Annexure 2.4:

Particular Technical Requirements

Kuilsrivier to Strand and Muldersvlei

Contents

1 GENERAL

1.1 Purpose of the Document

1.1.1 The purpose of this document is to provide the Particular Technical Requirements (“PTR”) which forms part of the minimum Requirements of the Passenger Rail Agency of South Africa (“PRASA”) for the enablement of the PRASA Train Control System (“PTCS”) Phase 1 through the restoration, verification, testing, and commissioning of the existing original equipment manufacturer (“OEM”) Electronic Signalling Interlocking System in PRASA’s Western Cape (“WC”) service region (“the Project”) that the Bidder shall meet and deliver at the Bidder’s cost therefore within the Bid Price.

1.2 Executive Overview

1.2.1 Notwithstanding any other PRASA Requirements stated throughout the RFP, the Bidder shall uncompromisingly deliver the whole of the Works required to achieve successful delivery of the Project.

1.3 Location and Minimum Extent of the Works

1.3.1 The boundaries of the Site are Western Cape region rail servitude for the section:

a) Kuilsrivier to Strand

b) Eersterivier to Muldersvlei

1.3.2 Kuilsrivier to Strand and to Muldersvlei. The extent of the Site is approximately 56 km and includes at least:

a) 13 Installations.

1.3.3 The Site(s) includes at least the following installations located in Signal Equipment Rooms (“SER”) and Apparatus Rooms (“AR”).

a) Kuilsrivier

b) Blackheath

c) Eersterivier

d) Faure

e) Firgrove

f) Somerset West

g) Van der Stel

h) Strand

i) Lynedoch

j) Vlottenburg

k) Stellenbosch

l) Koelenhof

m) Muldersvlei (TFR interface)

1.3.4 Any other Site(s) and Works, activities and resources required to achieve a fully integrated, functional, complete, and future-proofed RSS and meet any other requirements and specifications as requested throughout the RFP or as otherwise instructed in writing by PRASA.

