



TOTAL ROOF MANAGEMENT

October 4, 2018

Mr. Daniel Hebel, Supervisor of Maintenance & Operations
Mr. Joseph Pandolfo, Deputy Superintendent of Business Services
Rincon Valley Union School District
1000 Yulupa Avenue
Santa Rosa, CA 95405

SUBJECT: ROOF ASSESSMENT REPORT FOR RINCON VALLEY UNION SCHOOL DISTRICT (RVUSD)

Dear Daniel and Joe:

In December 2017 & January 2018 roof inspections were conducted on each of the eight(8) elementary schools in your district. The purpose of the roof inspections was to gather information to evaluate the condition of the different types of roof systems on the district's school buildings and to estimate the viable or sustainable service life remaining in the (E) roof systems. The following report will provide a synopsis of the (E) roof conditions and make roof repair, roof rehabilitation or roof replacement recommendations based on those conditions. Finally, photos of multiple roof decks at each school are provided that document the (E) roof conditions and corroborate any roofing work that is recommended.

Regarding cost estimates for any recommended roofing work, note that only a "per square foot cost" is provided in a range from low to high for the roofing work that is recommended; a "total project cost" is difficult to estimate for purposes of this report because a project could / would depend on a number of factors not known at this time. (Where a total project cost estimate is provided please note it is simply an extrapolation of the per square foot costs.) What I think is most important with respect to Facilities Maintenance budgeting is the difference between estimated project costs for a reroofing project when compared to the estimated costs of a roof rehabilitation project because RVUSD actually has a number of schools where the (E) roof conditions for the next few years will / should allow the roofs to be rehabilitated. Additionally, I estimate that there are 5 to 5.5 acres of (E) built-up and single ply roof systems that can be rehabilitated at this time!

Thank you for allowing Total Roof Management the opportunity to provide the roof assessment / roof condition report for the Rincon Valley Union School District. Please do not hesitate to contact me if you have any questions as I would be happy to gather additional roof condition information should you have concerns not addressed in this report. TRM hopes to work with you on any proposed roofing project in your district or on any other project where you think my company's services would be of benefit.

Sincerely,

M. Tom Terry
Total Roof Management

PREFACE TO THE ROOF ASSESSMENT REPORT

I'm adding this short preface to the Roof Assessment Report in the hope of adding clarity to a strategy for employing roof rehabilitation procedures in lieu of reroofing district buildings whenever possible, to provide a short explanation of the cost estimating method I've used to provide budget figures for future roofing work, to explain the treatment (or lack thereof) of your district's portable classroom buildings in this report as well provide explanations of a few roofing terms, but I'd like to start by alerting you to the repetitiveness inherent in roof assessment reports.

- Repetitiveness: Please note that there are only so many ways write about a roof system and there is only a finite amount of words, terms or phrases to describe a roof system and for that I'm truly sorry. You will read many of the same things over and over again because the roof conditions on one school building will be the same as, or very similar to, the conditions on every other school building that you have in your district. I suppose I should suggest that you read this report when you're tired but can't fall asleep because it will probably help put you right to sleep!
- Providing Budget Figures For Future Roofing Projects: Total Roof Management endeavors to be accurate when providing cost estimates to RVUSD (or any school district) and we do so by using the most recent "completed project costs" from "like" roofing projects on local public school buildings to provide the estimates. Note that cost estimates are greatly affected by the difficulty of the project being considered and hopefully we accurately account for labor intensity, additional trades that need to be employed, size of the project, unstable material prices, potential weather interruptions, etc.. Also, our typical cost estimates are presented in a "cost range format" into which we think most of the actual bids for the proposed roofing project will land. And, please note that TRM would always prefer to error on the side of overestimating cost rather than underestimating cost.
- Roof Rehabilitations: Roof rehabilitations are a way for facility managers to maintain and even salvage commercial roofing systems in lieu of reroofing. Typically when a commercial, industrial or institutional roof system starts to fail (experience roof leaks) attempts are made to find the leak origins so the leaks can be stopped and rightly so, but the success rate for that activity is historically quite low. The typical scenario is that after a full rainy season of attempts to patch the roof patches that were just patched is deemed fruitless, the whole roof is incorrectly considered a loss and the building is scheduled for reroofing. It's no exaggeration when I say that many, many times reroofing is completely unnecessary but is performed because it's expeditious to do so and it's become the "new normal." However, in a built-up roof system if aged BUR membranes are still viable, e.g., maintain some volatile oils, are not overly brittle, have waterproofing integrity over a large percentage of the roof surface, etc., it may be possible to perform rehabilitation procedures in lieu replacing the (E) roof. Using a typical roof system installed on one of your school buildings as an example, if a decision was made to reroof a 20,000 square foot classroom building the completed project cost for a (N) BUR system or a (N) thermoplastic single-ply system, both meeting all the current code requirements and be accompanied by a 15-year or 20-year manufacturer's warranty, would be approximately \$16 – \$22 per square foot. At 20,000 square feet the cost range would be \$320,000 – \$440,000 for the completed installation. And if you wanted an upgraded roof system with additional thermal insulation and all new sheet metal flashing systems, etc., the competed cost would certainly be more. But what if a new roof is not needed? Again, using the 20,000 square foot classroom building as an example, attending to some basic repairs on an aged roof that still has some waterproofing integrity may mean the (E) BUR could be completely rehabilitated, coated and warranted against roof leaks for a period of 15 – 20 years for an approximate cost of \$7.50 – \$8.50 per square foot, which is a savings of 55% - 60%! The cost range that was \$320,000 - \$440,000 is greatly decreased to \$150,000 - \$170,000! **Note**: Roof rehabilitations are not always possible as aged roof systems can be deteriorated beyond the point where rehabilitation procedures are effective and beyond the point where roof coating manufacturers are willing to provide long-term roof warranties. (Let's discuss the scenarios where roof rehabilitations are prudent recommendations in RVUSD and where they would not / could not be recommended.)

