The Upchurch Group, Inc.
123 North 15th Street Mattoon, Illinois 61938 Phone 217.235.3177 Fax 217.258.6115

Mr. Berrie Slade, Village President
Village Hall
105 East 1st Street
Hammond, IL 61929

05 September 2018

Re: Evaluation of Village Maintenance Building, 103 East 1st Street

Dear Mr. Slade:

You engaged The Upchurch Group, Inc. to make observations at the Village of Hammond's maintenance building located at 103 East 1st Street after a structural failure occurred, and to report an opinion on the relative costs to:

1. Repair the existing maintenance building.
2. Build a new pole building elsewhere on Village-owned property and tear down the existing maintenance building.
3. Build a new pole building behind a preserved East 1st Street façade of the existing maintenance building.

HISTORY

The masonry and wood structure currently used as the Village Maintenance Building was most likely constructed in the very early 20th Century. A single-story structure measuring about 36 x 80 feet, it occupies only about two-thirds of the whole building's foot print. The remaining third is occupied by a two-story structure under separate ownership. The pattern of the masonry and the fenestration indicate that both the one-story and two-story sections of the building were constructed at the same time as a single building.

A hardware store is remembered as one of the early businesses housed in the building. Before being acquired by the Village of Hammond, the one-story section of the building had been used as a service garage for the local Chevrolet dealer. It was the Chevrolet dealer who cleared a space at the south end of the building to make a vehicle service bay. Vehicle access was from 2nd Street through a large overhead door installed in the middle of that wall.

The two-story section of the building is currently owned by a private individual. It has been treated as a separate building and is currently used for residential apartments.

OBSERVATIONS

On Wednesday, 18 July 2018, I visited the Village Maintenance Building to observe the structural damage and I returned the following Wednesday, 25 July 2018 to climb onto the roof to make additional observations.

The southernmost section of a wood beam supporting the roof structure was observed to be broken allowing the section of the roof it supported to sag and interfere with operation of the overhead door. The wood beam, composed of four 2x boards laminated together, runs along the building's center line from the East 1st Street wall to the East 2nd Street wall, sloping downward from north to south. The ends of the wood beam are supported by the building's north and south walls. A series of wood posts spaced along the building's center line support

the beam between the end walls. A steel frame was installed at some time in the past to eliminate the southernmost post and open up space for a centrally located vehicle service bay.

Plastic sheeting, presumably installed as a vapor barrier during an insulation upgrade, was observed wrapped around the sides and bottom of the wood beam. The plastic sheeting had trapped water that leaked through the roof. Prevented from draining away from the beam or evaporating, the trapped water resulted in perennially wet conditions at the low end of the beam. Wood decay and the corrosion of metal fasteners were observed when the plastic was removed from the low end of the beam. The actual break in the beam occurred about three feet north of the south wall where butt joints in two of the laminations produced a weak plane in the beam.

The original masonry wall that once faced East 2nd Street had been replaced with a wood frame wall featuring a large opening fitted with an overhead door for vehicle access. The interior face of the wall has been sheathed with oriented strand board (OSB) and the exterior has been finished with steel siding. One end of the failed structural beam is supported by this wood framed wall over the vehicle access opening. As observed post-failure, the end of the beam appears to be bearing on a 2x6 header over the opening, which is, in turn, deforming under the load and pulling its fasteners out of the jamb framing. Although it was not apparent during my observations, it is likely that the end of the beam had been supported by a more substantial header closer to the roof line, possibly supported using joist hangers.

Observations during the more recent visit focused on the building's exterior, particularly the roof.

The roof appears to be a built-up system that has had a coating applied to extend its service life. Bounded by low parapet walls on the north and east and by a second-story wall on the west, the roof slopes downward from north to south. Water sheet drains over the roof's south edge and down a mansard where it is collected in a gutter. The low parapet walls are capped with vitreous clay coping tiles that appear to be intact. The upper edge of the membrane roof flashing appears to be adhered into place with hot asphalt. No termination bar or counter flashing was observed to secure or protect the upper edge of the membrane roof flashing.

The area of the structural failure is very apparent on the roof. A depression has formed in the roof deck over the broken beam. It has filled with water. The built-up roofing material at the depression is torn and rolled back, appearing to be the result of wind damage that may have occurred prior to the structural failure. The roof eave has been deformed by the collapsing roof deck and now slopes in the wrong direction, directing water from the roof back into the wall system immediately above the overhead door opening.

The roof had probably been leaking in multiple locations for a long time. Besides the obvious damage to the roof at the place where the structure has failed, the roofing is covered with blisters and the membrane flashings have become brittle and badly deteriorated. There are holes in the membrane flashings at the parapets big enough for small animals to enter.

