

Board of Trustees

2019 Information Packet



Wednesday
December 4, 2019
6:30pm
YDL-Whittaker



Ypsilanti District Library
YDL Special Board Meeting, December 4, 2019
6:30 pm, YDL – Whittaker Rd. Board Room

AGENDA

AGENDA ITEM	Information	Discussion	Action
Call to Order	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
*Roll Call Brian Steimel <input type="checkbox"/> Kay Williams <input type="checkbox"/> Jean Winborn <input type="checkbox"/> Patricia Horne McGee <input type="checkbox"/> Theresa M. Maddix <input type="checkbox"/> Bethany Kennedy <input type="checkbox"/> Kristy Cooper <input type="checkbox"/>			
Approval of the Agenda	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Public Comment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Approval of minutes from 11/20/19 Budget Hearing and regular Board meeting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Old Business			
A. Library Director's Evaluation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Presentation: Curtain wall window investigation report and remediation recommendations by Betsy Baird, O'Neal Construction	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Public Comment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adjournment	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Ypsilanti District Library
Board of Trustees
Budget Hearing Minutes, November 20, 2019 (Unapproved)

CALL TO ORDER

President Brian Steimel called the Budget Hearing to order at 6:16 p.m.

Attendance

Trustees Present: Brian Steimel, Kay Williams, Theresa M. Maddix, Bethany Kennedy, Patricia Horne McGee, Kristy Cooper and Jean Winborn (arriving 6:21 p.m.)

Also present: Director Lisa Hoenig, Assistant Director Julianne Smith, Business Office Manager Monica Gower and community member Jocelyn Dooley.

APPROVAL OF THE AGENDA

Trustee McGee moved to approve the meeting agenda. Trustee Williams supported this motion.

Vote: Ayes: Williams, Winborn, Maddix, McGee, Kennedy, Cooper and Steimel

Nays: None

Motion passed.

Public Comment

NONE

Adjournment

Trustee McGee moved to adjourn at 6:23 p.m. Trustee Cooper seconded this motion.

Vote: Ayes: Williams, Winborn, Maddix, Kennedy, McGee, Cooper and Steimel

Nays: None

Motion passed.

Ypsilanti District Library
Board of Trustees
Minutes, November 20, 2019 (Unapproved)

CALL TO ORDER

President Brian Steimel called the Regular Meeting to order at 6:30 p.m.

Attendance

Trustees Present: Kay Williams, Theresa M. Maddix, Jean Winborn, Brian Steimel, Bethany Kennedy, Patricia Horne McGee and Kristy Cooper

Also present: Director Lisa Hoenig, Assistant Director Julianne Smith, Business Office Manager Monica Gower and community member Jocelyn Dooley

APPROVAL OF THE AGENDA

Trustee Maddix moved to approve the meeting agenda. Trustee Williams supported this motion.

Vote: Ayes: Williams, Winborn, Maddix, McGee, Cooper, Kennedy and Steimel

Nays: None

Motion passed.

PUBLIC COMMENT

"I'm Jocelyn, Julianne's daughter. I am in an AP Government class and had to come to a Government meeting."

CONSENT AGENDA

Trustee Williams moved to approve the consent agenda (October 30, 2019 Special Meeting minutes, October 2019 Financials and Check Register) Trustee Winborn supported this motion.

Vote: Ayes: Williams, Winborn, Maddix, Cooper, Steimel, McGee and Kennedy

Nays: None

Motion passed.

COMMUNICATION

Lisa handed out communication showing all of the agencies that were granted an Opportunity Fund Grant by United Way this year. Lisa also included information regarding the MacArthur Blvd. neighborhood's health status from a new Washtenaw County Health website called "Health for all". On the website you can find stories and data snapshots.

COMMITTEE REPORTS

- Facilities Committee:
 - Met on Nov 1st. They heard from the window investigation consultant, Betsy Baird regarding the finding of the investigations on the curtain wall windows. They reviewed some proposed remedies and costs.
 - The committee would like the board to hear the findings. A special meeting is scheduled for December 4, 2019 at 6:30 p.m.

- Friends of the Library:
 - Met this past Month and will meet again this coming Monday November 25, 2019 at 4 p.m. This will be the last meeting of the year.

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- There have been a couple of changes. Jan has stepped down from doing the Michigan Ave. book cart, Donna is now doing it.
- Holiday Book sale is this Saturday Nov 23, 2019 from 11 a.m. – 4 p.m.

- Fundraising Committee:
 - Committee meets tomorrow November 21, 2019.
 - The library received three separate donations of \$1,000 each towards the project since the last board meeting
 - Lisa heard from the Buhr Foundation. They are not awarding any new grants this year. The library will pursue other avenues.
 - The annual appeal was mailed Thursday of last week.

- Superior Township Planning:
 - Soil Borings have been done, the results should be in soon. Then site planning can begin.
 - Lisa, Kay and Dan Whisler met with Ken Schwartz and Lynette Findley from Superior Township. The Township investigated what it would cost to engineer the proposed road improvements so the driveway can go where it was planned. The cost was around 60,000. The township supervisor thinks the township might cover this.
 - If the library entered into an agreement with the Township the Road commission will allow the library to pay back the cost of construction over a ten year period, interest free.

REPORT OF THE LIBRARY DIRECTOR

In addition to submitted Director's report, Director Hoenig relayed the following:

- Lisa wanted to thank Brian, Pat and Jean for coming to Laura Tucker's retirement party. Laura was overwhelmed with happiness. It was a nice event.
- The library had its Naloxone training today. It will go out tomorrow.
- Lisa met with the new management of Beezy's. They are driven by profit and not making much profit at the library location. Their lease goes until January of 2021. Lisa let them know the library likes having Beezy's here.
- The library bought a number of things with some end of the year funds that were left over. One of the things purchased was a new disc repair machine. The library was given a discount and trade in for speaking to the vendor at MLA. The machine was less than half price. CD's can now be repaired quicker with less mess.
- MLive did an article in the last week regarding students at YCS that are homeless. They expect this year to have over 500. Ever year the staff at the library donates items or money to a holiday charity. After reading the article staff has chosen this to be the holiday charity. There is a wish list listed on Washtenaw ISD's website.

NEW BUSINESS

- A. Consider approval of proposed FY 2019-20 budget and set millage rate

YPSILANTI DISTRICT LIBRARY

RESOLUTION NO. 2019-35

November 20, 2019

Ypsilanti District Library
Board of Trustees
Minutes, November 20, 2019 (Unapproved)

RESOLUTION TO ADOPT THE 2019-20 LIBRARY OPERATING BUDGET AND SET THE
MILLAGE RATE

Whereas the Ypsilanti District Library Board of Trustees is required to adopt an annual budget prior to the December 1 start of each fiscal year, and

Whereas the Library Director proposed a draft budget which was recommended by the Board Finance Committee and reviewed by the Board as a whole, and

Whereas a public hearing notice was posted and a hearing on the proposed budget was held as required by Michigan Public Act 43 of 1963, Budget Hearings of Local Governments,

Now Therefore,

IT IS RESOLVED BY THE YPSILANTI DISTRICT LIBRARY BOARD that:

The 2019-20 Library Operating budget is hereby adopted as presented, with the operating millage rate set at 2.535 mills.

