

		Inspection and Test Plan – Control and Supervision of the Works		Doc ID: FH-ZU2-QU-ITP013 Rev: 2	
Principal: Melbourne Airport (APAM)			Contract No: CP14038		Prepared By: Abdul Saad
Project: Taxiway Zulu 2.0				Reviewed By: Michael Natalizio	Date: 17/09/2024
Construction Process: Portland Cement Concrete (PCC) - Placement				Approved By: Angela Julianto	Date: 17/09/2024
Specifications: ZULU-BECA-001-SPC-00002 – Revision C04					
Structure / Component: Portland Cement Concrete (PCC)					

Lot No:	Lot Details:	Lot size/Quantity:	Date:
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		Frequency	Acceptance Criteria	Reference Documents	Inspection/ Test Method	Record of Conformity			Principal's Representative	Fulton Hogan	Date
1.0	Preliminary Activities										
1.1	Check for correct documentation	Prior to commencing works	Current revision of drawings, technical specifications and any other construction documentation is being utilised by Fulton Hogan and subcontractors. Current revisions of these documents to be obtained via Aconex or ACC.	Current Revisions in Aconex or ACC	Verify	This ITP signed	HP*	Project / Site Engineer			
1.2	Implementation of all measures and controls	Prior to commencing works	All necessary measures and controls are being implemented, that is: PSP, EMP, TMP, SWMS & WMS	PSP, EMP, TMP, SWMS, WMS	Visual Inspection	This ITP signed	HP*	Project / Site Engineer			
1.3	Mix Design Report Submission and Approval	Prior to commencing works	Theoretical mix design and preliminary trial mix results submitted in a report to the Contract Administrator for review and acceptance prior to full trial mixing.	Beca Spec 002 - 11.5.3	Verify	Aconex Reference	HP	Project / Site Engineer Principal's Representative	40mm mix (VF509BW45): BecaCPL-GCOR-000846 01/06/2024 20mm mix (VF502BW45): BecaCPL-GCOR-001287 08/11/2024		
1.4	Job Mix Formula	Prior to commencing works	The Job Mix Formula must state the mass proportion of all ingredients per cubic metre of concrete. The allowable limits in the Job Mix Formula (when compared to the agreed theoretical concrete mix design) must be in accordance with Table 11-2 of BECA 11.5.4 (see notes section).	Beca Spec 002 - 11.5.4	Verify	Aconex Reference	WP	Project / Site Engineer Principal's Representative	40mm mix (VF509BW45): BecaCPL-GCOR-000839 30/05/2024 20mm mix (VF502BW45): BecaCPL-GCOR-001287 08/11/2024		

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1.5	Production and Construction Trials	Prior to commencing works	A production and construction trial must be completed as per the requirements in the specification. The results, control procedures, construction methods and completed trial pavement will be presented for review and approval by the Contract Administrator.	Beca Spec 002 - 11.6.1 to 11.6.4	Verify	Aconex Reference	HP	Project / Site Engineer Principal's Representative	40mm mix (VF509BW45): DCWC Mgt-GCOR-009917 19/08/2024 20mm mix (VF502BW45): BecaCPL-GCOR-001287 08/11/2024		
1.6	Curing Compound Material Submission	Prior to use of curing compound	Membrane curing compounds shall be a white pigmented type confirming to AS 3799, Type 2. Wax based compounds shall not be used. No compound shall be used without written approval by the Contract Administrator.	Beca Spec 002 - 11.4.11.1	Verify	Aconex Reference	HP	Project / Site Engineer Principal's Representative	BecaCPL-GCOR-000791 22/05/2024		
1.7	Impermeable Blanket Material Submission	Prior to use of impermeable blanket	If required to be used , impermeable blankets shall comply with the requirements of ASTM C.171. The blankets shall have sufficient strength and weight to meet the required conditions of service and shall be approved by the Contract Administrator before use.	Beca Spec 002 - 11.4.11.2	Verify	Aconex Reference	HP	Project / Site Engineer Principal's Representative			
2.0	Pre-Placement Activities										