1.3.5 Below shows the section Kuilsrivier to Strand and Muldersvlei stations.

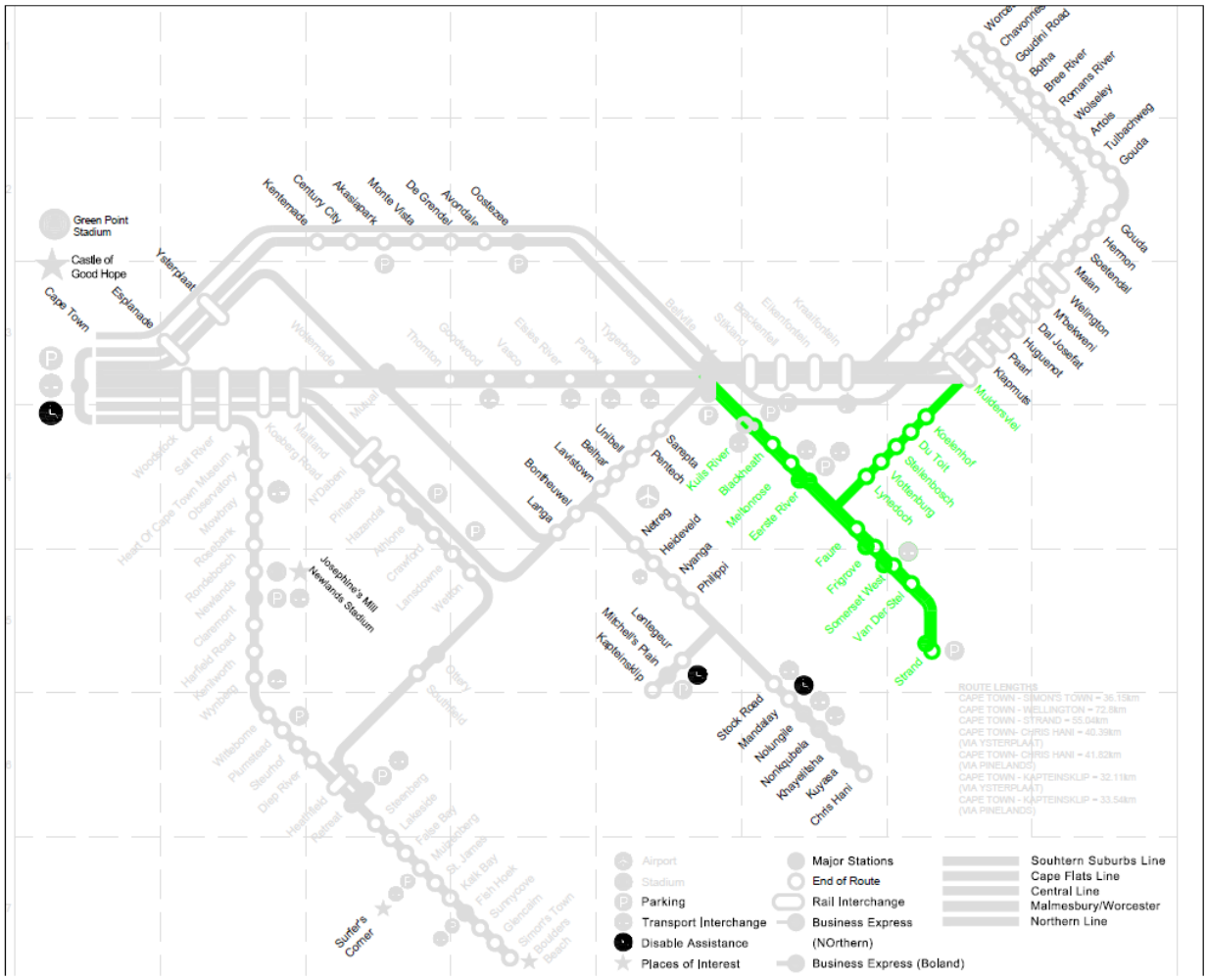

Figure 1 – Kuilsrivier to Strand and Muldersvlei

2 MINIMUM SYSTEM REQUIREMENTS

Restoration Scope summary. Site Detail below.

All quantities to be verified by the bidder

- Railway Signalling Systems
    - Restore the PRASA Railway Signalling System according to the approved As-built drawings provided by PRASA.
    - Restore all OEM Axle counter systems with detection heads.
    - Free issue of OEM axle counter detection heads
    - Restore BSG9i Point machines.
    - Restore Lineside Signals with LED clusters.
    - Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables and the Underground Signalling 48 Core Fibre Cable (OFC 2) between CTC, SERs and ARs to enable a fully functional RSS.
    - Restore damaged controlled level crossing installations as per the approved as-built designs for each level crossing where applicable
    - Replace UPS with battery back-up with Lithium type solution
    - All quantities to be verified by Bidders.
- Telecommunication
    - Restore the optical transmission network to achieve the full redundancy and functionality of the RSS to the required reliability and availability specifications.
    - Install / Replace, where required, the Telecommunication 24 or 48 Core Aerial Optic Fibre Cable (OFC 1), where applicable, as per regional Fibre Optic Link Plans to enable a fully functional Transmission and Telephone System for operational applications and backup for RSS.
    - All quantities to be verified by Bidders.
- Electrical
    - Install Electrical 11kV manual operated link switches.
    - Install connection point for mobile Generators at SER’s/AR’s
    - Restore, test and commission the alternative supply and associated feeder cable

2.1 Kuilsrivier SER

2.1.1 Signalling

(a) Restoration/Replacement of Lineside signalling equipment.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

(c) Replace the Underground Signalling 48 Core Fibre Cable (OFC 2), including patch panels, between the Bellville interface junction point, through Kuilsrivier SER to Blackheath AR.

(d) Replace UPS and battery back-up system with Lithium type solution.

