PROJECT: Minnesota State University Moorhead
   Holmquist Hall Area B1 & B2

DATE: April 6, 2018

RSI PROJECT #: 18-12687-02

REPORTED TO: Minnesota State University Moorhead
   1004 7th Ave S
   Moorhead, MN  56563

   Attn:  Mr. Mitchell Hogue

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SCHEMATIC DESIGN REPORT

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Project Scope

General:

The project scope consists of the roof replacement of approximately 3,300 sq. ft. of existing fully adhered EPDM and built-up asphalt roofing on Holmquist Hall, Areas B & B1. Work will also include the replacement of the existing drain bowls, raising the existing roof top equipment to accommodate the new insulation thickness, and removing and replacing the deteriorated perimeter edge precast fascia panel. Any obsolete penetrations will be removed from the roof area.

A cursory review of adjacent roof sections A & C was also performed to determine if their eventual roof replacement will require any significant interior alterations.

Existing Roof System:

The existing roof system on area B consists of a fully adhered EPDM membrane installed over multiple layers of rigid insulation and a concrete plank roof deck. The roof system within roof area B1 consists of an asphalt built-up roof membrane installed over minimal rigid insulation and a concrete plank roof deck.

The existing roof areas A & C consist of a Minnesota State standard gravel surface built-up roof over tapered rigid insulation and a concrete roof deck.

New Roof System:

The new roof system for area B will consist of completely removing the existing roof and insulation to the surface of the concrete deck. A 1” perlite insulation and a 2 ply asphalt vapor retarder installed. A 1/8” per foot tapered insulation will be installed prior to installing a 1” perlite insulation cover board and 4 ply gravel surface built-up roof system, all in hot asphalt. The existing roof drains will be replaced with new cast iron drains and strainers. The roof system will have a minimum R value of 35 throughout the entire roof area.

The new roof system for area B will consist of completely removing the existing roof and insulation to the surface of the concrete deck. Since the roofs are exterior canopies and not constructed over conditioned space, a 1” perlite layer will be installed over 1/8” per foot tapered insulation with minimal thickness, and a 4-ply gravel surface will be installed, all in hot asphalt. The existing roof drains will be replaced with new cast iron drains and strainers.

The roof systems for roof areas A & C both have in excess of 10 years remaining on their anticipated service life. The roof drains in these sections are centrally located with overflow accomplished via perimeter scuppers. There is minimal mechanical equipment present on the roof. Roof replacement will not require relocating the drains and interior work would be minimal.
Design Considerations

1. Staging for the project will take place in the parking lot on the east side of roof section B. Temporary staging on the building grounds will be required for the removal and replacement of the west B1 canopy. Staging area will be fenced in during construction and the contractor will protect all existing conditions. All doors accessing the facility will remain open at all times.

2. Portions of the building may be occupied during construction. The primary disruption for building occupants will be noise from the new roof system installation and fumes from the asphalt. Asphalt fumes will be controlled during the project by using a fume recovery system at the tanker. Additionally, shutting down of air intakes will be closely coordinated with the campus during construction.

3. The existing drain bowls are in poor condition and will be replaced as part of the project. Existing roof drains are centrally located and it’s possible to install the new 4 way unobstructed slope drain without relocating the roof drains. Overflow roof drainage will then be accomplished via adjacent perimeter overflow scuppers.

4. The existing drain bowls and rain water leaders are undersized per current plumbing code; the two drains are serving 1,958 and 1,323 square feet, but are capable of serving no more than 822 square feet each. However, since the drains will remain in it is not required of code to update the interior rain water leaders. During heavy rains, the water will discharge through the overflow scuppers and accommodations will need to be made at grade.

5. A new roof hatch and access ladder will be installed at the janitor room, and the obsolete stack and trash chute penetrations will be removed and the roof deck patched.

6. The existing precast aggregate faced fascia at the outside face of the perimeter edge is in a hazardous and deteriorated condition at several locations throughout the building, though in a much more advanced state at Area B. Cracks, spalling, and out-of-plane dislocation was observed.

The base bid will include the removal of the precast fascia throughout roof areas A, B, & C, and replacement with a new precast aggregate faced panel to match existing. The new design will include an air barrier installed to the back-up wall and through wall flashing at the joint between the existing brick and new panel. If the budget will not allow full replacement of the precast fascia throughout the building, the project may only include removal and replacement at area B, and at approximately one-quarter to one-third of the masonry price listed below.

As an alternate to the aggregate faced pre-cast panel, an air barrier and through wall flashing will be installed similar to the base bid, but a composite metal wall panel will
be installed in lieu of the precast panel. This would cut the project cost approximately in half.

In both of the above fascia replacement options, the existing precast coping cap would require removal. The addition of a 4” high CMU block, or possibly stacked wood blocking, would be required due to the removal of the 4” tall coping cap. New sheet metal flashing and coping cap at Areas A & C would likely be necessary.

7. Potential cost saving measures for the removal and replacement of the precast aggregate faced fascia panels would include; salvaging and reusing the existing sheet metal coping cap at Areas A & C, if possible; replacement of precast fascia with face brick to match existing; or, replacement of precast fascia with standing seam metal panels. These options would be explored during Design Development phase.

8. At the Area B1 canopies, the window and masonry flashing heights are too low. In addition, it appears there is no through wall flashing at the masonry walls. MnSCU design standards typically dictate a 12” minimum flashing height, and that window and flashing that do not achieve 12” minimum flashing need to be replaced to provide 30” height above the roof deck. However, as these roofs are only canopies, a variance should be sought to these requirements. We noted that the existing windows remain at the canopy below Area C, and that new through wall flashings were not installed, so there is precedence for the variances.

9. At the east elevation of Area B, a flood light is mounted to the existing precast coping cap, with conduit extending to a wall penetration through the face brick below. The light will temporarily be removed during construction and reinstalled and mounted to the new roof parapet.
Opinion of Probable Construction Costs

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The above estimate assumes the existing precast aggregate fascia panels are replaced in kind, with an added 4” CMU block. If metal composite panels are installed in lieu of precast aggregate fascia panels, the construction cost would drop to approximately $470,000.

The above estimated design fees include window replacement. If a variance is obtained, the elimination of a window consultant would decrease the design, construction administration and construction costs.

**Comments**

Attached please find the Schematic Design Drawings. Please review and provide comments at your earliest convenience. If you should have any questions or require further information, please contact our office. Thank you.

Respectfully,

ROOF SPEC, INC.

Tim Pekron, RRC
Senior Consultant
TP/rk