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REVISION REGISTER

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ERECTION OF PRETENSIONED PRECAST CONCRETE MEMBERS

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IC-DC-B150
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**FOREWORD**

**RMS COPYRIGHT AND USE OF THIS DOCUMENT**

Copyright in this document belongs to Roads and Maritime Services.

**When this document forms part of a deed**

This document should be read with all the documents forming the Project Deed.

**When this document does not form part of a deed**


**BASE SPECIFICATION**

This document is based on Specification RMS B150 Edition 3 Revision 2.
RMS SPECIFICATION D&C B150

ERECTION OF PRETENSIONED PRECAST CONCRETE MEMBERS

1 GENERAL

1.1 SCOPE

This Specification sets out the requirements for the erection of pretensioned precast concrete girders and planks in bridges. This Specification does not apply to piles.

1.2 STRUCTURE OF THIS SPECIFICATION

This Specification includes a series of annexures that detail additional requirements.

1.2.1 (Not Used)

1.2.2 Schedules of HOLD POINTS and Identified Records

The schedules in Annexure B150/C list the HOLD POINTS that must be observed. Refer to Specification RMS D&C Q6 for the definition of HOLD POINTS.

The records listed in Annexure B150/C are Identified Records for the purposes of RMS D&C Q6 Annexure Q/E.

1.2.3 Planning Documents

The PROJECT QUALITY PLAN must include each of the documents and requirements listed in Annexure B150/D and must be implemented.

1.2.4 Referenced Documents

Codes, standards, specifications and test methods are referred to in abbreviated form (eg AS 1234). For convenience, the full titles are given in Annexure B150/M.

1.3 DEFINITIONS

The terms “you” and “your” mean “the Contractor” and “the Contractor’s” respectively.

The following definitions apply to this Specification:

“Engineer”. An Engineer eligible for Corporate Membership of the Engineers Australia, who is experienced in the type of work for which certification for compliance with regulations, Australian Standards and/or specifications is required.

“Erection”. The process whereby precast concrete members are lifted, aligned, and placed in their final positions as shown in the Design Documentation. It includes all temporary supporting and bracing measures required to keep the member stable at all times until it takes up the correct final position in the permanent structure.
“Girders”. Pretensioned precast concrete members forming part of the bridge superstructure, spaced at intervals as shown in the Design Documentation.

“Planks”. Pretensioned precast concrete members which are placed side by side in the span to form, together with a cast-in-place concrete topping, a completed deck as shown in the Design Documentation.

1.4 ADDITIONAL PROJECT QUALITY PLAN REQUIREMENTS

Include the following information as part of your PROJECT QUALITY PLAN:

(a) details of any cranes, falsework and/or other equipment proposed for lifting, positioning and temporary support of the members;

(b) details of the method to be used for erection; and

(c) for girder bridges, details of the method to be used for distributing the load to the girders when loads are applied prior to the completion of the in-situ deck, together with the method of keeping the girders upright without twisting or buckling occurring.

2 (NOT USED)

3 (NOT USED)

4 PRE-ERECUTION REQUIREMENTS

4.1 CERTIFICATION OF ERECTION METHODS

HOLD POINT

Process Held: Erection of pretensioned precast concrete members.

Submission Details: Prior to the commencement of any erection, submit a certificate from an Engineer, certifying the structural adequacy and compliance of the proposed method of erection (including all supporting and bracing measures) and the falsework with any applicable regulations, Australian Standards, this Specification and relevant design requirements. The certificate shall be accompanied by any drawings necessary to clearly describe the proposed method of erection including detailed drawings of any supporting and bracing measures.

Release of Hold Point: The Nominated Authority will consider the details submitted, prior to authorising the release of the Hold Point.
4.2 **CONFORMITY OF STRUCTURAL MEMBERS**

Do not erect any member until:

(a) full conformity records for that member have been made available to the Project Verifier;
(b) the concrete in the supporting members has attained at least 80% of the specified strength, and
(c) the supporting formwork for these members has been removed,

unless specified otherwise in the Design Documentation.

4.3 **PRE-ALIGNMENT**

Set all bearings to achieve the correct final levels and inclinations, making allowance for and taking into account for variations in hog from design, as specified in the Design Documentation. All falsework and temporary supports must have adequate provision for adjustment to achieve the required profile detailed in the Design Documentation.

To allow for the change in length of members due to temperature variations, position the bearings so that the horizontal distance between the centres of base plates will result in the distance being as shown in the Design Documentation for the specified temperature.

At least one working day prior to erection, submit a certificate verifying that the location and levels of all permanent and temporary supports are in accordance with the profile shown in the Design Documentation.

For a girder bridge, apply the requirements in RMS D&C G71 for Joint survey to the verification of locations and levels of all permanent and temporary supports and the certification must conform to the requirements in RMS D&C G71 for Product Conformity Survey. Apply the associated Hold Points.

5 **HOG IN MEMBERS**

If the members are not expected to be loaded with deck concrete until they are older than 50 days from casting, detail in the design the anticipated increase in hog due to creep and measures you propose to accommodate these increases. These measures must not affect deck finished levels.

Place members so as to minimise variations in hog between adjacent members.

6 **ERECTION**

6.1 **GENERAL**

Take necessary actions, preparation and set up of cranes, equipment and site so as to comply with the relevant statutory regulations and to maintain safe working conditions at all times.

The erection operation must be supervised by an Engineer.

