



THE PWI

Under Pressure: Earthworks and drainage fit for the future

Emergency Repair of Earthwork Failures

8 November 2023, York

EMERGENCY REPAIR OF EARTHWORK FAILURES

Speakers:



Charles Mortimer, Managing Director – Introduction



Natasha Steele, Assistant Project Manager – Using Technology to Support Rapid Mobilisation



Kieran Taylor, Apprentice Civil Engineer – Managing the Delivery and 'Making it Happen'

PREVENTABLE OR INEVITABLE?

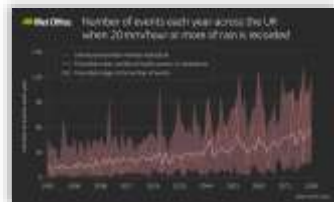


CHALLENGES

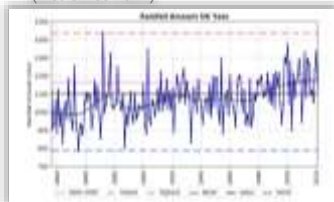


Aging infrastructure, increasingly fragile assets

- Network Rail are responsible for over 190,000 earthworks assets
- Majority of earthworks are over 100 years old
- Weathered, overly steep slopes, poor construction methods



(Met Office 2022)



(Met Office 2022)

The frequency and intensity of storms, floods, droughts and heatwaves is increasing, and sea level rise is impacting coastal areas

- The UK has had 17 record-breaking months of rainfall since 1910. Nine of these have been since the year 2000
- 9 of the U.K.'s 10 hottest days on record (since circa 1900) have occurred since 1990
- Sea levels are now rising at twice the rate compared with just 20 years ago

PRO-ACTIVE & PREVENTATIVE MEASURES

Interventions

- Inspection and maintenance of drainage systems during rainfall events
- Remote Condition Monitoring (RCM)
- Additional on-call support when weather warnings in place

Smart approach to manage weather events:

- Inspect and maintain prior to weather events
- Monitor using RCM during the event
- Follow up inspections and maintenance post event



ECM1 Stoke Jn – Trash Screen Clearance Before/After



Remote Drainage Condition
Monitoring Installation



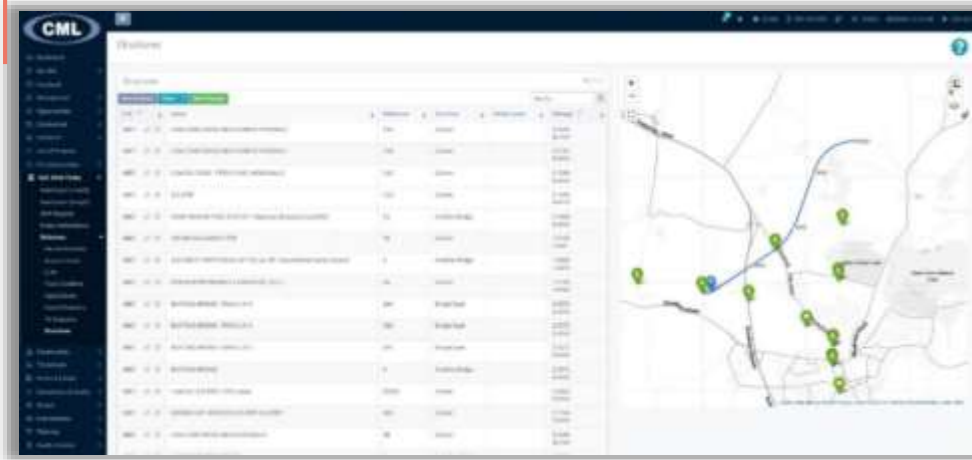
Track flooding and wash-out
incident at Pen Green, Corby 2022

A red L-shaped graphic element, consisting of a vertical line and a horizontal line meeting at a right angle, positioned to the left of the title box.

