied the nominated storage site shall be obtained from MRC Supplementary Specification Annexure 8302_1 Elevated Composite Boardwalk Section 3 and shall be the point of supply.

b) Site Specific Safety Plan

The Contractor shall ensure a pile driving site specific safety plan is produced to compliment the general site workplace health and safety plan and is available on site to all staff, the Geotechnical Engineer and Superintendent at all times. The plan shall contain but not be limited to the following items;

- I. Site access for staff, materials, various plant, and driving rig
- II. Ground stability for the driving rig and pile jig, and other equipment proposed to be used i.e. cranes and pile transport vehicles
- III. Location of all utilities have been located and potholed
- IV. Determine hazards, including confined and restricted work areas
- V. Assembly and disassembly of equipment
- VI. Environmental hazards including noise
- VII. A safe work method statement for each activity at each pile driving site, this also should include lift plans where cranes are proposed
- VIII. Equipment inspection and maintenance prior to and during piling activities at each site, including recording of these.
- IX. Updates of plan as required due to site conditions and restraints

c) Site preparation for equipment and pile driving

Site works required to create access to and from the individual piling locations shall be the responsibility of the Contractor, the nature of the access shall take into account the environment and ensure minimal damage to fauna and flora and limit erosion and sediment run off.

WITNESS POINT

Each of the pile driving locations shall ensure the driving rig can set up and sit level on the ground and is firmly and safely supported by the ground/platform. The Contractor shall utilise their Geotechnical Engineer to verify the ground/platform can accommodate the equipment and the activity proposed.

HOLD POINT

d) Transferring pile from onsite storage to its aligned position in the driving rig;

The contractor is responsible for the transferring of all piles from the storage site to the designated pile driving location as per the design drawings and alignment within the pile driving rig.

All activities shall be carried out as per the site specific safety plan for each location, it is the



responsibility of the Contractor to carry out site works for access for all equipment to allow for delivery and unloading to the aligned position in the driving rig at the specific piling location/s.

Prior to commencing pile driving the pile shall be inspected by the Contractor and Engineering Consultant for damage, this also includes stability of the working platform and the pile driving rig.

HOLD POINT

e) Provision and use of the driving rig;

The type of pile driving rig shall reflect the pile driving activity required i.e. small composite piles may only need a small vibratory driver. It is the responsibility of the Contractor for the provision of the pile driver that best suits the works. This shall be included as part of the Construction and Installation Procedure submission.

The operation of the driving rig shall only be performed by suitably qualified personnel for that type and size of pile driving rig, the Contractor is responsible to ensure all personnel involved in pile driving activities are listed within their Workplace Health and Safety Plan.

f) Retention of pile on line for driving;

Prior to commencing pipe driving at each location the set-up of the driving rig and any driving jig shall be checked to ensure the location is as per plans and within the tolerances of the manufacturer's requirements.

HOLD POINT

The pile jig used shall ensure the pile is firmly held and steady in the correct position aligned with the survey mark at the required location, continued monitoring during the pile driving process shall take place by the Contractor or Engineering Consultant.

g) Driving the pile;

Where the geotechnical report, design drawings and documentation require testing of the piles to ensure the piles are embedded enough to withstand the design loads. Requirements for testing procedure, frequency and loading will be provided by the certifying geotechnical engineer.

HOLD POINT

As required by the Geotechnical Report, design drawings and documentation the Contractor shall ensure certification of the piles by a geotechnical Engineer/Assessor to confirm that the design requirements have been achieved, and the foundation is safe, adequate and durable.

Where the Geotechnical Engineer identifies issues with the pile, such issues must be resolved prior to moving to the next stage of construction. The Geotechnical Engineer shall ensure all issues are resolved prior to the next stage of construction. The Contractor shall forward a copy of the geotechnical certification of the foundation to the Superintendent.

HOLD POINT

h) Provision and use of the pile driving hammer;

The type of pile driving hammer shall reflect the pile driving activity required i.e. small composite piles may only need a small vibratory hammer. It is the responsibility of the Contractor for the provision of the pile driving hammer that best suits the works. This shall be included as part of the Construction and Installation Procedure submission.

When lifting piles with the pile hammer, the operator shall ensure that the connection between the rigging and the pile hammer is adequate for the task. Use the hammer manufacturers designed attachment point(s) only.

The operation of the driving rig and hammer shall only be performed by suitably qualified



personnel for that type and size of pile driving rig and hammer type, the Contractor is responsible to ensure all personnel involved in pile driving activities are listed within their Workplace Health and Safety Plan.

The Contractor shall also be responsible for ensuring clear “fall” zones around the driving rig and hammer and pile during operational use.

WITNESS POINT

i) **Setting up for and re-driving piles which have lifted as a result of other driving operations;**

The Contractor shall monitor all driven piles during ongoing pile driving activities, where movement occurs with already driven piles these shall be re-driven to their correct levels and alignment at no cost to the Principal.

WITNESS POINT

Access to and setting up for re-driving piles is the responsibility of the Contractor, all cost incurred shall be borne by the Contractor.

