**Software Requirements Specification**

for

**Construction Project Supervision**

Version 1.0 approved

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**Revision History**

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| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
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# **1.** **Introduction**

## **1.1** **Purpose**

This document aims to provide a comprehensive exploration of the “Construction Project Supervision” web application. It seeks to clarify the purpose of the system, identify its main features, explain the interfaces it uses, clarify its intended functionality, identify operational constraints. Target both stakeholders and developers. It serves as a comprehensive reference linking understanding between the envisioned system and its practical realization, ensuring compatibility with the syndicate's objectives and successful development.

## **1.2** **Product Scope**

The application aims to streamline and enhance the management and monitoring of construction projects for the Engineers Syndicate. It facilitates a transition from a traditional paper-based system to a digital platform, providing a centralized hub for efficient tracking, analysis, and reporting. The primary goals include:

**1. Minimize Paperwork Overload:**

Address the challenge of managing large quantities of documents by digitizing project records, minimizing paperwork, and supporting a paperless workflow.

**2. Mobile Accessibility:**

Design the application for mobile accessibility, enabling on-site supervisors to access critical project data in real-time, enhancing communication, and decision-making directly from the field.

**3. Scalability and Adaptability:**

Build the software to be scalable and adaptable, accommodating new requirements without compromising performance and providing a sustainable, future-proof solution for evolving project scopes.

These key objectives define the purpose and direction of the "Construction Project Supervision" web application, ensuring it meets current needs and serves as a strategic asset for long-term success and environmental responsibility.

The product scope defines the boundaries and coverage of the Construction Project Supervision web application, outlining specific features, functionalities, and constraints. It encompasses the following key elements:

**1. Functionality Overview:**

Users can sign in, access project management sections, select assigned projects, review project details, track visits, monitor progress, utilize a reporting system, analyze reports, and provide optional feedback.

**2. Project Modification:**

Project administrators have the capability to add new projects, delete projects, and modify project details.

**3. Visits Modification:**

Project administrators have the capability to add new visits, delete visits, and modify visit details.

By establishing these boundaries, the product scope sets clear expectations for the project team and stakeholders, ensuring a focused and effective development process for the Construction Project Supervision web application.

This section offers a concise depiction of the "Construction Project Supervision" web application, elucidating its purpose, associated benefits, and alignment with overarching goals and objectives.

## **1.3** **Definitions, acronyms, and abbreviations**

## 

|  |  |
| --- | --- |
| **Term** | **Definition** |
| Supervisor & admin & administrator | Project supervisors at the Engineers Syndicate |
| User | Supervisor & admin & administrator |
| Database | Collection of all the information monitored by this system. |
| Software Requirements Specification | A document that completely describes all of the functions of a proposed system and the constraints under which it must operate. For example, this document. |

## 

## **1.4** **References**

The “Construction Project Supervision” web application is developed through various documents and resources:

**syndicate visits reports:**

Description: Detailed reports obtained during weekly visits to syndicates, outlining their needs, operational processes, and specific requirements.

Source: Internal documents collected during personal visits.

Date: September 9, 2023 - Ongoing.

Additional notes: Questions and inquiries about their operational methods and preferences are prepared in advance to ensure comprehensive data collection.

**Visible paper forms:**

Description: Paper models representing project structures and specifications.

Source: Paper forms taken from the syndicate’s projects supervisor.

**Excel files - project numbers and statistics:**

Description: Excel files containing data related to the project, including numbers and statistics.

Source: Internal records provided by the syndicate and obtained during visits.

## **1.5** **Overview**

The following chapter, denoted as the Overall Description section in this document, provides a broad understanding of the product's functionality. It outlines informal requirements and serves to set the context for the subsequent technical requirements specification in the following chapter. The third chapter, titled Requirements Specification section, is crafted primarily for developers. It delves into the technical intricacies, providing detailed insights into the product's functionality. While both sections comprehensively depict the software product, they are tailored for distinct audiences, employing language that aligns with the understanding and needs of their respective readerships.

# **2.** **Overall Description**

## **2.1** **Product Perspective**

The "Construction Project Supervision" web application is positioned as a new and self-contained product, designed to meet the specific needs of the Engineers Syndicate in tracking and overseeing construction projects. This application is not a part of an existing product family but is developed as a standalone solution to replace traditional paper-based systems.

***Context and Origin:***

**Origin:** The need for a digital project supervision platform arose from the inefficiencies of paper-based tracking systems used by the Engineers Syndicate.

**Context:** The application stands independently, serving as a modern and efficient alternative to manual project tracking. It is not an extension or replacement for existing systems but represents a technological advancement in project management.

**Relationship to Larger System:**

Larger System: While the "Construction Project Supervision" application is self-contained, it may interact with larger systems related to the Engineers Syndicate's overall workflow, allowing data exchange and coordination.

## **2.2** **Product Functions**

**Use Case: Project Supervisor**

**Brief Description**

This use case outlines the process of project supervisors reviewing project information within the "Construction Project Supervision" web application.

**Initial Step-By-Step Description:**

**Login:**

The authorized project supervisor logs into the system using their credentials.

**Access Project Management**:

The supervisor navigates to the "Project Management" section of the application.

**Select Assigned Project:**

The supervisor selects a construction project assigned to them for review.

**Review Project Details:**

The system presents project details, including progress, visit history, and current status.

**Visit Tracking:**

Recording and viewing of project visits to ensure comprehensive inspection history.

**Progress Monitoring:**

Centralized dashboard for monitoring project progress, including setting and tracking project milestones.

**Reporting System:**

Generation of detailed reports on project status, visit history, and other relevant information.

**Analyze Reports:**

The supervisor accesses detailed reports related to the project's status, visit history, and other relevant information.

**Additional Functionality (Optional):**

**Provide Feedback:**

If needed, the supervisor has the option to provide feedback or comments on the project.

**Add New Project:**

The project admin can initiate the addition of a new project, providing necessary details and specifications.

