ROOF ASSESSMENT REPORT

SHEA THEATER
71 AVENUE A
TURNER FALLS, MA 01376

Prepared For:

Mr. Steven Ellis
Town Administrator
Town of Montague, Massachusetts

Prepared By:

Northeast Roof Consultants, LLC
2 Peggy Drive
Southborough, MA 01772
(508) 277-0284

Date: January 13, 2022
NRC Project No. 22-001

January 13, 2022

Mr. Steven Ellis
Town Administrator
Town of Montague
One Avenue A
Turners Falls, MA 01376
(Email: townadmin@montague-ma.gov)

RE: Roofing Consulting Services
Roof Assessment and Report
Shea Theater (Low-Slope Roofs)
Turners Falls, MA

I. INTRODUCTION

On Thursday, January 6, 2022, Northeast Roof Consultants was on site to perform a visual assessment of the existing low-slope roofing systems on the front roof area, as well as the recently completed (2019) EPDM roofing systems over the main portion of the Shea Theater. Access to the roof was made through an interior window of the Colle Building, with the assistance of Highway Maintenance personnel. The weather on the day of the inspection was mostly clear with temperatures in the 30's. Following are the results of our assessment. As exploratory test cuts were not taken as part of this assessment, the thickness and type of underlying components on the front roofing system could not be verified. The report includes a general overview of the facility, verified roof sizes and areas, general roof observations, existing issues, conclusions and recommendations with cost estimates for the recommended scope of work. Photo documentation of the assessment and a roof sketch showing the locations of the problem areas is also included.

II. GENERAL DESCRIPTION

The Shea Theater roof consists of three separate low-slope roof areas which include the front equipment roof, the main roof over the theater seating area and the rear roof over the stage area. The main roof and rear roof areas were replaced in late 2019 with a fully insulated, 60 mil thick reinforced mechanically attached EPDM roofing system. The single-ply roofing system on the front roof had been coated with an elastomeric roof coating prior to the 2019 roof replacement project and was not included in the 2019 scope of work. The front and side parapet walls at the front roof have been completely covered with single-ply membrane and a white elastomeric coating. The membrane flashing on the rear wall terminates two feet above the membrane surface, leaving numerous courses of CMU block and brick masonry exposed to the weather. The flashing at the base of the Colle Building terminates in a mortar joint under a metal reglet flashing, which is below the window line. The placement of the mechanical duct work throughout the roof, close proximity to the surrounding walls and the minimal height between the bottom of the ductwork and surface of the roof made these areas difficult to properly inspect and assess.

The front roof slopes to two, four inch diameter internal roof drains located at the front corners of the roof. Emergency overflow scuppers are present adjacent to the two roof drains, through the perimeter parapet. The roof slope appears adequate. The rear roof slopes from the rear perimeter to the front edge and drains down to the main roof below. The main roof slopes from the center line out to the two long perimeters of the roof. The drain line at the base of the Colle Building has two sets of primary and emergency overflow drains. The outside perimeter has two internal primary drains and emergency overflow scupper through the low parapet. The roof drains were properly sumped during the 2019 roof replacement. The roof slope is positive.

Roof Measurements

- Roof Height - 20'(front of building) -35' (rear of building).
- Roof Area – Front Roof: 15'-6" x 53' = 822 sq. ft.
- Front Roof parapet width & height – (5' high, 14" wide for front and side), (9' high, 12" wide for rear parapet).
- Roof Area - Main Section: 68' x 51'-6" = 3,502 sq. ft.
- Roof Area - Rear Raised Section: 15'-6" x 51'-6" = 807 sq. ft.
- Total all areas: **5,131 sq. ft.**

Existing Roof Components and Thickness

The existing roofing assembly at the front roof was not verified. It appears that the single-ply membrane (EPDM) is coated with a liquid elastomeric product applied for additional useful service life. The underlying insulation appears to be tapered polyisocyanurate insulation sloping to two internal roof drains located at the front outside corners. The structural roof deck is metal.

