STRUCTURAL CONCEPTS INC.
CONSULTING ENGINEERS

2 May 2018

Mr. Dwayne Wallace
City of Bisbee
118 Arizona Street
Bisbee, Arizona 85603

Subject: Condition Review of Remaining Exterior Walls of
Bisbee City Hall after Fire-Damage
Owner: City of Bisbee
SCI Project Number: 18-127

Dear Mr. Wallace:

In accordance with your request, we have completed our condition review for the remaining portions of the original exterior walls of the Bisbee City Hall building.

A Google-Earth aerial photograph and twenty-six photographs, taken during this review, are attached for reference.

Introduction

The subject building was constructed in 1909 by the Calumet and Arizona Mining Company and has been utilized as Bisbee City Hall since 1974.

The building was a three-story rectangular building including a half-level basement. It was constructed of wood roof framing, concrete exterior walls, concrete basement walls, and concrete floor slabs-on-grade in the basement. At some point in time a two-story CMU (Concrete Masonry Unit) vault was added to the rear (east) side of the building (reference the attached aerial photograph from Google Earth).

A fire occurred within the building on the night of 10 October 2017 and created substantial damage to the building and contents. The building has been unoccupied since that time.

Demolition and clean-up of the site has taken place and this review is intended to determine the condition of the remaining exterior walls to determine if they are adequate for use in rebuilding the building.

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8230 E. BROADWAY BLVD. SUITE W-7 TUCSON, AZ 85710

Field Review and Testing

The following review, observations, and testing were made during the review:

Photographic Documentation

Photographs were taken by Jason Van Deusen of Structural Concepts Inc. (SCI) of both exterior and interior sides of exterior walls and are attached as Photos 1-26. These photographs were taken on 28 March 2018, the same day that Ground Penetrating Radar (GPR) testing was performed to locate wall reinforcement.

Substantial cracking and fire damage was observed at the top portion of the northern wall. Reference Photos 3-5 and 12-14.

Reinforcement Detection by GPR

Ground Penetrating Radar testing was performed on 28 March 2018 to determine location and size of steel reinforcement in the wall exterior walls. This testing was performed by Tom Tiedemann Western Technologies Inc (WTI) and the locations were documented by Jason Van Deusen of SCI in the attached field observation report of the same date. A brief summary of the results follows:

1. Basement floor slab appears to be 5" to 6" thick with no reinforcement.
2. Exterior basement walls are 16" thick with 3/8"-diameter smooth bars at 12" spacing horizontally and vertically. Bars appear to be off center, located approximately three inches from the exterior face of the walls. One bar detected vertically on both sides of door opening and horizontally above door opening.
3. Interior basement walls measured to be 12" thick and have no reinforcement.
4. Exterior walls above grade are 12" thick with 3/8"-diameter smooth bars spaced at 16" horizontally and 12" vertically. Bars appear to be off center, located approximately three inches from the exterior face of the walls. One bar detected vertically on both sides of door opening and horizontally above door opening.
5. Vault addition consists of 8x8x16 CMU walls grouted solid with rebar spaced at 8" horizontally and 8" vertically.
6. Columns at north wall, ground level, measured 24"x24" with three vertical bars detected each face at 8" on center. Horizontal ties were detected at 16" on center.

Concrete Cored and Samples Collected for Testing

A second site visit was performed by WTI on 8 April 2018 to core concrete and collect test specimens. Please refer to the attached report by WTI, dated 25 April 2018, for locations and results. Compression test results in psi (pounds per square inch), for each level, are listed for reference as follows:

Basement: 1680, 980, 3700, 2050, 1840, 1540, 4390, 1650, 3550
1st Floor: 1570, 2460, 1640, 1270, 850, 1710
2nd Floor: 1240, 1320, 1540, 1040, 1100

Finding of Condition

Based on our review the following conditions currently exist for this building:

1. The portions of the northern wall observed to be substantially cracked and damaged by the fire are not adequate for use.

2. The amount of steel reinforcement detected in the existing original walls, where present, is substantially less than minimum reinforcement requirements specified by current building code.

3. Results of compression tests of core samples taken from the building are widely ranging and are typically very low. This indicates concrete of nonuniform quality and generally poor strength.

Based on these conditions, use of the existing original walls for structural purposes in rebuilding will be difficult and require substantial reinforcement by other, new structural means.

Limitations

Please note that the inspection of an existing building requires that certain assumptions be made regarding existing conditions and some of these assumptions may not be verifiable without expending additional sums of money or destroying otherwise adequate or serviceable portions of the building. This report is based on visual observations and there is no claim, either stated or implied, that all conditions were observed.

I hope this report is responsive to your needs. Please do not hesitate to call if you have any questions.

