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Roof Spec Inc.

PROJECT: South Central College
Mankato, MN

DATE: December 14, 2015
14-8273-02

UPDATED PREDESIGN REPORT

GENERAL

This report is an update to the predesign report prepared by Inspec on September 8, 2010. The purpose of this report is to update the previously evaluated roof areas categorized to be reroofed within the next 0 to 5 years. This report revises and updates the design issues and new roofing systems approach, and projects costs associated with reroofing construction to MnSCU standards for planning purposes.

REROOFING DESIGN ISSUES

B Building

Areas B2 and B5

1. The existing deck at Area B2 has little or no structural slope; therefore, a fully-tapered insulation system will be required. The existing deck at Area B5 is structurally sloped deck. A fully-tapered insulation will not be required; however, tapered insulation will be necessary between the primary scuppers at the perimeter of the roof section.
2. The existing parapets will be raised to accommodate the necessary base flashing height required to meet current MnSCU standards.
3. The existing roof drains will be removed and/or relocated and replaced with new roof drains in order to provide a symmetrical and unobstructed drainage layout. Overflow drains and/or overflow scuppers will be installed. This work will require the services of a MnSCU mechanical sub-consultant.
4. The existing mechanical curbs and vent stacks will be raised to accommodate the necessary base flashing height. All associated mechanical/electrical/gas modifications will be incorporated. Mechanical

units will be relocated as necessary to provide a symmetrical and unobstructed drainage layout. This work will require the services of MnSCU mechanical and electrical sub-consultants.

5. Asbestos may be present in the existing four-ply asphalt built-up roof system; therefore, testing should be done at the time of reroofing design to determine if hazardous materials are present. This work will require the services of a MnSCU hazardous materials sub-consultant.
6. There are obsolete penetrations and curbs at isolated locations. Once verified these are no longer in use, they will be removed from the roof area, and the opening in the deck repaired.
7. The existing access ladder will be modified or replaced with a new OSHA-approved access ladder to meet current state and local codes. This work will require the services of a MnSCU structural sub-consultant.
8. The caulking at the existing stone fascia is deteriorated and will be replaced to provide a weather tight fascia condition.

B Building
Areas B6 and B7

1. The deck has little or no structural slope; therefore, a fully-tapered insulation system will be required.
2. The existing parapets will be raised to accommodate the necessary base flashing height required to meet current MnSCU standards.
3. The existing primary scuppers will be replaced with new primary scuppers and downspouts.
4. Masonry cavity wall construction is present; therefore, new double through-wall flashing will be required to provide the necessary base flashing heights required to meet current MnSCU standards. The masonry is rough-faced limestone, which will require special detailing. This will require the services of a MnSCU masonry sub-consultant.
5. MnSCU standards require that skylights be removed and deck replacement or a new clerestory provided. The additional tapered insulation required will make it necessary to raise the elevation of the skylight. This will require modifications to the skylight curbs and repairs to the interior. The skylights would only be considered to have a 20-year life expectancy. If

the skylights are replaced, this work will require the services of a MnSCU window sub-consultant.

6. The existing satellite dish currently mounted to the wall will be removed to make the necessary wall improvements and reinstalled upon completion. It will be verified at the time of roof design, if still in use and if not, will be removed.
7. Asbestos may be present in the vapor retarder; therefore, testing should be done at the time of reroofing design to determine if hazardous materials are present. This work will require the services of a MnSCU hazardous materials sub-consultant.
8. The wall transition to Area F2 will be evaluated as part of the design and possibly covered with underlayment and standing seam sheet metal.

