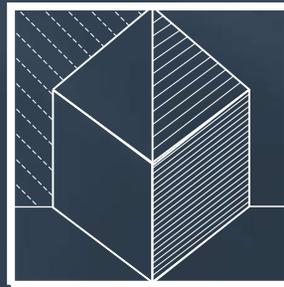


SURVEY FINDINGS & RECOMMENDATIONS

RAINIER SCHOOL – BUCKLEY, WA

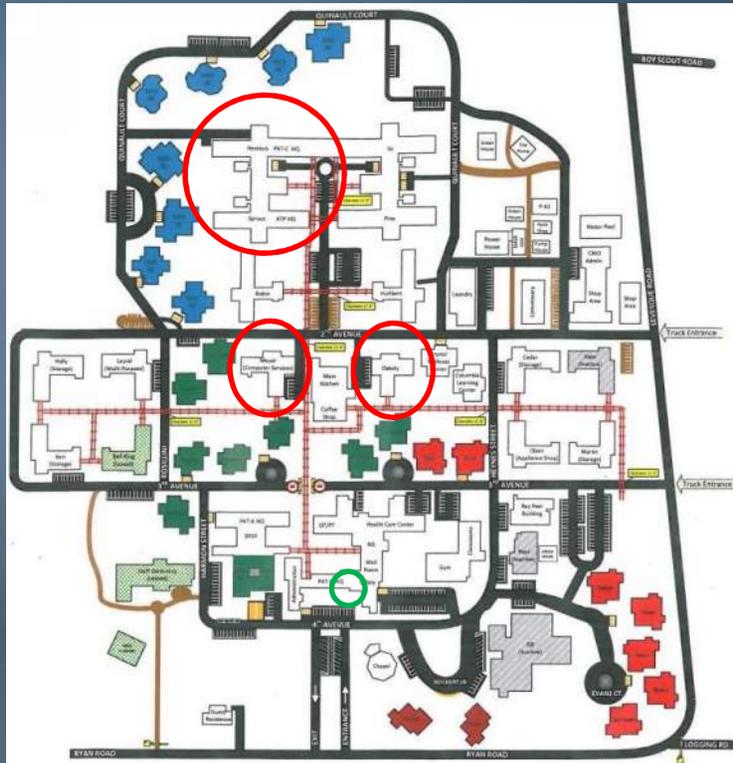
**OAKLEY HALL AND MEYER HALL ROOFING REPAIRS
AND HEMLOCK-SPRUCE HALL PARTIAL
REROOFING AND REPAIR PROJECT**



Building Envelope Technology & Research

Roofing, Waterproofing, Cladding, and Fenestration Consultants, Architects, Testing, & Research

AUDITORIUM BUILDING & ROOF AREA OVERVIEW



Overview showing the general layout of the Rainier School Campus.



