BUILDING TECHNICIAN APP – FULL SPECIFICATION DOCUMENT

1. INTRODUCTION & OVERVIEW

This document is a complete specification for the Building Technician App. It combines:
• Functional description / requirements
• Entities & attributes (database design)
• Example SQL schema structure
• UI screen and flow description
• ONT configuration PDF feature details

The purpose of the app is to help field technicians quickly access all important technical information about a building, such as technology type (Huawei, Nokia, SmartOLT, U2000, Positron, etc.), riser locations, floor details, parking information, complexity percentage, manpower requirement, and configuration PDFs for ONT/ONU installation.

2. USER ROLES & FUNCTIONAL REQUIREMENTS

2.1 User Roles

Admin:
• Add, edit, and delete buildings.
• Add floors and risers for each building.
• Upload images (parking, entrance, riser, equipment).
• Upload ONT configuration PDFs per technology and per building.
• Create and manage technician user accounts (username/password/role).

Technician:
• Log in using username and password.
• Search and select buildings from the list.
• View building details, technology details, and complexity level.
• Select their current floor and see nearest riser above and below.
• View building parking information and related images.
• View and download ONT configuration PDFs for that building's technology.
• Cannot modify building data (read-only access).

2.2 Key Functional Requirements

1. Secure login system with Admin and Technician roles.
2. Building search by name, address, or technology type.
3. Building profile view with:
– Name, address, GPS coordinates (optional).
– Technology types (Huawei, Nokia, SmartOLT, U2000, Positron, etc.).
– Complexity percentage and required technicians (1 or 2).
– Parking type and instructions.
4. Floor module to show all floors of the building.
5. Riser module to show riser numbers, floors covered, and location descriptions.
6. Automatic display of nearest riser above and nearest riser below the technician's current floor.
7. Ability to attach images (parking, entrance, risers, panels).
8. Ability to attach multiple technology-specific ONT configuration PDFs to each building and allow technicians to view/download them.

3. ENTITIES & ATTRIBUTES (FINAL)

3.1 User

- UserID (Primary Key, UUID)
- Username (String)
- Email (String)
- PasswordHash (String)
- Role (Admin / Technician)
- IsActive (Boolean)
- CreatedAt (Timestamp)
- LastLogin (Timestamp)

3.2 Building

- BuildingID (Primary Key, UUID)
- BuildingName (String)
- Address (Text)
- Latitude (Decimal, optional)
- Longitude (Decimal, optional)
- TechnologySummary (String – e.g., Huawei, Nokia, SmartOLT, U2000, Positron)
- ComplexityPercentage (Integer 0–100)
- RequiredTechnicians (Integer – usually 1 or 2)
- ParkingType (Underground / Outdoor / Street / Other)
- ParkingInstructions (Text)
- CreatedAt (Timestamp)
- UpdatedAt (Timestamp)

3.3 Floor

- FloorID (Primary Key, UUID)
- BuildingID (Foreign Key → Building.BuildingID)
- FloorNumber (Integer – can be negative for basement)
- Description (Text, optional)
- CreatedAt (Timestamp)
- UpdatedAt (Timestamp)

3.4 Riser

- RiserID (Primary Key, UUID)
- BuildingID (Foreign Key → Building.BuildingID)
- RiserNumber (String)
- FloorsCovered (String or JSON – e.g., “1–10,12”)
- LocationDescription (Text – e.g., “Electrical room near elevator”)
- CreatedAt (Timestamp)
- UpdatedAt (Timestamp)

3.5 BuildingImage

- ImageID (Primary Key, UUID)
- BuildingID (Foreign Key → Building.BuildingID)
- ImageType (Parking / Entrance / Riser / Panel / Other)
- ImageURL (String – path or URL to file)
- UploadedBy (Foreign Key → User.UserID)
- UploadedAt (Timestamp)

3.6 TechnologyDetail

- TechID (Primary Key, UUID)

- BuildingID (Foreign Key → Building.BuildingID)
- TechnologyType (Huawei / Nokia / SmartOLT / U2000 / Positron / Other)
- EquipmentModels (Text – e.g., MA5800, MA5680)
- Notes (Text)
- CreatedAt (Timestamp)
- UpdatedAt (Timestamp)

3.7 TechnologyPDF (ONT Configuration PDFs)

- PDFID (Primary Key, UUID)
- BuildingID (Foreign Key → Building.BuildingID)
- TechnologyType (String – Huawei, Nokia, SmartOLT, U2000, Positron)
- PDFTitle (String – e.g., “Huawei ONT Config Guide – MA5800/U2000”)
- PDFURL (String – file path or URL)
- Description (Text, optional)
- UploadedBy (Foreign Key → User.UserID)
- UploadedAt (Timestamp)

3.8 ComplexityRule (Optional Lookup)

- RuleID (Primary Key, UUID)
- MinPercentage (Integer)
- MaxPercentage (Integer)
- RequiredTechnicians (Integer)
- Notes (Text – e.g., “Above 70% complexity requires 2 technicians”)

4. EXAMPLE SQL SCHEMA (POSTGRES STYLE)

This section provides an example of how the tables may be implemented in PostgreSQL. The development team can adjust data types and constraints as needed.

