

Kraemer Design Group, LLC

Merchants Building

Building Façade Report –
Detroit Ordinance 15-88

Issued | March 23, 2023



This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 23022

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1 Executive Summary

This report presents the five-year façade inspection of Merchants Building per Detroit Ordinance 15-88.

Building Owner: Method Development LLC

Qualified inspector: Marc Steinhobel PE, Resurget Engineering, PC.

The following immediate stabilization is required:

- **Remove all loose and spalling concrete at rear and parking alley facades to prevent fall hazard.**
- **Remove all loose and spalling terra-cotta at street facades.**

The following items require repair/stabilization to be addressed during building rehabilitation construction.

Grand River Avenue Façade

- Spalling terra-cotta requires repair.
- Terra-cotta upper and lower water tables and street corner require repairs.

Broadway Street Façade

- Spalling terra-cotta requires repair.
- Terra-cotta upper water tables require repairs.

Rear Alley Façade

- Displaced brick and deteriorated mortar joints require repairs.
- Repair steel lintels above window openings.
- Tuck and re-point brick along original and replacement brick.
- Fire escape corrossions requires repair/replacement.

Parking Alley Façade

- Displaced brick and deteriorated mortar joints require repairs.
- Tuck and re-point brick along original and replacement brick

Rooftop and Coping Stones Assessment:

- Coping stones at parapet require repairs to prevent water infiltration into wall.
- Remove loose debris from roof to prevent fall hazard.
- Coping stones, flashing, and gutters at elevator shafts require repairs.
- **Provided these items are addressed during building rehabilitation construction, this certification is good for the five-year period required by City of Detroit Ordinance 15-88. (March 2023 through April 2028).**

2 Building Name and Location

The building is located at 206 East Grand River Ave, Merchants Building, Detroit, MI 48226.

The building is owned and operated by Method Development LLC.

2.1 Building Description

The Merchants Building is a 9-story Historic building constructed in 1922. The building is comprised of a retail floor on the first floor and apartments above. The proposed use for the renovated building is Hotel rooms with associated amenity spaces.

3 Project Team

Resurget Engineering is working with Method Development and contracted directly to Kraemer Design Group.

The qualified inspector who carried out field observations and draft report is Myriam Bobe, EIT, and reviewed and approved by Marc Steinhobel, PE (MI license no 6201051104).

4 Project Scope

Resurget Engineering's scope of work for this project includes the inspection and reporting on the current condition of the exterior façade and roof mounted equipment. The assessment forms the basis of the facade restoration drawings that will be part of the overall building renovation and adaptive re-use project. After completion of facade restoration work the facade will be reassessed and an updated facade report for submittal to the City of Detroit for their records will be issued as part of the five-year façade assessment required by City of Detroit ordinance 15-88:

- Inspect and observe the exterior façade and roof top structures via drone and accessible areas.

- Prepare a façade report in compliance with Detroit ordinance 15-88.

The basis of the façade inspection and report is ASTM E2270. The following components of ASTM E2270 were included in the scope:

- Review of project documents
- Preparation of inspection drawings
- Determination of service history
- Assessment of Watertight Integrity. This was not included in the scope of work as it is not required by Detroit ordinance 15-88.
- Façade Inspection
- Façade Report detailing the following conditions:
 - Unsafe conditions
 - Required repair/stabilization
 - Ordinary maintenance

5 Document Review Phase

Resurget Engineering, in discussions with Method Development and Kraemer Design Group, determined that no previous façade assessment reports were available to review and use as a baseline for the 2023 assessment.

Design drawings were not made available and not required as part of the assessment.

No service history was provided.

6 Visual Inspection Phase

Visual inspection of the façade and drone flights was carried out by licensed UAS pilot, Myriam Bobe, EIT on Thursday, March 2, 2023.

The façade inspection was carried out on two levels. A general inspection of the overall façade, and a detailed inspection of specific areas identified during the general inspection.

The general inspection included the following observations from more than 6 feet away from the façade:

- Binocular review from street
- Roof top review over parapets
- High-definition photographs from drone survey

The following techniques were used in performing the general inspections:

- Scanning horizontal and vertical surfaces for out-of-plane movement.
- Checking for signs of staining, spalling, water or moisture damage, weathering, or distress of façade components.
- Evaluation of high-definition drone footage for signs of damage or deterioration.

After the completion of the general inspection, the need for detailed inspection of specific areas was assessed. Detailed inspections of representative areas were carried out.

The following techniques were used in performing the general inspections:

- Viewing horizontal surfaces that can pond water, such as sills, ledges, cornices water tables, and other horizontal bands, from above wherever possible.
- Checking for out-of-plane displacement of façade elements while scanning horizontally and vertically.
- Checking for signs of staining, spalling, water or moisture damage, weathering, or distress of façade components.
- Pushing against or pulling on façade elements if considered safe to do so.
- Evaluating sealant adhesion by non-destructive methods.

7 Façade Report

The findings of the general and detailed inspection are summarized in the Façade Report.

