



December 6, 2016

Mr. Matthew S. Hendren  
Parks Superintendent  
City of Norman  
201-C West Gray Street  
Norman, OK 73069

Re: Norman Train Depot Reconstruction Project  
Explanation of Unforeseen Conditions  
Norman, Oklahoma

Dear Mr. Hendren:

Pursuant to your request, Kirkpatrick Forest Curtis PC (KFC) is providing this letter to describe the unforeseen conditions that have occurred on the Norman Train Depot Reconstruction Project and to confirm that Phoenix Construction Services' proposed changeorder to be presented to Council on December 13, 2016 is necessary and in our opinion very fair. Below, we outline the progression of construction activities and field observations that have led us recommend acceptance of this proposed changeorder.

### **History and Background**

The depot is a wood framed, brick clad structure that was originally completed in 1909. It consists of three distinct areas: a south office area of approximately 610 SF, a center waiting area of approximately 1,340 SF and a north porte cochere that covers approximately 380 SF.

Based on an assessment report completed by KFC and The McKinney Partnership on March 8, 2016, we recommended that the south office area be demolished and reconstructed based on the amount of roof wood framing degradation and stud wall degradation in some of the east and west wall studs. We further defined the four gabled parapet areas of the center waiting area be reconstructed above the roof as no definitive degradation below the gable areas were observed.

Bid documents were issued on September 8, 2016 and bids were accepted at 2:00 PM on September 29, 2016 and Phoenix Construction Disaster Services, Inc. was the accepted low bidder. Their contract was approved at the October 25, 2016 City Council meeting. A preconstruction meeting was held on site on Friday, October 28, 2016 and the contractor commenced work the following week.

### **Construction and Unforeseen Conditions**

Major demolition of the south portion of the Depot was completed before November 14, 2016. All of the unforeseen conditions relate to the center waiting area as outlined below.



1. November 16, 2016: During demolition of the west gable, heavy water damage was uncovered at the wall studs and rafters (see Photo 1). Another view of this area was taken on November 17, 2016 (Refer to Photo 5). This area must be repaired to restore the structural integrity of the roof.
2. November 16, 2016: As the south demolition was completed, the southwest and southeast corners were open to view. Stud degradation was initially observed as shown in Photo 2. As this area was opened up further on November 17, 2016, additional water damage was found around the corner on the stud walls and at the rafters of the south gable. See Photos 3 and 4. Photo 6 taken on November 22, 2016 exposes more of the deteriorated rafter at the south gable. These deteriorated wood studs, rafters and sheathing must be replaced in order to restore the load carrying abilities of the roof and walls.
3. November 30, 2016: The southwest wall corner was further exposed. The cedar bracket that supports the roof overhang was really just set in the brick and no direct support to the wall was observed. After the studs are repaired, the cedar beams must be connected with built up joist hanger brackets. Gravity loads in the top beam are supporting on the order of 2,500 pounds at the wall connection. The bottom decorative cedar strut is supporting approximately 2,500 pounds of compression. The rod is anchored to the roof rafters (that are water damaged) via blocking. This connection must be restored. Note that when the contractor shored the point of the bracket, he easily raised the bracket assembly.
4. December 1, 2016: The south gable wall is very unstable, the rafters which needed to be repaired have been removed on the west half; however, the contractor noted that the chimney was leaning 1" to the south for every 4 feet. The multi-wythe brick wall was not well connected as the contractor noted that he did not have to break the mortar bonds with much of the brick, i.e., most of it was already loose. The contractor has temporarily braced the chimney back to the gable. In order to properly repair this wall, the chimney and brick must be torn down below the windows to the low roof flashing point; a concrete beam installed to support a new wood wall, brick veneer and rebuilt chimney. KFC has recommended the contractor take down the chimney as a safety precaution.
5. December 2, 2016: The NW wall corner beneath the gable repairs was observed to have significant water damage as shown in Photo 9. Additionally, the west overhang support beams bear on the brick and are not connected directly into the stud wall. The cracked brick face and mortar cracks show these stress concerns (see Photos 10 and 11). These conditions must be repaired to restore the load carrying abilities of these systems. KFC has recommended that Phoenix provide shores under these roof overhang beams until permanent repairs can be made.

### **Discussion and Recommendations**

Please note that the conditions identified above occur in multiple similar locations. For example, the corner roof overhang bracket condition occurs at four locations. Gable

Mr. Matthew S. Hendren  
December 6, 2016  
Page 3

conditions at the south are expected to be similar at the north (without the chimney) and the west gable conditions similar to the east. Phoenix Construction Services' proposed changeorder is restoring the structural integrity at multiple locations of a 107 year old facility. These repairs are necessary and in our opinion the proposed costs are extremely reasonable.

KFC appreciates the opportunity to be of service to the City of Norman Parks and Recreation. Should you or any members of the Norman City Council have any questions or need additional information, please contact our office at your earliest convenience.

Sincerely,

KIRKPATRICK FOREST CURTIS PC  
OK CA #3888, Exp. 06/30/2017



12-06-2016

Larry E. Curtis, P.E.  
Principal





Photo 1 – November 16, 2016: West Gable Wood Damage Uncovered



Photo 2 – November 16, 2016: Southwest Corner Water Damaged Stud Uncovered



Photo 3 – November 17, 2016: More Water Damaged Studs Uncovered at SW Corner



Photo 4 – November 17, 2016: Water Damaged Rafters at South Gable of Waiting Area



Photo 5 – November 17, 2016: Water Damage at West Gable



Photo 6 – November 22, 2016: Damaged Rafter at South Gable Exposed





Photo 7 – November 30, 2016: SW Roof Overhang Bracket Not connected to Wall



Photo 8 – December 1, 2016: Chimney at South Wall Leaning to South



Photo 9 – December 2, 2016: Water Damaged Studs at NW Corner below West Gable



Photo 10 – December 2, 2016 – Roof Beam Support NW Corner below West Gable





Photo 11 – December 2, 2016 – Roof Beam Support SW Corner below West Gable