OFFERED BY: Kay Williams

SUPPORTED BY: Jean Winborn

YES: 7 NO: 0 ABSENT: 0 VOTE: 7-0

A. Amendment of FY 2018-19 budget

YPSILANTI DISTRICT LIBRARY

RESOLUTION NO. 2019-36

November 20, 2019

RESOLUTION TO AMEND THE 2018-19 BUDGET TO REFLECT PROJECTED YEAR-END
SPENDING

Whereas, the Ypsilanti District Library Board of Trustees approves an annual budget prior to the December 1 start of each fiscal year, and

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Whereas, the budget is a working document and unforeseen changes can and do occur during the course of a fiscal year, and

Whereas, accurate budget figures for each revenue and expenditure account have been approximated for year-end spending, Now therefore,

IT IS RESOLVED BY THE YPSILANTI DISTRICT LIBRARY BOARD that:

The Ypsilanti District Library budget for the fiscal year ending November 30, 2019 be amended as presented.

OFFERED BY: Kristy Cooper

SUPPORTED BY: Theresa M. Maddix

YES: 7 NO: 0 ABSENT: 0 VOTE: 7-0

- B. Resolution to approve the purchase of additional new patron PCs

YPSILANTI DISTRICT LIBRARY

RESOLUTION NO. 2019-37

November 20, 2019

RESOLUTION TO PURCHASE NEW PUBLIC COMPUTERS, MONITORS, AND SUPPORT

Whereas, the Ypsilanti District Library strives to provide high quality public computing services to its patrons, and

Whereas, the current public computers are more than 6 years old and are heavily used, and

Whereas, the Library budgeted to upgrade half of its computers this November and the other half early in the new fiscal year, and

Whereas, purchase of the first half was approved on September 25, 2019, and

Whereas, the Information Technology Manager researched options and solicited three quotes for the desired computers, monitors, and support, Now Therefore,

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IT IS RESOLVED BY THE YPSILANTI DISTRICT LIBRARY BOARD that the equipment specified on the attached quotes be acquired from the low bidder, CDW Government, for \$44,687.48 using funds from the 2019-20 budget.

OFFERED BY: Bethany Kennedy

SUPPORTED BY: Patricia Horne McGee

YES: 7 NO: 0 ABSENT: 0 VOTE: 7-0

C. Scheduling of 2020 Annual Board meeting

YPSILANTI DISTRICT LIBRARY

RESOLUTION NO. 2019-38

November 20, 2019

RESOLUTION TO SCHEDULE THE YDL BOARD'S ANNUAL MEETING FOR 2020

IT IS RESOLVED BY THE YPSILANTI DISTRICT LIBRARY BOARD that:

The Annual Meeting for 2020 shall be held at 6:30 p.m. on Wednesday, January 22nd.

OFFERED BY: Patricia Horne McGee

SUPPORTED BY: Kay Williams

YES: 7 NO: 0 ABSENT: 0 VOTE: 7-0

D. Officer nominations discussion

- At the annual meeting the election of officers is done.
- Kay, Jean and Brian are all in their second term and cannot run again for their positions.
- Trustees discussed possible positions and position assignments.

E. State of Michigan Public Act 152 of 2011

YPSILANTI DISTRICT LIBRARY

RESOLUTION NO 2019-39

Ypsilanti District Library
Board of Trustees
Minutes, November 20, 2019 (Unapproved)

November 20, 2019

RESOLUTION TO REAFFIRM ADOPTION OF THE 80/20 EMPLOYEE HEALTH CARE SPLIT

IT IS RESOLVED BY THE YPSILANTI DISTRICT LIBRARY BOARD that:

In accordance with Public Act 152 of 2011, (MCL 15.561 et seq.) the *Publically Funded Health Insurance Act*, for the calendar year 2020, The Ypsilanti District Library opts out of the "Hard Cap" of contributions to employee health insurance; and

Adopts the 80/20 contribution split, with the Ypsilanti District Library to pay 80% of the cost of employee health care insurance and the employees to pay 20%.

OFFERED BY: Jean Winborn

SUPPORTED BY: Patricia Horne McGee

YES: 7 NO: 0 ABSENT: 0 VOTE: 7-0

BOARD MEMBER COMMENTS

Trustee	Comment
Kay	No comments.
Kristy	It's great the staff is focusing on helping students in YCS.
Patricia	No comments.
Jean	No comments.
Theresa	Please pass along thanks to the people who do the reports and include the photos. The photos are a very nice touch. I feel like I gain more by seeing the activities.
Bethany	No comments.
Brian	No comments.
Lisa	No comments.

Adjournment to closed session

Role call vote taken adjourn to closed session to discuss Library Director's Annual Evaluation at 7:21 p.m.

Vote: Ayes: Williams, Winborn, Maddix, McGee, Cooper, Kennedy and Steimel

Nays: None

Motion passed.

Ypsilanti District Library
Board of Trustees
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Regular meeting reconvened

Trustee Williams moved to adjourn the closed session and return to the regular meeting at 7:50 p.m.
Trustee Cooper seconded this motion.

Vote: Ayes: Williams, Winborn, Maddix, McGee, Cooper, Kennedy and Steimel
Nays: None
Motion passed.

Adjournment

Trustee Williams moved to adjourn at 8:10 p.m. Trustee Cooper seconded this motion.

Vote: Ayes: Williams, Winborn, Maddix, McGee, Cooper, Kennedy and Steimel
Nays: None
Motion passed.

To: YDL Board of Trustees

From: Lisa Hoenig, Library Director

Date: 11/27/19

Re: Curtain wall window investigation report and recommendations

The Facilities Committee met with Architect Betsy Baird of O'Neal Construction on 11/1/19 to review the report from the Whittaker curtain wall window investigation findings and consider proposed solutions.

As the curtain wall is a complex system, the Committee felt it would be best for the full Board to hear the report. To that end this special meeting was called. Betsy Baird will be present to review the attached report and quotes for possible approaches to repair that follow it.

There is a lot of material to digest and the cost of repair is significant. Please consider the various options presented at the meeting carefully and ask questions. This decision will be key to future budgeting as we move forward with our facilities road map. If we plan to make window repairs in summer of 2020, we'll need to take action by February.



September 13, 2019

O'Neal Construction
525 W. William Street
Ann Arbor, MI 48103

Attention: Ms. Betsy Baird
P: (734) 769-0770
E: bbaird@onealconstruction.com

RE: LIMITED BUILDING ENCLOSURE CONSULTING SERVICES

Ypsilanti District Library- Water Infiltration Investigation

5577 Whittaker Rd.
Ypsilanti, MI 48197
Terracon Project No. FR196081

Dear Ms. Baird

Terracon Consultants, Inc. (Terracon) has completed the building enclosure consulting services proposed in Terracon's Proposal dated June 28, 2019 and authorized on August 9, 2019. This report summarizes Terracon's site activities, documents the results of our observations, and provides general recommendations for repair.