Disused chimneys built as part of the masonry walls have been abandoned without being properly closed. These chimneys provide an entrance for water into the building through their open flues and through the badly deteriorated masonry. Likewise, the deteriorated masonry in the second story wall above the membrane flashing provides another entry point for water into the building.

THREE STRATEGIES WITH COST ESTIMATES

1. REPAIR THE EXISTING BUILDING: $ 130,000.00
    a. Replace South Section of Center Beam:
        i. Remove and salvage for re-use the overhead door operator, traveling rail, tracks, door panels, etc.
        ii. Remove ceiling covering and insulation material from south bay.
        iii. Install temporary supports for rafters on east and west sides of beam in south bay.
        iv. Demolish existing section of center beam from steel frame support to south wall.
        v. Remove interior covering from south wall over vehicle door opening.
        vi. Demolish and replace header beam if determined to be structurally compromised.
        vii. Install new center beam from steel frame to south wall.
        viii. Fasten rafters to new center beam and remove temporary rafter supports.
        ix. Re-install overhead door.

    b. Replace Roof:
        i. Test roofing materials for the presence of asbestos and abate those materials found to contain asbestos.
        ii. Tear-off existing roofing and any roof decking that appears to be broken, warped, rotted, or water damaged.
        iii. Install new roof decking.
        iv. Install new roofing system:
            1. Double layer of perimeter 2x4" nailers.
            2. ½" Plywood backer boards applied to all vertical surfaces to receive membrane flashing from roof deck to reglet.
            3. Reglets cut into horizontal masonry joints 8" min. above the finished roofing to receive 2-part metal counter flashing.
            4. (2) Layers of 1½" thick polyisocyanurate insulation board for a total thickness of 3" with staggered joints set in insulation mastic.
            5. ¼" Securock cover board set in insulation mastic.
            6. 60 mil EPDM roofing membrane – fully adhered.
            7. 60 mil EPDM membrane flashing – adhered to plywood backer boards and terminated with 1" continuous aluminum termination bars secured at 8" on center.
            8. 2-piece pre-finished steel counter flashing to protect upper edge of membrane flashing.

    c. Repair Masonry:
        i. Tear down disused masonry chimneys to one course above highest adjacent coping.
        ii. Tuck point all exposed masonry joints on building exterior.
        iii. Install 2x and plywood closure cap over top of chimney so that the top slopes back toward the roof at ½" to 12".
        iv. Install a 60 mil EPDM membrane flashing over the entire wood construction.
        v. Install a pre-finished sheet metal cap over the membrane flashing.

2. BUILD NEW 36' x 80' MAINTENANCE BUILDING ELSEWHERE & RAZE EXISTING BUILDING: $ 476,000.00.

   a. Grade site and install rock base for a new building pad.

   b. Extend new utilities to building.
      i. Water and Sewer.
      ii. Electrical power and communications.
      iii. Natural gas.

   c. Construct a new wood pole framed building:
      i. Metal siding and roofing.
      ii. 14' Eave height.
      iii. Gabled roof with wood trusses.
      iv. One 12'w x 10'h overhead operating door.
      v. Two 3'x7' insulated steel man doors.
      vi. One 4'x5' window.
      vii. Insulation.
      viii. Metal liner panels on interior.
      ix. 6" reinforced concrete slab.
      x. Open shop area.
      xi. 12' x 8' office.
      xii. Single-user handicap accessible restroom.
      xiii. Secure tool storage room.
      xiv. Radiant heat over shop area.
      xv. Forced air furnace/AC for office/restroom.

   d. Demolish Existing Building:
      i. Test roofing materials for the presence of asbestos and abate those materials found to contain asbestos.
      ii. Saw cut masonry at First Street façade to separate one-story section of building from two-story section to remain.
      iii. Demolish one-story part of building:
         1. Disconnect all utilities serving building:
            a. Water and sewer.
            b. Natural Gas.
            c. Electrical power and communications.
         2. Relocate air-conditioner condenser units and coolant lines serving Village Hall.
         3. Preserve and protect common wall with two-story section of building.
         4. Preserve and protect concrete walk along First Street.
         5. Preserve and protect Second Street pavement.
         6. Sort demolition debris by categories for recyclable metals, glass, organic materials (wood), and inorganic materials (masonry and concrete). Dispose of demolition debris appropriately.
         7. Fill and grade site to drain toward Second Street.
         8. Apply 4" of clean top soil and seed with grass.
         9. Patch any openings made in pavements for utility disconnects.

10. Tuck point masonry on common wall with two-story section of building.
11. Apply stucco coating with a drainage layer and vents to face of two-story common wall.

