STRUCTURAL CONDITION ASSESSMENT

NEWTON PUBLIC LIBRARY

720 NORTH OAK

NEWTON, KANSAS

November 2009

PREPARED BY:

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OF
NEWTON PUBLIC LIBRARY
720 NORTH OAK
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EXECUTIVE SUMMARY

The existing library building at the northwest corner of Military Park is being investigated for possible future improvements. The existing structure is performing adequately and is in good condition. The exterior building envelope needs maintenance and repair to keep moisture out of the building. The existing flashing and waterproofing at the north and south walls of the original building have failed and allow moisture to penetrate the interior of the building. The roof drainage at the east addition poses a code problem should the primary drains become blocked and allow water to accumulate on the roof.

INTRODUCTION

The purpose of this report is to establish the general condition of the existing building structure so that informed decisions with regard to the costs associated with repair, reinforcing, or replacement can be made.

SCOPE OF INVESTIGATION AND ASSESSMENT

The scope of this investigation is limited to visual observations made on November 20, 2009, a review of existing constructions documents that were made available to us, and limited computational analysis of the major structural elements.

Four sets of construction drawings were made available to us by Gossen Livingston Associates, Inc, Architects. These sets include the original building drawings as prepared by Carmichael-Wheatcroft & Associates, Architects and Engineers, Wichita, Kansas, dated October 5, 1971, drawings for the east addition as prepared by Carmichael/Associates, P.A., Architecture, Wichita , Kansas, dated November 9, 1979, drawings for an interior remodel as prepared by Prigmore Krievins, Architects, Newton, Kansas, dated November 26, 1997, and drawings for a restroom remodel as prepared by Prigmore Krievins, Architects, Newton, Kansas, dated September 8, 1998. The original drawings dated 1971 are sealed but contain a hand written note stating, “APPROVAL SET NOT FOR CONST. USE.” The structural portion of the original drawings appears to be incomplete as a number of structural members are not included in the set.

Additional drawings, in the form of precast shop drawings, were obtained by our office from the archives of Prestressed Concrete Inc., a local precast supplier. The precast shop drawings are dated March 14, 1972.

Measurements were taken to determine approximate member sizes, spans, and deflected shapes using measuring tapes, string lines, and hand levels. Limited computational analysis of the structural members was performed to determine their capacity for current building code loading. Assessment of the structural materials by testing is not included in this investigation.

DESCRIPTION OF THE STRUCTURE

The current Library building is sited at the southeast corner of North Oak Street and East Seventh Street in Newton, Kansas. The building consists of two distinct areas defined by the type and age of construction.

ORIGINAL BUILDING

The first area of the library is the original building with plan dimensions of approximately 120 feet in the east/west direction and 84 feet in the north south direction. The original building is a one-story structure with a full basement. There is an interior stair at the east side of the building that extends 13 feet to the east and is approximately 23 feet in the north/south direction. The stair area is centered along the east wall.

The roof structure of the original building consists of 24 inches deep prestressed concrete double tees with a cast-in-place insulating concrete fill and topping slab. The double tee members span approximately 28 feet in the north/south direction and are supported by cast-in-place, reinforced concrete beams at the perimeter of the building and two interior beam and column lines. The perimeter spandrel beams are L-shaped and they are exposed to the exterior. The interior cast-in-place concrete beams are inverted tee beams and they span approximately 24 feet between cast-in-place reinforced concrete columns. The exterior walls are brick cavity walls consisting of brick units at the inside and outside wythe. The original drawings indicate a nominal 2 inch cavity between the brick wythes that is filled with insulation.

The first floor structure is similar to that of the roof. A three inch thick concrete topping slab is placed over the 24 inches deep prestressed concrete double tee members. The double tee members are supported by cast-in-place inverted tee beams along the two interior column and beam lines and by the basement walls at the north and south walls. The basement walls are reinforced cast-in-place concrete. Building sections in the original drawings indicate that the foundations consist of conventional spread footings bearing on native soils. However, footing sizes and reinforcing were not included in the drawings.

The lateral force resisting system for the original building appears to be a concrete frame with unreinforced masonry infill or Building Type C3 in accordance with the designations of ASCE 31-03, *Seismic Evaluation of Existing Buildings*. The original building was constructed in 1972 which is prior to any benchmark model building seismic design provisions for this building type.