THE INITIAL RESPONSE – USING TECHNOLOGY TO SUPPORT RAPID MOBILISATION

Natasha Steele – Assistant Project Manager

INITIAL RESPONSE – KEY ACTIONS



Extracts from CML 'Insight' digital enterprise system



Desktop planning

- Collate available information
- Create and authorise a Safe Work Pack
- Identify resources to respond to the site

ON CALL: INITIAL RESPONSE



ON CALL SUPPORT

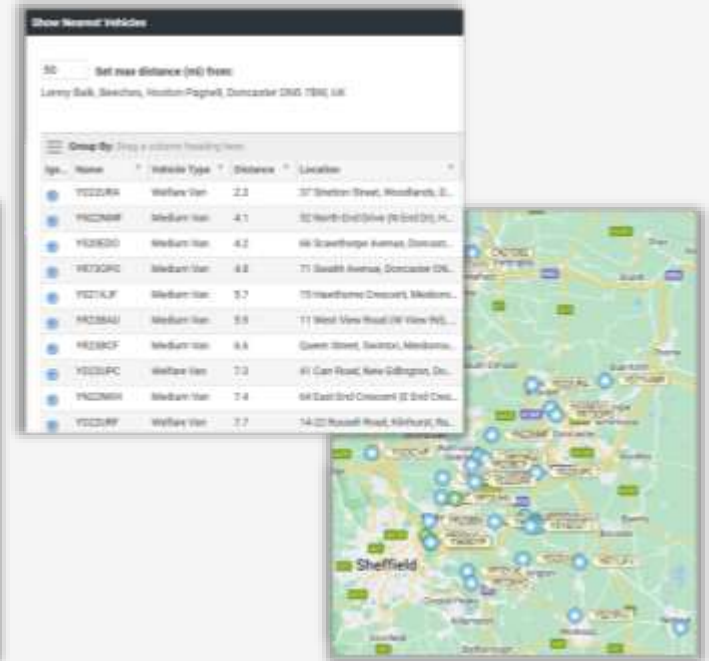
CML Provide On Call support with a dedicated and directly employed skilled workforce, who help keep the infrastructure safe and operational **24 hours a day, 365 days every year**, including Christmas and New Year.