3. BUILD NEW 36' x 80' MAINTENANCE BUILDING BEHIND PRESERVED FAÇADE OF EXISTING BUILDING: $ 480,000.00.
    a. Relocate contents of building to temporary storage.

    b. Test roofing materials for the presence of asbestos and abate those materials found to contain asbestos.

    c. Demolish one-story part of building:
        i. Disconnect all utilities serving building:
            1. Water and sewer.
            2. Natural Gas.
            3. Electrical power and communications.
        ii. Relocate air-conditioner condenser units and coolant lines serving Village Hall.
        iii. Preserve and protect common wall with two-story section of building.
        iv. Preserve and protect First Street façade,
            1. Construct temporary shoring and bracing for First Street façade.
            2. Saw cut masonry to separate First Street façade from east wall of building to be demolished.
        v. Preserve and protect concrete walk along First Street.
        vi. Preserve and protect Second Street pavement.
        vii. Sort demolition debris by categories for recyclable metals, glass, organic materials (wood), and inorganic materials (masonry and concrete). Dispose of demolition debris appropriately.
        viii. Re-grade building pad area to be level at 12 inches below the Second Street Elevation.

    d. Construct new 36' x 80' pole building on former building's site.
        i. Extend new underground utilities into building foot print.
            1. Water and sewer.
            2. Natural gas.
        ii. Construct new building shell behind First Street façade.
            1. Wood pole framing.
            2. Metal siding on east and south sides.
            3. East wall to match height of First Street façade (21'-4" above First Street grade).
            4. Eave height at Second Street = 14'-0" above First Street grade.
            5. Tie First Street façade to new wood framing.
            6. One 12'w x 10'h overhead operating door.
            7. One 3'x7' insulated steel man door.

8. One 3'x7' aluminum framed storefront door set in one 6'-4"w x 8'-4"h aluminum framed glazed storefront with 3'-2" radius aluminum framed storefront round-top.
9. Insulation.
10. Metal liner panels on interior except west common wall.
11. 6" reinforced concrete slab.
12. Open shop area.
13. 12' x 8' office.
14. Single-user handicap accessible restroom.
15. Secure tool storage room.
16. Radiant heat over shop area.
17. Forced air furnace/AC for office/restroom.
18. Roof:
    a. Wood mono trusses with ½" per foot slope.
    b. ¾" Plywood decking.
    c. Double layer of perimeter 2x4" nailers.
    d. ½" Plywood backer boards applied to all vertical surfaces to receive membrane flashing from roof deck to reglet on masonry walls and full height on framed wall.
    e. Reglets cut into horizontal masonry joints 8" min. above the finished roofing at common wall and First Street façade to receive 2-part metal counter flashing.
    f. (2) Layers of 1½" thick polyisocyanurate insulation board for a total thickness of 3" with staggered joints set in insulation mastic.
    g. ¼" Securock cover board set in insulation mastic.
    h. 60 mil EPDM roofing membrane – fully adhered.
    i. 60 mil EPDM membrane flashing – adhered to plywood backer boards and terminated with 1" continuous aluminum termination bars secured at 8" on center.
    j. 2-piece pre-finished steel counter flashing to protect upper edge of membrane flashing.

iii. One 12'w x 10'h overhead operating door.
iv. One 3'x7' insulated steel man door.
v. One 3'x7' aluminum framed storefront door set in one 6'-4"w x 8'-4"h aluminum framed glazed storefront with 3'-2" radius aluminum framed arch-top.
vi. Insulation.
vii. Metal liner panels on interior.
viii. 6" reinforced concrete slab.
ix. Open shop area.
x. 12' x 8' office.
xi. Single-user handicap accessible restroom.
xii. Secure tool storage room.
xiii. Radiant heat over shop area.
xiv. Forced air furnace/AC for office/restroom.

e. Repair Masonry.
    i. Tuck point masonry of common wall with two-story section of building.
        1. Leave repaired masonry within the interior of the new building exposed.
        2. Apply stucco coating with a drainage layer and vents to repaired masonry above new roofing.
    ii. Tuck point masonry on First Street façade.
        1. Cover repaired masonry on roof side of parapet entirely with roofing membrane flashing.
        2. Cover repaired masonry on building interior to match adjacent wall finish.
        3. Replace existing vertical siding and framing in three of the arched openings at the façade with new framing, insulation, and panels.

f. Patch any openings made in pavements for underground utility connections.

COMMENTARY

Of the three strategies considered for this report, the first strategy requires the smallest initial investment by the Village, only about $130,000.00. This investment will stabilize the existing building and keep the water out, but it does nothing to improve the space for use as a maintenance facility for Village equipment. The floor slab will remain uneven. The toilet facilities will remain what they are. Heating and cooling will remain as it is currently provided.

The second and third strategies both involve demolition of all or part of the existing building, and construction of a new maintenance building, either as a stand-alone structure on a new site (Strategy #2) or as a new structure built behind the 1st street façade of the existing building (Strategy #3). The cost estimates for these two strategies are separated by only about $4,000.00, making them virtually equal.

