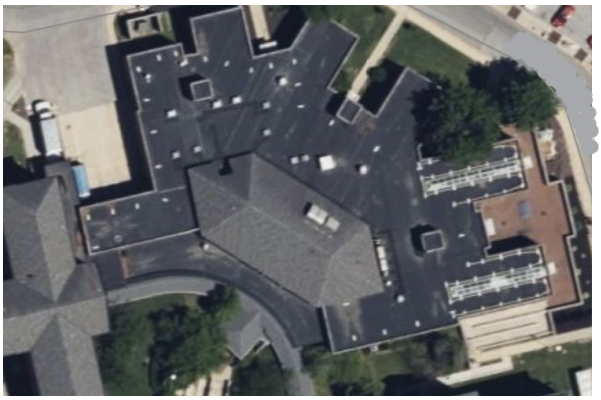
U.S. Department of Veterans Affairs

AE Replace Roof Building 69 and 139

Project No. 542-23-201

DESIGN NARRATIVE

For Bid Submission



1400 Blackhorse Hill Road
Coatesville, PA 19320

May 01, 2025

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1.0 Project Overview

1.1 Executive Summary

The Pettit Group, LLC (Pettit) has been contracted by the U.S. Department of Veterans Affairs (VA), to provide A/E services at the Coatesville VA Medical Center, 1400 Blackhorse Hill Road, Coatesville, PA 19320 for Project No. 542-23-201 Pettit will conduct this work under Contract Number 36C244D0067 Task Order 36C2442N0419.

The Pettit Group will be working with the following companies to deliver this project to the Coatesville VAMC:

The Pettit Group:	Architectural Design
	Contract and Project Management
	Quality Control
Keast and Hood:	Structural Design
NEI:	Mechanical Design
	Electrical Design
	Plumbing Design
TTI:	Hazardous Material Investigation Services
OCMI:	Cost Estimating Services
Garland Co.:	Roofing Consultant

The Coatesville VAMC Team has been identified as follows:

Elizabeth Wilson	Contracting Officer (CO)
Vanessa Chmielewski	Contract Specialist
Michael Wilcox	Contracting Officer Representative (COR),

This For Bid Submission includes architectural, mechanical, electrical, plumbing and structural drawings.

1.2 Project Understanding

The property is located at the southwest intersection of East Kings Highway and North Calin Road, outside the incorporated limits of Coatesville in Chester County. The site is an existing VA Medical Center.

As per the General Scope of work provided in Attachment B (Requirements For A/E Services for Construction Documents and Construction Period Services to Replace Roof Building 69 and 139 Project No. 542-23-201 At the VA Medical Center, Coatesville, PA, our understanding of the project is as follows:

This project provides design service for a demolition, abatement, repair, and replacing of the roof of buildings 139 and 69 at the Coatesville VA Medical Center. The Pettit Group will fully investigate and provide an accurate plan to perform the required services to fully and efficiently repair and replace the designated roofs for each building.

Building 139: Patient Dining Hall

These services denoted in the design created and provided by the Pettit Group will fully encompass the abatement of any asbestos, lead, and other hazardous materials and the replacement and repair of the roof of Building 139 in its entirety including both the pitched asphalt shingle and the flat (low slope) EPDM roofing. This will include the protection and preservation of the existing facilities.

There are skylights on the flat (low slope) EPDM roof that were to be removed. The scope of work has been modified by the Coatesville VAMC to no longer require the skylights to be replaced. The existing skylights will be removed in their entirety. The remaining voids left by the existing skylights will now be in filled and covered with roofing membrane. The existing lightning protection will be removed and replaced with code compliant protection equipment.

- Demolish the current pitched asphalt shingled roof of Building 139 as well as the flat (low slope) EPDM roof section over half of the building space.
- Due to a change in scope by the Coatesville VAMC there is no longer a requirement to provide temporary freezer plans for the food storage space that will be affected by the changing of the rail curbs on the roof. (Alternates noted in the body of this document)

- Phasing plans will be developed with assistance from the CVAMC to phase temporary relocation of refrigerated and frozen goods within the existing kitchen utilizing existing walk in cooler and freezers.
- Provide plans for new curb rails for equipment with proper maintenance clearances taken into amount.
- Repair structural damage due to leakage and age as needed and required for Building 139's roof structure. (Interior building work is outside the scope of this project)
- Replace pitched asphalt shingle roofing as well as the flat (low slope) EPDM roofing of Building 139 with pitching to ensure proper drainage.
- Remove the lightning protection on the roof and replace it with code complaint lightning protection equipment for Building 139.
- Due to a change in scope by the CVAMC, there is no longer a requirement to remove, repair the surrounding area, and replace the skylights above the patient dining hall in Building 139.
- The voids in the roof where the skylights currently are located will be infilled and add roofing material applied over the substrate similar to the adjacent conditions.
- The existing sconce lighting in the skylight lightwell are to be removed, with remaining surfaces patched and repaired as necessary.
- New pendant fixtures are to be installed in the existing lightwell utilizing existing circuitry.
- Drywall areas adjacent are to be repainted as noted in construction documents.
- New walking pads to be added to access required equipment.
- Remove two trees alongside the building that have their limbs resting on or hanging over the roof of Building 139.
- Protect the integrity of the equipment that is to be preserved on the roof that will be removed and reinstalled to replace the roof of Building 139.

Building 69: Physical Medicine and Rehabilitation, KT, OT, PT, Audiology, Speech, Prosthetics

For building 69, these services denoted in the design created and provided by the Pettit Group will fully encompass the abatement of any asbestos, lead, and other hazardous materials and the replacement and repair of the roof of Building 69 in its entirety but not limited to its flat (low slope) EPDM roofing. This will include the protection and preservation of the existing facilities.

There is dunnage on the flat (low slope) EPDM roof that will be removed and the area around it repaired while considering the structural integrity of the roof when performing this task. The lightning protection of the building will be removed and replaced with code required protection equipment.

The Coatesville VAMC has identified existing exhaust fans that are no longer in service which will be removed. Any voids remaining will be infilled and covered with roofing material.

The glazed natatorium will have targeted repairs identified to further ensure it is water tight. This is also a change in scope as directed by the Coatesville VAMC.

This project will provide complete and functional systems in accordance with the Department of Veterans Affairs (VA) requirements, Technical Information Library (https://www.cfm.va.gov/til/spec.asp), industry standards and all applicable code requirements. This applies to each system and every system, which is affected by this project, even if only partially modified. The systems and equipment will maximize energy efficiency to the extent practical.

- Demolish the current flat (low slope) EPDM roof of Building 69 while preserving the integrity of the building.
- Repair structural damage due to leakage and age as needed and required for Building 69's roof structure. (Interior work is excluded from this project scope.)
- Replace the (low slope) EPDM roofing of Building 69 as well as any damaged equipment or structure damaged during demolition. All new roofing to be pitched to ensure proper drainage.
- Investigate the space for asbestos, lead, and any other harmful materials as well as creating a plan to abate it within Building 69's construction zone as applicable.
- Remove the lightning protection on the roof and replace it with code required lightning protection equipment for Building 69.
- Investigate the structural effect of removing the dunnage on the roof of Building 69 and how it can be efficiently and safely done with minimal impact on the structural integrity of the building.
- Walking pads to be installed to allow access to required equipment.
- Protect the integrity of the equipment that is to be preserved on the roof that will be removed and reinstalled to replace the roof of Building 69.
- The glazed natatorium will have targeted repairs identified to further ensure it is water tight.

2.0 Architectural Design Approach

2.1 GENERAL

Technical disciplines include but are not limited to architectural, structural, mechanical, electrical, abatement of ACM if any are encountered, and construction cost estimating. The design will comply with VA-adopted codes and standards including VA Directives, Design Manuals, Master Construction Specifications, Design Criteria and other Guidance on the Technical Information Library (http://www.cfm.va.gov/til/).

2.2 Assessment of Existing Conditions - Building 139

The purpose of this evaluation is to detail the conditions of existing roofing materials; assess performance of present design and detailing; and provide recommendations for improved performance of the new roof design.

Low-sloped (EPDM) and steep-sloped roof sections

The low-sloped roof areas include the main roof level, which is the largest contiguous area of roofing. This area contains 3 roof monitors (clerestory spaces that allow daylight into the interior) which are situated approximately 10’ higher in elevation but otherwise share similar features to the main roof. A separate roof area at lower elevation to the southwest of the main roof covers a portion of the lobby space and runs follows the corridor connecting buildings 139 with buildings 57 and 58. One additional roof section adjacent to the loading dock on the west side of the building also has a low-sloped roof. Black EPDM membrane is installed over all of the existing low-sloped roof areas of the facility.

The two steep-sloped roof sections of the building are both roofed with asphalt shingles. The first area is the penthouse mechanical room and the other is located along the southwestern perimeter of the facility, covering the connecting corridor between 57 and 58 as well as the entrance lobby.

Field:

The existing roof membrane is a 60 mil, single-ply EPDM membrane fully adhered (glued) to the underlying insulation.

- The typical complete assembly is as follows:
- Steel Deck
- Plastic Vapor Barrier
- Gypsum Thermal Board
- Tapered Polyisocyanurate Insulation (1/8” per foot slope)
- 60 mil EPDM

This image shows Insulation Assembly from roof core, showing gypsum board on the left and polyisocyanurate on the right

Since the insulation is tapered, the R-value varies across the roof and cannot be calculated exactly. On the main roof area, the insulation thickness starts at approximately 2” or 2 ½” and gains 1” every 8’ moving out from the valleys. The high points vary from 5-6” thickness, potentially thicker in localized areas but often thinner in narrower areas of the roof. The average thickness of the insulation is estimated to be less than 5”, and therefore falls a little short of the current code minimum for R-30.

All roofs share similar construction, with one exception being the roof elevation adjacent to the loading dock which also has a ½” wood fiber cover board installed between the EPDM membrane and the polyisocyanurate insulation.

This image shows a typical area of the roof, the roof is a black EPDM membrane with marginal slope.

The membrane material itself is in fair condition overall, however there is some damage to the membrane in the form of punctures. This is one of the major downsides of a single ply membrane, they are easily damaged by foot traffic, dropped tools, etc. A more durable roof system utilizing a multi-ply modified bitumen will be specified for the new roof.

The seams of the roof are adhered with splice tape which generally provides a reliable bond but can fail at T-joints and other interruptions in the continuity of the seams. Patches are applied over these areas and some other locations. These may have been original to the roof or applied as a repair. Most of these are properly adhered however some are failing where water accumulates due to poor drainage.

This image shows two peeling seams in two locations at the wall flashing.

Organic debris piles were observed in multiple locations (leaves, branches, etc.). Even with a new roof installed, routine maintenance should include clearing of debris from the roof on a regular basis, to prevent accumulation and issues such as clogged drains.

Example of accumulated organic debris

Drainage:

The existing roof system has tapered insulation installed to create slope to the drains, however the layout of the tapered slope is not well matched to the roof drain layout. The plan fails to incorporate all of the drains on the roof, so some of the roof drains are essentially rendered inactive because they are not situated in low points.

This image shows the roof drain located within cricket

A comparison of the original drawings to the existing conditions reveals that the tapered design for the current roof departs from the original tapered layout when the building was constructed. When the roof was replaced, the new installation favored a 2-way slope configuration, reorienting some of the prevailing slopes.

A more effective drainage layout is needed. The design for the new roof will be to properly incorporate all internal roof drains into the tapered insulation plan. The existing tapered installation provides 1/8" slope which is 50% less than the required minimum ¼" per foot, so that will also be changed to improve overall roof slope. The new roof will be designed to have ¼" per foot slope and ½" crickets to expedite drainage and prevent ponding conditions.

An example of poor slope resulting in ponding water.

Crickets between the roof drains are too shallow in several areas. The minimum ratio of distance between drains to cricket width is 3:1 but several of the crickets fall short of that minimum.

There are overflow scuppers cut through the parapet walls in various locations around the roof perimeter. These provide emergency overflow capacity and should be maintained. One of these was improperly closed in during the last roof project and should be re-opened with the new roof installation. Others are installed but not properly sealed against water intrusion from the exterior side.

Image of a “Forgotten" overflow scupper at southwest corner of the main roof area.

This is another overflow scupper, with no exterior trim to seal against water intrusion

This is an example of an existing internal drain. It is recommended that all drains be replaced with new cast iron units with the roof replacement project.

Perimeter Conditions:

The prevailing perimeter condition is a parapet wall with a limestone coping. When the building was originally constructed, the first roof system was installed before setting the stone copings on the parapet wall. This old EPDM flashing beneath the stones is still in place and the building waterproofing is dependent upon it. Unfortunately, it is failing in numerous locations where exposed; and can be expected to also have splits where it is concealed.

Figure 1: Here is one of several examples of the old flashing membrane split with a direct path for water entry into the building. The new roof cannot rely on this material.

Figure 2: These are the original limestone copings, cracks existing in both the joints between stones as well as the mortar bed in which the stones are set.

Where the roof meets a masonry rising wall, there is typically a through-wall flashing in place at the brick veneer. This condition can be found at the penthouse wall, at the elevation change between the main roof and the lower-level hallway roof, and at the roof monitors. In general, the through-wall flashings appear to be performing properly, however the height that these flashings are set into the brick will be a problem with the new roof, which will have a

thicker base layer of insulation and a steeper pitch once converted to ¼" per foot slope. With the new roof design, these will be raised to prevent water infiltration.

This shows the rising wall from the loading dock roof area with a two-piece through-wall counterflashing receiver and insert.

A unique condition exists specifically at the clerestory/monitor walls. The brick walls are exhibiting signs of moisture within the masonry. This can be attributed to the limestone copings leaking at the joints above, where mortar has cracked, and potentially absorbing water on the face as well. At the base of each wall, there is a through-wall counterflashing which provides a barrier to this water getting down into the interior space. Unfortunately, similar to other areas, this flashing is too low and will be designed to be raised to prevent water intrusion.

The dark colored mortar joints are an example of areas of moisture within the masonry working its way back

One other rising wall condition to note is at the intersection with the adjacent buildings. Where the roof of Building 139 meets Building 58, there is a reglet style flashing cut into the wall. This is also too low but is much simpler to raise since this is a mass wall.

Reglet mounted counterflashing set in the wall at the junction with building 58.

The final perimeter condition for the low-sloped roof areas is the intersection of the membrane roof with the shingle roof at the hallway connector between 57 and 58. The flashing membrane between the shingle and EPDM roofing is dry rotted, cracked, and failing.

Cracking flashing membrane along length of shingle roof intersection, sealant is applied over the cracks but is ineffective.

The penthouse rising wall is a brick wall with a through-wall flashing similar to the roof monitors and other rising wall conditions on the facility. The door threshold is a solid curb with EPDM flashing run over the curb and terminated inside. This will be designed to be further protected from foot traffic with a metal sill plate installed over the finished roof membrane to prevent damage to the roof on the edge of the step.

Projections and Equipment:

There are a number of condensers on the roof set on free-standing supports. These are functional but not as stable as supports anchored to the structure and flashed into the roof system. With the new roof system, the insulation height will be increasing in numerous areas. New supports will be designed to be to create the proper height. The orientation of the supports, wherever possible, will be aligned with the roof slope to allow water to drain through.

Typical condenser set on freestanding rails.

Each condenser is served by refrigerant pipes and wiring that is routed through the roof. These penetrations are made watertight with pitch pockets. Some of the sealant was poured around the insulation and is not properly sealed to each pipe. These are also aging so the sealant is in need of replacement. Existing pitch pockets will be replaced with a roof penetration housing curb to provide lower-maintenance for the pipe penetrations.

Pitch pocket for condenser penetrations through roof

The roof has a perimeter warning line and fall protection railings set up on the roof. These are freestanding on weighted bases which are a good option for the roof to prevent unneeded penetrations and flashings into the roof. These will be noted to have a protection pad set beneath each stand to prevent potential damage to the roof membrane.

This shows one of the stands set on the roof without any protection pad beneath it.

The remaining projections through the roof include plumbing stacks, powered ventilators, gravity vents, and some other miscellaneous equipment – all of which are standard rooftop projections. Some pieces of equipment will need to be raised with the new roof but they do not pose any significant challenges, except some potential electrical work to extend wiring where needed.

This image shows an exhaust fan on a standard curb and a round projection with a cap, obsolete equipment curbs can and should be closed in with the new roof.

Steep-Sloped Roof Areas – Review of Existing Conditions

Field:

Building 139 has two steep-sloped roof areas – the penthouse and the corridor/entrance lobby roof area. The age of each section is unknown but the shingles are different styles so the installations were likely from different timelines. The penthouse roof appears to be older. The penthouse composition is a steel roof deck with a nailboard insulation on the decking (this is a composite of insulation and plywood). The roof is an asphalt shingle over an underlayment membrane. The corridor/lobby roof is a similar composition of asphalt shingle over membrane underlayment on a plywood deck. The penthouse roof has 8:12 slope, the shingle roof on the lobby is a 6:12 and the corridor area is a 4:12 pitch. On the penthouse roof, there are some concerns with ridging that can be observed through the shingles. This is an indication of warping of the plywood substrate. It can be caused by improper fastening leaving a loose or unsecured edge, or by water infiltration or overheating due to poor ventilation which is warping the wood. The corridor roof is not exhibiting this problem.

This shows the penthouse roof, some of the ridging effect can be observed across the field.

The corridor roofs are in better condition than the penthouse roofs, the substrate poses less of a challenge for asphalt shingle performance than the steel penthouse structure

Drainage:

There is no concern with moving water due to the steep slopes, but the penthouse roof lacks any control of water exiting the roof since the design does not incorporate gutters. Water spills off the roof edge to the lower roofs surrounding the penthouse. The corridor and entry roof does have gutters on the exterior facing roof edges. These also have screens to keep leaves and other debris out of the gutters.

The shingle roofs on the corridor drain towards the front into gutters, on the opposite side down onto the low-sloped roof area.

Perimeter Conditions:

The penthouse roof perimeter is in poor condition. The fascia, original to the building, is loose in at least two locations. When this roof was last replaced, the new shingles were installed without any drip edge detailing at the eaves and rakes. The shingles are properly overhanging the edge, so most of the water drips off the roof. However, this condition leaves open the possibility for some volume of water to track backwards beneath the shingle and into the structure. Without the drip edge, the wood blocking and edge of the plywood deck are exposed to repeated wet conditions. This is suspected to be a contributing factor to the fastener failure of the decorative fascia.

Detached fascia on the west elevation.

Another example of loose fascia and missing drip edge detail.

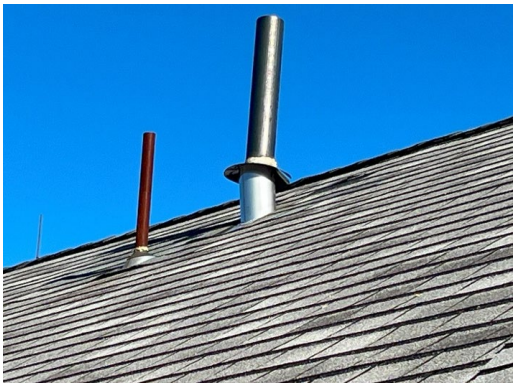
The existing assembly is 2” thick above the steel deck. With the plywood nailer, there is at most 1.5” of insulation within the system. This equates to an R-value of 8.6 or less if there is an air gap in the assembly. The penthouse may not require the typical R-30 standard due to its use and the nature of the space. If that is required, the new roof can be designed with increased insulation.

The penthouse roof edge overhangs the penthouse walls by several feet. Below this overhang is a metal soffit panel with small circular vents cut in. The ridge appears to be vented but not the hips. With the steel decking and solid wood at the eave as observed where the fascia is loose, it is unclear if or how air flows into the space below the shingles where needed to remove excess heat build-up. The corridor roof is also vented at the ridge and has vented soffit at the overhangs.