HEMLOCK -
SPRUCE HALL

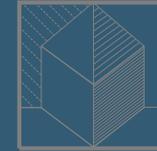


OAKLEY HALL



MEYER HALL

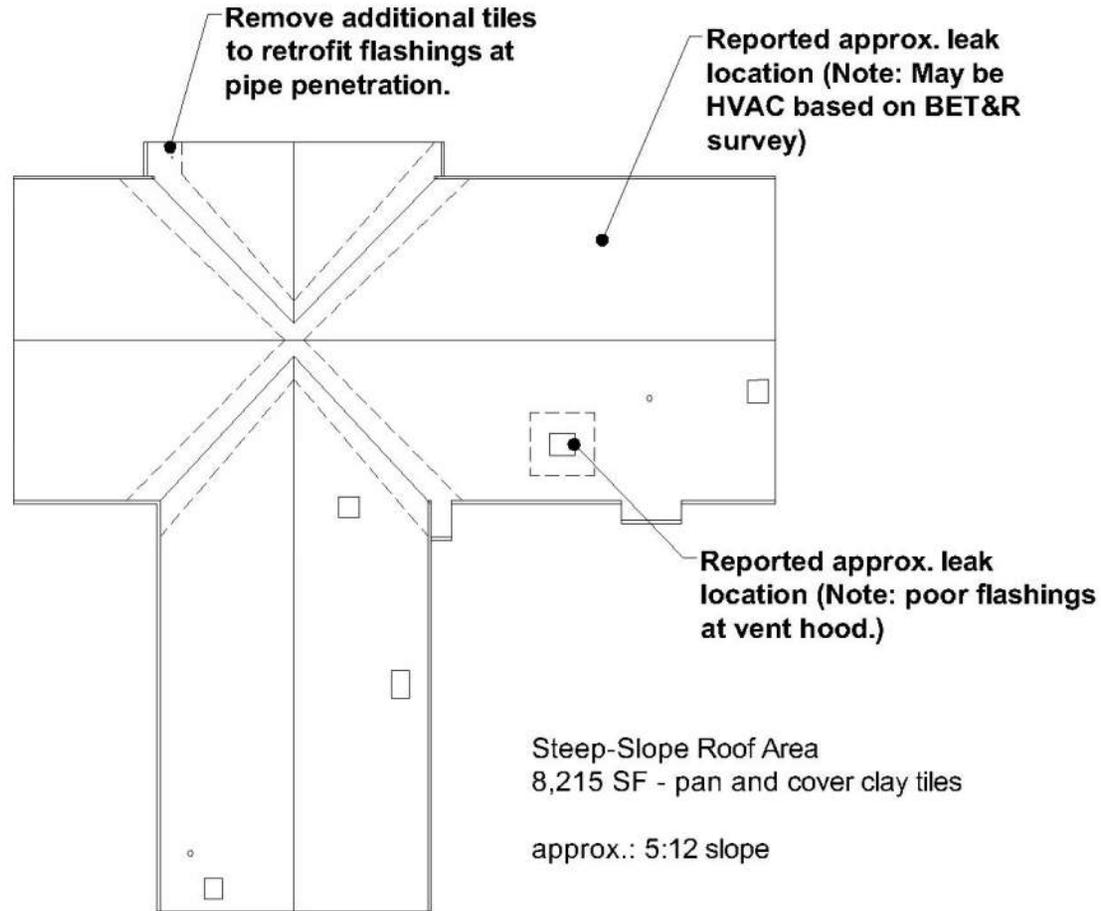
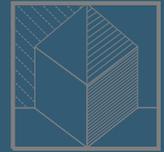
OAKLEY HALL-- OVERVIEW



Overview of Conditions at Oakley Hall

Reports of water intrusion primarily appear to be related to aged valley flashing conditions and defective flashings at select HVAC related penetrations.

OAKLEY HALL ROOF PLAN



OAKLEY HALL -- ROOF PLAN

1/8" = 1'-0"



NORTH

OAKLEY HALL --- GENERAL ROOF FINDINGS AND CONDITIONS



Overview of Oakley Hall pan-and-cover clay tile roofing and general survey findings.

OAKLEY HALL



View of water staining on underside of wood car decking from attic space



Deficient lead flashing at soil stack pipe penetration

OAKLEY HALL



Depicts generally dry and good condition of 2x car decking and wood-framed structure



While the roofing structure appears dry, water intrusion as reported in an office below select HVAC units. The leak in office 128 appears to be related to this HVAC unit.

OAKLEY HALL- VENT HOOD FLASHINGS



Photos of conditions at HVAC Hood at related leak location where curb not correctly flashed.

OAKLEY HALL— VALLEY FLASHINGS



Photos of conditions at typical valley

OAKLEY HALL— PIPE PENETRATION FLASHINGS



Photos of conditions at pipe penetration near northwest corner of building

OAKLEY HALL— DOWNSLOPE EAVE EDGE CONDITIONS



Photos of conditions at downslope eave edge flashings.

GYMNASIUM REROOFING PROJECT SAMPLE PHOTOS – DOWNSLOPE EAVE EDGE CONDITIONS



Gymnasium/Office Wing downslope eave edge at retrofit copper gutters.