- Strictly "Spot Patch" Roof Repairs: When it's written that a roof system should be "repaired only as required" but no mention is made of periodic roof maintenance or roof rehabilitation it means that **only** "spot patch roof repairs" should be made until such time that the failing roof system can be replaced. When an existing roof system can no longer provide reliable waterproofing because it is aged, deteriorated, void of volatile oils and beyond salvage, it is neither prudent or cost effective to invest additional resources for roof maintenance trying to prevent future leaks from occurring on any such a roof.
- In-House Roof Maintenance: For the purpose of this roof assessment report, in-house roof maintenance simply means blowing-off or cleaning the debris and foliage from the roof surfaces on your school buildings and removing leaves and debris from the gutters on your school buildings. These two(2) tasks should be performed twice each year. Also, when performing the semiannual cleaning, notations of any roof system irregularities can be recorded for follow-up by a roofing professional.
- Modular Classrooms: All modular classrooms (aka, portables) in RVUSD have standing seam metal roof systems on low sloped roof decks and the standing seams can vary in height from modular to modular. (Standing seam heights vary from 1 ½-inches to 3-inches.) Some of the roofs on the modular classrooms have been coated with sprayed polyurethane foam roofing and acrylic coating, some have been covered with a thermoplastic single ply roof membrane and some remain as you received them from the manufacturer or supplier. Each modular classroom has a roof deck of approximately 1,000 square feet, are typically repaired on an as needed basis and, as there is no real roof maintenance the district can perform other than to keep debris off the roof and out of the gutters, there is little or no mention of the modular classrooms in the roof assessment report.

RINCON VALLEY UNION SCHOOL DISTRICT

ROOF ASSESSMENT REPORT

OCTOBER, 2018

Roof Assessment Criteria (General)

- **District Elementary Schools:**

Roof inspections were conducted at each of the following eight(8) elementary schools:

Austin Creek / Binkley / Madrone / Matanzas / Sequoia / Spring Creek / Village / Whited

- **Types of Roof Systems:**

There are five(5) basic types of roof system(s) on the school buildings in the district. In addition, the roof surfaces vary on the Built-Up Roofing from campus to campus and, in some cases, from building to building on the same campus. The types of roof systems in the district are:

1. Built-Up Roof Systems surfaced with:
 - a. Decorative aggregate or gravel adhered with a flood coat of asphalt bitumen.
 - b. Emulsion w/ chopped fiberglass roving coated with elastomeric acrylic, urethane and silicone.
 - c. Mineral surfaced fiberglass cap sheet.
2. Composition Asphalt Shingle Roof Systems.
3. Standing Seam Metal Roof Systems.
 - a. Modular buildings at each school site and permanent buildings at Austin Creek.
4. Thermoplastic Single Ply Roof Systems.
5. Sprayed Polyurethane Foam Roof Systems.

