RUGGED ROBOTICS

Turner

Turner Construction breaks new ground in multi-trade layout efficiency with Rugged Robotics.

THE PROJECT

Turner Construction's Houston office was hired to undertake a gut renovation of the Texas Department of Criminal Justice (TDCJ) Infirmary. The main floor, covering 17,000 square feet, required a meticulous coordination and layout of walls, doors, MEP systems, and other medical infrastructure.

After an extensive coordination process, they sought an alternate layout approach that would ensure the fidelity of their model was carried into the field. Traditional, siloed, layout practices work well for each trade in isolation, but create vulnerabilities—especially for coordinated multi-trade layouts, due to their dependence on technologies, references, and starting points.

Rugged Robotics' solution, with its ability to simultaneously load an entire architectural design with multiple MEP systems ensured every system was positioned relative to the same building control reference, delivered a significant reduction in time, and improved accuracy across trades—leading to a faster installation that ultimately sped up completion of this intensive project.

TURNER CONSTRUCTION

Project:

TDCJ INFIRMARY RENOVATION

Use Case:

MULTI-TRADE LAYOUT

Project Size:

3000 LINEAR FEET /
17,000 SQUARE FEET

KEY BENEFITS OF RUGGED'S MULTI-TRADE LAYOUT

EXACT REPLICATION

Rugged extended the BIM coordination process from the model to the field by replicating the design and providing installation guidance across trades where their systems intersect or interact

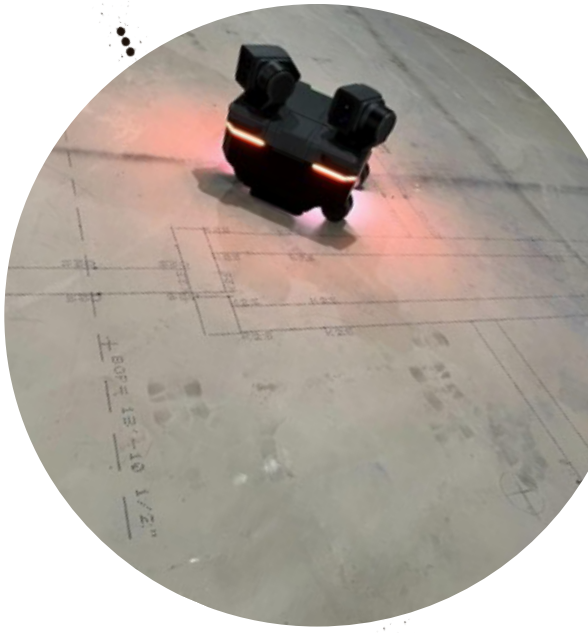
VERIFIED CONTROL REFERENCES

Rugged consolidated traditionally fragmented approaches to layout into one single layout from a unified network of verified control points, ensuring precision and alignment across multiple trades

REMOVED BOTTLENECKS

Rugged removed traditional bottlenecks by getting key information as well as detailed architecturals laid out quickly before full trade mobilization

THE CHALLENGE



The TDCJ Infirmary renovation project demanded precise layout coordination among the multiple trades. It involved a full gut renovation with a dense design of complex elements like walls, doors, MEP systems, and critical medical infrastructure—requiring pinpoint accuracy in layout for all project components to avoid clashes with both existing and new systems.

One particularly difficult challenge for Turner was its best fit alignment of the new design to the old building, where existing columns were over 2 inches out of place, and column grid lines twisted relative to the building shell—risking significant layout errors if the trades tried to use existing features (like columns) alone as layout control references. This posed a risk of inaccuracies across different trades, potentially leading to costly delays and exponential downstream inaccuracies.

> **"Rugged eliminated many of the errors and conflicts we see from each trade using different files, different starting points, and different measurement techniques. Rugged solved problems before they were built and prevented debate and delay between trades during the layout and rough-in process."**
>
> RANDI SCHIEBER, VDC MANAGER

THE SOLUTION

Armed with their proprietary layout robot, Mark1, Rugged Robotics proved essential in addressing the intricate layout requirements of this project.

A standout aspect of Rugged's solution was the fast and efficient printing of multiple trades' layouts in a single pass—including crucial elements marked for early installation, like priority walls, med-gas systems, and large-diameter drain pipes. One particular drain pipe, critical for another part of the facility, was a critical piece of early infrastructure that influenced the layout of the broader MEP system. Rugged laid out the entire drain pipe route with elevation information printed continuously along the run to ensure fast and accurate installation.

Additionally, Rugged played a pivotal role in accurately marking patient-bed centerlines, which were crucial for the placement of head-walls containing the appliances, devices, and fixtures, like medical gas systems, that sustain life. Some of those systems were still under design iteration during the layout, so Rugged's ability to extract bed centerlines (which were "signed-off" on by the owner) and print them on the floor enabled key geometric information to be communicated into the field and carefully reviewed prior to final coordination sign-off.

By establishing these key layout elements early, Rugged ensured that all trades had reliable reference points from the onset—tied directly to Turner's federated control, instead of individual (and unreliable) columns for alignment. This approach mitigated the risk of inaccuracies, layout errors, and physical clashes that could arise from trades unintentionally using incorrect reference points.

THE IMPACT

Integrating Rugged Robotics' technology into the TDCJ Infirmary project expedited the construction timeline while ensuring coordination between trades, and achieved the complete layout of critical information within the first week of trade mobilization.

An in-house audit by Turner's field engineer, along with real-time verification by the drywall subcontractor, confirmed that Rugged met or exceeded their accuracy requirements. Maintaining this high level of accuracy was pivotal in ensuring smooth coordination between trades, preventing potential layout clashes, and maintaining overall project precision.

The result was a streamlined layout, reduced workload across trades, and a significant acceleration in the installation timeline.

READ MORE ABOUT THE RUGGED DIFFERENCE

RUGGED ROBOTICS

Leave manual methods in the past and let Rugged Robotics modernize your layout processes. No more crawling around snapping lines—just pinpoint precision, detailed information, and expedited results.

GET STARTED