1.0 PROJECT INFORMATION

The subject building is a district library for Ypsilanti, Michigan designed by David Milling and Associates and constructed by Etkin Skanska Construction Company. Water infiltration has been reported at the Kawneer 1600 SSG curtain wall system located along the east elevation of the facility. This system captures the glass with pressure plates along the vertical mullions and utilizes a butt-glazed weather seal joint along the horizontal mullions. Based on dimensions from the shop drawings, the system is installed at an angle of approximately 12 degrees. The curtain wall as installed by Chelsea Glass.

The Ypsilanti District Library (Owner) reported water infiltration from the curtain sloped curtain walls located on the east elevation since the building opened in the early 2000's. The Owner informed us that although previous attempts have been made to stop the leaks, little to no improvement was experienced. The Owner did not have a record of the specific scope implemented during these attempts.

Terracon Consultants, Inc 17515 West Nine Mile Road, Suite 770, Southfield MI, 48075

P (248) 234-7780 F (248) 234-7781 Terracon.com

Although leaks were reported along much of the curtain wall on the east elevation, the bay of curtain wall located second from the north end (identified as CW5.1 on the shop drawings) was identified as the area with the most severe and frequent water infiltration. The Shop drawings indicate the vertical length of the system to be 59'- 2 5/8" with the top of the system set into the building several feet resulting in the elevation length of 53'-10 1/8". The curtain wall bays are 24'-4" wide and are installed between brick fins the extend from grade to above the roof level and extend from the exterior to the interior.

Our scope of services included a limited document review, water penetration testing, and intrusive probes. Access to the areas for testing and investigation and a glazer to assist Terracon was provided by O'Neal Construction (O'Neal), a representative of O'Neal was on site throughout this effort.

2.0 SITE ACTIVITIES

Terracon visited the site on August 20 and 21, 2019 to perform the proposed scope of services. During our site visit, we performed water penetration testing in general accordance with AAMA 501.2 on several portions of the east curtain wall Bay CW5.1 **[Attachment A]**.

2.1 VISUAL OBSERVATIONS

Terracon observed the interior and exterior of the building along the west elevation and noted the following conditions:

- The surface of the perimeter sealant joints are deteriorated with surface cracking and pitting noted. No section of disbonded sealant was identified from the ground **[Photo 1]**.
- The plane of the perimeter seal is not consistent between the jambs and sill condition, the perimeter seal is not visible along the base of the curtain wall **[Photo 2]**.
- The snap covers of the vertical mullions extend down and often touch the sill stone below the curtain wall **[Photo 3]**.
- Sealant has been installed in the head and bed joints of the sill stone, many of the head joints have failed adhesively.
- The full open-head weeps are installed in the brick course located between the sill stone and the upper layer of flashing, self-adhered membrane was visible at the weep **[Photo 4]**.
- Gaskets have shrunk significantly with evidence of shrinkage after they were sealed as part of a repair attempt **[Photo 5]**.
- Sealant has been installed at joints in the snap cover.
- Sealant on the sheet metal edge condition of the roof, located above the curtain wall, has failed **[Photo 6]**.
- Stainless steel flashing located above the roof level of the brick fins have migrated several inches out of the mortar joint **[Photo 7]**.

- The carpet has been removed from the edge of the floor slab between the radiator and the curtain wall **[Photo 8]**. The owner informed this was done to reduce the extent that water migrated toward the interior.
- A prefinished sheet metal trim has been installed along the base of the curtain wall **[Photo 9]**.

2.2 WATER PENETRATION TESTING

Test Specimens

Testing was conducted on several portions of curtain wall CW5.1. The curtain wall was tested in three areas, a portion of the formed metal siding, located above the curtain wall, was also tested. See **Attachment B** for general locations that testing was conducted. Testing began at the bottom corner of the system at the south end and progressed up the wall. The exterior was accessed by an articulating boom manlift while the interior was observed from the floor and from a scissor lift that extended approximately half way up the wall.

Water Penetration Testing

The water penetration testing was performed in general accordance with AAMA 501.2 *“Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems”*. Terracon observed the testing with the application of the water by O’Neal construction.

The location and size of each specimen as well as the result of the water penetration test is summarized in the table below.

Specimen 1

Water infiltration observed at the floor directly below the test specimen approximately 30 seconds into the test, **[Photo 10]**. The water infiltration continued throughout the remainder of the testing of this specimen with additional areas of infiltration observed several feet down from the test area at a joint in the prefinished trim. The water that infiltrated the system flowed into the joint between the edge of slab and the foundation wall and did not reach the carpet.

Specimen 2

Water observed dripping from the horizontal mullion at the bottom of the test specimen near the end of the first section of test. Water was bypassing the spacer gasket approximately 6 inches from the vertical mullion **[Photo 11]**. This infiltration continued throughout the remainder of the testing of this Specimen.

Specimen 3

During testing of the first horizontal mullion, water was observed entering 5 glass lites below the test specimen (at the dead-load tube steel) and at the two vertical mullions located north of the test specimen **[Photo 12, 13]**. Water was observed entering at 4 different locations during the test with infiltration becoming extensive. The testing was concluded after only testing one section of horizontal and one vertical mullion due to the extent of infiltration

Specimens 4

A section of the formed metal panels located directly above the mullion was also tested using the AAMA wand. Water was applied to approximately 10 feet of the “Z” flashing at the base, including on joint, and to the fascia located along the top of the metal panels. Water infiltration was observed at the first intermediate horizontal mullion generally located below the joint in the “Z” flashing. Several minutes after the test, water was also observed on the surface of the brick near the ceiling **[Photo 14]** and along the curtain wall **[Photo 15]**. Although no water was observed at these locations during testing the delay in the observed infiltration was likely due to the absorptive properties of brick and the length of the water path. Significant stains, consistent with long-term water infiltration and unrelated to this testing, were also noted on the interior brick **[Photo 16]**.

2.3 TESTING OBSERVATIONS

Upon completion of the testing, Terracon evaluated the exterior from the manlift to observe the conditions of the wall. The lift was unable to reach the roof level.

- The sealant joint between the metal fascia and face brick has failed adhesively **[Photo 17]**.
- The stainless steel edge of the masonry flashing located above the roof line does not extend to the east face of the fin **[Photo 17]**.
- Observations related to the internal seals include **[Photo 18]**:
 - The SSG seal is not installed at most of the horizontal mullions, although it was observed that the lower windows did have 3-4 inches of sealant that extended from the corner to the center of the glass on both sides.
 - Sealant at the frame joint was observed at several locations.
 - Sealant was not observed over frame screws.
- Joints between the horizontal weather seal and the gaskets of the vertical pressure bar have been sealed **[Photo 19]**.
- Several pieces of glass were not aligned across the joint of the horizontal mullion **[Photo 20]**.
- Adhesion failure and “pin-holes” were noted in several locations at horizontal mullions.

2.4 INVESTIGATION

Terracon and O'Neal returned the next day to conduct additional observation and intrusive probes.

