

<b>Project</b>	J235 Mary and William Streets Blackstone Traffic Signalisation	<b>Date Developed</b>	27/03/2024	<b>Developed By</b>	Shaheen Ahmed	<b>Reviewed By</b>	Reece Doyle
<b>Process</b>	GL – Gullies/ Access Chambers (Pavement Drainage)	<b>Contract No.</b>	22284	<b>Client</b>	Ipswich City Council	<b>Approved By</b>	Cameron Lochran

Ref No.	Inspection / Test / Approval Point	Inspection / Test Method / Standard / Specification	Stage or Frequency of Sampling	Acceptance Criteria	Method	Level of Inspection	Verification By	Record
1	Define Lot	MRTS50 CL7.1, 7.2	For each lot	Lot boundaries are defined to allow positive identification of work within the project.	QBC QA Records	Review	CQR	Verification Checklist Sheet GL
2	Underlying Lots conform (if applicable)	Lot Register Relevant Lots	Prior to commencement of works	Works cannot commence until underlying lots are conforming	QBC QA Records	Inspection	CQR	Verification Checklist Sheet GL
3	Survey set-out	MRTS01 CL8 HOLD POINT 1	Each location.	<p>The Contractor shall set out an installation as shown on the Drawings in sufficient detail to identify the location, length, and levels of the proposed installation.</p> <p>Once the initial set out is complete the Administrator will determine the design appropriateness of the set out with regard to the actual site conditions <b>Hold Point 1</b> The Administrator may direct amendments to the set-out details. Payment for such amendments will be made at appropriate rates in the Schedule of Rates or, where such rates are not deemed by the Administrator to be appropriate, as determined by the Administrator.</p> <p>Installations to be set out in accordance with the above requirements include:</p> <ul style="list-style-type: none"> <li>a) Drainage pipes, culverts, and structures</li> <li>b) Landscaping, and</li> <li>c) Traffic control and lighting ducts, pits, poles, and equipment.</li> </ul> <p>Set-out to be completed by a surveyor experienced in construction.</p>	QBC QA Records Visual check	<b>Hold Point</b>	Surveyor Administrator CQR	Verification Checklist Sheet GL Hold Point Release
4	Preparation of Underlying Material and Foundation	MRTS03 CL21.3 MRTS04 CL15 Table 15.3.b	Construction Foundation	<p><b>Construction</b> - Where in-situ material on or against which gullies are to be constructed is other than rock, the material shall be compacted as for material at the bottom of excavations in accordance with MRTS04 General Earthworks. The ground surface shall be moistened just prior to placing concrete.</p> <p>Foundations other than rock to be compacted to 95% relative dry density. 1 test per 50m2, min 2 tests per lot as per Table A.2 MRTS04</p> <p>Foundation bedding material shall be placed to provide continuous even support for the chambers and gullies.</p>	QBC QA Records Geotechnical Report	Inspection Records	CQR	Verification Checklist Sheet GL
5	Material Requirements	MRTS03 CL21.2	For the project	<p>Concrete shall comply with MRTS03 Clause 6.1.</p> <p>Cement mortar shall comply with MRTS03 Clause 6.2.</p> <p>Epoxy mortar shall be a suitable proprietary product.</p> <p>Precast concrete components for gullies shall be proprietary products manufactured in accordance with MRTS03 Clause 6.5 and as per relevant Standard Drawings.</p> <p>Grates, covers and frames shall be reinforced concrete, mild steel or cast iron as specified in the drawings and/or Standard Drawings and shall comply with MRTS03 Clause 6.4. Cast iron components shall be fabricated from cast iron, grade T200 and shall comply with AS 1830.</p> <p>Access within the chamber shall comply with AS 1657. Where step irons are used, step irons shall be galvanised mild steel bars. Mild steel bars shall comply with MRTS71 Reinforcing Steel. Step irons shall be galvanised in accordance with the requirements specified in AS/NZS 4680.</p> <p>Structural steel components shall comply with MRTS78 Fabrication of Structural Steelwork and hot-dipped galvanised in accordance with AS/NZS 4680.</p>	QBC QA Records	Inspection	CQR	Verification Checklist Sheet GL
