### SPECIFICATIONS

1. **PREFINISHED METAL ROOF SYSTEM**
   - **EXISTING STRUCTURE**: The existing structure is a precast concrete building with a flat roof. The building is 100 feet by 100 feet.
   - **EXISTING ROOF SURFACE**: The existing roof surface consists of a 20-year-old rubber membrane roof system.
   - **MEMBRANE FLASHING**: The membrane flashing is made of Kynar-coated aluminum.
   - **SEALANT**: The sealant is a high-performance, acrylic-based, single-component sealant.

2. **ROOF REPLACEMENT**
   - **FIRE HALL 10**: The project is located at 100 1st Avenue W, Duluth, Minnesota.
   - **REPORT**: The report was prepared by Mark R. Usl, P.E., on November 25, 2014.

3. **WALL FLASHING**
   - **EXISTING WALL**: The existing wall is a precast concrete wall.
   - **PREFINISHED MTL DRIP EDGE**: The drip edge is made of prefinished metal.
   - **ICE AND WATER SHIELD**: The ice and water shield is a high-performance, polymer-modified bitumen membrane.

4. **RIDGE / EAVE**
   - **PREFINISHED METAL RIDGE CAP**: The ridge cap is made of prefinished metal.
   - **PREFINISHED MTL REGLET**: The reglet is made of prefinished metal.

5. **CHIMNEY PARAPET**
   - **CHIMNEY PARAPET**: The chimney parapet is a precast concrete wall.
   - **ICE AND WATER SHIELD**: The ice and water shield is a high-performance, polymer-modified bitumen membrane.

### August 8, 2014

Mr. Robert Hunt
City of Duluth Facility Management
1532 West Michigan Street
Duluth, Minnesota 55806

Re: City of Duluth Fire Hall #10 Building - Roof Capacity Review

NCE Job No.: 14-144

Dear Rob,

We have reviewed the structural capacity of the existing roof framing systems at the City of Duluth Fire Hall #10 building located at 1102 Commonwealth Avenue in Duluth, Minnesota.

There are three roof areas on this building, an upper roof area and two lower roof areas. Therefore, there is a potential for drifting snow load on the lower roof areas due to the high/low roof condition. Based on our site visit and roof penetration it appears that the existing roof systems are 6" in depth. We believe there are two roof systems currently on these roofs, a built-up ballasted EPDM roof system was placed on top of an existing built-up roof system.

For all roof areas the existing roof framing system consists of open-web steel joists spaced at 23" on center. The steel joists are 12" in depth and span a distance of 21-4" between masonry bearing walls for the lower roof areas. The upper roof framing system consists of 16" deep steel joists spaced at 22" on center spanning a distance of 26-0" between masonry bearing walls. The ceiling baying is gusset board.

Our structural calculations have determined that the existing roof framing systems have a live (snow) load capacity of 35 pounds per square foot (psf). This capacity does not meet the 42 psf live load requirements, or the 95 psf drifting snow load we calculated for the lower roof areas, based on the current 2007 Minnesota State Building Code adopting and amending the 2005 International Building Code (IBC).

It is our professional opinion that the existing ballasted roofs be removed to the existing steel decking and the new roof system for the upper and lower roof areas on this building consist of a fully adhered EPDM rubber membrane over tappered insulation as required to provide proper roof drainage. This will reduce the net dead load on the existing roof framing system by approximately 6-10 psf. The R-value of the new roof system cannot be increased over the existing roof R-value.

Sincerely yours,

Mark R. Usl, P.E.
Partner

---

**Full Scale**

Date: November 25, 2014

TJB, JPG

Report: 1A-155

Locki-Scalo Arch., P.C.

Owner: City of Duluth

401 W. WASHINGTON STREET
DULUTH, MINNESOTA 55802

**SPECS**

**DATE**

**DRAWN**

**CHECKED**

**PROJECT**

**FULL SCALE**

**A3.0**