

2018-22

POWERLINK QUEENSLAND REVENUE PROPOSAL

Project Pack - PUBLIC

CP.02532

Bergins Hill to Goodna to Belmont 275kV TL Refit Rev 2.0

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Delivering better value



ID&TS - Reset 2017/18-2021/22 Project Proposal for CP.02532 Bergins Hill – Goodna – Belmont 275kV TL Refit

Document Approval

	Name	Position
Prepared by		Project Manager
Reviewed by		Team Leader Projects
Approved by		Group Manager Infrastructure Delivery



Contents

1.	EXECUTIVE SUMMARY	3
2.	PROJECT DEFINITION	3
2.1	Project Scope.....	3
2.2	Major Scope Assumptions.....	4
2.3	Scope Exclusions.....	4
3.	PROJECT EXECUTION	4
3.1	Project Dependencies & Interactions.....	4
3.2	Site Specific Issues	5
3.3	Project Delivery Strategy.....	6
3.4	Proposed Sequence of Works.....	7
3.4.1	Project Schedule	7
3.4.2	Project Staging	7
3.4.3	Network Impacts and Outage Planning	7
3.5	Project Health & Safety	7
3.6	Project Environmental Management.....	8
4.	PROJECT RISK MANAGEMENT	8
5.	PROJECT ESTIMATE	9
5.1	Estimate Summary.....	9
5.2	Asset Disposal Table.....	9
6.	REFERENCES	10

1. Executive Summary

The Bergins Hill – Goodna – Belmont 275kV transmission line (Built Sections 1015, 1067, 1068 and 1475) consists of 44 tension and 63 suspension double circuit steel towers constructed in 1972. The transmission line is an essential component of the transmission network supplying the Brisbane metropolitan area and has an electrical capacity which meets long term requirements. The transmission line has deteriorated due to natural ageing, and the condition of the line needs to be addressed to ensure its long term safety and reliability.

The objective of this project is to undertake refit works to extend the reliable life of the transmission line by November 2021.

2. Project Definition

2.1 Project Scope

Briefly, the project consists of member replacement, surface treatment and painting of approximately 37km (107 structures) of double circuit transmission line, as well as replacement of the existing overhead earth wires with one new earth wire and one OPGW.

2.1.1 Transmission Line Works

The following shall be addressed within the scope of work:

- Access track suitability for contractor works
- Site establishment
- Surface preparation and painting of 107 towers as per current Powerlink standards. **Note:** containment of materials used - surface treatment of structures located near residential or environmentally sensitive areas may require the construction of scaffold and plastic sheeting to protect residences and capture water and residue.
- Review all tower leg / stub members and encapsulate where the concrete to steel interface is showing signs of corrosion.
- Replacement of 5% of all tower nuts and bolts and 1% of steel members per tower.
- Replacement of insulators, conductor hardware, vibration dampers, tower accessories including signs and anti-climbing barriers and all step bolts.
- Replacement of existing two overhead earth wires with one OPGW and one OHEW of equivalent and matching rating.
- Review of drainage and clearing of all growth around tower foundations.
- Review of the electrical design to confirm electrical clearances and insulation levels.
- Review and documentation of the structural capacity of the structures.
- Tower earthing to be upgraded to the current standard
- Update SAP records and drawings

2.2 Major Scope Assumptions

- It is assumed access to the transmission line will be available immediately following Project Approval.
- It is assumed the transmission line has established access, suitable for light vehicles, and large plant if required.
- It is assumed that feeder outages will be available when requested, for durations needed to undertake the outage dependant works.
- It is assumed there will be only minimal further corrosion/dilapidation to the structures and line hardware between the submission of the estimate to execution of the works.
- It is assumed major road closures will be available for the OPGW/OHEW replacement works, i.e. Pacific Motorway, Logan Motorway and the like. Road closures and traffic management have been considered within the estimate.
- The painting system assumed for this project is a two coat application of metallic zinc to achieve a dry film thickness of 120 microns in two coats.
- It is assumed 10% of stubs/foundation interfaces require encapsulation only.
- D2S2 type structures have been assumed as standard for development of the structural refurbishment component of the estimate, as these are predominant along the built sections.
- It is assumed distribution feeder outages, (undercrossings) will be available when required for works above. Twenty Nine (29) undercrossings have been identified along the line route.
- It is assumed the OPGW will be terminated on the substation landing beams for connection by others.

