Culvert Fishway Planning and Design Guidelines

Part I - Design Drawings for Fishway Projects

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James Cook University School of Engineering and Physical Sciences
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**APPENDIX I1 - UNIVERSITY CREEK PROTOTYPE CULVERT FISHWAYS**

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**Notes**
These are prototype facilities in which the baffle fishway devices are constructed of light duty materials to suit adaptation and performance evaluation, and which include provisions for monitoring and access that will not normally be incorporated into field installations of culvert fishway facilities.

These drawings have been prepared specifically for use on the University Creek prototype fishways. They are not standard drawings and the designs are not necessarily applicable to other locations. Users should make their own site-specific evaluation and design arrangements and should seek specialist input on fish passage design as required.
University Creek Prototype Fishways - Reach 2 Crossings and Fishways

Legend - Stream Crossings

A – Bridges: Bruce Highway – University Road
B – Bridge: Douglas Arterial Ring Road
C – Box Culvert: Hospital Access Road
D – Box Culvert: Discovery Drive
E – Pipe Culvert: Solander Road
F – Footbridge: Vet / Biomed Science Walkway

1200 Stream distance upstream from Ross River (m)
This is a prototype facility in which the baffle fishway devices are constructed of light duty materials to suit adaptation and performance evaluation, and which includes provisions for monitoring and access that will not normally be incorporated into field installations of culvert fishway facilities.

**University Creek Discovery Drive Box Culvert Fishways - General Arrangement Plan, Section and Elevation**
This is a prototype facility in which the baffle fishway devices are constructed of light duty materials to suit adaptation and performance evaluation, and which includes provisions for monitoring and access that will not normally be incorporated into field installations of culvert fishway facilities.
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University Creek Douglas Arterial Project Crossing - Layout Plan

Legend
1300 Stream distance upstream from Ross River (m)

Discovery Drive – Eastern Access Road

University Road – Bruce Highway

Diversion drain and rock ramp fishways see detail plans

Initial diversion drain proposal

University Creek

Legend
1300 Stream distance upstream from Ross River (m)
Douglas Arterial Project Diversion Drain and Rock Ramp Fishways - General Arrangement

Legend
1300  Stream distance upstream from Ross River (m)

1350  Stream distance upstream from Ross River (m)

Discovery Drive

to James Cook University

to Condon

to University Road – Bruce Highway

to Ayr

University Creek

Diversion drain – earth bed

50 m

Rock revetment

50 m

Rock revetment

Fill original creek channel

Retain riverine vegetation

Earth drain batter

Ross Kapitzke • JCU School of Engineering • University Creek fishways • douglas_bride_diversion_drain.doc -3/89
4-span, 2-lane bridge

Q100 flood RL 14.05

Blockwork abutment protection

University Creek looking upstream

to Ayr

Overpass on Discovery Drive

to Condon

University Creek Douglas Arterial Project Bridge Crossing - Elevation
University Creek Douglas Arterial Project Rock Ramp Layout

** 300 mm drop between upstream and downstream drain bed levels (3 x 100 mm drops at ridges) **

Ridge rock 800 – 1000 mm nominal size refer detail

Apron rock 400 – 600 mm nominal size

Drain bed level *

Apron sill level

Low flow

Geofabric

Geofabric strip U/S rock ridge

Ridge

Section A-A

Apron rock

Ridge rock

Rock protection to drain bank

Toe wall

Flow

Drain batter
Section B-B – Ridge

Ridge rock 800 – 1000 mm nominal size

Nominal crest level of ridge

200 mm taper to drain centre over half drain width

Drain bed profile at apron

Geofabric

Nominal crest level of ridge

200 at drain centre downstream of ridge

Apron sill level

Section C-C – Apron within pool

Apron rock 400 – 600 mm nominal size

Nominal crest level of ridge

Geofabric

200 - 300

Section D-D – Drain bank protection

Gravel fill

Geofabric

Nominal crest level of ridge

200 - 300

University Creek Douglas Arterial Project Rock Ramp Details
This is a prototype facility in which the baffle fishway devices are constructed of light duty materials to suit adaptation and performance evaluation, and which includes provisions for monitoring and access that will not normally be incorporated into field installations of culvert fishway facilities.

Legend – rock protection
- Ridge Rock (800 – 1000)
- Cascade Rock (500 – 800)
- Batter Rock (500 – 800)
- Apron Rock (300 – 500)

University Creek Solander Road pipe culvert - Prototype Fishway # 3 - Plan
Longitudinal Section: Culvert and Fishways

University Creek Solander Road pipe culvert - Prototype Fishway # 3 - Long section

This is a prototype facility in which the baffle fishway devices are constructed of light duty materials to suit adaptation and performance evaluation, and which includes provisions for monitoring and access that will not normally be incorporated into field installations of culvert fishway facilities.
Solander Road culvert, causeway and apron

Longitudinal Section: Rock Ramp / Cascades

Section A-A: Rock Ridge 2

Detail: Rock Ridge / Cascade

Longitudinal Section: Bypass Channel – future fishway

Solander Road pipe culvert - Prototype Fishway # 3 - Rock ramp detail
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**Solander Road pipe culvert - Prototype Fishway #3 - Offset baffle fishway**
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APPENDIX 12 - BRUCE HIGHWAY CORDUROY CREEK TO TULLY BOX CULVERT AND PIPE CULVERT BAFFLE FISHWAYS: MAUNSELL DRAWINGS

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**Notes**

These design drawings, prepared by Maunsell, incorporate culvert fishway designs developed by James Cook University School of Engineering on the basis of fish passage planning and design studies *Bruce Highway Corduroy Creek to Tully High School Provisions for fish passage – Preliminary Design Assessment Tasks 1B and 2* (Kapitzke 2007) and *Bruce Highway Corduroy Creek to Tully High School Provisions for fish passage Landholder access crossing at 82 920* (Kapitzke 2008).

These drawings have been prepared for the Tully Alliance specifically for use on the Bruce Highway Corduroy Creek to Tully High School project. They are not standard drawings and the designs are not necessarily applicable to other locations. Users should make their own site-specific evaluation and design arrangements and should seek specialist input on fish passage design as required.
These drawings have been prepared for the Tully Alliance specifically for use on the Bruce Highway Corduroy Creek to Tully High School. They are not standard drawings and the designs are not necessarily applicable to other locations.
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