October 11, 2018

Mr. Paul Corcoran  
Minnesota State University Mankato  
118 Wiecking Center  
Mankato, MN 56001

Email: paul.corcoran@mnsu.edu

SUBJECT: TRAFTON SCIENCE CENTER  
RSI PROJECT #16-12273-01

Dear Mr. Corcoran:

In July of 2016, RSI performed a Cursory Curtain Wall Leak Investigation. Included in this report was a cost estimate based the completion of work in 2017. The following is intended to supplement the original cost estimate and is based on construction being completed in the summer of 2019.

VI ESTIMATE:

The estimate for the work as described above is as follows:

1) Curtainwall removal and replacement $ 690,000
2) Masonry probe to determine existing jamb condition $ 5,000
3) Masonry jamb removal and replacement $ 145,000
4) Parapet reconstruction (masonry, steel, roofing) $ 150,000
5) General interior prep, repairs, and reinstallation $ 200,000

Sub-total: $1,190,000

6) General conditions, permits, contingency $ 120,000
7) Design, inspection $ 90,000

Sub-total: $ 210,000
Estimate: $1,400,000

This estimate is based on limited observation and analysis of existing interior and exterior conditions and historical drawings. This estimate does not include possible abatement work, removal of owner/tenant equipment and property, and temporary heat if necessary. Year to year escalation is estimated at 5%.

From the Department of Administration building projects inflation schedule (attached at end of pre-design) the escalation from July 2019 to July 2021 is 10.58%.

$148,120 Escalation  
2020 Request $1,548,120
October 11, 2018

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If you should have any questions or require further information, please contact our office. Thank you.

Respectfully,

ROOF SPEC, INC.

Tim Pekron, RRC
Senior Consultant

TP/jrc
July 7, 2016

Curtainwall Leak Cursory Review

TRAFTON SCIENCE CENTER
MINNESOTA STATE UNIVERSITY MANKATO
MANKATO, MN

RSI Project #16-12273-01

Prepared For:

Mr. Barry Wilkins
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118 Wiecking Center
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Prepared By:

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www.roofspect.com

John Akiba
Window Consultant

Akiba Architects
I INTRODUCTION:

RSI was contracted to conduct a cursory review of the leaks into the building interior, review the existing curtainwall system at two elevations of the above referenced facility (the north elevation of Trafton South, and the south elevation of Trafton North), and to produce a cursory assessment and recommendation based on those findings.

II BACKGROUND INFORMATION:

The Trafton Science Center was constructed in 1970. The elevations in question measure approximately 60’ wide and 42’ tall. The existing curtainwall assembly appears to be original to the building construction, and generally consists of a 6” deep, stick-framed curtainwall assembly with 1” insulated vision glass and insulated spandrel panels at columns, beams, and wall divisions. At the south elevation of Trafton South there are two brick-clad volumes between the 2nd floor windows and extending past the roof parapet. The adjacent brick veneer walls consist of standard face brick, a 2” insulated cavity, and concrete masonry units of varying depth.

III SCOPE OF WORK:

In general, our scope of work was as follows:

A. Review relevant existing drawings, prepared by Solvik, Mathre & Madson Architects, dated May 1, 1970, as furnished by the University, and related documents as they applied to the cursory review (shop drawings of the installed curtain wall assembly could not be provided for review);

B. Perform a visual review of the exterior from ground around all elevation, noting existing conditions based on notes and photographs;

C. Perform a visual review of the interior leak locations and document existing construction details;
D. Based on the conditions observed and documented, produce a report noting conditions observed and recommendations including a construction cost estimate.

IV OBSERVATIONS:

Our initial review of the existing drawings and recent renovation drawings revealed an apparent attempt to stop water leaks in 20010/2011. The renovation drawings show a note to remove and replace a sealant joint that had been installed between the curtainwall glass and snap covers. The effectiveness of this repair method on curtainwall assemblies is typically limited, since the primary sealant joint is located behind the snap covers, and any water entering behind the snap covers can still enter the building through failed primary sealant joints and/or gaskets.

On January 8 and April 15, 2016, we were present at the above referenced facility to review the existing condition of curtainwall assembly and adjacent wall assemblies as they relate to the curtainwall. We were joined by Mr. Barry Wilkins of MSU Mankato, Mr. John Akiba of Akiba Architects, Mr. Peter Weum of W.L. Hall Co., and Jerry Peck of W.L. Hall Co.