OAKLEY HALL – BROKEN AND DEGRADED TILES

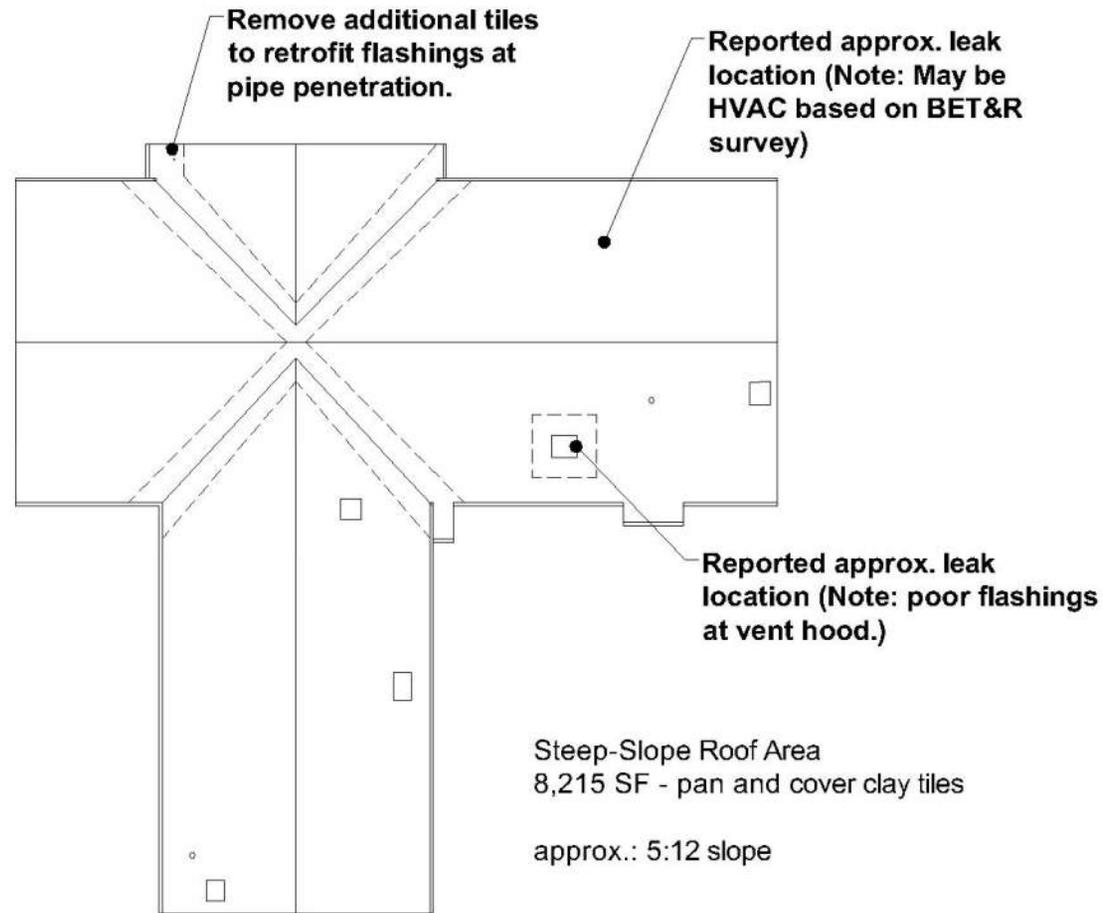
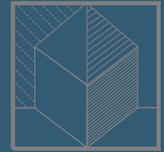


View of broken clay tile needing replacement



Apparent freeze-thaw damage eroding edges of select clay tiles

OAKLEY HALL ROOF PLAN AND GENERAL REPAIR RECOMMENDATIONS



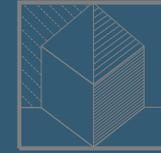
OAKLEY HALL -- ROOF PLAN

1/8" = 1'-0"



