**Inspection and test plan – Manufacturing and supply of precast elements**

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| **Project no.** | | CC0374 | **Project name** | Pakenham Roads Upgrade | | **Date** |  | | **Approved by** | Damian Hagebols |
| **ITP no.** | 16300-P200-SYM-QAC-ITP-00029 | | **Revision date** | 24/11/2023 | **Plant and equipment used** | | |  | | |
| **Lot no.** |  | | **Location (chainages, detailed description or marked up plan)** | | | | |  | | |

Attach Dockets, Certificates and QA Documents to ITP

|  |  |  |  |  | **Verification of acceptance by** | | | | | | | | **Remarks/record (eg. Test frequency reports, certificates, checklist etc)** |
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|  |  |  |  |  | **Symal** | | | | | **Superintendent** | | |
| **Item no.** | **Activity** | **Ref docs** | **Acceptance criteria** | **Freq** | **Key** | **Resp** | | | **Initial/ date** | **Key** | | **Sign/ date** |
| **1.0 Pre Construction** | | | | | | | | | | | | | |
| **1.1** | **Steel approval** | Section 611 ‘Steel Reinforcement. | Manufacturers and suppliers of steel reinforcement materials must be in possession of a current certificate of approval, issued by the Australian Certification Authority for Reinforcing Steel (ACRS). Certificates to be provided prior to use in elements. | **Prior to start of works** | **H** | **SE** | | |  |  | |  | **Steel Certs:** |
| **1.2** | **Concrete approval** | VR610.07  AS 1379 | Concrete mix design to be approved by the Superintendent. | **Prior to start of works** | **H** | **SE** | | |  |  | |  | **Mix Design:** |
| **1.3** | **Shop drawing approval** | IFC drawings | Shop drawings have been revied and approved per IFC design. Shop drawings to be uploaded to Team binder. | **Prior to start of works** | **H** | **SE** | | |  |  | |  | **RFI Number:** |
| **1.4** | **Curing methodology** | VR610.23 | The Contractor shall submit to the Superintendent for review, full details of the proposed methods of curing, as part of the concrete mix design submission, not less than four weeks prior to placement of concrete.  The Contractor shall not proceed with the placement of concrete until the curing method(s) has been reviewed and approved by the Superintendent. | **Prior to start of works** | **H** | **SE** | | |  |  | |  |  |
| **1.5** | Birth certificates | Vic roads  620.09 | All manufactured precast concreate shall be traced from the completion of manufacture to the final location by a unique identification number. Precast elements to be supplied with a birth certificate matching to the ID number of the element to ensure traceability. | **Each lot** | **H** | **SE** | | |  |  | |  | **Birth Certificate Number:** |
| **2.0 Forms** | | | | | | | | | | | | | |
| **2.1** | **Formwork** | Section 610 ‘Structural Concrete | The formwork shall be constructed to produce the finished concrete to the shape, lines and dimensions shown on the drawings, and in accordance with the surface finish and tolerances | **Each lot** | I | **SE** | | |  |  | |  |  |
| **2.2** | **Void formers** | Section 614 | Void formers shall be securely restrained in position vertically against the action of placing concrete and subsequent flotation under vibration. The void former shall likewise be laterally restrained against forces arising from differential pressures during placing of concrete | **Each lot** | W | **SE** | | |  |  | |  |  |
| **2.3** | **Embedded ties** | Section 610 surface finish provisions of | The use of wires or bolts extended to the surface of the concrete will not be permitted except were shown on the drawings. Any embedded ties shall remain embedded and shall terminate not less than the specified concrete cover. | **Each lot** | I | **SE** | | |  |  | |  |  |
| **3.0 Removal of units from forms** | | | | | | | | | | | | | |
| **3.1** | Compressive strength | Requirements of clause 610.16(l) | Individual precast units with mass of five tonnes or less shall have a minimum concrete compressive strength of 10 MPa for removal of units from forms. For individual precast units of mass greater that five tonnes, the minimum concrete compressive strength shall be 20 MPa for removal of units from forms. | **Each lot** | **R** | **SE** | | |  |  | |  |  |
| **3.2** | Minimum compressive strength | Requirements of clause 610.16(l) | Lifting of precast units at a minimum concrete compressive strength other than that specified in this clause shall be supported with structural calculations and maturity testing for estimating the in-situ strength of concrete in accordance with the requirements of clause 610.16(l). The structural calculations shall be certified by an Engineer who has qualifications admitting to Corporate Membership of the Institution of Engineers, Australia, with a minimum of five years’ experience in structural design. | **Each lot** | **R** | **SE** | | |  |  | |  |  |
| **4.0 Projecting reinforcement** | | | | | | | | | | | | | |
