General Description:
- **Location:** Farmington, MI
- **Profile:** Public High School
- **Project:** Exterior masonry restoration

Services Provided:
- Building Envelope Evaluation
- Design Development
- Construction Documents
- Bidding Services
- Construction Review and Administration

Challenge:
- Multiple embedded steel beams locations
- Matching new brick with existing structure
- Sealants failed throughout the building

Solution:
- Recommended restoration and reconditioning of embedded steel beams, lintels, and shelf plates
- Provide new thru-wall flashings
- Remove/repair existing masonry distress and tuckpoint damaged/deficient mortar joints
- Removed all damaged sealants and installed new materials

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Farmington Public Schools
Harrison High School

Built in 1970, Harrison High School has been a significant icon for both the City of Farmington and the Farmington Public School System. Unfortunately, the building exterior experienced multiple masonry deficiencies, as well as water intrusion. StructureTec was called to evaluate the condition of the building envelope, create realistic budgets for construction, write construction documents, coordinate project bidding, and provide field quality assurance during construction.

Overview of Harrison High School project in progress.

After evaluating the envelope conditions, several defects were found. Throughout the building, a vast majority of sealant materials at expansion joints and interfaces were weathered and deteriorated. In addition, sealants at EIFS to brick interfaces and perimeter soffit joints were split and separated. Significant surface staining below window mullions was present. Yet, the largest deficiency was the severely deteriorated embedded structural steel components. This careful evaluation determined that the watertight integrity of the building envelope had failed.

From this evaluation, several realistic budgets were created to forecast construction costs. These included options for alternative products and processes. Schedules and detailed timelines were also generated to keep the project running smoothly, ensuring timely delivery.

Next, StructureTec was asked to develop construction documents including specifications to provide the proper restoration and reconditioning of the building envelope, including: embedded steel beams, lin-

Embedded steel beams covered with two-component thru-wall flashing helped reinforce the structure.

StructureTec® Project Profile

Installation of new flashing materials at the roof interface on the back sides of towers. Membrane materials require trimming for proper installation.

tels, and shelf plates. These concise documents covered all aspects of restoring the masonry of the entire building. Work at the embedded steel included: removing exterior brick courses, removing existing flashing materials, thoroughly cleaning embedded steel to remove rust, reconditioning steel with a rust inhibitive primer, and applying a new protective paint coating. The work also included the replacement and/or strengthening of steel shelf plates. In addition, StructureTec specified new two-component thru-wall flashings for the exterior brick veneer embedded steel beams/shelf plates. The flashings combined fully-adhered membrane technology with durable sheet metal pan flashings for a long-term flashing detail.

Further, StructureTec included the removal and repair of existing masonry distress and tuckpointing of damaged mortar joints to provide sound conditions for proper weatherproofing performance of the exterior masonry. New silicone sealant materials were installed at exterior building joints to protect the structure from water intrusion.

In the end, StructureTec was able to efficiently and effectively restore the watertight integrity of the building, with a positive aesthetic impact. The project was completed within budget, and the school experienced a great return on investment with a school building that will last several more decades.

Bricks were removed at crack locations to expose rust deteriorated embedded steel columns.

FEATURES	BENEFITS
Scientific approach to problem-solving	Eliminated the cause of the problem, not just effect
Designed replacement of existing sealant	Provided long-term water tight integrity at joints
Designed new stainless steel through-wall counterflashing	Cost effective corrective action with long-term watertight integrity
Replaced existing defective masonry units	Provided structurally sound exterior wall
Developed procedures for saw-cutting and tuckpointing mortar joints	Provided long-term watertight integrity and structurally sound masonry
Evaluation of structural steel - extent of corrosion and section loss	Confirmed structural integrity and requirement for reinforcements

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