6	Concrete mix design & procedures	MRTS70 CL9.2 MRTS70 CL15.1 MRTS70 CL15.6	For the project	<p>The Contractor shall nominate the special class concrete mix to be used in the Works not less than four weeks prior to the commencement of concreting operations. – MRTS70 CL 9.2 <b>Milestone</b></p> <p>No concrete shall be placed in the Works until approval of the mix design has been obtained from the Administrator. <b>Hold Point 1</b></p> <p>Concrete operations shall not commence until all relevant procedures, listed in Table 5.2 have been approved by the Administrator. MRTS70 CL 15.6 <b>Hold Point 4</b></p>	QBC QA Records Contractor notice	<b>Hold point</b>	CQR Administrator	Verification Checklist Sheet GL Hold point release

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7	Acceptance of reinforcing steel supplier	MRTS71 CL6.1	At least three days prior to reinforcement supply	At least three days before steel reinforcement is supplied, the Contractor shall submit to the Administrator the identity and address of the proposed supplier and evidence of conformance with Clause 6.1.1 or Clause 6.1.2. <b>Milestone</b>  Steel reinforcement shall not be delivered to the Site until written acceptance of the proposed supplier and processor has been obtained from the Administrator. <b>Hold Point 1</b>	QBC QA Records Contractor notice	<b>Hold point</b>	CQR Administrator	Verification Checklist Sheet GL  Hold point release										
8	Testing of concrete	MRTS03 CL21.3 MRTS70 CL15.2	For each lot	Samples for compression strength testing, shall be taken from separate batches of concrete during the placing operation. Two cylinders (minimum) shall be cast from each sample. Samples shall be taken in accordance with AS 1012.1 with records kept as per Clause 9 of that Standard.  Standard testing  The normal rate of sampling per lot is defined in Table 15.2.2. For the purposes of determining rate of sampling, a lot shall not extend longer than 24 hours. Sampled batches shall be evenly distributed through the lot.	QBC QA Records Test	Test	CQR	Verification Checklist Sheet GL  Concrete Pour sheet  Test report										
9	Approval to place concrete	MRTS70 CL15.6.1	For each lot	No concrete shall be placed in the Works until: <b>Hold Point 5</b> a) the formwork and reinforcement have been inspected b) all foreign material has been completely removed from the forms c) the mixing, batching, and compaction equipment have been approved by the Administrator.  Where concrete is constructed on ground surfaces or on a foundation bedding, a polythene sheet separator of thickness not less than 100 µm shall be employed between the ground/bedding and the concrete. Where shown in the Drawings the foundation shall be covered with a layer of blinding concrete. The maximum thickness of unreinforced blinding concrete shall be 100 mm unless otherwise approved.	QBC QA Records Administrator surveillance on-site	<b>Hold point</b>	CQR Administrator	Verification Checklist Sheet GL  Hold point release										
10	Placement of concrete	MRTS70 CL15.6.3	For each lot	The placing operation shall be conducted in the presence of the Administrator. <b>Witness Point 2</b>  The Contractor shall give at least 24 hour notice to the Administrator of the time that placing shall start.	QBC QA Records Administrator surveillance on-site	Inspection	CQR Administrator	Verification Checklist Sheet GL										
11	Placing concrete against firm ground	MRTS03 CL21.3	For each lot	Where the sides of excavations are in firm ground, the access chamber shafts may be constructed without the use of back forms. Where concrete is placed against the ground without the use of back forms, the specified wall thicknesses shall be increased by 20 mm for gullies up to 5.0 m deep and 30 mm for gullies deeper than 5.0 m to provide additional cover to reinforcement.	QBC QA Records	Inspection	CQR	Verification Checklist Sheet GL										
12	Approval to remove formwork	MRTS70 CL15.8	For each lot	Forms, falsework and centring shall remain in position until the times stated below have elapsed after completion of concreting. <b>Hold Point 6</b> <ul style="list-style-type: none"><li>for soffits, until seven days</li><li>for side forms, in accordance with Table 15.8.</li></ul> <table><tr><th colspan="2">Table 15.8 – Retention of side forms</th></tr><tr><th>Exposure Classification</th><th>Minimum Form Retention (hours)</th></tr><tr><td>A</td><td>48</td></tr><tr><td>B1, B2</td><td>72</td></tr><tr><td>C1,C2</td><td>120</td></tr></table>	Table 15.8 – Retention of side forms		Exposure Classification	Minimum Form Retention (hours)	A	48	B1, B2	72	C1,C2	120	QBC QA Records Administrator surveillance on-site	<b>Hold point</b>	CQR Administrator	Verification Checklist Sheet GL