- **Justification:**

The different roof systems at each campus are at various stages of service life and judgments are presented below with respect to the condition of each roof system and the potential for additional or extended service life. For the purpose of this report the primary keys used to determine the existing condition and remaining service life of the roof systems at each school site are:

Leak History

Approximate age of roof system

Typical weather conditions encountered

Loss or absence of volatile oils in the roof system components, i.e., membrane or shingle rigidity or brittleness

Condition of membrane flashing

Roof system anomalies

Condition of roof accessories (counter-flashing, roof jacks, pitch pans, gutters, etc.)

In addition to the (E) roof conditions at each school site the scope of any anticipated modernization project must also be considered with respect to decisions about roof repair, roof rehabilitation and, or, roof replacement. Please note, however, that factoring a modernization scope may put a roofing recommendation in this report at odds with a conventional roofing recommendation based solely on the (E) roof conditions.

- **Roof Condition Scale:**

1 – 10 (1 = very bad / 10 = very good)

- **Recommendations:**

Remove and Replace
(As soon as it is feasible)

Repair and Maintain

Maintain

1 – 2
2 – 3
3 – 4

4 – 5
5 – 6
6 – 7

7 – 8
8 – 9
9 – 10

AUSTIN CREEK ELEMENTARY SCHOOL

Specific Roof Condition Assessments

The roof systems on this campus, with the exception of the built-up roofing with fiberglass cap sheet surfacing on six(6) small walkway canopy roof decks, appear to be the original roof system installations. The types of roof systems on this campus are: built-up roofing installed on all low sloped roof decks and standing seam metal roofs installed on all sloped roof decks and modular buildings.

1. Standing Seam Metal Roof Systems:

- a. General Roof Condition: **6 – 7** on the roof condition scale = **good condition, repair and maintain.**
- b. Roofing Related Anomalies: The gutters integral with the metal roof systems are in very poor condition (random locations); replace where required as soon as possible.

2. Built-Up Roof Systems surfaced with gravel:

- a. General Roof Condition: **4.5 – 5** on the roof condition scale = **poor to fair condition, repair only as required.**
- b. Roofing Related Anomalies:
 1. Roof membrane ridging
 2. Displacement of gravel with exposed felt (random locations)
 3. Open seams on parapet wall flashing (random locations)
 4. Cracked flashing membranes (random locations)

3. Built-Up Roof Systems surfaced with fiberglass cap sheet:

- a. General Roof Condition: **6 – 7** on the roof condition = **good condition, repair and maintain.**
- b. Roofing Related Anomalies: Minor loss of mineral granules

Roof Leaks: There were no active “roof leaks” reported at this campus which is puzzling because there are membrane flashing anomalies.

Potential Issues / Anomalies (not specifically roofing): None spotted.

RECOMMENDATIONS:

1. Remove and replace the badly deteriorated gutters as soon as possible.
2. Repair the flashing membrane anomalies as soon as possible.

COST ESTIMATE:

1. Gutter replacement as required: Unknown
2. T & M to make repairs to the flashing membranes: \$500 - \$750

BINKLEY ELEMENTARY SCHOOL

Specific Roof Condition Assessments

The roof systems on this campus, with the exception of the built-up roofing on two(2) small walkway canopy roof decks, were reported to have been reroofed in 2017. The types of roof systems on this campus are: built-up roofing installed on all low sloped roof decks / composition asphalt shingles installed on all sloped roof decks / standing seam metal roofing installed on all modular buildings.

1. Composition Asphalt Shingle Roof Systems:
 - a. General Roof Condition: **9 – 10** on the roof condition scale = **new condition, maintain.**
 - b. Roofing Related Anomalies: No roof anomalies were spotted.
 2. Built-Up Roof Systems surfaced with fiberglass cap sheet:
 - a. General Roof Condition: **9 – 10** on the roof condition = **new condition, maintain.**
 - b. Roofing Related Anomalies: Missing bolt to secure a drain ring and drain strainers in equipment well.
- Note: The BUR system on the two(2) small walkway canopy roof decks have a roof condition rating of **5 – 5.5** and can be / should be repaired as necessary and maintained.
3. Standing Seam Metal Roof Systems:
 - a. (Modular classroom including Kindergarten) General Roof Condition: **6.5 – 7** on the roof condition scale = **very good condition, maintain.**
 - b. (New walkway canopy) General Roof Condition: **9 – 10** on the roof condition scale = **new condition, maintain.** Note: This walkway canopy is technically not a “roof system,” it’s simply a steel paneled water-shed.
 - c. Roofing Related Anomalies: No roof anomalies were spotted.