C Building and K Building (Graphic Arts)
Areas C2, C4 and K1

1. The deck has little or no structural slope; therefore, a fully-tapered insulation system will be required.
2. The existing parapets will be raised to accommodate the necessary base flashing height required to meet current MnSCU standards.
3. The existing roof drains will be removed and/or relocated and replaced with new roof drains in order to provide a symmetrical and unobstructed drainage layout. Overflow drains and/or overflow scuppers will be installed. This work will require the services of a MnSCU mechanical sub-consultant.
4. The existing mechanical curbs and vent stacks will be raised to accommodate the necessary base flashing height. All associated mechanical/electrical/gas and cooling line modifications will be incorporated. Mechanical units will be relocated as necessary to provide a symmetrical and unobstructed drainage layout. This work will require the services of MnSCU mechanical and electrical sub-consultants.
5. All obsolete capped curbs, vent stacks, pipe penetrations, and sleeper curbs will be removed and deck replacement provided where necessary.
6. Asbestos may be present in the roofing materials on Areas C2 and C4; therefore, testing should be done at the time of reroofing design to

determine if hazardous materials are present. This work will require the services of a MnSCU hazardous materials sub-consultant.

7. A new OSHA-approved access ladder will be installed on both Areas C2 and C4 to meet current state and local codes and provide better roof access for maintenance procedures. This work will require the services of a MnSCU structural sub-consultant.
8. The existing satellite dishes on Areas C2 and C4 appear obsolete. This will be verified as part of the roof design and they will be removed if not in use.
9. The existing rough-faced limestone masonry wall is cavity wall construction at Areas C2 and C4. New MnSCU standard through-wall flashings will be necessary.

D Building (Heating Plant)

Area D

1. The deck has little or no structural slope; therefore, a fully-tapered insulation system is required.
2. The existing parapets will be raised to accommodate the necessary base flashing height required to meet current MnSCU standards.
3. The existing roof drains will be removed and/or relocated and replaced with new roof drains in order to provide a symmetrical and unobstructed drainage layout. Overflow drains and/or overflow scuppers will be installed. This work will require the services of a MnSCU mechanical sub-consultant.
4. The existing mechanical curbs, heat stacks, sleeper curbs and vent stacks will be raised to accommodate the necessary base flashing height. All associated mechanical/electrical/gas modifications will be incorporated. Mechanical units will be relocated as necessary to provide a symmetrical and unobstructed drainage layout. This work will require the services of MnSCU mechanical and electrical sub-consultants.
5. All obsolete capped curbs, vent stacks, pipe penetrations, and sleeper curbs will be removed and deck replacement provided where necessary.
6. The feasibility of an OSHA-approved access ladder and roof hatch will be reviewed with the facility. This work will require the services of a MnSCU structural sub-consultant.

7. Asbestos may be present in the vapor retarder; therefore, testing should be done at the time of reroofing design to determine if hazardous materials are present. This work will require the services of a MnSCU hazardous materials sub-consultant.
8. The existing stone fascia panel attachment at the southwest corner is coming loose and will be removed and re-secured to the backup wall. This work will require the services of MnSCU masonry and structural sub-consultants.

F Building
Areas F1 and F2

1. The existing concrete double tee deck at the lower roof has no structural slope; therefore, a fully-tapered insulation system is required. The small upper roof has no structural slope; therefore, a fully-tapered insulation system is required at that area.
2. The existing roof drains will be removed and/or relocated and replaced with new roof drains in order to provide a symmetrical and unobstructed drainage layout. Overflow drains and/or overflow scuppers will be installed. This work will require the services of a MnSCU mechanical sub-consultant.
3. The mechanical units and roof penetrations will be raised to accommodate the necessary base flashing heights.
4. The access ladders will be modified or removed and replaced to meet current state and local codes. This work will require the services of a MnSCU structural sub-consultant.
5. A new expansion joint curb will be installed.
6. MnSCU standards require that skylights be removed and deck replacement or a new clerestory provided. This work will require the services of a MnSCU structural sub-consultant. Further discussions can be held between campus facility personnel and MnSCU regarding the option to maintain or replace the skylights with new. The skylights would only be considered to have a 20-year life expectancy. If the skylights are replaced, this work will require the services of a MnSCU window sub-consultant.