Neither Strategy #1 nor Strategy #2 addresses the condition of the masonry in the two-story section of the building, except for in the common wall. (Repair of the masonry in the common wall is an element in all three strategies.) All of the masonry in both the one-story and two-story sections of the building would benefit from repair and restoration work.

Respectfully submitted,

Larry Niegowski, AIA, LEED AP
The Upchurch Group, Inc.
architects engineers surveyors
123 North 15th Street
Mattoon, IL 61938
(217) 235-3177
lniegowski@upchurchgroup.com

LICENSED ARCHITECT
LAWRENCE D. NIEGOWSKI
001-019687
STATE OF ILLINOIS
EXP. 11/30/2018

Google Maps

Hammond

Village Maintenance Building - 103 East 1st Street - Village of Hammond, IL

Imagery ©2018 Google, Map data ©2018 Google 50 ft

NORTH

PHOTOS

1. South wall interior at overhead door.

2. At overhead door in south wall.

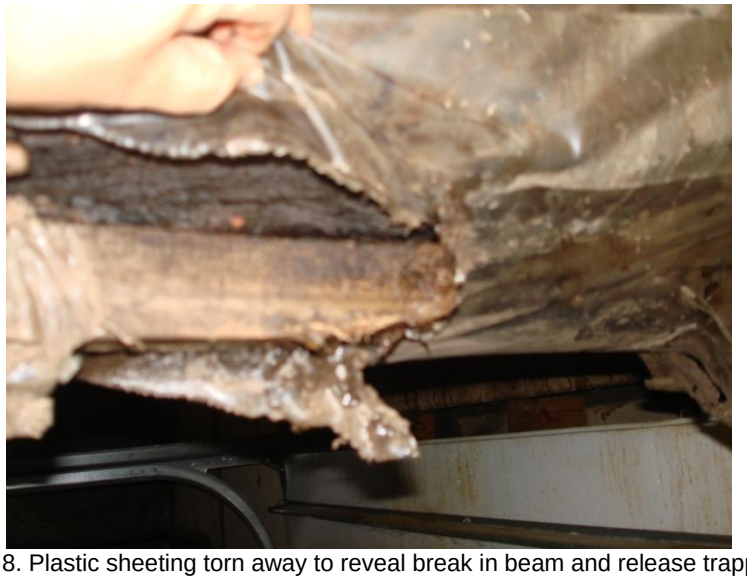
3. Detail view of collapsed ceiling above overhead door.

4. Detail view of broken beam.

5. Beam supported by steel frame.

6. Broken beam apparently bearing on and deforming header above overhead door.

7. Fasteners at west end of header above overhead door pulling out of jamb framing.



8. Plastic sheeting torn away to reveal break in beam and release trapped water.


9. Plastic sheeting torn away at break in beam.


10. Rotted wood and corroded fasteners revealed at break in beam.

11. Roof eave distorted by collapse of beam and roof deck.

12. Depression in roof above broken beam filled with water.

13. Blisters across surface of roof.

14. View of roof from north (high side) to south (eave side).

15. Roof eave distorted by collapsed beam and decking now drains up-hill.

16. Membrane flashing, pulled away from parapet, has become brittle. Breaks in the flashing are large enough for small animals to enter.


17. Membrane flashing pulled away from parapet, brittle, and broken.


18. Composite view of E. wall of second story.


19. Composite view of the upper part of the east parapet.

20. Composite view of the lower part of the east parapet.

21. Detail view of membrane flashing at 2nd story wall.

22. Detail view of 2nd story parapet condition.



23. Detail views of disused masonry chimneys at east parapet.


24. View north along east parapet.


25. 1st Street façade (North).


26. Cornice detail at one-story section of building, 1st Street façade.


27. Cornice detail at one-story section of building, 1st Street façade.


28. Masonry condition detail at one-story section of building, 1st Street façade.


29. Masonry condition detail at one-story section of building, 1st Street façade.


30. Masonry condition detail at one-story section of building, 1st Street façade.


31. Masonry condition detail at one-story section of building, 1st Street façade.


32. Masonry condition detail at one-story section of building, 1st Street façade.


33. Masonry condition detail at one-story section of building, 1st Street façade.


34. Masonry condition detail at transition from one- to two-story sections of building, 1st Street façade.


35. Masonry condition detail at two-story section of building, 1st Street façade.

36. Masonry condition detail at corner of building, 1st Street façade.

37. Masonry condition detail at corner.

38. East wall viewed from south (left) and from north (right).

39. Composite view of 2nd Street façade (South).

40. Detail of one-story to two-story junction, building's south side.

41. Building viewed from southwest.

42. Don Ryan Street façade (West).