Roof Leaks: A leak in the equipment well on classroom cluster 4 – 5 – 6 was reported but it was also reported that the leak had been repaired. There was also a stained ceiling tile in the new construction but the stain may not have been caused by a roof leak.

Potential Issues / Anomalies (not specifically roofing):

1. It was reported that water diverters over entrances to classrooms don’t work properly.
2. Connections of new GSM down leaders to schedule 40 down leaders are not aligned.

RECOMMENDATIONS:

1. Investigate the potential issues listed above and correct as necessary.

COST ESTIMATE:

1. Unknown

MADRONE ELEMENTARY SCHOOL

Specific Roof Condition Assessments

The types of roof systems on this campus are: built-up roofing installed on all low sloped roof decks / composition asphalt shingles installed on all sloped roof decks and mansard roofs / standing seam metal roofing installed on all modular buildings and the walkway canopy on the new Day Care Building.

1. Built-Up Roof Systems surfaced with mineral surfaced, modified bitumen cap sheet:
 - a. General Roof Condition: **6.5 – 8** on the roof condition scale = **good condition, maintain.**
Note: General Roof Condition of the School Office Building only: **4 – 5** on the roof condition scale = **poor to fair condition, repair only as required.**
 - b. Roofing Related Anomalies:
 1. It appears that there are two(2) roof systems in place on the School Office Building.

2. Composition Asphalt Shingle Roof Systems:
 - a. General Roof Condition: **7.5 – 8.5** on the roof condition scale = **very good condition, maintain.**
 - b. Roofing Related Anomalies: No roof anomalies were spotted.
3. Standing Seam Metal Roof Systems:
 - a. General Roof Condition: **7.5 – 9** on the roof condition scale = **very good condition, maintain.**
 - b. Roofing Related Anomalies: No roof anomalies were spotted.

Roof Leaks: There were no active “roof leaks” reported at this campus.

Potential Issues / Anomalies (not specifically roofing):

1. Existing electrical conduit anomalies (random locations)
2. New counter-flashing on the Day Care Building damaged during installation.

RECOMMENDATIONS:

1. Investigate the potential issues / anomalies listed above and correct as necessary.
2. Plan for roof rehabilitations of the built-up roof systems on the Classroom Buildings & walkway canopies.

COST ESTIMATE:

1. Unknown

MATANZAS ELEMENTARY SCHOOL

Specific Roof Condition Assessments

The types of roof systems on this campus are: built-up roofing installed on the roof decks of Classroom Wing 1, the School Office and the M/U Building / thermoplastic single ply roofing installed on the roof decks of Classroom Wings 2 & 3 and contiguous walkway canopies / standing seam metal roofing installed on all modular buildings.

1. Built-Up Roof System surfaced with elastomeric urethane coating:
 - a. General Roof Condition: **9.5 – 10** on the roof condition scale = **new condition, maintain.**
 - b. Roofing Related Anomalies: No roof anomalies were spotted.
2. Built-Up Roof System surfaced with decorative aggregate:
 - a. General Roof Condition: **9 – 9.5** on the roof condition scale = **new condition, maintain.**
 - b. Roofing Related Anomalies: No roof anomalies were spotted.
3. Built-Up Roof System surfaced with fiberglass cap sheet:
 - a. General Roof Condition: **5 – 6** on the roof condition scale = **good condition, maintain.**
 - b. Roofing Related Anomalies: Minor loss of mineral granules.
4. Thermoplastic Single Ply Roof System (TPO):
 - a. General Roof Condition: **5 – 6** on the roof condition scale = **good condition, maintain.**
 - b. Roofing Related Anomalies:
 1. Clogged drop-out drains on walkway canopies (random locations)
 2. Standing water on thermoplastic membrane (sever in random locations)
 3. Missing strainers on drain rings (random locations)
 4. Wood block sleepers supporting electrical conduit on the walkway canopy contiguous with Classroom Wing 2 is not properly cushioned on top of the thermoplastic membrane.