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2.1	Formwork Installation & Pre-pour Inspection	Prior to placing concrete	Formwork must rest firmly on the base to eliminate gaps and ensure no leakage of concrete will occur during placement. Formwork must be secured into position and locked together during placing, spreading and finishing of the concrete. The top of the form must not deviate by more than 3mm from the required level. The form face shall be vertical and not vary more than 6mm from the required alignment. The area in which concrete is proposed to be placed shall be inspected and checked immediately prior to commencement of placing.	Beca Spec 002 - 11.8.1.1, 11.9.1	Visual inspection	This ITP signed	WP	Project / Site Engineer Principal's Representative			
2.2	Pre-pour checklist	Prior to placing concrete	Completion of the pre-pour checklist: CL013A – Pre-Pour Checklist which details various checks required for formwork, reinforcement, joints and the pour area.	Beca Spec 002 - 11.8, 11.10, 11.13	Visual inspection	CL013A This ITP signed	HP*	Project / Site Engineer			
2.3	Pre-pour inspection	Prior to placing concrete	The area in which concrete is proposed to be placed shall be inspected and checked immediately prior to commencement of placing.	Beca Spec 002 – 11.9.1	Visual inspection	This ITP signed	WP	Project / Site Engineer Principal's Representative			
2.3	Weather Forecast Checks	Prior to placing concrete	Check the weather forecast for unfavourable conditions (rain, wind, hot weather or cold weather) on the day prior and immediately before confirming	Beca Spec 002 - 11.9.5.1	Verify	This ITP signed	HP*	Project / Site Engineer			
3.0	Placing Concrete										

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3.1	Place, Spread and Compact Concrete	Each concrete pour	Concrete placement must be at a rate appropriate to achieve a consistent high quality resulting pavement. During placing, the concrete must not drop freely by more than one metre onto the base of the paving lane. Concrete shall be placed uniformly over the width of the slab and in a way to minimise segregation. Concrete to be adequately compacted by internal mechanical vibration.	Beca Spec 002 - 11.9.1, 11.9.4, 11.11.2.1	Visual inspection	This ITP signed	IP	Project / Site Engineer			
3.2	Concrete Deliveries	Each concrete pour	Each concrete delivery to site is to be recorded on CL013B – Concrete Pour Record Sheet . Concrete shall be placed within 90 minutes from the time of batching and before the concrete has attained its initial set. The pour location, direction and order to be recorded on CL013C – Load-Batch Traceability .	Beca Spec 002 - 11.9.1	Verify	CL013B CL013C This ITP signed	IP	Project / Site Engineer			
3.3	Evaporation Rate	Each concrete pour	Concrete must not be when the evaporation rate from the surface of unprotected concrete is in excess of one (1) kg/m ² /hr. When the evaporation rate exceeds 0.6 kg/m ² /hr, precautionary measures to prevent plastic shrinkage shall be taken. Evaporation rate to be recorded on CL013D – Rate of Evaporation .	Beca Spec 002 - 11.9.5.2	Verify	CL013D This ITP signed	IP	Project / Site Engineer			

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3.4	Hot Weather Concreting	Each concrete pour	Undertake additional precautions when placing concrete in hot weather. Ensure the concrete is placed at the coolest temperature practicable – the concrete temperature should not exceed 32°C.	Beca Spec 002 - 11.9.5.3	Verify	CL013B This ITP signed	IP	Project / Site Engineer			
3.5	Cold Weather Concreting	Each concrete pour during 'cold weather concreting' conditions	Cold weather concreting applies when placing concrete when the temperature of the air, aggregates or water is below 10°C. Placement of concrete can only proceed if the ground temperature at the concreting site is greater than 5°C and the temperature of the concrete is not below 10°C. Refer to checklist CL013E – Cold Weather Concreting for ground temperature records.	Beca Spec 002 - 11.9.5.4	Verify	CL013B CL013E This ITP signed	IP	Project / Site Engineer			
3.6	Concrete Surface Finishing	Each concrete pour	Finishing operations shall compose transverse finishing, longitudinal straight-edge finishing, floating and broom finishing, in that order. Finishing operations must be started immediately after compaction of the concrete and completed as soon as possible but not later than 90 minutes from the time of batching and prior to the concrete attaining its initial set.	Beca Spec 002 - 11.11.2.2	Visual Inspection	This ITP signed	IP	Project / Site Engineer			
4.0	Sampling and Testing Concrete										

