DESIGN AND CONSTRUCTION OF PURLING BROOK FALLS SUSPENSION BRIDGE (JOHN STACEY BRIDGE), SPRINGBROOK NATIONAL PARK, QLD

Antony Schofield, Associate Principal
Arup Pty Ltd, Brisbane, Australia
antony.schofield@arup.com

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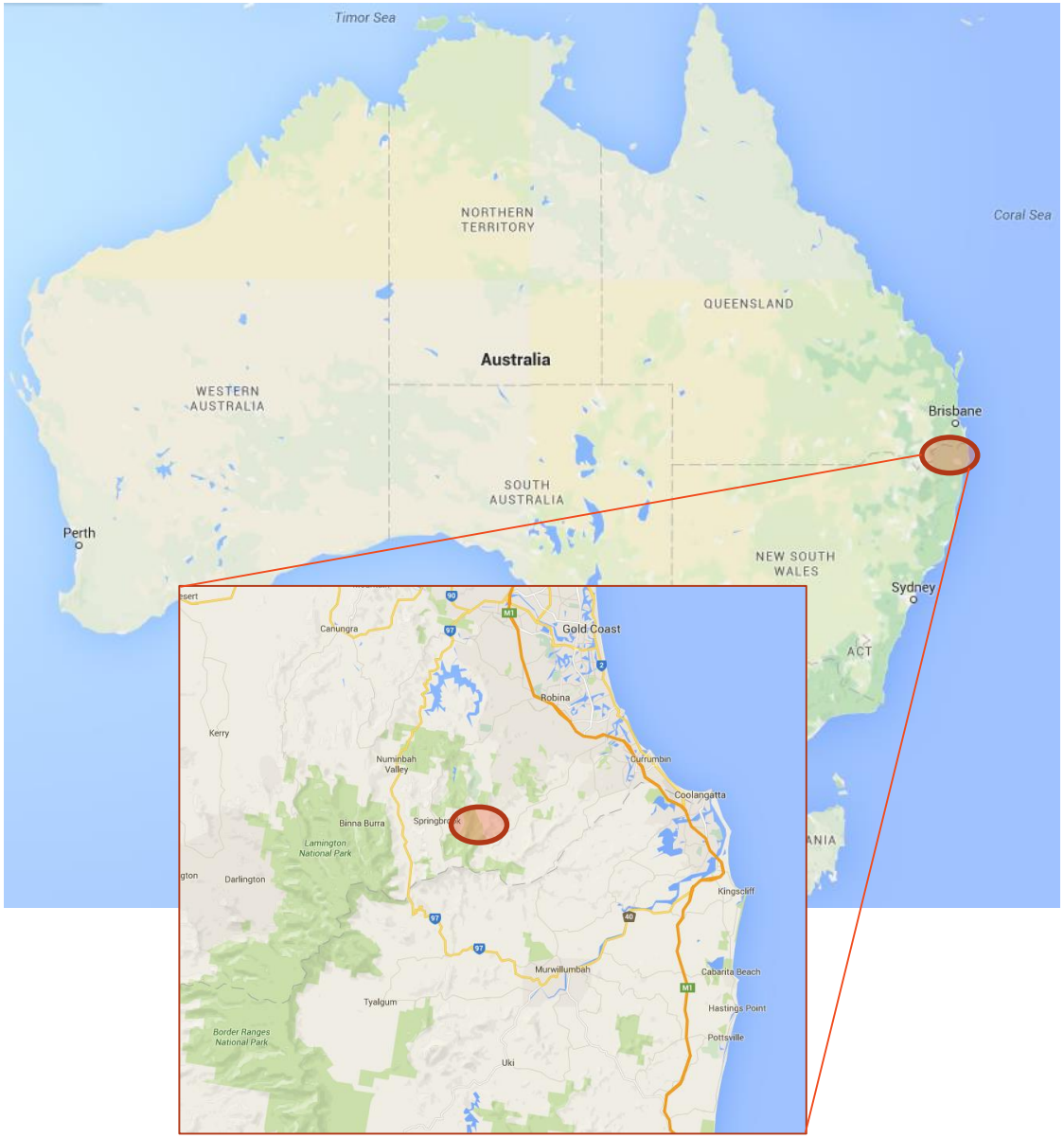
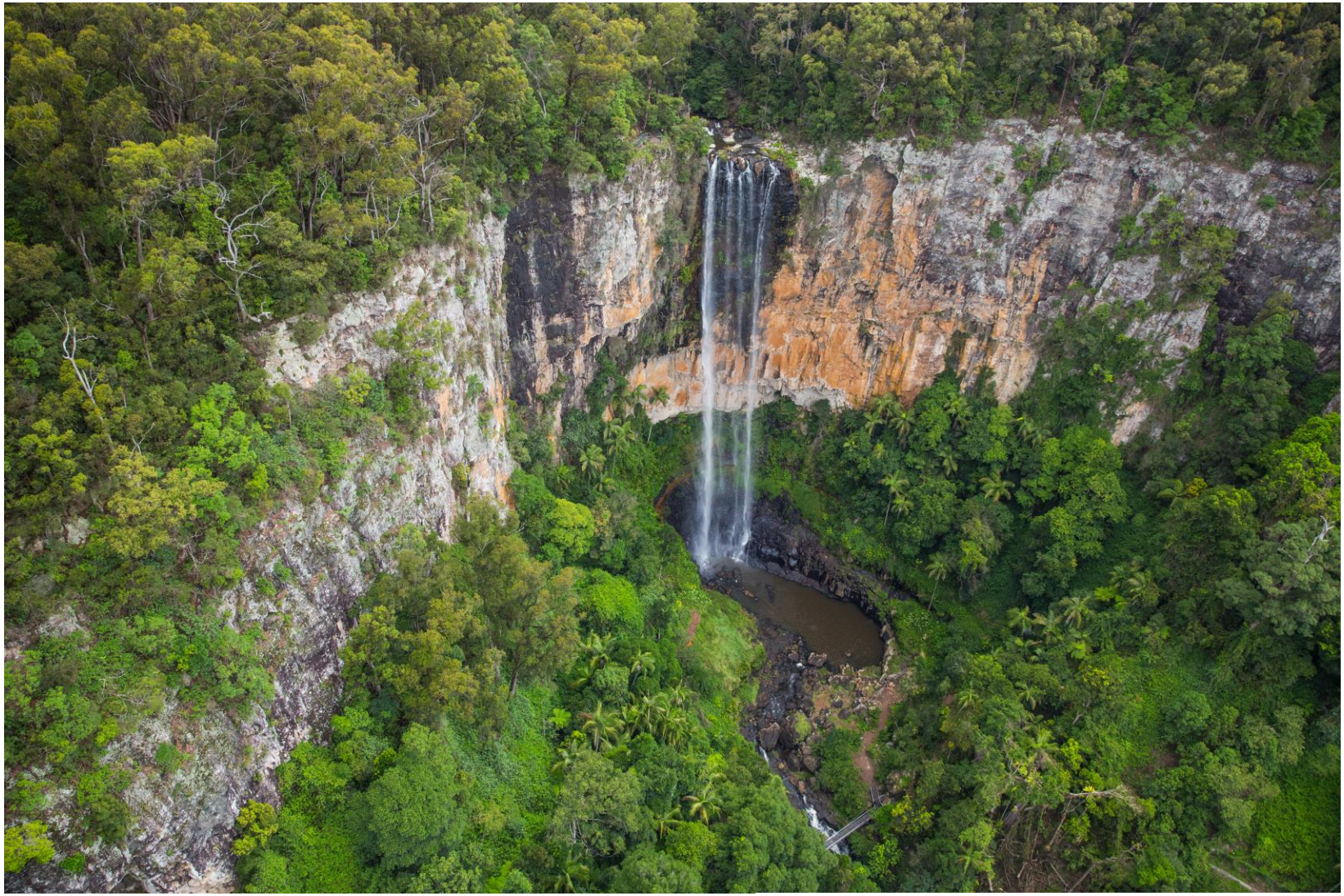
Location

