



Geotechnical Engineering Monitoring System

GEMS

**From Chaos to Clarity:
De-Risking the Underground**



Quality Services – Our Commitment



INTRODUCTION:
THE PROBLEMS



DEMO



WHAT WE OFFER



Q&A



Introduction : The Problems

The Reality: Data Everywhere, Clarity Nowhere

Chaos Hides Warning Signs!!





Site Engineer/ Contractor

The on-site Bottleneck

- **Trapped Data:** Critical progress updates locked in handwritten site logs, excel spreadsheet and disconnected Whatsapp chat.
- **Vulnerable "Master" Plans:** Handwritten marking and coloring on paper drawings
- **The Reporting Lag:** Hours wasted manually compiling reports.



Design Engineer/ Consultant

The Cognitive Overload Trap

- **Data Paralysis:** Decision made based on Scattered data (PDFs, AutoCAD, excel files, emails, and whatsapp messages) leading to delayed Decision made
- **Missed Warning Signs:** Potential issues go unnoticed until they become problems



Project Manager/ Developer

The Executive Blind Spot

- **The "Black Box" Effect:** Information lack of transparency and Visibility
- **Data Latency:** By the time the data reaches the Project Manager, it is historical rather than actionable





Demo

DEMO – A Day On Site



Role 1:
**Site Engineer/
Contractor**




Role 2:
**Design Engineer/
Consultant**



Role 3:
Project Manager

Geotechnical Engineering Monitoring System (GEMS)



 Site Monitoring Interactive Map

Source: Google Sheets Refresh Data

DashboardPiling WorksI&MSoil Nail

New TabLast modified: 10/7/202

Daily UpdatesOverall Progress Updates

Calendar

Select a date to view or add construction updates

< Previous

Tuesday, December 2, 2025

Next >

<

December 2025

>

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

Daily Update

Update for Tuesday, December 2, 2025

Date : 02/12/2025

Working times : 0800 hrs - 1900 hrs.

*Weather: Bright and sunny day, with heavy cloud cover in the afternoon.

Daily Work Activities:*

Earthworks - Excavation and removing of spoils in a continuous progress.

Demolishing of buried RC Barrette wall at G/L-C-B-4-5.5

Splicing pile reinforcement and trimming and making good for pile cap P-16

Formwork for soffits at proposed SOVO RC suction Tank G/L-C1-C-2

Concreting, floor hardener and Ring profile imprint for proposed RC ramp structure at G/L-B1-C-7-7.5 at B1b to B2a.

Dashboard =
Daily Updates
Record Daily
Records traceable
for whole
construction
period.

Geotechnical Engineering Monitoring System (GEMS)



