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HEB PRECAST
precasttenders@heb.co.nz

Inspection and Test Plan:	03 Issued 31/10/2023	Approval	Initial
Project:	Mangakootokutuku Bridge	HEB Precast Project Manager	Paul Malan
Procedure:	HEB Precast Prestressed	HEB Production Manager	Gareth Cole
Structure:	Super Tee Girder	HEB Production/Quality Coordinator	Duncan Taylor
Unit Type:	1225mm Super Tee Beam	Design Engineer	BBO

No:	Inspection / Test Point	ACTION (Hold, Monitor, Witness)	Detail	Reference	Frequency	Inspection / Test Method (submission, visual inspection, testing, measure, review)	Conformance Criteria	Records	Responsibility
A.	**Pre-Construction**								
1	**Shop Drawing Approval**	Hold	Shop drawings to be submitted for approval.	Structural drawings	Prior to casting	Document Review	Approved IFC Shop Drawings	Client approval	Project Manager
2	**Concrete Mix Design Approval**	Hold	Concrete mix design to be submitted for approval prior to concrete being supplied to site.	-	Prior to casting	Document Review	Minimum compressive strength at 28 days 60MPa. The mix design to comply with aspects of the contract specification.	Client approval	Project Manager
3	**Lift Design**	Hold	Lift design provided for units demoulding, storage and transportation.	-	Prior to casting	Document Review	Specific Lift design (Lifting eyes and position) produced and followed	Lift design Shop Drawings	Project Manager
4	**Steel Reinforcement compliance**	Hold	Mill certificates for steel reinforcing to be provided	AS/NZS 4671	Prior to casting	Document Review	Steel to be manufactured with ACRS certificate details and verification Mill certificates to match ACRS certificates.	Mill Certificates Detail sheets Test Certificates	Production / Quality Coordinator
5	**Steel pre-stressing material (Strands) compliance**	Hold	Mill certificates for prestressing strand coils to be provided	AS/NZS 4672	Prior to casting	Document Review	Prestressing strands (coils) to be supplied by ACRS accredited Manufacturer. Mill certificates checked against size, type and strand - mill certificate to match ACRS certificate	Mill Certificates ACRS Certificate	Production / Quality Coordinator
6	**Design Stressing calculation**	Hold	Design stressing calculation and calibration certificates to be submitted to the Design Engineer	Structural drawings	Prior to casting	Document Review	Expected extensions and gauge readings to be calculated for each cast.	Design Stressing Calculation Calibration Certificates Client Approval	Project Manager
B.	**During Casting**								
7	**Steel Reinforcement cage assembly**	Monitor	Steel reinforcing cage to be assembled and inspected.	Approved shop drawings	Prior to each cast	Visual Inspection	Cage assembly to comply with correct size, class, length, shape and location/spacing as specified in shop Dwgs. Free from visual damage.	Pre-Pour Inspection sheet REO detail sheets	Production / Quality Coordinator
8	**Mould Preparation**	Witness	Before casting ensure mould has been prepared to comply with tolerances.	NZS3109 Table 5.1	Prior to each cast	Measure	Tolerance on placement of moulds shall be a per NZS 3109	Pre-Pour Inspection sheet	Production / Quality Coordinator
9	**Pre-Stressing**	Monitor	Review actual strand extension/pressure compliance with approved design calculation. Draw-in measurements to be taken and recorded Check that debonding has been included as required. Debonding shell be by plastic sleeves around the strand. Ensure gauges calibration is up to date	Approved shop drawings Design Stressing calculation	Prior to each cast	Visual Inspection/Measure	Stressing data/records reported on stressing calculation sheet.	Stressing Calculation sheet Pre-Pour Inspection sheet	Stressing Controller
10	**Steel Reinforcement Placement**	Witness	Reinforcing steel shall be handled, placed as per NZS 3109.	Approved shop drawings NZS 3109	Prior to each cast	Visual Inspection	Steel reinforcing cage placed as per approved shop drawings. Spacers shall be installed evenly to ensure correct cover as per shop drawings achieved.	Pre-Pour Inspection sheet	Production / Quality Coordinator
11	**Cast-in Items**	Witness	All cast in items positioned as per shop drawings Lifters positioned as per lift design	NZS3109 Table 5.1 Approved shop drawings Approved Lift Design	Prior to each cast	Visual Inspection	Correct type and number of cast in items used Correct Lifters used, positioned in accordance with approved lift design	Pre-Pour Inspection sheet	Production / Quality Coordinator