Projections and Equipment:

The corridor roof has no projections. There is lighting protection cable running across the roof and the clips are fastened through the shingles, which is a poor detail but will only allow very minor water intrusion. The penthouse roof projections include pipe stacks through the roof and vents on curbs.

An example of several projections through the penthouse roof including some pipe penetrations and gravity ventilators on curbs. Crickets are required behind the large vent curbs.



This shows two flashing techniques, the smaller pipe has a premanufactured pipe boot, the larger has a sleeve with a rain collar above - both details are dependent on caulk applied as a repair.

Lightning arrestor clips are attached through the shingles with sealant beneath.

2.3 Building 69: Assessment of Existing Conditions

The low-sloped roof areas include a large main level roof area, separated roughly down the center by an expansion joint. There is also a small canopy over a loading dock area on the east side, and a separate, higher elevation roof area in the northwest corner of the building. Black EPDM membrane is installed over all of the existing low-sloped roof areas on this facility and all roofs appear to be of similar vintage. The adjacent shingle roof area on a connecting corridor and the therapy pool enclosure structure are not part of this project and evaluation, except may be mentioned where relevant for tie-in details.

Low-Sloped Roof Areas – Review of Existing Conditions

Field:

The existing roof membrane is a 60 mil, single-ply EPDM membrane fully adhered to the underlying polyisocyanurate insulation. The typical complete assembly on the main roof area is as follows:

- Steel Deck
- Tapered Polyisocyanurate Insulation (1/16” per foot slope)
- 60 mil EPDM membrane

Insulation Assembly from roof core, showing two layers polyisocyanurate. Note the discolored foam on the right side – this is the top of the core and the foam is deteriorated from high heat due to proximity to the black roof surface.

There is some slight variation on the other two roof sections which each have 1/8” tapered insulation. The canopy on the east side is a wood deck instead of steel deck.

The main roof area is tapered, however the slope is very low – measured at 1/16” change per foot. On this roof, the average thickness of the insulation is estimated to be between 3 and 4 inches, which would correspond to an R-value between 17 and 23. The goal with the new roof will be to achieve an R-30 or higher to meet code and improve energy efficiency.

This image shows a typical area of the roof, the roof is a black EPDM membrane with poor slope.

Puncture through the roof membrane.

In addition to noted damage to the roof surface, there are some locations where the insulation is warped due to water absorption and subsequent deformation.

Warped insulation due to past water damage.

The membrane material itself is in poor condition overall. Similar to Building 139, there is some damage to the membrane in the form of punctures and cuts. This is one of the major downsides of a single ply membrane, they are easily damaged by foot traffic, dropped tools, etc. A more durable roof system utilizing a multi-ply modified bitumen assembly will be specified for the new roof.

Because this is an older roof system, there is also evidence of seam issues. Unlike Building 139's roof, these seams are glued and sealed with lap sealant on the outside edge. Glued seams are not common anymore because they were less reliable seals. There are examples of broken-down lap sealant on the roof now and lifting seams, especially T-patches and other reinforcing patches around drains and other key areas.

This shows loose edges of patches around a drain flashing target membrane.

Several feet of seams have been coated to resolve previous issues with seam integrity.

This roof does not have as many concerns with debris as Building 139, but there are some areas of accumulation and dirt caked around roof drains.

Example of accumulated organic debris

Drainage:

The original drawings from 1960 show a built-up roof design, which was most likely a coal tar pitch system. Coal tar is the only roofing product approved in the building code for slopes less than ¼" per foot, due to its unique chemistry and characteristics as a waterproofing product.

The existing roof system has tapered insulation installed to create slope to the drains, however the tapered slope is too shallow, resulting in poor overall slope which falls short of minimum design standards. The new roof will have tapered insulation following a similar layout, except it needs ¼" per foot slope to more effectively move the water.

The roofs have 2-directional slope with crickets located in the valleys

The center of the cricket follows the true low point of the roof. The drains are offset from the low point. This is typically due to structural members obstructing the plumbing.

Larger sumps will be incorporated in the new design (8'x8' wherever possible) in order to overcome the drain placement offset from the true low-point in the roof.

The loading dock canopy slopes towards the building to a single roof drain.

Perimeter Conditions:

The roof perimeter at the exterior edges is a metal fascia flashed into the roof with a fascia extender. There is some damaged or loose fascia extender, both on the north side of the building as well as the loading dock.

This is the typical exterior edge as viewed from the ground. A metal fascia integral to the roof system and one extender that sits below it. There is a gap at each window bank where the stucco façade is recessed.

There are two small rising wall details, where the canopy roof meets the main roof and where the building elevation changes at the northwest corner. These two walls have existing brick exposed masonry with a through-wall counterflashing set in the brick. With increased height of tapered insulation, these flashings will be eclipsed by the new roof. The new roof detailing will include membrane flashing all the way up the wall terminating under the adjacent fascia.

At the pool enclosure, the pool wall is flashed with EPDM membrane that terminates beneath a sill under the glass curtain wall.

Lastly, there is a small intersection with the shingle roof on the corridor roof section that connects to Building 69 at the southwest corner.

The curb detail where the pool enclosure meets the flat roof area is flashed with membrane terminated beneath the sill.

Intersection of adjacent building shingle roof and Building 69 roof membrane. Replacement of the roof will necessitate some disturbance and patching to the shingle roof to create a watertight transition.

Projections and Equipment:

A large number of projections through the roof are obsolete and will be removed with the new roof project. This includes steel dunnage, capped curbs, unused rails, and capped pipe projections through the roof.

This is a view looking east, several obsolete projections can be seen including unused curbs, rails, and the steel dunnage in the background

There is very little clearance between the steel and the roof. This is likely the reason why such a shallow tapered insulation system was selected when this roof was installed. Removal of the dunnage clears the way for proper tapered design.

Existing equipment still in use will remain with the new roof system. This includes exhaust fans and plumbing stack penetrations through the roof, passive vents, and convenience outlets on posts that are flashed with pitch pockets. Raising equipment will be necessary in some locations with the new tapered insulation system. Some of the plumbing stacks or pipes through the roof have boots which are pulled down and not properly shedding water. This may be from movement of the pipes. All pipes through the roof which are active and in use will be stabilized as needed with pipe deck clamps to prevent settlement and disruption to the flashings.

Pipe penetration through roof with a collapsed pipe boot.

Obsolete pipes wrapped with tape/sealant to be removed.

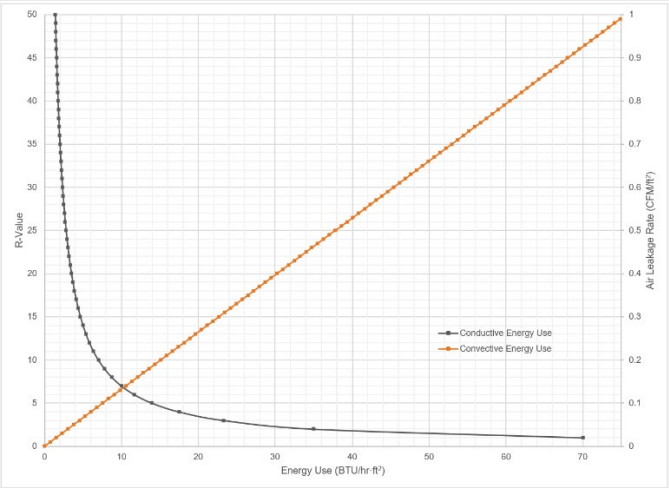
2.4 New Roof Design: Low-Sloped Roof Areas (Building 139 and 69)

Roof replacement encompasses a complete tear-off of all membrane, flashings, and insulation down to the structural roof deck followed by installation of a complete new roofing system including all insulation, flashings, and accessories.

On Building 139, the existing roof assembly includes a gypsum board directly on the roof deck. This is a design choice to increase fire rating of the roof assembly and should be maintained. The new roof assembly will start with a 5/8" gypsum board laid over the metal decking. There is also a vapor barrier membrane installed currently. A new vapor barrier that also functions as an air barrier will be installed on top of the gypsum thermal board. This will be a self-adhesive and self-sealing membrane so that it continues to function as an air barrier after subsequent layers of roof insulation are fastened in place.

Building 69, since it does not have kitchen space, does not currently have these design elements and they would not be required for the new roof system. An air barrier directly on the roof deck of building 69 is an option for enhanced energy efficiency.

The standard system will include ¼" tapered insulation to enhance the drainage. The added slope on the roof, along with good sumps at the scuppers and crickets between, will make a drastic improvement to the roof drainage performance. This will also bring these roof designs in line with the VA's standards for design as well as building code requirements for slope in the roof. The new insulation will provide some improved thermal performance as well, providing some energy savings payback after the roof is completed. An R-value average of 30 or more will be the target for each building.



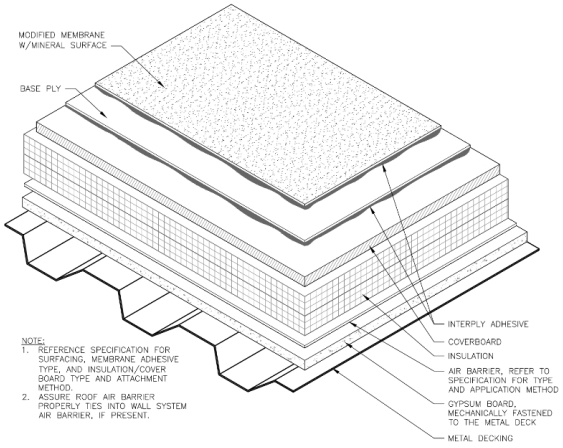
This chart shows how R-value increases provide diminishing returns, and there is very little benefit to going above the code-required R-30. Air leakage reduction is just as important and additional air sealing measures provide a 1:1 payback.

The increased height of insulation will be a challenge due to restrictions at the rising walls with flashing heights. The new design will include new through-wall flashings. Without one of this change, there will be leaks that occur behind the wall flashings. These modifications are needed at the three brink monitors located on the roof of Building 139.

New through-wall flashing involves removal of brick veneer to access the wall cavity, installation of the new flashing detail, then replacement of the bricks to close the wall upon completion.

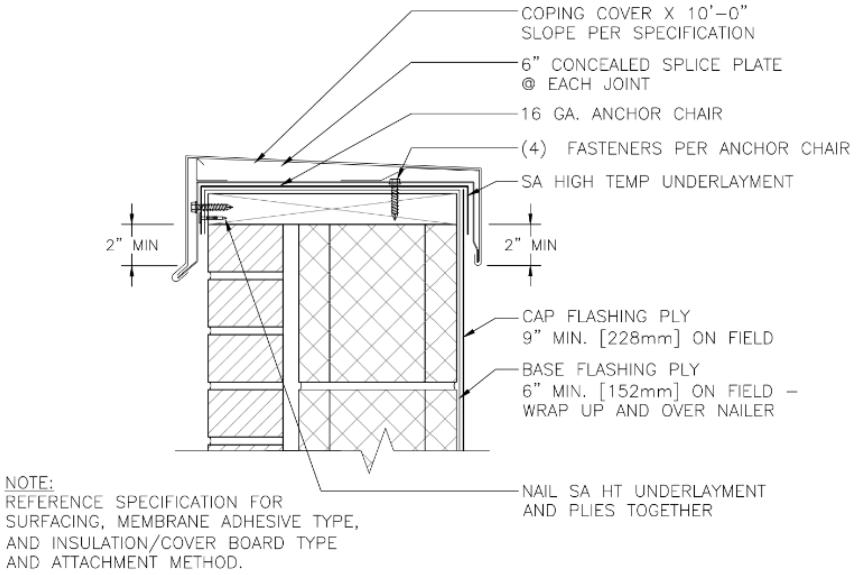
New roof insulation will be mechanically fastened to the roof decking. The fastening pattern will be based on ASCE 7-16 methodology and the roof system manufacturer's system testing. This is a code requirement and is vital to ensure that the new roof is properly designed to withstand uplift during severe weather. The new roofs will be more resilient and resistant to catastrophic failure, which is currently a concern especially with Building 69. After the new polyisocyanurate insulation is installed, the final layer of insulation is 1/2" cover board. This will consist of gypusm, perlite, or wood fiber. The cover board is denser than the insulation and provides a beneficial substrate for the new roof membrane.

There are many options for new roofs but the best is modified bitumen. It is more durable than EPDM or any other single ply system, is thicker and heavier so naturally has better wind resistance, and has a good track record for durability, longevity, and is less prone to leaks through the multi-ply system. The roof assembly would include an 80 mil thick base layer and a 155 mil surface layer. The base sheet and the cap sheet are both manufactured with SBS modified asphalt, a mixture of asphalt and rubber polymers that enhance flexibility. Fiberglass and polyester scrims within the sheets are manufactured to infuse strength and stability into the membranes. The end result is a strong, thick and durable waterproofing system. The redundant nature of the 2-layer construction provides extra protection against potential leaks. The overall thickness of the system and the durable membranes make the roof difficult to puncture or cut, so it is not prone to damage like the current roof systems. The membranes are installed using zero-VOC adhesives with virtually no odor, so the re-roofing process will not have disruptive odors. Membranes that incorporate recycled content would be selected to in pursuit of sustainability objectives. The roof surfacing is a factory applied granule. This is beneficial as it gives better traction than a single-ply membrane and is often preferred by many facility personnel that access the roofs for maintenance.

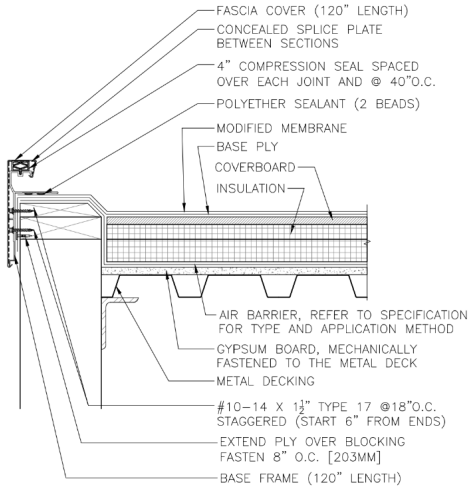


New roof assembly detail for proposed roof system.

Along with the new roof, new flashings at all perimeter and curbs will be installed. This would include new 2-ply membrane flashings and new perimeter metal. All of the new perimeter metal will be a .050 aluminum, kynar finished metal coping caps or fascia. This will last the life of the roof system and provide a clean finished aesthetic for the building. Only ANSI-SPRI ES-1 tested and approved metal edge products that are designed to perform through severe weather will be utilized. The edge metal should be sourced from the same manufacturer as the roof membrane to obtain a complete system warranty covering both components together. The new roof would be warranted for 30 years with a No Dollar Limit, Edge-to-Edge warranty that covers both the roof membrane and the perimeter metal.



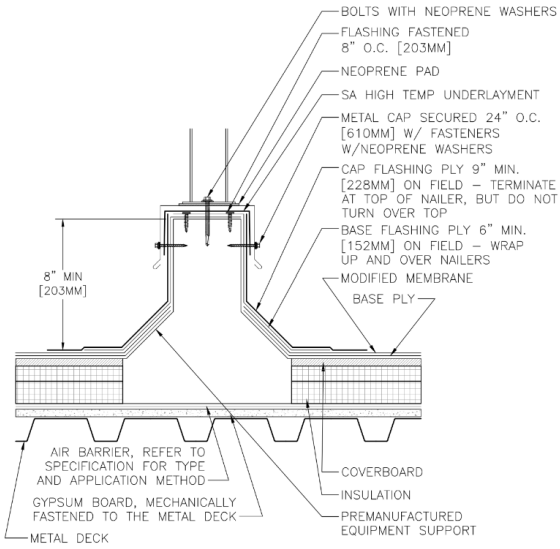
The typical perimeter detail at Building 139 will be a metal coping cap installed over the existing parapet wall.



The typical edge condition at Building 69 will be a new fascia. Fascia extenders (not shown) will also be necessary. Note the air barrier continuity to the outside edge.

It is best practice to install new cast iron roof drains with a new roof system. This will include new cast iron bowls, clamping rings, strainers, and hardware.

Specific details for each roof area will be developed to address flashing conditions for projections and equipment. The condenser supports on Building 139 are one specific area that is called out for improvement. Instead of the existing rail curbs free-standing on walkway mats, the new rail curbs can be installed attached to the deck and flashed into the roofing system.



Typical equipment rail support detail. The base will be elevated on wood blocking where the insulation thickness requires additional height for clearance.

Another potential upgrade for consideration in place of the standard pitch pocket flashing detail for condenser refrigerant piping and control wiring by installing roof penetration housings.

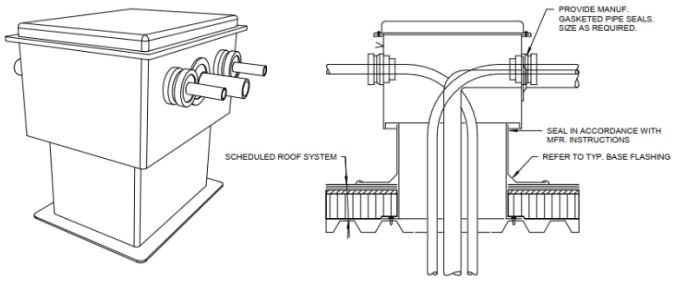


Figure 3: Roof penetration housing example.

Alternative Roof System Options:

The above-described roof system can be finished with a bright white surface coating as the final surfacing for enhanced reflectivity and UV shielding which may further contribute to energy efficiency. This coating would enhance the surface resilience of the roof system mentioned above and lead to longer life expectancy because of the extra protection from weathering and UV radiation.

A third option to consider is a hybrid system utilizing a thermoplastic membrane installed over a modified bitumen base sheet. The replacement would be nearly identical to the first option, with a complete tear off to the deck, followed by new insulation with drainage improvements via tapered insulation, a cover board, and the modified bitumen base sheet. The difference is in the final layer, which in this case is a smooth, thermoplastic KEE membrane in place of the mineral-surface modified cap sheet. The KEE membrane has a smooth, white reflective surface and the seams are welded to create a strong, monolithic final layer. This installation can be completed with a 2-component foam adhesive which is low-odor process that won't create issues inside the facility.

Note Regarding Existing Roof Restoration Compatibility:

It is a good idea whenever possible to review options for restoration of an existing roof, rather than a complete tear-off. Unfortunately, the general condition of all low sloped roof areas on the two facilities do not lend themselves to restoration products. Almost none of these roof areas have functional drainage design. It is irresponsible to restore a roof with ponding conditions or otherwise inadequate drainage – even if the products specified claim to resist ponding water. A secondary concern with restoration is that the underlying membrane adhesion cannot be guaranteed. Older EPDM roofs exhibit a loss of adhesion over their lifespan for numerous reasons. One of which is the high heat of the black surface that deteriorates the underlying insulation and weakens the overall bond and wind resistance of the roof. Catastrophic failures often occur to aged EPDM roofs where the wind resistance has fallen below the needed threshold. These roofs are not good candidates for repair or restoration and the plan for replacement is justified.

2.5 New Roof Design : Steep-Sloped Roof Areas (Building 139)

The shingle roofs are scheduled for replacement and can be replaced in-kind with new asphalt shingle roofing. That process would involve tear-off down to the plywood substrate of each roof section. The corridor and lobby roofs will be replaced with similar architectural shingles over an underlayment. The penthouse roof will require replacement of the entire

nailboard assembly with a new vented nailboard to have a successful roof installation. This offers the opportunity for increased insulation thickness if there is a need for further insulation over the penthouse space. Proper detailing, such as the inclusion of trim at the eaves, rakes, and other flashing details, will provide better performance than the existing roof. The existing soffit and fascia can be maintained with repairs to the loose pieces.

2.6 SKYLIGHTS

The existing dining hall (Building 139) currently has two large multi-pane skylights which measure 52’-9”x5’-10”. These appear to be originally installed skylights and are exhibiting signs of failure. The gaskets/seals are failed or failing and surface caulking over them has not been successful. The membrane flashing detail at the skylight curbing appears to be a similar condition to the parapet wall, where the old roofing membrane was flashed to the curb before the skylights were set in place. When the facility was reroofed, the new membrane was sealed to the old roof flashing. This original roof is not viable any longer but still is being relied upon. There is a counterflashing extension providing some protection over this detail but the problem won’t be fully resolved until the new roof installation is complete and a new skylight is installed or one of the options below is implemented.