2.3 Scope Exclusions

- Obtaining any permits/approvals for access to the transmission line if required.
- Removal of asbestos treated paint/s or asbestos containing components during the works.
- Connection/Commissioning of the new OPGW at remote ends.
- Stakeholder and/or landholder relations considerations.

3. Project Execution

3.1 Project Dependencies & Interactions

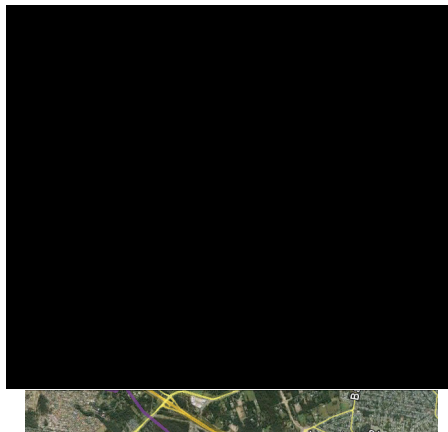
Project No.	Project Description	Planned Comm Date	Comment
Pre-requisite Projects			
N/A			
Co-requisite Projects			
N/A			
Other Related Projects			
N/A			

3.2 Site Specific Issues

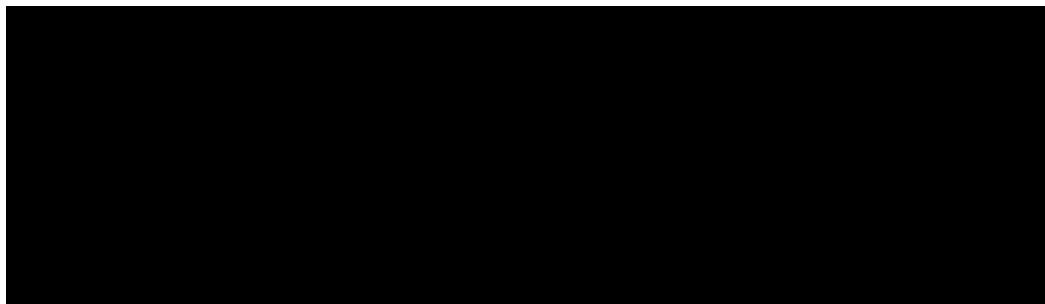
The transmission line traverses sections of suburban regions within Southern Brisbane. As such, it is anticipated that vigilant containment and monitoring will need to be implemented during any paint preparation works like sandblasting, as well as the painting works itself.



Similarly, a short section of the transmission line, (approximately 5km), lies within the [REDACTED], as pictured below. This area may require vigilant containment and monitoring during any paint preparation works like sandblasting, as well as the painting works itself.



Further to the above, the transmission line intersects several major/arterial roads along its alignment, as well as running parallel to [REDACTED]. Any works within these sections will subject Powerlink and its Contractor/s to significant public exposure during execution.



There are numerous road crossings along the alignment which will require considerable road closures and/or traffic management controls during OPGW/OHEW works.



3.3 Project Delivery Strategy

It is expected that the project will be delivered using a Powerlink Refit Panel Contractor for the structural refurbishment works, whilst the Maintenance Service Provider, (O&FS), is anticipated to be engaged for line hardware replacement works. Powerlink is expected to perform the design component.

Project Delivery Strategy Matrix		
Design	Earthworks Design	N/A
	Civil Design	N/A
	Electrical Design (Primary)	Powerlink
	Electrical Design (Secondary) – Protection	N/A
	Electrical Design (Secondary) – Automation	N/A
	Transmission Line Design	Powerlink
	Telecommunication Design	Powerlink
Construction	Earthworks Construction	N/A
	Civil Construction	N/A
	Electrical Construction / Installation	N/A
	Transmission Line Construction/OPGW-OHEW	Refit Panel Contractor/O&FS
Testing	Substation Testing – FAT	N/A
	Substation Testing – SAT	N/A
	Substation Testing – Cut-Over	N/A
	Telecommunication Testing	N/A



3.4 Proposed Sequence of Works

3.4.1 Project Schedule

To meet the required commissioning date of November 2021 full project approval will be required by March 2019.

High Level Schedule

- Project Approval : March 2019
- CA/Design/Scoping Complete : July 2019
- Refit Panel Engagement : November 2019
- MSP engagement complete : November 2019
- Structure Refurbishment (Refit) : March 2020– April 2021
- Hardware Replacement (MSP) : May 2021– August 2021
- OPGW/OHEW Replace't (MSP) : July 2021– September 2021
- Project Final Commissioning : October/November 2021

3.4.2 Project Staging

Major project stages of the project are considered to be:

Stage	Description/Tasks
1	Undertake structural upgrades/refurbishments to the line, including bolts, nuts, painting, step bolt replacement, civil works and the like.
2	Undertake line hardware replacement works, including insulators, vibration dampers and associated components. Undertake OPGW and OHEW replacement works.