Sincerely,
Structural Concepts Inc.,

George R. Stevenson Jr., P.E., S.E., SECB
Structural Engineer

attachment: Aerial Photograph – Google Earth
Photographs 1 through 26
NDT Results Letter – WTI, 25 April 2018
Field Observation Report – SCI, 28 March 2018

distribution: .pdf copy emailed to: addressee


N (Project North)
118 Arizona St
Tener Ave
Arizona St
Campbell St
Vault Addition
Bisbee City Hall Prior to Fire

1 – West (Front) Side

2 – Northwest Corner

3 – North Side

4 – Close-up of 3

5 – Close-up of 3

6 – East Side at North End

7 – Demolished Wall Opening

8 – East Wall at South End, Vault in Foreground

9 – South Wall

10 – Southwest Corner

11 – West (Front) Side

12 – North Side

13 – Close-up of 12

14 – Close-up of 13

15 – Northwest Corner

16 – West Side

17 – Southwest Corner

18 – South Side

19 – Southeast Corner

20 – Southeast Corner

21 – Southeast Corner

22 – Interior Wall, Close-up of 21

23 – Vault-side of Wall Opening

24 – Vault-side of Wall Opening

25 – North Side of Wall Opening

26– Close-up of Rebar at Wall Opening

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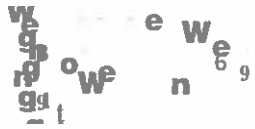

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STRUCTURAL CONCEPTS INC.
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CONSULTING ENGINEERS

STRUCTURAL OBSERVATIONS REPORT

Project No.	Project Name	Date	Page
18-127	CONDITION REVIEW OF REMAINING EXTERIOR WALLS BISBEE CITY HALL	3/28/18	1 of 2
Address		**Arrival Time**	**Weather**
118 ARIZONA ST. BISBEE, AZ		8:00AM	CALM SUNNY
Work Observed	**Dwg/Doc Ref.**	**Observations By**	
EXTERIOR WALLS FIRE DAMAGE	NONE PROVIDED	JASON VAN DEUSEN	

Comments

+ MET ON JOBSITE BY DEWAYNE WALL CITY OF BISBEE WHO PROVIDED A BASKET LIFT AND ACCESS TO BUILDING.

+ OBSERVED TOM TEIDMANN WITH WESTERN TECHNOLOGIES PERFORM PENETRATING RADAR TEST AT SLAB ON GRADE AND WALLS TO DETERMINE DEPTH, WIDTH, AND IF REINFORCING STEEL IS PRESENT.

A) UNABLE TO VISUALLY INSPECT OR TEST BUILDING FOOTINGS

B) SLAB ON GRADE AT BASEMENT FLOOR APPEARS TO BE 5" to 6" THICK WITH NO REINFORCING STEEL DETECTED

C) EXTERIOR BASEMENT WALLS MEASURED AND TESTED 16" THICK CONCRETE WALLS WITH REINFORCING STEEL DETECTED AT 12" VERTICALLY AND 12" HORIZONTALLY PLACED 3" FROM OUTSIDE FACE. (NOT CENTERED). REINFORCING STEEL VISUAL APPEARS TO BE 3/8" DIAMETER SMOOTH BARS. ONE BAR DETECTED EACHSIDE ~~VERTICAL~~ OF DOOR AND WINDOW JAMBS AND 1 BAR DETECTED ABOVE OPENINGS HORIZONTAL. INTERIOR BASEMENT WALLS AT EAST AND WEST VAULT MEASURED AT 12" THICK WITH NO REBAR DETECTED DURING TESTING.

D) ABOVE BASEMENT WALLS FROM ~~GROUND~~ LEVEL TO TOP OF PARAPET WALL MEASURED AND TESTED TO 12" THICK CONCRETE WALLS. REINFORCING STEEL 3/8" SMOOTH BAR 12" VERTICAL AND 16" HORIZONTAL, 3" FROM OUTSIDE FACE OF WALLS. ONE BAR DETECTED EACHSIDE AND ABOVE OPENINGS.

E) EAST OR BACK VAULT IS FROM GROUND FLOOR UP 2 STORY 8"x8"x16" C.M.U. WALLS APPEAR SOLID GROUT WITH REBAR DETECTED AT ~~AS~~ 8" VERTICAL AND 8" HORIZONTAL

F) COLUMNS AT NORTH WALL FROM GROUND LEVEL TO 2ND FLOOR MEASURED 24"x24" CONCRETE WITH

CONTINUE ON PAGE 2

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18-127	CONDITION REVIEW OF REMAINING EXTERIOR WALLS BISBEE CITY HALL	3/28/18	2 of 2
Address		**Arrival Time**	**Weather**
118 ARIZONA ST.		800AM	CALM, SUNNY
Work Observed	**Dwg/Doc Ref.**	**Observations By**	
EXTERIOR WALLS FIRE DAMAGE	NONE	JASON VANDEUSEN	

Comments CONTINUE FROM PAGE 1.

REBAR DETECTED 8" VERTICAL (3 EACH FACE) AND HORIZONTAL TIES SPACED AT 16" HORIZONTAL

G) NO FIRE DAMAGE VISIBLE ON WALLS FROM BASEMENT TO HALF WAY UP 2ND FLOOR WALL. FROM HALF WAY UP 2ND FLOOR WALL TO TOP OF PARAPET WALL SMOKE IS VISIBLE ON FACE OF WALLS BUT TO SMALL TO MEASURE IN FIELD. NORTH WALL FROM ROOF TO TOP OF PARAPET DAMAGE DURING DEMO CLEAN UP. CONCRETE IS CRACKED AND CAVED IN WARD 5" AT DEEPEST MEASURABLE POINT

H) CONCRETE WALL DEMOED FROM BASEMENT LEVEL TO TOP OF WALL FOR ACCESS AT EAST WALL FROM VAULT TO NORTH EAST CORNER.

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