



# SIKA AT WORK

## BAMAGA STORM WATER DRAIN CONCRETE CHANNELS

Providing concrete reinforcement with Fibres

BUILDING TRUST





# PROJECT OVERVIEW

## PROJECT DESCRIPTION

Some parts of NPARC get affected by floods every year during the storm season even though they have the network of large earth channels. The water flow velocity and the capacity of the earth channels weaken due to the vegetation and infill debris. Therefore, NPARC receives funding from state government to re-excavate and concrete the channel network in Bamaga, Injinoo, New Mapoon and Umagico communities. The funding started 2017 and will be followed by a couple of years to complete the whole network.

Bamaga is the capital of NPARC, 1000km north of Cairns in QLD and there are no sealed roads from Cairns to Bamaga. Therefore, all the goods are transported by ferry which takes about 3-4 days. Transportation of steel in this manner is quite difficult and it is also difficult to protect steel from sea spray during the journey.

This Project which consists of box culvert bases and channels, was designed by RECS Engineers Port Douglas. At the design phase of the project, RECS requested an alternative fibre proposal from Sika as they have used macro poly fibre for the Bamaga Helipad in 2016.





# PROJECT REQUIREMENTS

## PROJECT DESCRIPTION CONT.

Box culvert bases: Two 3 cell & 5 cell box culvert bases for Burster Creek Crossing were designed with FRC to minimise the amount of reinforcement use and also to speed up the construction. The total volume of 32/80/20 concrete required for the bases was 200m<sup>3</sup>.

Channels: Cross section of some of the open cut drains were over 10m wide and the shoulders were 1-3m. Expansion joints were at 8m intervals and the designed thickness of the concrete was 100mm. Grade of the proposed concrete was 25MPa which supplied from NPRAC ready mix plant which is the only concrete plant in the region.

## PROJECT REQUIREMENTS

The Concrete should be easily placed and finished without complex procedures due to lack of skilled labour in the area. The Concrete needed to be placed on the machine-trimmed red soil and with minimum amount of steel due to the fact that steel mesh is almost impossible to position pertinently, particularly on channel shoulders.

It has minimal cracks with high abrasion resistance and minimum steel reinforcement usage. It also required faster construction with limited formwork.





# SIKA'S REINFORCED FIBRE SOLUTION

## SIKA SOLUTION

Movement joints were designed at maximum 10m intervals and 600mm N12@ 300cc steel bars were placed at the middle of the MJ according to the engineer's specification. Concreting of the channel shoulders were done prior to the channel base and channel base was casted immediately after the shoulder to eliminate cold joints.

Box culvert bases: Considering the flexural reinforcements in culvert basset according to TMR standard, SikaFiber Force PP48 dosage rate of 5kg/m<sup>3</sup> was proposed to replace the crack control steel and also to increase the abrasion resistance.

Channels: Considering the bearing capacity of red soil, loading and 25MPa concrete, SikaFibre Force PP48 dosage rate of 5kg/m<sup>3</sup> was proposed to replace the SL62 mesh in 100mm thick concrete.

## PROJECT SIZE AND OUTCOME

The size of the project was 5000kg for 2017. Further works are to be undertaken, and we look forward to the council budget for 2018.

## PRODUCTS USED

SikaFiber Force PP48







## PROJECT DETAILS

Date: November 2017

Location: Bamaga, Injinoo, New Mapoon, Umagico

Contractors: Northern Peninsula Area Regional Council

Concrete Supplier: Council ready mix plant

Design Engineer: Peter Dutailis RECS Consulting Engineers

Specification Engineer: Chaminda Jayathilake

Sales Representative: Michael Chaplin

Our most current general sales conditions shall apply.  
Please refer to the relevant data sheet prior to any use or processing.



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