5. Standing Seam Metal Roof Systems:

- a. General Roof Condition (Library / Media Bldg.): 6 – 7 on the roof condition scale = **good condition, maintain.**
- b. General Roof Condition (Charter School / Kindergarten): 8.5 – 9 on the roof condition scale = **new condition, maintain.**
- c. Roofing Related Anomalies: The gutter on the east side of the Library / Media Building integral with the metal roof systems is in very poor condition; replace as soon as possible.

Roof Leaks: There was an active “leak” reported at this campus in the School Office but the leak origin was identified at the base of HVAC ductwork and repaired.

Potential Issues / Anomalies (not specifically roofing):

1. Existing electrical conduit runs mounted on the thermoplastic roof decks are much too low.

RECOMMENDATIONS:

1. Replace the deteriorated gutter on the Library / Media Building.
2. Plan for the roof rehabilitations of the mineral surfaced built-up roofing and the thermoplastic single ply roofing.

COST ESTIMATE:

1. Unknown

SEQUOIA ELEMENTARY SCHOOL

Specific Roof Condition Assessments

The two(2) types of roof systems on this campus are: built-up roofing installed on all low sloped roof decks and the M/U Building / standing seam metal roofing installed on all modular buildings.

1. Built-Up Roof Systems surfaced with elastomeric urethane / silicone coating:

- a. General Roof Condition (School Office and Kitchen roof decks): 10 on the roof condition scale = **new condition, maintain.**

- b. Roofing Related Anomalies: No roof anomalies were spotted.

Note: The existing built-up roofing on the M/U Building was rehabilitated and coated with urethane as part of a roof rehabilitation project performed concurrently with the reroofing project on the School Office & Kitchen at Sequoia Elementary in summer 2018. The existing built-up roofing on the walkway canopies contiguous with Classroom Wing 1 and Classroom Wing 2 were repaired, rehabilitated and coated with silicone as part of a roof rehabilitation project performed concurrently with an HVAC retrofit installation at Sequoia Elementary also in summer 2018. The General Roof Condition on the M/U Building and walkway canopies is 9.5 – 10 on the roof condition scale = **new condition, maintain.**

- c. Roofing Related Anomalies: Ponding water on the walkway canopy roof decks.

2. Built-Up Roof Systems surfaced with fiberglass cap sheet:

- a. General Roof Condition on Classroom Wing 1: 4.5 – 5 on the roof condition scale = **poor to fair condition, maintain if possible.**

- b. General Roof Condition on Restrooms: 3 – 3.5 on the roof condition scale = **poor condition, repair only as required.**

- c. General Roof Condition on Classroom Wing 2: 4.5 – 5 on the roof condition scale = **poor to fair condition, maintain if possible.**

- d. Roofing Related Anomalies:

1. Ponding water at roof perimeters; severe in random locations.
2. Loss of mineral granules in random locations; exposure of roof membranes to UV rays causing premature degradation of the membranes.
3. Damaged aluminum flashing for furnace flue.

3. Standing Seam Metal Roof Systems:

- a. General Roof Condition on Library / Media Building & Kindergarten buildings: **5.5 – 6** on the roof condition scale = **good condition, maintain.**
- b. General Roof Condition on Charter School Buildings: **7 – 8** on roof condition scale = **very good condition, maintain.**
- c. Roofing Related Anomalies:
 1. The gutter on the north side of the Library / Media Building integral with the metal roof systems is in very poor condition; replace as soon as possible.

Roof Leaks: The active roof leaks that were reported during last school year in the School Office and Kitchen, as well as over the walkway canopies, should now be eliminated with the roofing work performed during summer 2018.

Potential Issues / Anomalies (not specifically roofing): None spotted.

RECOMMENDATIONS:

1. Replace the deteriorated gutter on the Library / Media Building as soon as possible.
2. Plan for the roof rehabilitations of Classroom Wings 1 & 2 and reroofing of the restrooms at the east end of Classroom Wing 1 for the summer of 2019.

COST ESTIMATE:

1. Unknown for gutter replacement on Library / Media Building.
2. Roof Rehabilitation Project on Classroom Wings 1 & 2: \$7.50 - \$8.50 per square foot (includes 15 – 20 year manufacturer's roof warranty.)
3. Reroofing the Restrooms at the east end of Classroom Wing 1: \$20.00 – \$23.00 per square foot (includes 15 – 20 year manufacturer's warranty)

SPRING CREEK ELEMENTARY SCHOOL

Specific Roof Condition Assessments

The two(2) types of roof systems on this campus are: built-up roofing installed on all low sloped roof decks and the M/U Building / standing seam metal roofing installed on all modular buildings.