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4.1	Slump	1 test every 2 trucks	60mm +/- 10mm	Beca Spec 002 - 11.24.17 BecaCPL-GCOR-000846	AS 1012.3.1	NATA Test Certificate	TP	Project / Site Engineer Laboratory Technician			
4.2	Temperature	1 test every 2 trucks	Minimum 15°C (except in cold weather concreting where minimum is 10°C) Maximum 32°C	Beca Spec 002 - 11.24.16	AS 1012.3.1	NATA Test Certificate	TP	Project / Site Engineer Laboratory Technician			
4.3	Flexural Strength (7 day)	First 5 lots: 2 Beams per 75m3 or part thereof. After 5 lots: 1 Beam per 75m3 or part thereof.	Results for information only	Beca Spec 002 - 11.24.10	AS 1012.11	NATA Test Certificate	TP	Project / Site Engineer Laboratory Technician			
4.4	Flexural Strength (28 day)	First 5 lots: 2 Beams per 75m3 or part thereof. After 5 lots: 2 Beams per 75m3 or part thereof.	Mean of the pair of beams > 5.0 MPa Individual beams > 4.8 MPa	Beca Spec 002 - 11.24.10	AS 1012.11	NATA Test Certificate	TP	Project / Site Engineer Laboratory Technician			

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4.5	Air Content	1 test per Lot	3% - 5% ±1%	Beca Spec 002 - 11.24.8 11.24.9	AS 1012.4.1 or 1012.4.2	NATA Test Certificate	TP	Project / Site Engineer Laboratory Technician			
4.6	Mass Per Unit Volume	1 test per Lot	Results for information only	Beca Spec 002 - 11.24.9	AS 1012.5	NATA Test Certificate	TP	Project / Site Engineer Laboratory Technician			
4.7	Wet Analysis	1 test per Lot	Results for information only	Beca Spec 002 - 11.24.9	AS 1289.3.6.1	NATA Test Certificate	TP	Project / Site Engineer Laboratory Technician			
4.8	Concrete Core Analysis (Density & Compressive Strength)	First 10 lots: 6 cores per Lot After 10 lots: 1 core per 75m3 or part thereof	Cores must be not less than 120mm diameter. Calculate the degree of compaction by comparing the density of individual cores with the average density of flexural test beams (exclude beams whose density is less than 97.5% of maximum theoretical density). Refer to notes section for acceptance requirements. If a lot requires 3 or more cores, one third of the cores taken shall not be tested for density but shall be tested for compressive strength and results submitted for information purposes only. Refer Aconex: DCWC Mgt-RTRFI-001244	Beca Spec 002 - 11.24.12	AS 1012.12 AS 1012.9	NATA Test Certificate	TP	Project / Site Engineer Laboratory Technician			

