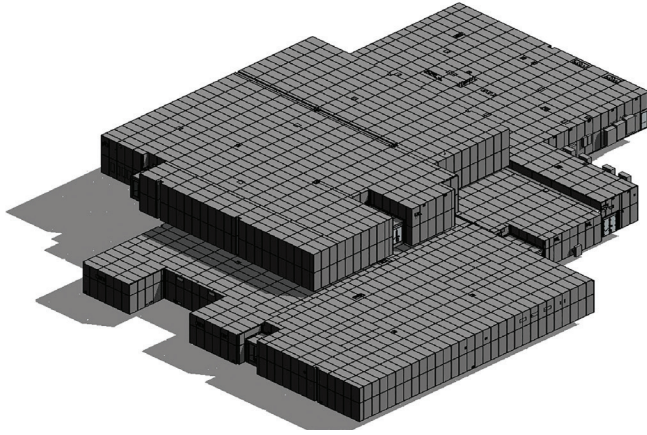


CASE STUDY UTILIZING BIM FOR SUPERIOR PROJECT EXECUTION – CEDAR PARK, TEXAS



A private regional corporation with numerous Fortune 1,000 clients decided to develop an original 16,723 m² (180,000 ft²) command-and-control operations center with over 9,290 m² (100,000 ft²) of surface area protected against an electromagnetic pulse (EMP). For this project to be successful, intense coordination was required by all trades involved due to the tight construction tolerances and numerous structural members and utility lines penetrating the shield. Because of its industry expertise and advanced Building Information Modeling (BIM) capabilities, ETS-Lindgren was selected as the shielding expert for this project.

BIM Coordination

The construction of the shield was to take place in conjunction with the construction of the operations center. This relied heavily upon close coordination between ETS-Lindgren and all other trades involved. With the use of several BIM-capable design software packages, 3D models of the operation center's structure, utility systems, and EMP shield were created and shared between all trades. Each 3D design was uploaded to a single model of the operations center in order to view how each design interacts with one another.

This BIM coordination provided:

- Interference detection between the layouts of each trade's components, allowing no shield penetration location to go unseen.
- The ability to locate and size the shielded penetrations required for the Mechanical Electrical Plumbing (MEP) lines penetrating the shield.

- Digital representation of the overall design for coordination with remote team members.
- The ability to create and insert customized shielding components into the 3D model

Benefits To Using BIM

ETS-Lindgren's use of BIM throughout the design, fabrication, and installation process provided the customer with numerous benefits including:

- A better understanding of the design and the ability to quickly make informed decisions.
- A better understanding of how the shielded enclosure interfaced with surrounding building structure and MEP facilities.

A better understanding and visualization of designs for use by all installation team members.

ETS-Lindgren's Certified BIM Professionals

All ETS-Lindgren's proprietary shielding BIM models are developed and maintained by our

own certified BIM professionals. Having created the BIM models specifically for ETS-Lindgren shielding applications gives our BIM professionals the ability to provide faster design submittals along with customized BIM models as required. Additionally, our continuous improvement training program ensures that our BIM professionals are up-to-date with the latest BIM software, practices, and capabilities.

Project Specifications

- 10,405 surface m² (112,000 ft²) of HEMP shielding, covering portions of the first and second floor of the control center.
- 3,500 each 1.2 m x 2.4 m (4.0 ft x 8.0 ft) RedEdge Shielded Panels
- 15,240 m (50,000 ft) of RedEdge Joint Clamps
- 250,000 RedEdge Clamp Fasteners
- 2,500 Threaded Rod Ceiling Penetrations

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- 975.5 m² of 1.3 cm (10,500 ft² of .5 in) Thick Welded Steel Floor
- 135 EMP Shielded Electrical Filters, from 10 Amp to 1,200 Amp
- 162 Pipe Penetrations
- 19 HVAC Penetrations

About ETS-Lindgren

ETS-Lindgren is an international manufacturer of components and systems that measure, shield, and control electromagnetic and acoustic energy. The company's products are used for electromagnetic compatibility (EMC), microwave and wireless testing, electromagnetic field (EMF) measurement, radio frequency (RF) personal safety monitoring, magnetic resonance imaging (MRI), and control of acoustic environments.

Headquartered in Cedar Park, Texas, ETS-Lindgren has manufacturing facilities in North America, Europe, and Asia. Additional information about ETS-Lindgren is available at www.ets-lindgren.com. Additional information about ETS-Lindgren's parent company ESCO and its subsidiaries is available at www.escotechnologies.com.