BUILDING ADDITION

The second area of the library is the east addition. The east addition has plan dimensions of approximately 55 feet in the east/west direction and 70 feet in the north/south direction. The addition is adjacent to the stair of the original building on the stair's east and west sides. The south wall of the addition extends approximately 17 feet to the south of the original building. The addition is a one-story structure with a slab-on-grade first floor.

The roof structure consists of 1 ½ inch, narrow rib, metal roof deck supported by steel joists. The open web steel joists are 24 inches deep and span between exterior load bearing masonry walls at the east and west walls. Additional support for the joists is provided by two, north/south, steel beam and column lines located adjacent to the east walls of the original stair and the east wall of the original building. The exterior walls are brick cavity walls consisting of brick units at the inside and outside wythe. The original drawings indicate a nominal 2 inch cavity between the brick wythes that is filled with insulation. There are 2-#5 reinforcing bars in a 10 inch wide grout space at approximately 9 feet on center in the wythe at the load bearing east and west exterior walls.

The first floor is a concrete slab-on-grade. Foundations are reinforced concrete stem walls and pedestals supported by shallow spread footings bearing on native soils.

The lateral force resisting system for the building addition appears to be an unreinforced masonry building or Type URM in accordance with the designations of ASCE 31-03, *Seismic Evaluation of Existing Buildings*. The building addition was constructed in 1979 which is prior to any benchmark model building seismic design provisions for this building type.

OBSERVATIONS AND THEIR SIGNIFICANCE

ORIGINAL BUILDING

1. The roof and floor framing members have no noticeable sag or deflection and appear to be performing adequately.

2. Some cracking of the floor slab was observed in the basement mechanical rooms. The cracks appear to be old and may be shrinkage cracks from the original slab placement. See Photos 1 and 2. The cracks did not appear to have any vertical offset.

3. Some cracking of the exterior concrete basement walls was observed at the south wall. See Photos 3 and 4. The crack at Photo 3 is near an opening to an exterior area way. These cracks appear to be newer than the paint on the wall indicating some movement of the wall since that time. There was no staining around the crack that might indicate moisture infiltration.

4. Moisture infiltration at the exterior basement walls was noted as a concern by library personnel. The existing lower wall detail and window sill detail appear to be allowing moisture to enter the basement or collect on the first floor slab. The source of water could be leakage of the lower wall and window flashing or wicking through unsealed joints. See Photos 5 through 9. A more thorough review of the existing conditions at the base of the wall and window should be conducted by an Architect qualified in building waterproofing.

5. There are a number of open masonry joints in the exterior walls. Open horizontal joints occur at the top and bottom of the brick infill walls and open vertical joints occur between the brick walls and cast-in-place concrete columns. See Photos 6, 8, 9, 10, 11, 12, 13, and 14. These joints allow water access to the walls. Moisture within the wall can freeze and the repetitive freeze and thaw action will cause the masonry to crack. Additional cracks will allow additional moisture to enter the wall and will result in an increasing rate of masonry deterioration. Additionally, the moisture may be finding a pathway to the basement area or the moisture may collect at the first floor slab. The open joints should be rehabilitated and properly sealed.

6. Some cracking of the exterior concrete sill was observed. See Photos 7, 8, and 15. These cracks may allow water to enter the wall. The water entering the wall must exit at another location and this can be on the inside or outside of the building. Moisture within the wall can freeze and the repetitive freeze and thaw action will cause the concrete cracks to expand. Additional cracks will allow additional moisture to enter the wall and may result in an increasing rate of concrete deterioration.

7. A window flashing at the south side of the building has been reworked to include a gutter that directs water to the splash block at the north end of the window. The gutter is full of leafs and has been repeatedly hit by mowing equipment so that it may not function as designed. See Photo 16. Improved window flashing details should be installed to replace the gutter system.

8 Several slabs adjacent to the building or the area way wall have open joints that can allow water to enter the joints. See Photos 9, 17, 18, and 19. Water in the joint can freeze and the repetitive freeze and thaw action will cause the slab joints to expand and potentially move the slab away from the building. Additionally, water may pass through the joint and could find a pathway into the basement. Some of the joints have plant material growing in them. The joints should be cleaned out and properly sealed to prevent moisture infiltration.

9. Leafs at the bottom of the stair area way can potentially block the area way drain resulting in flooding of the basement through the adjacent door. See Photo 20. Clean the area way of foreign materials to prevent drain blockage.

