



**AEDS / Little Africa Building**

Structural Damage Assessment

Steel Roof Trusses/ CMU Walls

Prepared by:

**Kimley»»Horn**

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**African Economic Development Solutions / Little Africa**

**Structural Assessment for Roof Trusses and Masonry Walls**

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Prepared for:

AEDS / Little Africa  
1821 University AVE  
Suite S-145  
St. Paul, MN 55104

Attention:

Gene Gelgelu

Location:

678 N Snelling Ave  
St. Paul, MN 55104

Prepared by:

Bradley E Severson PE, SE  
767 Eustis Street, Suite 100  
St. Paul, MN 55114

Date:

May 6, 2022

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## REFERENCE DOCUMENTS

## 1.0 INTRODUCTION

In accordance with our agreement, Kimley-Horn has conducted a structural assessment of the steel roof trusses and masonry bearing walls. The structural system of the building consists of masonry perimeter bearing walls with 90'-0" long steel trusses spanning across the building width. The roof decking is supported by wood framing that spans between the trusses. In the front portion of the building a mezzanine level is constructed of wood framing.

In February of 2022, a fire occurred on the mezzanine level of the building at 678 N. Snelling Ave. The fire was limited to the central mezzanine area and significantly burned the wood framing near Truss 1. To evaluate the condition of the steel trusses, seven samples were taken of the three trusses and sent to St. Louis Testing Laboratory for strength and chemical evaluations. As requested by the city of St. Paul the perimeter masonry walls were also reviewed for potential fire damaged conditions.

The opinions and conclusions expressed in this report are based on the site observation and supplemental reports provided by AEDS/Little Africa. This report has been prepared solely for AEDS/Little Africa and contractual partners and the opinions and recommendations provided should not be considered to be final construction repair documents. Any reliance on this report by any party other than the AEDS/Little Africa and contractual partners shall be without liability to Kimley-Horn and Associates, Inc. or their employees.

Please call us at 612-294-9735 if you have any questions.

Very Truly Yours,

KIMLEY-HORN AND ASSOCIATES, INC.



Bradley E. Severson P.E., S.E.  
Senior Structural Engineer  
MN PE Lic # 25498

## 2.0 OBSERVATIONS

### **Roof Trusses:**

The long span roof trusses are constructed of steel angles and plates. The top and bottom chord and diagonal members are double angles. All connection points are made with gusset plates that are typically riveted and then bolted at construction splice points. Relative to the attached truss diagram, the T1 truss, located adjacent to the mezzanine, was closest to the fire with the T2 truss being nearby on the edge of the fire. The T3 truss was farther away and a sample was taken of the angles to act as the control sample for comparison. The diagram provided shows the layout of each truss and the location of the test samples. Samples 2 and 3 were observed to be closest to the center of the fire. The attached test results provide the data for each sample. Photos 1 & 2 are representative of the truss configuration.

For this review the data for the angle members are most relevant for comparison since they carry the primary loads in compression or tension and have the longer unbraced lengths. Considering the age and type of steel used, it was common for the angle shapes to have a higher yield strength relative to that of plate steel due to the rolling process to make the specific shapes. The results of the angle sample testing showed that the yield strengths ranged from 98% to 130% to that of the control sample.

### **Masonry Walls:**

The masonry wall adjacent to the fire was also reviewed. From visual observations it was readily apparent that the primary heat of the fire did not reach the north wall which was closest to the fire. The wall is painted and there were not any indications of paint bubbling on the surface. The wall appears to be dirty from smoke exposure which is typical for fire conditions like this. See Photos 3 & 4 for visual reference.

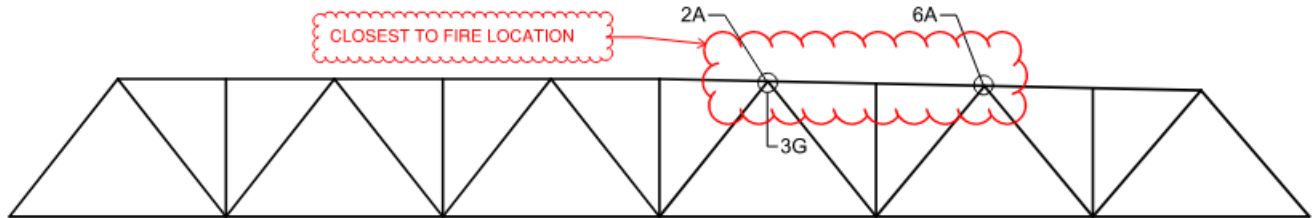
### 3.0 CONCLUSIONS AND RECOMMENDATIONS

The primary focus of this report was to evaluate the condition of the steel trusses and masonry walls. However, the interior of the building and roof decking was constructed of wood framing which was significantly damaged in the fire. There are a few holes in the roof currently that were created by the fire department to vent the fire. All wood framing in the general area should be replaced to fix the roof and mezzanine framing. It is our understanding that a claim has been filed with the insurance company for replacement.

The conclusion of the steel testing report is that the steel roof trusses were not exposed to the fire long enough to cause any damage. The steel trusses can be reused in place when the wood framing is replaced. During the demolition process of removing the damaged wood framing, the lateral stability of the trusses should be maintained. Temporary lateral bracing may be required during the construction process.

The masonry walls adjacent to the fire also appear to be in relatively good condition as they were not damaged in the fire. However, there may be some repairs necessary for future occupancy that are more visible on the exterior of the building that are related to water damage issues. These conditions are not part of this report but should be considered for the proposed upgrades to the property.