2.4.1 Location 1- Base of Wall

The snap covers and portions of the pressure bars were removed from the base of the curtain wall at the location of test Specimen 1, observations include:

- Screws were generally installed every third hole of the pressure bar (approximately 9 inches); torque readings were taken ranged from 15-70 in-lbs. Note the current Kawneer requirements indicate 95-100 in-lbs.
- Weeps had been drilled into the base of the pressure bar **[Photo 21]**.
- Sealant was installed between the edge of glass and the tongue of the vertical mullion, no sealant was installed across the joint plugs at the base **[Photo 22]**.
- The glass unit is supported with a setting block that does not support the exterior glass pane **[Photo 23]**.
- A sealant joint is installed between the bottom mullion and wood blocking below **[Photo 24]**.
 - The perimeter joint as the sill appears to extend up the jambs several inches behind the exposed perimeter sealant joint **[Photo 25]**.
 - The wood blocking located at the sill was wet and appeared soft in the limited area exposed.
 - A return-leg pressure bar was used instead of the aluminum pocket filler indicated in the shop drawings.
 - The perimeter seal was located at the shoulder of the frame instead of the pressure bar indicate in the shop drawings.

2.4.2 Location 2- Jamb Condition

The portion of the pressure bars and perimeter sealant joint was removed along the south jamb near the curtain wall expansion joint **[Photo 26]**.

- Cap seals had been installed along gasket of the jamb mullion **[Photo 27]**.
- The zone dams were installed and appeared to be sealed with a non-skinning butyl product. Cracks in the sealant, consistent with shrinkage, were observed at several locations **[Photo 28]**.
- Several zone dams were removed and the sealant generally released clean from the aluminum substrate indicating that the sealant is not well bonded **[Photo 29]**.

- It appeared that joints in the frame had been sealed, the sealant appeared discontinuous and may be in part due the removal of the zone dam **[Photo 30]**. It appeared that the portion of the frame joint, located below the horizontal tongue of the horizontal mullion, had not been sealed.
- Observations of the sealant joint between the exterior glass pane and the tongue of the vertical mullion appeared consistent with the shop drawings.
 - Portions were not bonded to the aluminum at frame joints due to the fame sealant that extended onto the tongue **[Photo 31]**.
 - Sealant displayed questionable bond when applied directly to the aluminum tongue **[Photo 32]**.
- The sealant at the frame joints is discontinuous due to sealant failure **[Photo 33]**.
- Failed weather seal at horizontal joint **[Photo 34]**.
- Torque measurements of the screws used to secure the pressure bars ranged from 10 to 70 in-lbs.
- The sealant at the expansion curtain wall expansion joint is discontinuous **[Photo 35]**. This condition is consistent with the use of non-curing sealant in this application.
- Sealant of expansion joint does not extend back on one side of the mullion and on the sleeve fastener visible in the glazing pocket is not sealed **[Photo 36]**.
- The perimeter seal bridges between the brick and the pressure bar assembly, it does not seal between the secondary water barrier of the masonry and the air seal plane of the curtain wall **[Photo 37]**.
- A return-leg pressure bar was used instead of the aluminum pocket filler indicated in the shop drawings.
- The shop drawings indicate two lines of perimeter sealant at the jamb condition, only the outer seal, between the brick and the pressure bar/snap cover, was observed.

2.4.3 Location 3- Formed Metal Panels

Due to the constraints of the site and the limits of the lift, this investigation was conducted on the south end of the curtain wall bay located to the north (identified in the shop drawings as CW5). A horizontal pressure bars was removed at the top of the curtain wall and the adjacent perimeter sealant joint was removed along the head **[Photo 38]**, a joint in the “Z” flashing of the formed metal panels system above was also evaluated.

- Torque measurements of the 3 screws that secure the pressure bars ranged from 20 to 30 in-lbs.
- Cracking of the sealant used at the intersection of the pressure bars **[Photo 39]**.

- The perimeter seal extended between the top of the curtain wall frame to the wood blocking and fabric weather resistive barrier (Tyvek) above. It was noted that the distance the Tyvek's returns into the opening is minimal **[Photo 40]**.
- Although an end dam was observed in the "Z" flashing it did not appear to be sealed.
- The lap in the "Z" flashing overlapped by several inches; however, sealant between the metal was not identified.

3.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of Terracon's limited visual observations, water penetration test results, and our experience with similar systems, several potential water infiltration paths have been identified within or adjacent to the curtain walls system. Likely water infiltration paths include:

- Water bypassing the "Z" flashing at joints and end dams of the formed metal panels located above the curtain wall system.
- Water bypassing the fascia seal to the brick fin.
- Water bypassing flashing of the brick fin located above the roof.
- Water bypassing the weather joints at the horizontal mullions due to adhesion failure.
- Water bypassing the seals at the curtain wall expansion joints due to deteriorated sealant, poor bond to the aluminum framing, and discontinuous seals at the expansion joint.
- Water bypassing the frame seals due to disbonded and deteriorated sealant and the lack of frame seal below the zone dam and at the frame screws in the horizontal mullions.
- Water bypassing the perimeter seals that do not provide continuity of the air/water control components of the curtain wall system to the weather resistive barrier of the masonry.
- Water bypassing the perimeter seal at the sill due to improper substrate/coordination to the masonry assembly below.

Each of these conditions are magnified by the sloped installation of the wall. In addition, this system relies extensively on the seal between the glass and the tongue of the vertical mullions and the weather seal of the horizontal. Water that bypasses those seals are held in the glazing pocket instead of being drain back to the exterior.

3.1 ADDITIONAL STUDY

This investigation was focused on the curtain wall assembly. Conditions observed that should be verified that are beyond the scope of this investigation include:

- Water may be bypassing the flashing of the masonry fins above the roof. A separate water test and investigation is required to determine the likely path and to provide recommendations.
- The lack of structural silicone sealant at the horizontal joints of the curtain wall. Although the shop drawings do not indicate sealant and no evidence of damage caused by this condition was noted, this condition creates distinct frame load and deflection conditions.

These conditions are generally reviewed by the curtain wall structural engineer and the glass manufacturers during the design phase.

- The wood blocking observed below the curtain wall should be exposed and further evaluated to determine the extent of damage and if that damage may cause problems in the foreseeable future. This is of significant concern if the clips of curtain wall system were set on the plywood.

3.2 REPAIR RECOMMENDATIONS

Based on the results of our site activities, we have developed the following general recommendations for repair for the transitions and assemblies adjacent to the curtain wall system:

- Replacement of the perimeter seals, all sides. The self-adhered flashing observed at the brick should be supplemented to enable the perimeter seal to transition and adhere properly to that membrane to provide a continuous air and water-tight seal. Provide dual perimeter seal with the inner (primary) seal between the shoulder of the curtain wall and the existing self-adhered membrane. The out (secondary) should be installed between the pressure bar/snap cover and the brick.
- Replacement of the formed metal panel and underlying weather resistive barrier located above the curtain wall system. Provide transitions to the adjacent cladding and roofing systems as required to maintain an effective and durable seal.
- Installation of a sheet metal flashing at base of curtain walls glazed into the mullions. Remove a portion of the tongues of the vertical mullions to accommodate a continuous installation.
- Install preformed silicone tape over joints in fascia and horizontal edge metal, replace sealant joint between fascia and brick.