2.1.2 Telecommunication

(a) Install / Replace the Telecommunication 24 Core Aerial Optic Fibre Cable (OFC 1), including patch panels, between Kuilsrivier to Blackheath.

2.1.3 Electrical

(a) Install connection point at SER for mobile Generator.

(b) Install Electrical 11kV manual operated link switch.

(c) Restore, test and commission the main PRASA supply and associated feeder cable from the 11kV transmission line.

2.2 Blackheath AR

2.2.1 Signalling

(a) Restoration/Replacement of Lineside signalling equipment.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

(c) Replace the Underground Signalling 48 Core Fibre Cable (OFC 2), including patch panels, between Blackheath AR to Eersterivier AR.

2.2.2 Telecommunication

(a) Install / Replace the Telecommunication 24 Core Aerial Optic Fibre Cable (OFC 1), including patch panels, between Blackheath to Eersterivier.

2.2.3 Electrical

(a) Install connection point at AR for mobile Generator.

(b) Restore, test and commission the alternative supply and associated feeder cable.

2.3 Eersterivier AR

2.3.1 Signalling

(a) Restoration/Replacement of Lineside signalling equipment.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans

(c) Replace the Underground Signalling 48 Core Fibre Cable (OFC 2), including patch panels, between Eersterivier AR to Faure AR and Eersterivier AR to Lynedoch AR as per as-built cable plans.

2.3.2 Telecommunication

(a) Install / Replace the Telecommunication 24 Core Aerial Optic Fibre Cable (OFC 1), including patch panels, between Eersterivier to Faure and Eersterivier to Lynedoch.

2.3.3 Electrical

(a) Install connection point at AR for mobile Generator.

(b) Restore, test and commission the alternative supply and associated feeder cable.

2.4 Faure AR

2.4.1 Signalling

(a) Restoration/Replacement of Lineside signalling equipment.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

(c) Replace the Underground Signalling 48 Core Fibre Cable (OFC 2), including patch panels, from Faure AR to Firgrove AR as per as-built cable plans.

2.4.2 Telecommunication

(a) Install / Replace the Telecommunication 24 Core Aerial Optic Fibre Cable (OFC 1), including patch panels, between Faure to Firgrove.

2.4.3 Electrical

(a) Install connection point at AR for mobile Generator.

(b) Install 2 x Electrical 11kV manual operated link switches.

(c) Restore, test and commission the alternative supply and associated feeder cable.

2.5 Firgrove AR

2.5.1 Signalling

(a) Restoration/Replacement of Lineside signalling.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

(c) Replace the Underground Signalling 48 Core Fibre Cable (OFC 2), including patch panels, from Firgrove AR to Somerset West AR as per as-built cable plans.

2.5.2 Telecommunication

(a) Install / Replace the Telecommunication 24 Core Aerial Optic Fibre Cable (OFC 1), including patch panels, between Firgrove to Somerset West.

2.5.3 Electrical

(a) Install connection point at AR for mobile Generator.

(b) Relocate 2 x Electrical 11kV manual operated link switches to new positions.

(c) Restore, test and commission the alternative supply and associated feeder cable.

2.6 Somerset West AR

2.6.1 Signalling

(a) Restoration/Replacement of Lineside signalling equipment.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

(c) Replace the Underground Signalling 48 Core Fibre Cable (OFC 2), including patch panels, from Somerset West AR to Van Der Stel AR as per as-built cable plans.

2.6.2 Telecommunication

(a) Install / Replace the Telecommunication 24 Core Aerial Optic Fibre Cable (OFC 1), including patch panels, between Somerset West to Van Der Stel .

2.6.3 Electrical

(a) Install connection point at AR for mobile Generator.

(b) Install 2 x Electrical 11kV manual operated link switches.

