Mining & Site Investigation

How does it affect me?

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An example of how mining can affect you!

But more about this later...
Overview

• Types of mining feature & How do they affect development.
• Methods of investigation
• The responsibilities of developers
• Redruth case study – how we put things right
Mining Features

- Steeply Dipping Lode Zones
- Vertical Shafts
- Horizontal Adits & Crosscourses
- Shallow Costain Pits & Exploration Trenches
- Engine House Pits & Surface Features
Lode Zones

- Typically dipping at around 60° from horizontal
- Can be worked out from surface
- Can be laterally extensive
- Can be backfilled or choked
- The easiest mining features to find
- Can suffer from catastrophic collapse
- Can subside slowly over time
- The most expensive and time consuming features to remediate
Shafts

- Typically Vertical – Although may be included along a Lode
- Always come to surface
- Often backfilled or choked
- Can be difficult to find
- Can catastrophically collapse
- If filled – can be easily remediated
- If open can be complicated to remediate
Tunnels & Adits

- Typically within rock
- Rarely backfilled
- Very difficult to find
- Rarely come to surface
- Pose less of a threat
- Will typically migrate upwards towards the surface as the roof collapses
- Difficult to remediate
Backfilled Pits & Surface Features

- Typically shallow
- Nearly always backfilled
- Difficult to find
- Pose less of a threat
- Can lead to slow subsidence over time
- Not to be confused with a choked shaft
Methods of Investigation

- Desk Top Study
- Walkover Survey
- Non-Intrusive Investigation
- Intrusive Investigation
  - Drilling
  - Pitting & Trenching
  - Probing
Where am I?
Responsibilities of a Developer

- Planning Policy Statement PPS 14 ‘Developing on Unstable Land’

“The responsibility for determining whether land is suitable for a particular purpose rests primarily with the developer. In particular, the responsibility and subsequent liability for safe development and secure occupancy of a site rests with the developer and/or the landowner. It is in any case in the developer's own interests to determine whether land is unstable or potentially unstable since this will affect the value of the land the costs of developing it. The developer should therefore make a thorough investigation and assessment of the ground to ensure that it is stable or that any actual or potential instability can be overcome by appropriate remedial, preventive or precautionary measures.”
Costs of Remediation

Approximate Costs of dealing with mining features at the various stages of Development:

- ££££££££ - Before buying the Land - The cost of the investigation only. You can walk away if the site needs too much work.
- ££££££££ - Before anything has been built - Good access for large plant and space to work.
- ££££££££ - After building work has started - Work has to stop. Some parts of the structure may need to be demolished.
- ££££££££ - After work has been completed - You may have to turn away prospective buyers. Confined space access and small tools will hamper investigation and increase the time and the expense of remedial works.
Case Study - Redruth

• Single residential dwelling
• Previous site investigation identified a costain pit on the site
• Foundations designed to avoid feature
Case Study - Redruth

Feature Identified

Feature Mapped

More Mapping!

Additional feature found

Overview of site
Case Study - Redruth

- Costain pit turned out to be a shallow shaft
- Two unrecorded tunnels
  - One very short – was where void was encountered
  - Other was an unrecorded length
- Soft ground was excavated and replaced with concrete
- Foundations were re-designed to bridge the feature as an extra precaution
- 33 m² of concrete was used for the small feature
In Conclusion

• Many ways in which mining can affect your development
• Just because you cannot see a mining feature do not assume it is not there
• Do your homework. Always carry out a desk-top study before buying land for a development
• A good SI can be undertaken at a reasonable cost and will save you time and money in the long run
• The best time to act is now
Any Questions?

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Mining – Ground Contamination - Geotechnics

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