Canberra Airport Taxiway Bravo Extension

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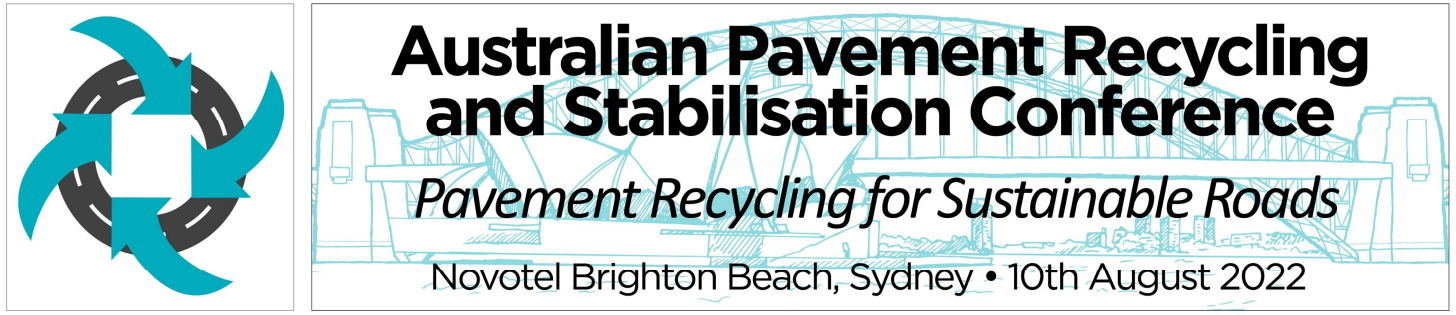
Downer EDI



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Introduction

Client: Canberra Airport

Project: Taxiway Bravo Extension

Location: Canberra, ACT

Commencement: October 2019

Completion: July 2020

Design Consultant: GHD

Downer Capability:

Ex Situ Foam Bitumen Stabilisation & Placement

Asphalt Production & Placement

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Project Overview

- The northern extension of Taxiway Bravo at Canberra Airport, allows the efficient operation of the Canberra Airports main Runway 17/35
- The project consists of 1.5kms of new pavement and associated infrastructure
- Pavement construction adjacent to runway, consisting of lean mix concrete subbase and foam bitumen stabilised base with asphalt wearing course

Downer Delivery

- Production & placement of Foam Bitumen Stabilised (FBS) Crushed Rock, using mobile KMA220 Pugmill (Under Curfew) 2 x layers to form 250mm layer thickness
- Installation & removal of temporary ramps during FBS programme (Under Curfew)
- Cutback Bitumen Prime coat application to all crushed rock base on aircraft pavements and associated shoulders
- Cold milling & Tie-in to existing interfaces at Runway17/35, TWY Bravo, TWY Foxtrot & TWY Delta
- Production, delivery & placement of asphalt from fixed asphalt production facility, Hume ACT

The task at hand

Key Facts

- Mobilisation & Establishment of KMA Pugmill from Qld to Canberra Airport
- Source local Aggregate supplier
- Establish Mix Design with 100% virgin crushed graded 20mm fine crushed rock
- Ex-Situ Production Foam Bitumen Base (FBB), using mobile KMA220 Pugmill (Under Curfew/Night shift)
- Ex-situ placement (by paver) of FBB in 2 x layers to form 250mm overall layer thickness – Average 385t placed per Shift

Key Plant	Wirtgen KMA 220 Mobile Pugmill (Foamed Bitumen) Vogele Super 1800-3 Tracked Paver
Pavement Level Control	Paveset Level Control
Expedient Pavement	7,300m2 TWY Echo & TWY Foxtrot
Material	4,600t Foam Bitumen Stabilised Crushed Rock
Working Shifts	12no.

Establishment

KMA Plant Set up

Removal of Temporary Ramps

Delivery

Taxiway Echo

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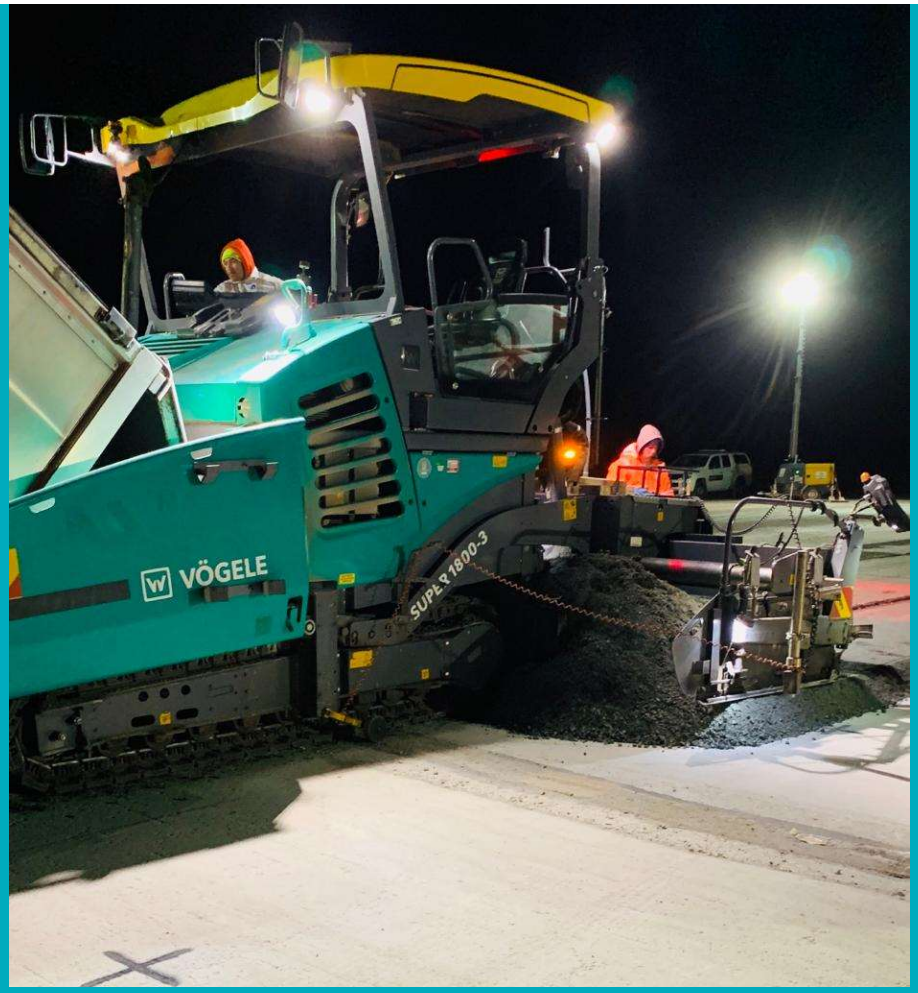
Taxiway Foxtrot