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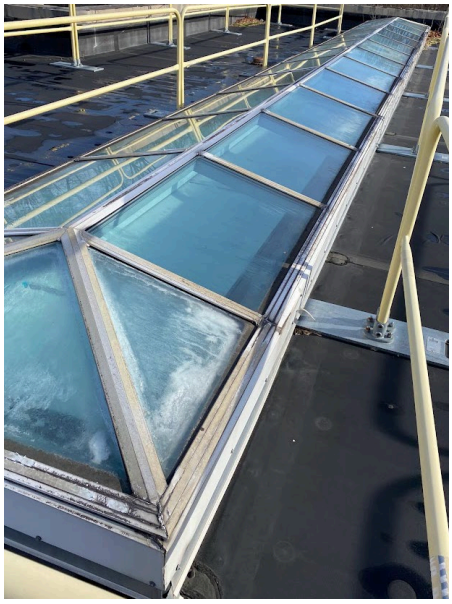
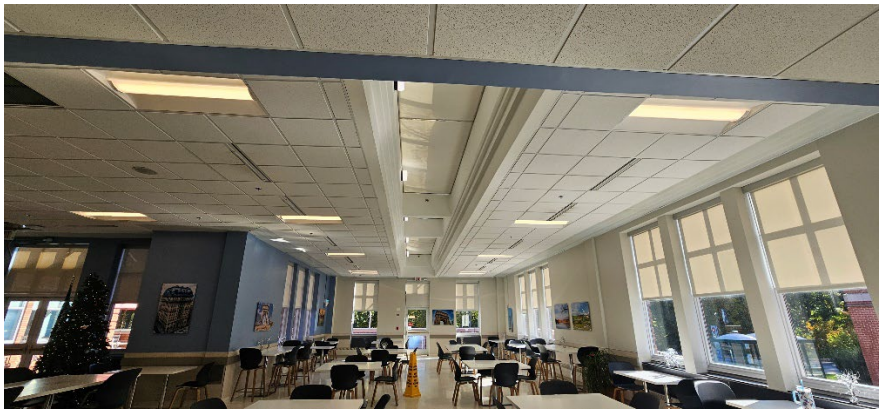


This shows the skylight with condensation on the panes, the gaskets have failed and sealant applied to the surface is needed to stop water infiltration

These skylights are currently blocked off with a fixed canvas sheet, so the skylight and the sky beyond are no longer visible from the interior of the building.

Existing interior view of the skylights

The dining hall is well lit with natural daylighting currently with no additional light provided from the skylights. With the skylights not offering natural light currently the Coatesville VAMC has directed Pettit to omit the skylights.



Existing daylighting conditions in the Patient Dining Hall of Building 139.

The design will be developed to infill the existing skylights with light gauge framing and roof over the former opening with similar roofing materials. On the interior of the dining hall the design will be developed to infill with drywall and painted white. The voids in the roof where the skylights currently are located will be infilled and add roofing material applied over the substrate similar to the adjacent conditions. The existing sconce lighting in the skylight lightwell are to be removed, with remaining surfaces patched and repaired as necessary. New pendant fixtures are to be installed utilizing existing circuitry. Drywall areas adjacent are to be repainted as noted in construction documents.

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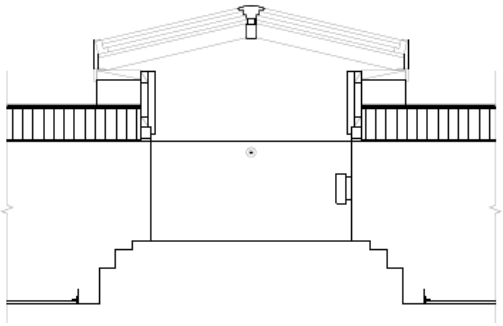
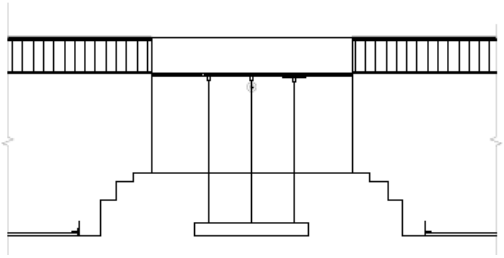


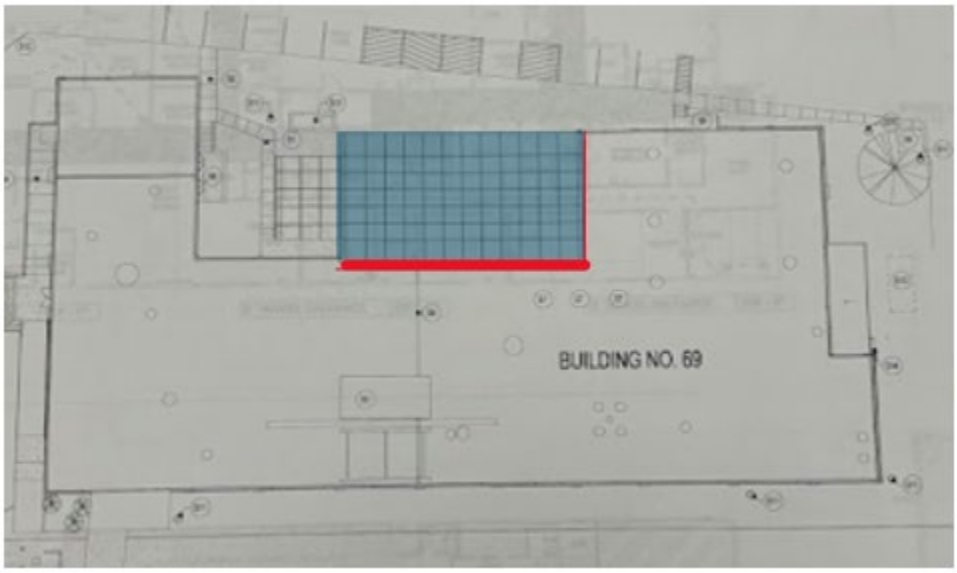
EXISTING



PROPOSED

2.7 Natatorium Enclosure

It was visually observed on the interior of Building 69 that there was water damage in the pool area where the glass enclosure meets the building. Also in the ceramics studio which is also on this same connection line. It was noted by staff that on days of heavy rain that the infiltration is visibly noticeable. (See figure below : The heavy redline indicates the line of water infiltration observed.



As these images show there are other contributing factors to potential water ingress during wet weather:

- Seals at sill failing directly above where the building and roof meet
- Vertical downspouts draining directly where the building and roof meet. These should be extended or diverted
- Connections at gutters failing directly above where the building and roof meet
- There is also a window that needs to be replaced.

There was no visible condensation in the glass panels which is a good indicator that the seals are still intact.

2.8 Code Abstract

All work shall be designed, furnished and installed in accordance with the following codes:

- VA TIL PG 18-15 Volume C - A/E Submission Instructions for Minor and NRM Construction Program. dated November 2008
- VA TIL PG 18-3 – DESIGN AND CONSTRUCTION PROCEDURES dated September 2013
- VA TIL CODES, STANDARDS & EXECUTIVE ORDERS 1-1 TOPIC 1 – CODES, STANDARDS AND EXECUTIVE ORDERS
- VA TIL PG-18-1 - MASTER CONSTRUCTION SPECIFICATIONS
- VA TIL PG-18-10 - DESIGN MANUALS
- VA Directives, Design Manuals, Master Specifications
- VA National CAD Standard Application Guide, and other Guidance on the Technical Information Library (TIL) (www.cfm.va.gov/til/
- NFPA National Fire Codes, current Editions, including NFPA 101 Life Safety Code 2018

- VA Barrier Free Design Guidelines
- National Electrical Code (NEC)
- International Plumbing Code (IPC)
- Ventilation for Acceptable Indoor Air Quality – ASHRAE Standard 62.1- 2004

2.9 Calculations

There are no critical calculations required for the roof renovations.

3.0 Electrical Design Approach

Electrical work under this scope shall include disconnecting the existing HVAC equipment effected by the replacement of the existing roof membrane located on Buildings 69 and 139 per the VA provided scope of work. Under this scope the design team has been directed to reconnect the equipment to the existing distribution equipment circuits in which they are currently connected to. The equipment is to be returned to operational status per its current state following the completion of construction. Associated equipment shutdowns shall be coordinated with the overall phasing to minimize outage durations.

Per scope of work and direction per the Coatesville VAMC, it is not included to evaluate the size or condition, or compliancy of the existing connections to source power. It is not required under this scope to replace any of the existing conduit, conductors, or means of disconnects associated with the equipment located on the roof of Buildings 69 and 139. In the event that damages are observed, the A/E shall notify the VA and request direction forward. The contractor will be responsible for maintaining the current integrity of the associated equipment during construction period services.

In addition to disconnecting/reconnecting the source power to the associated equipment that is temporarily disconnected for the replacement of the roofing membrane, the existing lightning protection system located on Buildings 69 and 139 shall be removed and replaced with a new system, compliant with current code requirements. This includes but is not limited to VA requirements as well as requirements listed within NFPA 780 and UL 96. The installation of this system shall be coordinated with the roofing manufacturer and installer during construction period services. Connections shall be provided for all metallic projections and equipment throughout both Building 69 and 139 roofing systems as required by NFPA 780.

Within this schematic submission, the existing equipment which shall be required to be disconnected and reconnected has been identified as well as schematic references for the demolition of the existing lightning protection systems on both roof systems. Additional details shall be provided throughout design development.

4.0 Mechanical and Plumbing Design Approach

The mechanical and plumbing scope for the project is driven by the need to replace the existing roof membrane for Buildings 69 and 139 at the Coatesville VAMC. Multiple roof curbs and roof rails do not meet standard VA requirements, and additional roof supports are abandoned entirely. All equipment roof curbs have been evaluated and roof curbs shall be extended to VA compliant height if possible or curbs shall be replaced entirely to satisfy this requirement. Additionally, there are instances of roof rails which must be relocated to accommodate the installation of new roofing materials. HVAC equipment that must be temporarily shut down or relocated must be coordinated and identified with the station. The kitchen cooler condensing units are a high priority for this coordination effort. Other high priority equipment that will require station user coordination includes but is not limited to exhaust fans and outside air intakes.

For Building 69, all equipment must be evaluated to determine if it is still in use or if it can be permanently removed. A majority of the existing equipment and roof curbs are abandoned. Coordination with the station is required to decide whether this equipment and these curbs should be removed entirely. Any equipment designated to remain in use by the station, shall be removed and stored for reinstallation by the contractor. Prior to reinstallation, the contractor shall make any necessary curb modifications and follow any phasing requirements as outlined in the contract documents. Upon permanent removal, any required repairs to roof penetrations will be completed by the selected roofing contractor.

For Building 139, equipment and roof curbs will be removed and reinstalled. A majority of equipment located on the roof is still in use by existing systems within the building. Any HVAC or plumbing equipment that is damaged during removal, prior to reinstallation, will be replaced to existing specifications by the contractor at no additional cost to the station. Equipment that is identified to be removed and not reinstalled will be disposed of according to specifications. Equipment that is reinstalled must utilize curbs and supports that adhere to VA specifications

Building 139 contains equipment that, if temporarily taken offline during the roof replacement, would cause significant disruptions to normal hospital operations. Equipment such as refrigeration condensing units would have serious repercussions to perishable food items if taken offline. Equipment such as exhaust fans and outside air intakes provide essential functionality including but not limited to kitchen equipment exhaust and outside air to primary building air handling units. The primary phasing solutions to accommodate the removal and reinstallation of rooftop equipment is as follows:

- Items requiring refrigeration will be consolidated in coordination with the roofing contractor. When the contents of one refrigeration unit are moved to another, one refrigeration unit can be taken offline while the roofing contractor takes that condensing unit offline. Once the unit has been reinstalled and is operational, perishables can be moved to

the unit that has already had its associated rooftop condensing unit taken offline and reinstalled, while the remaining units are taken offline.

- Coordination with kitchen and hospital staff will be required to ensure that all items requiring refrigeration are maintained at the proper temperatures throughout the duration of construction.

- Exhaust fans utilized by kitchen equipment must be identified and coordinated with VA kitchen staff to ensure that said kitchen equipment is not relied upon while the corresponding rooftop exhaust fan is offline.

- When exhaust fans and additional rooftop kitchen equipment needs to be temporarily taken offline to allow for replacement of the roof, it is recommended that downtimes occur during off hours such as nights or weekends. This will minimize the overall impact of the roof replacement on both buildings.

- Kitchen equipment located on the roof should only be taken offline once to minimize disruptions to Buildings 69 and 139.

Example Phasing Sequence for Roof Equipment:

Roof Rail

1) Roofing Contractor (RC) and Mechanical Contractor (MC) to coordinate location of new condensing unit location(s). Refrigerator condensing unit to locate adjacent to existing unit to minimize refrigerant piping length. Also, roof rails should coordinate with the roofing structure below such that it is adequately supported.

2) RC to remove section of roofing material. Coordinate date with VA and MC.

3) MC to install new roof rails adjacent to existing rails and condensing unit.

4) RC to install temporary roof material around new roof rails.

5) MC to deenergize condensing unit, and capture refrigerant. Refrigerant piping to disconnect and condensing unit to relocated to new adjacent roof rails. Reconnect refrigerant piping and recharge unit. Startup and commissioning kitchen cooler system.

6) RC to remove roofing and existing roof rails. Refinish roofing around new roof rails.

Exhaust Fans

1) Roofing Contractor (RC) and Mechanical Contractor (MC) to coordinate date with VA for temporary exhaust fan removal.

2) MC to deenergize exhaust fan and disconnect from roof curb. Then remove exhaust fan from existing curb.

3) RC to apply new roof flashing to curb. Flashing to finish to top side of curb.

4) MC to install curb extension to existing roof curb.

5) MC to install duct sleeve to connect between top of curb extension and existing duct.

6) MC to reinstall exhaust fan. Startup and commission existing exhaust fan.

5.0 Structural Design Approach

5.1 Building 139

Building 139 is a steel framed structure constructed in 1988. It is a single-story building with a flat roof, except for a sloped roof above the mechanical penthouse. A southern portion of the building contains a lower, flat roof. The flat roof portions are constructed with metal deck spanning between steel open-web bar joists that are supported by steel girders spanning to columns. From the existing drawings, the flat roof system appears to have been designed as an EDPM membrane over rigid insulation and covered with a ballast layer. The ballast roof has since been replaced with a non-ballasted roof. The sloped roof is a hip roof which is framed with steel wide-flange purlins spanning between sloping wide-flange beams that frame to columns at the ridge and eaves. Metal deck spans between the purlins and is topped with plywood sheathing to accept the asphalt shingles. The flat roof is surrounded by a parapet with pop-ups at window boxes, skylights, and over the mechanical penthouse.

The main flat roof has multiple small pieces of MEP equipment supported on a mixture of 4-sided curbs and 2-sided curbs with light-gage metal framing similar to Unistrut spanning between the curbs. The mechanical penthouse roof has two large openings for exhaust hoods. The roofs are drained with thru-roof drains on the flat roofs that are interior to the building footprint. The parapet is a CMU backup wall with brick veneer on the exterior side. The roofing membrane continues to the underside of the limestone parapet capstones. The sloping skylights over the dining hall sit on a CMU curb that is supported on steel beams below.

The roof structure of Building 139 appears to be in generally good condition. The visible sections of deck and framing at the flat roof do not show signs of corrosion or deterioration that would require replacement. The roof contains a very shallow slope which may inhibit proper flow of rain water off of the roof surface. It is proposed to increase the roof slope by adding tapered insulation under the new roof membrane. The roof framing is adequate for that additional loading because the roof ballast has been removed.

At the parapet minor cracks and holes were noted in the capstone. These will be repaired and sealed to prevent water infiltration through the cap and onto the top of parapet wall below. At the vent openings on the north side of the sloped roof, the shingles appear to be swelling upwards. It is anticipated that the flashing in that area has failed and water is entering through the joint between the fan and the shingles and saturating the plywood,

causing the wood to swell. This wood will be replaced after removing the shingles. The metal deck does not show signs of deterioration or rusting from below and is not assumed as needing to be replaced at this time. The rooftop units that currently bear on temporary unit supports – typically Unistrut beams spanning between the original curbs – will be relocated to four-sided curbs adjacent to their current locations. Original documentation of the structure is limited however it appears that the existing roof deck will be adequate to support the units without reinforcing the underside of the deck, which would require localized demolition of the ceiling below for installation. Further investigation during the next phase of the project will be required. This will entail researching the operation weights of the existing rooftop units, further investigation of the original drawings at the Medical Center, and possibly performing a probe of the roof to determine the profile and gage of the roof deck.

New structural work on this building is limited. The skylights over the dining hall will be demolished and infilled with roof deck. The infilled portion of the roof deck can span between the existing CMU curbs that form the skylight opening so that no additional structural steel framing will be required. The CMU will need to be grouted solid in order to fasten the steel deck to the CMU.

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5.2 Building 69

Building 69

Building 69 is U-shaped in footprint with a glass-roofed natatorium addition within a portion of the two wings. It was constructed in 1960 with the natatorium added in 2014 and is a single story with a flat roof and no parapets. The roof is primarily one elevation except a portion of the west wing that steps up approximately two feet at its north end and a small low canopy over the loading dock on the east side of the building. Abandoned dunnage exists on the south-central portion of the building which has an approximate footprint of 25’ x 50’.

The structure is constructed with metal deck spanning to steel open web bar joists that are supported by steel girders spanning to columns. An expansion joint is located at the center of the main wing of the building breaking the structure into two L-shaped sections. The existing roof is a membrane type system over insulation. The dunnage is constructed of structural steel beams, girders, and angle braces. Most of the connections are bolted except the girder to post connection, which is welded. It appears that the W8 dunnage posts are an extension of the building columns.

The flat roof has multiple small pieces of MEP equipment supported on curbs as well as multiple abandoned openings, and curbs. The MEP equipment on this roof is all on curbs that meet current VA standards The Building 69 roof is drained thru roof drains on the flat roofs that are interior to the building footprint.

The roof structure of Building 69 appears to be in generally good condition as observed from above. The visible sections of deck and framing below do not show signs of corrosion or deterioration that would require replacement. The roof has soft spots but it is believed

this is due to inadequate fastening of the insulation to the metal deck and structural damage is not anticipated.. The rain leaders at the natatorium terminate on the top of the curb where the natatorium meets the flat roof. These leaders will be extended to prevent water from draining along the glass or curb and drain water directly to the Building 69 roof.

There is no new structural work anticipated for this building but there are multiple existing items that will be removed and/or infilled prior to re-roofing. The abandoned dunnage will be removed. If it is desired to lower the four columns at the corners of the dunnage below the roof, they could be cut flush with the top of deck and capped with a sheet metal plate. Around the dunnage there are multiple roof openings and curbs that are abandoned and will be infilled or removed to simplify the roofing details. The openings will be infilled with angle frames and deck. There are also 3 steel angles penetrating the roof to the west of the existing dunnage that appear to be for previous roof equipment that has since been removed. These angles will also be removed and the deck penetrations covered with sheet metal plates. There is also a wood structure that appears to be abandoned in place including some conduits. The wood structure will be demolished and the conduits will be terminated below the roof deck. All roof deck penetrations will be infilled with sheet metal plates. There are also multiple pieces of abandoned MEP equipment that will be removed. At these units the unit curbs will be removed and any openings for ducts, pipes, or conduit supplying the unit infilled with angle frames and steel roof deck.

