HIGHWAY CONSTRUCTION

Project Profile

Great Northern Highway/North West Coastal Highway Intersection Upgrade, Port Hedland, WA

Re-prioritisation of a key intersection enables free-flowing movement for trucks on a major freight route

PROJECT DESCRIPTION

The Great Northern Highway (GNH) and North West Coastal Highway (NWCH) are the two main north-south routes between Perth and the north of Western Australia.

The GNH typically carries high volumes of heavy vehicle traffic between Newman and Port Hedland; and the NWCH coastal route carries tourist traffic and lighter freight vehicles between Karratha and Port Hedland.

Port Hedland has also taken its place as the busiest port (by tonnage) in the World, as the iron ore juniors are without access to a mine-to-port rail link and use the road network as their primary transportation route.

As a result, the time taken for heavy vehicle road traffic to travel between the port can have significant cost considerations for the iron ore juniors and the wider WA freight industry, with seemingly minor delays at intersections adding up to millions of dollars per year.

The configuration where the GNH intersected with the NWCH was originally a simple t-junction. This meant heavy vehicle traffic travelling north was required to stop before making a right turn from the GNH onto the NWCH to proceed northwards to Port Hedland.

Works to upgrade this intersection were therefore commissioned to eliminate the old t-junction to allow heavy vehicle traffic a free-flow of movement between Newman and Port Hedland. The NWCH was then realigned to form a t-junction.

The majority of truck movements, up to a super quad length of 60 metres, now enjoy the priority movement through this modified intersection.

SCOPE OF WORKS

- Construction of a new intersection at Great Northern Highway (GNH) and North West Coastal Highway (NWH) within the town of Port Hedland (SLK 1576.5 to SLK. 1577.95);
- Material pit sourcing and development, earthworks, improved subgrade, pavements, seal and asphalt;
- Drainage including box culvert, concrete pipe and open drains;
- Solar lighting installations; and
- Traffic Management services.

CONTRACT

41/15 - AS2124
construct only (roadworks)

CLIENT

Main Roads WA

PRE-QUALIFICATION

R3

TIMEFRAME

Jun 2016 - Nov 2016

LOCATION

Port Hedland, WA

PROJECT VALUE

$3.6 million

PROJECT MANAGEMENT & CONSTRUCTION TECHNIQUES

Partnership and collaboration

Natural materials are generally favoured for use as basecourse in the Pilbara region due to obvious cost advantages over using quarried materials.

However, the natural basecourse material identified at tender stage for this project proved unsuitable for the project's traffic loading.

As a result, Highway Construction and Main Roads WA worked together to determine the final solution, which involved the precise mixing of two different materials.

Environmental considerations

Water use was minimised through the use of a wetmixer to condition materials from subgrade through to basecourse.

Water was also sourced from a Main Roads WA bore on an adjacent cattle station involving regular liaison with the station manager to ensure stock remained secure.

Our team was also able to provide machinery and personnel to assist with a significant bushfire in the area.

Maximising use of local supplier networks

The Highway Construction team was able to invest approximately 30 per cent of project expenditure into the local supplier and contractor network. Additionally, the key material cartage subcontract was awarded to a subcontractor from the adjacent Kimberley region.

Aboriginal heritage management

Access to the subbase material pit was via the Yandeyarra Community Road. Traffic Management and signage had to be set-up with this in mind to control interface between light vehicles going to and from the community, and the triple road trains carting to and from the subbase pit. This interface and the control measures put in place formed part of the site induction.

A change in the basecourse pit location required diligent checking and confirmation of heritage clearances prior to pit development.

OVERCOMING KEY CHALLENGES

As with any road subject to high ambient temperatures and high percentages of heavy vehicles, the seal design is always a balanced compromise between the risk of immediate aggregate stripping and longer-term bitumen flushing.

Main Roads WA specified up to 16 different application rates across the different lanes of the two roads, so our team worked closely with the sealing contractor to ensure the bitumen was applied at the design rate.

Traffic Management

Traffic management was staged and included the use of both portable traffic signals and traffic controllers to ensure all movements were maintained with minimal disruption throughout the construction period.

Due to the 24/7 cartage activity from the iron ore juniors, there was a steady flow of traffic rather than peak/off peak periods. The significant heavy vehicle traffic, grey nomad tourist traffic and changed intersection configuration therefore required the precise use and auditing of signage and variable message boards to ensure changes to the traffic configuration were clear and effective.

REFEREES

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