7. Relocate satellite dishes onto vertical penthouse walls and relocate conduit to below roof deck. This work will require the services of a MnSCU structural sub-consultant.
8. The walls at the F1 penthouse will be completely covered with underlayment and sheet metal flashing to provide a long-term watertight condition. At penthouses, masonry cavity wall construction exists; therefore, a new reglet will be cut and new through-wall will be installed. This work will require the services of a MnSCU masonry sub-consultant.
9. The small upper roof area has an exhaust chimney, gas lines, and safety grate. Further investigation will be done at the time of redesign to determine if these will need to be modified to meet current state and local codes.

G Building

Areas G1 and G2

1. The existing concrete double tee deck at the lower roof has no structural slope; therefore, a fully-tapered insulation system is required. The steel deck on the radiused upper area has a structural slope of $\frac{1}{4}$ " to $\frac{1}{2}$ " per foot. The small upper roof has no structural slope; therefore, a fully-tapered insulation system is required at that area.
2. The existing roof drains will be removed and/or relocated and replaced with new roof drains in order to provide a symmetrical and unobstructed drainage layout. Overflow drains and/or overflow scuppers will be installed. This work will require the services of a MnSCU mechanical sub-consultant.
3. The mechanical units and roof penetrations will be raised to accommodate the necessary base flashing heights.
4. The access ladders will be modified or removed and replaced to meet current state and local codes. This work will require the services of a MnSCU structural sub-consultant.
5. Relocate satellite dishes onto vertical penthouse walls and relocate conduit to below roof deck. This work will require the services of a MnSCU structural sub-consultant.
6. The walls at the F1 penthouse will be covered with underlayment and sheet metal flashing to provide a long-term watertight condition. At penthouses, masonry cavity wall construction exists; therefore, a new

reglet will be cut and new through-wall will be installed. This work will require the services of a MnSCU masonry sub-consultant.

H Building
Area H1

1. The existing concrete double tee deck has no structural slope; therefore, a fully-tapered insulation system is required.
2. The existing roof drains will be removed and/or relocated and replaced with new roof drains in order to provide a symmetrical and unobstructed drainage layout. Overflow drains and/or overflow scuppers will be installed. This work will require the services of a MnSCU mechanical sub-consultant.
3. The mechanical units and roof penetrations will have to be raised to accommodate the necessary base flashing heights.
4. The lower wall has a sandstone fascia, which may require new through-wall flashing and/or special detailing to provide a long-term watertight condition. This work will require the services of a MnSCU masonry sub-consultant.
5. The access ladder between Areas H1 and B3 will be modified or removed and replaced to meet current state and local codes. This work will require the services of a MnSCU structural sub-consultant.
6. New expansion joint curb will be installed to accommodate building movement on the west side of the lower roof.

NEW ROOF SYSTEM

The following is a general sense of the reroofing construction. Further development will take place when this roof is approved for design.

The performance characteristics and suitability of several roof systems were examined for this project. The built-up system offers the best long-term performance and meets the roofing standards set by the Minnesota State Colleges and Universities. A built-up system would also provide more durability for foot traffic and can be monitored using nondestructive methods. Therefore, we would recommend the use of a built-up roof system.

On B Building Area B2 and the Heating Plant Area D, the roof system will be removed to the existing concrete deck. A base layer of 1" rigid insulation will be mopped in asphalt

to the concrete deck followed by a two-ply asphalt vapor retarder. A new fully tapered rigid insulation system boards would follow topped by a 1" layer of rigid insulation and a four-ply asphalt built-up membrane with gravel surfacing.

On B Building Area B5, the existing roof membrane and insulation will be removed down to the existing structurally sloped concrete deck. A 1" rigid insulation will be mechanically fastened to the deck followed by a two-ply asphalt vapor retarder, two layers of 2" isocyanurate insulation followed by a 1" layer of rigid insulation and a four-ply asphalt built-up membrane with gravel surfacing.

On all areas except Areas B2, B5, and D, the existing roof system will be removed to the existing steel deck. A base layer of 1" rigid insulation will be mechanically fastened to the steel deck followed by a two-ply asphalt vapor retarder, a fully-tapered rigid insulation system, a 1" top layer of rigid insulation, and a four-ply asphalt built-up membrane with gravel surfacing.