| **4.1** | Projecting reinforcement | Drawings 610, 611,614 | Where shown on the drawings, steel reinforcement shall be left projecting for the purpose of bonding on subsequent work. Care shall be taken to avoid disturbing the bars during the specified period for curing of the concrete. Projecting reinforcement which has been damaged or dislodged or which is loose in the concrete will be cause for rejecting of the units. | **Each lot** | **I** | **SE** | | |  |  | |  |  |
| **4.2** | Continuity bars | Drawings 610, 611,614 | Continuity bars shall be positioned within 3 mm of the positions shown on the drawings. The relative deviation of any two bars cross sections, taken at right angles to the longitudinal centreline of the unit over the projecting length of bar, shall be within 3 mm. | **Each lot** | **I** | **SE** | | |  |  | |  |  |
| **5.0 Marking** | | | | | | | | | | | | | |
| **5.1** | Individual marking | N/A | The identification number, date of casting, the manufacturer’s name or registered mark and the maximum mass shall be marked on every precast unit. | Each lot | **W** | **SE** | | |  |  | |  |  |
| **5.2** | Temporary marking | N/A | Temporary identification shall be made on the top surface of the unit near an end, except for parapet units. Final marking shall be made by indelible marking material, using letters approximately 40 mm high.  For parapet units, temporary identification shall be made on the broomed surface of the parapet as shown on the drawings. Final markings shall be made on one end of each unit. | Each lot | **W** | **SE** | | |  |  | |  |  |
| **6.0 Handling & storage** | | | | | | | | | | | | | |
| **6.1** | Storage | Clause 620.07 | Units shall not be stored in areas subject to flooding. Units shall not be stored within 10 m of existing or proposed overhead power or telephone lines, or over service conduits, drainage pipes or uncompacted fill.  All beams shall be laterally supported. The lateral bracing shall be designed for 10% of the dead load of the beam at the mid height of the beam. Beams and parapet units shall not be stored in stacks.  Slabs, planks, and piles may be stored in separate stacks of identical units up to a maximum height of 2 m, or two units high, whichever is greater. Crown units may be stored in separate stacks of identical units up to a maximum height of 3 m. The upper layers shall be separated from the lower layers by suitable timber bearers in line vertically at the specified supporting points. Timber supports for upper layers shall be placed directly above the supports of the layer below. | Each lot | **W** | **SE** | | |  |  | |  |  |
| **6.2** | Handling | Clause 620.07 | The units shall be supported on bearers clear of the ground. Bearers shall support the units over their full width and be placed perpendicular to the longitudinal axis of the unit. Unless specified otherwise, bearers shall be placed beneath the specified or approved lifting points clear of any sole plates. The ground or space between the bearers supporting the units shall be carefully cleared and levelled to prevent the unit from being supported other than on the bearers. The bearers shall rest on a firm foundation, and adequate precautions shall be taken to prevent subsidence from occurring and to prevent the units bearing other than at the specified support positions.  Unless otherwise specified, precast units shall be lifted using the lifting points provided and supported with the top surface uppermost at all times. The angle subtended by the slings and the longitudinal axis of the unit shall be not less than 60°. | Each lot | **W** | **SE** | | |  |  | |  |  |
| **7.0 Transporting** | | | | | | | | | | | | | |
| **7.1** | Pre transportation requirements | Clause 620.08 | Units shall not be transported from the precast yard until specified 7-day concrete compressive strength has been achieved, and not before 7 days after casting. | **Each lot** | **H** | **SE** | | |  |  | |  |  |
| **7.2** | Transportation requirements | Clause 620.08 | Units shall be securely fixed to the transporter and provision shall be made to protect the units from damage caused by lashings.  During transport of beam units, the Contractor shall provide end bracing and, if necessary, top flange bracing. Bearings and supports shall allow for longitudinal rotation of the unit in transport and have adequate width and bearing capacity. | **Each Lot** | **H** | **SE** | | |  |  | |  |  |
| **8.0 Work Lot Close Out** | | | | | | | | | | | | | |
| **8.1** | Product Non-Conformance | QMP | All Product Non-Conformance(s) recorded and closed (if applicable) | **Each Lot** | **R** | | **SE** |  | |  |  | |  |

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| **Works complete (signer SE/SS)** | |  | | | **Date works complete** | |  | | | |
| **Lot conforms (signer PE)** |  | | **Date lot closed** |  | | **NCR/s no. raised** | |  | **Date NCR closed for this lot** |  |

**Responsibility (Resp.) Key**: **PM**-Project Manager, **PE**-Project Engineer, **SE**- Site Engineer, **CS**-Civil Superintendent, **SS**-Site Supervisor, **SV**-Surveyor, **CR**-Client Representative

**SI** – Superintendent

**Inspection Key: W –** Witness, **H –** Hold Point, **S –** Surveillance**, I** – Inspection, **R**  – Review