**Delete Project:**

The admin has the capability to delete a project if it is no longer relevant or required.

**Modify Project Details:**

Ability to edit and update existing project details for accuracy and relevance.

**Add New Visit:**

The project admin can initiate the addition of a new visit, providing necessary details and specifications.

**Delete Visit:**

The admin has the capability to delete a visit if it is no longer relevant or required.

**Modify visit Details:**

Ability to edit and update existing visit details for accuracy and relevance.

## **2.3** **User Classes and Characteristics**

For the "Construction Project Supervision" web application, the user class is primarily defined as follows:

**Project Supervisors:**

Role: Responsible for overseeing and managing construction projects.

Characteristics: Requires in-depth project information, reporting capabilities, and the ability to track project milestones. Internet literacy and familiarity with project management concepts are expected.

Understanding the unique requirements and characteristics of this single user class is vital for tailoring the application to meet their specific needs, ensuring a user-friendly and efficient experience within the scope of the Construction Project Supervision web application.

## **2.4** **Operating Environment**

The "Construction Project Supervision" web application is designed to be user-friendly and adaptable within a typical web environment. It is expected to operate smoothly in the following conditions:

**Web Browsers:**

The application is accessible through standard web browsers, including Google Chrome, Mozilla Firefox, Microsoft Edge, Safari and Opera.

Users are recommended to use the latest versions of these browsers for optimal performance.

**Operating Systems:**

The web application is compatible with common operating systems, such as Windows (versions: 7, 8, 10), MacOS, and various Linux distributions.

**Hardware Requirements:**

The application is optimized to run efficiently on standard computing hardware commonly available in typical office setups. It is designed not to impose high-end hardware requirements, ensuring compatibility with a wide range of devices.

**Network Connectivity:**

A stable internet connection is essential for accessing the web application and ensuring real-time data synchronization.

## **2.5 Design and Implementation Constraints**

The Construction Project Supervision web application faces unique constraints that influence the project's development and timeline. These specific constraints are essential considerations for managing expectations and ensuring a successful outcome:

**Time Constraints:**

Limited time is available due to academic commitments, impacting the speed of project completion.

The project timeline should be balanced to accommodate study schedules while maintaining steady progress.

**Variable Client Requirements:**

The client's requirements for front-end design are subject to change.

Regular communication with the client is crucial to understand evolving preferences and incorporate dynamic design elements.

**Client's Limited Programming Knowledge:**

The client lacks in-depth knowledge of programming concepts.

Effective communication strategies and non-technical explanations are necessary to ensure the client's understanding of technical decisions and implications.

**Balancing Design Preferences:**

Front-end design decisions heavily depend on the client's subjective preferences.

Balancing aesthetic choices with usability and industry best practices is crucial for an optimal user experience.

**Variable Project Scope:**

The project scope may evolve as the client refines their expectations and requirements.

Flexibility in project planning and adaptability to changing scope are critical for success.

Acknowledging and addressing these project-specific constraints will contribute to a more realistic and successful development process, aligning the project outcomes with the client's expectations and accommodating the unique challenges posed by time constraints and variable client requirements.

## **2.6 Assumptions and Dependencies**

In the development of the Construction Project Supervision web application, certain assumptions and dependencies have been considered to guide the project's progression. It is crucial to recognize these factors for a well-informed and successful development process:

**Assumptions:**

**Internet Connectivity:**

Users engaging with the web application are assumed to have consistent and reliable internet connectivity to access and interact with project features.

**User Technological Familiarity:**

Users are expected to possess basic technological familiarity, allowing them to navigate the web application's functionalities effectively.

**Unique Project Identification Numbers:**

When users enter identification numbers for new projects, it is assumed that the provided number is unique and not associated with any previously recorded projects on paper within the guild.

**Dependencies:**

**Internet Access During Project Engagement:**

The project's seamless operation is dependent on users maintaining an active internet connection throughout their engagement with the web application.

**User Familiarity with Technology:**

The successful utilization of the web application relies on users' familiarity with fundamental technology concepts and user interfaces.

**Unique Project Identification Validation:**

The application is dependent on the assumption that the identification number entered for a new project is unique, avoiding conflicts with any existing projects within the guild.

By acknowledging these assumptions and dependencies, the project team can navigate potential challenges effectively and ensure that the web application aligns with the anticipated user experience. It is essential to maintain clear communication regarding these expectations to enhance the overall project understanding and success.

# **3.** **Specific requirements**

## **3.1** **External Interface Requirements**

### **3.1.1** **User Interfaces**

The user interfaces of the "Construction Project Supervision" web application are designed for intuitive navigation and efficient access to project-related information. Here are the key components:

**Main Dashboard:**

Displays statistics and key metrics for all projects in a tabular format.

Each project is represented as a row, providing a quick overview.

Clicking on a project name navigates the user to the detailed project page.

**Project Overview Page:**

Presents basic project information at the top of the page.

Below, all visits related to the selected project are displayed in rows.

Each visit row includes essential details, such as visit date and status.

**Visit Details Page:**

Accessed by clicking on a specific visit from the project overview.

Displays comprehensive details of the selected visit, including inspection findings and progress.

Allows users to add, delete, or modify visits after logging in to a specific project.

The design adheres to a clean and organized layout, prioritizing user experience and efficient information retrieval.

### 

### **3.1.2** **Hardware Interfaces**

The "Construction Project Supervision" web application will interact with hardware components based on specific logical and physical characteristics. These interfaces are designed to support various device types and ensure efficient data and control interactions. Key aspects of the hardware interfaces include:

**Supported Devices:**

The application is designed to support standard computing devices, including desktop computers, laptops, tablets, and smartphones.

Compatibility with major operating systems, including Windows, macOS, iOS, and Android.

**Data and Control Interactions:**

Efficient data exchange between the software and hardware components to facilitate project data management.

Control interactions for seamless navigation and functionality, ensuring a responsive user experience.

**Communication Protocols:**

Utilization of standard communication protocols for data transmission between the web application and hardware components.