- Springbrook National Park
- The Park is listed within the World Heritage Gondwana Rainforests of Australia
- Park managed by Queensland Park and Wildlife Service



Location



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Site Landslips

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- Major landslips in 2008 / 2009
- On going smaller land slips
- Almost $400m spent on repairs
- 2013 major landslips on both east and west of waterfall
- Walking track closed and alternative solution required.
- Arup won contract for option study.

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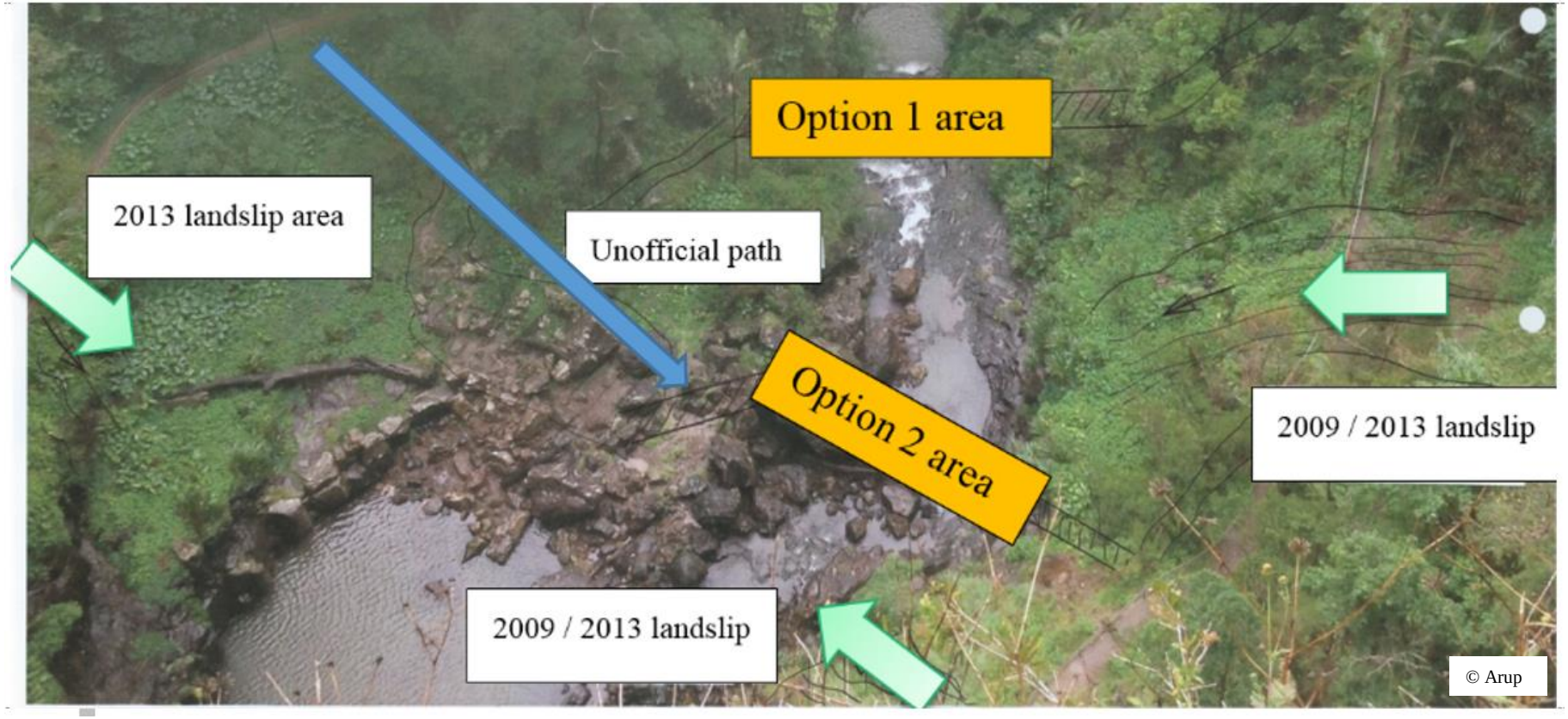
Bridge Feasibility

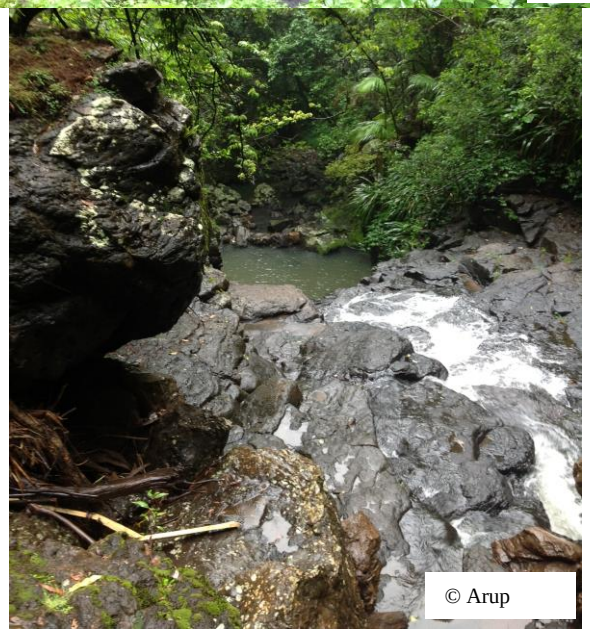
- Determine the best site for the bridge
- Determine a suitable bridge form, visual amenity.
- Establish an initial estimate of probable cost
- Sympathetic materials for all infrastructure components
- Minimisation of maintenance (no timber).
- Rare and threatened species (Nature Conservation Act 1992)
- Cultural Heritage Artefacts.
- Water quality. (drinking water catchment for the Little Nerang Dam).

