Fulton Hogan	Inspection and Test Plan – General Concrete Works	Doc ID: R53-GCW-ITP

Client: Iluka Resources Limited	**Prepared By: Simon Welsh**	
Project: Public Roads Upgrade	**Reviewed By: Joshua Kliemnt**	**Date: 11/11//2024**
Construction Process: General Concrete Works	**Approved By: Simon Jaworksi**	**Date: 11/11//2024**
Specifications: ETS100, 101, 102		
Structure / Component:		

Lot No:	Lot Details:	Lot size/Quantity:	Date:

Item No.	Task/Activity Description	Inspection/Test					Type	Responsibility	Checked/Verified by (initial/Date):		
		Frequency	Acceptance Criteria	Reference Documents	Inspection/ Test Method	Record of conformity			TFNSW	Fulton Hogan	PV
1	**Preliminary**										
2	Verify relevant Hold point for production of each concrete mix has been released	Per Product / per Supplier	▪ Documents submitted to TFNSW Representative 7 days prior to production ▪ Verify that the concrete manufacturing plant operates under a quality system in accordance with ISO 9001 Hold Point No:…….. CON-MIX Lot No.:…….	R53.1.4		CON-MIX Lots	IP	Site Engineer			
3	Submit Certificate of conformity for supply of curing compound, and proposed curing compound application methodology, for TFNSW approval	Per Supplier	The curing compound must be: ▪ A hydrocarbon resin compound complying with AS 3799 Type 1-D, or ▪ A bitumen emulsion complying with TFNSW 3254 ▪ Develop a methodology for application of curing compound and submit to TFNSW Representative along with certificate of conformity	R53.7.1 R53.7.3		iTWOcx Transmittal No.:……	AP	Site Engineer			
4	Obtain Certificate of conformity for reinforcement supply	Per Supplier	▪ Comply with either AS/NZS 4671, AS 1311 or the supplier is accredited with ACRS ▪ Galvanizing comply with AS/NZS 4680 ▪ Steel fibre reinforcement must be of a type recommended by the fibre manufacturer for the intended use ▪ Welding comply with AS 1554.3	R53.4		Compliance Certificate	AP	Site Engineer			
5	Cement mortar and grout	Per Mix	Must be a mixture of 3 parts sand or fine aggregate to 1 part cement with sufficient water to produce suitable consistency	R53.2.2		Verification Checklist	IP	Site Engineer			
6	Designate concrete truck washout area (s)	Per Area	Impermeable plastic lined or approved equivalent	CEMP		Verification Checklist	IP	Site Engineer			
7	**Pre-construction**										
8	Set out the works	Per Lot	Establish Pegs (or equivalent) to identify location, length, and levels as per design dwgs	Design dwgs CMS		Verification Checklist	IP	Surveyor			
9	Foundation preparation including blinding layer	Per Lot	▪ Foundation prepared & compacted (tested if required in relevant Specs.)	R53.3.1 CMS		Verification Checklist	IP	Site Engineer			

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			▪ When placing Concrete in earth excavation, pre-place 50mm of unreinforced concrete blinding layer								
10	Check the formwork	Per Lot	Unless otherwise shown on the drawings, formwork must: ▪ Be of Class 3 (AS 3610) for external surfaces, or Class 4 for permanently hidden surfaces ▪ Face step minimum spacings 2m horizontally, 1m vertically ▪ Be in the correct position, level and dimensions ▪ Erected so that fresh concrete is not placed directly against the sides of the excavation ▪ Embedment in correct position ▪ Fillets in correct position and level ▪ Joints constructed to prevent loss of mortar ▪ Formwork is clean, oiled, adequately supported	R53.3 AS 3610		Verification Checklist	IP	Site Engineer			
11	Check the construction joints	Per Lot	▪ If placing adjoining concrete, roughen the surface of constructions joints to remove all laitance and expose coarse aggregate (surface roughness profile ≥ 3 mm) ▪ Ensure projecting reinforcement surfaces are washed clean & all excess water and loose material removed	R53.6.6 Design DWGs		Verification Checklist	IP	Site Engineer			
12	Check the movement joints	Per Lot	Movement joints constructed as shown on design drawings and relevant specifications	Design DWGs		Verification Checklist	IP	Site Engineer			
13	Check the reinforcement	Per Lot	Unless otherwise shown on the drawings, reinforcement must comply with the following: ▪ Bar sizes and spacing correct ▪ Lapped splices length must be 35 bar diameters for 500N deformed steel, 50 bar diameters for plain steel, two outermost transverse wires overlapping for fabric or mesh, 90 strand diameters for 7-wire prestressing strands ▪ All reinforcement are firmly supported on concrete or plastic chairs & are secure ▪ Electrical, Hydraulic, Mechanical conduits/Services, etc. are securely in place ▪ Cover to formwork faces is ≥ 50mm, unless otherwise specified on design drawings ▪ Where a sheet of fabric has been cut so that the outermost wire parallel to an edge of the concrete is more than 20 mm	R53.4 Design Drawings		Verification Checklist	IP	Site Engineer			