5.3 Structural Design Criteria

1. Design Codes and Standards
    a. PG-18-10 Structural Design Manual by the Dept. of Veterans Affairs
    b. International Building Code (IBC) 2024
    c. International Existing Building Code (IEBC) 2024
    d. ASCE 7-22 Minimum Design Loads for Buildings and Other Structures through reference by IBC 2024

Both buildings will be governed by the IEBC. Based on IEBC alteration requirements it is not anticipated that a full building gravity or lateral analysis will be needed because the building’s use is not changing, the loading changes from the insulation and roofing membrane will be insignificant, and the lateral system is unchanged by reroofing. The scope of the renovations to the building do not meet the requirements for seismic evaluation outlined in VA H-18-8. The building area of the proposed renovation does not exceed 50% of the total building area.

6.0 Site Design – Design Approach

The only change to the site will be the removal of two trees identified by the CVAMC located adjacent to Building 139. These two trees are currently overgrown onto the roof of this building and are increasing the required maintenance to the existing roofs. The excess leaves are causing drainage issues and potentially causing leaking inside the building.

Existing Conditions at Building and on roof

The two trees identified in red circles will be removed during construction

7.0 Construction Phasing

7.1 Phasing Plan Development

The phasing plan for the renovations to Buildings 69 and 139 will be developed in conjunction with the Coatesville VAMC Engineering staff. The plan will minimize disruption to the building users and maintain operations throughout the renovation. It is understood that at no time can this building lose a functional HVAC system or refrigeration/freezer capability supporting the dining hall in Building 139.

Phasing the removal of HVAC and plumbing equipment from both buildings presents the biggest challenge for the project. Building 139 contains multiple pieces of equipment that, if temporarily taken offline during the roof replacement, would cause significant disruptions to normal hospital operations. Equipment such as refrigeration condensing units would have serious repercussions if taken offline.

Building 139

Phasing solutions to accommodate the removal and reinstallation of refrigeration condensing units are shown in the 95% construction documents.

In conjunction with the CVAMC, this phasing plan has been developed to utilize Building 139's existing walk in freezers and coolers to move refrigerated and frozen foods in conjunction with the temporary shut down of individual units. Mechanical units would be taken off line in an isolated phased approach.

Building 69 – This would be done in three phases to minimize the impact on any patient services . A more detailed phasing plan is included in the 95% Construction Documents submission.

Please Note in Room 158 in Building 69 (Ceramics) leak adjacent to the pool room. While this was noted during our walkthrough it is not intended to be part of the project scope as it is outside the area of work.

8.0 Contract Administration

The Pettit Group will follow Specification Sections including but not limited to Section 10 32 16.10 Architectural and Engineering CPM Schedules as well as 01 33 23 Shop Drawings, Product Data and Samples.

The Pettit Group will develop a detailed submittal register to monitor contractors for all required submissions

The Pettit Group will review contractor's proposed schedule and advise the Coatesville VAMC of any conflicts or issues

The Pettit Group to field check all construction filed changes, provide construction cost estimate, and assist CO/Engineering in contractor negotiation.

9.0 Hazardous Material Survey

A Hazardous Material Survey of the existing roofing conditions of Coatesville VAMC Building 139 and Building 69 was performed to identify potential environmental conditions that may require remediation prior to commencing with replacing the roof on both of the buildings.

The work performed as part of this project was completed to meet the following objectives:

- Identify, sample and quantify regulated asbestos containing building materials (ACBM) (friable or non-friable) at the site that will be directly impacted, or has the potential to be impacted, during the proposed renovation activities. If such asbestos containing materials are identified, determine the correct remediation activities according to all applicable Local, State and Federal regulations prior to the initiation of the scheduled renovations.

- Identify lead-based paint (LBP) surfaces at the site that will be directly impacted, or have the potential to be impacted, during the proposed renovation activities. If such LBP surfaces are identified, determine the correct remediation activities according to all applicable Local, State and Federal regulations prior to the initiation of the scheduled renovations.

The results of this investigation are included in Appendix E. The only hazardous material identified is outside the project area in Building 139, room 158.

Table 3.0: Lead-Based Paint Positive Results Summary

Location	Side	Structure	Condition	Substrate	Color	Lead (mg/cm2)
Theraputic modalities clinic 158 bldg 139		Beams above ceiling tiles		Metal	Orange	10+

The HUD Guidelines define LBP, when analyzed by a portable XRF, as paint with a lead concentration of greater than or equal to 1.0 mg/cm². It should be noted, however, that Occupational Safety and Health Administration (OSHA) regulations apply to any detectable concentrations of lead in paint.

10.0 Construction Cost Estimate

A cost estimate will be provided as noted in the Project Schedule (APPENDIX A).

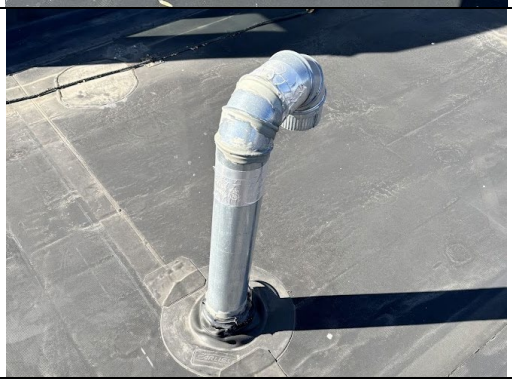
11.0 PA SHPO Submission

It has been determined by the Coatesville VAMC that there is no requirement regarding submission to PA SHPO.

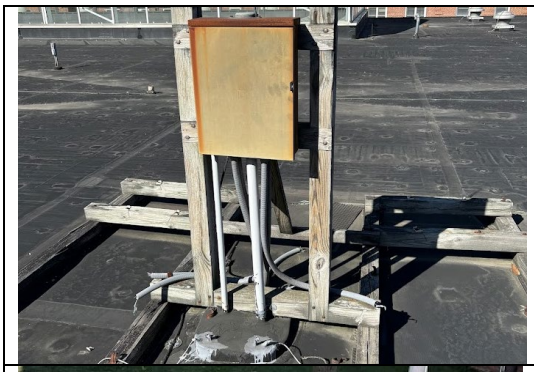
APPENDIX B

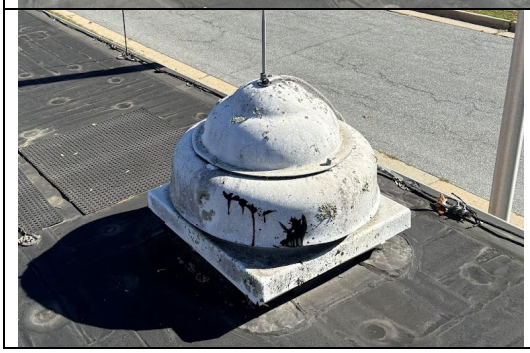
CATALOG OF ROOF MOUNTED EQUIPMENT AND PENETRATIONS

COATESVILLE VAMC - BUILDING 69

PHOTO	TAG	DESCRIPTION
	01	Typical Roof Drain (Qty.12) – Replace existing Strainer Basket and assembly and Replace with new.
	02	Plumbing Vent (Qty.16) – remain in place, reuse
	03	Abandoned Roof Cap
	**04**	Exhaust Vent Fan

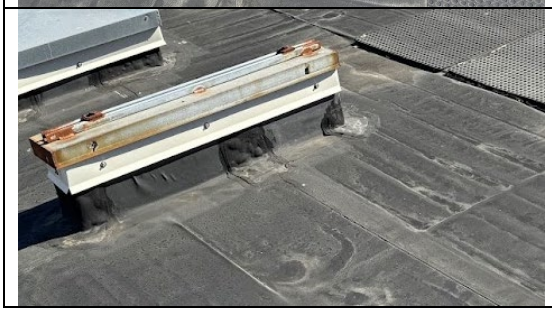
		05	RoofJack Round
		06	Receptacle
		07	Abandoned Roof Cap
		08	Abandoned Roof Rail
		09	Goose Neck Exhaust Roof Vent

		**10**	Electrical Panel
		11	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
		12	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
		13	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
		14	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit

	15	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	16	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	17	Existing Upblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	18	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	**19**	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit

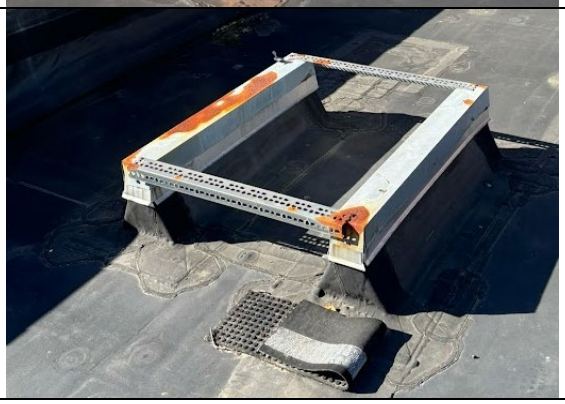
	20	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	21	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	22	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	23	Existing Upblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	24	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit

		25	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
		26	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
		27	Existing Upblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
		28	Abandoned Roof Cap – Recommend removing entirely and infilling void and roofing over.
		29	Abandoned Roof Cap – Recommend removing entirely and infilling void and roofing over.

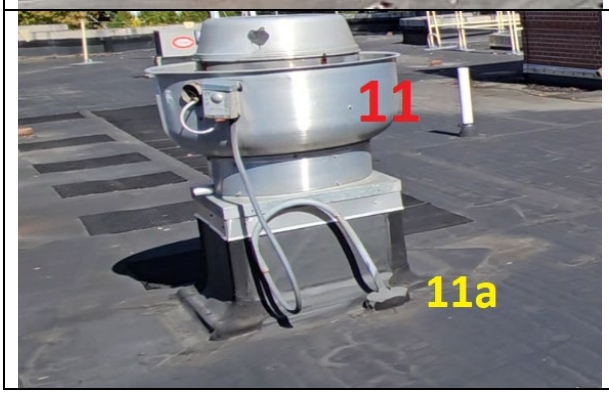
	30	Abandoned Roof Cap – Recommend removing entirely and infilling void and roofing over.
	31	Abandoned Roof Cap – Recommend removing entirely and infilling void and roofing over.
	32	Abandoned Roof Cap – Recommend removing entirely and infilling void and roofing over.
	33	Abandoned Roof Cap – Recommend removing entirely and infilling void and roofing over.
	**34**	Abandoned Roof Rail – Recommend removing entirely and infilling void and roofing over.

	35	Abandoned Roof Cap
	36	Existing Expansion Joint – to remain
	37	Abandoned Roof Rail

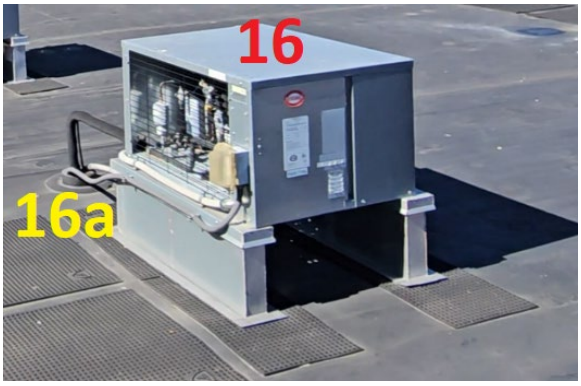
COATESVILLE VAMC - BUILDING 139

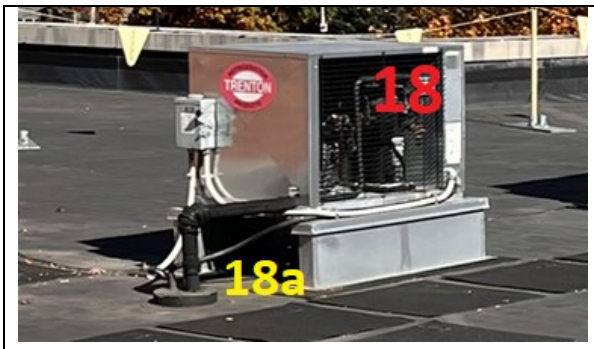
PHOTO	TAG	DESCRIPTION
	01	Typical Roof Drain (Qty.30) – Replace existing Strainer Basket and assembly and Replace with new.
	02	Plumbing Vent (Qty.21)– remain in place, reuse
	03	Plumbing Vent
	**04**	Abandoned Mechanical Curb – Remove and patch recommended

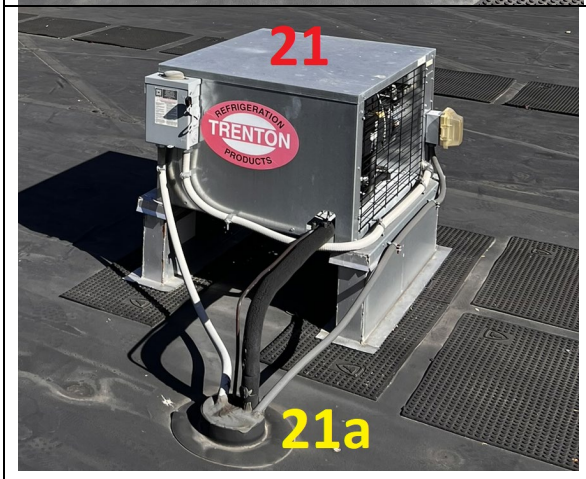
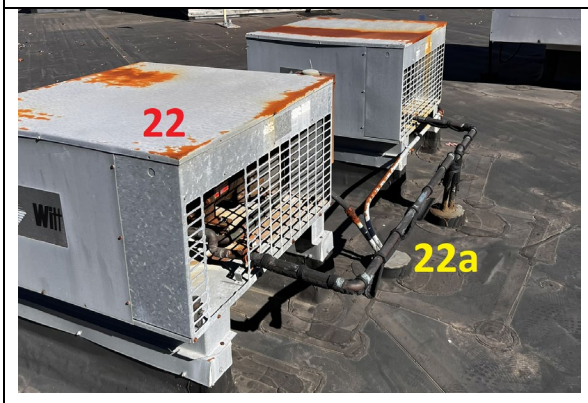
	05	Abandoned Roof Cap
	06	Existing Upblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	07	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit

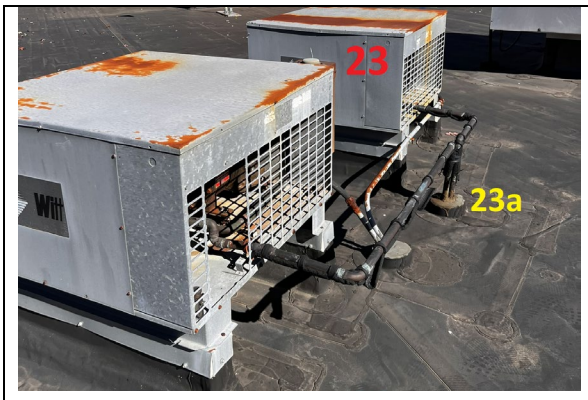
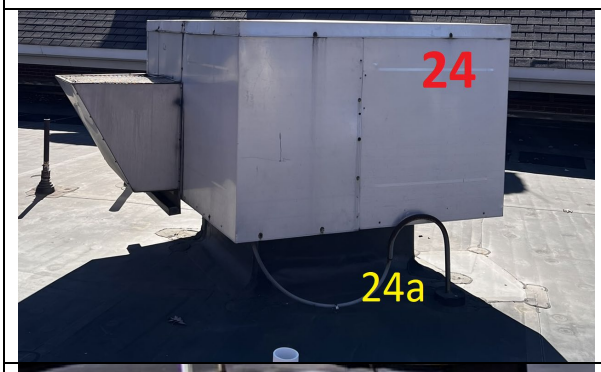
	08	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	09	Existing Upblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	10	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	**11**	Existing Upblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit

	12	Existing Downblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	13	Existing Upblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	14	Existing Upblast Exhaust Fan unit and associated curb- reflash curb and reinstall Exhaust unit
	15	**15**: Refrigeration Condensing Unit serves COOLER#1, WALK IN 135 (R404 11 lbs) – • Existing Mechanical Unit to be reused • Existing rail/curb to be removed. New curb to be installed • Multiple options to be discussed for phasing

		15a: Recommend Roof Penetration Housing to replace existing penetration
	**16**	**16**: Refrigeration Condensing Unit serves COOLER#2, WALK IN 133 (R404 11 lbs) – • Existing Mechanical Unit to be reused • Existing rail/curb to be removed. New curb to be installed • Multiple options to be discussed for phasing **16a**: Recommend Roof Penetration Housing to replace existing penetration
	17	**17:** Refrigeration Condensing Unit serves FREEZER#1, WALK IN 136 Existing Mechanical Unit to be reused • Existing rail/curb to be removed. New curb to be installed • Multiple options to be discussed for phasing **17a**: Recommend Roof Penetration Housing to replace existing penetration

	**18**	**17**: Refrigeration Condensing Unit serves FREEZER#2, WALK IN 134 Existing Mechanical Unit to be reused • Existing rail/curb to be removed. New curb to be installed • Multiple options to be discussed for phasing **18a**: Recommend Roof Penetration Housing to replace existing penetration
	19	**19**: Refrigeration Condensing Unit serves FREEZER#3, WALK IN 134 Existing Mechanical Unit to be reused • Existing rail/curb to be removed. New curb to be installed • Multiple options to be discussed for phasing **19a**: Recommend Roof Penetration Housing to replace existing penetration
	20	**20**: Refrigeration Condensing Unit serves COOLER#4, WALK IN 127 Existing Mechanical Unit to be reused • Existing rail/curb to be removed. New curb to be installed • Multiple options to be discussed for phasing

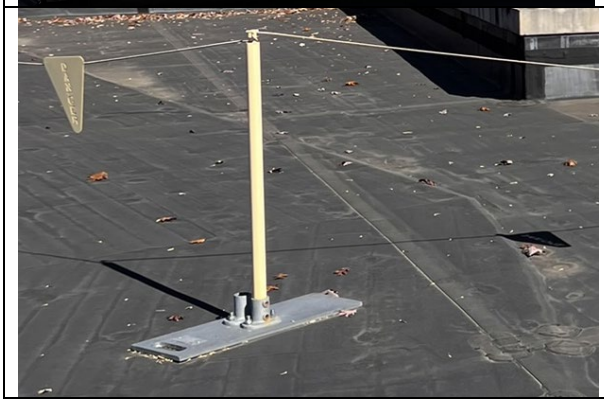
		20a: Recommend Roof Penetration Housing to replace existing penetration
	**21**	**21**: Refrigeration Condensing Unit serves COOLER#3, WALK IN 131 Existing Mechanical Unit to be reused • Existing rail/curb to be removed. New curb to be installed • Multiple options to be discussed for phasing **21a**: Recommend Roof Penetration Housing to replace existing penetration
	**22**	**22**: Refrigeration Condensing Unit serves Existing Mechanical Unit to be reused • Existing rail/curb to be removed. New curb to be installed • Multiple options to be discussed for phasing **22a**: Recommend Roof Penetration Housing to replace existing penetration

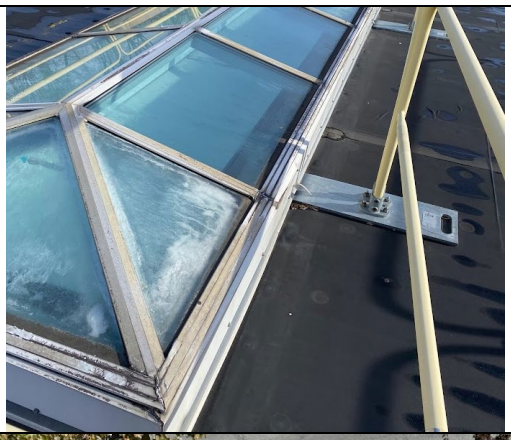
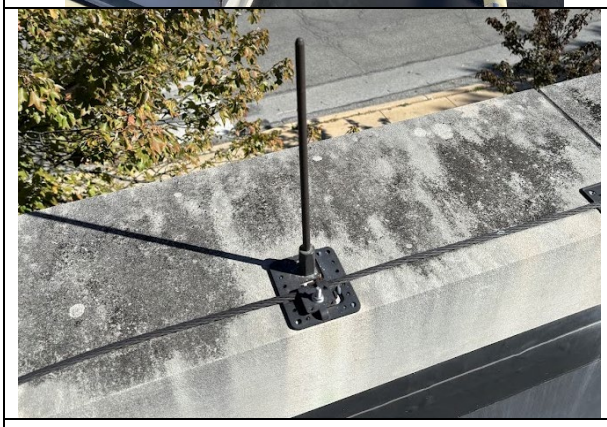
	**23**	**23**: Refrigeration Condensing Unit serves Existing Mechanical Unit to be reused • Existing rail/curb to be removed. New curb to be installed • Multiple options to be discussed for phasing **23a**: Recommend Roof Penetration Housing to replace existing penetration
	**24**	Make-Up Air Unit
	25	**25**: Refrigeration Condensing Unit serves Existing Mechanical Unit to be reused • Existing rail/curb to be removed. New curb to be installed • Multiple options to be discussed for phasing **25a**: Recommend Roof Penetration Housing to replace existing penetration

