

**Subject : General Indoor
Solution Proposal**

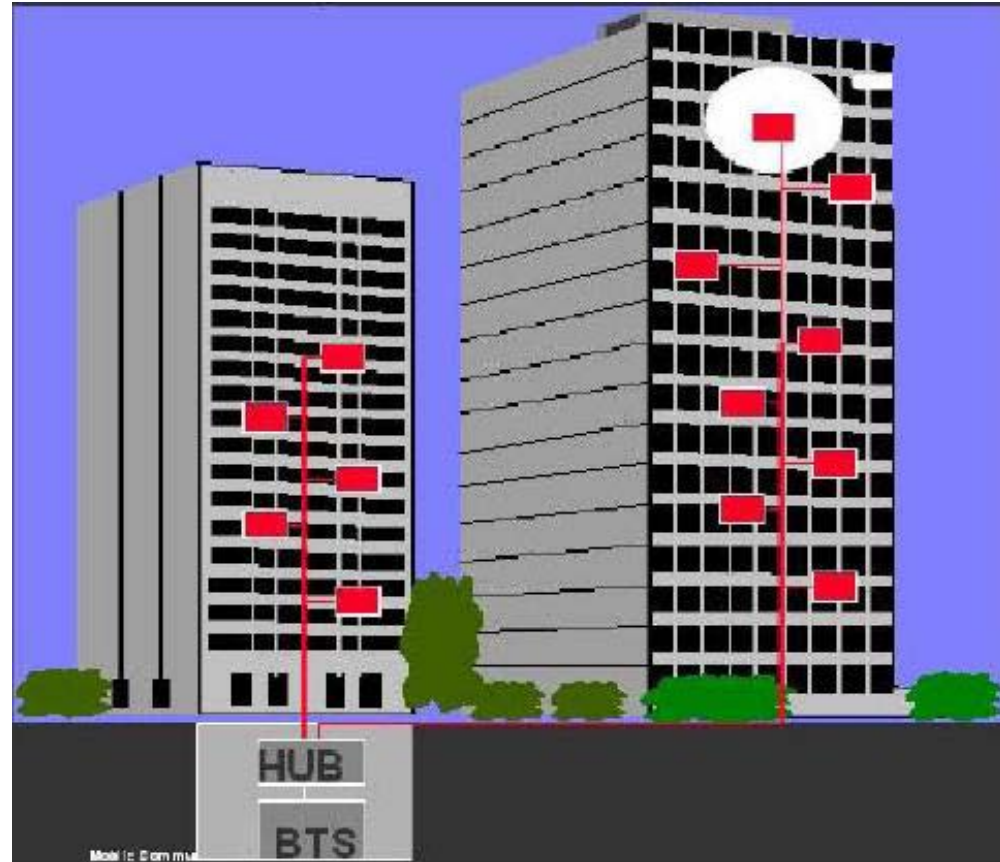
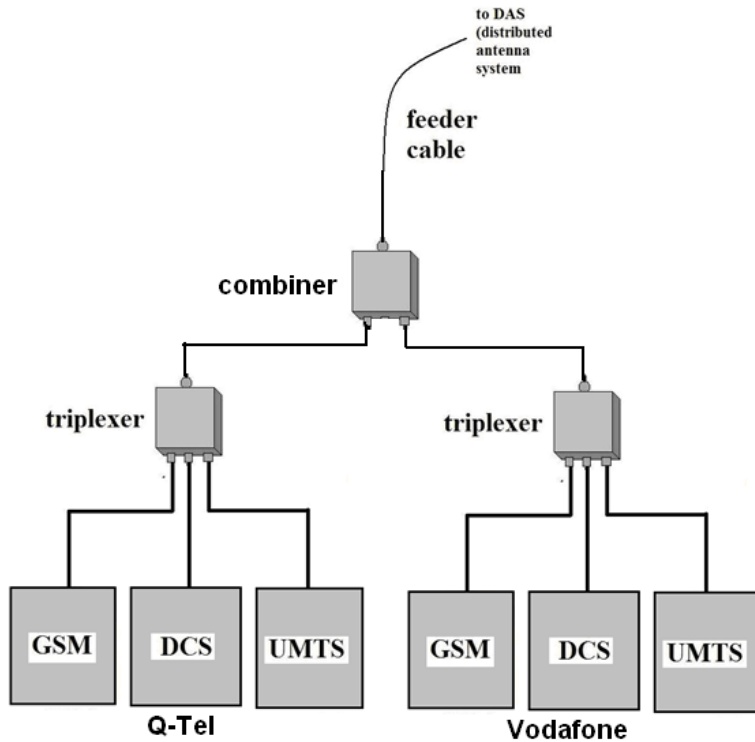


- While GSM Systems can Cover wide areas through outside base stations, complete coverage within a building requires dedicated micro cellular systems
- A state of art wireless GSM DAS (Distributed Antenna System) solution will be provided for dedicated coverage inside the building.
- Solution will consists of small indoor antennas distributed across the building.
- Antennas will be connected through network of RF cables and splitters which will be hidden.
- Wireless signal will be feed from the equipment located inside the QTel Telecom rooms.
- All these solution are shareable with second operator (Vodafone), under mutual sharing agreement, with common antenna approach.