 Site Monitoring Interactive Map

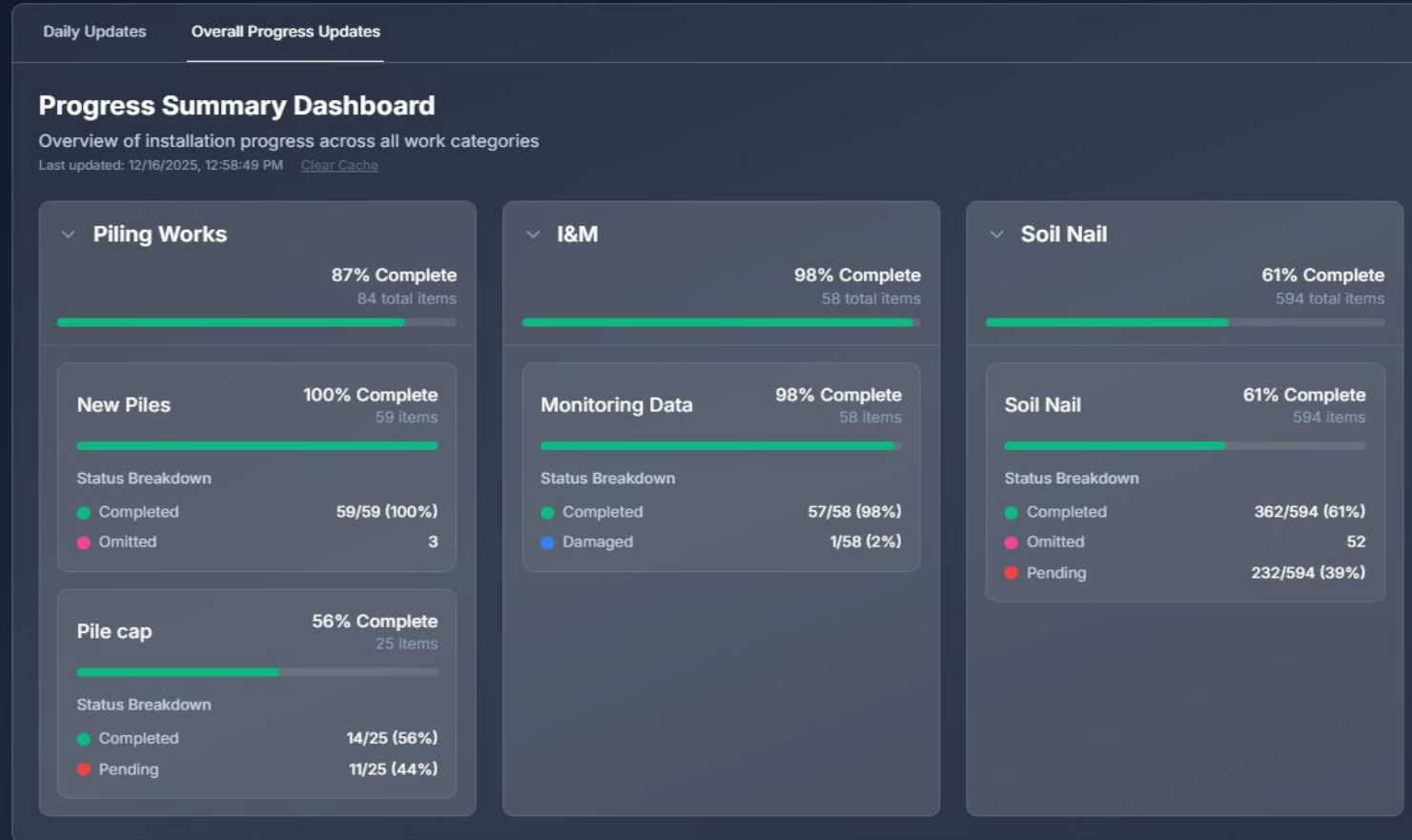
Source: Google Sheets Refresh Data

Dashboard Piling Works I&M Soil Nail

+ New Tab Last modified: 10/7/2025



Overall Progress Update =
Keep track of Progress of all Geotechnical Works (Daily UPDATES)
Can be used in Site Progress Meeting and Report



Geotechnical Engineering Monitoring System (GEMS)