Note: These stages may possibly be carried out simultaneously, depending on availability of resources during execution and possibly outage availabilities. If staged, it is preferential to complete structural upgrades prior to hardware refurbishment, to ensure the structures are most adequate to allow access to personnel for the works. Staging the works also allows for clear delineation between Principal Contractors on site.

3.4.3 Network Impacts and Outage Planning

Outage advice from Network Operations has indicated that single circuit outages during winter months are most likely, i.e. April to September. Also, fast return to service (RTS) timeframes will be required, which should be achievable given the scope of works.

It is believed that early planning will allow outages to be available, the risk associated with outages is considered low.

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.

This project scope is not uncommon for Powerlink and does not introduce any specialised construction techniques, nor health and safety issues specific to this scope of works.



3.6 Project Environmental Management

This project involves work on existing assets, and as such, existing environmental management plans are in place regarding accessing structures, new access works are not anticipated.

Section 3.2 identifies project specific issues associated with work of this nature. It is anticipated there will be heavy involvement from environmental groups during the structure refurbishment works, namely any blasting and painting works.

4. Project Risk Management

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

Inclement weather poses a risk to delivery of the project, however, this will best be mitigated by avoiding site works during the traditional wet season, namely December through March.

Unavailability of outages will be a minor risk for the project. To mitigate this risk, single circuit outages with minimal Return to Service (RTS) timeframes should be factored into the work methodologies.

Delays in required road closures may impact project delivery, but can be mitigated by means of early planning.



5. Project Estimate

5.1 Estimate Summary

Quote Summary V2 : CP.02532 Bergins Hill – Goodna – Belmont 275kV TL Refit			
The quotation at current cost levels and escalated for completion by 30 November 2021 at 4.1% per year, for CP.02532 Bergins Hill – Goodna – Belmont 275kV TL Refit is as follows;			
CP.02532 Quotation in \$,000 AUD	Base Cost Levels	Escalated to Compln.	Comment (Costs @ Base Cost Levels)
Transm. Line #1 Bergins Hill – Goodna – Belmont : Line Refit			Bergins Hill – Goodna – Belmont 275kV TL Refit (107 towers - structure bolt/member replacement, insulators, conductor hardware, step bolts, vibration dampers, tower accessories replacement and painting)
			Line Refit (Excluding Painting and Wet Weather)
			Surface preparation and Painting
			Wet weather allowance
Project Concept/Investment & Planning, Statutory Costs and O&FS -Network Ops			Overheads
TOTAL QUOTE (EXCL. EW REFIT & RISKS)	24,871	30,635	
Risk Estimate	1,533	1,533	
TOTAL QUOTE (EXCL. EW REFIT, INCL. RISKS)	26,404	32,168	
Transm. Line #2 Bergins Hill – Goodna – Belmont: OHEW Refit			Bergins Hill – Goodna – Belmont 275kV OHEW Refit - 37km of 11mm ² EW + 39km x 11mm 24 Fibr OPGW
			Mgt, Design & Compliance
			Procurement E/W OPGW & Hardware
			EW/OPGW Retrofit by MSP including EWP Hire
			Other Construction Costs - Road Crossings (\$1.3M), Undercrossings (\$596k), Steel (\$74k), OPGW J Boxes (\$47k) & Washdown bays (\$19k)
			Wet Weather Allowance
Project Concept/Investment & Planning, Statutory Costs and O&FS -Network Ops			Extra QLeave
TOTAL QUOTE EW REFIT (EXCL. RISKS)	4,653	5,732	
Risk Estimate EW REFIT	290	290	
TOTAL QUOTE EW REFIT (INCL. RISKS)	4,943	6,022	
TOTAL QUOTE V2 (EXCL. RISKS)	29,524	36,367	
Risk Estimate V2	1,823	1,823	
TOTAL QUOTE V2 (INCL. RISKS)	31,347	38,190	

5.2 Asset Disposal Table

Not applicable.



6. References

Document name and hyperlink (as entered into Objective)	Version	Date
Project Scope Report	2	08/12/2015
Estimate Detail	2	15/12/2015