All parties were present to make interior observations of the leaks at the first floor of South Trafton. As the offices at first floor were empty and the interior furnishing removed due to water infiltration and possible mold growth, the interior wall was fully visible. Water stains and damage were apparent at the curtainwall frame, the sill, concrete beam at the window head, and the interior of the concrete wall and plaster walls adjacent to the vertical mullions. The water stains and damage appear to indicate that water infiltration and/or condensation has been occurring for some time. The University confirmed that water infiltration through the curtainwall installation now occurs during
wind driven rain. We also observed water staining and damage to a lesser degree at several rooms at all three floors of South Trafton during our initial site visit. The same water staining and damage appears at the interior rooms of North Trafton as well.

More than half of the curtainwall installation utilizes spandrel panels that are located horizontally along each floor line and the roofline and vertically at each building column location. We note that spandrel cells were glazed with glass lites rather than the 1” thick insulated panels called for in the existing drawings. Because the back faces of the spandrels panels were either concealed by concrete edge beams, plastered column enclosures, or radiator housings, we could not determine construction of spandrel panels and if these cells were insulated. The acoustical tile ceiling was removed to observe the wall conditions above the ceiling; however, the spandrel panel was restricted from view by the structural system.

A cursory examination of the curtainwall assembly revealed that various sealant joints appear to have failed, glazing gaskets do not appear to properly compress the glass, curtainwall frame joinery no longer provides air and water tight seals, and formed aluminum sills create a thermal bridge between exterior and interior conditions. In addition, we also noted that numerous vertical snap covers have warped and allow water into the curtainwall system. Another observed condition and a telltale sign on the aging of this assembly was the degradation of its black anodized finish in to a chalky, whitish one.

**SUMMARY:**

It was generally agreed by all parties in attendance that these curtainwall installations, after 35 years of use, have reached the end of their service life. Furthermore, the type of existing curtainwall assembly installed in this project are today considered second tier products when compared to current Minnesota State Facilities Design Standards Approved Manufacturer’s Products for Curtain Wall Systems.

Funds should therefore be secured for replacing this installation with Minnesota State Facilities Design Standards compliant curtain wall assemblies. Replacement curtain wall
would provide improved performance for air infiltration, water resistance and energy conservation. Spandrel panels would be insulated while providing vapor containment assemblies as required by the Design Standards.

Replacement with a new curtainwall assembly would involve: selective removal of masonry at the jamb to reveal hidden conditions; probable modifications to the masonry jamb conditions to accept the curtainwall primary sealant joint; the complete removal of the existing curtainwall system and adjacent roof sheet metal; temporary removal of interior furnishings and displacement of office occupants; interior plaster and finishes repair; removal and reinstallation and/or modification of mechanical units and/or distribution grills; and a temporary enclosure of the subjected offices. Future work will need to address relevant State Building Code requirements for conditions such as fire resistance-rated floor; floor/ceiling; or roof/ceiling assembly requirements. Future work will need to address relevant State Energy Code and B3 Sustainable Building Design Guidelines requirements.

In addition, the curtainwall will terminate below the roof parapet as per current MnSCU design standards. This will affect the uniform design appearance across the Trafton. The material to replace the spandrel panel would either be brick masonry veneer or composite metal panels. Replacement with brick veneer would provide a more consistent appearance with the rest of the building, but a structural analysis would need to be made for accommodating the additional weight. In addition, the distance from parapet back-up wall to exterior face of the wall would be approximately 6 to 6-1/2”, resulting in a half inch air gap between masonry and wall insulation, which is less than ideal. Composite metal panels would likely be a cheaper option, but will depart further from the existing design throughout Trafton than replacement with brick veneer.
VI ESTIMATE:

The estimate for the work as described above is as follows:

1) Curtainwall removal and replacement  $600,000
2) Masonry probe to determine existing jamb condition  $5,000
3) Masonry jamb removal and replacement  $125,000
4) Parapet reconstruction (masonry, steel, roofing)  $110,000
5) General interior prep, repairs, and reinstallation  $170,000

Sub-total:  $1,010,000

6) General conditions, permits, contingency  $100,000
7) Design, inspection  $60,000

Sub-total:  $160,000

Estimate:  $1,170,000

This estimate is based on limited observation and analysis of existing interior and exterior conditions and historical drawings. This estimate does not include possible abatement work, removal of owner/tenant equipment and property, and temporary heat if necessary. Year to year escalation is estimated at 5-7%.

VII REMARKS:

If you should have any questions or concerns regarding this report, please contact our office.

Respectfully,

ROOF SPEC, INC.

[Signature]

Ryan Kohl, RRO, CDT
Building Envelop Consultant
If you should have any questions or require further information, please contact our office. Thank you.

Respectfully,

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