10. There is a diagonal crack in the south retaining wall of the exterior stair. See Photo 21. The crack appears to be tight at this point in time. Monitor the crack for a worsening condition and consider repairs if the crack worsens.

11. Site drainage away from the building is poor. The splash blocks at the downspouts lack adequate slope to direct water away from the building. See Photo 22. There is evidence of water collecting adjacent to the splash block. Re-grade the perimeter of the building to provide good drainage. Common recommendations are for a 5 percent slope for the first 10 feet from the building except where handicap accessibility is required.

12. There is a climbing vine at the northeast corner of the building that is attached to the wall. See Photo 23. The vine roots in any crack or crevice it can find and then grows to fill any voids. This allows moisture to enter the wall and potentially begin the freeze thaw action that can result in deterioration of the building materials. Remove all vegetation from the exterior walls and repair any damage to the wall and joint sealants.

13. The roof membrane is a modified bitumen material and there are a number of bubbles in the system. See Photos 24 and 25. Review the roof condition with a qualified waterproofing consultant and repair or replace the roofing as recommended.

14. There is a masonry screen wall around the cooling tower on the roof. The steel angle lintel above the access opening at the east side is rusted at the south bearing. Rusting is a chemical process that causes the steel to expand. The expansion of the horizontal leg of the angle is large enough to crack the masonry pilaster and fail the bearing below the lintel. See Photo 26. The lifting action caused by the rusting has caused the entire lintel to rotate and has resulted in a long horizontal crack in the joint adjacent to the lintel. See Photo 27. The cracks extend through the joint to the outside face of the masonry. See Photos 28 and 29. Replace the rusted lintel with a new lintel that is hot dip galvanized and avoid damaging the galvanizing during installation. Repair the adjacent masonry.

BUILDING ADDITION

15. The roof framing members have no noticeable sag or deflection and appear to be performing satisfactorily. However, there was a soft, spongy, area in the roofing near the south east roof drain that may be indicative of water damage to the underlying roof insulation.

16. In general, the in-place structure is consistent with the 1979 drawings. One exception is the size of the steel roof joists adjacent to the original building. The joists in the first bay from the original building are 24 inches deep and match the depth of the joists in the adjacent bay to the east. The 1979 drawings indicate these joist to be 10 inches deep.

17. The existing foundations appear to be performing satisfactorily. No noticeable settlement or cracking of the exterior brick was observed.

18. The exterior precast concrete veneer is weathered and shows signs of deterioration. There are a number of cracks in the sides and surface of the precast units. See Photos 30, 31, and 32. These cracks may allow water to enter the precast unit. Moisture within the precast unit can freeze and the repetitive freeze and thaw action will cause the concrete cracks to expand. Additional cracks will allow additional moisture to enter the wall and may result in an increasing rate of concrete deterioration.

19. Some of the precast units have exposed reinforcing or connection elements that are rusting. See Photos 31and 33. The rusting action results in expansive forces that will induce forces within the concrete that result in cracks. The cracks may allow water to enter the precast unit and set up the freeze thaw action that results in material degradation.

20. Many of the sealant joints around the precast units are cracked and leaking. See Photos 30, 31, 34, 35, and 36. Failure of the sealant allows water to enter the wall. The water entering the wall must exit at another location and this can be on the inside or outside of the building. Moisture within the wall can freeze and the repetitive freeze and thaw action may result in movement and/or cracking of the precast veneer or the masonry backup. Several of the lower precast vertical units appear to be pushed out away from the building. See Photos 34 and 36. This may be indicative of a possible connection failure within the wall system.

21. A continuous steel angle is being used to support the horizontal precast veneer at the top of the exterior wall. The steel angle is rusting and the rust is staining the brick. See Photo 37. There is no drip designed in the bottom surface of the precast. Water runs down the face of the precast and returns the corner to the steel lintel.

22. The exterior brick at the east wall has mold or fungi growing on the mortar joints. See Photo 38. This may hold water and result in potential deterioration of the mortar as water is allowed to enter the mortar and begin the freeze thaw action. The masonry should be cleaned and sealed to prevent future growth.

23. The sealant at the joint between the original building and the building addition is cracked and leaking. See Photo 39. The joint design should be reviewed to accommodate building movement and the sealant replaced to prevent moisture and air infiltration.