The following options have been identified to provide a water-tight curtain wall assembly, one of these options in conjunction with the repairs indicated above are required to mitigate the infiltration issues identified.

3.2.1 Option 1- Replacement

Full replacement of the existing glass and framing system with new. This approach allows for full access to the perimeter conditions to make necessary changes and extension to the self-adhered membrane at the jambs, the wood blocking at the sill, and the metal panels system above. This option is expected to be the most expensive but also provides the longest expected service life for addressing the water infiltration as well as for the glass units. Note that a quality assurance program, including field verification testing is recommended to ensure proper installation.

3.2.2 Option 2- Reglazing

This option includes the full removal and salvage of glass for reuse, extensive on-site cleaning of the frames, and installation of the existing glass. This approach relies heavily on detailed and thorough cleaning of small areas, profiles, and components to provide proper sealant adhesion. This approach would utilize the majority of the same components however the use of new

pressure bar, snap covers, and gaskets should be anticipated. Re-installing the sealant joints between the glass and the frame tongue of the vertical mullion is recommended to maintain consistency, this detail should be applied to the each joint and made continuous with the weather seal joint that remain exposed at the horizontal mullions.

Note that re-installation of the existing glass is not ideal as they are already 20 years into their expected service life, however, the installation of new insulated glass units will increase the cost significantly.

Although provided as an option, this approach is generally not recommended due to the level of cost, disruption to occupants, heavy reliance on workmanship, and the difficulty to access perimeter condition provided during full replacement.

3.2.3 Option 3- Over-sealing

This approach essentially abandons the reliance of existing seals and water management system and provides an exposed barrier on the exterior side of the assembly. Two approaches have been identified, although similar in concept both have distinct advantages and disadvantages. Both options will enlarge the apparent width of the vertical curtain wall mullions and the horizontal joints by approximately 3/8 inch along both sides. Also note that both approaches will not provide the same level of finish (e.g. crisp corners, straight lines) as the existing system does due to the properties and application process of the materials. In addition, although the color of the exposed materials can be matched to the existing curtain wall framing, the appearance will remain considerably different due to the properties and sheen of the materials. Lastly, and similar to Option 2 above, this option does not provide for access to the perimeter conditions to evaluation and make transitions to the adjacent masonry as provided by Option 1.

3A Preformed Silicone

This approach utilizes preformed silicone tape that is profiled to fold over the existing snap cover/pressure bar assemblies. The tape is then sealed to the glass along both sides. Versions of this system are available from each of the major silicone sealant manufactures including Dow, GE/Momentum, and Tremco. Smaller flat sections of the same material are used to cover the horizontal weather seals, again extending approximately 3/8 inch onto the glass along each side. The tape is generally 1/4 to 1/2 inch wider on both sides to allow for adhesion to the substrate with gun grade sealant. Installed properly, the service life of this approach is expected to be 10-15 years and may be extended with maintenance and localized repair.

3B Wet-Sealing

This approach relies on the use of proper cleaning and application of a gun grade silicone sealant along the pressure bars/snap covers and the use of preformed silicone sealant tape at joints in the snap cover and over the weather seal joints of the horizontal mullions. Both the gun grade sealant and the tape should extend onto the substrates approximately 3/8 inch to provide appropriate surface for adhesion. Installed properly, the service life of

this approach is expected to be 5-10 years and may be extended with maintenance and localized repair.

The installation of a mock-up of the selected approach is recommend to facilitate review of the aesthetic, technical, and workmanship components of the approach. This mock-up can also be utilized to discuss duration/schedule, cost, disruption, and labor.

In addition, verification testing can be performed to validate the approach prior to full implementation. Note that full cure of the sealant should be accounted in the schedule prior to testing. Periodic verification testing during construction is also recommended throughout the installation process to ensure proper installation and identify concerns prior to completion.

3.3 Quality Control

Terracon recommends developing a repair plan to include the mock-up and associated verification testing. Once the repairs are documented to perform adequately, the same method can be applied to the balance of the curtain walls.

It is critical that the repair/replacement is completed to the standards of a high-quality installation. Therefore, regular site observation and testing is also recommended at regular intervals throughout the project to verify that the work remains effective.

4.0 Closing

The extent and full scope of water intrusion that has affected the building may require additional water testing after implementation of recommended remedial actions due to the possibility of multiple sources of water entry contributing to the same interior leak(s). See the Additional Testing section above.

We appreciate the opportunity to assist you on this project. If we can be of further assistance, please do not hesitate to contact us.

Sincerely,
Terracon Consultants, Inc.

Jared Lawrence, AIA
Senior Architect
Facilities Engineering Services



Brian DuChene
Principal
Facilities Engineering Services

Attachments: Photographs
Attachment A- Location Plan
Attachment B- Test Locations