12	**Pre Pour Inspections**	Hold	Pre Pour Inspection shall be carried out before casting. The Engineer's Rep shall be advised at least 48 hours before the proposed pour.	Approved shop drawings	Prior to each cast	Measure, Document review	Confirmation that the unit has been cast in accordance with approved shop drawings and NZ standards for tolerances.	Pre Pour inspection sheet Marked up shop drawing, Stressing records	Foreman & Production / Quality Coordinator
13	**Concrete Mix Conformance**	Hold	All concrete dockets reviewed at time of delivery.	Approved mix design	Prior to placement of concrete	Visual Inspection	All concrete delivered to site shall be produced in accordance with the approved mix design	Concrete Delivery Dockets	Supervisor & Production / Quality Coordinator
14	**Concrete Mix Workability**	Hold	Fresh concrete to be visually assessed for its workability compliance.	Approved mix design	Prior to placement of concrete	Visual Inspection	Workability as per mix design. Concrete slump test to be performed by concrete supplier before delivery	Concrete Delivery Dockets	Supervisor & Production / Quality Coordinator
15	**Concrete Finish**	Witness	Concrete to be placed to achieve the specified formed and unformed finishes	Approved shop drawings NZS3114	During and after placement of concrete	Visual Inspection	ST Beam to be Type F4 finish All construction joints - Type B / UNO Top surface Type B / CJ and U2 where specified	Pre-Pour Inspection sheet	Foreman & Production / Quality Coordinator
C.	**Post-Construction**								
16	**Curing and Release Strength**	Hold	Heat accelerrated curing as per approved methodology. 7 Day post mould water curing as per approved methodology	NZS 3109 NZS 3112	Prior to every unit transfer	Testing (Schmidt hammer or Compressive strength test)	Minimum compressive strength at transfer of prestressed units to be 40MPa prior to stripping and demoulding.	Post-Pour Inspection sheet	Production Manager
17	**Transfer**	Monitor	Visual inspection to ensure strands are tight and no slippage of strand into concrete. Localised spalling around full bonded strand at transer as result of excessive slippage will be identified as non conformance and the unit will be rejected and remade.	Approved shop drawings	Prior to transfer	Visual Inspection	Stressing data/records reported on stressing calculation sheet.	-	Production / Quality Coordinator
18	**Draw-in**	Monitor	Strand draw-in to be measured on each cast. If ave draw-in for group exceeds 2mm, or 4mm for single strand, then results to be submitted to Eng	NZS3109 C8.72.3	Every unit - at transfer	Measure	Draw-in to be measured on each beam at transfer	Post-Pour Inspection sheet	Production / Quality Coordinator
19	**Lifting**	Monitor	Units are to be demoulded following lift design	Approved lift design	Every unit	Document Review	Approved lift design to be followed.	-	Production / Quality Coordinator
20	**Marking**	Hold	Units are to be clearly marked each end with unique number, cast date and installation direction (Super T).	Approved shop drawings	Every unit - after demoulding, prior storing	Visual Inspection	Ensure every unit is clearly marked	-	Production / Quality Coordinator
21	**Concrete Supply Testing**	Hold	Concrete compressive strength test to be carried out by supplier. 1 Set per beam with additional set for any truck with water added after leaving the batch plant	NZS 3112, Part 2	1 test sample for every beam [1 cylinder - at 7 days age 3 cylinders - at 28 days age 3 cylinders - transfer strength]	Testing	Compressive Strength result to be a minimum orf 60MPa at 28 days	Concrete suppliers Test Reports	Concrete Supplier + Production / Quality Coordinator
22	**Post Pour Inspection**	Hold	All units shall be inspected for its compliance prior to delivery	Approved shop drawings	Every unit - prior delivery	Visual Inspection	Confirmation that the unit has been cast in accordance with approved shop drawings and NZ standards	Post-Pour Inspection sheet (red pen mark-up - as-built)	Production / Quality Coordinator
23	**QA Package / As-Built**	Hold	Compliance documentation is to be collated as per project requirements	-	At Delivery and installation	Document Review	Compliance documentation is to be submitted to the Engineer.	Post Pour inspection sheet Marked up shop drawings - as built	Production / Quality Coordinator

Comments:

Accepted by HEB Precast Project Manager Paul Malan **Signature:** _____ **Date:** _____

Accepted by HEB Production Manager Gareth Cole **Signature:** _____ **Date:** _____

Accepted by HEB Production/Quality Coordinator Duncan Taylor **Signature:** _____ **Date:** _____

Accepted by Design Engineer _____ **Signature:** _____ **Date:** _____