NORTH

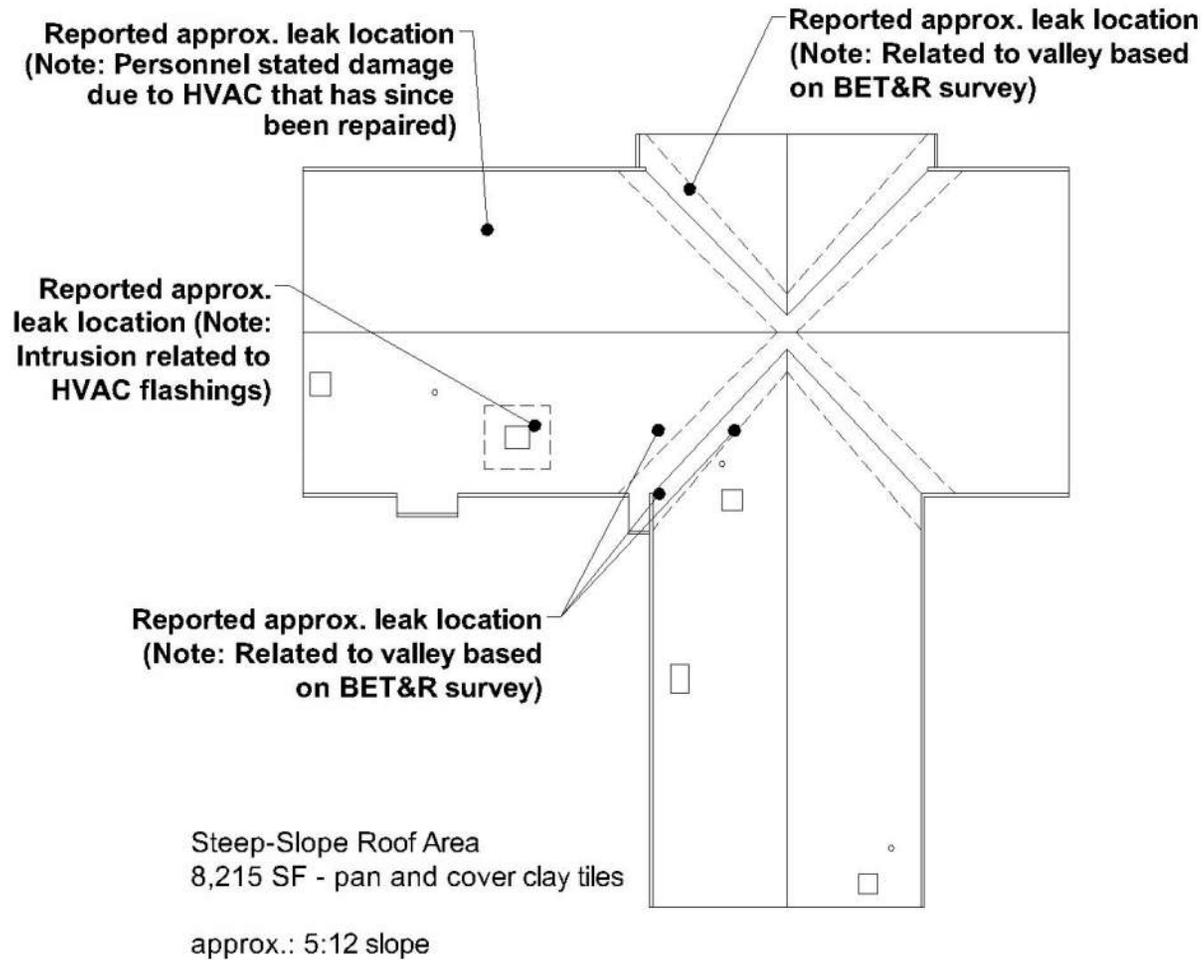
MEYER HALL-- OVERVIEW



Overview of Conditions at Meyer Hall

Reports of water intrusion also appear to be primarily related to valley flashing conditions and flashings at select HVAC units' penetrations.

MEYER HALL ROOF PLAN AND GENERAL REPAIR RECOMMENDATIONS



MEYER HALL -- ROOF PLAN
1/8" = 1' - 0"



MEYER HALL – WET AND WATER STAINED DECKING NEAR VALLEYS



View of water stained and decayed car decking and adjacent framing members at a valley transition.



Placement of buckets to collect rain water run-off leaks. Note: insulation has been displaced on concrete ceiling due to previous water intrusion.

MEYER HALL— ROOFING OVERVIEW



Overview of Roof Level Conditions

MEYER HALL— VALLEY CONDITIONS



Overview of Roof Level Valley Conditions

MEYER HALL – BROKEN AND MISPLACED TILES



View of broken clay tile needing replacement



Misplaced tiles at valley-to-ridge transitions.