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11

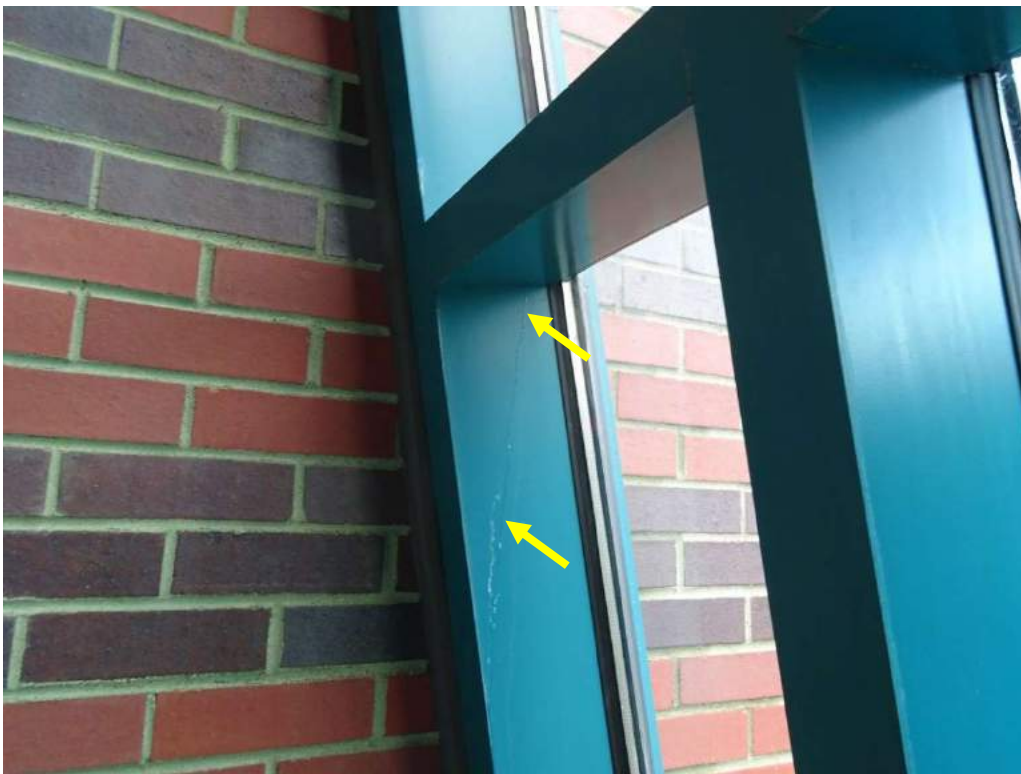


Photo 12

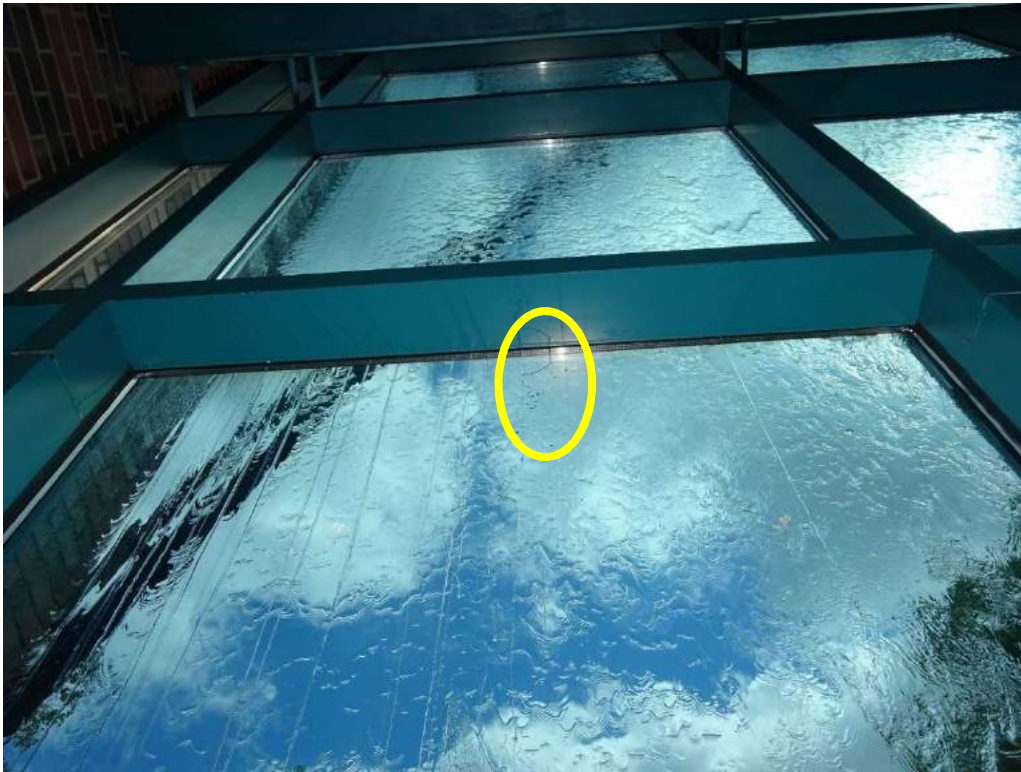


Photo 13



Photo 14



Photo 15



Photo 16



Photo 17

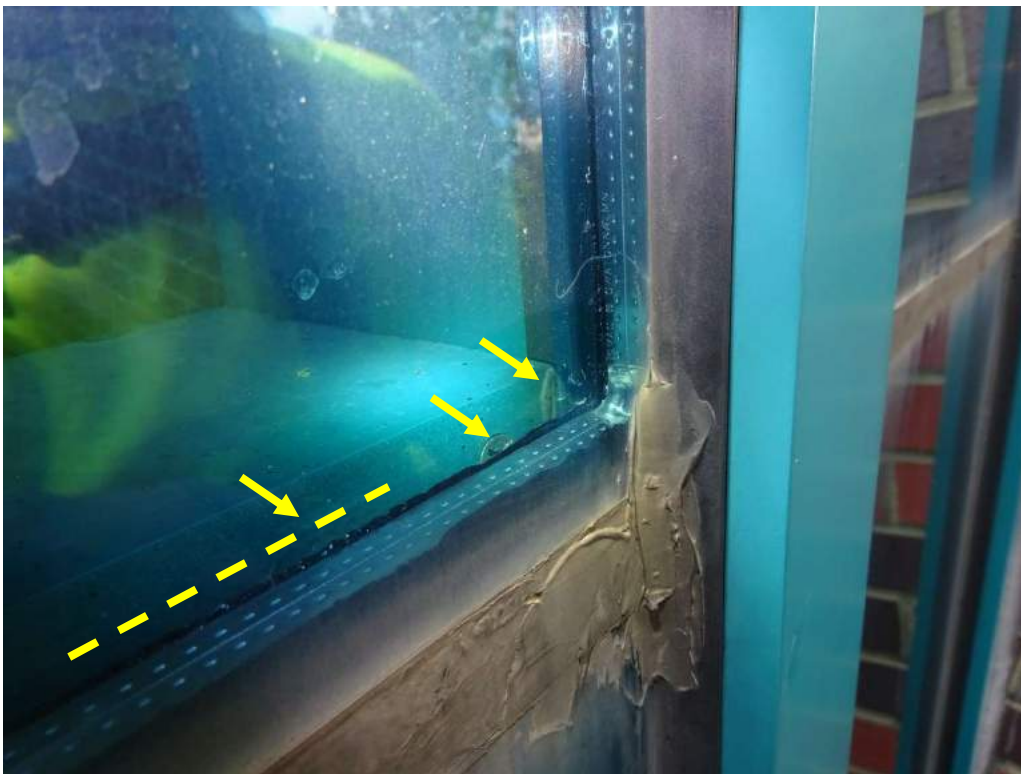


Photo 18



Photo 19

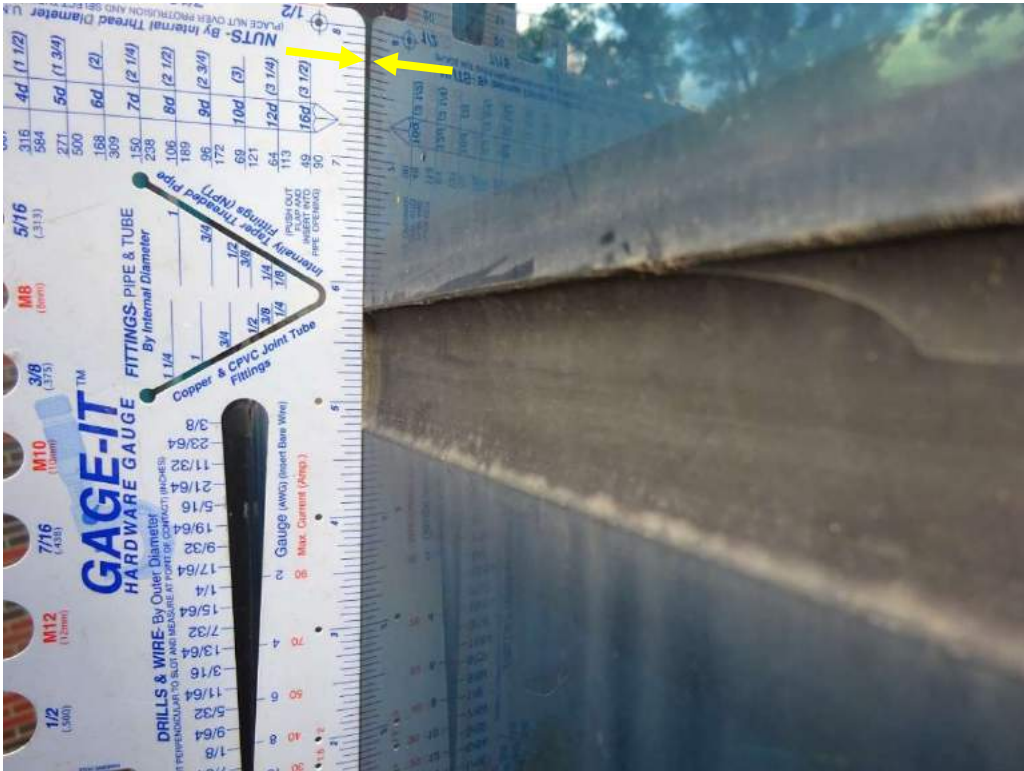




Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Photo 28



Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36



Photo 37



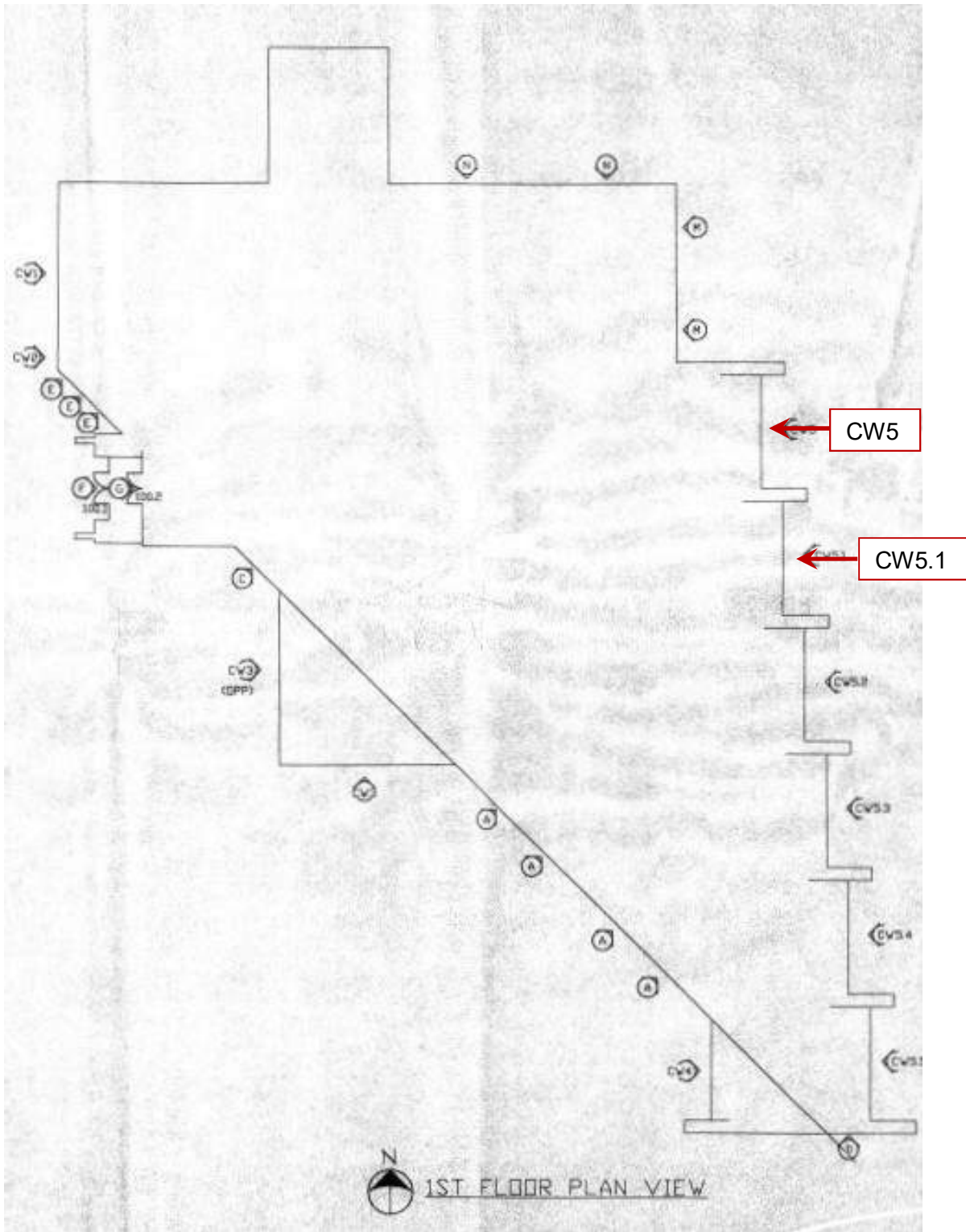
Photo 38



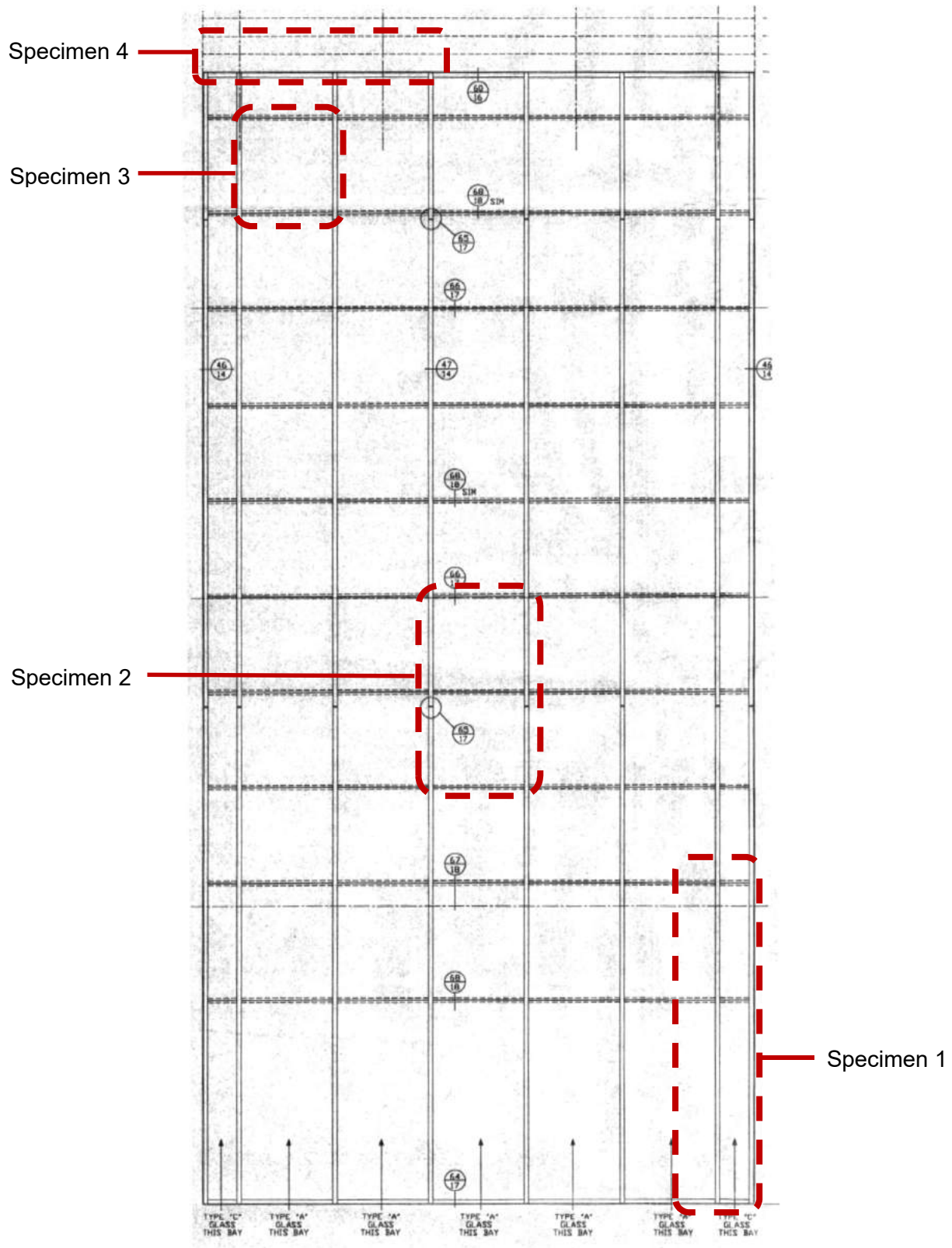
Photo 39



Photo 40



Location Plan



Test Locations- Interior Elevation



Project name & location:	Ypsilanti District Library		Ypsilanti, MI
Bldg. size & description:	8,728	Sq. Ft	Curtain Wall Remediation
Bid date: & estimator:	10/22/2019		Bbaird
Revision #1	10/25/2019		

- OPTION 3A Cured silicone seal, includes curtain wall sill flashing & head flash (metal panel)
- OPTION 3B Cured silicone at the horizontals with wet sealed verticals, includes curtain wall sill flashing & head flash (metal panel)
- OPTION 1 Curtain wall replacement
- ALTERNATE Critical areas (access, metal panel/head of curtain wall, sill) + Maintenance

#	Category Name:	Pricing Source:	Option 3A	Option 3B	Option 1	Option 2 Not Viable	Alternate	Notes
1	Pre-Construction	O'Neal Construction	\$ 10,000	\$ 10,000	\$ 15,000	-	\$ 7,500	
2	Design Services	Terracon	\$ 34,800	\$ 34,800	\$ 52,200	-	\$ 26,100	
3	General Conditions	O'Neal Construction	\$ 54,535	\$ 54,535	\$ 81,803	-	\$ 40,902	See separate Estimate