OPINION OF PROBABLE CONSTRUCTION COSTS

The following costs are based on roof systems meeting the requirements of Minnesota State Colleges and Universities and are based on 2015 pricing and should be adjusted as necessary for inflation.

B Building

Areas B2 and B5	112 squares @ \$2,500/square	\$280,000
	Masonry/Caulking Work	15,000
	Mechanical/Electrical Work	90,000
	10% Contingency	38,000
	Design	35,000
	Construction Observation	<u>45,000</u>
	Total	\$503,000

B Building

Areas B6 and B7	14 squares @ \$5,000/square	\$70,000
	Sheet Metal Work	45,000
	Masonry Work	40,000
	Skylight Work	85,000
	Mechanical/Electrical Work	15,000
	10% Contingency	18,000
	Design	38,000
	Construction Observation	<u>45,000</u>
	Total	\$356,000

C Building and K Building(Graphic Arts)

Areas C2 and C4	272 squares @ \$2,500/square	\$680,000
Area K1	23 squares @ \$3,000/square	69,000
	Masonry Work	150,000
	Mechanical/Electrical Work	210,000
	10% Contingency	110,000
	Design	50,000
	Construction Observation	<u>75,000</u>
	Total	\$1,344,000

D Building (Heating Plant)

Area D	27 squares @ \$3,300/square	\$89,100
	Masonry Work	90,000
	Mechanical/Electrical Work	80,000
	10% Contingency	26,000
	Design	35,000
	Construction Observation	<u>45,000</u>
	Total	\$365,100

F Building

Areas F1	73 squares @ \$2,500/square	\$182,500
Area F2	35 squares @ \$3,000/square	105,000
	Sheet Metal Work	35,000
	Masonry Work	50,000
	Skylight Work	850,000
	Mechanical/Electrical Work	100,000
	Structural Work	20,000
	10% Contingency	133,000
	Design	70,000
	Construction Observation	<u>80,000</u>
	Total	\$1,625,500

G Building

Areas G1 and G2	79 squares @ \$3,000/square	\$237,000
	Sheet Metal Work	45,000
	Masonry/Stone Work	75,000
	Mechanical/Electrical Work	110,000
	10% Contingency	46,000
	Design	40,000
	Construction Observation	<u>55,000</u>
	Total	\$608,000

H Building

Area HI	48 squares @ 3,000/square	\$144,000
	Sheet Metal Work	25,000
	Masonry/Stone Work	60,000
	Mechanical/Electrical Work	40,000
	10% Contingency	27,000
	Design	30,000
	Construction Observation	<u>40,000</u>
	Total	\$366,000

REMARKS

This report is a supplement to our Roof Management Inspection and Reporting of the roof system at South Central College, Mankato, Minnesota. Copies of the field notes and photographs will be retained in our files for future reference. Please feel free to call our office if you have any questions.

ROOF SPEC, INC.



By: _____
Tim Pekron

TP/fj

SOUTH CENTRAL COLLEGE
 MANKATO, MINNESOTA
 0-5 YEAR REROOFING BUDGET

AREA	REROOFING YEAR				
	2015	2016	2017	2018	2019
B Building Areas B2 and B5				\$503,000	
B Building Areas B6 and B7	\$356,000				
C Building Areas C2 and C4 K Building (Graphic Arts) Area K1			\$1,344,000		
D Building (Heating Plant) Area D	\$365,100				
F Building Areas F1 and F2	\$1,625,500				
G Building Areas G1 and G2	\$608,000				
H Building Area H1		\$366,000			
Total	\$2,999,600	\$366,000	\$1,344,000	\$503,000	

Note: Figures shown include estimated reroofing construction costs and other roof-related construction costs (i.e. masonry and mechanical), contingency, design and full-time inspection and testing. The construction costs shown represent 2015 construction and are not adjusted for infiltration.

TP/fj

12/15