Construction Records

Installation Records Management System

Current Role: Subcontractor

Subcontractor ✓
IOW (Inspector)
Client Rep

Can have
Multitier
Approvals
set up
customize
for each
project

Zone Summary

Zone A

Installation progress

Completed 1
Pending IOW 2
Pending Client 3

Zone B

Installation progress

Completed 1
Pending IOW 1
Pending Client 4

Zone C

Installation progress

Completed 0
Pending IOW 3
Pending Client 3

Zone D

Installation progress

Completed 1
Pending IOW 4
Pending Client 1

Zone E

Installation progress

Completed 1
Pending IOW 2
Pending Client 3

Installation Records

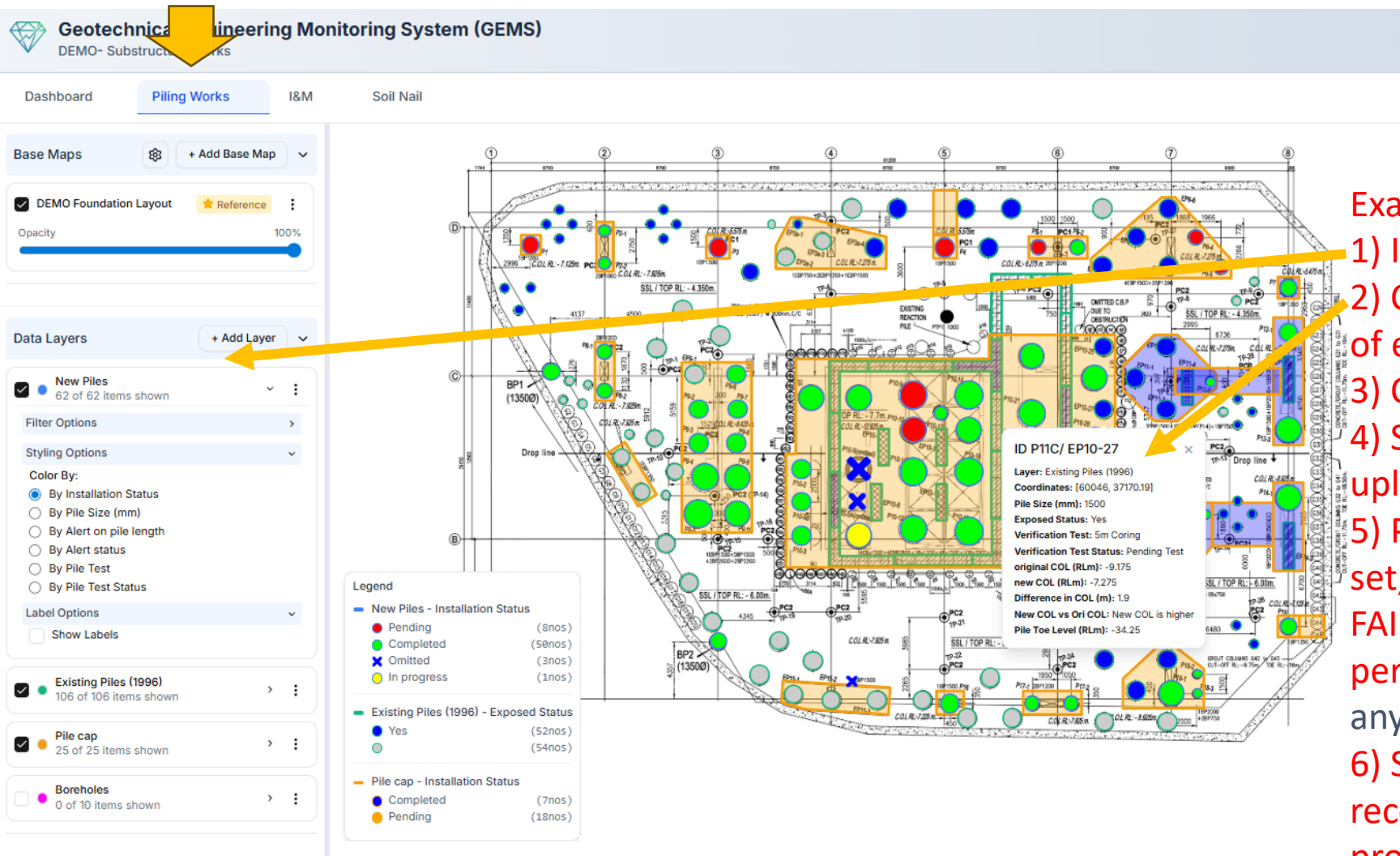
Manage and track soil nail installation records