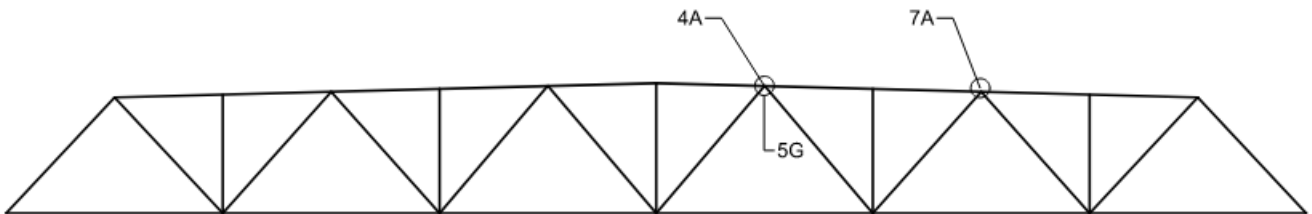
## 4.0 TRUSS DIAGRAM AND TESTING RESULTS



1  
S100

### T1 DIAGRAM

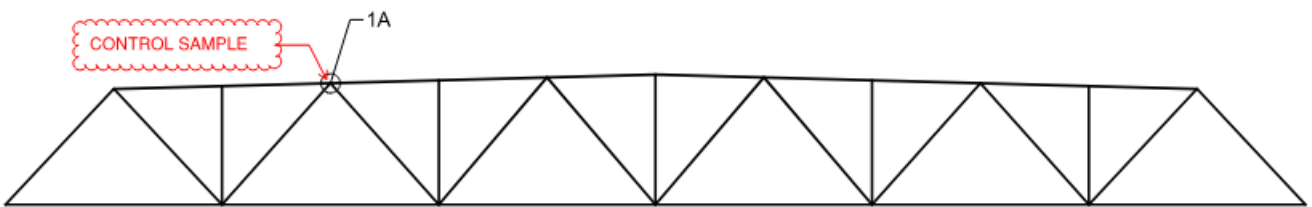
SCALE: NTS



2  
S100

### T2 DIAGRAM

SCALE: NTS



3  
S100

### T3 DIAGRAM

SCALE: NTS

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 Chemical, Metallurgical, Mechanical, Nondestructive, Environmental Testing, Analyses and Field Service.

**AMERICAN ENGINEERING TESTING**  
 550 Cleveland Ave North  
 St. Paul, MN 55114

April 29, 2022  
 WO# P-0189701  
 Invoice No. INSTL19583  
 P.O. No. P-00010917  
 Page 1 of 2

**Attention: Brandon Mikelson**

**REPORT OF MECHANICAL TESTS**

**Sample ID:** Steel Coupons: Samples 1 through 7

Sample ID	Width Inches	Thickness Inches	Area Sq. Inches	Yield Strength PSI	Tensile Strength PSI	Elongation (2.0" Gage Length)		Rockwell Hardness (HRBW)
						In.	%	
Sample 1 <b>A</b>	0.5100	0.2420	0.1234	43000	63100	0.71	35.5	71.6
Sample 2 <b>A</b>	0.5100	0.2490	0.1270	49900	69700	0.50	25.0	77.5
Sample 3 <b>G</b>	0.5100	0.4750	0.2422	33300	55800	0.82	41.0	64.0
Sample 4 <b>A</b>	0.5100	0.2480	0.1265	56500	71700	0.50	25.0	81.3
Sample 5 <b>G</b>	0.5100	0.4750	0.2422	34600	56100	0.77	38.5	62.5
Sample 6 <b>A</b>	0.5100	0.2410	0.1229	42200	60800	0.70	35.0	70.6
Sample 7 <b>A</b>	0.5100	0.2400	0.1224	45000	61200	0.69	34.5	71.5

Rectangular, reduced section tensiles

Yield taken at .2% offset

Tested in accordance with ASTM A370-21 & ASTM E18-20

Identification of tested specimen(s) provided by the client.

**Kimley Horn Notes:**  
 A - Web Angle Sample  
 G - Gusset Plate Sample

See truss diagram for locations.

KS/tz

  
 Karl Schmitz, Director  
 Materials Testing



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 Page 2 of 2

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**REPORT OF ANALYSIS**

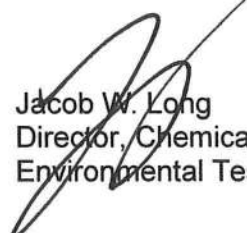
**MATERIAL:** Steel Coupons Samples 2 & 3  
**SUBJECT:** Compositional Analysis  
**TEST METHOD:** ASTM E415-21  
**UNITS:** Percent by Weight (%)  
**METHOD DETECTION LIMIT:** 0.01% for chromium, molybdenum & vanadium

**RESULTS:**

ANALYTE	Sample 2	Sample 3	ASTM A29 Grade 1017
Total Carbon	0.17	0.17	0.15-0.20
Silicon	0.10	0.01	---
Sulfur	0.034	0.033	0.050 max
Manganese	0.41	0.32	0.30-0.60
Phosphorus	0.018	0.007	0.040 max
Nickel	0.01	0.01	---
Chromium	<0.01	<0.01	---
Molybdenum	<0.01	<0.01	---
Copper	0.01	0.01	---
Vanadium	<0.01	<0.01	---
Aluminum	0.01	0.02	---
Iron	Remainder	Remainder	Remainder

Samples meet ASTM A29 Grade 1017 with respect to chemical composition.

*Identification of tested specimen(s) provided by the client.*

  
 Jacob W. Long  
 Director, Chemical and  
 Environmental Testing

JWL/tz

St. Louis Testing Laboratories decision rule is "Simple Acceptance"



## 5.0 SITE PHOTOGRAPHS



**PHOTO #1: View of T1 truss near file location.**



**PHOTO #2: View of north end of T1 truss.**





**PHOTO #3: View of North Wall at T1 support column.**



**PHOTO #4: View of North wall closest to fire location**