2018-22
POWERLINK QUEENSLAND REVENUE PROPOSAL

Project Pack - PUBLIC

CP.02296
PDH Mux Replacement

Delivering better value

ID&TS - Reset 2017/18-2021/22 Project Proposal for CP.02296 PDH Mux Replacement

Document Approval		
	Name	Position
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Contents

1. Executive Summary

The telecommunications network is a critical supporting system for the transmission network, providing protection signalling, control and monitoring functionality and other data and voice communications. The telecommunications network makes extensive use of Plesiochronous Digital Hierarchy (PDH) technology.

Based upon assessments of the expected useful life, the majority of PDH multiplexors are expected to reach end of life by 2019. At this time, the equipment will become increasingly obsolete with little or no manufacturer support. Maintaining the equipment in service beyond its useful life will result in loss of services on the telecommunications network, impacting the reliability of the transmission network and it must therefore be replaced.

The objective of this project is to replace PDH multiplexors at 136 sites throughout the state by June 2019.

2. Project Definition

2.1 Project Scope

The following scope presents a functional overview of the desired outcomes of the project. The proposed solution presented in the estimate must be developed with reference to the remaining sections of this Project Scope Report, in particular *Section 1.7 Matters to Consider*.

Briefly, the project consists of replacing PDH multiplexors at 136 sites throughout the state, details as follows:

- procure, install and commission new PDH multiplexors (MUX) to replace the existing PDH MUX on a like for like basis at the following one hundred and thirty six (136) sites throughout the state, classified as large, medium and small installations:

  Large Installations

Functional Location	Site
H010	Bouldercombe
H036	Blackwall
R002	Braemar
T046	Garbutt
BSCC	Belmont
PLVC	Virginia Complex

  Medium Installations

Functional Location	Site	Functional Location	Site
H002	South Pine	H039	Woree
H003	Belmont	H067	Calliope River
H007	Gladstone PS	R003	Bulli Creek
H010	Bouldercombe	R004	Millmerran Switch Yard
H013	Ross	S003	Greenbank

H014	Middle Ridge	T024	Runcorn
H018	Tarong	T034	Moranbah
H020	Broadsound	T051	Cairns
H021	Murarrie	T056	Townsville South
H022	Loganlea	T065	Alligator Creek
H029	Stanwell	T194	Columboola
H031	Molendinar	MSTR	Mt Stuart Repeater
H032	Chalumbin	MTGR	Mt Gravatt Repeater
H035	Strathmore	RECC	Rockhampton Control Centre

Small Installations

Functional Location	Site	Functional Location	Site
H004	Mudgeeraba	T101	Callemondah
H005	Woolooga	T110	Peak Downs
H006	Gin Gin	T127	Egans Hill
H008	Boyne Island	T129	Edmonton
H009	Palmwoods	T134	Cardwell
H012	Mt England	T136	Abermain
H015	Lilyvale	T137	North Goonyella
H016	Rocklea	T139	Burton Downs
H023	Upper Kedron	T140	Townsville Zinc
H024	Calvale	T141	Pioneer Valley
H027	Tarong PS Annexe	T142	Tennyson
H028	Wivenhoe PS	T150	Alan Sherriff
H030	Callide B	T152	Gladstone South
H033	Stanwell PS	T153	QAL West
H038	Goodna	T155	West Darra
H040	Wurdong	T157	Ingham South
H044	Bay View Heights	T160	Sumner
H049	Auburn River	T161	Algester
H056	Yabulu South	T162	Bundamba
H058	Larcom Creek	T171	El Arish
H062	Abermain	T172	QR Mindi
H063	Teebar Creek	T175	QR Bolingbroke
H072	Blackstone	T177	King Creek
H076	Wandoan South	T178	Stony Creek
H077	Columboola	T181	Bowen North
S002	Halys	T182	QAL South
S005	Western Downs	T187	Richlands
T022	Callide A SY	T189	Oakey
T023	Rockhampton	T193	Clare South
T026	Biloela	T199	Yarwun
T027	Moura	T220	Collinsville North
T030	Ashgrove West	BWHR	Bloodwood Hill Repeater
T031	Baralaba	CCBR	Brendale
T032	Blackwater	CCMR	Maryborough Control Centre
T035	Dysart	CCVP	Victoria Park
T036	Invicta Mill	CMHR	Cameron Hill Repeater
T037	Collinsville PS	EHTR	Eagle Heights
T038	Mackay	GMWR	Gladstone Microwave Repeater
T048	Tully	HOMS	Mary Street
T049	Kareeya	KMTR	Kelly Mount Repeater
T050	Innisfail	MAHR	Maurice Hill
T053	Kamerunga	MDVR	Mt Domville Repeater
T054	Barron Gorge PS	MFXR	Mt Fox Repeater
T055	Turkinje	MGLR	Mt Glorious Repeater
T061	Pandoin	MTER	Mt England Repeater
T067	Kemmis	QRMC	QR Mackay
T069	Newlands	RAWR	Rawbelle Repeater
T080	Redbank Plains	SMHR	Smith's Hill Repeater
T092	Dan Gleeson	WARR	Warra Repeater
T094	Townsville East	WRLR	Wright's Lookout Repeater
T097	Gregory	YARR	Yarongmulu

Note: it is assumed that installed DC systems are adequate, and no allowance is to be made for their upgrading under this project.

- transfer all communications traffic from legacy [redacted] PDH mux to new PDH mux;
- decommission, recover and dispose of legacy mux and associated equipment;
- modify the data communications network (DCN) to incorporate the new PDH MUX; and
- update all documentation and drawings, including [redacted] neXus and SAP, etc.

