

275KV XLPE CABLE BRIDGE CROSSINGS: DESIGN & CONSTRUCTION ISSUES

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ABSTRACT

Final design and construction of above-ground crossings are underway for an 18km, 275kV XLPE underground cable circuit currently being installed in Adelaide, South Australia.

The crossings incorporate a purpose-built structure and use of existing road bridges.

This paper describes design and construction arrangements developed to satisfy the complex and sometimes conflicting requirements to achieve cable rating; installation constraints; maintenance and security criteria; protecting 3rd party assets; and management of planning and environmental issues.

KEYWORDS

Architectural design; cable rating; cable bridge design; cable bridge installation; inspection and maintenance access; emergency rescue; planning approval.

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INTRODUCTION

Installation of an 18km, 275kV XLPE cable circuit is underway in the City of Adelaide. A design, supply and install contract was established with a consortium of two cable manufacturers. Commissioning of the circuit is planned for October 2011

The circuit is located predominantly within an urban environment. Obstacles within the planning corridor include a sea-water inlet, a river valley and a major arterial road underpass.

The contractor's scope required the preparation of detailed design and installation of crossings structures to negotiate the obstacles. Installation arrangements incorporate a purpose-built structure and use of existing road bridges. The designs have been developed to achieve specified cable rating, and to satisfy constructability, maintenance, access and security provisions. Architectural features to meet local planning requirements and conditions imposed by bridge owners are discussed. Separate studies address issues associated with induction and corrosion impacts on adjacent services and structures, and EPR (earth potential rise).

CABLE CROSSING SITES & CONSTRUCTION OPTIONS

Significant obstacles that lay within the nominated planning corridor are:

- North Arm sea water inlet (Fig. 1),
- River Torrens (Fig. 2) and
- Bakewell Underpass road crossing (Fig. 3).



Fig 1: North Arm Sea-Water Inlet

Existing 200m Road Bridge



Fig 2: River Torrens crossing

New Cable Bridge incorporating pedestrian/cycle bridge path