MEYER HALL— VENT HOOD FLASHINGS



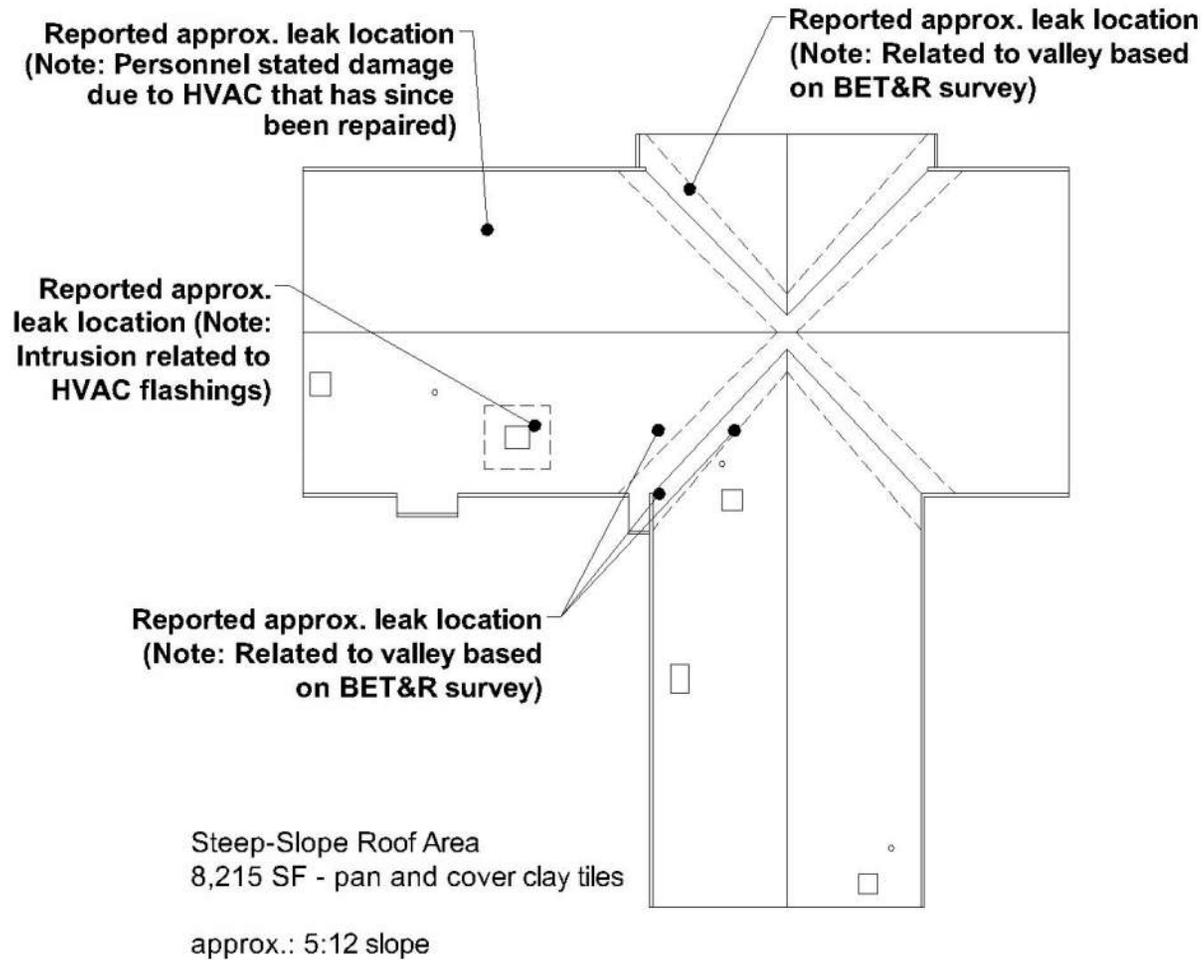
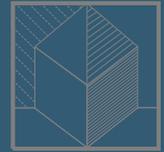
Photos of flashing conditions at typical HVAC Hood.

MEYER HALL— DOWNSLOPE EAVE EDGE CONDITIONS



Photos of conditions at downslope eave edge flashings.