	26	Upblast Exhaust Fan
	27	Intake/Relief Hood
	28	Intake/Relief Hood
	29	Upblast Exhaust Fan

	30	Intake/Relief Hood
	31	CVAMC to remove
	32	Intake/Relief Hood

	33	Intake/Relief Hood
	34	Plumbing Vent
	35	Plumbing Vent X2
	36	Plumbing Vent

	37	Plumbing Vent X2
	38	Plumbing Vent
	**39**	Fall Protection

	**40**	Skylights
	**41**	Lightning Protection – to be removed and replaced with new units.
	42	Existing Steep Slope Asphalt Shingled Roof
	43	Existing Low Slope EPDM roofing system

APPENDIX C

SPECIFICATIONS INDEX

DEPARTMENT OF VETERANS AFFAIRS
VHA MASTER SPECIFICATIONS

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APPENDIX D

HAZARDOUS MATERIALS REPORT

TTI ENVIRONMENTAL, INC.
1253 NORTH CHURCH STREET, MOORESTOWN, NJ 08057
www.ttienv.com o 856-840-8800 f 856-840-8815

TTI Project No. 24-060
November 19, 2024

LIMITED ASBESTOS AND LEAD-BASED PAINT SURVEY REPORT

[COATESVILLE VA MEDICAL CENER – BUILDINGS 69 AND 139 ROOF AREAS]

Prepared by:

Richard C. Clayton
Technical Administrator

Reviewed by:

Brian Clark
Senior Project Manager

SITE LOCATION:
Coatesville VA Medical Center
1400 Blackhorse Hill Road
Coatesville, PA 19320

CONDUCTED ON:
October 25, 2024

PREPARED FOR:
The Pettit Group, LLC
497 Center Street
Sewell, New Jersey 08080

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1.0 INTRODUCTION

TTI Environmental, Inc. (TTI) was requested by The Pettit Group, LLC to conduct a limited hazardous building material survey to properly characterize hazardous materials that will be impacted during a roof renovation project for Buildings 69 and 139 at the Coatesville VA Medical Center, Coatesville, PA. The inspection was limited to the Roof areas of Buildings 69 and 139 of the Medical Center. The testing was performed to identify potential environmental conditions that may require remediation and/or segregation of building materials for the renovation project within the Roof area. Samples of suspect Asbestos Containing Building Materials (ACBM) and X-Ray Fluorescence (XRF) testing for Lead-Based Paint (LBP) were completed from the areas located in Building 69 and 139.

The work performed as part of this project was completed to meet the following objectives:

- Identify, sample and quantify regulated ACBM (friable or non-friable) from proposed renovation areas at the site that will be directly impacted, or have the potential to be impacted, during the renovation project.

- Identify LBP surfaces in proposed renovation areas at the site that will be directly impacted, or have the potential to be impacted, during the renovation project.

2.0 SURVEY INFORMATION

2.1 Asbestos Containing Building Materials (ACBM)

TTI performed an asbestos National Emissions Standard for Hazardous Air Pollutants (NESHAPS) inspection and sampling of the Roof area, Penthouse, Chief of Staff and the Quality Management offices located in Building 1 of the medical center. Eric Cole, US Environmental Protection Agency (USEPA) certified asbestos building inspector number #ACC-1024-6-014 conducted the NESHAPS inspection using industry-standard and EPA protocols for sampling methods. All sampled materials were analyzed using PLM (Polarized Light Microscopy). The USEPA defines ACBM as those materials that contain greater than one percent (>1%) asbestos. Laboratory analysis of the suspect materials revealed that none of the materials tested contain greater than one percent (>1%) asbestos. A complete summary of all suspect asbestos containing materials tested and the EMSL Analytical, Inc. Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy is located in **Appendix B**. Diagrams showing suspect asbestos containing material sample locations can be found in **Appendix D**.

Table 1.0: List of Positive ACBM Identified				
Homogeneous ID Number	**Location**	**Material**	**Estimated Quantity**	**% Asbestos**
Laboratory analysis revealed that none of the suspect materials tested contain greater than one percent (>1%) asbestos.				
The US Environmental Protection Agency (EPA) defines ACBM as those materials that contain greater than one percent (1%) asbestos.				

TTI performed limited destructive sampling as the building is still occupied. Note that there is a potential that concealed materials may be present in spaces not directly assessed at the time of our investigation due to both occupant restrictions and the inability to damage materials for access. The client should be aware that there is a possibility of these additional materials existing and this may increase any cost estimate fees significantly as it relates to any additional testing, removal and disposal at the time of demolition.

In order to collect roofing samples, core penetrations of the roof were required. TTI repaired the roof penetrations; however, TTI does not guarantee the integrity of the patches. A certified roofing contractor was present and conducted the patching of the roof penetrations.

The suspect ACBM listed in **Table 2.0** below were sampled and found to contain less than one percent (<1%) asbestos.

Table 2.0 Asbestos Bulk Sampling Results Summary				
Sample Number	**Sample Location**	**Sample Material**	**Asbestos Result**	
			PLM	**Type**
01-01-Gypsum	Bldg. 139 Main Flat Roof	Roof Material Core 1	ND	
01-01-Insulation	Bldg. 139 Main Flat Roof	Roof Material Core 1	ND	
01-01-Rubber Membrane	Bldg. 139 Main Flat Roof	Roof Material Core 1	ND	
01-02-Gypsum	Bldg. 139 Main Flat Roof	Roof Material Core 2	ND	
01-02-Insulation	Bldg. 139 Main Flat Roof	Roof Material Core 2	ND	
01-02-Rubber Membrane	Bldg. 139 Main Flat Roof	Roof Material Core 2	ND	
02-03-Gypsum	Bldg. 139 Penthouse Roof	Roof Material Core 3	ND	
02-03-Insulation	Bldg. 139 Penthouse Roof	Roof Material Core 3	ND	
02-03-Insulation 2	Bldg. 139 Penthouse Roof	Roof Material Core 3	ND	
02-04-Gypsum	Bldg. 139 Penthouse Roof	Roof Material Core 4	ND	
02-04-Insulation	Bldg. 139 Penthouse Roof	Roof Material Core 4	ND	
02-04-Rubber Membrane	Bldg. 139 Penthouse Roof	Roof Material Core 4	ND	
03-05	Bldg. 139 Main Pitched Roof	Roof Material Core 5	ND	
03-06-Shingle	Bldg. 139 Main Pitched Roof	Roof Material Core 6	ND	
03-06-Tar	Bldg. 139 Main Pitched Roof	Roof Material Core 6	ND	
04-07-Gypsum	Bldg. 139 Lower Curved Flat Roof	Roof Material Core 7	ND	
04-07-Insulation	Bldg. 139 Lower Curved Flat Roof	Roof Material Core 7	ND	
04-07-Rubber Membrane	Bldg. 139 Lower Curved Flat Roof	Roof Material Core 7	ND	
04-08-Gypsum	Bldg. 139 Lower Curved Flat Roof	Roof Material Core 8	ND	
04-08-Insulation	Bldg. 139 Lower Curved Flat Roof	Roof Material Core 8	ND	
04-08-Rubber Membrane	Bldg. 139 Lower Curved Flat Roof	Roof Material Core 8	ND	
05-09-Gypsum	Bldg. 139 Small Flat Roof	Roof Material Core 9	ND	
05-09-Insulation	Bldg. 139 Small Flat Roof	Roof Material Core 9	ND	
05-09-Fiberboard	Bldg. 139 Small Flat Roof	Roof Material Core 9	ND	
05-09-Rubber Membrane	Bldg. 139 Small Flat Roof	Roof Material Core 9	ND	
05-10-Gypsum	Bldg. 139 Small Flat Roof	Roof Material Core 10	ND	
05-10-Insulation	Bldg. 139 Small Flat Roof	Roof Material Core 10	ND	
05-10-Fiberboard	Bldg. 139 Small Flat Roof	Roof Material Core 10	ND	
05-10-Rubber Membrane	Bldg. 139 Small Flat Roof	Roof Material Core 10	ND	
06-11	Bldg. 139 Curved Pitched Roof	Roof Material Core 11	ND	
06-12-Shingle	Bldg. 139 Curved Pitched Roof	Roof Material Core 12	ND	
06-12-Tar	Bldg. 139 Curved Pitched Roof	Roof Material Core 12	ND	
07-13-Insulation	Bldg. 69 Main Flat Roof	Roof Material Core 1	ND	
07-13-Rubber Membrane	Bldg. 69 Main Flat Roof	Roof Material Core 1	ND	
07-14-Insulation	Bldg. 69 Main Flat Roof	Roof Material Core 2	ND	
07-14-Insulation 2	Bldg. 69 Main Flat Roof	Roof Material Core 2	ND	
07-14-Rubber Membrane	Bldg. 69 Main Flat Roof	Roof Material Core 2	ND	
08-15-Insulation	Bldg. 69 Roof Overhang	Roof Material Core 3	ND	

Table 2.0 Asbestos Bulk Sampling Results Summary				
Sample Number	**Sample Location**	**Sample Material**	**Asbestos Result**	
			PLM	**Type**
08-15-Insulation 2	Bldg. 69 Roof Overhang	Roof Material Core 3	ND	
08-15-Rubber Membrane	Bldg. 69 Roof Overhang	Roof Material Core 3	ND	
08-16-Insulation	Bldg. 69 Roof Overhang	Roof Material Core 4	ND	
08-16-Rubber Membrane	Bldg. 69 Roof Overhang	Roof Material Core 4	ND	
09-17-Insulation	Bldg. 69 Upper Flat Roof	Roof Material Core 5	ND	
09-17-Insulation 2	Bldg. 69 Upper Flat Roof	Roof Material Core 5	ND	
09-17-Rubber Membrane	Bldg. 69 Upper Flat Roof	Roof Material Core 5	ND	
09-18-Insulation	Bldg. 69 Upper Flat Roof	Roof Material Core 6	ND	
09-18-Rubber Membrane	Bldg. 69 Upper Flat Roof	Roof Material Core 6	ND	
09-18-Tar	Bldg. 69 Upper Flat Roof	Roof Material Core 6	ND	
10-19	Bldg. 69 Main Flat Roof	Perimeter Tar Flashing	ND	
10-20	Bldg. 69 Main Flat Roof	Perimeter Tar Flashing	ND	
11-21	Bldg. 69 Main Flat Roof	Equipment Flashing	ND	
11-22	Bldg. 69 Main Flat Roof	Equipment Flashing	ND	
12-23	Bldg. 139 Skylight	Skylight Window Caulk White Exterior	ND	
12-24	Bldg. 139 Skylight	Skylight Window Caulk White Exterior	ND	
13-25	Bldg. 139 Skylight	Skylight Window Glazing Black Exterior	ND	
13-26	Bldg. 139 Skylight	Skylight Window Glazing Black Exterior	ND	
14-27	Bldg. 139 Main Flat Roof	Equipment Flashing	ND	
14-28	Bldg. 139 Main Flat Roof	Equipment Flashing	ND	
15-29-Flashing	Bldg. 139 Main Flat Roof	Perimeter Flashing	ND	
15-29-Mastic	Bldg. 139 Main Flat Roof	Mastic	ND	
15-30-Flashing	Bldg. 139 Main Flat Roof	Perimeter Flashing	ND	
15-30-Mastic	Bldg. 139 Main Flat Roof	Mastic	ND	
16-31	Bldg. 139 Main Pitched Roof Interior	Fireproofing on Metal Decking	ND	
16-32	Bldg. 139 Main Pitched Roof Interior	Fireproofing on Metal Decking	ND	
16-33	Bldg. 139 Main Pitched Roof Interior	Fireproofing on Metal Decking	ND	
17-34	Bldg. 139 Curved Flat Roof	Equipment Flashing	ND	
17-35	Bldg. 139 Curved Flat Roof	Equipment Flashing	ND	
18-36	Bldg. 139 Small Flat Roof	Perimeter Tar Flashing	ND	
18-37	Bldg. 139 Small Flat Roof	Perimeter Tar Flashing	ND	
19-38	Bldg. 139 Penthouse Roof	Gray Exterior Roof Caulking	ND	
19-39	Bldg. 139 Penthouse Roof	Gray Exterior Roof Caulking	ND	
20-40	Bldg. 139 Cafeteria Skylight Int.	Skylight Plaster Skim Coat	ND	
20-41	Bldg. 139 Cafeteria Skylight Int.	Skylight Plaster Skim Coat	ND	

Table 2.0 Asbestos Bulk Sampling Results Summary				
Sample Number	**Sample Location**	**Sample Material**	**Asbestos Result**	
			PLM	**Type**
20-42	Bldg. 139 Cafeteria Skylight Int.	Skylight Plaster Skim Coat	ND	
21-43	Bldg. 139 Cafeteria Skylight Int.	Skylight Plaster Brown Coat	ND	
21-44	Bldg. 139 Cafeteria Skylight Int.	Skylight Plaster Brown Coat	ND	
21-45	Bldg. 139 Cafeteria Skylight Int.	Skylight Plaster Brown Coat	ND	
PLM: Polarized Light Microscopy; ND: None Detected The US Environmental Protection Agency (EPA) defines asbestos-containing materials as those materials that contain greater than 1% asbestos.				

TTI recommends sampling any materials not identified in this report prior to commencement of any activities that would impact them. If materials are found to contain greater than one (1%) percent asbestos, removal activities should be performed by a licensed asbestos abatement contractor.

2.2 Lead Based Paint (LBP)

TTI performed a lead paint XRF screening of the exterior surfaces of the roof areas located on Building 69 and 139 of the Medical Center to identify lead painted building components. Eric Cole, USEPA and US Department of Housing and Urban Development (HUD) Lead Paint Risk Assessor conducted the lead-paint screening utilizing the Sci-Aps X550 portable XRF. One of the building components tested in the proposed work areas yielded lead concentrations that were greater than or equal to the HUD guideline for LBP of 1.0 milligrams per square centimeter (mg/cm^2) (see **Table 3.0**). A complete summary of all suspect LBP coated components tested can be found in **Appendix C**.

Table 3.0: Lead-Based Paint Positive Results Summary

Location	Side	Structure	Condition	Substrate	Color	Lead (mg/cm2)
Theraputic modalities clinic 158 bldg 139		Beams above ceiling tiles		Metal	Orange	10+

The HUD Guidelines define LBP, when analyzed by a portable XRF, as paint with a lead concentration of greater than or equal to 1.0 mg/cm^2. It should be noted, however, that Occupational Safety and Health Administration (OSHA) regulations apply to any detectable concentrations of lead in paint.

Six (6) building components tested in the proposed work areas yielded lead concentrations that were greater than or equal to the OSHA level for LBP of 0.1 milligrams per square centimeter (mg/cm^2) (see **Table 4.0**).

Table 4.0: Lead-Based Paint OSHA Positive Results Summary

Location	Side	Structure	Condition	Substrate	Color	Lead (mg/cm2)
Exterior pitched roof building 139	A	Flashing		Metal	White	0.01
	B	Flashing		Metal	White	0.02
	D	Flashing		Metal	White	0.01
	A	Soffit		Metal	White	0.03
	B	Soffit		Metal	White	0.02
		I beams		Metal	White	0.08

The HUD Guidelines define LBP, when analyzed by a portable XRF, as paint with a lead concentration of greater than or equal to 1.0 mg/cm^2. It should be noted, however, that Occupational Safety and Health Administration (OSHA) regulations apply to any detectable concentrations of lead in paint.

3.0 Conclusions and Recommendations

TTI conducted a limited asbestos and lead-based paint survey to identify potential environmental conditions that may require remediation and/or segregation of building materials that will be impacted during the renovation project within the Roof areas located on Building 69 and 139 at the Coatesville VA Medical Center, Coatesville, PA.

None of the suspect asbestos containing materials sampled contain greater than one percent (>1%) asbestos. Therefore, no abatement will be required prior to building renovation.

The lead paint XRF screening did identify one-(1) lead coated component in the renovation project area that were tested. The HUD Guidelines define LBP, when analyzed by a portable XRF, as paint with a lead concentration of greater than or equal to 1.0 mg/cm^2. It should be noted that Occupational Safety and Health Administration (OSHA) regulations apply to any detectable concentrations of lead in paint. There were three-(3) components that were above 0.0 mg/cm^2.

Appendix A: General Information and Definitions

1.0 ASBESTOS

1.1 General Information and Definitions

The inspection was conducted in accordance with the guidelines established by the National Emissions Standard for Hazardous Air Pollutants (NESHAPS), also known as a pre-renovation inspection, this inspection is required before demolition or renovation. It involves a thorough identification of suspect materials, including invasive sampling that may penetrate walls, floors, and ceilings. In addition, the Asbestos Hazard Emergency Response Act (AHERA) guidelines represent the most up-to-date inspection and sampling protocol available, and as such, provided a framework for inspecting and sampling this the proposed renovation areas of this building.

The US Environmental Protection Agency (USEPA) defines "Homogeneous Areas" as those areas of surfacing, thermal system insulation, or miscellaneous materials, which are uniform in color, texture, and assumed to be installed at the same time. The suspected ACBM has been categorized into homogeneous areas. This assigned ID number can be used for cross-referencing between each section of the report.

The USEPA requires that bulk samples of suspect ACBM be collected in a manner sufficient to determine whether this material is ACBM. ACBM is any building material, which contains more than 1% asbestos. Generally, for thermal system areas, three (3) bulk samples randomly taken are required to determine that suspected material is not ACBM. Suspect surfacing materials sprayed or troweled-on may require up to nine (9) bulk samples, depending on area size, to determine whether the material is ACBM.

Samples were taken in sufficient quantity in each Homogeneous Area to reliably determine the presence of asbestos. Analysis of samples collected in conjunction with this report was conducted by the EPA 600/R-93/116 method.

Please note that limited destructive or exploratory sampling methods were employed during the survey. In addition, access was limited to certain areas; therefore, TTI made a prudent effort to identify all accessible ACBM included inspection areas within the building.

All accessible materials are assessed and bulk sampled, and therefore, included within this inspection report. Voids above ceilings, behind walls, and beneath floors were not assessed. Therefore, any concealed materials were not bulk sampled. Due to these conditions, a qualified person should continuously oversee all future demolition or demolition activities once they commence. During future demolition or demolition procedures, if a suspicious material is exposed that was previously inaccessible, then all activities in that area of the building shall immediately stop.

1.1.1 Drywall/Wallboard and Joint Compound

To comply with the Occupational Safety and Health Administration (OSHA) asbestos regulation, which requires each individual layer of material be analyzed, wall board and joint compound are analyzed as separate materials. When analyzed as a separate material, if either of these materials is greater than 1% asbestos, OSHA requires the removal of this material to be class II asbestos work. As such, all work that impacts the wall board systems would be abated according to the OSHA asbestos standard. All workers performing the work will have the proper OSHA required training and protective equipment. All work will be performed by complying with the work practices and controls designated by the OSHA asbestos standard.