The existing roofing assembly at the main and rear raised roof areas consists of the following components from top to bottom:

- 60 mil reinforced Ethylene Propylene Diene Monomer (EPDM) membrane mechanically attached.
- EPDM flashing at base walls, curbs and penetrations.
- Two layers of 2.6 inch thick polyisocyanurate insulation board.
- ½" thick thermal barrier board.
- Plywood sheathing.
- Wood plank deck.
- ANSI/SPRI ES-1 Approved metal edging.

III. ROOFING/FLASHING ISSUES

(Front Roof) - Our inspection of the Front Roof revealed the following issues and concerns:

- The surface of the existing roof membrane is covered with bird droppings, which can be considered toxic, often causing respiratory issues with prolonged exposure.
- The underlying roof components are soft/spongy which often indicates the presence of subsurface moisture in the insulation.

- A number of one way relief vents are present on the roof. Relief vents were intended to dry out wet roof components in the area around the vents.
- Prolonged exposure to moisture may cause deterioration of the structural metal roof deck. (This has not been verified.)
- The drain baskets are clogged with mud, bird droppings and vegetative debris.
- Penetrations through the rear wall are not properly sealed and do not appear to be watertight.
- The CMU block on the rear wall is deteriorated in areas.
- Mortar joints in the brick masonry at the rear wall were noted to be open to the weather.

(Main Roof and Rear Roof)

- The 2019 roofs are in generally good condition with no visible issues.
- Sealant joints above the metal counter flashing at the base of the Colle Building wall are weathering and will need to be resealed periodically.
- Debris was observed around the roof drains and in isolated locations on the roof membrane.

IV. CONCLUSIONS/RECOMMENDATIONS

(Front Roof Area) - Due to the elastomeric roof coating applied to the membrane and amount of mud, algae and bird droppings on the roof, seams in the membrane could not be thoroughly inspected for voids and/or delamination. Based on the age and condition of the roofing system, past leaks and underlying soft/spongy components, we recommend that the roof be removed down to the structural metal deck and be replaced with a fully insulated single-ply roofing system utilizing tapered insulation to promote positive drainage to the internal roof drains.

Best practice would include the disconnection and temporary removal and storage of the existing metal ductwork, to allow the new roofing system to be properly secured and installed to the substrate. This would also allow for unincumbered removal and replacement of deteriorated metal decking (if any) and the additional height of new tapered insulation meeting the current energy code requirements. Protection from roosting birds should be considered to eliminate the need to clean the roof periodically.

(Recommendations – Roof Replacement - Fall 2022- Spring 2023)

(Proposed Scope of Work)

- Clean roof surface (power wash) of all mud, algae, bird droppings and debris to provide safe and healthy work environment for the roof replacement project.
- Carefully disconnect, remove and store the existing metal duct work from the large rooftop unit to the rear parapet wall to allow for deck renovation and installation of the new roofing system. The large rooftop unit can remain in place. (This work

should be done prior to the roofing contractor getting on site and by a licensed and insured mechanical Contractor.)

- Remove all existing materials including roof membrane, flashing membrane, insulation, one way relief vents, metal flashings, fasteners, plates and perimeter metal down to the existing structural metal deck.
- Repair/replace deteriorated metal decking on a unit price basis as needed.
- Replace deteriorated parapet blocking on a unit price basis.
- Raise fan curbs and roof hatch as required for the new insulation height.
- Install and secure substrate board over metal decking.
- Install self-adhering vapor barrier membrane over substrate board. The self-adhering membrane will act as a secondary/emergency water barrier during the roof replacement operation.
- Install tapered polyisocyanurate insulation mechanically attached or set in low rise foam adhesive, to meet the current energy code requirements.
- Provide an 4' x 4' tapered sump around each internal roof drain.
- Install minimum 60 mil thick adhered single-ply membrane (thermoplastic or thermoset) over new tapered insulation.
- Install minimum ½" thick plywood sheathing over all parapets and exterior walls to be flashed.
- Reflash all curbs, penetrations, parapets and roof projections. Extend membrane to top of front and side parapets and two feet up rear and Colle side wall intersections (approximately 550 sq. ft. of wall area).
- Remove and reattach wall mounted fixtures to allow for installation of new wall flashings. Cut in new reglet joint at base of Colle Building wall and install metal counterflashing.
- Install new ES-1 compliant metal edging at all perimeter parapets.
- Replace broken drain parts with matching materials as needed.
- Install walkway pads or buffer sheets under all unit or duct supports per the roof membrane manufacturer's written requirements. Walkway pads should extend from roof hatch to base of wall mounted ladder at rear parapet.
- Provide 20 year roof manufacturer's warranty and two year Contractor's guarantee.
- (Repair/replacement of deteriorated metal deck not included in this estimate as it is an unknown quantity, if any.)
- **Cost Estimate - $42 per square foot, $34,524 (Based on 2022 Costs).**