Bridge Feasibility



Bridge Feasibility

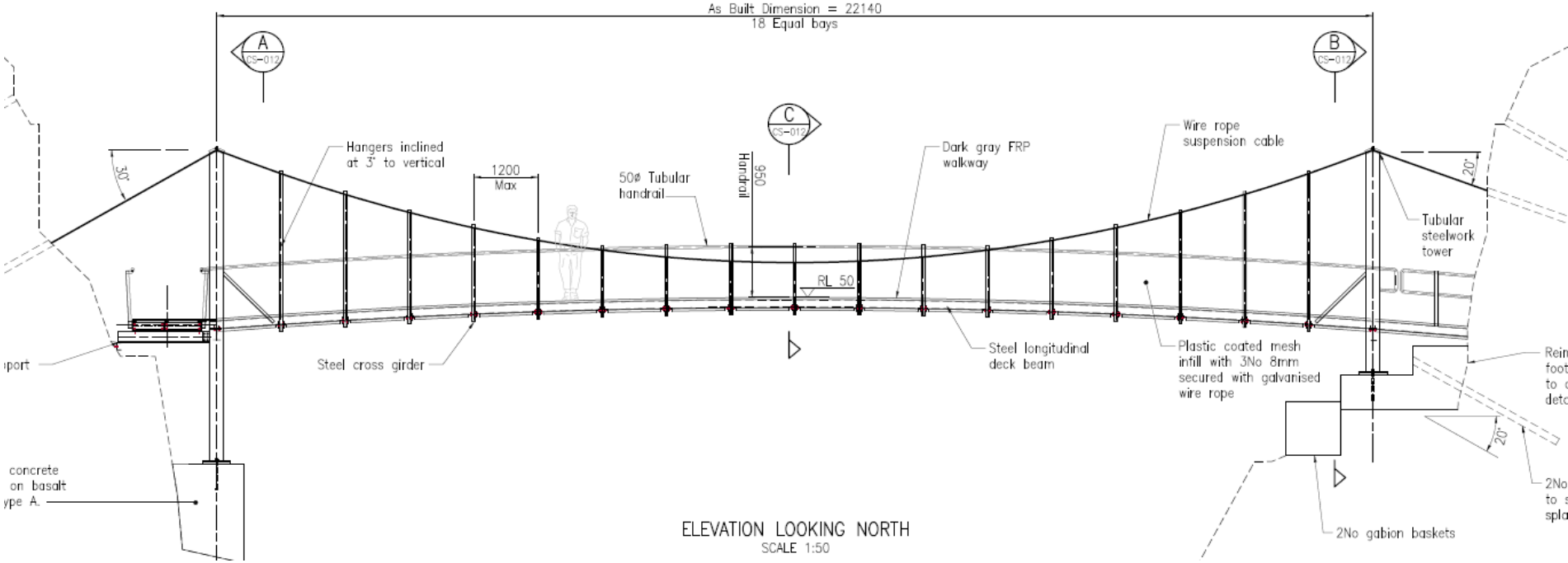
- Good anchorage options for a possible suspension bridge structure
- Good foundations for general bridge supports on either side of the creek.
- Sufficient clearance over the river
- Avoided all existing landslips
- Good views both upstream to the existing falls but also downstream to a small falls
- Reduced visual impact from rim viewpoints offered



Bridge Design

- Suspension Bridge preferred for lightweight deck structure
- 30 to 40m span
- No timber for low maintenance
- Black colour to merge into background
- Easy to build since no site access for vehicles
- AS 2156.2 *Walking tracks Part 2: Infrastructure design*
- 4 kPa live loading for class 3 track
- 1.4 kN point load
- 4 x 100kg people as point load

