Detailed Breakdown of All 11 Tables

1. FireStation Table

- **Elements:**
  - **Station_ID (Primary Key):** A unique identifier for each fire station.
  - **Name:** The name of the fire station (e.g., "Central Fire Station").
  - **Location:** The physical address of the fire station.
  - **Contact_Number:** The contact number for the fire station.
  - **Total_Staff:** The total number of staff members at the station.
  - **Total_Vehicles:** The total number of vehicles at the station.
- **Normalization:**
  - **1NF:** The table is in 1NF because each column contains atomic values. For example, `Name` only stores the name of the station, and `Contact_Number` only stores a single phone number.
  - **2NF:** The table is in 2NF because it has a single-column primary key (`Station_ID`), and all non-key attributes (like `Name`, `Location`, etc.) are fully dependent on the primary key. There are no partial dependencies.
  - **3NF:** The table is in 3NF because there are no transitive dependencies. All attributes depend directly on the primary key (`Station_ID`), and not on any other non-key attribute.
  - **BCNF:** The table is in BCNF because the primary key (`Station_ID`) is the only determinant, and it uniquely identifies every other attribute in the table.

2. Vehicle Table

- **Elements:**
  - **Vehicle_ID (Primary Key):** A unique identifier for each vehicle.
  - **Type:** The type of vehicle (e.g., fire truck, ambulance).
  - **Model_No:** The model number of the vehicle.
  - **Status:** The current status of the vehicle (e.g., active, under maintenance).
  - **Water_Capacity:** The water-carrying capacity of the vehicle (if applicable).
  - **Station_ID (Foreign Key):** Links the vehicle to a specific fire station.
  - **Last_Maintenance_Date:** The date when the vehicle was last serviced.
- **Normalization:**
  - **1NF:** The table is in 1NF because all columns contain atomic values. For example, `Type` only stores the type of vehicle, and `Model_No` only stores the model number.
  - **2NF:** The table is in 2NF because it has a single-column primary key (`Vehicle_ID`), and all non-key attributes depend entirely on this key. There are no partial dependencies.
  - **3NF:** The table is in 3NF because there are no transitive dependencies. For example, `Status` depends directly on `Vehicle_ID`, not on any other attribute like `Station_ID`.
  - **BCNF:** The table is in BCNF because the primary key (`Vehicle_ID`) is the only determinant, and it uniquely identifies every other attribute in the table.

3. Supplier Table

- **Elements:**
  - **Supplier_ID (Primary Key):** A unique identifier for each supplier.
  - **Name:** The name of the supplier (e.g., "Fire Safety Supplies Inc.").
  - **Contact:** The contact information of the supplier.

- **Email:** The email address of the supplier.
- **Address:** The physical address of the supplier.
- **Item_Provided:** The type of item provided by the supplier (e.g., fire extinguishers, hoses).

- **Normalization:**
  - **1NF:** The table is in 1NF because all columns contain atomic values. For example, `Email` only stores a single email address.
  - **2NF:** The table is in 2NF because it has a single-column primary key (`Supplier_ID`), and all non-key attributes depend entirely on this key. There are no partial dependencies.
  - **3NF:** The table is in 3NF because there are no transitive dependencies. For example, `Address` depends directly on `Supplier_ID`, not on any other attribute like `Name`.
  - **BCNF:** The table is in BCNF because the primary key (`Supplier_ID`) is the only determinant, and it uniquely identifies every other attribute in the table.

4. Inventory Table

- **Elements:**
  - **Inventory_ID (Primary Key):** A unique identifier for each inventory item.
  - **Item_Name:** The name of the item (e.g., fire extinguisher, hose).
  - **Quantity:** The quantity of the item in stock.
  - **Station_ID (Foreign Key):** Links the inventory item to a specific fire station.
  - **Supplier_ID (Foreign Key):** Links the item to the supplier who provided it.
  - **Last_Updated:** The timestamp of the last update to the inventory.

