



Telecom & Wireless Division

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The **Telecom Division of Interactive Euro Technologies** has a proven track record of providing radio network design and performance management services. IET provides these services for various technologies such as WCDMA (3G), CDMA2000 (1XRTT, 3XRTT), GSM, GPRS, EDGE, TDMA, and GSM-R. IET also has extensive experience working with various vendor equipment types.

For turnkey Telecom projects with specific customized needs, IET has a group of expert professionals who specialize in the execution of such contracts and have the ability to respond to the most demanding challenges.

The greatest asset of IET is our experienced personnel. With experiences across multiple technologies and across regions, IET is positioned to provide the right people in the right place at the right time. Additionally, IET is committed to the technical and the professional development of our engineers making IET a smart decision for engineers as well as our customers.

The following sections provide a general description of the types of network design and performance management services offered by Interactive Telecom Division.

- **RF Planning and Optimization**

- Dimensioning
- CW Data Collection
- Model Tuning
- Nominal Cell Planning
- Coverage and Interference Analysis
- Search Rings Technical Site Surveys
- Frequency or Code planning
- Parameter Settings
- Transmission Planning
- RF Datafills/CDD Definitions
- Site-on Air Verification
- System Audits
- Network Optimization
- Network Acceptance

- **Planning Tools**

- TEMS Cell Planner (TCPU)
- Desk-cat
- Pathloss 4.0
- TEMS Link Planner (TLP)
- Actix Analyzer
- Asset 3G

- **Transmission Planning:**

- Creation of transmission topology drawings
- Link performance calculations for new hops
- Path profile analysis
- Channel frequency assignment
- Capacity and time slot allocation diagram

- Line of site surveys and confirmation of the design
- Detailed reporting

- **Survey & Testing:**
 - RF Survey
 - LOS Survey
 - VSWR testing
 - DT/CQT testing

- **Engineering Services:**
 - Building Strength analysis / Soil testing
 - Layout planning & design
 - Tower Height calculations
 - Topographic and Boundary Survey
 - Geotechnical Engineering
 - Environmental Assessment
 - Cultural Assessment
 - Lease Exhibits
 - Permitting and Expediting Services
 - Title Procurement and Permitting
 - Construction Drawings
 - Existing Structure As-Built (Mapping of Structure and Site) if any
 - Structural assessment, evaluation and analysis of Existing Structure if any
 - Structure design modifications (Strengthening Drawings)
 - Foundation Design and Design modifications
 - Electrical and Mechanical Engineering
 - Photo Simulations
 - Construction Stakeout
 - Site As-Built Drawings

- **SITE ACQUISITION**

We undertake site acquisition works, which consists of the following activities:

- Identification of BTS candidate sites along with customer RF team.
- Discussion with the owners to explain the requirements.
- Preparation of the preference list of options with report for acquisition.
- Space ownership verification for the selected candidate site.
- Be associated with customer personnel for commercial negotiations & finalizations.
- Agreement with the owner on customer guidelines for the selected candidate site.

The following documents of the acquired site are submitted to the customer

Lay Out Drawings

- Site Survey
- Site Engineering
- Preparation of site-specific drawings (Site layout plan & Site layout report).
- Site survey and inspection are provided for all the candidate sites but the Site Engineering will be done.

Structural Analysis Report

- Structural Analysis of existing structure.
- Certification for stability by certified structural engineer for the selected candidate.
- **Site Construction Services Management**
 - Prepare constructability reports
 - Coordinate survey, soil analysis, FAA, and geo-technical issues
 - Plan and coordinate power/telco requirements
 - Prepare and oversee project budgets
 - Coordinate all civil and structural engineering activities
 - Review and select qualified contractors
 - Supervise site construction
 - Submit construction progress reports and documentation
 - Procurement, warehousing, and materials management
 - Field quality control
 - Site security
 - Manage all required inspections
 - As-built mark-ups
- **Civil/Site Works**
 - Site prep & clearance
 - Access roads
 - Refurbish grounds to match existing
 - Site fencing and landscaping
- **Foundations**
 - Ancillary equipment foundations or modification
 - Shelter and tower foundation installation/modification
- **Structural**
 - Equipment shelter placement and installation
 - Framing for support of equipment
 - Tower erection (Monopole, guyed, self-supporting, roof-tops, water tanks, stealth designs)
 - Tower structural upgrades
 - Tower Mapping
- **Electrical & Precision Air-conditioning**
 - Grounding systems installation and testing
 - Connection of power and Telco
 - Install utility lines
 - Install coax cables and antennas
 - Provide and install electrical works (raceways, disconnects, switches, underground ducts, lighting, HVAC, fire protection, etc.)
 - Installation of Generators, support & maintenance
 - Installation of Air Conditioning Systems, support & maintenance

- **Testing**
 - Sweep testing
 - Ground testing
 - Material testing
 - Certify soil compaction

- **Installation & Commissioning Services for Telecom / Transmission Equipment**
 - I&C Services for BTS (GSM/CDMA) & Ancillaries
 - I&C Services for MW & Ancillaries
 - I&C Services for BSC / XCDR & Ancillaries
 - I&C Services for MSC

- **O&M for Entire Network**
 - O&M Support for Radio/BTS/BSC including**
 - Diesel Generator Engine side
 - Diesel Generator Alternator side
 - PIU
 - Fire Alarm System
 - Electrical Installations
 - Battery
 - Integrated Panel
 - Air Conditioner units
 - Towers
 - Shelters
 - Cables
 - Battery Bank
 - DC Power Supply
 - Mobile DG Services
 - Fire Extinguishers
 - Fire Extinguishers
 - Maintenance of Earth pits
 - Power Measurement
 - Voltage Standing Wave Ratio Measurements
 - Connectorization Checks (Tightening of nuts& bolts, Cables, Isolators)
 - Antenna Alignment
 - Card Replacements

- **Tower Maintenance**
 - ✓ Perform audit and will certify that the tower is built as per drawings. In case of deviations the same will be highlighted.
 - ✓ Identify variations of tower and accessories with respect to tower drawings and prepare list of variations and submit to Customers.
 - ✓ All bolts and nuts will be tightened with torque wrench for 90 lbs/ft.
 - ✓ Submit list of missing members along with details like member size, whole center- to center dimensions, weight etc.
 - ✓ Submit list of bent, twisted items along with details like size, quantity, weight etc.