Bridge Design



Bridge Design

- Deck cross section

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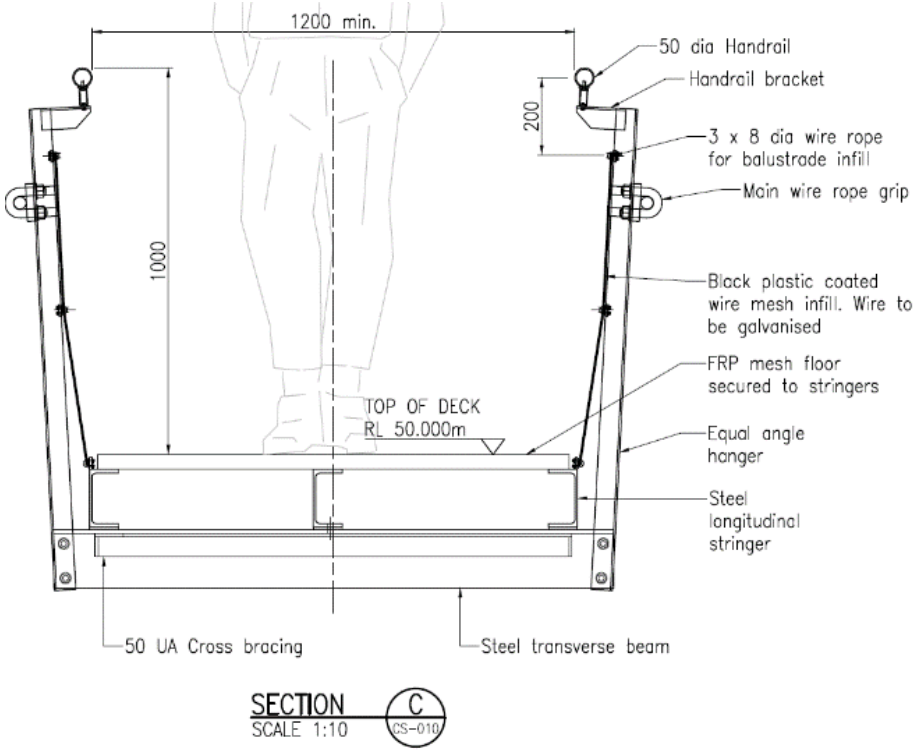


