

CIVIL CONNECT

THE INVISIBLE GOLDEN THREAD

Extending the Building Safety Act Below Ground:
De-risking Tier 1 Infrastructure

Subsurface Safety & Digital Engineering
Civil Connect | Tier 1 Contractor

00 EXECUTIVE SUMMARY

The **Building Safety Act 2022** has fundamentally altered the compliance landscape for UK construction. The concept of the "Golden Thread"—a digitally maintained, accurate record of building information—is now the gold standard for high-rise safety. Yet, a critical disconnect remains.

While BIM (Building Information Modelling) precision is mandated above ground, the subsurface environment is frequently left to chance. Reliance on outdated statutory records (Quality Level D) remains endemic, despite the fact that **utility strikes cost the UK economy £2.4 billion annually**.

This whitepaper argues that for Tier 1 contractors and Principal Designers, the legal and moral obligations of the Building Safety Act do not stop at the foundation slab. They must extend downwards.

The Strategic Argument:

- **Legal Exposure:** Under CDM 2015 and the new Safety Act regime, claiming "the plans were wrong" is no longer a viable legal defence for a catastrophic utility strike.
- **Digital Continuity:** A "Digital Twin" that lacks verified subsurface data is incomplete. You cannot manage a building's safety if you do not know what lies beneath it.
- **The Civil Connect Solution:** We propose the "Total Visibility" mandate—moving from passive utility record searches to active, high-frequency GPR and Electromagnetic detection (PAS 128 QL-B) as a standard gateway for all major projects.

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01 THE REGULATORY VOID

Why "Tick-Box" Compliance is Failing

The introduction of the Building Safety Regulator (BSR) signifies a move away from self-certification towards rigorous evidence. However, in the realm of ground engineering, a dangerous habit persists: treating PAS 128 (Specification for underground utility detection) as a menu of options rather than a safety hierarchy.

The "Quality Level D" Trap

Far too many projects proceed to excavation based on PAS 128 Quality Level D (Desktop Utility Records Search). It is an open secret in the industry that statutory undertaker records are historically inaccurate.

"Relying on statutory records alone is not engineering; it is gambling. The 'Golden Thread' of safety snaps the moment it hits the ground."

The Legal Implications under CDM 2015

Regulation 13 of the CDM Regulations places a duty on the Principal Contractor to plan, manage, and monitor the construction phase. If a contractor strikes a high-pressure gas main because they relied on a 10-year-old PDF map instead of conducting a survey, they are arguably in breach of their duty to "identify, eliminate or control foreseeable risks."¹

The NUAG Initiative

The government's *National Underground Asset Register (NUAG)* is a positive step towards digitizing this data. However, NUAG is an aggregation of existing records. It does not replace the physical verification required on a live Tier 1 site. Civil Connect argues that **active verification (QL-B/A)** must become the non-negotiable standard for any project valued over £5m.

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02 THE COST OF BLINDNESS

Economic and Human Impact

The "invisible" nature of underground assets creates a false sense of security. Yet, the data from the Utility Strike Avoidance Group (USAG) paints a stark picture of the risks involved in excavation without adequate intelligence.



The Project Delay Multiplier

For a Tier 1 contractor, the cost of the repair is often negligible compared to the **consequential loss** striking a fibre-optic cable doesn't just incur a fine; it stops work on that section. If that section is on the critical path (e.g., a bridge abutment or attenuation tank), the delay damages can run into hundreds of thousands of pounds per day.

Reputational Risk

In an era of social value and community engagement, cutting off power or water to a local hospital or residential estate is a PR disaster that can disqualify contractors from future framework agreements. The "Golden Thread" is also about maintaining trust with stakeholders.

The Moral Argument

Beyond the money, every strike carries the risk of injury or death. Civil Connect operates on a "Safety First" philosophy: We do not dig until we know. We provide our clients with the certainty required to send their operatives home safe every night.

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03 THE SUBSURFACE DIGITAL TWIN

Integrating GPR with BIM (ISO 19650)

To extend the Golden Thread underground, we must change how we deliver data. A spray mark on the ground is temporary. A PDF report is static. A **Digital Twin** is permanent, accessible, and evolving.

The Civil Connect Workflow:

- **Data Capture:** We utilize dual-frequency Ground Penetrating Radar (GPR) and Electromagnetic Locators (EML) to scan the site footprint.
- **Data Processing:** This raw data is post-processed to remove noise and identify anomalies that automated algorithms miss.
- **3D Modelling:** The verified assets are modelled in 3D (Revit/Civil 3D) and attributed with metadata (depth, material, confidence level).
- **Federation:** This model is federated into the Project Information Model (PIM).

Clash Detection Before Excavation

By having a 3D subsurface model, the Principal Designer can run automated clash detection during the design phase. You can spot that a proposed pile foundation clashes with a high-voltage cable months before a piling rig arrives on site.

This is the essence of the Golden Thread: **Information Management that prevents harm.**

This approach aligns perfectly with the **ISO 19650** standard for information management, ensuring that Civil Connect integrates seamlessly into the digital workflows of Tier 1 giants like Balfour Beatty, Skanska, and Costain.

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04 THE TIER 1 APPROACH

Why Civil Connect?

The subsurface market is fragmented. It is populated by small survey firms who lack the insurance to handle major risks, and large generalists who lack the specialized equipment. Civil Connect occupies the strategic middle ground: A specialist Tier 1 contractor.

Our Verification Hierarchy:

1. Survey (QL-B):

We employ the most advanced GPR arrays in the UK market, capable of detecting non-conductive utilities (plastic pipes, fibre ducts) that standard CAT scans miss.

2. Vacuum Excavation (QL-A):

When critical assets are identified, we do not guess their depth. We use our in-house Vacuum Excavation fleet to safely expose the asset (potholing) to provide visual verification (Quality Level A). This is the only way to guarantee 100% safety.

3. The "Permit to Dig" Guarantee:

We don't just hand over a drawing. We can manage the entire "Permit to Dig" process for the Principal Contractor, taking on the liability of the permit issuance based on our own verified data.

Conclusion

The Building Safety Act demands a higher standard of care. By extending the Golden Thread below ground with Civil Connect, you are not just buying a survey; you are buying project resilience, legal compliance, and peace of mind.

References & Standards:

- [1] Construction (Design and Management) Regulations 2015, HSE.
- [2] PAS 128:2022 - Specification for underground utility detection, verification and location.
- [3] The Building Safety Act 2022.
- [4] USAG (Utility Strike Avoidance Group) 2024 Report.

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Secure Your Site Below Ground

Don't let the subsurface be the weak link in your Golden Thread. Partner with a Tier 1 specialist.

Book a Technical Consultation

Our Digital Engineering team is available to audit your current project's subsurface risk profile.

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