

General Description:

- **Location:**
Toledo, Ohio
- **Profile:**
Multistory corrections facility
- **Project:**
Exterior Masonry and Below Grade Restoration

Services Provided:

- Evaluation
- Design Development
- Guide Specification

Challenge:

- Needed to determine water sources because leakage was only occurring below grade
- Staining, efflorescence, cracking, and spalling of masonry block around exterior building envelope
- Profuse leakage and staining below grade, particularly problematic at the stairwells
- New building showed significant distress

Solution:

- Used flood and ritem tube testing to determine moisture source and migration
- Recommended cleaning exterior facades to remove the staining and efflorescence
- Recommended installing a new, breathable, water repellant system to satisfy the porosity of the masonry block and prevent moisture ingress
- Worked with the original construction team to ensure the owner received quality construction

Restoration - Municipal

Lucas County, Ohio

Lucas County Corrections Center

Lucas County, a large municipality in northeastern Ohio which includes the city of Toledo, was experiencing significant distress and leakage in the new corrections center. The interior leakage was occurring primarily below grade and was causing complications, particularly at the stairwells. Severe leakage had caused significant staining and masonry distress. Above grade, interior leakage was minimal but the exterior envelope was exhibiting masonry staining, efflorescence, and mild stair-step cracking. StructureTec was consulted to evaluate the building and provide recommendations for correcting the problems. StructureTec began by conducting vi-

sual inspections of the building and reviewing the original construction documents. Flood testing was then



Overview of the building, which is constructed of split-face masonry block as well as standard masonry block and brick.



Previous sealant repairs had been performed at the joint between the standard masonry block and the split face masonry block. The weep holes have been plugged with sealant at various locations.

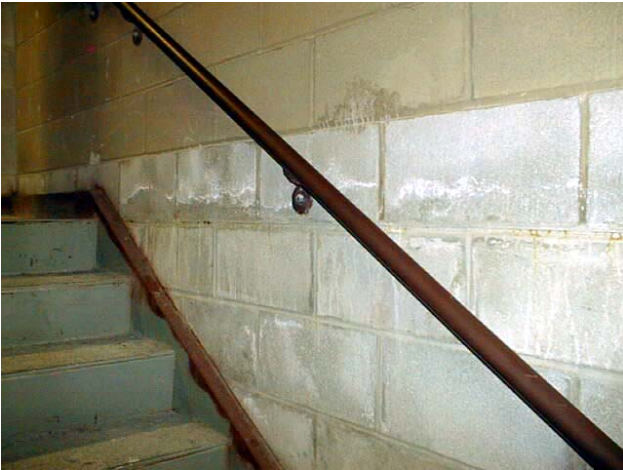
employed to determine the areas of water ingress and the path of water migration. Ritem tube tests were also employed to determine the porosity of the masonry block and mortar. Limited destructive testing and boroscope analysis were performed to determine the existence and condition of through-wall counterflashing systems, which were ultimately determined to be deficient. StructureTec then developed recommendations for correcting the deficient construction. The original contractor was contacted to correct all the deficiencies. StructureTec designed new flashing and terminations at the base of the walls. Recommendations for the removal and



Web: www.structuretec.com

Email: geninfo@structuretec.com

All rights reserved.



Moisture stains observed on the interior side of the masonry block wall located at the north stairwell.



Efflorescence is observed due to moisture ingress into masonry wall, primarily concentrated near wall weep system.

FEATURES

Scientific approach to problem-solving

Designed new stainless steel through-wall counterflashing

Research included exploratory openings in the wall

Boroscope technology behind the exterior wythe allowed actual observation of hidden conditions

Rilem tube test for masonry absorption to determine the porosity

Designed sealer system for exterior masonry walls to satisfy the porosity

Designed proper weep holes at strategic locations in the exterior walls

Developed procedures for saw-cutting and tuck-pointing mortar joints

BENEFITS

Eliminated the cause of the problem, not just effect

Cost-effective action with long-term watertight integrity

Enabled the owner to address the specific areas requiring attention

Allowed the owner to pinpoint the true integrity of the through-wall conditions and address the root of the problem

Able to determine proper corrective action for exterior facade

Created a moisture barrier to minimize moisture ingress through the exterior masonry wall

Allowed moisture to dissipate from the interior cavity of the exterior wall

Provided long-term watertight integrity and structurally sound masonry

replacement of masonry units and for the installation of proper through-wall waterproofing flashings were a part of the guide specification. StructureTec also designed proper termination and stripping in exposed waterproofing seams. The designed restoration work also included removing masonry units which were exhibiting distress and tuckpointing deficient mortar joints. StructureTec recommended cleaning the remaining surfaces on the exterior walls to remove stains and applying a clear water repellent sealer to change the porosity of the masonry and prevent moisture ingress. New sealants were also designed at the joints. In conclusion, the new flashing/counterflashing systems were successful in preventing moisture ingress through the wall to the below-grade areas. The new sealer and sealant were successful in minimizing the amount of moisture allowed into the system. Combined, these solutions were able to fully correct all the deficiencies in the relatively new corrections center and ultimately provide Lucas County with the greatest return on investment. ■

Total Building Envelope Management SolutionSM

www.structuretec.com

(800) 745-7832