Upload PDF Record

Zone: All Zones Status: All Status

Status	Zone	Subcontractor	Soil Nail ID	Install Date	Upload Time	IOW Signed	Client Approved	Overdue
Pending IOW	Zone C	Subcon Gamma	SN-C-0024	2025-12-15	Dec 16, 09:18 AM	-	-	
Pending Client	Zone C	Subcon Gamma	SN-C-0022	2025-12-14	Dec 16, 03:18 AM	Dec 16, 07:47 AM	-	
Approved	Zone E	Subcon Epsilon	SN-E-0041	2025-12-14	Dec 15, 09:18 PM	Dec 16, 08:37 AM	Dec 16, 09:26 AM	
Approved	Zone A	Subcon Alpha	SN-A-0005	2025-12-14	Dec 15, 07:18 PM	Dec 16, 04:00 AM	Dec 16, 07:40 AM	
Pending IOW	Zone A	Subcon Alpha	SN-A-0003	2025-12-14	Dec 15, 03:18 PM	-	-	
Pending Client	Zone D	Subcon Delta	SN-D-0031	2025-12-14	Dec 15, 01:18 PM	Dec 16, 12:06 AM	-	
Approved	Zone D	Subcon Delta	SN-D-0035	2025-12-14	Dec 15, 12:18 PM	Dec 15, 08:22 PM	Dec 16, 02:37 AM	
Overdue (0d)	Zone B	Subcon Beta	SN-B-0012	2025-12-14	Dec 15, 10:18 AM	Dec 15, 06:55 PM	-	Od

Geotechnical Engineering Monitoring System (GEMS)



Geotechnical Engineering Monitoring System (GEMS)



New Piles											
62 items											
ID	INSTALLATION STATUS	PILE TYPE	PILE SIZE (MM)	PILE EXPOSED STATUS	PILE TEST	PILE TEST RESULTS	COL (RLM)	FINAL DEPTH (M)	TOE LEVEL (RLM)	PILE LENGTH (M)	REMARKS
P1-1	Completed	Bored Pile (G&P)	1350	-	SLT	OK	-7.125 (original -5.475)	49.6	-46.1	40.58	9/7/24 - start boring until depth 12m from TOC & stop; 18/7/24 - continue boring back; 19/7/24 - Terminated to toe & casting
P2-1	Completed	Bored Pile (G&P)	1000	-	HSDLT	Pile enlargement issue from 1m to 8m depth (33.2 to 40.2m from pile toe). Pending site verification	-7.925 (original -6.275)	42.5	-38.9	32.58	-
P2-2	Completed	Bored Pile (G&P)	1000	-	-	-	-7.925 (original -6.275)	42.9	-39.1	32.85	-
P3-1	Completed	Bored Pile (G&P)	1500	-	SLT	OK	-5.575	54.1	-50.8	45.18	-
P4-1	Completed	Bored Pile (G&P)	1500	Yes	-	-	-5.575	52.6	-50.7	45.16	API insufficient length by 2.175m/P4 got memo on ecc out of tolerance but contractor insist to proceed/Previous already bore until 38m and contractor decide to hold & backfill back until 5m due to problem on ecc & waiting for confirmed casing as-built from surveyor/Boring back from 5m until toe from 29/7-30/7 -Concrete bulding at depth between 10.3m-6.5m from TOC
P5-1	Completed	Bored Pile (G&P)	1200	Yes	HSDLT	OK	-6.275	42.3	-41.2	34.92	-
P5-2	Completed	Bored Pile (G&P)	1200	Yes	-	-	-6.275	41.9	-41.0	34.73	-
P6-4	Completed	Bored Pile (G&P)	1200	Yes	-	-	-7.275	42.6	-42.1	34.8	-
P6-5	Completed	Bored Pile (G&P)	1200	Yes	MLT (Bi-Directional) with SLT	OK	-7.275	43.3	-42.9	35.66	-
P7-1	Completed	Bored Pile (G&P)	1350	Yes	-	-	-5.475	46.2	-45.7	40.23	undercast by 2.5m
BP1	Completed	Bored Pile (GPC)	1350	Yes	-	-	2.14	48.7	-45.2	47.32	-
P8-1	Completed	Bored Pile (G&P)	1200	-	-	-	-7.925 (original -6.275)	44.6	-41.2	34.95	-
P8-2	Completed	Bored Pile (G&P)	1200	-	-	-	-7.925 (original -6.275)	44.3	-41.1	34.86	-
P9-2	Completed	Bored Pile (G&P)	1500	-	-	-	-9.425	58.2	-55.0	45.56	-
P9-3	Completed	Bored Pile (G&P)	1500	-	-	-	-9.425	58.0	-54.8	45.33	-
- - -	- - -	- - -	- - -	- - -	SLT& Corina Test/GSB own	Suspected pile integrity issue at around 2m to 8m below COL (due to drop in	- - -	- - -	- - -	- - -	FIRST BORE AT 1/7/24 AND ENCOUNTER EXISTING PILING & BACKFILL BACK