Vogele Super 1800-3 Tracked Paver

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Taxiway Foxtrot

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Time Lapse - Shift 11

Footage courtesy of Canberra Airport & Huon Contractors

Activity	Detail	Start	Finish	Comment	Run No	Start Run	Finish Run	Tonnes per Run	Prog. Tonnes (inc. wastage)	Comments
Toolbox Meeting	Site Compound	14:00	14:30	FBS Production Team	Actual					
	Site Compound	22:00	22:45	FBS Placement Team & Subbies.	1	01:00	01:16	67	67	TWY Foxtrot - Layer 2 - Straight Runs
Security Checks	TBC	22:45	23:15		2	01:26	01:42	67	135	TWY Foxtrot - Layer 2 - Straight Runs
Site Handed Over		23:45	0:00	WSOs to place U/S Cones	3	01:52	02:08	67	202	TWY Foxtrot - Layer 2 - Straight Runs
Establish on Site		0:00	0:10	Establish light towers and traffic management	4	02:18	02:34	67	269	TWY Foxtrot - Layer 2 - Straight Runs
Cut Ramp & Proof Roll		0:10	1:00	Use Front-End Loader and 2 Rigids	5	02:44	03:00	67	336	TWY Foxtrot - Layer 2 - Straight Runs
Prep Site	Sweeping	1:00	1:30		6	03:10	03:26	67	404	TWY Foxtrot - Layer 2 - Straight Runs
Survey	Set Out & Mark Paving Runs	0:30	2:08		7	03:36	03:52	67	471	TWY Foxtrot - Layer 2 - Straight Runs
FBS Laying TWY Foxtrot		1:00	3:52	Long straight runs, thus large volume FBS FCR						
Compaction		1:20	4:30	Excl. Temp Ramps Compaction	Temporary Ramp					
Testing	In-Situ Tests	3:00	4:45			-	-	0		RWY Adjacent - Static Roll
Surveying	Finish surface pick up	1:52	4:45			-	-	0		Longitudinal - Static Roll
Temp Ramp	Laying & Static Roll (FCR)	3:36	4:00				04:30	Finish Rolling of Placed FBS (excl. Ramps)		
	Bitumen Emulsion	4:00	4:20				125	Average Thickness (mm)		
Site Cleanup	0:15	4:30	4:45				0	Paving Tonnes (excl. Ramps)		
Final FOD Check	0:15	4:45	5:00				Stockpile	Paving Tonnes/hour		
Site Handed Back		5:00					varies	Run Length (m)		

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Project Challenges

- Most significant challenges was completing the works within the short night curfew of 00: 00 to 05:00
- Removal & Installation of temporary ramps (Select Fill & FBB) to maintain compliance to MOS 139, each shift
- Technical specification required the FBB to be constructed in a total thickness of 250mm, but no greater than a single 200mm layer thickness
- Paving the Taxiway Shapes
- Inclement weather experienced during the FBB programme
- Managing the daily deliveries of ex-situ raw materials in a restricted area. Also, managing bitumen & lime deliveries Ex-Sydney

Key Outcomes

- Placement of Ex-Situ FBB by paver provided consistent layers of the required thickness, uniform density and without segregation. Also avoided the disturbance to underlying layers
- Paver placement of FBB materials, enabled efficient planning of the shifts in a small working window, minimising quality issues and maximising waste control
- The use of paving equipment with pre-compaction devices i.e. vertical oscillating tamper blades, maximises initial compaction at placement, therefore, enabling optimum productivity each shift
- The use of level control system ensured a single paved run & efficient compaction – No trimming required
- The works completed on time and within budget, No incidents or MTI's or LTI's recorded
- Post FBB works, Downer successfully delivered all 14mm A10E Asphalt works approx. 12,000t

Conclusion

- Foam bitumen stabilisation process, has provided improved strength of the granular materials while retaining a flexible pavement in critical aircraft turning locations
- Through the use of Foamed Bitumen Stabilisation at TWY Echo & TWY Foxtrot, the expedient pavement will exhibit superior fatigue properties, which will result in a benefit for whole of life costs for Canberra Airport
- This project demonstrates that Ex-situ Foam Bitumen Stabilisation is a viable pavement solution and method, working within the constraints of an operational airfield environment

Thank you

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