

# M E M O

DATE: 10/05/2018  
TO: Ted Hunyadi - Westport Public Schools  
FROM: Joe Reilly  
KG+D Architects, PC  
RE: Coleytown MS Water Infiltration - Preliminary Envelope Observations



## Message:

On Wednesdays, September 26 and October 3, 2018 we visited the Coleytown Middle School and had the opportunity to review the apparent conditions. The primary focus of the observations was the building exterior envelope. We also had the opportunity to review the building plans provided by the District. Our knowledge of the building is incomplete but expanding. The following is a compilation of observations and outstanding issues that require further investigation.

- A. The Masonry Envelope:** The majority of the building exterior is ground faced concrete masonry units (CMU) that appear to be constructed as a rain screen for the interior layer of wall construction. That is, the CMU is a permeable layer that protects the weathertight construction that wraps the interior wall construction. It is intended to capture water that penetrates the exterior layer – the rain screen – and allow gravity to take the water out of the wall assembly. The drawings that we have reviewed indicate that this was the intended construction type with some locations having CMU interior wall construction and some having light gauge steel framing and gypsum board wall construction. The wall system is not functioning properly.

Accurate, detailed information about the actual construction and waterproofing is typically contained in the record of product submittals and as-built drawings that are attendant to the construction process. We have not seen those records. If they are available, they will be a valuable asset to this process. The following is a listing of observations that identify problems and concerns with that wall construction.

- a. The construction of the CMU walls is inconsistent. The placement of flashings and weeps are not uniform and not consistent with sound practice. Flashings are intended to capture and direct the flow of water within the wall structure. Weeps are the openings provided through which water is directed by the flashings to exit the wall. Flashing and weeps are to be provided at any obstruction in the flow of water within the wall cavity, these include floor levels, door and window heads, the tops of louver openings, and other similar penetrations. On this building, they are appropriately present in some locations and absent from others.
- b. Where there are weeps present, there is very little evidence of active water flow from the openings. This is often an indication that the weeps are blocked or that water is prevented from reaching the weeps.
- c. In some locations the CMU construction continues down into the earth at grade without weeps above grade. It is possible that the height of the flashings and weeps is not properly coordinated with the final grade at the building exterior.

- d. The attachment of the outboard sunscreens is inconsistent and problematic.
    - i. In multiple locations the fastening plates straddle expansion joints in the wall construction.
    - ii. In multiple locations fastening plates are cut into the CMU construction with no apparent flashings or adequate sealant.
    - iii. There are several apparent fastener types and strategies.
  - e. There is significant and wide spread evidence of water saturating the exterior CMU. This is apparent due to changes in coloration and the presence of a surface film of moisture.
  - f. There is significant and wide spread evidence of water leaking through the face of the CMU at failed mortar joints and fastener penetrations. Many of these locations are made apparent by the presence of active algae blooms and moss growth.
  - g. There is reason to be concerned that the CMU clad portions of the wall systems retain water that significantly contributes to the humidity problem in the building.
- B. Aluminum Window and Wall Construction:** There are aluminum wall systems comprised of framing, direct glazing, inset operable windows, and inset insulated panels. These wall systems sit directly on floor slabs and are also inset in CMU walls. There are also operable windows and window unit assemblies directly set in the CMU wall construction. It is apparent that these elements of the envelope also leak. We observed the following:
- a. Inadequate or missing sill flashings in multiple locations that allow water into the wall assembly below.
  - b. Failed insulated glass seals that have resulted in fogged lights and are a point of entry for water into the envelope.
  - c. Multiple generations of surface applied sealant at panel and mullion junction points. This is a temporary stopgap application which has experienced several generations of failure.
- C. Building Adjacent Site Concerns:** The existing grade and hardscape that abuts the building is problematic in many areas and in several ways. We observed the following:
- a. There are concrete sidewalks abutting the building that are at the same elevation as the interior floor to which they are adjacent. In many locations, these slabs are sloped toward the building, directing water to the junction of the wall system and the foundation sill. This problem is exasperated by the placement of the louvers for the unit ventilators which also sit directly on the foundation sill. The louvers and the wall base are vulnerable to leaking and have failed in multiple locations. There were dramatic examples of this failure type from rain fall on October 2 in the lower corridor adjacent to the elevator and in Room 116.
  - b. There appear to be locations where the grade adjacent to the building is places above the waterproofed foundation and against CMU wall construction that is not protected from sub-grade water infiltration. These locations are also suspected of failure of the rain screen system as described in Section A, Item c. of above.
  - c. There has been remedial drainage added in problem locations. These efforts have been successful to varying degrees but do not address the causal problems.
- D. Roofing:** See Initial Comments by Watsky Associates, attached herein.
- E. Next Steps:** More information is required to gain a fuller understanding of all of the issues allowing and causing water infiltration into the building. These steps include:

- a. A complete search of District records of construction projects and documentation. It is not immediately apparent from review of the documents provided what the phasing and sequence of the work on the building has been. A fuller understanding is necessary.
- b. The exploration of the composition of the wall and roof systems via destructive testing. We must cut holes to observe the locations, types and condition of waterproofing, flashings, and other wall and roof components.
  - i. A contractor should be retained to open the walls and roof in locations as directed by our office, and to close and patch the openings. If the WPS does not have a General Services contract with a qualified local contractor, we can assist in procuring that service.
  - ii. This work should be scheduled early in the week of October 14 so that we can be on site to make the required observations.
  - iii. We will note not only the type and condition of the wall and roof construction, but also the overall condition of the wall and roof systems. To the greatest degree possible we will try to determine the extent of the water penetration and damage.
    1. If the infiltration is limited to the rain screen and wall cavity and has not penetrated the weather barrier, the remedies contemplated will be limited to the repair of specific elements or the rain screen system in its entirety.
    2. If the water has passed through the weather barrier and migrated into the interior wall structure, there is a much larger and more pervasive problem. Any solution will have to include drying or replacing wet components in addition to establishing an effective rain screen system.

cc: Tom Olam - Watsky Associates  
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