MEYER HALL ROOF PLAN AND GENERAL REPAIR RECOMMENDATIONS



MEYER HALL -- ROOF PLAN
1/8" = 1' - 0"

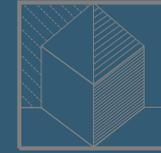


GYMNASIUM REROOFING PROJECT SAMPLE PHOTOS – TYPICAL DETAIL CONDITIONS AT VALLEYS & TRANSITIONS



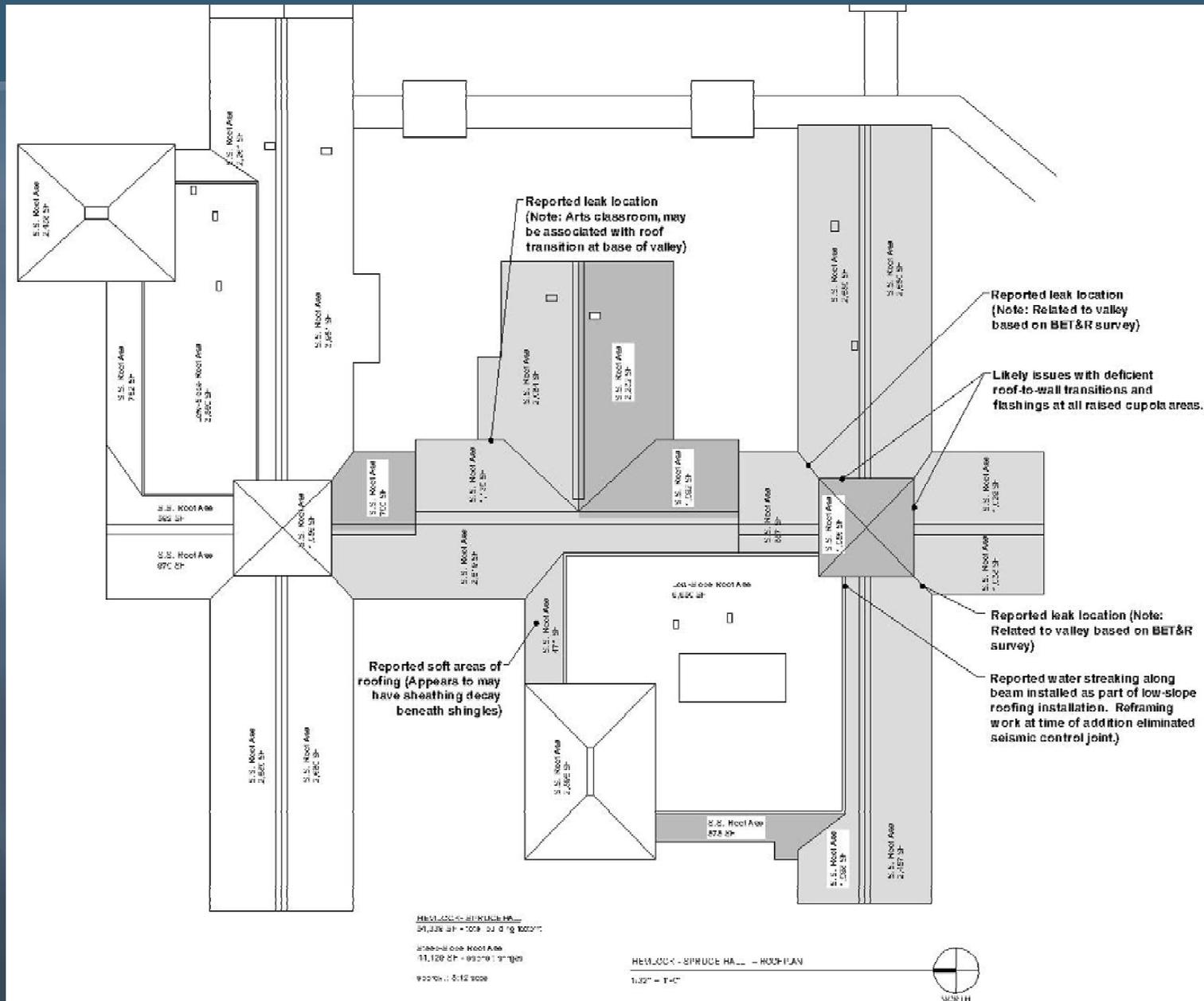
Gymnasium/Office Wing Reroofing Project Sample Photos of typical details.

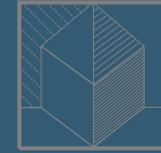
HEMLOCK-SPRUCE- OVERVIEW OF ROOF CONDITIONS



Overview of Conditions at hemlock-Spruce Hall
The existing 3-tab asphalt shingles appear to be approaching 26+ years of service life, are cracking and are generally in need of replacement.