2.1.1 Transmission Line Works

Not applicable.

2.1.2 Substation works

Not applicable.

2.2 Major Scope Assumptions

It has been assumed that:

- secondary system isolations will be done on all protection signalling equipment, as required for the cut-overs;
- procurement agreements will be in place for the supply of PDH equipment at commencement of the project;
- all costs are based on the [redacted] suite of PDH Equipment;
- the existing Network Management System is suitable for management of the new PDH equipment (network elements);
- sufficient DC capacity is available at all sites to be able to supply load to both the existing and new PDH equipment for the cut over process; and
- sufficient floor/cubicle space is available at all sites for both the existing and new PDH equipment.
- based on a one for one replacement of the existing network;
- new network/panels to be built in parallel with existing network;

2.3 Scope Exclusions

Nil

3. Project Execution

3.1 Project Dependencies & Interactions

Project No.	Project Description	Planned Comm Date	Comment
Pre-requisite Projects			
Co-requisite Projects			
Other Related Projects			
CP.02650	SDH Replacement Central Region	June 2021	Project Proposal

3.2 Site Specific Issues

The project involves work at 136 sites. Individual site assessments will be required to identify issues prior to commencing work at each site.

3.3 Project Delivery Strategy

It is expected that the project will be delivered using a PanTel Panel Contractor for the installation and Factory Acceptance Testing (FAT) of all equipment. Powerlink is expected to perform the design with the Maintenance Service Provider performing the final testing, configurations, commissioning, cut overs and decommissioning of the redundant equipment.

Project Delivery Strategy Matrix		
Design	Earthworks Design	N/A
	Civil Design	N/A
	Electrical Design (Primary)	N/A
	Electrical Design (Secondary) – Protection	N/A
	Electrical Design (Secondary) – Automation	N/A
	Transmission Line Design	N/A
		Powerlink

	Telecommunication Design	
Construction	Earthworks Construction	N/A
	Civil Construction	N/A
	Electrical Construction / Installation	N/A
	Telecommunication Construction	Pan Tel Contractor
	Transmission Line Construction	N/A
Testing	Substation Testing – FAT	N/A
	Substation Testing – SAT	N/A
	Substation Testing – Cut-Over	N/A
	Telecommunication Testing	MSP's/TNOC

3.4 Proposed Sequence of Works

3.4.1 Project Schedule

To meet the required commissioning date of 30 June 2019 full project approval will be required by December 2016. In order to achieve a commissioning date of June 2019 the work will have to be staged with design, construction, commissioning and cutover happening simultaneously.

High Level Schedule

- Project Approval : December 2016
- Design : December 2016 - June 2018
- Construction : May 2017 – December 2018
- Commission new System : July 2017 - February 2019
- Cut over all traffic : January 2018 – April 2019
- Recover Redundant Equipment : March 2018 – June 2019
- Final commissioning : June 2019

3.4.2 Project Staging

Major project stages of the project are considered to be:

Stage	Description/Tasks
1	Design
2	Construction and FAT
3	Establish new DCN
4	Commission all PDH equipment
5	Cut over all circuits
6	Decommission redundant equipment
7	Deconstruction of redundant equipment

3.4.3 Network Impacts and Outage Planning

No outages will be required on the HV network. Outages will be limited to operational and commercial telecommunications circuits only and will be managed and planned through the AFW process.

3.5 Project Health & Safety

The implications of relevant workplace health & safety legislation in delivering the proposed solution have been considered in preparing this estimate. In particular, this estimate includes an allowance for typical safety related activities required in the delivery phase of the project.

3.6 Project Environmental Management

No specific environmental management implications for the delivery of this project have been identified.

4. Project Risk Management

Some allowances have been allowed in the estimate. Please see estimate for details.
Please refer to the assumptions and exclusion as these items have implications for the overall project risk.

5. Project Estimate

5.1 Estimate Summary

Quote Summary :CP.02296 - PDH Mux Replacement 136 sites

The quotation at current cost levels and escalated for completion by June 2019 at 4.1% per year, for - PDH Mux Replacement 136 sites

OR.02296 Quotation in $,000 AUD	Base Cost Levels	Escalated to Compln.	Comment (Costs @ Base Cost Levels)
Telecommunications - PDH Mux Replacement	[redacted]	[redacted]	**PDH Mux Replacement 136 sites**
	[redacted]	[redacted]	Telecommunication Design
	[redacted]	[redacted]	Telecoms Works - Procurement
	[redacted]	[redacted]	Telecommunications Construction
	[redacted]	[redacted]	Telecommunications Recovery
	[redacted]	[redacted]	Safety and Environmental Compliance
	[redacted]	[redacted]	Telecommunications Commissioning
	[redacted]	[redacted]	Project Concept/Investment & Planning, Statutory Costs, Project Management and O&FS -Network Ops
TOTAL QUOTE (EXCL RISKS & Offsets)	**34,796**	**37,759**	
Offsets	**0**	**0**	
Risk Estimate	**2,088**	**2,088**	
Climate Construction Design	[redacted]	[redacted]	
TOTAL QUOTE (INCL RISKS)	**36,883**	**39,847**	

5.2 Asset Disposal Table

The current net book value of assets to be disposed of as a result of this project is in the attached hyperlink in section 6 References. The total value of the assets to be written off is $11,370,574.04

6. References

Document name and hyperlink (as entered into Objective)	Version	Date
Project Scope Report	1	28/08/2015
Asset Disposal Table	1	10/09/2015
Estimate Detail	1	16/09/2015