
		<b>Inspection and Test Plan - Open Drains (Vegetated drains, concrete catch drains &amp; concrete channel)</b>		<b>Doc ID: R11-ODR-ITP</b>	
<b>Client: Iluka Resources Limited</b>			<b>Prepared By: Simon Welsh</b>		<b>Date: 15/10/2024</b>
<b>Project: Public Roads Upgrade</b>			<b>Reviewed By: Joshua Kliemnt</b>		<b>Date: 11/11//2024</b>
<b>Construction Process: Construction of Open Drains</b>			<b>Approved By: Simon Jaworksi</b>		<b>Date: 11/11//2024</b>
<b>Specifications: ETS100, 101, 102</b>					
<b>Structure / Component:</b>					

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		Frequency	Acceptance Criteria	Reference Documents	Inspection /Test Method	Record of conformity			TfNSW	Fulton Hogan	PV	Date
1	Type of open drain to be constructed: <input type="checkbox"/> Vegetated Channel drain <input type="checkbox"/> Concrete Catch Drain <input type="checkbox"/> Concrete Channel Drain <input type="checkbox"/> LWQB	Per Area	As indicated on design drawing	Design DWGS		Verification Checklist	IP	Site Engineer				
2	Obtain and submit mix design documentation from concrete supplier for approval R53-MIX Lot N0..... Hold Point No: .....	Per Product /Per Supplier	N25 Concrete Concrete mix design submitted to the PV 7 days prior to construction verifying the concrete, constituent materials and curing compounds comply with R53 specification	R53.1.4 Design DWGs		R53-GCW-Mix Lot's	IP	Site Engineer		HP		
3	Set out the works	Per Lot	Notification that set out of drainage system has been completed. The Nominated Authority will inspect the set out prior to authorising the release of the Hold Point.  Set out the location and level of open drains as shown on the Design Drawings.	R11.4.1.1 Design DWGs		Hold Point	HP	Site Engineer		HP		
4	Excavation for Drainage Structures	Per Lot	Excavate to dimensions shown on drawings. Where dimensions are not shown, excavate to: ▪ Min 300mm depth ▪ Min waterway of 0.2 m² ▪ Batter slope ≤ 2H:1V steep ▪ Have a grade slope of ≥1% ▪ Extend open drains as necessary to natural drainage depressions or to a drainage system.	R11.4.2.1		Verification Checklist	IP	Site Engineer				

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5	Construction of open drains with grade less than 1%.	Per Lot	Notification that 1% minimum grade cannot be achieved. The PV will consider the matter, and will direct you further, prior to authorising the release of the Hold Point.	R11.4.2.1		Hold Point	HP	Site Engineer		HP		
6	Inadequate Foundation Material	Per lot	Notification to the PV that inadequate foundation material has been excavated to the extent required. Replace inadequate foundation material with materials from cuttings, or with other conforming material, and compact to the requirements of Clause 4.9.2 of this Specification.	R11 4.3.3 R11 4.9.2		Witness Point	WP	Site Engineer		WP		
7	Trim and compact open drains	Per Lot Q6/L.3.1	Trim open drains to produce a uniform surface free of irregularities. Trimmed surface of excavated open drains to a depth of 150 mm, before placing lining or spreading topsoil for vegetation or fill material in <b>embankments</b> of open drains Min. Relative Compaction 95%	R11.4.2.1 R11.4.9.2	T166	Test Report	TP	Site Engineer				
8	Line open drains with organic fibre mat (jute mesh) Lining	Per Lot	Unless otherwise shown on the Design Documentation drawings, line open drains with Jute Mesh and vegetation where the longitudinal grade of the completed drain lies between 1% and 5% inclusive <ul style="list-style-type: none"> <li>Minimum 75mm topsoil with Jute mesh lining and bitumen emulsion, refer to landscape Dwg for vegetation details</li> <li>Jute mesh is lined and pinned in accordance to manufacturer's instructions</li> <li>Minimum 75mm topsoil</li> </ul>	R11.4.2.3		Verification Checklist	IP	Site Engineer				

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**Specifications:** ETS100, 101, 102