4	Hazardous Material Survey & Abatement	Owner	\$ -	\$ -	\$ -	-	\$ -	Assume none
5	Glazing Manpower & Material	Glasco	\$ 242,800	\$ 152,900	\$ 1,330,698	-	-	Opt 1 is estimate only at \$140/sf
5	Glazing Manpower Sill Only	Glasco	-	-	-	-	\$ 8,350	new cw + demo+ temp protect
5a	Glazing Manpower - Surface Sealing	Glasco	-	-	-	-	\$ 21,400	.032 aluminum
6	Site Access	ET Mackenzie	\$ 17,971	\$ 17,971	\$ 17,971	-	\$ 17,971	
7	Metal Panel Rework	MW Morss	\$ 46,000	\$ 46,000	\$ 46,000	-	\$ 46,000	Includes \$10,000 allowance
8	Quality - Meetngs & Onsite Observation	Betsy Baird	\$ 10,000	\$ 10,000	\$ 15,000	-	\$ 7,500	
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19		Sub-Total:	\$ 416,106	\$ 326,206	\$ 1,558,672	\$ -	\$ 175,723	
20								
21		Building Permit	\$ 4,026	\$ 3,037	\$ 16,295	-	\$ 1,532	
22								
23		Contingency	\$ 50,416	\$ 39,509	\$ 188,996	\$ -	\$ 21,271	12.0%
24		OCI OH&P: %	\$ 50,416	\$ 39,509	\$ 188,996	\$ -	\$ 21,271	12.0%
25								
26	TOTAL BUDGET COST SUMMARY		\$ 520,965	\$ 408,262	\$ 1,952,959	\$ -	\$ 219,796	



Project name & location:	Ypsilanti District Library	Ypsilanti, MI
Bldg. size & description:	8,728 Sq. Ft	Curtain Wall Remediation
Bid date: & estimator:	10/22/19	Bbaird
Revision #1	10/25/19	

Estimated const duration (in months):	4
Approximate Construction Budget:	\$ 400,000

PERSONNEL COSTS		Quantity	Unit	Total Months	Total Hours	Rate	Total
01300	Project Manager	10	Hrs/Wk	4.0	174	75	\$ 13,050
01010	Site Superintendent	20	Hrs/Wk	4.0	348	65	\$ 22,620