Support for HTTPS protocols for secure and reliable communication over the internet.

**Browser Compatibility:**

Compatibility with popular web browsers, including but not limited to Google Chrome, Mozilla Firefox, Microsoft Edge, and Safari.

Ensuring consistent performance and functionality across different browsers.

**Mobile Device Optimization:**

Responsive design to optimize the application's performance on various mobile devices, adapting to different screen sizes and resolutions.

Utilization of touch interfaces for mobile devices to enhance user interaction.

### **3.1.3** **Software Interfaces**

The "Construction Project Supervision" web application will interact with various software components, each serving a specific purpose in the overall system. These interfaces include connections with databases, operating systems, tools, libraries, and integrated commercial components. Key aspects of the software interfaces are outlined below:

**Database Management System (DBMS):**

Interaction with a relational database to store and retrieve project-related data.

Utilizing SQL queries for data manipulation and retrieval.

**Front-End Frameworks and Libraries:**

Integration with key front-end technologies, including BOOTSTRAP.

Utilization of React.js, incorporating features like React Router for efficient navigation.

Implementation of responsive and visually appealing user interfaces using industry-standard web development languages and libraries.

This ensures a modern and dynamic front-end experience, with an emphasis on user interface responsiveness and compatibility across various devices and screen sizes.

**Back-End Frameworks and Libraries:**

Interaction with server-side frameworks, like laravel, for handling business logic and database operations.

Implementation of Laravel APIs for communication between the front-end and back-end components.

**Communication Protocols:**

Implementation of standard communication protocols for data exchange between the applications.

Utilizing Laravel API for structured communication.

### **3.1.4** **Communications Interfaces**

The "Construction Project Supervision" web application necessitates robust communication interfaces to facilitate various functions. The requirements associated with communications functions are outlined as follows:

Web Browser Communication: Interaction through standard web browsers (e.g., Google Chrome, Mozilla Firefox, Microsoft Edge, Safari, Opera) for user access.Utilization of HTTPS protocol for secure data exchange between the client and server.

Network Server Communication: Communication between the application and network servers to retrieve and store project data.

E-mail Integration: Integration with e-mail services for communication purposes, such as notifications and alerts.

Electronic Forms: Implementation of electronic forms for data input and submission within the application. Ensuring user-friendly interfaces for efficient form completion.

## **3.2 Functional requirements**

The Logical Structure of the Data is contained in [**Section 3.4**](#_jakyoxo7itgi)

## **3.2.1 Review Project Details**

|  |  |
| --- | --- |
| **Use Case Name** | Review Project Details |
| **Trigger** | The authorized user initiates the process of reviewing project details within the construction project supervision web application. |
| **Precondition** | The user is logged into the system and goes to the "Project Management" section. |
| **Basic Path** | 1. The user selects a specific construction project for review by clicking on the project icon. 2. The system displays comprehensive project details, including progress and current status. 3. The user can track progress and use the reporting system to gain additional insights. 4. The system allows the user to analyze detailed reports related to the project status and visit history. 5. The user has the option to provide feedback or comments on the project. |
| **Alternative Paths** | In the absence of detailed reports, the system informs the user that certain data is not available. |
| **Postcondition** | The user completes the review of project details and can move on to other functions within the application. |
| **Exception Paths** | 1. If there is a system error or connection problem, an error message is displayed and the user is asked to try again. 2. If details of the selected project are not available or the project is no longer accessible, the system notifies the user. |
| **Other** | The “Review Project Details” functionality contributes to the comprehensive project management capabilities within the construction project supervision web application. |

## **3.2.2 Add New Project**

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| --- | --- |
| **Use Case Name** | Add New Project |
| **Trigger** | The user initiates the process of adding a new construction project within the Construction Project Supervision web application. |
| **Precondition** | The user is logged into the system and has appropriate permissions to add a new project. |
| **Basic Path** | 1. The user navigates to the "Project Management" section of the application.  2. The user selects the option to "Add New Project."  3. The system presents a form or interface for entering project details, including project name, location, and other relevant information.  4. The user fills in the required project information.  5. Upon completion, the user submits the new project details to the system.  6. The system validates the information and adds the new project to the database. |
| **Alternative Paths** | - If there are missing or invalid details, the system prompts the user to correct the information before submission.  - In case of system errors or connectivity issues during submission, the user is informed and encouraged to try again. |
| **Postcondition** | The new project is successfully added to the system, and the user receives confirmation of the addition. |
| **Exception Paths** | -If the system encounters unexpected errors during the addition process, an error message is shown, and the user is guided to address the issue. |
| **Other** | - The "Add New Project" functionality enhances the project management capabilities of the Construction Project Supervision web application. |

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## **3.2.3 Delete Project**

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| **Use Case Name** | Delete Project |
| **Trigger** | The user initiates the process of deleting a construction project within the Construction Project Supervision web application. |
| **Precondition** | The user is logged into the system, has appropriate permissions to delete a project, and has selected a specific project for deletion. |
| **Basic Path** | 1. The user navigates to the "Project Management" section of the application.  2. The user selects the option to "Delete Project."  3. The system presents a confirmation prompt, ensuring the user intends to delete the selected project.  4. The user confirms the deletion. |
| **Alternative Paths** | - If the user selects the wrong project for deletion, there is an option to cancel the operation before final confirmation.  - In case of system errors or connectivity issues during deletion, the user is informed and encouraged to try again. |
| **Postcondition** | The selected project is successfully deleted from the system, and the user receives confirmation of the deletion. |
| **Exception Paths** | - If the user lacks the necessary permissions to delete a project, an error message is displayed, and the deletion process is halted.  - If the system encounters unexpected errors during the deletion process, an error message is shown, and the user is guided to address the issue. |
| **Other** | - The "Delete Project" functionality adds flexibility to project management, allowing users to remove irrelevant or completed projects from the system. |

