Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	06 February 2026
Team ID	LTVIP2026TMIDS66241
Project Name	Civil Engineering Insight studio
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web-based interface where users upload site images, input project details, and request analysis	Streamlit (Python Web Framework)
2.	Application Logic-1	Input validation and preprocessing of civil engineering data	Python
3.	Application Logic-2	Structural analysis, quantity estimation, and report generation logic	Python(Numpy, Pandas)
4.	Application Logic-3	AI request handling and response processing	Google Generative AI API
5.	File Storage	Local storage for uploaded images, reports, and logs	Local File System
6.	External API-1	Generative AI and recommendations for civil projects	Gemini Flash Lite (models/gemini-flash-lite-latest)
7.	Machine Learning Model	Pre-trained generative AI model for text generation	Gemini Flash Lite Model
8.	Infrastructure (Server / Cloud)	Deployment of application	Streamlit Cloud / Local Deployment

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Web framework and development tools used for building civil engineeering analysis platform	Streamlit, Python
2.	Security Implementations	Secure storage of API keys and environment variables	Environment Variables (.env), Streamlit Secrets
3.	Scalable Architecture	Web-based architecture supporting multiple users And scalable deployment	Cloud-based deployment (Streamlit Cloud)
4.	Availability	Application accessible online after deployment for project analysis and reporting	Streamlit Cloud Hosting
5.	Performance	Fast response generation using lightweight AI model and efficient data processing	Gemini Flash Lite (optimized for low latency)