Example on Piling Works (Daily Updates) :-
1) Key information also clearly Displayed
2) Records can be used by Contractor, Consultant and QS.

Geotechnical Engineering Monitoring System (GEMS)



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DEMO- Substructure Works

Dashboard

Piling Works

I&M

Soil Nail

Base Maps



+ Add Base Map



☒ I&M Layout Plan

★ Reference



Opacity

100%

Data Layers

+ Add Layer



☒ Monitoring Data

5 of 58 items shown



Filter Options



Clear Filters

Instrument Types

All

- ☐ Building Settlement Marker
- ☐ Displacement Marker
- ☐ Ground Settlement Marker
- ☐ Inclinator
- ☐ Recharge Well

Breach AAA

All

- ☒ Action
- ☒ Alarm
- ☒ Alert
- ☐ No

Styling Options



Color By:

- ☐ By Instrument Types
- ☒ By Breach AAA

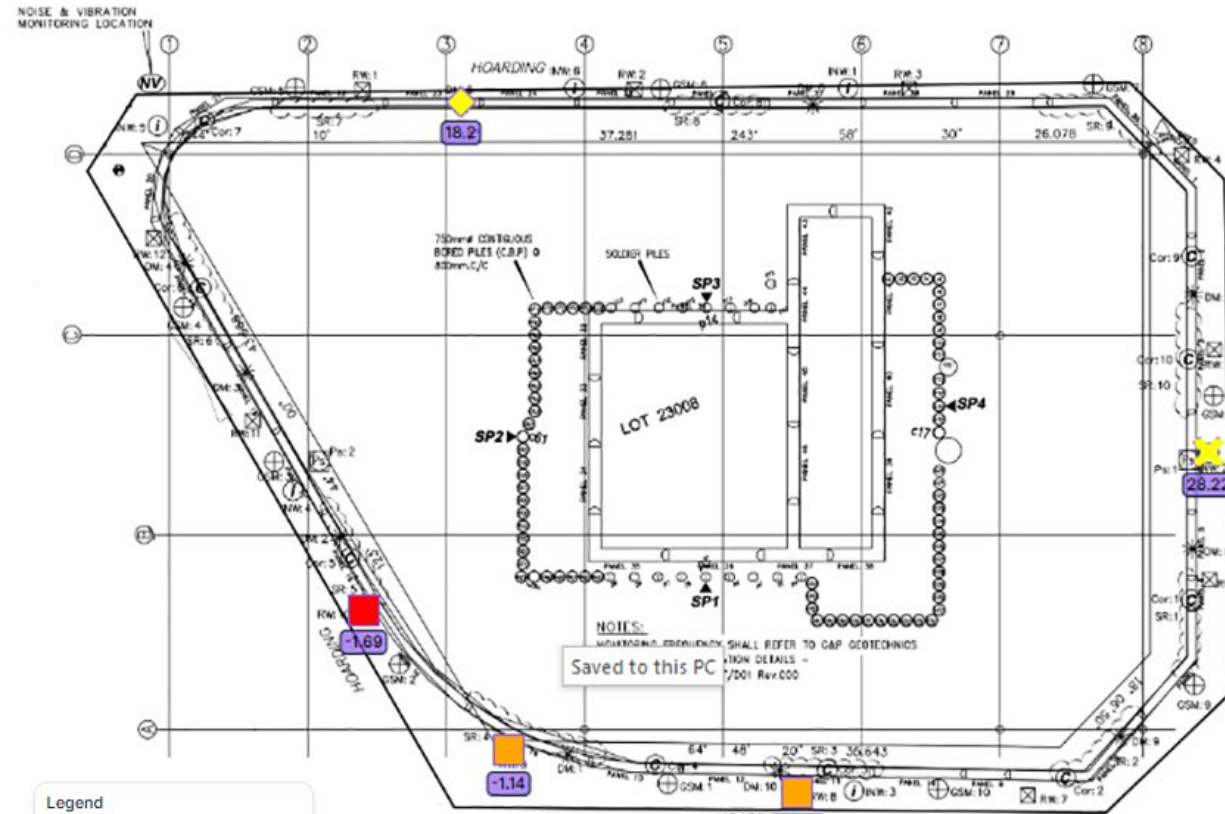
Label Options



☒ Show Labels

Label Field:

Latest Readings



Legend

- Monitoring Data - Breach AAA
- Alert (2nos)
- Action (2nos)
- Alarm (1nos)

Example of Instrumentation and Monitoring (I&M) :-

- 1) Daily Updates
- 2) Set Limit (Alert, Alarm and Action) when reach will SEND email to key personnel to inform (So being alerted)

Geotechnical Engineering Monitoring System (GEMS)



Example of Soil Nails

1) Daily Updates

2) Every constructed Soil Nails are being monitored

☒ Soil Nail Layout Plan ★ Reference

Opacity 100%

Data Layers + Add Layer

☒ Excavation level
39 of 39 items shown

Filter Options

Styling Options

Color By:

☐ By colour column

☒ By Excavation Level (RL)

Label Options

☐ Show Labels

☐ Ground Anchor
0 of 79 items shown

☒ Soil Nail
646 of 646 items shown

Filter Options

Styling Options

Color By:

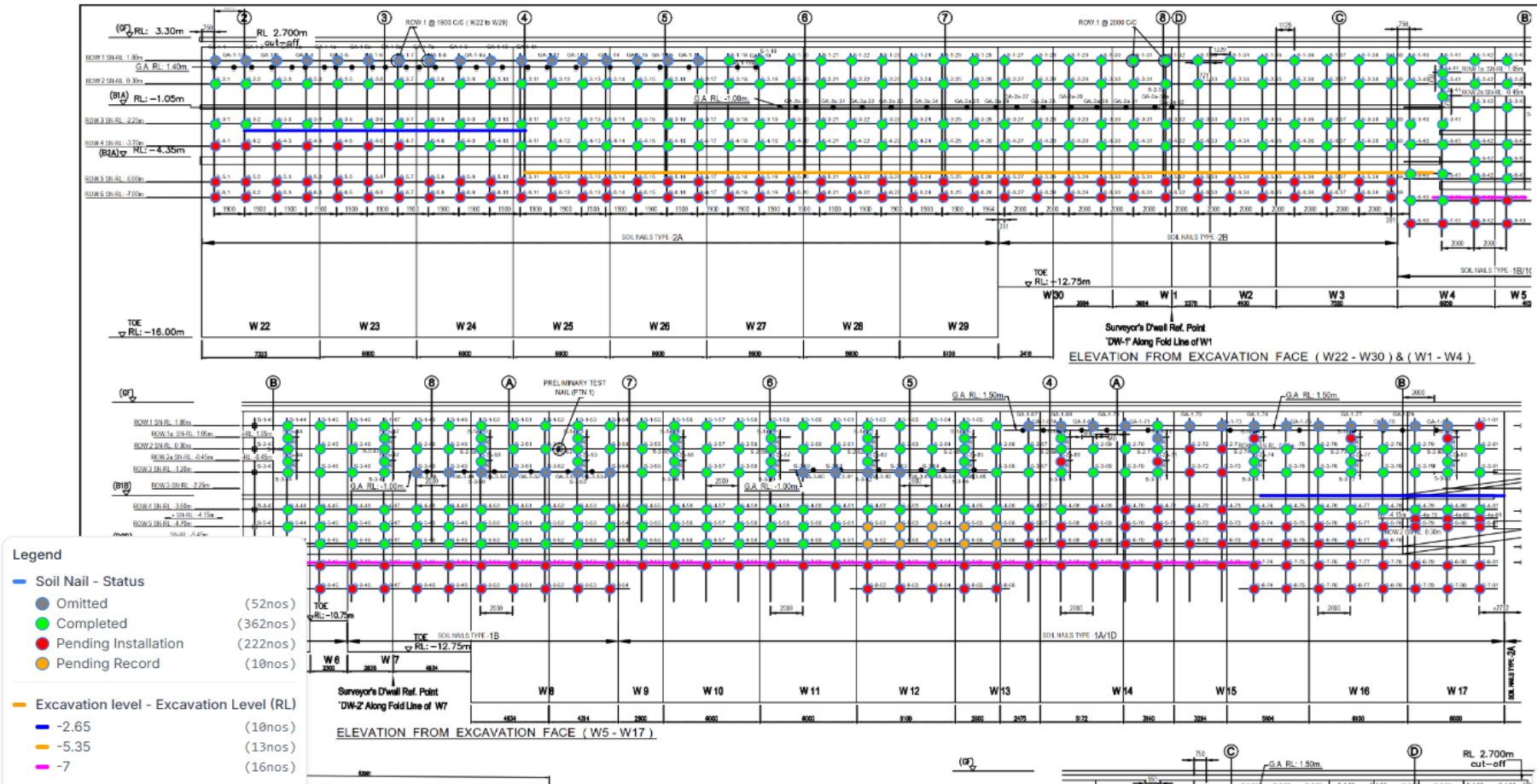
☒ By Status

☐ By Installation Record Received

☐ By Pullout Test Status

Label Options

☐ Show Labels



Zoom: 140.0%

Print

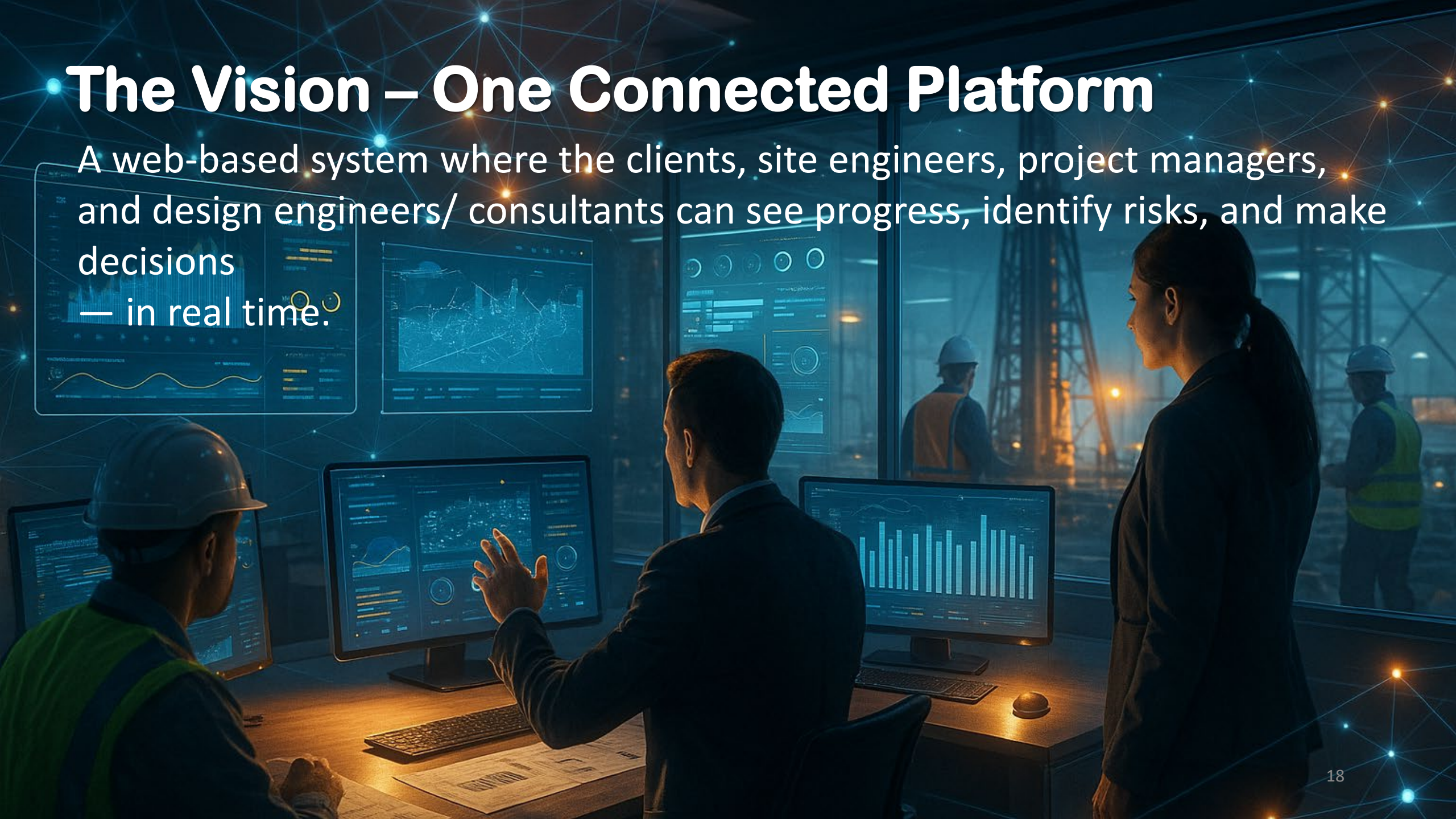
+ -



What we offer

The Vision – One Connected Platform

A web-based system where the clients, site engineers, project managers, and design engineers/ consultants can see progress, identify risks, and make decisions — in real time.



Engineered Intelligence, Not Just Software.



Generic dashboards show data. **GEMS** understands *Geotechnical Logic* –
identifying risk patterns in geotechnical works



Over decades of site investigations and design audits, recurring failure patterns emerged.



Root causes and decision patterns were distilled into structured knowledge.



These lessons now power real-time validation, alerts, and dashboards.



BEFORE

AFTER