## 

## **3.2.4 Modify Project Details**

|  |  |
| --- | --- |
| **Use Case Name** | Modify Project Details |
| **Trigger** | The user initiates the process of modifying details for a construction project within the Construction Project Supervision web application. |
| **Precondition** | The user is logged into the system, has appropriate permissions to modify project details, and has selected a specific project for modification. |
| **Basic Path** | 1. The user navigates to the "Project Management" section of the application.  2. The user selects the option to "Modify Project Details."  3. The system presents an interface displaying the current details of the selected project.  4. The user makes the necessary modifications to the project details.  5. The user confirms and submits the changes. |
| **Alternative Paths** | - If the user encounters an error or changes their mind during the modification process, there is an option to cancel and revert to the original details.  - In case of system errors or connectivity issues during modification, the user is informed and encouraged to try again. |
| **Postcondition** | The project details are successfully modified in the system, reflecting the changes made by the user. |
| **Exception Paths** | - If the user lacks the necessary permissions to modify project details, an error message is displayed, and the modification process is halted.  - If the system encounters unexpected errors during the modification process, an error message is shown, and the user is guided to address the issue. |
| **Other** | - The "Modify Project Details" functionality provides users with the ability to keep project information up-to-date, accommodating changes and ensuring accurate project representation. |

## **3.2.5 Review Project Visits Details**

|  |  |
| --- | --- |
| **Use Case Name** | Review Project Visits Details |
| **Trigger** | The user selects a specific project and chooses to review details related to its visits. |
| **Precondition** | The user must be logged into the system, and a project should be selected for review. |
| **Basic Path** | 1. The user logs into the system using valid credentials.  2. Navigates to the "Project Management" section of the application.  3. Selects a specific project from the list.  4. Clicks on the option to review project visits details.  5. The system displays a page with detailed information about visits related to the selected project.  6. The user can scroll through the list of visits, examining details such as visit date, inspection findings, and progress. |
| **Alternative Paths** | - If the user selects a project with no associated visits, a message indicates that no visits are available.  - The user has the option to return to the main project overview page at any time. |
| **Postcondition** | The user has reviewed the details of visits related to the selected project. |
| **Exception Paths** | - If there is a system error or connectivity issue, an error message is displayed, and the user is prompted to try again.  - If the user tries to access the details without proper authentication, an access denied message is displayed. |
| **Other** | - The visit details are organized in a clear and accessible format.  - Users can navigate back to the main project interface easily. |

## 

## **3.2.6 Add New Visit**

|  |  |
| --- | --- |
| **Use Case Name** | Add New Visit |
| **Trigger** | The user, logged into the system, chooses to add a new visit to a specific project. |
| **Precondition** | The user must be authenticated and have a selected project to which the visit will be added. |
| **Basic Path** | 1. The user logs into the system with valid credentials.  2. Navigates to the "Project Management" section of the application.  3. Selects a specific project from the list.  4. Choose the option to add a new visit.  5. Completes the required information for the new visit, such as visit date, inspection findings, and progress.  6. Submits the information for the new visit.  7. The system validates the input, adds the visit to the project, and updates the project's visit list. |
| **Alternative Paths** | - If there are missing or invalid entries, the system prompts the user to correct them before submission.  - The user has the option to cancel the visit addition at any point in the process. |
| **Postcondition** | A new visit is successfully added to the selected project, and the project's visit list is updated. |
| **Exception Paths** | - If there is a system error or connectivity issue during the visit addition process, an error message is displayed, and the user is prompted to try again.  - If the user lacks the necessary permissions to add a visit, an access denied message is displayed. |
| **Other** | - The interface for adding a new visit is designed for user-friendly input.  - Relevant validations are in place to ensure the accuracy of the entered information. |

## **3.2.7 Delete Visit**

|  |  |
| --- | --- |
| **Use Case Name** | Delete Visit |
| **Trigger** | The user, logged into the system, chooses to delete a specific visit associated with a project. |
| **Precondition** | The user must be authenticated, have selected a project with existing visits, and have the necessary permissions to delete visits. |
| **Basic Path** | 1. The user logs into the system with valid credentials.  2. Navigates to the "Project Management" section of the application.  3. Selects a specific project from the list.  4. Choose the option to view the project's visits.  5.Specifies the visit to be deleted.  6. Selects the option to delete the identified visit.  7. Confirms the deletion action.  8. The system removes the selected visit from the project's visit list. |
| **Alternative Paths** | - If the user decides not to confirm the deletion, the system cancels the operation.  - If there is an error in the deletion process, an error message is displayed, and the user is prompted to try again. |
| **Postcondition** | The selected visit is successfully deleted from the project, and the project's visit list is updated accordingly, and the user receives confirmation of the deletion. |
| **Exception Paths** | - If the user lacks the necessary permissions to delete visits, an access denied message is displayed.  - If the identified visit is not found or has already been deleted by another user, the system informs the user of the unavailability of the visit for deletion. |
| **Other** | - Confirmation prompts are in place to avoid accidental deletions. |

## 

## **3.2.8 Modify Project Visit Details**

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| --- | --- |
| **Use Case Name** | Modify Project Visit Details |
| **Trigger** | The user, logged into the system, chooses to modify details of a specific visit associated with a project. |
| **Precondition** | The user must be authenticated, have selected a project with existing visits, and have the necessary permissions to modify visit details. |
| **Basic Path** | 1. The user logs into the system with valid credentials.  2. Navigates to the "Project Management" section of the application.  3. Selects a specific project from the list.  4. Choose the option to view the project's visits.  5. Specifies the visit to modify.  6. Selects the option to modify the identified visit.  7. Edits the necessary details of the visit (e.g., date, notes, status).  8. Confirms the modification.  9. The system updates the project's visit list with the modified details. |
| **Alternative Paths** | - If the user decides not to confirm the modification, the system cancels the operation.  - If there is an error in the modification process, an error message is displayed, and the user is prompted to try again |
| **Postcondition** | The details of the selected visit are successfully modified, and the project's visit list reflects the changes. |
| **Exception Paths** | - If the user lacks the necessary permissions to modify visit details, an access denied message is displayed.  - If the identified visit is not found or has already been modified by another user, the system informs the user of the unavailability of the visit for modification. |
| **Other** | - Confirmation prompts are in place to avoid accidental modifications. |

## 

## **3.3** **Other Nonfunctional Requirements**

### **3.3.1** **Performance Requirements**

No Results

### **3.3.2** **Safety Requirements**

The "Construction Project Supervision" web application prioritizes safety considerations to mitigate potential risks and ensure secure usage. The safety requirements are outlined as follows:

**Access Control:**

Requirement: The system enforces secure authentication and authorization mechanisms to control user access levels.