At the completion of pile driving activities the Geotechnical Engineer shall certify all piles have been installed and the design requirements have been achieved.

HOLD POINT

Any ground material forced up between the piles during the driving operation shall be removed and disposed of by the Contractor at no cost to the Principal

j) **Provision and establishment on site of plant and equipment required for pre-boring, if necessary;**

As indicated in the geotechnical report and design drawings and documents, the Contractor shall where necessary make provisions for pre-boring of pile locations. It is the responsibility of the Contractor to carry out site works for access for all equipment to allow for pre-boring and disposal of material at the specific piling location/s at no cost to the Principal.

Prior to commencing pre-boring of the pile pilot hole the pad/site shall be inspected by the Contractor and Engineering Consultant for stability of the working platform and the boring rig.

The requirement for pre-boring shall be included as part of the Construction and Installation Procedure submission.

HOLD POINT

The operation of the boring plant shall only be performed by suitably competent and qualified personnel for that type and size of rig, where it is required pre-boring of pile pilot hole is required the Contractor is responsible to ensure all personnel involved in boring activities are listed within their Workplace Health and Safety Plan.

k) **Undertaking any necessary pre-boring and disposing of excavated material;**

Prior to commencing boring activities at each location the set-up of the rig and any supporting jig shall be checked to ensure the location is as per plans and within the tolerances of the manufacturer's requirements.

HOLD POINT

Where pre-boring is necessary and the geotechnical report and design documentation requires, the Contractor shall ensure the Geotechnical Engineer is on site supervising the activity and verifies all pre-bored pilot holes comply.

HOLD POINT



The Contractor shall ensure all pilot holes are compliant and within tolerances for location, vertical angle, diameter and depth of the pilot hole according to the geotechnical report, design drawings and documents prior to driving piles.

HOLD POINT

Inspection of all bored pilot holes (preferably with a 360 degree camera with a light source lowered into the pilot hole) shall be carried out by the Geotechnical Engineer to certify all works have been carried out and are compliant with the geotechnical Report, design drawing and documentation.

HOLD POINT

Excess excavated materials shall be disposed of by the Contractor at their cost or utilised as per Superintendents instructions. Material stockpiled shall ensure that all Environmental ESC measures are in place and maintained.

l) Splicing piles, if necessary, and applying protective coating on joints;

Where required the Contractor shall follow all requirements of the manufacturers procedures for splicing of piles ensuring any splicing occurs only to undamaged pile. Piles to be spliced shall be shown on the design drawings.

WITNESS POINT

At all joints or protrusions the cut surface of the pile and/or bolt holes shall be sealed with a protective coating as recommended or approved by the manufacturer of the pile before continuing activities.

Prior to bolting the splice "sleeve" and continuing pile driving activities the sealants shall be allowed to cure in accordance with the supplier/manufacturers requirements.

HOLD POINT

m) Trimming pile heads (steel piles only), including disposal of offcuts

Driven piles shall be completed to within the level tolerances of the design drawings, if the finished level is above the tolerance allowable the Contractor shall consult the Superintendent and the pile manufacturer to determine the best method for trimming the pile heads.

HOLD POINT

All piles shall be trimmed as per the agreed method, sealed as required, with all off cuts disposed of as per the Contractors Environmental Plan. The costs of such trimming shall not be at the Principals cost.

n) Clean up of site and disestablishment of pile driving rig

The contractor shall ensure all piles are installed and comply with the design drawings, have been certified by the RPEQ Consultant, and accepting by the Superintendent prior to the pile driving rig and associated equipment is disassembled and removed from site.

HOLD POINT

Once the equipment used for the pile driving activity has been disestablished the Contractor shall clean the site and remove any rubbish and debris from the pile driving activity. This includes off cuts and sealants. All removed materials are to be disposed of as set out in the approved environmental plan at no cost to the Principal.

8302.6.2.8 Item 8302.09 Supply and installation of boardwalk, excluding foundations / piles / abutments

Work operations incorporated in this item will include:



a) Supply of boardwalk excluding foundations/piles/abutments

This task follows that all foundations/piles/abutments and any fixings/ties have been installed/constructed, supply of all boardwalk components shall be as per design plans and in accordance with Clause 8302.6.2.2 and shall be free on ground on site.

All components shall be distinctly marked or tagged for identification. Location of any markings shall be such that when installed they are on a hidden face to the public view.

HOLD POINT

b) Carrying out all works to allow the installation of the elevated composite boardwalk as specified on the Drawings and project specifications;

The contractor shall carry out all works to instal the boardwalk in accordance with the design plans and documents;

- I. Check footing dimensions and tolerances are compliant with manufacturers specification

HOLD POINT

- II. Instal components (bearers, joists, stubs, decking) with the correct fixings and installation as per design drawings and manufacturers requirements allowing for required tolerances. All fixings

HOLD POINT

- III. Instal balustrading, railings, kick rails as per design drawings and manufacturers requirements. Fixings shall not leave protrusions on the inside of the deck.

WITNESS POINT

- IV. Where the bridge is partly assembled or fully assembled the Contractor shall install the bridge and assembled components (railings/kerb etc) via the approved construction procedure and their Safety Plan especially where there is lifting via a crane or similar machinery.