Advantage of Solution

- ▶ Wireless coverage will be provided - e.g. High raised buildings, apartments, offices, corridors, basements, parking, lifts etc.
- ▶ Better voice quality- low interference from external sites.
- ▶ Dedicated Capacity - from the BTS reserved for the building and placed inside the QTel telecom rooms.

Solution Summary








Equipment will be placed inside the Telecom room

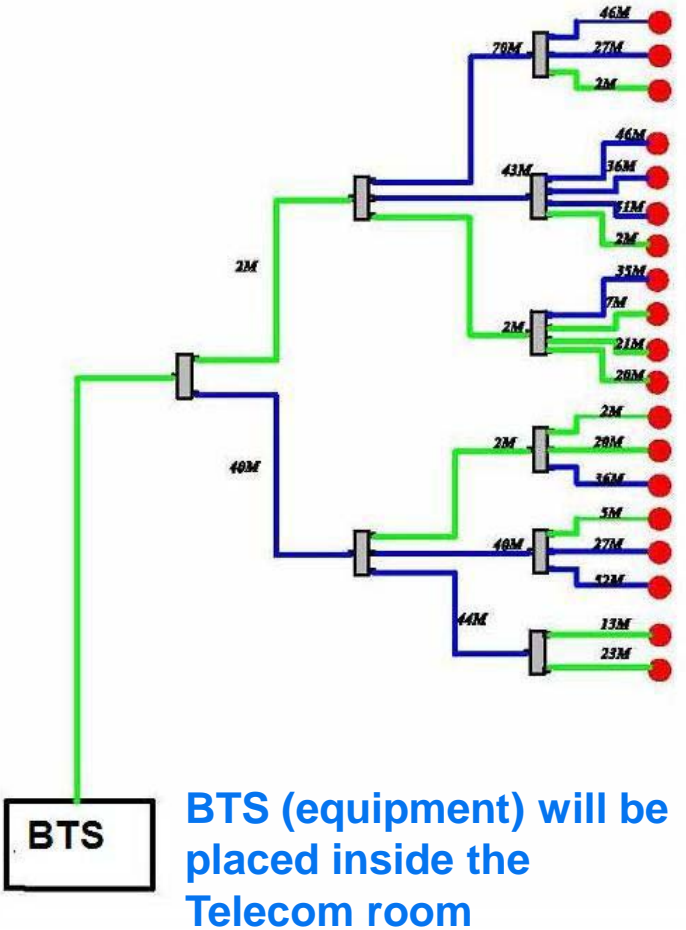
Sample Antenna Pictures (As Installed)



Sample Diagram DAS (Distributed Antenna System)

Legend

-  Omni Antenna
-  1/2" RF Cable
-  3-way Splitter
-  7/8" RF Cable
-  2-way Splitter



Antennas Technical Specs



- ▶ **Height 3.3 cm**
- ▶ **Diameter 6.5 cm**
- ▶ **Weight 0.3 Kg**



- ▶ **Length 8.0 cm**
- ▶ **Width 6.1 cm**
- ▶ **Height 1.8 cm**
- ▶ **Weight 0.5 Kg**

Q-TEL Requirements- Design Stage:

- AutoCAD drawings of the building with floor plans.
- Permission and access to all the floors during the survey to identify the antenna locations and cable routings.
- Information of cable trays routes and risers shall be needed.
- QTel Telecom rooms needs to be Identified.
- One focal point required during the survey & installation.

Q-TEL Requirements- Implementation Stage:



- 300 mm dedicated space on the shaft /riser.
- 40 mm diameter wall openings (with PVC sleeves) required; to route the cables from shaft to each individual floors.
- Horizontal accessible cable trays to route the cables to the antenna locations (as per design)
- 400mm X 400mm temporarily access panels required on horizontal floor to at every 5m (not required in case of removable tiles)
- 400mm X 400mm permanent access panels required where splitters are located for maintenance (as per design)
- 400mm X 400mm access panels are required inside & outside the shaft cable to pull the cables
- Similarly 400mm X 400mm access panels are required inside & outside the walls /partition where antennas are planned inside the rooms/ offices etc

Q-TEL Requirements- Implementation Stage (Cont...):

- Drillings/openings needs to be provided in case there are any bock walls/obstruction above the false ceilings (during installation).
- All the RF cables will be routed above the false ceilings using TIE cables were cable trays are not available/provided.
- All the RF cables will be routed using a saddling in basements/technical areas were cable trays are not available/provided.
- In special areas like ball rooms, lobbies, halls opening/support needs to be provided as required.
- Incase of any antennas planned inside the elevator shafts openings are required to route the cable inside along with the access panels inside the lift lobby.
- Lift operator needs to be dedicated during the installations inside the elevators
- All omni antennas will be installed on the ceilings and panel antennas on the wall (as per the design).