Ensure that:

(a) each member is placed in position safely, without damage to the member or the structure; and
D&C B150  Erection of Pretensioned Precast Concrete Members

(b) the intended permanent structural action of the member is not
    (i)  restrained; or otherwise
    (ii) adversely affected by the process of erection or by movements which occur due to
         environmental or construction-related forces,

before the member is finally integrated with the adjacent parts of the structure.

Do not place girders by crane directly on the following types of permanent bearings:
(a)  Pot type bearings;
(b)  Spherical bearings;
(c)  Steel roller bearings; or
(d)  Steel rocker bearings

For these types of bearings, use temporary supports during placement and alignment of girders. The
method of subsequently transferring the girder load onto the permanent bearings must be certified as
safe, by an Engineer.

Give the Project Verifier 5 working days' notice of the proposed date to commence erection.

6.2 LIFTING

For the purpose of erection, lift members only by the devices specified in the Design Documentation.
The angle of the lifting sling must be as specified at all times.

The mass of the units to be lifted must be within the safe capacity of the equipment, as certified by an
Engineer. Position the lifting equipment such that any required turning radius does not endanger the
stability of the equipment.

6.3 BRACING OF GIRDER

Effectively support and brace the girders so as to prevent overturning, unintended sliding and any
other unintended movement, when subjected to any loads, including loads induced by handling and
environmental factors.

When being placed in position, effectively support and brace the girders before being released by the
crane or other lifting device.

Maintain effective support and bracing at all times during subsequent deck forming and concreting
operations, and until the deck concrete has hardened.

6.4 TOLERANCES IN POSITION AND ALIGNMENT

Place members in their correct position as shown on the Design Documentation drawings. Align
members placed in series adjacent to one another within specified tolerances.

Unless specified otherwise on the Design Documentation drawings or relevant specification, the
following tolerances must not be exceeded:
(a)  Deviation from the correct position must not exceed 20 mm in any direction;
(b) The deviation from plumb or design inclination between any two points must not exceed 1/200 times the distance between the points or 10 mm, whichever is less.

Check all alignment dimensions before final fixing in position.

7 POST-ERECTION LOADING OF PLANKS AND GIRDERS

7.1 PRIOR TO THE PLACEMENT OF THE DECK CONCRETE

Where the spans are simply supported, a vehicle conforming to Ordinance 30C and 30D of the Roads Act 1993, may travel over bridge planks before the cast-in-place concrete is placed, provided that timber planks of minimum 125 mm thickness are used to distribute the load uniformly over at least six planks and the concrete in the piers and/or abutments supporting such members has attained the specified strength.

Subject to the requirements of Clause 1.4, a girder bridge may be similarly loaded. In this case, distribute the load to at least three girders.

7.2 AFTER THE PLACEMENT OF THE DECK CONCRETE

Do not impose loads on the deck between the commencement of placing of the cast-in-place concrete and 7 days after completion of such concreting.

A vehicle conforming to Ordinance 30C and 30D of the Roads Act may travel over the deck between 7 days after completion of the concreting and such time that the concrete has achieved the strength specified in the Design Documentation drawings provided that timber planks to distribute the load, as specified in Clause 7.1, cover the entire track to be traversed by the vehicle.

8 PROFILE DIAGRAM

Before placing of the cast insitu concrete, submit a diagram that sets out the profile of the completed member(s) in relation to the profile specified in the Design Documentation. For girder bridges this diagram must conform to the requirements in Specification RMS D&C G71 for Product Conformity Survey and apply the associated Hold Point.

9 REMOVAL OF TEMPORARY WORKS

Remove all inserts and fixtures used solely for lifting or installation, temporary supports, packers, falsework and temporary bracing and carry out any repairs due to the use of such temporary works using suitable cementitious patching material to the specified finish as the Project Works proceed.
ANNEXURES B150/A TO B150/B – (NOT USED)

ANNEXURE B150/C – SCHEDULES OF HOLD POINTS AND IDENTIFIED RECORDS

C1 SCHEDULE OF HOLD POINTS

Refer to clause 1.2.2.

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<td>4.3 &amp; RMS D&amp;C G71</td>
<td>Notification of Joint Survey of permanent and temporary supports for girder bridges</td>
</tr>
<tr>
<td>4.3 &amp; RMS D&amp;C G71</td>
<td>Submission of survey report for permanent and temporary supports for girder bridges</td>
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<tr>
<td>8 &amp; RMS D&amp;C G71</td>
<td>Submission of Profile Diagram for girder bridges</td>
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C2 SCHEDULE OF IDENTIFIED RECORDS

The records listed below are Identified Records for the purposes of RMS D&C Q6 Annexure Q/E.

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<tr>
<th>Clause</th>
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<td>4.3</td>
<td>Certificate verifying that the location and levels of all supports are in accordance with the Design Documentation</td>
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<td>Diagram setting out profile of completed members in relation to profile specified in the Design Documentation</td>
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ANNEXURE B150/D – PLANNING DOCUMENTS

Refer to Clause 1.2.3.

The following documents are a summary of documents that must be included in the PROJECT QUALITY PLAN. The requirements of this Specification and others included in the deed must be reviewed to determine additional documentation requirements.

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ANNEXURES B150/E TO B150/L – (NOT USED)

ANNEXURE B150/M – REFERENCED DOCUMENTS

Refer to Clause 1.2.4.

RMS Specifications

RMS D&C G71 Construction Surveys
RMS D&C Q6 Quality Management System (Type 6)
RMS D&C B110 Supply of Pretensioned Precast Concrete Members