

Thermal Remediation Beneath Buildings and Active Facilities

Contaminant source zones are frequently located beneath buildings, active industrial facilities, roadways, rail corridors, and utility-dense areas where traditional vertical drilling and installation methods are not feasible. In these constrained settings, thermal remediation remains a viable and effective solution when supported by appropriate engineering, drilling expertise, and operational controls. As a result, sites traditionally considered impractical for in situ treatment can be remediated safely and predictably with thermal technologies.

TerraTherm, working seamlessly with Cascade's drilling division, has successfully designed and implemented numerous thermal remediation systems beneath active infrastructure while protecting people, assets, and ongoing operations.

Designing Thermal Remedies for Constrained, Sensitive Sites

Every project conducted beneath buildings or active facilities begins with a rigorous, site-specific evaluation to fully understand subsurface conditions and constraints. This upfront work is critical to managing risk and ensuring successful outcomes.

Our design process includes a comprehensive review of:

- Geology and hydrogeology
- Geotechnical properties
- Building foundations and structural elements
- Active and abandoned utilities
- Operational and access constraints
- Vapor intrusion and indoor air considerations



This upfront work informs selection of the appropriate thermal technology, such as Thermal Conduction Heating, Electrical Resistance Heating, Steam Enhanced Extraction, or combined systems, along with integrated vapor, pneumatic, and hydraulic controls.

Flexible Wellfield Design for Constrained Sites

Thermal systems beneath infrastructure require flexible installation approaches tailored to site constraints. TerraTherm develops three-dimensional wellfield designs tailored to each site, incorporating combinations of vertical, angled, and horizontal installations to fully access the target treatment zone:

- Vertical wells where access is available
- Angled drilling to reach source zones beneath buildings, pavements, and active process areas
- Horizontally-installed heating and vapor extraction networks using directional drilling where traditional layouts are infeasible

Precise Installation Beneath Sensitive Infrastructure

Advanced 3D modeling tools are used to optimize well spacing, depths, orientations, and heating uniformity, ensuring effective treatment while minimizing construction risk and operational disruption.

Installation is executed in coordination with Cascade's drilling services and experienced directional drilling contractors. These capabilities allow for precise placement of thermal infrastructure beneath and around sensitive features, including utilities, foundations, and active facilities, while maintaining the geometry required for uniform heating and effective vapor and liquid capture. Work is carefully executed to avoid impacts to these features and ongoing operations.

Safe and Effective Operation Beneath Occupied Facilities

TerraTherm's experience extends beyond installation to include sustained safe system operation beneath active and occupied facilities. Systems are designed and managed to:

- Achieve uniform and effective heating
- Capture steam and contaminant vapors to mitigate vapor intrusion risks
- Maintain pneumatic and hydraulic control
- Address floor temperature and occupied space considerations
- Allow business operations to continue safely during remediation

Operational strategies are supported by continuous performance monitoring and adaptive management to ensure safety, effectiveness, and regulatory compliance throughout treatment. Together, these controls enable safe and predictable thermal remediation beneath active infrastructure.

Contact Us

For sites where contaminant source zones are located beneath buildings or active facilities, TerraTherm offers proven thermal remediation solutions designed to work within real world constraints. Talk with TerraTherm to discuss applicability at your site.



Contact:

thermal@cascade-env.com | 978.730.1200