24. The top of wall flashing at the joint between the original building and the addition appears to be terminated with a butt joint. Roofing mastic has been placed over the remaining crack to seal the joint. See Photo 40. A more flexible joint is required at this location due to the differential movement of the different structures. The flashing should be redesigned to accommodate the movement.

25. There is a climbing vine at the northeast corner of the building addition that is attached to the wall. See Photo 41. The vine roots in any crack or crevice it can find and then grows to fill any voids. This allows moisture to enter the wall and potentially begin the freeze thaw action that can result in deterioration of the building materials. Remove all vegetation from the exterior walls and repair any damage to the wall and joint sealants.

26. Bricks are used to form the window sills and the mortar between bricks is showing signs of deterioration where water, snow, and ice can collect on the horizontal surface. See Photo 42. The damaged joints can be repointed with new mortar.

27. The existing site drainage is poor. See Photos 34 and 43. There is evidence of water collecting in a low spot at the south east corner of the addition. The soil adjacent to the south wall appears to slope towards the building. Re-grade the perimeter of the building to provide good drainage.

Common recommendations are for a 5 percent slope for the first 10 feet from the building except where handicap accessibility is required.

28. Sidewalk pads at the exterior doors have open joints adjacent to the building that can allow water to enter the joints. See Photos 44 and 45. Water in the joint can freeze and the repetitive freeze and thaw action will cause the slab joints to expand and potentially move the slab away from the building. Additionally, water may pass through the joint and could find a pathway to the foundation. Some of the joints have plant material growing in them. The joints should be cleaned out and properly sealed to prevent moisture infiltration.

29. The grade adjacent to the east side of the building addition has settled and compromised the bearing for the slab at the exterior door. See Photo 45. Compact new fill in the voids below the slab and adjust the grade at the perimeter of the slab to provide adequate drainage away from the building.

30. Roof drainage at the southeast roof drain is compromised by debris that has built up around a piece of hardware cloth that has been installed to correct a broken roof drain cover. See Photo 46. There is evidence of some ponding around the roof drain. Clear the debris to allow free flow of rain water at the drain. Replacement of the broken roof drain cover is recommended.

31. A mopped sealant joint where the modified bitumen roofing makes a transition from the original building to the addition has raised edges and poses a potential roof leak. See Photo 47.

32. The roofing transition from the original building to the building addition consists of a section of the modified bitumen roofing placed over the joint. See Photo 48. The construction drawings for the building addition indicated a roof expansion joint that would allow for differential movement between the original building and the addition. The current roofing does not allow for much movement between the different structures of the original building and the addition. It is likely that the structures of the original building and the building addition will move differently when subjected to wind loads or temperature changes. Even though the roofing appears to be performing satisfactorily today, future differential movement may cause the roofing membrane to tear and result in a leak. Installation of a roof joint that is designed to accommodate building movement is recommended between the original building and the addition.

33. There doesn't appear to be any overflow drains or scuppers. If the two primary roof drains become blocked it is possible for water to pond on the roof due to the raised edge at the perimeter of the roof. Overflow drains or scuppers are recommended to prevent possible overloading of the structural roof system caused by ponding water.

COMPUTATIONAL ANALYSIS

Structural calculations were performed to determine the approximate capacity of the existing structural members for today's design roof and floor loads.

The floor and roof members of the original building appear to be designed for a live load of 150 psf as is required by current building codes for a library occupancy containing stacks. The drawings for the original building indicated the longitudinal reinforcing for the roof beams only. Details for the reinforcing of the floor beam members was not available The analysis of the cast-in-place concrete roof beams using the indicated reinforcing indicates that the roof is capable of supporting approximately 150 psf. This is in excess of the code required design roof live load and snow loads. An analysis of the first floor beams was not performed due to the lack of adequate information. However, the floor member sizes appear to be the same as that of the roof suggesting that the floor may be adequate for the same 150 psf live load.

The roof framing at the building addition was checked for code required roof live load and snow load. The analysis indicates that the roof framing members are adequate for the typical roof live and snow loads. However, the lack of overflow roof drains or scuppers could result in water accumulating on the roof of the building addition if the primary drains become blocked. Analysis of the accumulated rainwater load on the roof indicates that the steel roof joists would be overloaded by the weight of the water and could fail.

