



## CASE STUDY >

# NORTHCONNEX TUNNEL E&I DESIGNING, COMMISSIONING AND OPERATION SUPPORT

## PROJECT OVERVIEW

NorthConnex, the longest and deepest road tunnel in Australia, is a nine-kilometre tunnel that will link the M1 Pacific Motorway at Wahroonga to the Hills M2 Motorway at West Pennant Hills.

## SCOPE OF WORK

RSGx assigned a specialized team to integrate into the existing NorthConnex LLBJV MEI Commissioning team. The team consisted of:

- ◆ Commissioning Leads
- ◆ Senior Project Engineers
- ◆ Project Engineers
- ◆ HV Permit Manger
- ◆ HV Permit Controllers
- ◆ Fiber Network Design Engineer
- ◆ Network Engineers
- ◆ Mechanical and Electrical Superintendents
- ◆ Mechanical and Electrical Supervisors.

Tasked with managing the commissioning of tunnel services, this team was distributed along the surface, tunnel and at the Motorway Control Centre. The commissioning workforce ranging from Electricians, Instrumentation and Controls Technicians, Fiber Optic Technicians, and trades Assistants, worked on an extensive range of commissioning services on all systems.

Areas of expertise:

Design:

- ◆ HV cable pit design
- ◆ Conduit layout preparation
- ◆ Transformer sizing and functionality
- ◆ Switchgear function and design
- ◆ HV protection study and design
- ◆ Relay specification and product information
- ◆ General substation design
- ◆ Low Point Sump design

Level 1 to Level 5 Commissioning:

- ◆ LV Commissioning Instrumentation & Control
- ◆ LV cable testing
- ◆ VSD, soft-start motor control systems
- ◆ Lighting and emergency lighting systems
- ◆ MVAC system
- ◆ SCADA system

Calibration and PLC to remote I/O testing:

- ◆ Low Point Sump pressure transmitters, level transmitters, flowmeters and control valves
- ◆ Traffic management system (ISLUS, TMS, Smoky Vehicle, PTZ, Boom Gates)
- ◆ Vibration sensors for axial fans in vent facilities
- ◆ Photometers for transition lighting
- ◆ Air quality and air velocity sensors

High Voltage Commissioning

- ◆ VLF testing
- ◆ High potential testing
- ◆ Transformer testing
- ◆ Circuit breaker testing
- ◆ Relay protection testing

Operations:

- ◆ High Voltage Authority (Network Controller)
  - Implementing HV Safe Operating Procedures and Training Packages
- ◆ Permit controls and documentation – Initiating at Construction Completion stage to Client Handover
- ◆ Point of Contact for Network Supply Authorities

## SOLUTION

Our team brought with them vital experience and lessons learned from similar infrastructure projects. RSGx's integrated approach in the design and commissioning phases provided well-structured workflow and more productive programming from energisation to handover. This approach further enhanced RSGx's performance and involvement on the project, leading to the mobilisation of just over 200 personnel. The scope then lead to additional support in the areas of HV operations and permit to work.

## ACHIEVEMENTS TO DATE

RSGx made significant contributions to the project and were recognised by our clients and other key LLBJV stakeholders, such as the project commissioning manager who said "From an LLBJV Commissioning point of view, RSGx were integral to the project and have continually delivered great, top grade work".

### CLIENT

**LLBJV**  
(Lend Lease Bouygues Joint Venture)

### SERVICES PROVIDED

**FRONT END ENGINEERING DESIGN  
CONSTRUCTION AND  
COMMISSIONING SUPPORT**

### SCOPE

**DESIGN  
CONSTRUCTION  
COMMISSIONING  
COMPLETIONS**

### INDUSTRY

**INFRASTRUCTURE**

### LOCATION

**SYDNEY, NEW SOUTH WALES**



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