1. Built-Up Roof Systems surfaced with elastomeric urethane coating:
 - a. General Roof Condition (M/U Building): **9.5 – 10** on the roof condition scale = **new condition, maintain.**
 - b. Roofing Related Anomalies: No roof anomalies were spotted.
2. Built-Up Roof Systems surfaced with fiberglass cap sheet:
 - a. General Roof Condition (Classroom Wing 1): **5 – 5.5** on the roof condition scale = **good condition, maintain.**
 - b. General Roof Condition (Classroom Wing 2): **5.0** on the roof condition scale = **good condition, maintain.**
 - c. General Roof Condition (Classroom Wing 3): **5 – 5.5** on the roof condition scale = **good condition, maintain.**
 - d. General Roof Condition (Office & Kitchen): **5 – 5.5** on the roof condition scale = **good condition, maintain.**
 - e. Roofing Related Anomalies:
 1. Ponding water at roof perimeters; sever in random locations.
 2. Clogged drains & drop-out drains; deck deflection making drains slightly higher than roof deck / roof surface.
 3. Minor loss of mineral granules (random locations.)
 4. Evidence of roof repairs (random locations.)
 5. Raise & install permanent flashing on gas line penetration on kitchen roof.

3. Standing Seam Metal Roof Systems:

- a. General Roof Condition (Library / Media Bld.): 6 – 6.5 on the roof condition scale = **good condition, maintain.**
- c. Roofing Related Anomalies: No roof anomalies were spotted

Roof Leaks: There was an “active” leak reported on the exterior window of classroom #7 but it may not have been a roof leak.

Potential Issues / Anomalies (not specifically roofing):

1. Electrical conduit run mounted on the connector walkway canopy roof deck is much too low; too heavy.(?)

RECOMMENDATIONS:

1. Plan for the roof rehabilitations of the Classroom Wings & walkway canopies; plan project as soon as it is feasible to do so.

COST ESTIMATE:

1. Roof Rehabilitation Project on Classroom Wings & walkway canopies: \$8.50 - \$9.00 per square foot (includes 15 – 20 year manufacturer’s roof warranty & “fill at low spots” to mitigate the problem ponding water conditions.)

VILLAGE ELEMENTARY SCHOOL

Specific Roof Condition Assessments

The two(2) types of roof systems on this campus are: built-up roofing installed on all low sloped roof decks and the M/U Building / standing seam metal roofing installed on all modular buildings.

1. Built-Up Roof Systems surfaced with fiberglass cap sheet:

- a. General Roof Condition: 4.5 – 5.5 on the roof condition scale = **fair condition, maintain if possible.**
- b. Roofing Related Anomalies:
 1. Minor ponding water at roof perimeters of the walkway canopies.
 2. Loss of mineral granules (random locations.)
 3. Evidence of roof repairs (random locations.)
 4. Deteriorated gutters & debris in gutters (random locations.)

2. Standing Seam Metal Roof Systems:

- a. General Roof Condition (Library / Media Bld.& Kindergarten Classrooms): 6.5 – 7 on the roof condition scale = **good condition, maintain.**
- b. Roofing Related Anomalies: No roof anomalies were spotted

Roof Leaks: “Active” leaks were reported in the Kindergarten classrooms (classrooms not identified.)

Potential Issues / Anomalies (not specifically roofing):

1. Electrical conduit and dense mechanical equipment “cluster” on the roof deck above or near the entrance to the school on the west side of the campus is VERY SEVERE and will impede any roof rehabilitation procedures or reroofing procedures.

RECOMMENDATIONS:

1. Plan for the roof rehabilitations of the Classroom Wings & walkway canopies; plan project as soon as it is feasible to do so.

COST ESTIMATE:

1. Roof Rehabilitation Project on Classroom Wings & walkway canopies: \$8.50 - \$9.00 per square foot (includes 15 – 20 year manufacturer’s roof warranty.)