Safeguard: Access control measures prevent unauthorized users from tampering with or obtaining sensitive project information, maintaining the integrity of project data.

**Backup and Recovery:**

Requirement: Regular automated backups of project data must be performed to facilitate swift recovery in case of data loss or system failure.

Safeguard: Backup and recovery procedures ensure that critical project information can be restored promptly, minimizing potential data loss.

**User Training:**

Requirement: Provide comprehensive user training programs to educate users on the proper and safe use of the application.

Safeguard: Well-trained users are less likely to make errors that could lead to safety or security issues, promoting a secure and efficient working environment.

### **3.3.3** **Security Requirements**

The "Construction Project Supervision" web application places an emphasis on security to safeguard user data and maintain the integrity of the system. The security requirements are delineated as follows:

**User Authentication:**

Requirement: Users must undergo a secure authentication process username/password. Authentication ensures that only authorized individuals can access sensitive project information, preventing unauthorized access.

**Data Encryption:**

All communication between the application and its users must be encrypted using industry-standard protocols (HTTPS) to protect data during transmission. Encryption safeguards against data interception and ensures the confidentiality of information exchanged between users and the application.

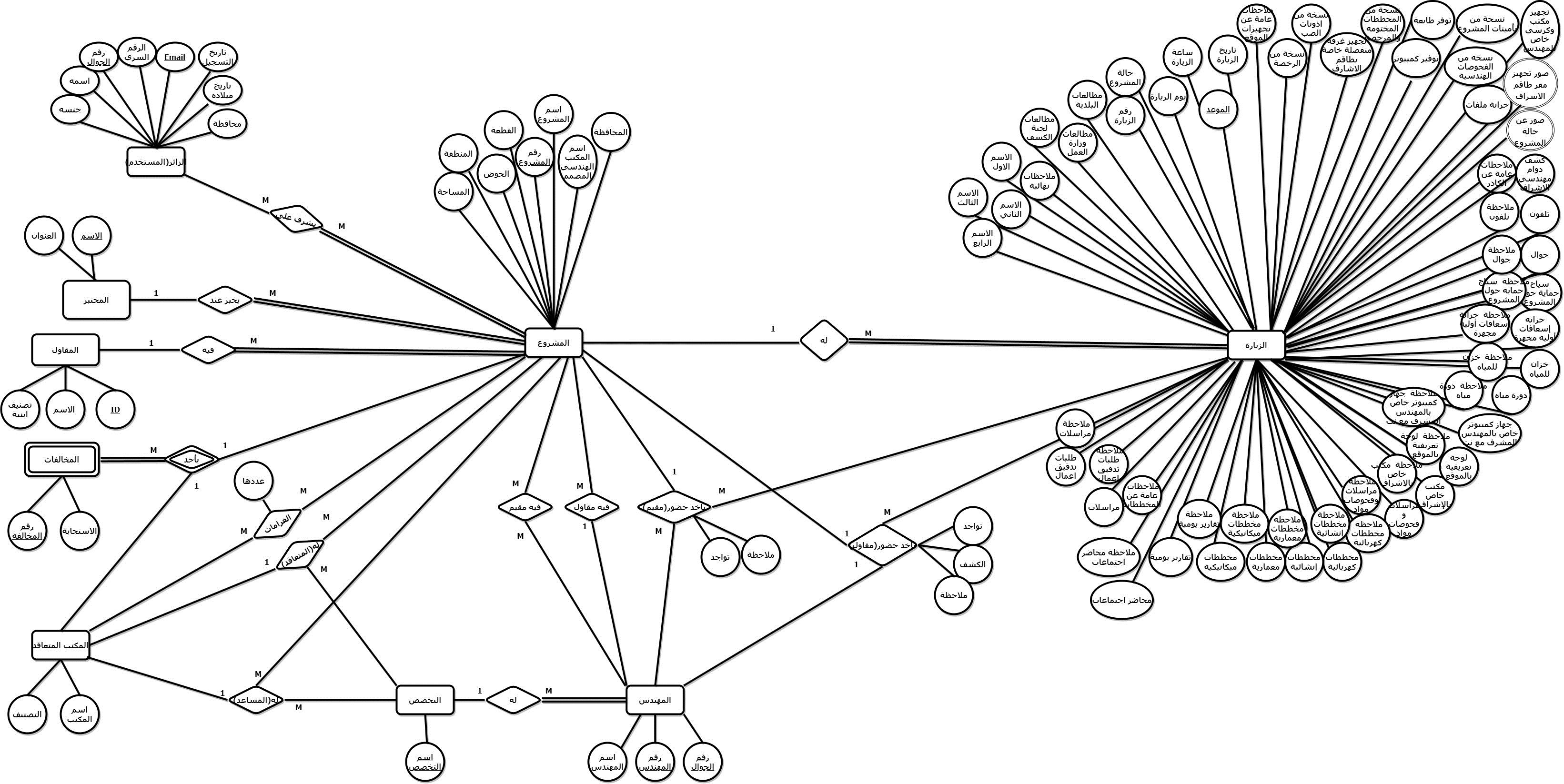
## **3.3.4 Software Quality Attributes**

Usability: The application has an intuitive interface for easy project management.Features such as project creation, visit tracking, and report generation are logically organized and user-friendly.