According to NESHAPS, if joint compound is used only at the joints and nail holes, the material is considered part of a wall board system and a composite sample may be taken. The composite samples of the sheetrock and joint compound may result in the material containing less than 1% asbestos. As such, this material is not considered an ACBM under NESHAPS regulations.

2.0 LEAD-BASED PAINT

2.1 General Information and Definitions

A visual inspection of all painted surfaces was performed and testing of all painted surfaces within the facility was conducted using a portable X-Ray Fluorescence spectrum analyzer (XRF). All testing combinations identified within each functional space of the building were assessed and tested. The condition of all painted surfaces was then documented. In addition, concrete floors, walls, and/or ceilings were tested in case the concrete is to be recycled after demolition.

The XRF used in this inspection was the SciApps X-550 Pb analyzer. The SciApps X-550 Pb analyzer is a spectrum analyzer that provides an on-site lead concentration of a painted surface in milligrams per square centimeter (mg/cm^2) of painted surface.

The XRF provides the measured lead concentration in weight of lead per unit area. Calibration checks of the XRF were frequently conducted. No paint chip sampling or laboratory analysis was performed as part of the sampling activities. Interior sides of the rooms are identified upon the location of the street relative to the facility. Side A faces the street and goes clockwise to Side D.

The US Department of Housing and Urban Development (HUD) Guidelines define LBP, when analyzed by a portable XRF, as paint with a lead concentration of greater than or equal to 1.0 mg/cm^2. It should be noted, however, that OSHA regulations apply to any detectable concentrations of lead in paint above 0.0 mg/cm^2.

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Appendix B: Summary Test Report for Asbestos Analysis of Bulk Materials

EMSL Analytical, Inc.

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EMSL Order:	042422535
Customer ID:	TTIE54
Customer PO:	040039
Project ID:	

Attention:	Eric Cole TTI Environmental Inc. 1253 North Church Street Moorestown, NJ 08057	**Phone:**	(856) 840-8800
		Fax:	(856) 840-8815
		Received Date:	10/31/2024 4:00 PM
		Analysis Date:	10/31/2024 - 11/01/2024
		Collected Date:	10/25/2024
Project:	24-060 / Coatesville, PA / VA Medical Center		

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
01-01-Gypsum *042422535-0001*	Bldg. 139 Main Flat Roof - Roof Material Core 1	White Non-Fibrous Homogeneous	10% Cellulose 3% Glass	87% Non-fibrous (Other)	None Detected
01-01-Insulation *042422535-0001A*	Bldg. 139 Main Flat Roof - Roof Material Core 1	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01-01-Rubber Membrane *042422535-0001B*	Bldg. 139 Main Flat Roof - Roof Material Core 1	Black Fibrous Homogeneous	20% Synthetic	80% Non-fibrous (Other)	None Detected
01-02-Gypsum *042422535-0002*	Bldg. 139 Main Flat Roof - Roof Material Core 2	White Non-Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
01-02-Insulation *042422535-0002A*	Bldg. 139 Main Flat Roof - Roof Material Core 2	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
01-02-Rubber Membrane *042422535-0002B*	Bldg. 139 Main Flat Roof - Roof Material Core 2	Black Non-Fibrous Homogeneous	10% Synthetic	90% Non-fibrous (Other)	None Detected
02-03-Gypsum *042422535-0003*	Bldg. 139 Penthouse Roof - Roof Material Core 3	White Fibrous Homogeneous	10% Cellulose 3% Glass	87% Non-fibrous (Other)	None Detected
02-03-Insulation *042422535-0003A*	Bldg. 139 Penthouse Roof - Roof Material Core 3	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02-03-Insulation 2 *042422535-0003B*	Bldg. 139 Penthouse Roof - Roof Material Core 3	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02-04-Gypsum *042422535-0004*	Bldg. 139 Penthouse Roof - Roof Material Core 4	White Fibrous Homogeneous	15% Cellulose 5% Glass	80% Non-fibrous (Other)	None Detected
02-04-Insulation *042422535-0004A*	Bldg. 139 Penthouse Roof - Roof Material Core 4	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
02-04-Rubber Membrane *042422535-0004B*	Bldg. 139 Penthouse Roof - Roof Material Core 4	Black Non-Fibrous Homogeneous	40% Synthetic	60% Non-fibrous (Other)	None Detected
03-05 *042422535-0005*	Bldg. 139 Main Pitched Roof - Roof Material Core 5	Black Fibrous Homogeneous	15% Glass	85% Non-fibrous (Other)	None Detected
03-06-Shingle *042422535-0006*	Bldg. 139 Main Pitched Roof - Roof Material Core 6	Black Non-Fibrous Homogeneous	10% Glass	90% Non-fibrous (Other)	None Detected
03-06-Tar *042422535-0006A*	Bldg. 139 Main Pitched Roof - Roof Material Core 6	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
04-07-Gypsum *042422535-0007*	Bldg. 139 Lower Curved Flat Roof - Roof Material Core 7	White Fibrous Homogeneous	10% Cellulose 3% Glass	87% Non-fibrous (Other)	None Detected
04-07-Insulation *042422535-0007A*	Bldg. 139 Lower Curved Flat Roof - Roof Material Core 7	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
04-07-Rubber Membrane *042422535-0007B*	Bldg. 139 Lower Curved Flat Roof - Roof Material Core 7	Black Non-Fibrous Homogeneous	20% Synthetic	80% Non-fibrous (Other)	None Detected
04-08-Gypsum *042422535-0008*	Bldg. 139 Lower Curved Flat Roof - Roof Material Core 8	White Fibrous Homogeneous	10% Cellulose 3% Glass	87% Non-fibrous (Other)	None Detected
04-08-Insulation *042422535-0008A*	Bldg. 139 Lower Curved Flat Roof - Roof Material Core 8	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
04-08-Rubber Membrane *042422535-0008B*	Bldg. 139 Lower Curved Flat Roof - Roof Material Core 8	Black Non-Fibrous Homogeneous	5% Cellulose 20% Synthetic	75% Non-fibrous (Other)	None Detected
05-09-Gypsum *042422535-0009*	Bldg. 139 Small Flat Roof - Roof Material Core 9	White Fibrous Homogeneous	10% Cellulose 3% Glass	87% Non-fibrous (Other)	None Detected
05-09-Insulation *042422535-0009A*	Bldg. 139 Small Flat Roof - Roof Material Core 9	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
05-09-Fiberboard *042422535-0009B*	Bldg. 139 Small Flat Roof - Roof Material Core 9	Brown Fibrous Homogeneous	90% Cellulose	10% Non-fibrous (Other)	None Detected
05-09-Rubber Membrane *042422535-0009C*	Bldg. 139 Small Flat Roof - Roof Material Core 9	Black Fibrous Homogeneous	20% Synthetic	80% Non-fibrous (Other)	None Detected
05-10-Gypsum *042422535-0010*	Bldg. 139 Small Flat Roof - Roof Material Core 10	White Fibrous Homogeneous	8% Cellulose 3% Glass	89% Non-fibrous (Other)	None Detected
05-10-Insulation *042422535-0010A*	Bldg. 139 Small Flat Roof - Roof Material Core 10	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
05-10-Fiberboard *042422535-0010B*	Bldg. 139 Small Flat Roof - Roof Material Core 10	Brown Fibrous Homogeneous	65% Cellulose	35% Non-fibrous (Other)	None Detected
05-10-Rubber Membrane *042422535-0010C*	Bldg. 139 Small Flat Roof - Roof Material Core 10	Black Non-Fibrous Homogeneous	10% Cellulose 45% Synthetic	45% Non-fibrous (Other)	None Detected
06-11 *042422535-0011*	Bldg. 139 Curved Pitched Roof - Roof Material Core 11	Black Fibrous Homogeneous	15% Glass	85% Non-fibrous (Other)	None Detected
06-12-Shingle *042422535-0012*	Bldg. 139 Curved Pitched Roof - Roof Material Core 12	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
06-12-Tar *042422535-0012A*	Bldg. 139 Curved Pitched Roof - Roof Material Core 12	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
07-13-Insulation *042422535-0013*	Bldg. 69 Main Flat Roof - Roof Material Core 1	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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EMSL Order:	042422535
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Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
07-13-Rubber Membrane *042422535-0013A*	Bldg. 69 Main Flat Roof - Roof Material Core 1	Black Fibrous Homogeneous	20% Synthetic	80% Non-fibrous (Other)	None Detected
07-14-Insulation *042422535-0014*	Bldg. 69 Main Flat Roof - Roof Material Core 2	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
07-14-Insulation 2 *042422535-0014A*	Bldg. 69 Main Flat Roof - Roof Material Core 2	Orange Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
07-14-Rubber Membrane *042422535-0014B*	Bldg. 69 Main Flat Roof - Roof Material Core 2	Black Non-Fibrous Homogeneous	15% Synthetic	85% Non-fibrous (Other)	None Detected
08-15-Insulation *042422535-0015*	Bldg. 69 Roof Overhang - Roof Material Core 3	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
08-15-Insulation 2 *042422535-0015A*	Bldg. 69 Roof Overhang - Roof Material Core 3	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
08-15-Rubber Membrane *042422535-0015B*	Bldg. 69 Roof Overhang - Roof Material Core 3	Black Non-Fibrous Homogeneous	20% Synthetic	80% Non-fibrous (Other)	None Detected
08-16-Insulation *042422535-0016*	Bldg. 69 Roof Overhang - Roof Material Core 4	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
08-16-Rubber Membrane *042422535-0016A*	Bldg. 69 Roof Overhang - Roof Material Core 4	Black Non-Fibrous Homogeneous	12% Synthetic	88% Non-fibrous (Other)	None Detected
09-17-Insulation *042422535-0017*	Bldg. 69 Upper Flat Roof - Roof Material Core 5	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
09-17-Insulation 2 *042422535-0017A*	Bldg. 69 Upper Flat Roof - Roof Material Core 5	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
09-17-Rubber Membrane *042422535-0017B*	Bldg. 69 Upper Flat Roof - Roof Material Core 5	Black Fibrous Homogeneous	20% Synthetic	80% Non-fibrous (Other)	None Detected
09-18-Insulation *042422535-0018*	Bldg. 69 Upper Flat Roof - Roof Material Core 6	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
09-18-Rubber Membrane *042422535-0018A*	Bldg. 69 Upper Flat Roof - Roof Material Core 6	Black Non-Fibrous Homogeneous	15% Synthetic	85% Non-fibrous (Other)	None Detected
09-18-Tar *042422535-0018B*	Bldg. 69 Upper Flat Roof - Roof Material Core 6	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
10-19 *042422535-0019*	Bldg. 69 Main Flat Roof - Perimeter Tar Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
10-20 *042422535-0020*	Bldg. 69 Main Flat Roof - Perimeter Tar Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

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Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
11-21 *042422535-0021*	Bldg. 69 Main Flat Roof - Equipment Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
11-22 *042422535-0022*	Bldg. 69 Main Flat Roof - Equipment Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
12-23 *042422535-0023*	Bldg. 139 Skylight - Skylight Window Caulk White Exterior	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
12-24 *042422535-0024*	Bldg. 139 Skylight - Skylight Window Caulk White Exterior	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
13-25 *042422535-0025*	Bldg. 139 Skylight - Skylight Window Glazing Black Exterior	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
13-26 *042422535-0026*	Bldg. 139 Skylight - Skylight Window Glazing Black Exterior	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
14-27 *042422535-0027*	Bldg. 139 Main Flat Roof - Equipment Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
14-28 *042422535-0028*	Bldg. 139 Main Flat Roof - Equipment Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
15-29-Flashing *042422535-0029*	Bldg. 139 Main Flat Roof - Perimeter Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
15-29-Mastic *042422535-0029A*	Bldg. 139 Main Flat Roof - Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
15-30-Flashing *042422535-0030*	Bldg. 139 Main Flat Roof - Perimeter Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
15-30-Mastic *042422535-0030A*	Bldg. 139 Main Flat Roof - Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
16-31 *042422535-0031*	Bldg. 139 Main Pitched Roof Interior - Fireproofing on Metal Decking	Gray Fibrous Homogeneous	90% Min. Wool	10% Non-fibrous (Other)	None Detected
16-32 *042422535-0032*	Bldg. 139 Main Pitched Roof Interior - Fireproofing on Metal Decking	Gray Fibrous Homogeneous	90% Min. Wool	10% Non-fibrous (Other)	None Detected
16-33 *042422535-0033*	Bldg. 139 Main Pitched Roof Interior - Fireproofing on Metal Decking	Gray Fibrous Homogeneous	85% Min. Wool	15% Non-fibrous (Other)	None Detected
17-34 *042422535-0034*	Bldg. 139 Curved Flat Roof - Equipment Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
17-35 *042422535-0035*	Bldg. 139 Curved Flat Roof - Equipment Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
18-36 *042422535-0036*	Bldg. 139 Small Flat Roof - Perimeter Tar Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Initial report from: 11/01/2024 16:12:02

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Tel/Fax: (800) 220-3675 / (856) 786-5974
http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order:	042422535
Customer ID:	TTIE54
Customer PO:	040039
Project ID:	

Test Report: Asbestos Analysis of Bulk Materials via AHERA Method 40CFR 763 Subpart E Appendix E supplemented with EPA 600/R-93/116 using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
18-37 *042422535-0037*	Bldg. 139 Small Flat Roof - Perimeter Tar Flashing	Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
19-38 *042422535-0038*	Bldg. 139 Penthouse Roof - Gray Exterior Roof Caulking	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
19-39 *042422535-0039*	Bldg. 139 Penthouse Roof - Gray Exterior Roof Caulking	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
20-40 *042422535-0040*	Bldg. 139 Cafeteria Skylight Int. - Skylight Plaster Skim Coat	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
20-41 *042422535-0041*	Bldg. 139 Cafeteria Skylight Int. - Skylight Plaster Skim Coat	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
20-42 *042422535-0042*	Bldg. 139 Cafeteria Skylight Int. - Skylight Plaster Skim Coat	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
21-43 *042422535-0043*	Bldg. 139 Cafeteria Skylight Int. - Skylight Plaster Brown Coat	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
21-44 *042422535-0044*	Bldg. 139 Cafeteria Skylight Int. - Skylight Plaster Brown Coat	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
21-45 *042422535-0045*	Bldg. 139 Cafeteria Skylight Int. - Skylight Plaster Brown Coat	Tan Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Steven Wells (39)
Megan Bosch (38)

Samantha Rundstrom, Laboratory Manager
or Other Approved Signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. The above analyses were performed in general compliance with Appendix E to Subpart E of 40 CFR (previously EPA 600/M4-82-020 “Interim Method”) but augmented with procedures outlined in the 1993 (”final”) version of the method. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Estimation of uncertainty is available on request.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA LAP, LLC-IHLAP Lab 100194, PA ID# 68-00367, LA #04127

Initial report from: 11/01/2024 16:12:02

1253 North Church Street, Moorestown, NJ 08057
856-840-8800 Fax 856-840-8815

* NO TEM analysis *
PLM Only - 042422535

E-MAIL ALL RESULTS AND COC TO: ih-lab@ttienv.com
&→ : ericc@ttienv.com

Asbestos Bulk Sample Data and Chain of Custody Record

PO: 040039

PROJ #: 24-060	CLIENT: The Pettit Group	CONTACT: Tim Hogan	TTI PM: ☐ Jim Guilardi ☐ Michael Sande ☐ Michael Keehn
FACILITY: Coatesville, PA VA Medical Center		SAMPLER(S): Eric Cole / Xander Emmert	DATE: 10/25/2

Sample #	Room / Location	Material Description	Friable Y	Friable N	Analysis Method
01-01	Bldg. 139 Main Flat Roof	Roof Material Core 1 (Layers)			
01-02	↓ ↓ ↓	Roof Material Core 2 (Layers)			
02-03	Bldg. 139 Penthouse Roof	Roof Material Core 3 (Layers)			
02-04	↓ ↓ ↓	Roof Material Core 4 (Layers)			
03-05	Bldg. 139 Main Pitched Roof	Roof Material Core 5 (Layers)			
03-06	↓ ↓ ↓	Roof Material Core 6 (Layers)			
04-07	Bldg. 139 Lower Curved Flat Roof	Roof Material Core 7 (Layers)			
04-08	↓ ↓ ↓	Roof Material Core 8 (Layers)			
05-09	Bldg. 139 Small Flat Roof	Roof Material Core 9 (Layers)			
05-10	↓ ↓ ↓	Roof Material Core 10 (Layers)			
06-11	Bldg. 139 Curved Pitched Roof	Roof Material Core 11 (Layers)			
06-12	↓ ↓ ↓	Roof Material Core 12 (Layers)			
07-13	Bldg. 69 Main Flat Roof	Roof Material Core 1 (Layers)			
07-14	↓ ↓ ↓	Roof Material Core 2 (Layers)			
08-15	Bldg. 69 Roof overhang	Roof Material Core 3 (Layers)			

RECEIVED EMSL CINNAMINSON, NJ 24 OCT 31 PM 4:00

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
E. Cole	10/31/24	4:00 PM	Daniel Stapp WJ	10-31-24	4:00 pm
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

24 Hr Turnaround Time ☒ Stop First Positive

NOB MATERIALS:

- ☒ Perform TEM analysis of 1st sample in each homogeneous group. (Initials ____)
- ☒ For NOB samples with insufficient material for TEM analysis, please perform composite analysis using material from other samples in the same homogeneous group. (Initials ____)
- ☐ For NOB samples, please stop analysis when the following number of samples have been analyzed. ____ (Initials ____)
- ☐ Perform Composite Analysis on positive sheetrock/joint compound samples. (Initials ____)

45 DS

OrderID: 042422535

1253 North Church Street, Moorestown, NJ 08057
856-840-8800 Fax 856-840-8815

NO TEM analysis
PLM Only -

E-MAIL ALL RESULTS AND COC TO: ih-lab@ttienv.com

042422535

Asbestos Bulk Sample Data and Chain of Custody Record

PO: 040039

PROJ #: 24-0100	CLIENT: The Pettit Group	CONTACT: Tim Hogan	TTI PM: ☐ Jim Guilardi ☐ Michael Sander ☐ Michael Keehn
FACILITY: Coatesville, PA VA Medical Center		SAMPLER(S): Eric Cole / Xander Emanuel	DATE: 10/25/24

Sample #	Room / Location	Material Description	Friable Y	Friable N	Analysis Method
08-16	Bldg. 69 Roof Overhang	Roof Material Core 4 (Layers)			
09-17	Bldg. 69 Upper Flat Roof	Roof Material Core 5 (Layers)			
09-18	↓ ↓ ↓	Roof Material Core 6 (Layers)			
10-19	Bldg. 69 Main Flat Roof	Perimeter Tar Flashing			
10-20	↓ ↓ ↓	↓ ↓ ↓			
11-21	Bldg. 69 Main Flat Roof	Equipment Flashing			
11-22	↓ ↓ ↓	↓ ↓ ↓			
12-23	Building 139 Skylight	Skylight Window caulk white exterior			
12-24	↓ ↓ ↓	↓ ↓ ↓			
13-25		Skylight Window Glazing Black exterior			
13-26	↓ ↓ ↓	↓ ↓ ↓			
14-27	Bldg. 139 Main Flat Roof	Equipment Flashing			
14-28	↓ ↓ ↓	↓ ↓ ↓			
15-29	Building 139 Main Flat Roof	Perimeter Flashing w/ mastic			
15-30	↓ ↓ ↓	↓ ↓ ↓			

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EMSL
CINNAMINSON, NJ
24 OCT 31 PM 4:00

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
E. Cole	10/31/24	4:00 PM			
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

24 Hr Turnaround Time ☒ Stop First Positive

NOB MATERIALS:

- ☒ Perform TEM analysis of 1st sample in each homogeneous group. (Initials _____)
- ☒ For NOB samples with insufficient material for TEM analysis, please perform composite analysis using material from other samples in the same homogeneous group. (Initials _____)
- ☐ For NOB samples, please stop analysis when the following number of samples have been analyzed. _____ (Initials _____)
- ☐ Perform Composite Analysis on positive sheetrock/joint compound samples. (Initials _____)