Analysis of the lateral wind and earthquake loadings indicate that today's code required earthquake forces govern the lateral system design. Building earthquake design was not prevalent at the time that the original library and its addition were designed and the existing lateral force resisting system may be weak for today's required loadings. The structure of the original building and the addition appear to have a complete lateral force resisting system even though some of the mechanisms for force transfer may be by indirect means.

CODE CONFORMANCE

Our observations and computational analysis of the structure indicate that portions of the structure do not conform to today's model building codes. The existing roof at the addition was not designed for the effects of rain water accumulating due to a blocked primary roof drain as is required by Chapter 8 of ASEC 7-05, *Minimum Design Loads for Buildings and Other Structures*. Additionally, the existing structures do not conform to the requirements for benchmark buildings for model building code seismic design provisions of ASCE 31-03, *Seismic Evaluation of Existing Buildings*.

It is recommended that any remodeling of the building conform to the greatest extent possible to the current model building code. The model building codes allow for some leeway in the acceptance of existing structures that appear to be performing satisfactorily even though structural analysis indicates code deficiencies. Roof and floor systems should be reinforced for the code required gravity roof and floor loads. Reinforcing of the existing lateral force resisting system for wind and earthquake forces is considered optional by most building codes.

FINAL ANALYSIS AND RECOMMENDATIONS

In general, the structure of the existing Library Facility is performing adequately and is in good condition. There are structural deficiencies in the gravity framing of the roof at the building addition due to a roof drainage problem and at a lintel above the access opening at the screen wall surrounding the roof top cooling tower. Additionally, the lateral force resisting system is deficient by today's standards. The main issue facing the continued use of the facility is the migration of moisture into the building through a number of access points, including failed sealant joints, failed flashing, leaky windows, and poor site drainage.

The following are recommendations for repair and reinforcing of the existing structure:

1. Initial steps should be taken to prevent moisture from infiltrating the building and the structural members. Moisture is the primary cause of building and structure deterioration. Proper maintenance of the building envelope is critical to the preservation and performance of the existing structure.

2. The existing roof membrane should be inspected by a qualified roofer and a condition assessment should be made. Structural movement at the joint between the original building and the building addition should be accommodated in any roofing modifications. Bubbled roof areas should be repaired or replaced.

3. A new sloped roof structure with overhangs at the eave could be considered for construction over the existing structure to provide better moisture protection for the exterior walls and windows. The

new roof could also eliminate the potential for ponding roof water at the building addition area and mitigate a building code deficiency.

4. Significant areas of the existing masonry walls require new joint sealants where abutting concrete columns, beams, or precast concrete elements.

5. The detail at the first floor double tee bearing at the north and south walls should be investigated for leakage. A waterproofing system should be considered to protect the joints between building materials where possible leaks can occur.

6. Flashing details at the sill of the windows should be reviewed and improved to prevent water from leaking into the building.

7. Sidewalk joints adjacent to the building should be sealed and maintained to prevent water from entering the joints and migrating to other areas.

8. Exterior site drainage should be reviewed and improved to provide positive drainage away from the building. Do not allow water to pond adjacent to the building.

9. Replace the angle lintel at the roof mechanical screen opening with a new hot dip galvanized lintel angle. Repair the masonry at the lintel bearing and above and adjacent to the lintel.

10. Remove the rust from the perimeter precast support angle at the perimeter of the building addition and provide a long lasting protective coating. Place a drip edge at the bottom of the precast to prevent water from traveling along the bottom of the precast and into the lintel or the joint below the lintel.

11. The existing brick window sills should be repointed.

12. Remove all vegetation from the exterior masonry walls and repoint the masonry where damage is found.

13. Review the condition of the exterior precast units at the building addition for possible repair or replacement based on the most economical long term solution.

14. Monitor the existing basement and retaining wall cracks to determine if the cracks are actively moving or stable and if the cracks allow moisture to enter the wall. Seal the cracks with the appropriate sealant for the crack condition to prevent moisture infiltration. Consult an engineer for additional evaluation if the cracks are found to be actively moving.

15. A statement was made during the onsite investigation that perhaps the roof structure was designed for an additional future floor. This condition could not be confirmed or denied based on the information made available at this time. A more thorough review of possible sources of additional original drawings with a later date than those reviewed could reveal more information on which to base an analysis of the roof, column, wall, foundation, and footing for confirmation of the roof structure to support a future floor.