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13	Witness point – Removal of formwork	MRTS70 CL15.8	For each lot	Forms shall be removed with care, without hammering and wedging, and in a manner which shall not injure the concrete or disturb the remaining supports. Centres shall be lowered gradually and uniformly in such a manner as to avoid injurious stress in any part of the structure. <b>Witness Point 4</b> The Contractor shall repair any damage caused by such operations.  In addition, the curing requirements of Clause 15.11 shall apply to the newly exposed surfaces within one hour of stripping the forms.	QBC QA Records Administrator surveillance on-site	<b>Witness point</b>	CQR Administrator	Verification Checklist Sheet GL										
14	Joints	MRTS03 CL21.3	For each structure	The joints between gullies and culverts shall be made watertight using cement mortar. The mortar shall be used within one hour of mixing and shall not be re-tempered. The joints shall be finished to provide smooth surfaces, uniform with the inner surfaces of the gullies.	QBC QA Records	Inspection	CQR	Verification Checklist Sheet GL										

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15	Miscellaneous – construction	MRTS03 CL21.3	For each structure	<p>Step irons shall be installed horizontal, vertically in line, and shall project uniformly from shafts.</p> <p>Concrete top slabs shall be joined to the shafts using cement mortar or epoxy mortar.</p> <p>Where back forms are used, they shall be removed, and backfilling shall be undertaken in accordance with MRTS04 General Earthworks.</p> <p>Frames shall be joined to the top slabs using cement mortar or epoxy mortar or as specified in the drawings and/or Standard Drawings. Approved grates shall be installed in the frames.</p>	QBC QA Records	Inspection	CQR	Verification Checklist Sheet GL
16	Geometrics, tolerances	MRTS03 CL21.3	For each structure	<p><b>Horizontal tolerances:</b></p> <p>The locations of gullies shall not vary from those specified in the drawings by more than <math>\pm 100</math> mm in the direction of the construction centre line and <math>\pm 50</math> mm in the direction at right angles to the construction centre line.</p> <p><b>Vertical tolerances:</b></p> <p>The invert heights of gullies shall not vary from those specified by the drawings by more than <math>\pm 50</math> mm, provided always that the gullies join neatly to existing drainage structures, do not pond water unnecessarily and are at heights compatible with other adjacent structures. The heights of the tops of back-units, grates and frames shall not vary from those described in the drawings by more than <math>\pm 10</math> mm.</p>	QBC QA Records  Survey	Survey	CQR  Surveyor	<p>Verification Checklist Sheet GL</p> <p>Survey report</p>
17	Installation of Grates, concrete top slabs, inlet units, and converter slabs	MRTS03 CL21.3	For each structure	<p>Grates on gullies shall not be installed until all the surveying requirements have been met as specified in Clause 54 and notice of such works provided to the Administrator. <b>Hold Point 5</b></p> <p>For access chambers or gullies in roadworks, temporary covers shall remain in position and installation of the frames and surrounds shall be deferred until pavement construction has reached a stage where the frames and surrounds can be positioned accurately.</p> <p>Concrete top slabs, inlet units or converter slabs as applicable on access chambers and gullies shall not be placed until all the surveying requirements have been met as specified in Clause 54 and notice of such works provided to the Administrator. <b>Hold Point 6</b></p> <p>A precast concrete gully chamber and converter slab (if required) shall be joined to the shafts / pits using cement mortar or epoxy mortar.</p>	QBC QA Records  Administrator surveillance on-site	<b>Hold point</b>	CQR  Administrator	<p>Verification Checklist Sheet GL</p> <p>Hold point release</p>
