

School of Engineering and Physical Sciences

University Creek Solander Road pipe culvert fishway

PS01







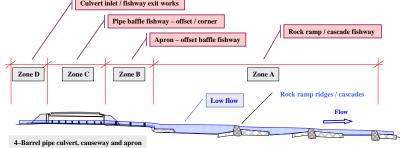
(Photo: Ross Kapitzke 09/04/06)

(Photo: Ross Kapitzke 11/04/06)

(Photo: Ross Kapitzke 09/04/06)

- Solander Road prototype pipe culvert fishway is located on University Creek on James Cook University campus in Townsville
- University Creek has 13 native freshwater fish species the crossing has been a barrier to migration to upstream habitat areas
- the fishway was developed in 2005 at least 9 native fish species have moved upstream through the crossing since 2006
- collaborative funding support for the project was provided through the University and industry and community partners

CLIENT AND PARTNERS PROJECT OBJECTIVES • provide for upstream fish passage at crossing of develop remediation measures for culvert and creek • concept design of fishway facilities of design and development of prototype fishways • concept design of fishway facilities of design and development of prototype fishways • detailed design and construction of fishway facility of hydraulic and biological monitoring and evaluation • downstream apron 6.3 m long – slope 1 in 20 (5%) • pipe culvert slope 1 in 50 (2%) • water surface drop downstream of culvert of shallow water depths on downstream apron • high velocity and turbulence in culvert barrel or regular culvert cross section and lack of rest place • A-barrel 1200 mm diameter pipe culvert 7.2 m long of the pipe culvert slope 1 in 50 (2%) • water surface drop downstream of culvert or shallow water depths on downstream apron • high velocity and turbulence in culvert barrel or regular culvert cross section and lack of rest place • Zone C – offset baffle fishway for pipe culverts • Zone C – corner "Quad" baffle fishway for pipes • provisions for adaptation and testing • see http://www.jcu.edu.au/fishpassagedesign/ • see http://www.jcu.edu.au/fishpassagedesign/			
OBJECTIVES • develop remediation measures for culvert and creek • provide demonstration site for community SCOPE OF WORK • concept design of fishway facilities • design and development of prototype fishways • design and development of prototype fishways • 4-barrel 1200 mm diameter pipe culvert 7.2 m long • pipe culvert slope 1 in 50 (2%) MIGRATION BARRIERS • water surface drop downstream of culvert • shallow water depths on downstream apron MITIGATION MEASURES • Zone A – rock ramp / cascade fishway • Zone B – apron offset baffle fishway OTHER FEATURES • hydraulic and biological monitoring facilities (gauge boards, flow control boards) REFERENCES • Kapitzke 2007, Solander Road pipe culvert fishway • see http://www.jcu.edu.au/fishpassagedesign/		Queensland Government of Main Roads Superment of Main Roads	Markwell G R O U P
 design and development of prototype fishways hydraulic and biological monitoring and evaluation CROSSING DESCRIPTION 4-barrel 1200 mm diameter pipe culvert 7.2 m long pipe culvert slope 1 in 50 (2%) MIGRATION BARRIERS water surface drop downstream of culvert shallow water depths on downstream apron high velocity and turbulence in culvert barrel regular culvert cross section and lack of rest place Zone A – rock ramp / cascade fishway Zone B – apron offset baffle fishway Zone C – corner "Quad" baffle fishway for pipes hydraulic and biological monitoring facilities (gauge boards, flow control boards) REFERENCES Kapitzke 2007, Solander Road pipe culvert fishway see http://www.jcu.edu.au/fishpassagedesign/ 			
 pipe culvert slope 1 in 50 (2%) road causeway – crest 1.9 m above culvert invert water surface drop downstream of culvert shallow water depths on downstream apron in culvert barrel regular culvert cross section and lack of rest place Zone A – rock ramp / cascade fishway Zone B – apron offset baffle fishway Zone C – offset baffle fishway for pipe culverts Zone C – corner "Quad" baffle fishway for pipes provisions for adaptation and testing provisions for adaptation and testing see http://www.jcu.edu.au/fishpassagedesign/ 		1 0	, ,
 shallow water depths on downstream apron regular culvert cross section and lack of rest place MITIGATION MEASURES Zone A – rock ramp / cascade fishway Zone B – apron offset baffle fishway Zone C – offset baffle fishway for pipe culverts Zone C – corner "Quad" baffle fishway for pipes hydraulic and biological monitoring facilities (gauge boards, flow control boards) provisions for adaptation and testing provisions for adaptation and testing see http://www.jcu.edu.au/fishpassagedesign/ 		• • • • • • • • • • • • • • • • • • • •	
MEASURES • Zone B – apron offset baffle fishway • Zone C – corner "Quad" baffle fishway for pipes OTHER • hydraulic and biological monitoring facilities (gauge boards, flow control boards) • provisions for adaptation and testing • provisions for adaptation and testing • see http://www.jcu.edu.au/fishpassagedesign/		•	•
FEATURES (gauge boards, flow control boards) REFERENCES • Kapitzke 2007, Solander Road pipe culvert fishway • see http://www.jcu.edu.au/fishpassagedesign/		1	7 11
REFERENCES - Rupiczke 2007, Solumer Rodu pipe envert fishway	•	,	• provisions for adaptation and testing
Culvert inlet / fishway exit works	REFERENCES	(Prototype Fishway # 3) – Case study report	• see http://www.jcu.edu.au/fishpassagedesign/





Fish passage planning and design for small waterway structures

JCU School of Engineering and Physical Sciences provides consulting and R & D services in fish passage planning and design, and development of fishway technology for small waterway structures (e.g. road culverts). Fish passage facilities (e.g. baffles, ramps) are designed to meet multipurpose requirements, overcome hydraulic barriers (e.g. high velocities, water drop), and mitigate connectivity impacts. Scope of services includes catchment prioritisation, corridor scale planning, site design and evaluation, product development.

CONTACT

Ross Kapitzke, Environmental Engineer

Web: http://www.jcu.edu.au/fishpassagedesign/

Ph: 0402 316 404

E: ross.kapitzke@jcu.edu.au