01160	Main office support staff	2	Hrs/Wk	4.0	35	47	\$ 1,636
01270	Misc laborers	8	Hrs/Wk	4.0	139	58	\$ 8,074
01303	Safety plan & inspections	2	Hrs/Wk	4.0	35	52	\$ 1,810

PROJECT INSURANCES & BONDS

01080	Insurances (general & umbrella liability)	-	-	N/A	N/A	-	\$ 1,113	Based on Approx Construction Budget
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TEMPORARY CONST FACILITIES, UTILITIES & EQUIPMENT

01340	Site computers	1	Site Staff	N/A	N/A	205	\$ 820	Incs 1 x 115/mo
01440	Misc equipment	1	LS	N/A	N/A	500	\$ 500	Tools/supplies

PROJECT SAFETY, SECURITY & MAINTENANCE

01524	First aid equipment	1	EA	N/A	N/A	100	\$ 100	Incs 1 first aid kit
01304	Safety Equipment	1	Months	N/A	N/A	125	\$ 125	Incs \$125/mo
01525	Fire extinguishers	0	Each	N/A	N/A	65	\$ -	New x \$65/ea
01360	Temporary partitions & enclosures	0	LS	N/A	N/A	2756	\$ -	Incs 2Mx16hrs + \$900 matl
01390	Meter bags	0	Bag/Day	N/A	N/A	25	\$ -	10 days
01410	Dumpsters	0	Dumpsters	N/A	N/A	463	\$ -	Incs .75 dumpster/wk for unidentifiable only
01420	Final cleaning	8728	SF	N/A	N/A	0.5	\$ 4,364	Incs \$.50 per SF ALLOWANCE
01440	Temporary floor protection	0	Rolls	N/A	N/A	350	\$ -	Covergaurd floor protection by Colony

MISCELLANEOUS PROJECT COSTS

01140	Parking	0	Days	N/A	N/A	15	\$ -	Assume available
01174	Printing costs: bid & const documents	0.25	LS	N/A	N/A	500	\$ 125	
01150	Shipping & mailing	4.00	Months	N/A	N/A	50	\$ 200	Incs \$50/mo average

TOTAL GENERAL CONDITIONS:	\$ 54,535
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