HEMLOCK-SPRUCE ROOF PLAN



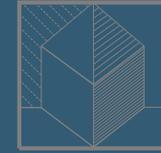


HEMLOCK-SPRUCE- CONDITIONS AT CUPOLAS



General Conditions at Cupolas

Water intrusion appears to be occurring at roof-to-wall transition at areas related to valley flashings.

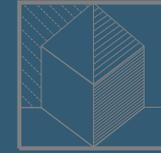


HEMLOCK-SPRUCE- REPORTED LEAK LOCATIONS



Water Intrusion Beneath Woven Valleys

Water intrusion reported in hallway near wood shop appears to be emanating from asphalt shingle woven valley.



HEMLOCK-SPRUCE- REPORTED LEAK LOCATIONS



Water Intrusion at Valley-to-Roof Transition at Art Room
Water intrusion reported in the Arts Classroom appears to be related to valley-to-intersecting roof transition.

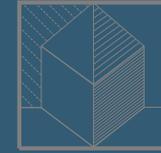
HEMLOCK-SPRUCE- REPORTED DECAYED SHEATHING



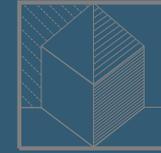
Soft, Decayed Sheathing Beneath Shingles

Although no interior leaks have been reported at this area, the sheathing is decayed / degraded and quite soft. Replacement of sheathing is needed.

HEMLOCK-SPRUCE- SHINGLE CONDITION



Overall Condition of Existing 3-tab Asphalt Shingles
The existing 3-tab asphalt shingles are generally in poor condition. Extensive granule loss is widespread with reinforcing degrading from long-term exposure.

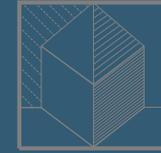


HEMLOCK-SPRUCE- CONDITIONS AT CUPOLA



General Conditions at Cupolas

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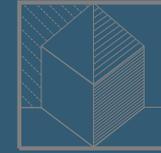


HEMLOCK-SPRUCE- CONDITIONS AT CUPOLA



General Conditions at Cupolas

Stucco repairs and proper integration with weather-resistive barrier are needed as part of the retrofit of roof-to-wall flashing details.

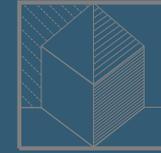


HEMLOCK-SPRUCE- RIDGE VENT OBSERVATIONS



General Conditions at Ridge Vents

Wood-framed ridge vents have experienced shingles being blown off and are susceptible to water intrusion and wind-driven rain.

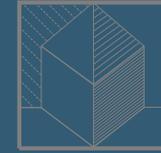


HEMLOCK-SPRUCE- SOFFIT VENT OBSERVATIONS



General Conditions at Soffit Vents

Downslope eave in-take air ventilation provided by intermittent 6" diameter soffit vents at some locations, and strip vents at others.



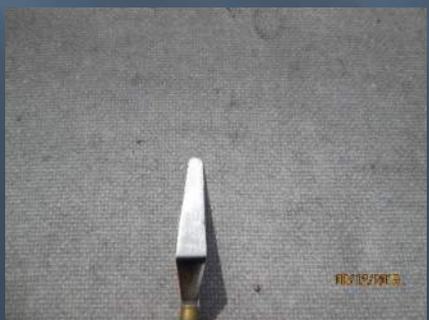
HEMLOCK-SPRUCE- SHINGLE TEST OPENING



Observations at Test Opening

Select shingles were carefully removed, which revealed just one layer of No. 15 asphalt-saturated underlayment over plywood sheathing.

