STRIDEArc Consulting

Case Study: Redevelopment of Environmentally Impacted Site

Client Type: Developer

Project Focus: Risk Assessment and Pre-Acquisition Assessment

Project Overview: the Foundry was an 8.5-acre redevelopment site that once housed a metalworks foundry. Historical industrial processes at the foundry had left the land contaminated with asbestos, heavy metals, and petroleum. When the foundry structures were demolished, the contaminants were exposed, necessitating multiple cleanup operations. The final remediation strategy was to contain the pollutants onsite, covering them with an ID barrier (a heavy-duty landscape fabric) and fill. The primary challenge in redeveloping the site was how to proceed with construction without disrupting the ID barrier or compromising the integrity of the remediation efforts.

Challenges:

- **Environmental Contamination:** Asbestos, heavy metals, and petroleum present in the soil required a careful and controlled approach to redevelopment.
- **ID Barrier Restrictions:** The contaminants had been safely encapsulated by an ID barrier, which could not be disturbed, presenting significant design and construction limitations.
- **Uncertain Development Path:** Lacking precise information on the subsurface conditions, the team faced uncertainty on how to integrate critical infrastructure like streets and utilities without compromising the barrier or triggering extensive, costly environmental rework.

Innovative Solution: After thorough review of the environmental and geotechnical reports, I proposed a unique solution to overcome these constraints. The key was to determine the precise location and depth of the ID barrier. I directed the civil engineering team to conduct a series of strategically placed test holes across the site in a grid pattern. This approach enabled us to map the subsurface contours and fully understand the barrier's layout.

With the subsurface conditions mapped, we had to reverse the traditional design process. Instead of starting with surface-level designs and working down, we began by determining the main utility layouts to understand the depths required for proper servicing. Once the utilities were planned, we proceeded to lay out the streets and then positioned the buildings accordingly. However, the process did not end there. To ensure the entire design would work in conjunction with the ID barrier, we had to adjust the final elevation of the site, raising it between 4 to 8 feet in certain areas. This adjustment allowed us to maintain the integrity of the ID barrier while ensuring the utilities and infrastructure could be safely and efficiently installed, ultimately providing a functional and sustainable development plan.

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Results: This proactive and methodical approach eliminated months of potential trial-and-error design, reducing the risk of disturbing the ID barrier and avoiding expensive testing and redesigns. As a result, we achieved significant cost savings and a significant reduction in projected expenditures. The redevelopment was able to move forward on schedule, with environmental risks managed effectively and efficiently.

Key Takeaways:

- **Innovative Problem-Solving:** By employing a reverse-design methodology based on precise subsurface data, we successfully navigated the complex environmental constraints.
- **Collaboration and Data-Driven Decisions:** Close collaboration with civil engineers and a focus on gathering critical data through testing allowed us to develop a clear, actionable plan.
- **Significant Cost and Time Savings:** Avoiding unnecessary site disruptions and preventing extensive retesting and redesign saved both time and financial resources, delivering a more streamlined redevelopment process.