Solution Architecture

Date	2nd February 2026
Team ID	LTVIP2026TMIDS66183
Project Name	Civil Engineering Insight Studio
Maximum Marks	4 Marks

Solution Architecture:

The Civil Engineering Insight Studio follows a modular and layered architecture that enables efficient data processing, analysis, and insight generation. The system is designed to accept civil engineering project data, validate it, perform analytical computations, and present meaningful insights through an interactive interface.

Steps to be followed: -

1. **User Login & Project Creation**
   The user logs into the system and creates a new civil engineering project.
2. **Project Data Input**
   Users enter project details such as structure type, loads, materials, dimensions, and site conditions.
3. **Data Validation**
   The system checks the entered data for errors, missing values, and invalid inputs.
4. **Data Preprocessing**
   Valid data is formatted and prepared for analysis.
5. **Engineering Analysis**
   Structural safety, material optimization, cost estimation, and sustainability analysis are performed.
6. **Result Storage**
   Analysis results and project data are stored in the database for future reference.
7. **Insight Generation**
   The system generates insights, charts, and performance indicators.
8. **Report Visualization**
   Results are displayed through dashboards and downloadable reports.

9. **Decision Support**

   Engineers and planners use the insights to make informed design and planning decisions.

10. **Feedback & Iteration**

    Users can modify inputs and re-run the analysis for improved outcomes.