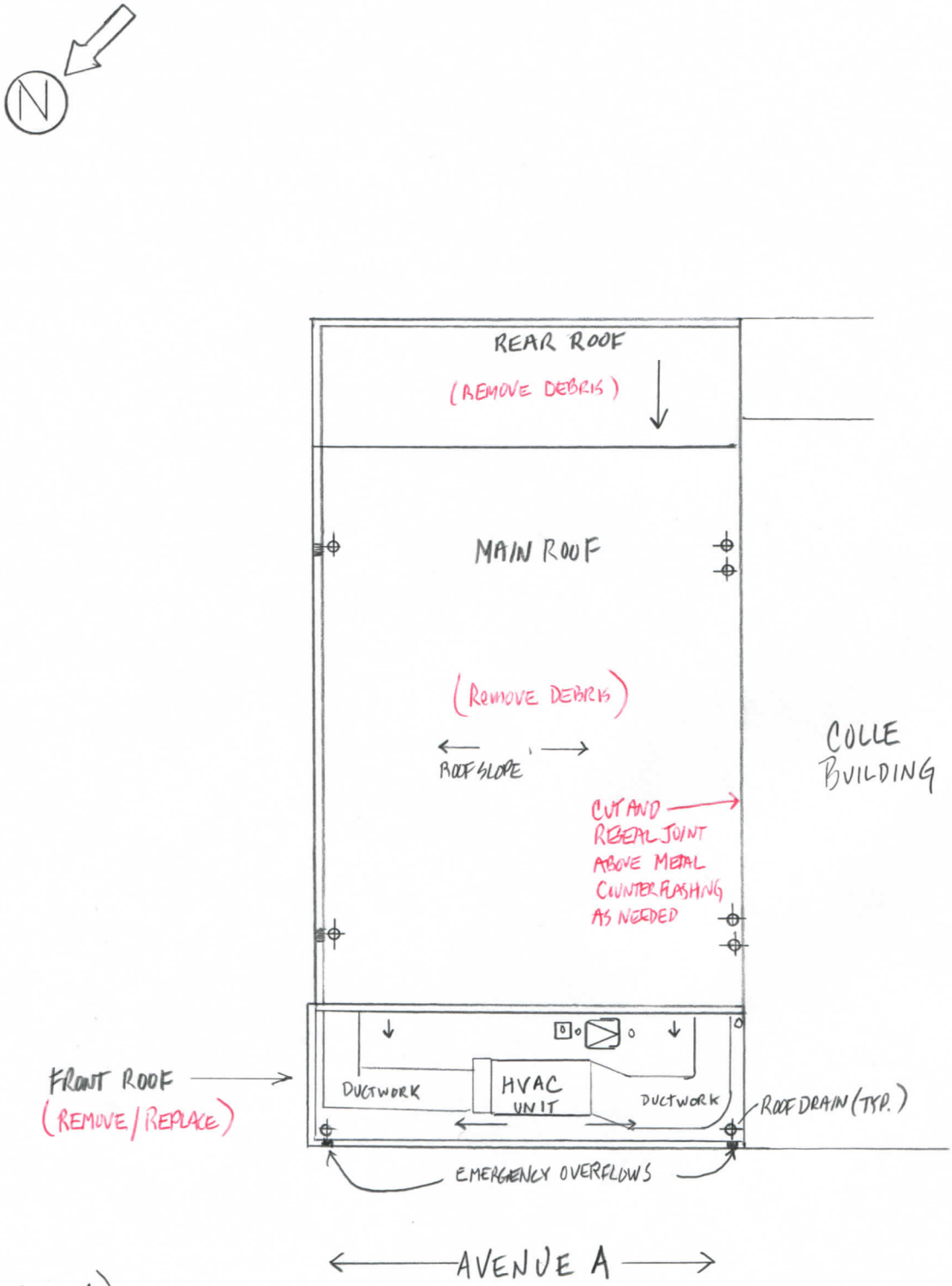
(Main Roof and Rear Roof Areas – 2019 Installation) - The 2019 roof areas are in good condition and require no repairs at this time. Periodic maintenance should include a visual inspection of the roof and clearing of any debris accumulating on the surface of the membrane or around the internal roof drain assemblies. As sealant is a maintenance item, remove and reseal the sealant joint above the metal counterflashing along the base of the intersecting high Colle Building wall every five years or as needed.