OrderID: 042422535

1253 North Church Street, Moorestown, NJ 08057
856-840-8800 Fax 856-840-8815

NO TEM analysis
PLM Only - 04242535

E-MAIL ALL RESULTS AND COC TO: ih-lab@ttienv.com

Asbestos Bulk Sample Data and Chain of Custody Record

PO: 040039

PROJ #: 24-060 | CLIENT: The Pettit Group | CONTACT: Tim Hogan | TTI PM: ☐ Jim Guilardi ☐ Michael Sander ☐ Michael Keehn

FACILITY: Coatesville, PA VA Medical Center | SAMPLER(S): Eric Cole / Xander Emmert | DATE: 10/25/2

Sample #	Room / Location	Material Description	Friable Y	Friable N	Analysis Method
16 - 31	Bldg. 134 Main Pitched Roof Interior	Fireproofing on Metal Decking			
16 - 32	↓	↓			
16 - 33	↓	↓			
17 - 34	Bldg. 134 Curved Flat Roof	Equipment Flashing			
17 - 35	↓	↓			
18 - 36	Bldg. 134 Small Flat Roof	Perimeter Tar Flashing			
18 - 37	↓	↓			
19 - 38	Bldg. 134 Penthouse Roof	Gray exterior Roof caulking			
19 - 39	↓	↓			
20 - 40	Bldg. 134 Cafeteria Skylight Int.	Skylight Plaster Skim Coat			
20 - 41	↓	↓			
20 - 42	↓	↓			
21 - 43	↓	Skylight Plaster Brown Coat			
21 - 44	↓	↓			
21 - 45	↓	↓			

RECEIVED EMSL CINNAMINSON, NJ 24 OCT 31 PM 4:00

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
E Cole	10/31/24	4:00 PM			
Relinquished by: (Signature)	**Date**	**Time**	**Received by: (Signature)**	**Date**	**Time**

24 Hr Turnaround Time ☒ Stop First Positive

NOB MATERIALS:

- ☒ Perform TEM analysis of 1st sample in each homogeneous group. (Initials EC)
- ☒ For NOB samples with insufficient material for TEM analysis, please perform composite analysis using material from other samples in the same homogeneous group. (Initials EC)
- ☐ For NOB samples, please stop analysis when the following number of samples have been analyzed. _____ (Initials _____)
- ☒ Perform Composite Analysis on positive sheetrock/joint compound samples. (Initials _____)

OrderID: 042422535

Appendix C: XRF Analytical Sampling Results

XRF ANALYTICAL SAMPLING RESULTS

Coatesville VA XRF Screen

Reading Number	Location	Side	Structure	Condition	Substrate	Color	Lead (mg/cm2)	
1	Calibration 1						0.98	
2	Calibration 2						1.08	
3	Calibration 3						1.06	
4	Exterior pitched roof building 139	A	Flashing		Metal	White	0.01	OSHA
5		B	Flashing		Metal	White	0.02	OSHA
6		C	Flashing		Metal	White	0.00	
7		D	Flashing		Metal	White	0.01	OSHA
8		A	Soffit		Metal	White	0.03	OSHA
9		B	Soffit		Metal	White	0.02	OSHA
10		C	Soffit		Metal	White	0.00	
11		D	Soffit		Metal	White	0.00	
12			Exposed beam behind soffit		Metal	Red	0.00	
13	Interior pitched roof building 139		Ceiling beams		Metal	Red	0.00	
14			Ceiling beams		Metal	Red	0.00	
15			Wall		Block	White	0.00	
16	Building 69 exterior rooftop	A	Flashing		Metal	White	0.00	
17		B	Flashing		Metal	White	0.00	
18		C	Flashing		Metal	White	0.01	
19		D	Flashing		Metal	White	0.00	
20			I beams		Metal	White	0.08	OSHA
21			Flashing under windows		Metal	White	0.00	
22	Theraputic modalities clinic 158 bldg 139		Beams above ceiling tiles		Metal	Orange	10+	LEAD
23	Cafeteria in building 139	A	Skylight		Plaster	White	0.00	
24		B	Skylight		Plaster	White	0.00	
25		C	Skylight		Plaster	White	0.00	
26		D	Skylight		Plaster	White	0.00	
27	Calibration 1						1.00	
28	Calibration 2						1.02	
29	Calibration 3						1.06	
30								
31	*RED – lines in red are positive for lead-based paint*							
32	*BLUE – line in blue are OSHA positive components*							
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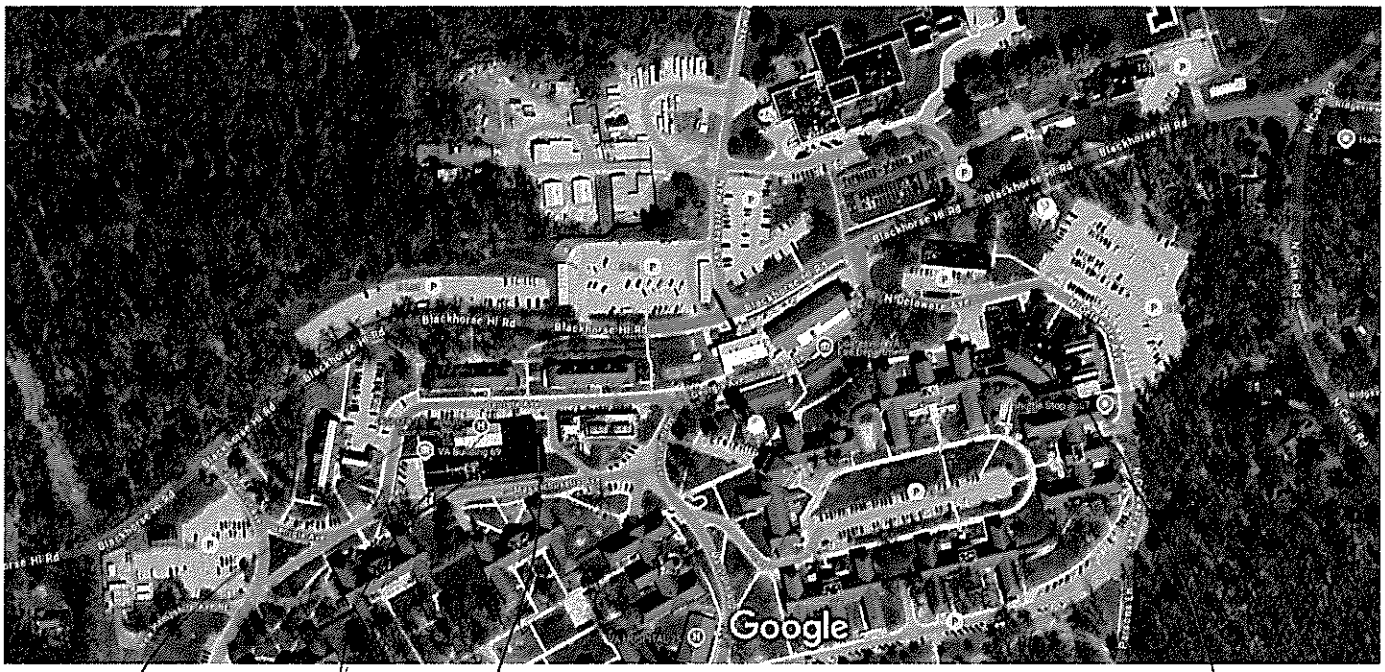
Appendix D: Sample Location Diagram

Google Maps

Coatesville, PA VAMC
- Bldgs 69 & 139 Sample Location Map



Imagery ©2024 Airbus, Maxar Technologies, Map data ©2024 100 ft

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APPENDIX E

ICRA / PCRA FORMS

VHA Infection Control Risk Assessment
for Construction, Renovation and Maintenance

Introductory Information and Instructions

Use this template as a baseline for performing facility Infection Control Risk Assessments (ICRAs) for construction, renovation, and maintenance work (referred to as the "activity" in this document). The template provides minimum requirements for categorizing activity types and patient risk to determine the level of precautions needed to prevent infection risks. Facilities may customize this template to incorporate site-specific information and/or to add more stringent criteria.

NOTE: *This VHA ICRA template pertains specifically to infection prevention. It must be used in conjunction with the required Pre-Construction Risk Assessment (PCRA) for the activity which addresses other activity-related safety concerns (e.g., vibration, noise) outside the scope of the ICRA.*

To complete the template:

1. Use **Table 1** to identify the category of the construction, renovation and/or maintenance activity.
2. Use **Table 2** to identify the areas affected by the activity.
3. Use **Table 3** to identify the overall patient risk category that will be affected by the activity.
4. Use **Table 4** to determine the level of infection prevention and control precautions needed for the activity.

Once all 4 steps above are completed: Refer to **Table 5** for the minimum required control measures for the level of infection prevention and control precautions needed for the activity. Refer to **Table 6** for the minimum infection prevention and control measures required on completion of the activity.

PERMIT: See the last page of this document for a fillable permit form to be used for posting at the activity site as needed.

Table 1 - Construction, Renovation, and/or Maintenance Activity Category

NOTE: *If any of the bulleted criteria in a higher activity category pertains to the work that will be done (even if the other criteria are in a lower category), use the higher activity category for the VHA ICRA.*

Activity Category determined from Table 1 (*A, B, C, or D*): B

Category A	**Inspection and/or facility upkeep generally defined as follows**: • Work can be completed in a single shift, not to exceed 10 hours. • Patients and/or employees may be in the area depending on the activity. • Work that does not create dust or debris. • Removal of ceiling tile or access to mechanical or electrical chase for visual inspection limited to 1 tile per 50 square feet with limited exposure time (not to exceed an hour for each tile) within the shift. • Minor interior updates (e.g., replacing floor or ceiling tiles, carpentry work to include hanging signage, and painting without sanding) that do not create dust or debris. • Limited building system maintenance such as plumbing on potable systems limited to faucet replacement etc. and electrical work such as replacement of bulbs, receptacles, or switches.
Category B	**General maintenance and repair work generally defined as follows:** • Prolonged inspection and work that may take longer than a single shift but not exceeding a week. • Patients and employees are not to be in the area until activity is completed. • Work that creates minimal dust and debris.

	• Interior finish or surface repairs, updates, or modifications such as repair of firewalls and barriers, and new flooring that produces minimal dust and debris. Controlled sanding activities (e.g., wet or dry sanding) that produce minimal dust and debris. • Plumbing work such as installation or replacement of a single fixture or piping for a single fixture. Any work on sanitary plumbing including snaking of drains. • Electrical work such as installation of cabling/wiring/conduit for a single device, installation of new device such as a light fixture that produces minimal dust and debris. • Air Handler and/or fan shutdown/startup and HVAC work such as replacement of a single diffuser, single terminal unit or a single device that produces minimal dust and debris.
Category C	**Small-scale construction, renovation, or maintenance generally defined as follows**: • Work requiring longer than a single week to complete but not exceeding 6 months. • Patients and employees are not to be in the area until activity is completed. • Demolition/removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements. • Demolition/removal of more than 32 ft^2 of drywall/framing, hard ceilings, and doors/framing and minimal infrastructure such as electrical circuits and branch piping. • Installation of new walls, ceilings and doors including framing, drywall/plaster and associated work. • Plumbing work such as the installation of new sinks, showers and toilets and associated plumbing. • Shut down of sections of potable water systems. • Electrical work such as installation of conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc. • Modification of existing fire alarm and suppression systems. • Mechanical work such as the installation of ductwork, diffusers, and terminal units for an area.

Category D	**Large-scale construction, renovation, or maintenance generally defined as follows**:
	• Work exceeding 6 months in duration.
	• Patients and employees are not to be in the area until activity is completed.
	• Large-scale demolition of building components and infrastructure including removal of multiple doors, walls, framing, ceilings, flooring, piping, electrical and HVAC.
	• The installation building components such as new walls, ceilings and doors including framing, drywall and associated plaster work.
	• Plumbing work such as the installation of:
	  ○ new medical gas systems,
	  ○ steam/heating hot water, condensate systems,
	  ○ multiple sinks, showers and toilets including associated plumbing.
	• Shutdown of potable water, steam/heating hot water, condensate, and medical gas systems.
	• Electrical work such as installation of electrical feeders, distribution panels, conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc.
	• Installation of fire alarm and suppression systems.
	• Electrical shutdown of multiple panels.
	• Mechanical work such as the installation of air handling equipment, associated ductwork, diffusers, heat exchangers, terminal units and controls.

Table 2 - Affected Area Assessment

Identify the areas and associated patients that will be affected by the construction/renovation/maintenance activity (see the Figure for a visual representation of adjacent affected areas).

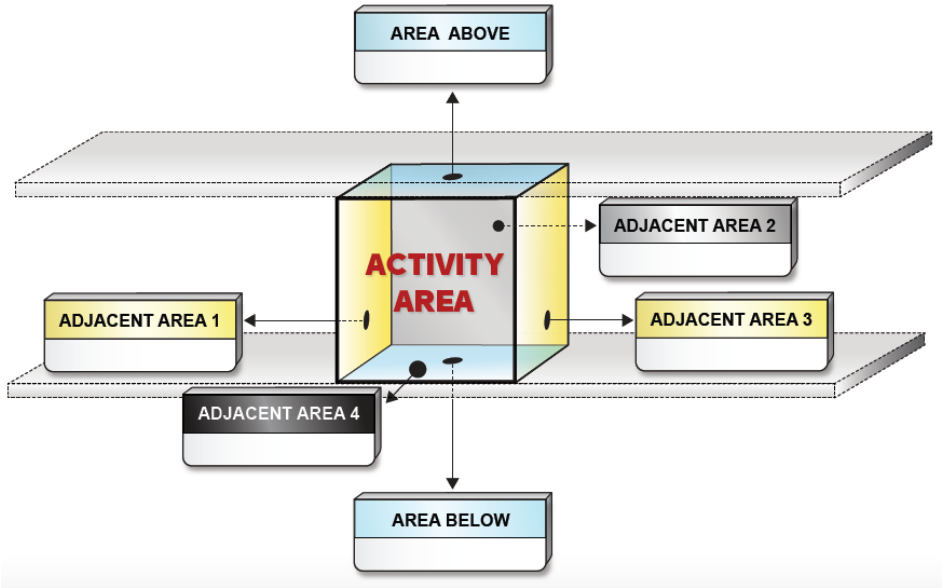

Figure: Isometric drawing of affected area assessment

Area	Service(s)/Type(s) of Area(s) *(e.g., OR, Unit/Ward, Sterile Processing, Administrative, etc.)**	Point of Contact (POC)	POC Contact Information
Activity Area**	Dining Hall Building 139	Michael Wilcox	Michael.Wilcox1@va.gov
Area Above			
Area Below			
Adjacent Area 1			
Adjacent Area 2			
Adjacent Area 3			
Adjacent Area 4			

* There may be more than one Service/type of area for each row. List all.

** List the area(s) in which the construction/renovation/maintenance activity will occur. ***NOTE: When the Activity Category is B, C, or D, the control measures are determined by the Patient Risk in the adjacent affected areas.***

Table 3 - Patient Risk Category

Using Table 3, identify the patient risk category for each area listed in Table 2. Of the patient risk categories identified, select the one with the greatest risk as the overall Patient Risk Category for the activity.

Overall Patient Risk Category determined from Table 3 (*Low, Medium, High, or Highest*): Medium

Low Risk	Medium Risk	High Risk	Highest Risk
Non-patient care areas such as:	Patient care support areas such as:	Patient care areas such as:	Procedural, invasive, sterile support and highly compromised patient care areas such as:
• Public hallways and gathering areas not in clinical areas • Office areas not in clinical areas • Breakrooms not in clinical areas • Bathrooms or locker rooms not in clinical areas • Mechanical/electrical rooms not in clinical areas	• Waiting areas • Clinical engineering (biomedical) • Materials management • Sterile processing department – dirty side • Kitchen, cafeteria, gift shop, coffee shop, and food kiosks	• Patient care rooms and areas, including spinal cord injury units • All acute care units, including mental health • All outpatient units and clinics • Emergency department • Community Living Centers, domiciliaries, and transitional residences • Employee health • Pharmacy – general work zone • Medication rooms and clean utility rooms • Imaging suites – diagnostic imaging • Laboratory	• All transplant units • All intensive care units • All oncology units and chemotherapy/infusion centers • OR theaters and restricted areas • Hemodialysis units • Procedural rooms* • Pharmacy compounding area • Sterile processing department – clean side • Transfusion services • Imaging suites – interventional imaging • Dedicated isolation wards/units for infectious diseases

* Procedural Rooms are designated for the performance of patient care activities that may require high-level disinfected or sterile instruments and some environmental controls but is not required to be performed with the environmental controls of an operating room (OR). The room is intended for procedures that are performed in an aseptic surgical field and penetrates the protective surfaces of a patient's body (e.g., subcutaneous tissue, mucous membranes, cornea) or entry into or opening of a sterile body cavity. Examples of these spaces include Cardiac Catheterization Suites, Electrophysiology Suites, Endovascular/GI Suites, Angio Suites and other spaces which may have high risk patient populations.

Table 4 - Level of Infection Prevention and Control Precautions

Match the Overall Patient Risk Category (*Low, Medium, High, Highest*) determined from Table 3 with the planned Construction/Renovation/Maintenance Activity Category (*A, B, C, D*) from Table 1 to determine the minimum Level of Infection Prevention and Control Precautions (*I, II, III, or IV*) using Table 4 below.

Level of Precautions determined from Table 4 (*I, II, III, or IV*): II

Patient Risk Category	Activity Category			
	A	**B**	**C**	**D**
Low Risk	I	II	II	III
Medium Risk	I	II	III	IV
High Risk	I	II	IV	IV
Highest Risk	II	III	IV	IV

An infection prevention and control permit is required for Level III and Level IV. Consult with Infection Prevention and Control for Level I and Level II.

Table 5 - Required Infection Prevention and Control Measures, by Level of Precautions

Controls defined below for the Level of Precautions identified for the activity must be in place before the activity begins and maintained until work is completed and the area is activated. Control measures for each Precaution Level must also include the control measures in the preceding Level(s).

As the activity progresses, a full re-evaluation of remaining activity type and patient risk is required prior to downgrading the Level of Precautions.

Level of Precautions	Control Measures
Level I	1. Perform work activity in a manner that does not create dust. 2. Immediately replace any ceiling tile, close access panels, etc., upon completion of work. 3. Any materials and equipment being brought into the facility must be free of contaminants and loose material.
Level II	**All control measures in Level I and the following:** 1. Provide active means to control airborne dust from dispersing into occupied areas and/or water mist surface to control dust (e.g., Mobile Dust Containment Cart or some other system). 2. Ensure worker clothing is clean and free of visible dust before leaving the work area. 3. Remove or isolate air diffusers (supply and return) to protect the HVAC system from dust and reduce air turbulence. Rebalance system to address diffuser isolation.