- **Normalization:**
  - **1NF:** The table is in 1NF because all columns contain atomic values. For example, `Item_Name` only stores the name of the item.
  - **2NF:** The table is in 2NF because it has a single-column primary key (`Inventory_ID`), and all non-key attributes depend entirely on this key. There are no partial dependencies.
  - **3NF:** The table is in 3NF because there are no transitive dependencies. For example, `Quantity` depends directly on `Inventory_ID`, not on any other attribute like `Station_ID`.
  - **BCNF:** The table is in BCNF because the primary key (`Inventory_ID`) is the only determinant, and it uniquely identifies every other attribute in the table.

5. Staff Table

- **Elements:**
  - **Staff_ID (Primary Key):** A unique identifier for each staff member.
  - **Name:** The name of the staff member.
  - **Designation:** The role or designation of the staff member (e.g., firefighter, paramedic).
  - **Contact:** The contact information of the staff member.
  - **Email:** The email address of the staff member.
  - **Station_ID (Foreign Key):** Links the staff member to a specific fire station.
  - **Shift:** The shift timing of the staff member (e.g., morning, night).

- **Normalization:**
  - **1NF:** The table is in 1NF because all columns contain atomic values. For example, `Designation` only stores the role of the staff member.
  - **2NF:** The table is in 2NF because it has a single-column primary key (`Staff_ID`), and all non-key attributes depend entirely on this key. There are no partial dependencies.
  - **3NF:** The table is in 3NF because there are no transitive dependencies. For example, `Shift` depends directly on `Staff_ID`, not on any other attribute like `Station_ID`.
  - **BCNF:** The table is in BCNF because the primary key (`Staff_ID`) is the only determinant, and it uniquely identifies every other attribute in the table.

6. User Table

- **Elements:**
  - **User_ID (Primary Key):** A unique identifier for each user.
  - **Name:** The name of the user.
  - **Username:** A unique username for login purposes.
  - **Password:** The password for login.
  - **Contact:** The contact information of the user.
  - **Email:** The email address of the user.
  - **Address:** The physical address of the user.
- **Normalization:**
  - **1NF:** The table is in 1NF because all columns contain atomic values. For example, `Username` only stores a single username.
  - **2NF:** The table is in 2NF because it has a single-column primary key (`User_ID`), and all non-key attributes depend entirely on this key. There are no partial dependencies.
  - **3NF:** The table is in 3NF because there are no transitive dependencies. For example, `Address` depends directly on `User_ID`, not on any other attribute like `Username`.
  - **BCNF:** The table is in BCNF because the primary key (`User_ID`) is the only determinant, and it uniquely identifies every other attribute in the table.

7. Admin Table

- **Elements:**
  - **Admin_ID (Primary Key):** A unique identifier for each admin.
  - **Name:** The name of the admin.
  - **Username:** A unique username for login purposes.
  - **Password:** The password for login.
  - **Contact:** The contact information of the admin.
  - **Role:** The role of the admin (e.g., super admin, station admin).
- **Normalization:**
  - **1NF:** The table is in 1NF because all columns contain atomic values. For example, `Username` only stores a single username.
  - **2NF:** The table is in 2NF because it has a single-column primary key (`Admin_ID`), and all non-key attributes depend entirely on this key. There are no partial dependencies.
  - **3NF:** The table is in 3NF because there are no transitive dependencies. For example, `Role` depends directly on `Admin_ID`, not on any other attribute like `Username`.
  - **BCNF:** The table is in BCNF because the primary key (`Admin_ID`) is the only determinant, and it uniquely identifies every other attribute in the table.

8. Report Table

- **Elements:**
  - **Report_ID (Primary Key):** A unique identifier for each report.
  - **Street_Address:** The street address of the incident.
  - **City:** The city where the incident occurred.
  - **State:** The state where the incident occurred.
  - **Pincode:** The postal code of the incident location.
  - **Description:** A detailed description of the incident.

- **Report_Date_Time:** The timestamp of when the report was filed.
- **Severity_Level:** The severity level of the incident (e.g., low, medium, high).
- **User_ID (Foreign Key):** Links the report to the user who filed it.
- **Action_Taken:** A description of the action taken in response to the report.
- **Action_Date_Time:** The timestamp of when the action was taken.
- **Admin_ID (Foreign Key):** Links the report to the admin who handled it.
- **Assigned_Vehicle (Foreign Key):** Links the report to the vehicle assigned to the incident.
- **Assigned_Staff (Foreign Key):** Links the report to the staff assigned to the incident.