**Structure / Component:**

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9	Line catch drains with 100mm concrete, line Type C channel with 150mm concrete	Per Lot	Only if longitudinal grade is <1% or >5% or shown on the drawings <ul style="list-style-type: none"> <li>Install 20±5mm deep grooved movement joints to prevent cracking at 90°±5° to line of drain and spaced @ 3m intervals</li> <li>Install expansion joint complying with D&amp;C TfNSW 3204 &amp; DR-01 Drawing Package for full depth spaced @ 12m intervals.</li> <li>Carry out foundation inspection with GDR and determine if dowel detail at expansion joints can be removed as per RFI 384.</li> <li>Concrete must be colour matched to surroundings</li> </ul>	R11.4.2.3 R11.4.2.4		Verification Checklist	IP	Site Engineer				
10	Inspection of formwork and reinforcement before placing concrete	Per Lot	The PV may inspect the completed reinforcement and formwork prior to concrete placement <ul style="list-style-type: none"> <li>Before commencing placement of concrete, remove all dirt, and other foreign matter from the forms.</li> <li>Gaps which are to be filled with mortar must be free of all dirt and other foreign matter.</li> <li>Prepare revetment mattresses, which are to be filled with grout, in accordance with the manufacturer's recommendations.</li> <li>Reference to RFI 384: DSGR to assess channel foundation if intending to remove the dowel sleeve from the concrete-lined channel expansion joint detail (refer RFI384) and, if required, confirmation of foundation suitability to be provided to PV prior to closure of this hold point."</li> </ul>	R53.6.1		Hold Point	HP	Site Engineer		PV		
11	Placing of Concrete	Per Lot	Notify the Project Verifier, not less than 24 hours and not more than 3 clear working days prior to the intended time of commencing to place concrete, mortar or grout, when fixing of the formwork and reinforcement in position	R53.6.1		Witness Point	WP	Site Engineer		PV		

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			(if applicable) will be completed and when concrete, mortar or grout will be placed.									
12	Curing the concrete	Per Lot	<ul style="list-style-type: none"> <li>Only suitable curing compound used</li> <li>After initial set of concrete apply curing and cure for at least 7 days</li> <li>Curing compound applied according to manufacturer's recommendations or at a spray rate min. 0.2L/m2</li> <li>Ensure all exposed surfaces receive a uniform cover of the curing compound.</li> </ul>	R53.7		Verification Checklist	IP	Site Engineer				
13	Construct rock lined channels	Per Lot	Use rock mattresses only where shown on the Dwg. Rock mattresses must comply with Specification TfNSW D&C R55 <ul style="list-style-type: none"> <li>Width and height to dimensions shown on Drawings</li> <li>Place Geofabric as detailed</li> <li>Rocks are placed in such a way to ensure good mechanical interlock</li> </ul>	R11.4.2.3 R55		Verification Checklist	IP	Site Engineer				
14	Construct LWQB	Per Lot	<ul style="list-style-type: none"> <li>Place Geofabric as detailed</li> <li>Install Filter Media as detailed</li> <li>Drainage Layer Specification</li> </ul>	DR-01-0011		Verification Checklist	IP	Site Engineer				
15	Construct LWQB inlets and spillways	Per Lot	Install Inlets and spillways as per drawings	Design Drawings		Verification Checklist	IP	Site Engineer				
16	LWQB Install pipes and fittings		Install ELLIS Pipes as per schedule, uPVC	Design Drawings		Verification Checklist	IP	Site Engineer				

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17	LWQB Install Bitumen - Impregnated Dam board	Per Lot	For water resistant bitumen – impregnated damn board apply durable paint coating. Refer to paint manufacturer for suitable paint, durability and maintenance requirements (20 years durability) 4m Long, 230mm deep 18 mm thick.	Design Drawings		Verification Checklist	IP	Site Engineer				
18	Construction tolerance & inspection	Per Lot	Verify catch drains have been constructed to tolerance in table R11.4 <ul style="list-style-type: none"><li>Level is within 50 mm of the design level at any point provided that there is a continuous downgrade in the direction of flow not less than 1% at any point.</li><li>Waterway area is not less than 95% of the design cross sectional area at any point.</li></ul>	R11.5.1		Verification Checklist	IP	Site Engineer				

Legend:

<b>HP</b>	Hold Point	Work shall not proceed past the HP until released by the Project Verifier	<b>IP</b>	Inspection point	Formal Inspection to be done and recorded
<b>HP*</b>	Fulton Hogan Hold Point	Work shall not proceed past the HP* until released by Fulton Hogan	<b>TP</b>	Test Point	Product compliance test to be undertaken and recorded/reported
<b>WP</b>	Witness Point	An inspection which must be witnessed by the Project Verifier	<b>SU</b>	Survey conformance point	A qualified surveyor to check product/section/structure and report
<b>AP</b>	Approval Point	Written or verbal approval given by the Project Verifier	<b>SC</b>	Survey Check	
<b>AP*</b>	Fulton Hogan Approval Point	Written or verbal approval given by Fulton Hogan's nominated personnel	<b>PV</b>	Project Verifier	

Notes
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