The primary intent of the report is to convey any threat to person or property. The secondary purposes of the report are:

- Collate all information gathered in document review and visual inspection phases.
- Convey to the City the condition of the façade and information gathered related to service history and façade inspections.
- Convey to Building Ownership finding and identify immediate or pending façade issues and make recommendation on general maintenance.

The inspection of each major façade is discussed in the following sub-section.

7.1 Grand River Avenue Façade

In general, the Grand River Ave façade is in moderate to poor condition. Several locations that require immediate repair were identified below the roof level and at lower water tables.

7.1.1 Terra-Cotta Façade

Overall, the terra-cotta façade is in moderate condition, in several areas below water tables and coping stones, the glazed terra-cotta is showing signs of severe surface delamination and spalling.

Delamination occurs overtime as water infiltrating the wall and coping gets trapped behind the glazed surface expands and contracts during freeze/thaw cycles. This condition occurs the full length of upper (P-1) and lower water tables (P-2).

Vertical cracks at corners and horizontal crack below upper water table (P-3) are likely caused by water infiltration along upper water tables and corroding embed steel behind terra-cotta façade (P-4).

Stabilization and repairs:

- **Immediate action: Remove all loose and spalling surfaces at water table to reduce fall hazard.**
- During building rehabilitation construction, address corner terra-cotta water-table pieces to repair joints and prevent water infiltration.
- Determine extent of steel corrosion behind broken terra-cotta pieces and clean exposed steel to base metal
- After coping stones and flashing issue (Section 7.5.2) has been addressed then repair/replace delaminated and damaged terra-cotta.



P-1 Spalling of terra-cotta below water table



P-2 Delamination of terra-cotta around lower water tables



P-3 Spalling and cracking terra-cotta at upper water table



P-4 Cracks in corner terra-cotta due to corroded embedded steel

7.2 Broadway Street Façade

In general, the Grand River Ave façade is in moderate to poor condition. Several locations that require immediate repair were identified at water tables and below coping stones.

7.2.1 Terra-Cotta Façade

Lower water tables are in good condition and no delamination of terra-cotta is observed (P-5).

Similar to section 7.1.1, the terra-cotta façade is in moderate condition. In several areas below upper water tables and coping stones (P-6), the glazed terra-cotta is showing signs of severe delamination. Water infiltrating the wall and coping stones gets trapped behind the glazed surface expands and contracts during freeze/thaw cycles. This condition occurs the full length of upper water tables.

Stabilization and repairs:

- **Immediate action: Remove all loose and spalling surfaces at water table to reduce fall hazard.**
- After coping stones and flashing issue (section 7.5.2) has been addressed then repair/replace delaminated and damaged terra-cotta.



P-5 Lower water table in good condition along Broadway Street



P-6 Spalling terra-cotta at parapet and upper water table

7.3 Rear Alley Façade

The rear alley façade is in moderate to poor condition and requires minor repairs to lintels and brick, and immediate removal of spalling concrete.

7.3.1 Brick Façade

Overall, the brick façade is in moderate condition and showing signs of brick-and-mortar deterioration.

Deterioration is caused by exposure freeze-thaw cycles as observed by the efflorescence below window sills (P-7). Displaced coping stones at the roof and failed mortar joints between brick and concrete frame results in further water infiltration and deterioration.

Corroding steel lintel above window opening causing displaced brick and allowing further water infiltration (P-8). Flashing above steel lintels is likely not present or is beyond serviceable life. Corroding steel expands and the resulting rust pack imposes jacking forces on the adjacent masonry. This rust jacking results in warping and deflection of steel and cracking and deterioration of brick.

Stabilization and repairs:

- During building rehabilitation construction, the open mortar joint should be tucked and re-pointed to prevent more serious structural issues.
- During building rehabilitation construction, the corroding steel lintel should be repaired to prevent further damage.

7.3.2 Fire Escape

Fire escape shows signs of corrosion but does not pose a fall hazard (P-9). Brick at fire escape support brackets is displacing and cracking. It is assumed that the fire escape is not currently used as an emergency exit. Remove and reconstruct to match existing geometry if the fire escape is required as second means of egress for proposed use.



P-7 Efflorescence at brick below window sill



P-8 Rust jacking of brick above corroded steel lintels



P-9 Corrosion at fire escape steel

7.3.3 Exposed Concrete Framing

The exposed concrete frame is in moderate to poor condition. The following issues were observed.

The exposed concrete frame is constructed with concrete that does not contain entrained air and is susceptible to damage/deterioration due to freeze/thaw cycling. Previous repairs have been made to reduce exposure to reinforcement but were not constructed properly and have started spalling (P-10).

When constructed, the proper concrete cover over embedded reinforcing bars and exterior surfaces was not provided. The embedded steel reinforcing located too close to the exterior surface corrodes. Corroding steel expands and the resulting jacking forces cracks and spalls the thin concrete cover (P-11).

Spalling concrete at building joint is severe due to improper sealant between the two buildings (P-12). Further deterioration is observed due to proximity to plumbing lines adjacent to building façade.

Stabilization and repairs:

- **Immediate action: Remove all loose and spalling concrete to reduce fall hazard.**
- Shotblast or mechanically clean exposed steel reinforcing bars to base metal.
- Hammer sound and chip away deteriorated and damaged concrete around exposed rebar.