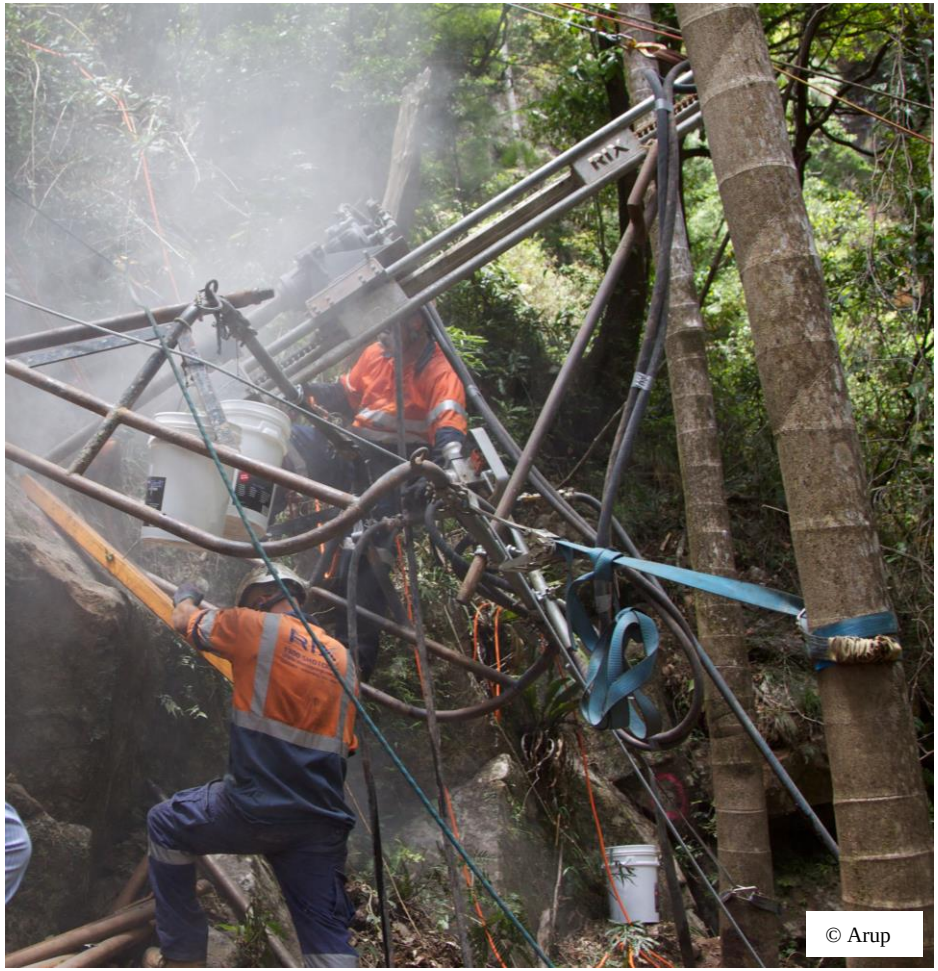
Bridge Design

- 7-8m active anchors
- 3m debonded
- Ischebeck Anchors
- Spot bolting agreed on site
- West side in Rhyolite
- East side in Basalt
- Boulders removed

Bridge Construction

1. Prepare bridge site, detailed site survey.
2. Construct reinforced concrete foundations for west tower
3. Construct reinforced concrete foundations for east tower
4. Install main cable anchorages and rock bolting.
5. Install main towers.
6. Install main cables to defined free hanging profile
7. Install hangers.
8. Install deck stringers.
9. Install GRP deck and handrails.

Bridge Construction



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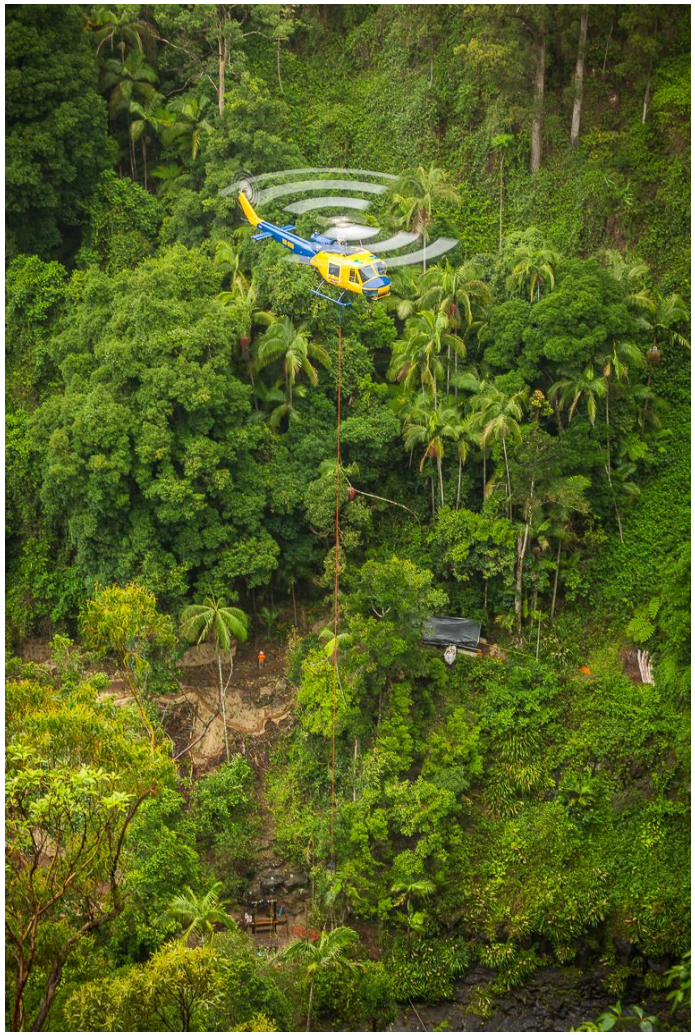

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Bridge Construction

- Bridge opened on 10 March 2015
- Named John Stacey Bridge after local ranger.
- Opened by National Parks Minister, Dr Steven Miles.
- $780,000 cost for bridge
- Existing path removed by QPWS staff
- Planting by QPWS staff
- Approach tracks constructed by Track and Trail Management Services.

Conclusions

- Bridge constructed safely and with no incidents
- Trail now reopened and successfully diverted from main landslip areas
- Careful detailing greatly simplified construction
- Met brief for minimal visual impact
- Visitor numbers are up
- Bridge is a visitor attraction itself
- Old path is returning to nature very quickly

Acknowledgements

- Michael Shelton, Queensland Parks and Wildlife Service Project Manager

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