User Table

```
CREATE TABLE user_account (
  user_id UUID PRIMARY KEY,
  username VARCHAR(100) UNIQUE NOT NULL,
  email VARCHAR(255),
  password_hash VARCHAR(255) NOT NULL,
  role VARCHAR(30) NOT NULL,
  is_active BOOLEAN DEFAULT TRUE,
  created_at TIMESTAMPTZ DEFAULT now(),
  last_login TIMESTAMPTZ
);
```

Building Table

```
CREATE TABLE building (
  building_id UUID PRIMARY KEY,
  name VARCHAR(255) NOT NULL,
  address TEXT,
  location_lat NUMERIC(10,7),
  location_lng NUMERIC(10,7),
  technology_summary VARCHAR(255),
  complexity_pct SMALLINT,
  required_technicians SMALLINT,
  parking_type VARCHAR(50),
  parking_instructions TEXT,
  created_at TIMESTAMPTZ DEFAULT now(),
  updated_at TIMESTAMPTZ DEFAULT now()
);
```

TechnologyPDF Table

```
CREATE TABLE tech_pdf (
  pdf_id UUID PRIMARY KEY,
  building_id UUID REFERENCES building(building_id),
  tech_name VARCHAR(100),
  pdf_title VARCHAR(255),
  pdf_path VARCHAR(1000),
  uploaded_by UUID REFERENCES user_account(user_id),
  uploaded_at TIMESTAMPTZ DEFAULT now()
);
```

Additional tables (floor, riser, building_image, technology_detail, complexity_rule) follow the entity definitions above and can be implemented similarly.

5. UI SCREENS & FLOWS

5.1 Login Screen

• Fields: Username/Email, Password.
• Buttons: Login, Forgot Password (optional).
• Logic: Validate credentials and route user based on role (Admin/Technician).

5.2 Building List / Search Screen

• Search bar: by name, address, or technology type.
• Filter options: Complexity (low/medium/high), Technology (Huawei, Nokia, etc.).
• List items show: BuildingName, short Address, Complexity badge, RequiredTechnicians icon.
• Tap on a building → opens Building Detail screen.

5.3 Building Detail Screen

• Header: BuildingName, Address, optional map pin from Latitude/Longitude.
• Section: TechnologySummary (badges for Huawei, Nokia, SmartOLT, U2000, Positron).
• Section: ComplexityPercentage + RequiredTechnicians.
• Section: ParkingType + ParkingInstructions + images (if available).
• Section: List of Risers or link to Riser List.
• Button: “View ONT Configuration PDFs” – opens TechnologyPDF list for this building.
• Admin-only: Edit Building, Add Floor, Add Riser, Upload Images, Upload PDFs.

5.4 Floor Selection & Nearest Riser

• Technician selects current floor number from building’s floor list.
• System calculates:
– Nearest riser above that floor.
– Nearest riser below that floor.
• Screen shows riser numbers and location descriptions, with links to Riser Detail.

5.5 Riser Detail Screen

• Shows RiserNumber, FloorsCovered, LocationDescription.
• Shows any Riser-related images (if available).

5.6 TechnologyPDF (ONT Configuration) Screen

• Shows a list of PDFs attached to this building:
– PDFTitle
– TechnologyType (Huawei, Nokia, SmartOLT, U2000, Positron)
– UploadedAt
• Actions for technician:
– Open PDF (in-app viewer).
– Download PDF (for offline use).

5.7 Admin Dashboard

• Manage Buildings (add/edit/delete).
• Manage Floors & Risers.
• Manage Building Images.
• Manage TechnologyDetail records.
• Manage Technology PDFs (upload, edit title/tech, delete).
• Manage Users (create technician accounts, reset passwords, disable users).

6. ONT CONFIGURATION PDF FEATURE (HIGHLIGHT)

The app supports attaching one or more ONT/ONU configuration PDFs to each building. These PDFs are not created by the app; they are existing documents that contain configuration instructions for different vendors/technologies, such as:

- Huawei ONT configuration (e.g., with U2000 / MA5800).
- Nokia ONT configuration.
- SmartOLT ONT provisioning.
- U2000-based ONU/ONT setup.
- Positron GAM/ONU configuration.

Admin Actions:

- Upload PDF and assign it to a specific building and technology type.
- Example: For Building “38 Bidwell”, attach “Huawei MA5800 ONT Config Guide.pdf”.

Technician Actions:

- Open the building profile in the app.
- Tap “View ONT Configuration PDFs”.
- Select the relevant PDF based on the technology in that building (e.g., Nokia).
- Open it in the app viewer or download it to the device for offline reading at site.

This ensures technicians always have the proper configuration procedures ready when they are on-site.

7. SUMMARY

This full document provides all major details required by the software development team to design and implement the Building Technician App, including functional requirements, entities and attributes, example SQL structure, UI flow, and the ONT configuration PDF feature. This can be used as a base specification for backend, frontend, and database design.