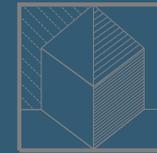
HEMLOCK-SPRUCE- LOW-SLOPE ROOF OBSERVATIONS



General Conditions at Low-Slope Roof Areas

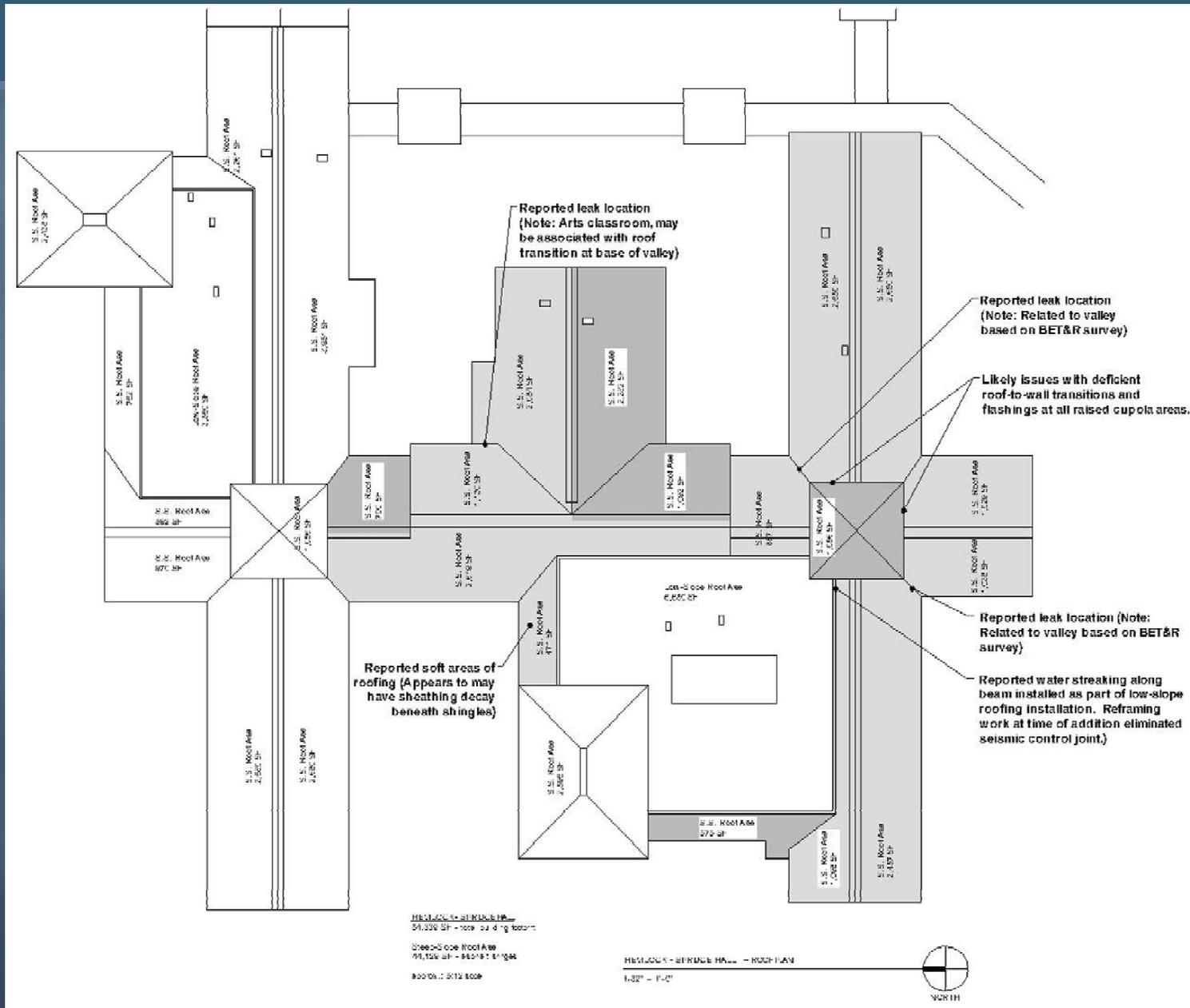
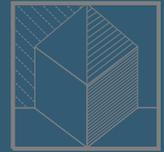
Debris needs to be removed from the roof areas. We believe the life of the membrane can be extended with careful cleaning, proper prep, priming, and polyurethane coating application.

HEMLOCK-SPRUCE- LOW-SLOPE ROOF OBSERVATIONS



General Conditions at Low-Slope Roof Areas
Debris needs to be removed from the roof areas. We believe the life of the membrane can be extended with careful cleaning, prep, and coating application.

HEMLOCK-SPRUCE ROOF PLAN

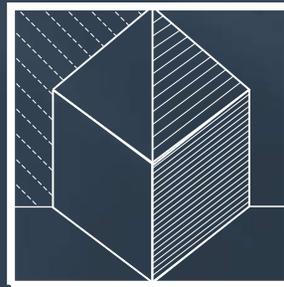


RAINIER SCHOOL – REROOFING AND REPAIR PROJECT

Questions?

Open for Discussion

Please contact BET&R with any questions, comments, or concerns.



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