

## Project Profile



<b>Client</b>	JLL Augility
<b>Location</b>	Woomera, South Australia
<b>Value</b>	\$16.5 million
<b>Duration</b>	March 2019 to August 2019
<b>Type</b>	Lump Sum Construct Only

## Project Overview

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The Department of Defence's Woomera Range Complex located in South Australia, approximately 500km northwest of Adelaide, is comprised of the Woomera Test Range, RAAF Base Woomera and the Nurrungar Test Range.

The function of the Woomera Test Range is to provide a specialised operations environment in support of directed whole-of-Defence activities for the testing of war materiel and other activities in the wider national interest. The range also supports a wide variety of trials covering many Defence related technologies including ground-based weapons systems, explosive ordnance and hazardous materials, and specialised force preparation activities. The Woomera Test Range is managed by Air Force Test Ranges Squadron, a command unit of the Air Warfare Centre.

### Scope of Work

The 38.1km Range E Access Road is part of the local road network and runs east to northwest connecting Woomera Defence facilities to the Woomera Range. The project scope of works included road and shoulder repair, pavements including stabilisation and bituminous surfacing, stormwater including the replacement of two culvert structures, remediation and repair of existing culvert structures, and new road safety furniture including new w-beam safety barriers, signage and reflector guide posts.

Overall, the project team completed 76km of road shoulder repair, 215,000m<sup>2</sup> of pavement lime stabilisation, 235,000m<sup>2</sup> of spray seal, 4800m<sup>2</sup> of road reconstruction and stormwater upgrade along 38.1km of road.

Tech Road included culvert replacement up to 1200mm by 900mm triple cells, 8km of new shoulder construction, 5500m<sup>2</sup> of pavement lime and cement stabilisation and 36,000m<sup>2</sup> of spray seal. Road upgrade works in the Village included 3000m<sup>2</sup> of road reconstruction, 35,000m<sup>2</sup> of spray seal and 500m of concrete kerbing and spoon drains.

As the site location is 500km from Adelaide, construction planning was critical to ensure resources and material would be available on time and be used efficiently. At peak time, the project had 50 site personnel and large numbers of plant and trucks that included E85, PC130 and PC300 excavators, 12M and 140M graders, road profilers, scrapers, L250 front end loaders, road trains, 6t tippers, 10t rollers, service trucks, skid steers, pumps, portable traffic lights, 12,000L water trucks, 20kVA generators.

Main works were completed six weeks ahead of program. Project is targeted to achieve a 35% Indigenous Participation rate.

## **Innovations**

### **Real time kinematic GPS surveying of as built roads**

As built surveying of completed roads was undertaken using real-time kinematic (RTK) GPS sensor mounted on a vehicle to record completed road centre lines, and bitumen edges. The real-time kinematic GPS sensors uses measurements from a base station mounted sensor as well as GPS positioning and a sensor mounted on a vehicle to provide centimetre-level accuracy of data.

The alternate method of survey would have required a two-person crew stopping every 20m to take three manual survey points, potentially taking up to two weeks to complete the survey for this project. With the vehicle mounted sensors, all as built surveying was completed in one and a half days.

### **Road profiler to double construction rates**

Road profilers were used instead of traditional excavation equipment for the subgrade box-out works which resulted in an increase in construction rates of 100%. This innovation in part allowed the project to be completed six weeks ahead of schedule.

## **Project Challenges**

### **Limited water supply**

Stabilisation works requires significant quantities of water which was not possible to obtain on a continuous basis from mains water as local supplies were limited and fill times could take up to 45 minutes per 12,000L water truck. To minimise delays to the work, multiple supply points utilised 50,000L water tanks filled on a continuous basis. 6' pumps and supply pipes from the tanks allowed for water trucks to be filled in as little as five minutes.

### **Winter spray seal works**

The original design called for S20E hot binder sealing, which could only be laid when temperatures were over 20oC. As the works were undertaken in the winter, and the road only had low traffic volumes, it was decided that the original design was not required. The project team proposed an alternative mix suitable for the traffic volumes that could be applied in cold conditions with a higher application rate that suited Defence's requirements.

### **Traffic management**

Range E Road was a 6m wide sealed road and was required to be open at all times to traffic, leaving little manoeuvrability for overtaking and had the potential to delay traffic in regions where construction works were underway. Construction methodology

therefore required a revision to significantly reduce standby times, such as maximising plant movements so that productivity targets were over-achieved and impacts to Defence traffic was minimised.

## Road shoulder repair

The existing shoulder on Range E Road had been severely damaged by construction vehicles in the past resulting in a significant drop-off between the edge of the seal and the shoulder. Intract in appreciation of Defence's limited budget that had not allowed for these works in the scope of the contract, developed an economical solution utilising onsite plant and resources. These works helped Defence save millions of dollars in future repair works by completed a 1.0m shoulder on each side of the road with little additional costs to the works.

## Community Engagement

### Support for Neil Murray Fundraiser in Woomera

Intract Australia with McMahon Services sponsored a local community event at the Woomera Theatre on 30 July 2019, a performance by singer and songwriter Neil Murray.

Neil is a founding member of the pioneering Warumpi Band, who brought Indigenous contemporary songs such as, My Island Home, Blackfella Whitefella and Fitzroy Crossing into the Australian mainstream music industry. Neil was joined on stage with opening act 'The Dusty Feet Mob', an Aboriginal dance group from Port Augusta. The event was attended by over 100 community members.

The event also raised funds for the local Lincoln Park Horse and Human Rehabilitation Centre that offers equine therapy as an alternative to clinical counselling for veterans and the general public and also homes rescue horses.



# Woomera Civil Works Edinburgh Defence Precinct