Scalability: Design the system to scale with the Engineers Syndicate's increasing number of projects and users.Scalability is essential to accommodate future project needs without compromising performance.

Maintainability: Design the system for easy maintenance and updates, ensuring that code is well-documented and modular.Version control and systematic software updates should be part of the maintenance strategy.

## **3.4** **Logical database requirements**



**The data descriptions of each of these data entities is as follows:**

* **Supervisor's**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Name | Text | Supervisor's Name for Visit |  |
| email | Text | Email for the Supervisor's Account |  |
| password | Text | Password for the Supervisor's Account |  |
| date of registration | Date | Supervisor's Registration Date |  |
| gender | Enum(male,female) | Supervisor's Gender |  |
| Province | text | Supervisor Province |  |
| Mobile number | text | Supervisor's Phone Number |  |
| date of birth | date | Supervisor's Date of Birth |  |
| project | pointer | project entity | May be several |

* **Engineer**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Engineer number | Number | Engineer ID Number. |  |
| engineer name | Text | Engineer Name |  |
| Mobile number | Number | Engineer Phone Number |  |
| project | pointer | project entity | May be several |
| Visit | pointer | visit entity |  |

* **Laboratory**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Laboratory name | Text | Laboratory name |  |
| Laboratory address | text | Laboratory address |  |
| project | pointer | project entity | May be several |

* **Contractor**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| ID | Number | Identification Number |  |
| Contractor name | Text | Contractor Name |  |
| Building classification | Enum | This field is for determining the contractor's level and capabilities |  |
| project | pointer | project entity | May be several |

* **Specializations**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Specialization name | text | Specialization name |  |
| Engineer | pointer | Engineer entity | May be several |
| Supervision Contracting Office | pointer | Supervision Contracting Office entity | one Supervision Contracting Office in one project |
| project | pointer | project entity |  |

* **Supervision Contracting Office**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Office name | Text | Name of the Office |  |
| Office classification | Number | classification of the Office |  |
| Violations | pointer | Violations entity | May be several |
| project | pointer | project entity | May be several |
| Specialization | pointer | Specialization entity | May be several |

* **project**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| project number | Text | Project Number |  |
| Governorate | Text | Project Governorate |  |
| Name of the designing engineering office | Text | Name of the Engineering Design Office for the Project |  |
| project name | Text | Project Name |  |
| Widget | Number | Parcel Number for the Project |  |
| The basin | Number | Project Basin Number |  |
| Region | Text | Project Area Name |  |
| Space | Number | Project Size |  |
| visit | pointer | visit enity | May be several |
| Supervisor | pointer | Supervisor entity | May be several |
| Laboratory | pointer | Laboratory entity |  |
| Contractor | pointer | Contractor entity |  |
| Supervision Contracting Office | pointer | Supervision Contracting Office entity |  |

* **Violations**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Violation number | Number | Violation Number |  |
| Response | text | it is indicated whether a response has been made to this violation |  |
| Contracting Office | Number | Contracting Office entity | Single Contracting Office |
| project | pointer | project entity | For one project for the contracting office |

* **visits**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Visit number | number | Current project visit number |  |
| Visiting day | text | Current visit day of the project |  |
| Visiting date | date | Current visit date for the project |  |
| First Name | text | Name of the first supervising engineer |  |
| the second name | text | Name of the second supervising engineer |  |
| Third name | text | Name of the third supervising engineer |  |
| Fourth name | text | Name of the fourth supervising engineer |  |
| Municipality surveys | text | Municipality notes |  |
| Reviews of the inspection committee | text | Detection committee notes |  |
| Ministry of Labor reports | text | Ministry of Labor notes |  |
| Final notes of the visit | text | Final notes of the visit |  |
| Supervision engineer timesheet | enum('exists','does not exist') | A statement of the supervising engineer’s working hours, whether he is present or not |  |
| General comments about the staff | text | General comments about the supervisory staff |  |
| Project state | text | Clarify the project status |  |
| A special supervision office | enum('exists','does not exist') | A special supervision office, whether it exists or not |  |
| Note a special supervision office | text | Note a special supervision office if there are any |  |
| Site information board | enum('exists','does not exist') | An information board on the site, whether it exists or not |  |
| Notes: Information board on the site | text | Notes: An information panel on the site, if there are any |  |
| W.C | enum('exists','does not exist') | A bathroom, whether it exists or not |  |
| Bathroom notes | text | Bathroom notes, if there are notes |  |
| Water tank | enum('exists','does not exist') | A water tank, whether present or not |  |
| Note: Water tank | text | Note the water tank if there are any |  |
| Protection fence around the project | enum('exists','does not exist') | A protective fence around the project, whether it exists or not |  |
| Note the protection fence around the project | text | Note the protective fence around the project if there are any |  |
| Equipped first aid cabinet | enum('exists','does not exist') | A first aid cabinet is equipped, whether present or not |  |
| Note equipped first aid cabinet | text | Note that a first aid cabinet is equipped if there are any |  |
| A computer for the supervising engineer with the Internet | enum('exists','does not exist') | A computer for the supervising engineer with Internet, whether available or not |  |
| Note: The supervising engineer’s computer is connected to the Internet | text | Note the supervising engineer’s computer with the Internet if there are any notes |  |
| telephone | enum('exists','does not exist') | Telephone, whether present or not |  |
| Telephone note | text | Write the phone number if it exists |  |
| cell phone | enum('exists','does not exist') | Mobile phone, whether available or not |  |
| Mobile note | text | Write the mobile number if it exists |  |
| General notes on site preparations | text | General comments about site preparations, if there are any |  |
| Architectural plans | enum('exists','does not exist') | Architectural plans, whether they exist or not |  |
| Note architectural plans | text | Note architectural plans, if there are any |  |
| Construction plans | enum('exists','does not exist') | Construction plans, whether present or not |  |
| Note construction plans | text | Note the construction plans, if there are any |  |
| Electrical diagrams | enum('exists','does not exist') | Electrical diagrams, whether present or not |  |
| Note electrical diagrams | text | Note the electrical diagrams if there are any |  |
| Mechanical diagrams | enum('exists','does not exist') | Mechanical diagrams, whether present or not |  |
| Note mechanical diagrams | text | Note mechanical diagrams if there are any |  |
| Daily reports | enum('exists','does not exist') | Daily reports whether it exists or not |  |
| Note daily reports | text | Note daily reports if there are any |  |
| Minutes of meetings | enum('exists','does not exist') | Minutes of meetings, whether available or not |  |
| Note minutes of meetings | text | Note meeting minutes if there are any |  |
| Correspondence and material checks | enum('exists','does not exist') | Correspondence and checks of materials whether they exist or not |  |
| Note correspondence and material checks | text | Note correspondence and material checks if there are any notes |  |
| Business audit requests | enum('exists','does not exist') | Requests for business audits, whether they exist or not |  |
| Note business audit requests | text | Note business audit requests, if there are any notes |  |
| Correspondence | enum('exists','does not exist') | Correspondence whether it exists or not |  |
| Correspondence note | text | Correspondence note if there are any |  |
| General notes on the plans and reports that must be available on sites | text | General notes on the plans and reports that must be available on sites, if there are any |  |
| Preparing a separate room for the supervisory staff | enum('exists','does not exist') | Prepare a separate room for the supervisory staff, whether present or not |  |
| Preparing a special desk and chair for the engineer | enum('exists','does not exist') | Preparing a special desk and chair for the engineer, whether present or not |  |
| Providing a computer | enum('exists','does not exist') | Providing a computer, whether available or not |  |
| Providing a filing cabinet | enum('exists','does not exist') | Providing a filing cabinet, whether it exists or not |  |
| Availability of a printer | enum('exists','does not exist') | Availability of a printer, whether one exists or not |  |
| A copy of the sealed and licensed plans | enum('exists','does not exist') | A copy of the sealed and licensed plans, whether present or not |  |
| A copy of the license | enum('exists','does not exist') | A copy of the license, whether it exists or not |  |
| A copy of the project insurance | enum('exists','does not exist') | A copy of the project insurance, whether it exists or not |  |
| A copy of the engineering examinations | enum('exists','does not exist') | A copy of the engineering examinations, whether present or not |  |
| A copy of casting permissions | enum('exists','does not exist') | A copy of the casting permissions, whether they exist or not |  |
| project | pointer | project entity |  |
| Pictures of the Project Status | image | Photos to display the project status. |  |
| Pictures of the Supervision Team. | image | Photos to display the status of the supervision headquarters |  |