This facility is a good candidate for continued structural use and could be structurally evaluated and rehabilitated to meet current model building codes. Further evaluation and rehabilitation of the building's lateral force resisting system is recommended as part of any remodeling plans. Additionally, a plan to solve the moisture infiltration into the building should be a critical part of any improvement plan. The costs of any improvement plans must be weighed against the costs of new construction. Once rehabilitated the building may require higher maintenance costs than newer types of construction. These points need to be considered but there are also advantages in preserving and in the reuse of an existing building.

This assessment has dealt primarily with structural issues. There are other issues including mechanical, electrical, plumbing, handicap accessibility, etc. that must be considered when making decisions with regard to this facility. Attached are photographs that support our observations and recommendations. Also attached is a CD containing all photographs that were taken during our site visits. If you have any questions or we can be of further assistance, please do not hesitate to call.

Sincerely,

Dudley Williams and Associates, P.A.

By: Mark Hodges, P.E.

Attachments

PHOTO 1
SLAB ON GRADE CRACKING AT BASEMENT

PHOTO 2
SLAB ON GRADE CRACKING AT BASEMENT

PHOTO 3
BASEMENT WALL CRACKING NEAR AN AREAWAY OPENING

PHOTO 4
BASEMENT WALL CRACKING NEAR AN AREAWAY OPENING

PHOTO 5
WINDOW FLASHING/MASONRY JOINT FAILURE

PHOTO 6
NORTH AREAWAY CONSTRUCTION JOINT AT
DOUBLE TEE BEARING

PHOTO 7
CRACKED AND OPENED CONSTRUCTION JOINT

PHOTO 8
SEALANT FAILURE AT BOTTOM OF BRICK

PHOT0 9
OPEN SLAB JOINT - RAKED MASONRY BED JOINT

PHOTO 10
SEALANT FAILURE (MASONRY TO SPANDREL BEAM)

PHOTO 11
SEALANT FAILURE (MASONRY TO CONCRETE COLUMN)

