

CASE STUDY

Brick Veneer Stabilization After Partial Façade Collapse

30 Kimberly Road | East Brunswick, New Jersey



Aerial view of the approximately 430 ft x 240 ft warehouse and attached office. The failed area was located along the east wall.

~120 FT	~30 FT	45-50 YRS
length of collapsed veneer	warehouse height	estimated building age

CLIENT ENGINEER OF RECORD

Iron Mountain KSI Engineering

Project No. 2400_47

SYSTEM INSTALLATION

Thor Helical USA stainless-steel retrofit wall ties Thor Helical USA associate contractor

What the Engineer Found

KSI inspected the property on April 10, 2024 after a high-wind storm event. Approximately 120 feet of the nominal 4-inch brick veneer had separated from the east wall for the full height of the warehouse, exposing the 8-inch CMU backup wall.



Collapsed veneer removed, exposing the CMU backup wall. Deteriorated and broken corrugated steel masonry tie visible in the cavity.

Key observations

- Most visible original corrugated steel ties were deteriorated or broken; the few intact ties extended about 4 inches from the CMU.
- The cavity gap measured approximately 7/8 inch to 1-5/8 inches at the edges of the failed area.
- The remaining veneer adjacent to the collapse was visibly bulged outward; localized bulging was also observed near a control joint at the south end of the east wall.
- No waterproofing coating or membrane was observed between the CMU and brick veneer.
- Grade along much of the east wall covered the lowest brick course and likely blocked the weep holes.
- Interior efflorescence and water staining supported a history of moisture within the wall system.

ENGINEER'S CONCLUSION

The engineer found the building structure itself stable and occupiable. No structural steel deficiencies, excessive deflection, or damage to the CMU backup wall were observed in the collapse area. However, because of the building age and the widespread condition of the original ties, KSI recommended assuming the remaining brick veneer was not adequately attached throughout the building.

Repair Strategy: Strengthen the Retained Veneer

KSI presented two principal approaches: remove and replace the brick façade, or strengthen the existing veneer in place with small-diameter stainless-steel helical ties drilled through the brick and anchored into the CMU backup wall. The in-place strengthening approach was selected for retained wall areas.



Field work at the east elevation. Stainless-steel helical wall ties used to reconnect the veneer to the backup wall.

Scope of the stabilization program

- Install stainless-steel helical retrofit ties through the existing brick veneer into the CMU backup to restore out-of-plane restraint.
- Lay out and install ties in accordance with the engineer's repair design and verified field conditions.
- Complete targeted masonry repairs and repointing where needed around distressed areas. •

Maintain and reseal vertical control joints with an appropriate compressible joint filler.

- Address drainage conditions, including lowering grade where weep holes are blocked and maintaining clear drainage paths.

Why helical

ties

The system provides a minimally invasive means of reconnecting retained brick veneer to the existing CMU backup. Stainless steel improves durability in a cavity previously affected by moisture, while the small installation diameter limits disruption to the façade and occupied building.

Outcome and Lessons



Stabilized retained veneer

The retrofit tie program restored a direct mechanical connection between the retained brick veneer and the structurally stable CMU backup wall, avoiding wholesale removal of serviceable masonry in treated areas.

Long-term performance depends on both anchorage and water management. The engineer's report makes clear that restoring ties without correcting blocked weeps, failed joints, or other moisture pathways would leave the original deterioration mechanism in place.

Project takeaways

- Façade distress can be severe even when the primary steel frame and CMU backup remain structurally stable.
- Blocked weep holes and poor cavity drainage can shorten the service life of light-gage metal veneer ties.
- A collapse at one location can signal a building-wide anchorage concern when original ties are the same age and type.
- Engineered stainless-steel helical ties can strengthen retained veneer in place with less demolition and disruption than full replacement.
- Drainage, flashing, sealants, control joints, and ongoing inspection are essential parts of a durable stabilization program.

ENGINEERING BASIS	SYSTEM	APPLICATION
KSI Engineering report dated April 23, 2024	Stainless-steel helical retrofit wall ties	Brick veneer-to-CMU backup stabilization

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Technical note: This case study summarizes the referenced engineering report and the implemented retrofit approach. Final tie selection, spacing, embedment, and installation requirements are project-specific and must follow the engineer's design and verified field conditions.