18	In-situ concrete access chambers	ICC SD02 & SD03 MRTS03 CL21.5	For each structure – where applicable	Cast insitu access chambers shall be in accordance with ICC Standard Drawings SD02 & SD03 or MRTS SD1307 and SD1308.	QBC QA Records	Inspection	CQR	Verification Checklist Sheet GL
19	Precast concrete access chambers	MRTS03 CL21.5.1	For each structure – where applicable	<p>Where the base is cast insitu and the shaft is precast, base for chambers shall be of thickness not less than 150 mm. The base slab shall extend not less than 150 mm radially beyond the outside of the precast access chamber shafts. The lowest precast concrete shaft section of the access chamber shall be placed on the concrete base before the concrete base sets.</p> <p>Openings for culverts shall be cored out of the precast shaft sections during manufacture. "Knockout" pits are not permitted. Minimum gaps of 25 mm shall be provided all around between connecting culverts and shaft sections.</p> <p>Precast concrete shaft sections shall be sealed with an epoxy compound in accordance with the manufacturer's instructions to produce watertight joints. The joints shall be pointed from the inside.</p> <p>Precast concrete top slabs shall be joined to the shafts using cement mortar or epoxy mortar.</p> <p>After shafts have been completed and top slabs placed in position and closed with temporary covers, excavations shall be backfilled. Backfilling shall be undertaken in accordance with MRTS04 General Earthworks.</p>	QBC QA Records	Inspection	CQR	Verification Checklist Sheet GL
20	Concrete inlet gullies	MRTS03 CL21.6	For each structure	<p>Concrete roadside inlet gullies shall be in accordance with ICC Standard Drawings SD04, SD05, SD05 &amp; SD07 or MRTS SD1321, SD1322, SD1443, SD1444, SD1445 and SD1459 as applicable. Concrete field inlet gullies shall be in accordance with ICC Standard Drawings SD08 or MRTS SD1309 and SD1310.</p> <p>Where precast concrete gully shafts are placed on the cast insitu base, the lowest precast shaft shall be placed in the concrete base before the concrete base sets. Openings for culverts shall be cored out of the shaft sections during manufacture or carefully broken out to avoid shaft fractures. Minimum gaps of 25 mm shall be provided all around between connecting culverts and shaft sections. Joints in precast concrete shaft sections shall be sealed from the inside with an epoxy compound in accordance with the manufacturer's instructions to produce watertight joints.</p>	QBC QA Records	Inspection	CQR	Verification Checklist Sheet GL

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21	Tolerances (gullies)	MRTS03 CL21.6.1	For each structure	In addition to the tolerances specified in Clause 21.4, the horizontal and vertical alignment of the side inlet gully shall not vary from those specified in the drawings by more than $\pm 10$ mm.  Notwithstanding the above tolerances, the alignments of the side inlet gully shall have smooth lines.  The overall dimensions of any component shall be nowhere less than that specified on the applicable drawings or Standard Drawings.	QBC QA Records	Inspection	CQR	Verification Checklist Sheet GL
22	Water Test	MRTS03 CL21.6.2	For each structure	A water test on a side inlet gully shall be carried out where the longitudinal grade of the road is less than 1%.  Water shall be discharged into the side inlet gully to check uniformity of flow. After the flow has ceased, water shall not pond to a depth of more than 5 mm in any section of the channel.  The test shall be carried out as soon as possible after the concrete in the channel has cured. <b>Witness Point 3</b>	QBC QA Records  Administrator surveillance on-site	<b>Witness point</b>	CQR  Administrator	Verification Checklist Sheet GL
23	Lot Closed	MRTS50 CL10.1, 11	For this lot	Lot records conform to relevant specifications. Any NCRs have been actioned and closed.  <b>Final conformance requirements:</b> <ul style="list-style-type: none"> <li>Verification Checklist Sheet GL</li> <li>Concrete docket</li> <li>Test report – concrete compressive strength</li> <li>Survey report</li> </ul> Hold points released	QBC QA Records	Review	CQR	Verification Checklist Sheet GL