	4. When the work involves or impacts potable water systems including stagnation due to reduced usage, the piping shall be flushed twice a week or isolated from the main system. 5. Seal doors to prevent dust migration. 6. Contain all trash and debris in the work area. Perform daily cleaning and disposal of trash (covered) from work area using an identified exit route. 7. Any equipment, tools, or materials removed from the work area must be in sealed containers and/or cleaned of dust and debris prior to removal from the area. 8. Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area. 9. Install a sticky (dust collection) mat at entrance of contained work area based on facility policy. Sticky mats must be changed routinely and when visibly soiled. 10. Maintain clean surroundings when area is not contained by damp mopping or HEPA vacuuming surfaces at least daily.
Level III	**All control measures in Levels I and II and the following:** 1. Ensure availability of equipment for cleaning hands. 2. Construct and complete critical barriers meeting NFPA 241 requirements. Barriers must extend to the ceiling or if ceiling tile is removed, to the deck above. 3. All (plastic or hard) barrier construction activities must be completed in a manner that prevents dust release. Plastic barriers must be effectively affixed to floor and ceiling (or floor/roof deck above) and secure from movement or damage. 4. Seal all penetrations in containment barriers, including floors and ceiling, using approved materials (UL schedule firestop if applicable for barrier type). 5. Maintain .01 inches /water gauge negative pressurization of the entire workspace by use of HEPA exhaust air systems directed outdoors (unless a work specific waiver is approved by VHA's Office of Healthcare Engineering); this must be maintained continuously 24/7 for the duration of the project. Exhaust discharged directly to the outdoors that is 25 feet or greater from entrances, air intakes and windows is not required to be HEPA-filtered. Exhausting discharged air into shared or recirculating HVAC systems, or other shared exhaust systems (e.g., bathroom exhaust) is prohibited. 6. Install a differential pressure sensing device (e.g., magnehelic, manometer, or digital monitoring) on exterior of work containment to continually monitor and document negative pressurization. The "ball in the wall" or similar apparatus are not acceptable.
Level IV	**All control measures in Levels I, II and III and the following:** 1. Barriers must be hard barriers unless temporary to install final barrier. 2. Containment must include an anteroom to ensure pressure control. Anteroom must be large enough for equipment staging, cart cleaning, workers' PPE and cleaning. 3. Worker clothing and/or PPE must be removed or clean and free of visible dust before leaving the work area anteroom. HEPA vacuuming of clothing or use of cover suits is acceptable. 4. Workers must wear shoe covers or have a method to clean shoes in anteroom. Shoe covers must be removed prior to exiting the anteroom to the occupied space (non-work area). Damaged shoe covers must be changed immediately.

Table 6 - Minimum Infection Prevention and Control Measures Required Upon Completion of the Activity

Controls defined below shall be completed upon completion of the activity and inspected prior to terminating measures defined in Table 5.

Level of Precautions	Measures
Levels I - II	**Cleaning:** 1. Clean work areas including all environmental surfaces, high horizontal surfaces and flooring materials. 2. Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces. **HVAC Systems:** 1. Remove isolation of HVAC system in areas where work is being performed. Verify that HVAC systems are clean and operational. 2. Verify the HVAC systems meet original airflow and air exchange design specifications. **Water systems:** 1. Until the potable water system is activated and in use, flushing shall continue at least twice per week in accordance with VHA Directive 1061.
Levels III - IV	Construction areas must be inspected by an infection preventionist and engineering representative (and others as determined by the facility) for final activity/project close out and removal of infection prevention and control measures. **Work Area Cleaning:** 1. Clean work areas including all environmental surfaces, high horizontal surfaces and flooring materials. 2. Check all supply and return air registers for dust accumulation on upper surfaces as well as air diffuser surfaces. **Removal of Critical Barriers:** 1. Critical barriers must remain in place during all work involving drywall removal, creation of dust and activities beyond simple touch-up work. The barrier may NOT be removed until a work area cleaning has been performed. Additional cleaning may be needed after removal of barrier. 2. All (plastic or hard) barrier removal activities must be completed in a manner that prevents dust release. Use the following precautions when removing hard barriers: i. Carefully remove screws and painter tape. ii. If dust will be generated during screw removal, use hand-held HEPA vacuum. iii. Drywall cutting is prohibited during removal process. iv. Clean all stud tracks with HEPA vacuum before removing outer hard barrier. v. Use a plastic barrier to enclose area if dust could be generated. **Negative Air Requirements:** 1. The use of negative air must be designed to remove contaminants from the work area. 2. Negative air devices (fans, filters, monitoring and documentation equipment) must remain operational at all times and in place for a period after completion of dust creating activities to remove contaminants from the work area and before removal of critical barriers. **HVAC systems:** 1. Upon removal of critical barriers, remove isolation of HVAC system in areas where work is being performed. 2. Verify that HVAC systems are clean and operational. 3. Verify and document through a TAB the HVAC systems meets original airflow and air exchange design specifications. **Water systems:** 1. Until the potable water system is activated and in use, flushing shall continue at least twice per week in accordance with VHA Directive 1061.

Infection Prevention and Control Construction/Renovation/Maintenance Permit

This page must be posted at the entrance to the project area for Level III and Level IV activities.

Unique permit number:			
Location of construction/renovation/maintenance			
Project manager		Project start date	
Contact phone number		Completion date	
Contractor		Permit expiration date	

Activity Category (*A, B, C, or D*)		Overall Patient Risk Category (*Low, Medium, High, or Highest*)		Level of Infection Prevention and Control Precautions (*I, II, III, or IV*)	

Level of Precautions	**Control measures to be in place for the duration of the activity** *(Check the box for the activity's Level of Precautions to indicate the Control Measures)*
Level I ☐	1. Perform work activity in a manner that does not create dust. 2. Immediately replace any ceiling tile, close access panels, etc., upon completion of work. 3. Any materials and equipment being brought into the facility must be free of contaminants and loose material.
Level II ☐	**All control measures in Level I and the following:** 1. Provide active means to control airborne dust from dispersing into occupied areas and/or water mist surface to control dust (e.g., Mobile Dust Containment Cart or some other system). 2. Ensure worker clothing is clean and free of visible dust before leaving the work area. 3. Remove or isolate air diffusers (supply and return) to protect the HVAC system from dust and reduce air turbulence. Rebalance system to address diffuser isolation. 4. When the work involves or impacts potable water systems including stagnation due to reduced usage, the piping shall be flushed twice a week or isolated from the main system 5. Seal doors, to prevent dust migration. 6. Contain all trash and debris in the work area. Perform daily cleaning and disposal of trash (covered) from work area using an identified exit route. 7. Any equipment, tools, or materials removed from the work area must be in sealed containers and/or cleaned of dust and debris prior to removal from the area. 8. Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area. 9. Install a sticky (dust collection) mat at entrance of contained work area based on facility policy. Sticky mats must be changed routinely and when visibly soiled. 10. Maintain clean surroundings when area is not contained by damp mopping or HEPA vacuuming surfaces at least daily.
Level III ☐	**All control measures in Levels I and II and the following:** 1. Ensure availability of equipment for cleaning hands. 2. Construct and complete critical barriers meeting NFPA 241 requirements. Barriers must extend to the ceiling or if ceiling tile is removed, to the deck above. 3. All (plastic or hard) barrier construction activities must be completed in a manner that prevents dust release. Plastic barriers must be effectively affixed to floor and ceiling (or floor/roof deck above) and secure from movement or damage. 4. Seal all penetrations in containment barriers, including floors and ceiling, using approved materials (UL schedule firestop if applicable for barrier type). 5. Maintain .01 inches /water gauge negative pressurization of the entire workspace by use of HEPA exhaust air systems directed outdoors (unless a work specific waiver is approved by VHA's Office of Healthcare Engineering); this must be maintained continuously 24/7 for the duration of the project. Exhaust discharged directly to the outdoors that is 25 feet or greater from entrances, air intakes and windows is not required to be HEPA-filtered. Exhausting discharged air into shared or recirculating HVAC systems, or other shared exhaust systems (e.g., bathroom exhaust) is prohibited. 6. Install a differential pressure sensing device (e.g., magnehelic, manometer, or digital monitoring) on exterior of work containment to continually monitor and document negative pressurization. The "ball in the wall" or similar apparatus are not acceptable.
Level IV ☐	**All control measures in Levels I, II and III and the following:** 1. Barriers must be hard barriers unless temporary to install final barrier. 2. Containment must include an anteroom to ensure pressure control, Anteroom must be large enough for equipment staging, cart cleaning, workers' PPE and cleaning. 3. Worker clothing and/or PPE must be removed or clean and free of visible dust before leaving the work area anteroom. HEPA vacuuming of clothing or use of cover suits is acceptable. 4. Workers must wear shoe covers or have a method to clean shoes in anteroom Shoe covers must be removed prior to exiting the anteroom to the occupied space (non-work area). Damaged shoe covers must be changed immediately.

Additional requirements:			
Project Manager signature		Date	
Infection Preventionist signature		Date	

VHA Pre-Construction Risk Assessment (PCRA)

PCRA Introductory Information and Instructions

Use this template as a baseline for performing facility Pre-Construction Risk Assessments (PCRA) for Construction, Renovation, and Maintenance work (referred to as the "activity" in this document). The template provides minimum requirements for categorizing activity type(s) and safety risk to determine the level of precautions needed to prevent impact related to Construction, Renovation and Maintenance on patients, employees, and contractors.

Ensure that the activity statement of work and any drawings available are used for the PCRA assessment and included in the project file with the completed PCRA.

Communication and coordination of all types of activity with affected areas are to be included among the control measures. The development of communication and coordination plans must begin during the activity planning phase.

Facilities may customize this template to incorporate site-specific information and requirements.

NOTE: *This VHA PCRA template pertains specifically to non-infection-related safety for Construction, Renovation, and Maintenance activities. It must be used in conjunction with the VHA Infection Control Risk Assessment (ICRA) for the activity, if required, which specifically addresses infection risks outside the scope of this PCRA.*

PERMIT: See the last page of this document for a fillable permit form to be used for posting at the activity site.

Activity Location: Buildings 69 and 139 , Coatesville VAMC, Coatesville PA

Activity Name, Number, and/or Brief Description: Replace Roofs at Buildings 69 and 139. Complete roof replacement, removal of skylights at Bldg 139. Replacement of lightning protection

Table 1 - Construction, Renovation, and/or Maintenance Activity Type and Control Measures

NOTE: *If any of the bulleted criteria in a higher activity type pertains to the work that will be done (even if the other criteria are in a lower type), use the higher activity type for the VHA PCRA.*

Controls defined in Table 1 for the activity must be in place before the activity begins and maintained until work is completed and the area is activated. Control measures for each activity must also include the control measures in the preceding row(s).

As the activity progresses, a full re-evaluation of remaining activity type and risk is required prior to changing the level of control measures.

Activity Type determined from Table 1: Small Scale

Activity Type and Description	Control Measures
Inspection/upkeep generally defined as follows: • Work can be completed in a single shift, not to exceed 10 hours. • Patients, employees and/or visitors may be in the area depending on the activity. • Work that does not create dust or debris. • Work that does not create vapors or fumes. • Removal of ceiling tile or access to mechanical or electrical chase for visual inspection that will not impair fire safety systems and are limited to 1 tile per 50 square feet with limited	1. Immediately replace any ceiling tile, close access panels, etc., upon completion of work. 2. Site visits of construction area are required weekly by member of multi-disciplinary team. Site visits will be documented on standard checklist. 3. Site specific safety plan, task hazard analysis, and hazard communication required to be provided by the contractor and approved where a contact is in place. For internal work the

exposure time (not to exceed an hour for each tile) within the shift. • Minor interior updates (e.g., replacing floor or ceiling tiles, carpentry work to include hanging signage, and painting with hand tools) that do not create vibration or noise. • Limited building system maintenance that does not require Lock Out Tag Out (LOTO) such as plumbing on potable systems limited to faucet replacement, steam trap replacement etc. and electrical work such as replacement of bulbs, receptacles, or switches.	shop involved must work with Safety to ensure proper precautions are in place. 4. Must address identified hazards and controls that will be implemented to ensure minimal impact to patients, employees, contractors and facility. 5. Communication and coordination plan for all affected areas

Small scale Construction, Renovation and general maintenance/repair work, generally defined as follows:
• Prolonged work that may take longer than a single shift but not exceeding six months.
• Patients and employees are not to be in the area until activity is completed.
• Work that creates some noise and vibration due to power tool use.
• Selective demolition/removal of preexisting floor covering, casework, lay-in ceiling, or other architectural elements that may
  o disturb asbestos, lead or silica
  o create the potential for falling objects
  o create vibration and/or noise in excess of 80 dB(A) in surrounding areas.
  o cause penetrations in fire or smoke barrier
• Plumbing work such as the installation of new sinks, showers and toilets and associated plumbing that requires utility outages or work on the steam system that may require:
  o LOTO
  o The use of compressed gas cylinders
• Electrical work such as installation of conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc. Electrical work such as installation of cabling/wiring/conduit for a single device, installation of new device such as a light fixture that require LOTO.
• Air Handler and/or fan shutdown/startup and HVAC work such as replacement of a single diffuser, single terminal unit, a single device and the installation of ductwork, diffusers, and terminal units for an area that may require:
  o Work on ladders
  o Rigging, hoisting or lifting of equipment or materials overhead
• Modification of existing fire alarm and suppression systems requiring system outages and ILSMs or obstruction of exits and or impact on corridors.
• Architectural, structural, or any other work that may cause vapors or fumes such as:
  o Roofing work
  o Flooring work
  o Painting or other large-scale use of such substances.
	All control measures in the row above and the following:
	1. Hazard communication chemical inventory required to be provided by the contractor and approved.
	2. Where construction, Renovation and maintenance are done in an accredited facility, and ILSM assessment is required to be done and ILSMs put into place in accordance with TJC LS.01.02.01 and the local facility policy including Fire watch if necessary. Staff is trained and the ILSM is verified regularly
	3. Hot Work or burn permits in place and staff trained
	4. LOTO procedures in place and staff trained on their use
	5. Site visits will be reviewed using the criteria in standardized guide.
	6. Daily inspections of the site are to be conducted by the General Contractor or shop supervisor and documented on their daily log.

Large-scale construction, renovation, or maintenance generally defined as follows: • Work exceeding 6 months in duration. • Patients and employees are not to be in the area until activity is completed.	**All control measures in the two rows above and the following Activity Hazard Analyses and Control Plans (check all that apply):** 1. Excavation safety plan in place ☐ 2. Dust control plan in place ☐

• Excavation or heavy equipment use taking place
  o Dig safe required utility location
  o Trench safety
  o Dust control plan
  o Equipment exhaust, Noise, Vibration
• Confined space entry required (permit required or not)
• Requires crane work
  o General crane work
  o Lift over buildings
• Includes elevated work
  o Roof work, fall protection
  o Window work, scaffolding and fall protection
  o Odor control
• Welding, cutting or use of torches requiring burn permits
• Demolition of building components and infrastructure including removal of multiple doors, walls, framing, ceilings, flooring, piping, electrical and HVAC that may
  o require asbestos, lead or silica abatement
  o create the potential for falling objects
  o create vibration and/or noise in excess of 90 dB(A) in surrounding areas.
  o cause breaches to fire or smoke barrier
• The installation building components such as new walls, ceilings and doors including framing, drywall and associated plaster work that requires transport of significant materials through building and up elevators i.e., weight limits of floors and elevators
• Plumbing work requiring LOTO and system shutdown and startup such as the installation of:
  o new medical gas systems,
  o steam/heating hot water, condensate systems,
  o Potable water and sanitary drainage, multiple sinks, showers and toilets including associated plumbing.
• Electrical work such as installation of electrical feeders, distribution panels, conduit and wire for lighting, receptacles and switches for an area, the installation of conduit and wire for new devices such as terminal units, fans etc. requiring LOTO and system isolation.
• Installation of fire alarm and suppression systems requiring outages of those systems and ILSMs or closure of exits/corridors
• Mechanical work such as the installation of air handling equipment, associated ductwork, diffusers, heat exchangers, terminal units and controls requiring lifting and support of equipment and systems.
	3. Pollution prevention plan in place ☐
	4. Dig safe paper work in place ☐
	5. Crane lift plan in place ☐
	  a. Crane placement
	  b. Crane swing
	  c. Crane load evaluation
	6. Fall protection plan in place and staff trained ☐
	7. Confined entry plan in place and staff trained ☐

Table 2. Affected Adjacent Area Assessment

In addition to the minimum precautions noted above for the Activity Type, it is critical that the activity be coordinated with the areas adjacent to the activity to ensure operations in those areas are not disrupted or impacted. List the adjacent areas in Table 2 below and develop activity-specific coordination plans and associated communication plans with each area to address activity work that could impact or disrupt the operation of the areas, in general as follows:

- If adjacent area is **vacant** (e.g., work outside, construction of new building, etc.):
  - Coordination is typically not necessary other than potentially traffic flow and pedestrian access.

VHA Pre-Construction Risk Assessment (PCRA)

- If adjacent area is **non-continuously occupied** (e.g., areas where outpatient care is provided, employee health, etc.):
    - Develop a list of activities that will potentially impact or disrupt the operation of the area (e.g., work involving noise, vibration or exit obstruction) and meet with POC to coordinate execution of work in a way that mitigates the impact (e.g., conduct work after hours).
- If adjacent area is **occupied continuously** (e.g., areas where inpatient care is provided, residential areas such as Community Living Centers, etc.):
    - Develop a list of activities that will potentially impact or disrupt the operation of the area (e.g., work involving noise, vibration or exit obstruction) and meet with POC to coordinate execution of work in a way that mitigates the impact (e.g., move affected party temporarily).

Area	**Service(s)/Type(s) of Area(s)** *(e.g., OR, Unit/Ward, Sterile Processing, Administrative, etc)**	**Point of Contact (POC)**	**POC Contact Information**	**Construction plan communicated to POC?**
Activity Area**	Dining Hall Building 139	Michael Wilcox	Michael.Wilcox1@va.gov	
Area Above				
Area Below				
Adjacent Area 1				
Adjacent Area 2				
Adjacent Area 3				
Adjacent Area 4				

* There may be more than one Service/type of area for each row. List all. The information entered on this table must be used in the ICRA if required.

** List the area(s) in which the construction/renovation/maintenance activity will occur.

Infection Control Risk Assessment (ICRA)

Consult with Infection Prevention and Control regarding the assessment of potential infection risks associated with the activity and the need for control measures. See VHA Directive 7715 and the VHA ICRA Template for more information.

Is an ICRA required for the Activity? Yes ☒ No ☐

Pre-Construction Risk Assessment (PCRA) Permit

This page must be posted at the entrance to the project area, or other designated area

Unique permit number:			
Location and brief description of construction/renovation/maintenance			
Project manager		Project start date	
Contact phone number		Completion date	
Contractor or lead shop		Permit expiration date	

Activity Type *Inspection/Upkeep, Small-scale, or Large-scale)*	

Activity Type	**Control measures to be in place for the duration of the activity** *(Check the box for the Activity Type to indicate the Control Measures)*
Inspection/Upkeep ☐	1. Immediately replace any ceiling tile, close access panels, etc., upon completion of work. 2. Site visits of construction area are required weekly by member of multi-disciplinary team. Site visits will be documented on standard checklist. 3. Site specific safety plan, task hazard analysis, and hazard communication required to be provided by the contractor and approved. 4. Must address identified hazards and controls that will be implemented to ensure minimal impact patients, employees, contractors and facility. 5. Communication and coordination plan for all affected areas
Small-scale ☐	**<u>All control measures in the row above</u> and the following:** 1. Hazard communication chemical inventory required to be provided by the contractor and approved. 2. ILSMs in place and staff trained on situation 3. Hot Work or burn permits in place and staff trained 4. LOTO procedures in place and staff trained on their use 5. Site visits will be reviewed using the criteria in standardized guide. 6. Daily inspections of the site are to be conducted by the General Contractor and documented on their daily log.
Large-scale ☐	**<u>All control measures in both rows above</u> and the following Activity Hazard Analyses and Control Plans as applicable (check all that apply):** 1. Excavation safety plan in place ☐ 2. Dust control plan in place ☐ 3. Pollution prevention plan in place ☐ 4. Dig safe paperwork in place ☐ 5. Crane lift plan in place ☐ a. Crane placement b. Crane swing c. Crane load evaluation 6. Fall protection plan in place and staff trained ☐ 7. Confined entry plan in place and staff trained ☐

Additional requirements:

Is an Infection Control Risk Assessment (ICRA) required for the Activity? Yes ☐ No ☐

Infection Prevention and Control signature:
Date:

Project Manager signature		Date	
Safety Officer signature		Date	
Chair, Construction Safety Committee signature		Date	

*The location of all Activity Hazard Analyses and Control Plans (excavation, dust, pollution, etc.) as applicable shall be identified on this permit and shall be made available to all workers on the job.