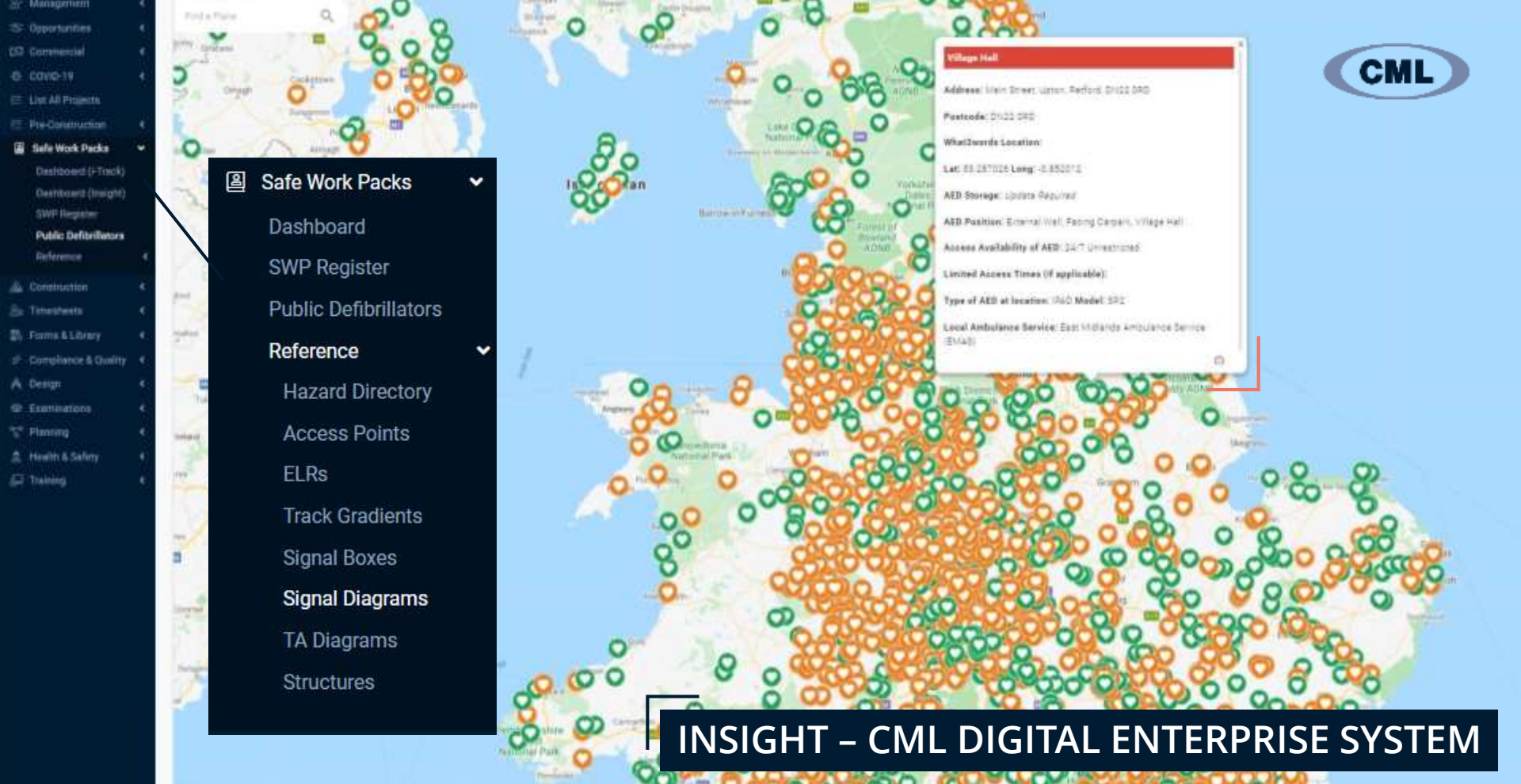
CML On-Call Manager



Extract from CML's 'Insight' – worksite location map



Extract from Teletrac Navman software – live vehicle location data



INSIGHT – CML DIGITAL ENTERPRISE SYSTEM

Out of Hours

Dashboard / Out of Hours / On-Call Panel

13/06/2021

SAEField

Load Log

Emergency

On-Call Log

10482

SLR PCH - Midgee PCH - Structure PCH - Risk N/A
Deadline 24/10/2021 - Response N/A

SOUTH, Christopher

BURNS, Howard

WATERS, Bernard

HOLLAND, Tim

MIDGEL, Anthony

WALKER, James

7000.0041

SLR SHPS - Midgee 24/10/21 - Structure PCH - Risk N/A
Deadline 27/10/2021 - Response N/A

COLLINS, Adam

SUTHER, John

7000.3100

SLR SPCL - Midgee 30/09/21 - Structure PCH - Risk N/A
Deadline 30/10/2021 - Response Planned Reaction

[Viewed report details for Emergency 30/09/21](#)

SUNBURY, Paul

STEFANIA, Craig

7000.3100

SLR SPCL - Midgee 30/09/21 - Structure PCH - Risk N/A
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SUNBURY, Paul

STEFANIA, Craig

7000.3100

9100.0002

SLR SPCL - Midgee 30/09/21 - Structure PCH - Risk N/A
Deadline 30/10/2021 - Response

HENFLEY, Alan

WETLAND, John

9100.0000

SLR PCH - Midgee 24/10/21 - Structure PCH - Risk N/A
Deadline 27/10/2021 - Response

DIANEY, Mark

WATSON, Bob

9100.3402

SLR PCH - Midgee 24/10/21 - Structure PCH - Risk N/A
Deadline 27/10/2021 - Response

9100.3000

SLR SPCL - Midgee 30/09/21 - Structure PCH - Risk N/A
Deadline 30/10/2021 - Response

HENFLEY, Alan

HUTCHESON, Tom

9100.0226

SLR SPCL - Midgee 30/09/21 - Structure PCH - Risk N/A
Deadline 30/10/2021 - Response

HENFLEY, Alan

HUTCHESON, Tom

9100.0225

SLR SPCL - Midgee 30/09/21 - Structure PCH - Risk N/A
Deadline 30/10/2021 - Response

HENFLEY, Alan

HUTCHESON, Tom

Emergency Response Risk

Risk Factors

Initial Cost

Works Arising

Specialist Work

Operational Risk

Reputational Risk

Access

NWR Scheme

Item Details

Project Name

Brief Description of Work

NWR Contact

Project Type

Select Type...