WITNESS POINT

- V. Carry out necessary works to ensure boardwalk and pathway interface merge together through tapering the railing to guide users back to the path width or tapering the pathway to meet the boardwalk width as required by the design drawings.

WITNESS POINT

During installation any modified materials or joints or protrusions shall be sealed with a protective coating as recommended or approved by the manufacturer of the boardwalk and allowed to cure in accordance with the supplier/manufacturers requirements.

HOLD POINT

Where the project requires electrical and water reticulation installation the Contractor shall carry out the initial installation works on the boardwalk as required by the design drawings and documents, the following shall apply;

- I. Where required instal lighting poles and standards, conduits and wiring, and attachment to structure as per design plans and manufacturers specifications and AS3000. All electrical works shall be carried out by a Queensland licensed electrician.

HOLD POINT

- II. Where required instal water reticulation service and tap/s and attachment to structure as per design plans and manufacturers requirements. All works shall be the subject of a plumbing permit, the contractor is to apply for and get approval for the regulated works.

**HOLD POINT**

The contractor shall ensure the Consulting RPEQ carries out inspections of the works at various stages as it is installed to enable certification of the works, Council's Superintendent is also required to conjointly inspect the works.

WITNESS POINT

c) Prior to requesting an "On maintenance" inspection the Contractor shall carry out the required testing of the structure for all surfaces and grades;

- I. Slip resistance testing and reporting shall be carried out in accordance with AS 4586 - The Slip Resistance Classification in New Pedestrian Surface Materials, and SA HB 198:2014 Handbook – Guide to the Specification and Testing of Slip Resistance of Pedestrian Surfaces.

HOLD POINT

8302.7 Post Construction

Upon completion of the construction works the following operations shall be followed;

8302.7.1 Item 8302.10 RPEQ certified construction of foundations / piles / footings and elevated composite boardwalk, including Form 12

Work operations incorporated in this item will include:

- a) **Work Operations listed in Clause 2.1.5 of MRS01 Introduction to Specifications**
- b) **Preparation and RPEQ certification of Form 12;**

The Contractor shall collate all documentation and drawings relating to all facets of construction and must supply technical specifications for the structure, including but not limited to:

- 1) Structural certification by a registered professional engineer of Queensland (RPEQ).
- 2) All inspections, final approvals and documentation must be certified by a suitably qualified engineer detailing that the design, construction and installation of the structure has been undertaken to the manufacturers specifications in compliance with Australian Standards and all other relevant statutory requirements codes, regulations and standards, and design drawings.
- 3) Compliance to approved permits (development operations and SARA conditions), and where required electrical certification, plumbing and drainage certification as required.
- 4) Private certification of the installed structure/s based on site specifics due to differing topography and shielding class (wind classification).

c) Submission of RPEQ certified Form 16 to the Superintendent

The contractor shall ensure submission of RPEQ certified Form 12 to the Superintendent including verification documentation for review and approval prior to request for "On Maintenance" inspection.

HOLD POINT

8302.7.2 Preparation and submission of "As Constructed" drawings and documentation as per MRC "D20 Drawings and Documentation Guidelines" with RPEQ Certification.

The Contractor is to supply and submit certified "As Constructed" documentation as required by *MRC D20 - Drawings and Documentation* for approval by the Superintendent 4 weeks prior to requesting a practical completion inspection.

HOLD POINT



Format of submitted “As Constructed” documentation shall be compliant with MRC Supplementary Specification 8919.

8302.7.3 Inspection of boardwalk and associated structure/s with Superintendent

The Contractor shall carry out an “On Maintenance” (practical completion) inspection with the Superintendent and other certifiers as may be required for the type of works. The Superintendent shall nominate who should be present at this inspection.

HOLD POINT

8302.7.4 Defect Liability (“On Maintenance”) Period Inspection

No more than 8 weeks prior to completion of the “On Maintenance” period, a level 2 bridge inspection will be undertaken by an independent, qualified inspector and all identified defects repaired at no cost to the Principal. A copy of the level 2 inspection and defect rectification shall be provided to the Superintendent at the time of requesting an “Off Maintenance” inspection 4 weeks prior to the end of the defects liability period.

HOLD POINT

8302.8 Measurement and Payment

All works associated with the design, supply, and/or installation, and certification of works for elevated composite boardwalk/s shall be measured as per each listed task.

Provision for these works shall be included in the scheduled unit rate for the items show in Clause 8302.3 of this Supplementary Specification and annexure. No separate payment will be made for the works specified within this Supplementary specification or it’s annexure.

Version Control:

| Version | Description | Reviewed / Endorsed | Date |
|---------|-------------------------------------|---------------------|------------|
| 1.0 | Original issue | R.Mogg | 03.05.2022 |
| 2.0 | Review of Specification | C. Sultana | 14.05.2024 |
| 2.1 | Update of Fire Resistance Standards | C. Sultana | 24.07.2025 |
| 2.2 | Inclusion of pile boring details | C. Sultana | 07.08.2025 |