- ✓ Bolts & nuts, which are not having washer, like plain and spring will be removed and fixed with washer & spring washer. All bolts & nuts will be painted with zinc paint or apply zinc spray on all bolts. (Customer will supply Zinc spray or zinc paint).
- ✓ Rusted bolts & nuts, Antenna mounts stud bolts, will be removed and replace with new hot dip galvanizing 5.6 graded and apply zinc spray or zinc paint on bolt head, back of nut and exposed threaded portion. (Customer would supply Material)
- ✓ Rusted Members: If rust is small and covers small area. Remove rust with hard iron brush; clean the surface with cloth or brush. Finally apply Zinc spray or zinc (Zinc spray or zinc paint will be supplied by Customer).
- ✓ Verify whether copper LA, cable lugs connections and terminations are good.
- ✓ Check Tower grounding to earth pit with 25 x 6 GI flat or cable end connection is good and measuring earth resistance and submits the report.
- ✓ Apart from riggers qualified supervisor will ensure work is done to high quality.
- ✓ Provide riggers working at site will be insured with PF, ESI etc.

S.No.	Item	Work Involved
1	Tower Light	Checking of Tower Light, dismantling if faulty and mounting the repaired/new bulbs, holders
2	Feeder & power cables between RR station & Tower	Checking cables and couplings for breakage, loose fittings, other faults and replacing /rectifying the same
3	Antenna	Checking for any possible antenna faults, dismantling if faulty and mounting the repaired new antenna
4	Antenna Alignment	Checking for Antenna misalignment and correcting the same
5	Tower Nut/Bolts	Checking tower nuts, bolts etc. and replacing rusted/tightening any loose ones
6	Other Associated Works	It will include but not limited to tracing the fault location and cause of faults (if not one of the above) and rectifying the same. Further contractor is also required to remove insects, Bee hives, bird nest etc. from tower

- **Supply, Installation & Commissioning Services for all external works**

- Tower/ Masts/ Poles/ Mono Poles
- Shelters
- DGs/ Power Back-up
- Air Conditioning
- Civil/ Foundation/ Reinforcement

- **Supply, Installation & Commissioning Services for all internal works**

- Electrical
- Alarms
- Lighting

- **Commissioning & Network Integration Services**
- **Specialized Manpower on Outsourcing Basis**
- **Planning & Execution of Network Expansion Projects**
- **ATP**
 - Testing & Acceptance of the final As-built Site
 - Final documents, Test Result & Design
 - Specialized Tools & Test Equipments

Site Master (Anritsu & BIRD)	8
Site Analyzer	7
Site Master Cum Power Meter(Anritsu)	5
Site Analyzer Cum Power Meter	4
Digital Power Meter	8
Frequency Counter	13
E 1 Tester	11
PDA	21
G.P.S	48
Digital Earth Meters	8

Competitive Advantage of IET Telecom Division

- Single point of contact for site acquisition, engineering, construction, network services. Single point of accountability translates into cost effective solutions, streamlined schedule, greater reliability, flexibility and quality
- Efficiencies of Acquisition, Design and Build being under the same roof:
 - ✓ Control of design and drawing issues in relation to program.
 - ✓ Build ability aspects of each site are considered at the earliest stage.
 - ✓ Close interface between acquisition, design, and construction from the outset, ensures that the site design meets the requirements of the local Planning Authorities and Operator to reduce the risk of delays and/or rejected proposals.
 - ✓ Construction feasibility aspects of each site are investigated and considered at the earliest possible stage resulting in lower cost budgets for the Operator.

- ✓ Early interaction ensures detailed drawings are produced without the need for further information or amendments.
 - ✓ Interaction from the outset will allow for economic solutions to be developed.
 - ✓ Partnering of acquisition, engineering and construction in order to work as a team.
 - ✓ Ease of arranging acquisition, design and construction visits at site identification stage to increase the success rate of the site.
 - ✓ Fully documented design quality system.
- **Health & Safety:** Safety is regarded as one of our Key Performance Indicators (KPI's). Our Safety Department has overall responsibility for safety within our organization. We have full-time professionally qualified Safety Managers who report directly to the Safety Director. Since its inception, IET has maintained an excellent safety record.
 - **Environmental Management System:** We recognize that, while the end product of its activities should enhance the quality of the environment, the build out process itself, and the materials used, have a potential impact on the environment. We have developed an Environmental Management System with the aim of minimizing the impact of its activities on the environment. This Environmental Policy is reviewed annually.
 - **Quality Assurance:** Our employees work to get it right the first time and have a positive commitment to quality and the ability to respond quickly and effectively to changing environments. Quality will be effectively managed through:
 - Process and procedures
 - Requirements and responsibilities defined early
 - Continuous quality control
 - Regular feedback and reaction
 - Random but specific assessments or audits