PHOTO 12
SEALANT FAILURE
BRICK TO COLUMN AND BRICK TO SPANDREL

PHOTO 13
SEALANT FAILURE
BRICK TO COLUMN

PHOTO 14
SEALANT FAILURE
MASONRY TO CONCRETE COLUMN

PHOTO 15
WINDOW FLASHING
CRACKED CONCRETE SILL

PHOTO 16
MODIFIED WINDOW FLASHING WITH
GUTTER TO SPLASH BLOCK

PHOTO 17
PLANT GROWTH IN OPEN SLAB JOINT

PHOTO 18
PLANT GROWTH IN OPEN SLAB JOINT

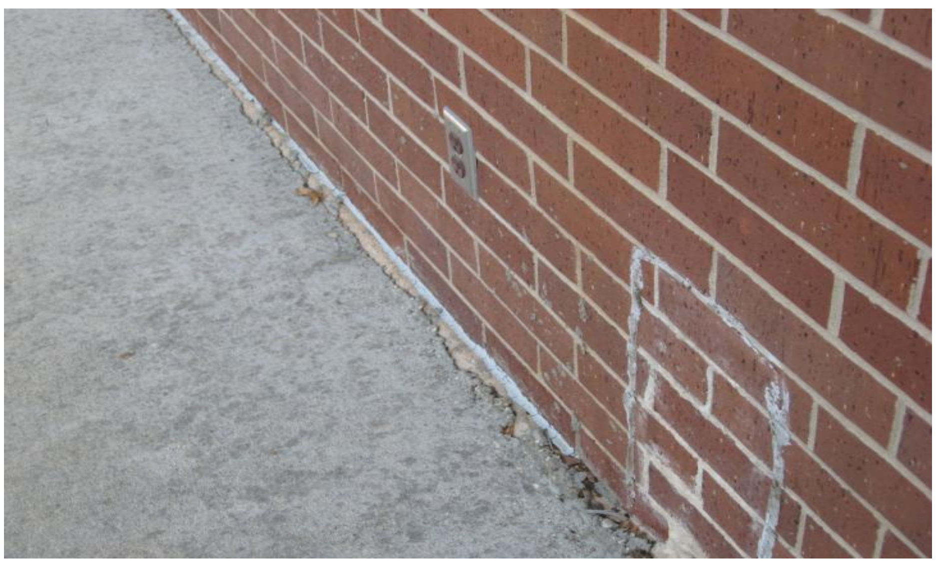

PHOTO 19
POOR SIDEWALK JOINT TO PRECAST

PHOTO 20
BOTTOM OF AREAWAY - POTENTIAL FOR BLOCKED DRAIN

PHOTO 21
CRACKED WALL AT EXTERIOR STAIR

PHOTO 22
SPLASH BLOCK DRAINS TO BUILDING

PHOTO 23
VINES ON BUILDING

PHOTO 24
BUBBLED ROOFING

PHOTO 25
BUBBLED ROOFING

PHOTO 26
RUSTED LINTEL BEARING AND JOINT EXPANSION

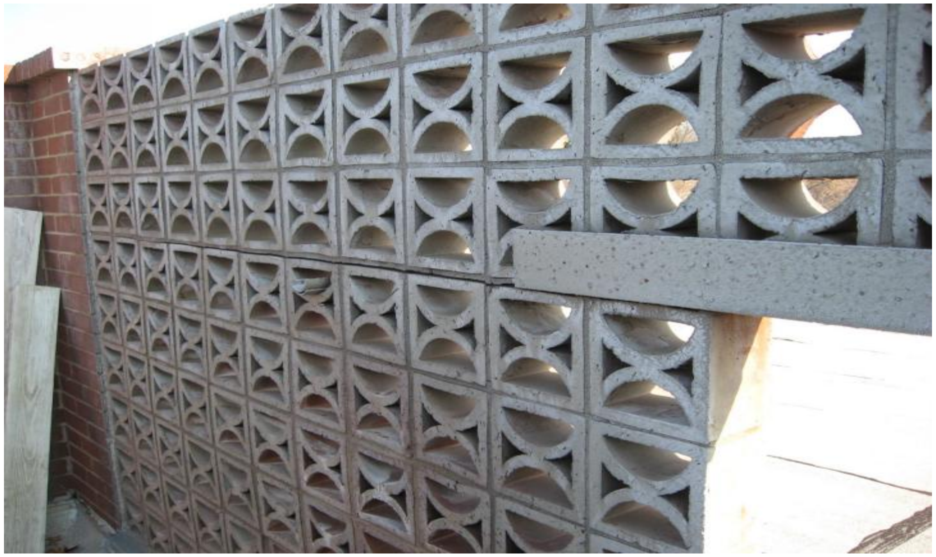

PHOTO 27
CRACKED MASONRY DUE TO LINTEL ROTATION

PHOTO 28
CRACKED PILASTER JOINT

PHOTO 29
CRACKED MORTAR JOINT

PHOTO 30
CRACKED PRECAST VENEER AT ADDITION AND SEALANT FAILURE

PHOTO 31
CRACKED PRECAST VENEER AT ADDITION AND SEALANT FAILURE

PHOTO 32
STAINING OF PRECAST VENEER AT CONCRETE CRACK LOCATIONS

PHOTO 33
EXPOSED AND RUSTING STEEL IN PRECAST VENEER

PHOTO 34
POSSIBLE PRECAST VENEER CONNECTION FAILURE

PHOTO 35
SEALANT FAILURE AT PRECAST VENEER

PHOTO 36
POSSIBLE PRECAST VENEER CONNECTION FAILURE

PHOTO 37
RUSTING VENEER LINTEL (NO DRIP ON PRECAST VENEER)

PHOTO 38
MOLD ON BRICK MORTAR SURFACE

PHOTO 39
SEALANT FAILURE AT JOINT BETWEEN ORIGINAL BUILDING AND ADDITION

PHOTO 40
SEALANT FAILURE AT FLASHING TRANSITION

PHOTO 41
VINES ON SIDE OF BUILDING
SOURCE OF MASONRY DETERIORATION

PHOTO 42
MORTAR DETERIORATION AT WINDOW SILL

PHOTO 43
SITE GRADING AT SOUTHEAST BUILDING CORNER

PHOTO 44
OPEN JOINT AT SIDEWALK SLAB

PHOTO 45
SETTLEMENT OF SOILS ADJACENT TO BUILDING AND BELOW SIDEWALK

PHOTO 46
PARTIALLY BLOCKED AND BROKEN ROOF DRAIN

PHOTO 47
POTENTIAL ROOF LEAK AT SEALANT

PHOTO 48
ROOF TRANSITION BETWEEN ORIGINAL BUILDING AND BUILDING ADDITION