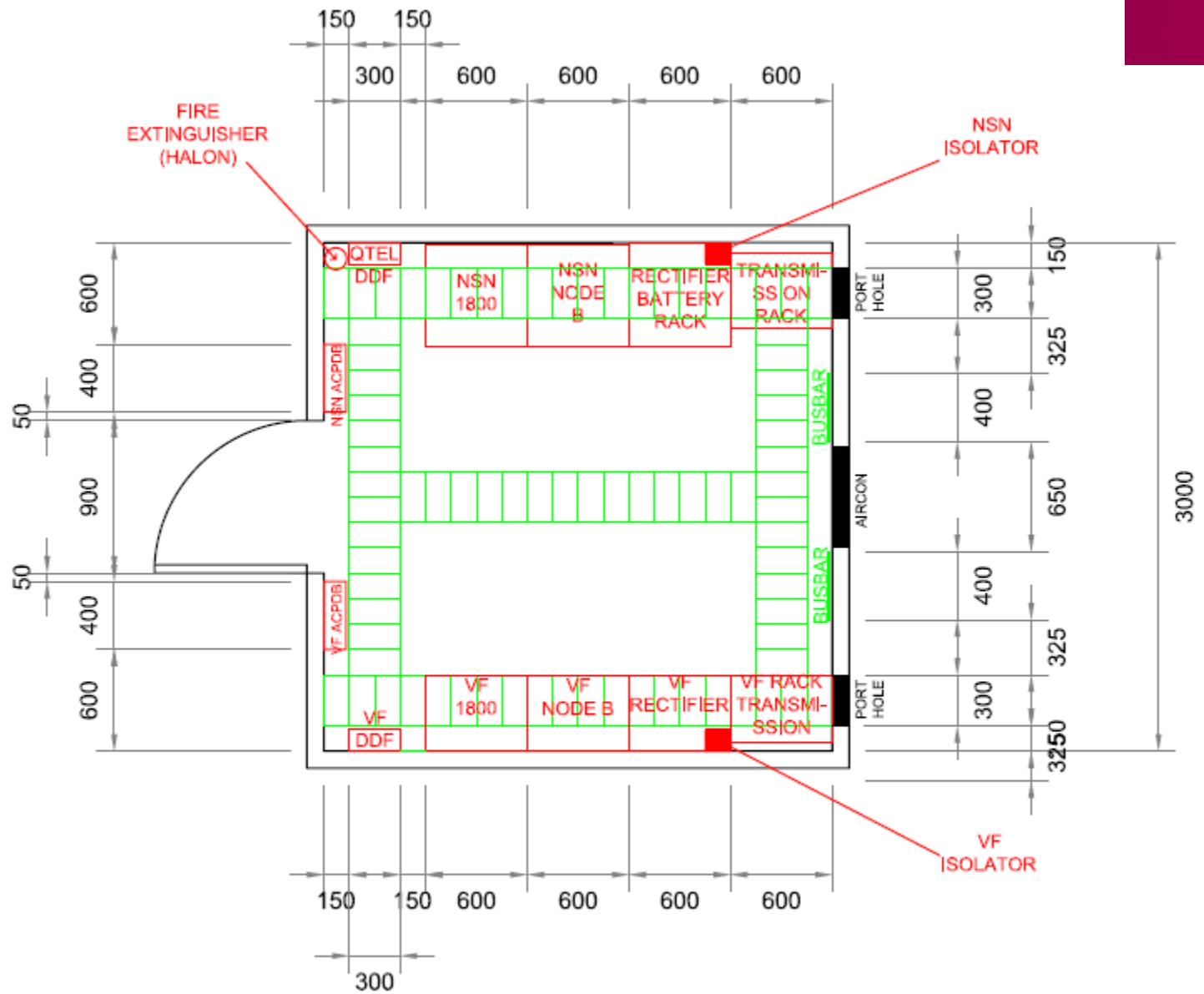
Sample Opening Requirements



-  400mm X 400mm permanent access panel
-  400mm X 400mm temporarily access panel

QTEL Requirements- Telecom Room

- ✓ Room size of (3X3) m or footprint of (3x2) m with unobstructed and unrestricted access (Number of Telecom Rooms vary depending upon the height of the building eg:1-30 Floors (1),1-60 (2) , 1-90 (3).
- ✓ Air condition approx 20-22 deg with dust free environment.
- ✓ Two numbers of 3 phase Mains supply with 63 amp isolator and communication earth.
- ✓ Four numbers of 15 amp power socket.
- ✓ Anti-static floor for telecom equipments.
- ✓ Earthing cable connected to the earth bar inside the telecom room (s).
- ✓ Provisioning of Fire Extinguisher.



EQUIPMENT LAYOUT

Reference Projects - Qatar

- Doha International Airport
- Malls – Villaggio, Centre Point, Landmark etc
- Hotels –Grand Haytt, La Cigale, Ramada, Millennium Hotel, W-Hotel, Holiday Villa etc
- High Rise Building – Tornado, West Bay Lagoon, Ezdan Towers, TMR & TMC, Aspire Tower, ASAS, Murgab, 44 West Bay etc



Reference Projects - Qatar

Asian Games -2006

- Khalifa Stadium
- Indoor Sports Hall
- Aspire Sports Academy
- Al Sadd & Al Arabi Sports Hall
- Aspire Tower etc



The End