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			from the end of the transverse wires or the wires are not parallel to the edge, tie a D500N12 bar to the edge of the fabric. ▪ Use concrete or plastic chairs only; where concrete chairs are used, ensure they are of the same compressive strength as the concrete mix design to be used in the pour ▪ Place caps over exposed ends of reo bars for WHS purposes, retain caps in place until ready to pour								
14	**Placement**										
15	Commence with pre pour planning activities	Per Lot	▪ Areas free of water & construction debris removed ▪ Rain not imminent, air temperature between 5-38°C ▪ Concrete tester arranged as required ▪ Penetrations securely covered or isolated ▪ Revetment mattress prepared if to be filled with grout	R53.6.1 R53.6.3 CMS		Verification Checklist	IP	Site Engineer			
16	Placing of concrete, mortar or grout	Per Lot	Notify TFNSW Representative, 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 (if applicable) will be completed and when concrete, mortar or grout will be placed, and where washout of delivery vehicles & cleaning tools will take place	R53.6.1		Witness Point No.:……....	WP	Site Engineer			
17	(Where nominated in the relevant specification) Hold Point for Placing of Concrete	Per Lot	Notify TFNSW Representative, 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 (if applicable) will be completed and when concrete, mortar or grout will be placed, and where washout of delivery vehicles & cleaning tools will take place	R53.6.1		Hold Point No.:……....	HP	Site Engineer			
18	Carry out the concrete pour	Per Lot	▪ Concrete docket checked for correct mix ▪ Slump and cylinders sampled. For sprayed concrete test the compaction by using 75 mm diameter cores taken from the in-place sprayed concrete ▪ If concrete is placed in a deep formwork it is not allowed to drop freely inside the formwork more than 1.2m. Concrete is placed through a rigid tube to ensure it does not segregate	R53.6 CMS		Concrete Pour Record Sheet	IP	Site Engineer			

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			due to aggregate hitting the reinforcement ▪ Concrete is being spread and compacted adequately to produce a homogeneous product monolithic between joints and edges ▪ No mortar leaks or movement in formwork, reo or embedment ▪ Ensure entrapped air is expelled and concrete surrounds all reinforcement & embedments ▪ Provide specified thickness, cover & surface finish ▪ Unless specified otherwise, do not finish unformed surface with wood float ▪ Monitor evaporation of water from concrete surface and prevent plastic shrinkage cracking								
19	Post Pour										
20	Curing the concrete	Per Lot	▪ Only approved curing compound and approved curing compound application methodology to be used ▪ After initial set of concrete, apply curing and cure for at least 7 days ▪ Curing compound thoroughly mixed, applied according to manufacturer's recommendations or at a spray rate of 0.2L/m^2, whichever is greater ▪ Ensure all exposed surfaces receive a uniform cover of the curing compound ▪ For moist curing, ensure curing water is free from ingredients harmful to concrete	R53.7 CMS		Verification Checklist	IP	Site Engineer			
21	Stripping formwork	Per Lot	Minimum Stripping times: ▪ 7 MPa for vertical foTfNSW on external surfaces ▪ 80% of $f_{c,min}$ for vertical foTfNSW on permanently hidden surfaces ▪ After stripping and before applying curing compound, moisten formed surfaces by light spraying ▪ Apply curing within 30 minutes of removal of formwork if minimum curing period not served ▪ 2 days for vertical foTfNSW on external surfaces ▪ 1 day for vertical foTfNSW on permanently hidden surfaces	B80.5.9.2 R53.7.3 R53.3.3		Verification Checklist	IP	Site Engineer			

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			▪ 24 hrs notice will be provided to TFNSW Representative prior to removing formwork								
22	Inspect concrete Surface Finish/Class	Per Lot	▪ Surface finish is in compliance with Class 3 for external surfaces and Class 4 for hidden surfaces ▪ Cracks are less than 0.05 mm – any cracks to be identified as nonconformities and require NCR ▪ Finished unformed concrete surfaces to be neat, clean and specified texture If any NCR required, NCR No.: ……..	R53.3.2 R53.6.4 R53.8		Verification Checklist	IP	Site Engineer			
23	Check the tolerance of finished level and dimensions where specified in relevant Specifications	Per Lot	Finished level to be within tolerance where specified in Specifications or on design drawings	R53.9 Design dwgs		Survey Report	SCP	Surveyor			
24	Check conformance of concrete test results if required	R53/L	Test certificates received, reviewed and conforming to R53/E if Project Assessment Required: ▪ Slump (1 / first 3 batches at the start and then 1 per 4 batches) ▪ Compressive strength ▪ Compaction of sprayed concrete (1 pair per 50 m^3 and min of 2 pair per pour) ▪ Grout compressive strength (1 pair per 20m^3 and min of 2 pairs)	R53/E	AS1012.3.1 AS1012.9	Test Reports	TP	Site Engineer			

Final Inspection

The signature below verifies that this ITP has been completed in accordance with the Fulton Hogan's Quality system Procedures and verifies lot compliance with specifications.

Print Name: **Position:** **Signature:** **Date:** / /

Legend:

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

Notes