2.7 Van der Stel AR

2.7.1 Signalling

2.7.2 Restoration/Replacement of Lineside signalling equipment.

(a) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

(b) Replace the Underground Signalling 48 Core Fibre Cable (OFC 2), including patch panels, from Van Der Stel AR to Strand AR as per as-built cable plans

2.7.3 Telecommunication

(a) Install / Replace the Telecommunication 24 Core Aerial Optic Fibre Cable (OFC 1), including patch panels, between Van Der Stel to Strand.

2.7.4 Electrical

(a) Install connection point at AR for mobile Generator.

(b) Install 1x Electrical 11kV manual operated link switch.

2.8 Strand AR

2.8.1 Signalling

(a) Restoration/Replacement of Lineside signalling equipment.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

2.8.2 Telecommunication

(a) N/A.

2.8.3 Electrical

(a) Install connection point at AR for mobile Generator.

(b) Install 1 x Electrical 11kV manual operated link switch.

2.9 Lynedoch AR

2.9.1 Signalling

(a) Restoration/Replacement of Lineside signalling equipment.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

(c) Replace the Underground Signalling 48 Core Fibre Cable (OFC 2), including patch panels, between Lynedoch AR to Vlottenburg AR as per as-built cable plans.

2.9.2 Telecommunication

(a) Install / Replace the Telecommunication 24 Core Aerial Optic Fibre Cable (OFC 1), including patch panels, between Lynedoch to Vlottenburg.

2.9.3 Electrical

(a) Install connection point at AR for mobile Generator.

(b) Restore, test and commission the main PRASA supply and associated feeder cable from the 11kV transmission line.

2.10 Vlottenburg AR

2.10.1 Signalling

(a) Restoration/Replacement of Lineside signalling equipment.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

(c) Replace the Underground Signalling 48 Core Fibre Cable (OFC 2), including patch panels, between Vlottenburg AR to Stellenbosch AR as per as-built cable plans.

2.10.2 Telecommunication

(a) Install / Replace the Telecommunication 24 Core Aerial Optic Fibre Cable (OFC 1), including patch panels, between Vlottenburg to Stellenbosch.

2.10.3 Electrical

(a) Install connection point at AR for mobile Generator.

(b) Install 2x Electrical 11kV manual operated link switches.

2.11 Stellenbosch AR

2.11.1 Signalling

(a) Restoration/Replacement of Lineside signalling equipment.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

(c) Replace the Underground Signalling 48 Core Fibre Cable (OFC 2), including patch panels, between Stellenbosch AR to Koelenhof AR as per as-built cable plans.

(d) Restore the full level crossing protection functionality at the Distell and the Stellenbosch Farmer’s Winery level crossing installations as per the approved as-built designs.

2.11.2 Telecommunication

(a) Install / Replace the Telecommunication 24 Core Aerial Optic Fibre Cable (OFC 1), including patch panels, between Stellenbosch to Koelenhof.

2.11.3 Electrical

(a) Install connection point at AR for mobile Generator.

(b) Relocate 2 x Electrical 11kV manual operated link switches to new positions.

2.12 Koelenhof AR

2.12.1 Signalling

(a) Restoration/Replacement of Lineside signalling equipment.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

(c) Replace the Underground Signalling 48 Core Fibre Cable (OFC 2), including patch panels, between Koelenhof AR to Muldersvlei AR as per as-built cable plans

2.12.2 Telecommunication

(a) Install / Replace the Telecommunication 24 Core Aerial Optic Fibre Cable (OFC 1), including patch panels, between Koelenhof to Muldersvlei.

2.12.3 Electrical

(a) Install connection point at AR for mobile Generator.

(b) Install Electrical 11kV manual operated link switch.

2.13 Muldersvlei (Interface)

2.13.1 Signalling

(a) Restoration/Replacement of Lineside signalling equipment.

(b) Restore Cable infrastructure inclusive of SCCA4, SCCA5 signalling cables as per as-built cable plans.

2.13.2 Telecommunication

(a) N/A.

2.13.3 Electrical

(a) N/A.