The Logical Structure of the data to be stored in the Construction Project Supervision database on the server is as follows :

**To store supervisor information:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Name | Text | Supervisor's Name |  |
| email | Text | Email for the Supervisor's Account |  |
| password | Text | Password for the Supervisor's Account |  |
| date of registration | Date | Supervisor's Registration Date |  |
| gender | text | Supervisor's Gender |  |
| Governorate | Enum(male,female) | Supervisor Province |  |
| Mobile number | Number | Supervisor's Phone Number |  |
| date of birth | date | Supervisor's Date of Birth |  |

**To store engineer information:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Engineer number | Number | Engineer ID Number. |  |
| engineer name | Text | Engineer Name |  |
| Mobile number | Number | Engineer Phone Number |  |
| Specialization name | Text | Specialization name for Engineer |  |

**To store laboratory information:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Laboratory name | Text | Laboratory name |  |
| Laboratory address | text | Laboratory address |  |

**To store contractor information:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| ID | Number | Identification Number |  |
| Contractor name | Text | Contractor Name |  |
| Building classification | Enum | This field is for determining the contractor's level and capabilities |  |

**To store specializations**:

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Specialization name | text | Specialization name |  |

**To store information about supervision contracting offices:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Office name | Text | Name of the Supervision Contracting Office |  |
| Office classification | Number | classification of the Office |  |

**To know the supervisor who visited the project:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Email | Text | Email for the Supervisor's Account |  |
| project number | text | project number |  |

**To know the engineer in charge (resident engineer) on the project:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| project number | Text | project number |  |
| Engineer number | Number | Engineer ID Number. |  |

**To know the specializations of the supervision contracting office on the project:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| project number | Text | project number |  |
| Specialization name | Text | Specialization name for office |  |
| Office classification | Text | Classification of contracting office supervision |  |

**To store project information:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| project number | Text | Project Number |  |
| Governorate | Text | Project Governorate |  |
| Name of the designing engineering office | Text | Name of the Engineering Design Office for the Project |  |
| project name | Text | Project Name |  |
| Widget | Number | Parcel Number for the Project |  |
| The basin | Number | Project Basin Number |  |
| Region | Text | Project Area Name |  |
| Space | Number | Project Size |  |
| Laboratory name | Text | Project Sample Laboratory Name. |  |
| Contractor ID | Number | Contractor ID. |  |
| Contractor engineer number | Number | Contractor Engineer Number |  |

**To know the specializations of the assistant office on the project:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| project number | Text | project number |  |
| Specialization name | Text | Specialization name for office |  |
| Office classification | Text | Classification of contracting office supervision |  |

**To know the violations received by the office in the project:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Violation number | Number | Violation Number |  |
| project number | Text | project number |  |
| Classification of office | Number | Classification of office |  |
| Response | text | it is indicated whether a response has been made to this violation |  |

**To know the fines received by the office in the project:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| project number | Text | project number |  |
| Classification of office | Number | Classification of office |  |
| the number | Number | Number of fines |  |

**Pictures of the Supervision Office:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Photo | text | Photos to display the status of the supervision headquarters |  |
| project number | text | project number |  |

**Pictures of the Project Status:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Photo | text | Photos to display the project status. |  |
| project number | text | project number |  |

**To know if the resident engineer is present at the project:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Visit Date | Date | Project Visit Date |  |
| Engineer Number | Number | Engineer's ID for Attendance |  |
| Project Number | Text | Project Number |  |
| Presence | enum('موجود','غيرموجود') | Determine if the Engineer is present or not |  |
| Notes | text | Notes if available |  |