P-10 Spalling of exposed concrete frame



P-11 Reinforcement visible above window at spalled concrete



P-12 Spalled concrete at building joint between columns

7.4 Parking Alley Façade

The rear alley façade is in moderate to poor condition and requires minor repairs brick, and immediate removal of spalling concrete.

7.4.1 Brick Façade

Overall, the brick façade is in moderate condition and showing signs of brick-and-mortar deterioration.

Deterioration is caused by exposure freeze-thaw cycles similar to section 7.3.1 (P-13). Displaced coping stones at the roof and failed mortar joints between brick and concrete frame results in further water infiltration and deterioration (P-14).

The brick façade toward Broadway Street is partially covered with advertisement and not visible during inspection (P-15).

Stabilization and repairs:

- **Immediate action: Remove all loose and spalling brick below parapet to reduce fall hazard.**
- Coping stones need to be addressed to prevent water infiltrating the brick and stop delamination and spalling.
- During building rehabilitation construction, the open mortar joint should be tucked and re-pointed to prevent more serious structural issues.
- Loose and spalled brick to be removed to prevent fall hazard.



P-13 Brick and mortar deterioration around concrete frame



P-14 Brick and mortar deterioration below coping stones



P-15 Advertisement covering brick wall

7.4.2 Exposed Concrete Framing

The exposed concrete frame is in moderate to poor condition. The following issues were observed.

The exposed concrete frame is constructed with concrete that does not contain entrained air and is susceptible to damage/deterioration due to freeze/thaw cycling. Previous repairs have been made to reduce exposure to reinforcement but were not constructed properly and have started spalling (P-16 and P17).

When constructed, the proper concrete cover over embedded reinforcing bars and exterior surfaces was not provided. The embedded steel reinforcing located too close to the exterior surface corrodes. Corroding steel expands and the resulting jacking forces cracks and spalls the thin concrete cover.

Stabilization and repairs:

- **Immediate action: Remove all loose and spalling concrete to reduce fall hazard.**
- Shotblast or mechanically clean exposed steel reinforcing bars to base metal.
- Hammer sound and chip away deteriorated and damaged concrete around exposed rebar.



P-16 Spalling along patched concrete column



P-17 Spalling along patched concrete column

7.5 Coping Pieces and Flashing

Overall, coping pieces are in moderate to poor condition with broken ornamental terra-cotta coping observed at alley facades and ineffective flashing over coping stones at street facades.

Delamination of terra-cotta observed on upper parapet walls due to water leaking through coping stone head joints and through rear side of parapet wall.

7.5.1 Parking and Rear Alley Parapet

Ornamental coping stones at the parking and rear alley facades are in poor condition with several observed broken coping stones and the majority of stones displaced. Deterioration of brick below alley coping stones is minor due to flashing on the underside of the stones (P-18).

To reduce further deterioration, continue flashing beyond edge of parapet and reset/replace coping stones to redirect water as well as repair and maintain all exposed head joints.

7.5.2 Broadway and Grand River Parapet

Rubber flashing on top of terra-cotta coping stones joints and mortar joints is beyond their serviceable life allowing water infiltration between coping stones (P- 19) and into parapet below causing delamination/spalling of terra-cotta faces.

Stabilization and repairs:

- Option 1: Through wall flashing is recommended under the coping and top horizontal and vertical joints sealed to prevent water infiltration.
- Option 2: Add metal flashing over the top of the coping to cover all joints.
- Option 3: Seal horizontal and vertical joints with impermeable sealant to prevent water infiltration.

7.5.3 Building Joint Parapet

Coping stones at building joint parapet are displaced, however roof flashing is continuous underside of stones (P-20). Reset coping stones as part of ongoing maintenance.



P-18 Broken and displaced coping stones at parapet



P-19 Delaminating coping stones and deteriorated joints



P-20 Displaced coping stones overtop flashing at building joint parapet

7.6 Rooftop Structures

Overall, the roof is in fair condition. The roof membrane appears in good condition with few areas at the roof showing water ponding (P-21) to be addressed.

All rooftop equipment is properly secured and attached to the structure.

There is some loose trash on the roof that should be removed to prevent blow-off from storm winds.

7.6.1 Elevator Shafts

Coping stones and mortar joints are allowing water infiltration and into brick wall below (P-22) causing mortar and brick deterioration.

Efflorescence and substantial brick deterioration observed below elevator roof gutters. The gutters and flashing below are beyond serviceable use and are allowing water infiltration into the building (P-23).

Stabilization and repairs:

- During building rehabilitation construction, remove coping stones, install flashing overtop parapet and reinstall ornamental coping stones.
- During building rehabilitation construction, Remove and replace gutters and flashing at elevator shafts.
- After coping stones, flashing, and gutters have been addressed, tuck and repoint mortar joints to prevent serious structural issues.



P-21 Poor drainage and ponding at roof



P-22 Broken coping stones and deteriorated mortar joints at elevator shaft



P-23 Broken gutters and deteriorated flashing below elevator roof