



RADIO COMMUNICATIONS TOWER



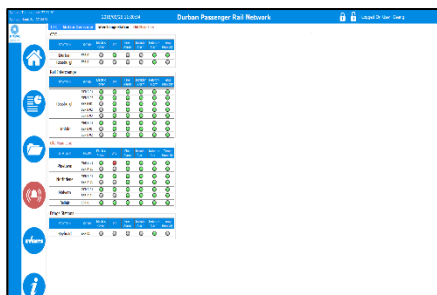
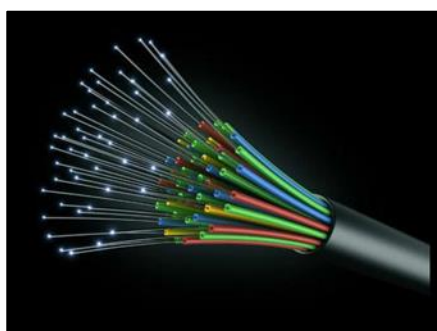
TELECOMMUNICATION INFRASTRUCTURE SERVICES

Telecommunication forms the backbone of any train control system and is therefore an integral part of any signalling solution. The services offered by R&H Rail include, but are not limited to the following:

- Technology solutions and suitable migration paths
- Network optimization strategies
- Analysis of existing high site condition assessments
- Telecommunication system evaluation
- Feasibility analyses and costing
- Procurement processes and tendering
- System and project specifications including Bill of Quantities
- Construction management
- Maintenance management
- Basic and detail designs
- OFC Location and Route Plans
- Factory Acceptance Tests, FAT
- Testing and commissioning of telecommunication installations
- As-Built drawings



Telecommunications



TELECOMMUNICATIONS SOLUTIONS

Solutions for the abovementioned items are based on the most appropriate and available telecommunication technologies:

- Fibre Optic Systems
- Microwave based backhaul systems
- Analogue voice and data radio network systems
- Digital voice and data radio network systems
- Global System for Mobile Communications – Railway (GSM-R)
- Radio based voice communication in shunting yards
- Voice and data communication systems in locomotives
- SCADA systems
- End-of-Train devices
- Satellite based voice and data communication systems
- GPS based tracking systems
- Telecommunication systems to support Train Condition Monitoring Systems
 - Long range digital radio links
 - GPRS links
 - WiMax links
- Point-to-multi-point systems
- Correct selection of Transmission Mediums
- Network Topologies
- Telecommunication Redundancy Measures
- Network Management Systems (NMS)
- VoIP-based Telephony Systems
- Public Address Systems (PA)
- Closed Circuit Television Systems (CCTV)

All telecommunication is based on the long-term convergence of telecommunication technologies.

RECENT PROJECTS

Recent projects where R&H has provided the above services, either as part of the holistic multidisciplinary design effort, or as a standalone service include:

- Upgrade of various level crossing protection systems in the Durban area (2009 to 2012); PRASA
- Nacala Corridor FEL3 in association with Aurecon (2010); Vale Mozambique Limitada
- Dorstfontein Coal loading siding (2009 to 2012); Total Coal SA
- Tweefontein coal loading siding (2013 - 2015); Xstrata Coal SA
- Durban Metro Resignalling Project (2013 - 2018); PRASA
- Mayoko Iron Ore Export Project (2012 - 2014); Exxaro