

General Description:

- **Location:**
Niles, Michigan
- **Profile:**
Multilevel Masonry Structure
- **Project:**
Restoration of Exterior Walls

Services Provided:

- Evaluation
- Design Development
- Construction Document
- Bidding
- Field Quality Assurance

Challenge:

- Multiple problems involving entire building envelope
- Previous repairs unsuccessful
- Perimeter metal coping leaked at parapet wall

Solution:

- Designed solution which encompassed entire building
- Scientific approach to solve the cause of the problem rather than simply the effect
- Designed new metal coping detail

Niles Community Schools Eastside Elementary School

Eastside Elementary School was experiencing profuse leakage conditions, as well as obvious visible structural distress. Masonry brick surfaces were eroding due to aging and weathering. Decorative concrete features and foundation walls were cracking and spalling. Efflorescence was present on masonry brick surfaces. Deterioration also included masonry mortar joints and steel window lintels. Window glazing/sealants were missing or deteriorated. Algae and vegetation growth were observed at various locations.

repairs had been previously attempted, but these had been unsuccessful. Paint/coating materi-



Overview of Eastside Elementary School.

als had been applied over concrete belt, coping caps, decorative caps and foundation walls. These materials do not allow concrete to "breathe," thereby trapping moisture. Rather than solving the problem, these materials caused further degradation and resulted in cracking, spalling, and deterioration. Sealant had been installed between steel window lintels and masonry construction without adding weep holes for moisture relief. Concrete coping on the penthouse had been repaired with cementitious painting/coating materials, further compounding the problem. Cracks had been repaired with sealant in many places.

StructureTec designed a solution that would treat the cause of the problem rather than just the



Window lintel and masonry degradation. Also, previous unsuccessful caulking.

StructureTec was contracted to do an evaluation because of our high level of expertise in dealing with the total building envelope. During this evaluation, it was found that several



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*Masonry mortar joints were deficient.
Concrete belt stone was cracking and spalling.*



Deficient mortar joints were saw-cut to remove existing sealant and then tuckpointed with new mortar.

effects. Construction documents were then written and the project was publicly bid. During the construction phase, damaged/deficient mortar joints were saw-cut to remove existing sealant and then tuckpointed with new mortar. Areas of unsound concrete were removed, cleaned, and repaired with new concrete materials. Designated areas of concrete were cleaned and coated with a new elastomeric system. Exterior masonry surfaces were cleaned and weatherproofed with a clear, penetrating sealer. Steel lintels were reconditioned by removing existing sealant and applying new elastomeric sealant at lin-

tel perimeters. The existing sheet metal coping system was removed, a new waterproofing sheet membrane was installed on the top of parapet walls, and then the coping system was installed. Additional repairs consisted of re-

construction of the brick masonry chimney. These creative solutions were successful at solving Niles Community Schools' problems. Eastside Elementary School now has a weatherproof and visibly pleasing exterior building envelope. In conclusion, Niles Community Schools was able to best utilize their budget dollars by correcting the cause of the problem rather than simply treating the effect. ■

FEATURES

- Scientific approach to problem-solving
- Developed procedures for saw-cutting and tuckpointing mortar joints
- Replaced existing deficient masonry units
- Designed replacement of existing sealant
- Designed sealer system for exterior masonry walls to satisfy the porosity
- Designed weatherproofing, breathable coating for cementitious surfaces
- Provided Field Quality Assurance

BENEFITS

- Eliminated the cause of the problem, not just effect
- Provided long-term, watertight integrity and structurally sound masonry
- Provided structurally sound exterior wall
- Provided long-term, watertight integrity at joints
- Created moisture barrier to minimize ingress through exterior masonry wall
- Aesthetically pleasing and able to minimize moisture ingress
- Ensured high quality end product

Total Building Envelope Management SolutionSM

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