**To know if the contractor engineer is present at the project :**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Visit Date | Date | Project Visit Date |  |
| Engineer Number | Number | Engineer's ID for Attendance |  |
| Project Number | Text | Project Number |  |
| Presence | enum('موجود','غيرموجود') | Determine if the Engineer is present or not |  |
| The sheet | Determine whether the attendance sheet is present or not |  |  |
| Notes | text | Notes if available |  |

**To store visit information:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Data item** | **Type** | **Description** | **Comment** |
| Visit number | Type | Current project visit number |  |
| Visiting day | number | Current visit day of the project |  |
| Visiting date | text | Current visit date for the project |  |
| First Name | date | Name of the first supervising engineer |  |
| the second name | text | Name of the second supervising engineer |  |
| Third name | text | Name of the third supervising engineer |  |
| Fourth name | text | Name of the fourth supervising engineer |  |
| Municipality surveys | text | Municipality notes |  |
| Reviews of the inspection committee | text | Detection committee notes |  |
| Ministry of Labor reports | text | Ministry of Labor notes |  |
| Final notes of the visit | text | Final notes of the visit |  |
| Supervision engineer time sheet | text | A statement of the supervising engineer’s working hours, whether he is present or not |  |
| General comments about the staff | enum('exists','does not exist') | General comments about the supervisory staff |  |
| Project state | text | Clarify the project status |  |
| A special supervision office | text | A special supervision office, whether it exists or not |  |
| Note a special supervision office | enum('exists','does not exist') | Note a special supervision office if there are any |  |
| Site information board | text | An information board on the site, whether it exists or not |  |
| Notes: Information board on the site | enum('exists','does not exist') | Notes: An information panel on the site, if there are any |  |
| W.C | text | A bathroom, whether it exists or not |  |
| Bathroom notes | enum('exists','does not exist') | Bathroom notes, if there are notes |  |
| Water tank | text | A water tank, whether present or not |  |
| Note: Water tank | enum('exists','does not exist') | Note the water tank if there are any |  |
| Protection fence around the project | text | A protective fence around the project, whether it exists or not |  |
| Note the protection fence around the project | enum('exists','does not exist') | Note the protective fence around the project if there are any |  |
| Equipped first aid cabinet | text | A first aid cabinet is equipped, whether present or not |  |
| Note equipped first aid cabinet | enum('exists','does not exist') | Note that a first aid cabinet is equipped if there are any |  |
| A computer for the supervising engineer with the Internet | text | A computer for the supervising engineer with Internet, whether available or not |  |
| Note: The supervising engineer’s computer is connected to the Internet | enum('exists','does not exist') | Note the supervising engineer’s computer with the Internet if there are any notes |  |
| telephone | text | Telephone, whether present or not |  |
| Telephone note | enum('exists','does not exist') | Write the phone number if it exists |  |
| cell phone | text | Mobile phone, whether available or not |  |
| Mobile note | enum('exists','does not exist') | Write the mobile number if it exists |  |
| General notes on site preparations | text | General comments about site preparations, if there are any |  |
| Architectural plans | text | Architectural plans, whether they exist or not |  |
| Note architectural plans | enum('exists','does not exist') | Note architectural plans, if there are any |  |
| Construction plans | text | Construction plans, whether present or not |  |
| Note construction plans | enum('exists','does not exist') | Note the construction plans, if there are any |  |
| Electrical diagrams | text | Electrical diagrams, whether present or not |  |
| Note electrical diagrams | enum('exists','does not exist') | Note the electrical diagrams if there are any |  |
| Mechanical diagrams | text | Mechanical diagrams, whether present or not |  |
| Note mechanical diagrams | enum('exists','does not exist') | Note mechanical diagrams if there are any |  |
| Daily reports | text | Daily reports whether it exists or not |  |
| Note daily reports | enum('exists','does not exist') | Note daily reports if there are any |  |
| Minutes of meetings | text | Minutes of meetings, whether available or not |  |
| Note minutes of meetings | enum('exists','does not exist') | Note meeting minutes if there are any |  |
| Correspondence and material checks | text | Correspondence and checks of materials whether they exist or not |  |
| Note correspondence and material checks | enum('exists','does not exist') | Note correspondence and material checks if there are any notes |  |
| Business audit requests | text | Requests for business audits, whether they exist or not |  |
| Note business audit requests | enum('exists','does not exist') | Note business audit requests, if there are any notes |  |
| Correspondence | text | Correspondence whether it exists or not |  |
| Correspondence note | enum('exists','does not exist') | Correspondence note if there are any |  |
| General notes on the plans and reports that must be available on sites | text | General notes on the plans and reports that must be available on sites, if there are any |  |
| Preparing a separate room for the supervisory staff | text | Prepare a separate room for the supervisory staff, whether present or not |  |
| Preparing a special desk and chair for the engineer | enum('exists','does not exist') | Preparing a special desk and chair for the engineer, whether present or not |  |
| Providing a computer | enum('exists','does not exist') | Providing a computer, whether available or not |  |
| Providing a filing cabinet | enum('exists','does not exist') | Providing a filing cabinet, whether it exists or not |  |
| Availability of a printer | enum('exists','does not exist') | Availability of a printer, whether one exists or not |  |
| A copy of the sealed and licensed plans | enum('exists','does not exist') | A copy of the sealed and licensed plans, whether present or not |  |
| A copy of the license | enum('exists','does not exist') | A copy of the license, whether it exists or not |  |
| A copy of the project insurance | enum('exists','does not exist') | A copy of the project insurance, whether it exists or not |  |
| A copy of the engineering examinations | enum('exists','does not exist') | A copy of the engineering examinations, whether present or not |  |
| A copy of casting permissions | enum('exists','does not exist') | A copy of the casting permissions, whether they exist or not |  |
| Project number | Text | Project number |  |