SLR

Midgee

Enter first letter...

Search

Cancel

United Kingdom

INSIGHT - SAFE WORK PLANNING TOOLS

MOBILISE



Delivery teams loading plant and materials from stock Inside CML's Sheffield depot



RESPOND



A red L-shaped graphic element is positioned to the left of the title bar.

MAKING IT HAPPEN

Kieran Taylor – Apprentice Civil Engineer

DAY ONE

Who is managing the works?



When will the line re-open?



How much will it cost?

How do we fix this?

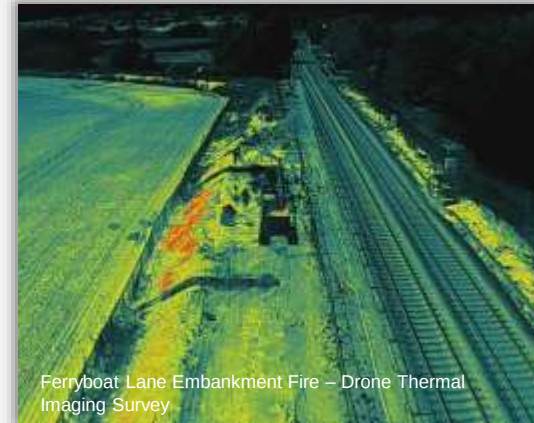
How long will it take?

Why can't we do it this way?

Can we implement 24 hour working?

UNDERSTANDING THE PROBLEM

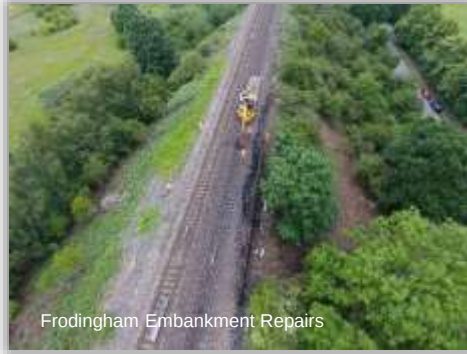
- Determining the cause and extent of the failure
- Initial investigations and monitoring
- Identify access options with consideration of critical constraints
- Monitoring Requirements / Line Closure



COMMUNICATION & COLLABORATION



Drax Branch Flood Damage Repairs



Frodingham Embankment Repairs

- Establishing lines of Communication & reporting
- Make best use of existing knowledge
- Understanding stakeholder requirements – establish timescales
- Define the scope of works / outcomes

CLARITY

MOBILISATION CHALLENGES

Allocation of specialist resource

24/7 on-call services agreed with key supply chain partners

Using CML's Insight database to identify local supply chain

Liaison with residents & third parties



ACCELERATED DESIGN & DELIVERY



SPC1 Harlington Embankment Failure 2021



Mexborough Slope Failure Repair 2023

- Proven and experienced designer appointed
- Use of standard details
- Form G Schematic / Retrospective Form B Design
- Emergency works can provide opportunities for accelerated delivery
- However, there are often constraints which prevent 24/7 working

FINAL THOUGHTS

What works well:

- A combination of pro-active interventions is proving successful
- Agile and responsive business systems are key to enabling delivery teams to mobilise to sites quickly
- Well informed teams with instant access to information using a centralised digital portal
- Long standing business relationships; assisting delivery, instilling confidence

Areas for improvement:

- Sharing access to data between client, supplier and stakeholder systems
- How can we further improve on delivering solutions quicker, reducing disruption to passengers and freight services

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THE PWI

THANK YOU

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