These above referenced cost estimates do not include the cost for design fees, permitting, hazardous material testing, roof cleaning, disconnection, storage and reinstallation of ductwork on the front roof, structural deck renovation (if required), plumbing requirements or hidden conditions. We hope this provides you with the information you require. After your review of this report, feel free to call with any questions, comments or concerns. Please see the following photo pages to view the existing conditions and areas of concern at each location.

Sincerely,

John R. Skypeck, RRC
President
Northeast Roof Consultants, LLC

Reliance: This report is for exclusive use and may be relied upon by the Town of Montague officials. No parties or persons other than those identified as authorized users may use or rely on the information or opinions in this report without the express written consent of Town of Montague officials and Northeast Roof Consultants, LLC.



ROOF PLAN

NORTHEAST ROOF CONSULTANTS, LLC **2 PEGGY DRIVE** **SOUTHBOROUGH, MA 01772** **508-277-0284**	**2022 ROOF ASSESSMENT** SHEA THEATER 71 AVENUE A TURNERS FALLS, MA 01376 MAIN ROOF	DRAWN BY: JRS	SCALE: NTS	DRAWING NUMBER: **SK-1**
		DATE: 1/6/2022	REV. DATE:	
		DESCRIPTION: ROOF AREA PLAN		

Photo R1
01/06/22

Photo Location:
Front Roof

Description:
View of untreated CMU block and surface of roof membrane covered with mud, debris and bird droppings.

Photo R2
01/06/22

Photo Location:
Front Roof

Description:
View of rear parapet wall with unsealed conduit penetration and algae covered membrane. (Note one way relief vent to right of photo.)

Photo R3
01/06/22

Photo Location:
Front Roof

Description:
View or roof termination under window at intersection of Colle Building. (Note narrow work space between wall and mechanical duct would not allow for removal and replacement of roof.)

Photo R4
01/06/22

Photo Location:
Front Roof

Description:
View of existing internal roof drain and emergency overflow scupper through parapet at front corner of roof.

Photo R5
01/06/22

Photo Location:
Front Roof

Description:
View of existing ductwork shows little space for removal and replacement of roof system.

Photo R6
01/06/22

Photo Location:
Front Roof

Description:
Overview of membrane covered front and side parapets and surface of coated membrane.

Photo R7
01/06/22

Photo Location:
Front Roof

Description:
View of ductwork and surface of membrane covered with mud and bird droppings.

Photo R8
01/06/22

Photo Location:
Front Roof

Description:
View of rear parapet wall with multiple penetrations and attachments. (Note horizontal mortar joints in brick in need of repointing.)

Photo R9
01/06/22

Photo Location:
Upper Rear Roof

Description:
View of 2019 EPDM roofing system at intersection of Colle Building wall.

Photo R10
01/06/22

Photo Location:
Main Roof

Description:
View of 2019 installed EPDM roofing system on main roof. (Note debris accumulating in drain basket.)

Photo R11
01/06/22

Photo Location:
Main Roof

Description:
View of main roof on opposite side of ductwork from Photo R10. Roofing system in good condition with no repairs necessary.

Photo R12
01/06/22

Photo Location:
Main Roof

Description:
Overview of main and rear raised 2019 EPDM roofing system.

Photo R13
01/06/22

Photo Location:
Main Roof

Description:
View of roof membrane on main roof with stones and other debris on roof surface and around roof drain baskets.

Photo R14
01/06/22

Photo Location:
Intersection of Main Roof and rear raised roof.

Description:
Existing roofing system with no visible issues. (Note stone on roof surface, most likely thrown on roof from rear of building.)