- **Normalization:**
  - **1NF:** The table is in 1NF because all columns contain atomic values. For example, `Description` only stores a single description.
  - **2NF:** The table is in 2NF because it has a single-column primary key (`Report_ID`), and all non-key attributes depend entirely on this key. There are no partial dependencies.
  - **3NF:** The table is in 3NF because there are no transitive dependencies. For example, `Severity_Level` depends directly on `Report_ID`, not on any other attribute like `User_ID`.
  - **BCNF:** The table is in BCNF because the primary key (`Report_ID`) is the only determinant, and it uniquely identifies every other attribute in the table.

9. EquipmentUsage Table

- **Elements:**
  - **Usage_ID (Primary Key):** A unique identifier for each usage record.
  - **Inventory_ID (Foreign Key):** Links the usage record to the inventory item used.
  - **Used_Quantity:** The quantity of the item used.
  - **Date_Used:** The timestamp of when the item was used.
  - **Purpose:** The purpose of using the item (e.g., training, emergency).
  - **Staff_ID (Foreign Key):** Links the usage record to the staff member who used the item.

- **Normalization:**
  - **1NF:** The table is in 1NF because all columns contain atomic values. For example, `Purpose` only stores a single purpose.
  - **2NF:** The table is in 2NF because it has a single-column primary key (`Usage_ID`), and all non-key attributes depend entirely on this key. There are no partial dependencies.
  - **3NF:** The table is in 3NF because there are no transitive dependencies. For example, `Used_Quantity` depends directly on `Usage_ID`, not on any other attribute like `Inventory_ID`.
  - **BCNF:** The table is in BCNF because the primary key (`Usage_ID`) is the only determinant, and it uniquely identifies every other attribute in the table.

10. Maintenance Table

- **Elements:**
  - **Maintenance_ID (Primary Key):** A unique identifier for each maintenance record.
  - **Vehicle_ID (Foreign Key):** Links the maintenance record to the vehicle being maintained.
  - **Maintenance_Type:** The type of maintenance performed (e.g., oil change, engine repair).
  - **Date_Performed:** The timestamp of when the maintenance was performed.
  - **Cost:** The cost of the maintenance.
  - **Performed_By:** The name of the person or entity who performed the maintenance.

- **Normalization:**

- **1NF:** The table is in 1NF because all columns contain atomic values. For example, `Maintenance_Type` only stores the type of maintenance.
- **2NF:** The table is in 2NF because it has a single-column primary key (`Maintenance_ID`), and all non-key attributes depend entirely on this key. There are no partial dependencies.
- **3NF:** The table is in 3NF because there are no transitive dependencies. For example, `Cost` depends directly on `Maintenance_ID`, not on any other attribute like `Vehicle_ID`.
- **BCNF:** The table is in BCNF because the primary key (`Maintenance_ID`) is the only determinant, and it uniquely identifies every other attribute in the table.

11. FuelLog Table

- **Elements:**
  - **Fuel_ID (Primary Key):** A unique identifier for each fuel log.
  - **Vehicle_ID (Foreign Key):** Links the fuel log to the vehicle being fueled.
  - **Date:** The timestamp of when the fueling occurred.
  - **Fuel_Amount:** The amount of fuel added.
  - **Cost:** The cost of the fuel.
- **Normalization:**
  - **1NF:** The table is in 1NF because all columns contain atomic values. For example, `Fuel_Amount` only stores a single value.
  - **2NF:** The table is in 2NF because it has a single-column primary key (`Fuel_ID`), and all non-key attributes depend entirely on this key. There are no partial dependencies.
  - **3NF:** The table is in 3NF because there are no transitive dependencies. For example, `Cost` depends directly on `Fuel_ID`, not on any other attribute like `Vehicle_ID`.
  - **BCNF:** The table is in BCNF because the primary key (`Fuel_ID`) is the only determinant, and it uniquely identifies every other attribute in the table.