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5.0	Post-Placement										
5.1	Curing	Each concrete pour	Concrete shall be cured by protection against loss of moisture and rapid temperature changes for a period of not less than seven (7) days from completion of the finishing operations. Curing of the concrete shall comprise an initial mist curing followed as soon as possible with continuous wet curing with hessian matting for the duration of curing period.	Beca Spec 002 - 11.12.4	Visual Inspection	This ITP signed	IP	Project / Site Engineer			
5.2	Cold Weather Concreting Concrete Protection	Each concrete pour during 'cold weather concreting' conditions	The surface of the concrete must be maintained at a temperature of at least 10°C, for not less than 72 hours after placing and at a surface temperature above freezing (0°C) for the remainder of the curing period. Concrete surface temperatures post-pour to be recorded on checklist CL013E – Cold Weather Concreting .	Beca Spec 002 - 11.9.5.4	Verify	CL013E	IP	Project / Site Engineer			
5.3	Inducement Saw Cutting	Each concrete pour	An initial 3-5mm wide saw cut to a depth of T/4 to T/3 where 'T' is the concrete thickness (generally 150mm) is performed along transverse contraction joints as early as possible post pour. The concrete must harden sufficiently to permit cutting the concrete without excessive chipping, spalling, or tearing.	Beca Spec 002 - 11.13.5.2	Visual Inspection	This ITP signed	IP	Project / Site Engineer			

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5.4	Formwork Removal	Each concrete pour	Forms must remain in place at least 12 hours after the concrete has been placed (but no longer than 48 hours).	Beca Spec 002 - 11.8.1.3	Verify	This ITP signed	IP	Project / Site Engineer			
6.0 Completion											
6.1	Surface Smoothness Testing	Per Lot	The finished surfaces of the concrete pavements shall not deviate from the testing edge of an approved 3.5m straight-edge more than 5mm longitudinally and 5mm transversely. No ponding of water is permitted. Points exceeding tolerances and any observed areas of ponding water will be recorded on ArcGIS.	Beca Spec 002 - 11.14.3	Visual Inspection	ArcGIS This ITP Signed	IP	Project / Site Engineer			
6.2	Pavement Surface Levels	Per Lot	The Contractor shall take levels on the finished pavement surface at the corner of each slab. The finished surface levels taken shall be within ±5mm of the design levels shown on the Drawings. The levels shall be measured to an accuracy of 2mm.	Beca Spec 002 - 11.14.2	Verify	Conformance Report	SCP	Project / Site Engineer Surveyor			
6.3	Protection of Slabs	Per Lot	Concrete pavement must not be trafficked until 7 days old or early strength results are obtained. Steel tracked or steel wheeled equipment is not to be used.	Beca Spec 002 - 11.17	Verify	This ITP signed	IP	Project / Site Engineer			

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6.4	Defects to Slabs	Per Lot	Check for any nonconforming defects (cracks) in the concrete slabs.	Beca Spec 002 - 11.19	Verify	This ITP signed	IP	Project / 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 Superintendent	IP	Inspection point	Formal Inspection to be done and recorded
HP*	Fulton Hogan 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 Superintendent	SCP	Survey conformance point	A qualified surveyor to check product/section/structure and report
AP	Approval Point	Written or verbal approval given by the Superintendent			

Notes

Table 11-2 – Approved Limits on Job Mix Formula (BECA 11.5.4)

Combined Aggregate Grading		% Passing Sieve - Variation from Agreed Mix Design Quantity
Aggregate passing 4.75mm sieve or larger		± 4
Aggregate passing AS sieves from 2.36mm to 0.600mm		± 3
Aggregate passing 0.300mm AS sieve		± 2
Aggregate passing 0.15mm and 0.075mm AS sieve		± 2
Material		% of Mix Design Quantity
Cement		± 1
Admixtures		± 3
Water		+0 as required for workability
Property		Value
Water-cement ratio		Not greater than 0.45

Section 11.24.13 – Density of Concrete Pavement

If the **degree of compaction** for any sub-lot of pavement:

- a) **≥ 98.5%** then the sub-lot is compliant for density requirements; or
- b) **≤ 97.0%** then the sub-lot is non-compliant for density requirements and shall be rejected; or
- c) **Is between 98.5% and 97.0%** then an additional core must be cut from the sub-lot

Then if the average degree of compaction of the two (2) cores from the sub-lot:

- d) **≥ 98.5%** then the sub-lot is compliant for density requirements; or
- e) **< 98.5%** then the sub-lot is non-compliant for density requirements and shall be rejected.