Paper/PDF drawings,
manual updates



Daily updates in Whatsapp



Delayed design feedback/
Overlooked potential issues



Disconnected teams



Real-time Interactive Map



Structured Progress Updates



Automated Alerts



Unified digital platform

GEMS PRICING PLAN

Geotechnical Insight tailored to your site conditions built into every plan



Quartz Plan

Clarity in Every Foundation

Essential plan for single site activity (e.g. Piling Works). Designed for focused monitoring of one workstream – simple, reliable and crystal clear. Expert-guided configuration.

Includes:

- ✓ 1 Interactive activity map
- ✓ Daily progress updates
- ✓ Progress Summary Dashboard
- ✓ Multi-user access & data sync

RM 5000 *per month per project*



Sapphire Plan

Strength Across Disciplines

Advanced Plan for projects with multiple parallel activities up to three site activities. Integrates insights across tabs for stronger coordination and deeper visibility.

Includes:

- ✓ Everything in Quartz Plan
- ✓ Up to 3 site activities
- ✓ Cross-tab Interactive map
- ✓ Multi-activity progress dashboard

RM 8000 *per month per project*



Diamond Plan

Brilliance Tailored to Your Project

Premium customizable plan for complex projects requiring bespoke dashboard, data integrations, or enterprise reporting. Each setup is uniquely engineered to your project.

Includes:

- ✓ Fully customized layout & features
- ✓ Dedicated setup & support
- ✓ API/ Automation Integrations
- ✓ Price upon consultation

CUSTOM
Contact us!

Disclaimer: GEMS provides engineering-informed visualization and notification logic based on general geotechnical practices and site conditions. It does not replace formal geotechnical consultancy, design review, or professional engineering approval.



Q&A