WHITED ELEMENTARY SCHOOL

Specific Roof Condition Assessments

The two(2) types of roof systems on this campus are: built-up roofing installed on all the roof decks of the permanent school buildings / standing seam metal roofing installed on all modular buildings.

1. Built-Up Roof Systems surfaced emulsion, chopped glass roving and acrylic coating:
 - a. General Roof Condition: **8.0 – 8.5** on the roof condition scale = **very good condition, maintain.**
 - b. Roofing Related Anomalies:
 1. Very minor ponding water along roof perimeter (random locations) and at small deflections in the roof deck at random locations.
 2. The acrylic coating, while still providing the reflectivity required by the roof system, shows accelerated “weathering” due to ambient conditions and the October 2017 firestorm. (There are some minor anomalies in the surface coating caused by the ash and embers.)
 3. The wood block sleepers and cushioning protective pads that the electrical conduit and gas lines are mounted on are slipping / have slipped due to gravity.
2. Standing Seam Metal Roof Systems:
 - a. General Roof Condition (Library / Media Bldg. & Kindergarten Classrooms): **6.5 – 7** on the roof condition scale = **good condition, maintain.**
 - b. Roofing Related Anomalies:
 1. The gutter on the north side of the Library / Media Building integral with the metal roof system is badly deteriorated / rusted and should be replaced as soon as possible.

Roof Leaks: There were no “active” roof leaks reported at this campus.

Potential Issues / Anomalies (not specifically roofing):

1. There is a spot of minor “dry rot” on the wood fascia behind the gutter at the northeast corner of the M/U Building.

RECOMMENDATIONS:

1. Repair the dry rot on the wood fascia behind the gutter at the northeast corner of the M/U Building.
2. Plan for recoating the roof decks that have acrylic coating with an upgraded coating (urethane or silicone) to initiate a manufacturer’s 15 – 20 year “roof warranty.”

COST ESTIMATE:

1. Unknown for small dry rot repair to the wood fascia.
2. Roof Rehabilitation Project on Classroom Wings & walkway canopies: \$5.50 - \$6.50 per square foot (includes 15 – 20 year manufacturer’s roof warranty.)

**Roof Photos
Of
Austin Creek Elementary School**

Photo 1

Panoramic view of roofs at Austin Creek Elementary School. The existing roof systems on this campus are:

1. Stand Seam Metal Roofs**
2. Built-Up Roofs surfaced with gravel**
3. Built-Up Roofs surfaced with fiberglass cap sheets

****pictured**



Photo 2

Panoramic view of roofs at Austin Creek Elementary School. The existing roof systems on this campus are:

1. Stand Seam Metal Roofs**
2. Built-Up Roofs surfaced with gravel
3. Built-Up Roofs surfaced with fiberglass cap sheets**

****pictured**



Photo 3

Panoramic view of standing seam metal roof systems at Austin Creek Elementary School. There were no reported roof leaks in the standing seam metal roof systems but there are, however, very bad gutter leaks caused by deteriorated / rusted gutters that are integral with the metal roof systems. (Photos 12, 13 & 14 show the deteriorated / rusted gutters.)



**Roof Photos
Of
Austin Creek Elementary School**

Photo 4

Panoramic view of standing seam metal roofing and contiguous roof decks with built-up roofing surfaced with gravel.



Photo 5

Panoramic view of standing seam metal roofing and contiguous roof decks with built-up roofing surfaced with gravel.



Photo 6

Panoramic view of a roof deck with gravel surfaced built-up roofing. While there are minor roof anomalies on the gravel surfaced roofs throughout the campus there were no reported roof leaks.



**Roof Photos
Of
Austin Creek Elementary School**

Photo 7

Panoramic view of roof decks with built-up roofing that are surfaced with gravel. While there are minor roof anomalies on the gravel surfaced roofs throughout the campus there were no reported roof leaks.



Photo 8

Panoramic view of a roof deck with gravel surfaced built-up roofing. While there are minor roof anomalies on the gravel surfaced roofs throughout the campus there were no reported roof leaks.



Photo 9

Panoramic view of a roof deck with gravel surfaced built-up roofing. While there are minor roof anomalies on the gravel surfaced roofs throughout the campus there were no reported roof leaks.



**Roof Photos
Of
Austin Creek Elementary School**

Photo 10

The indicator arrow is pointing at an opening to the weather where the base flashing membranes have pulled away from the curb and are no longer counter-flashed by the frame of the roof access hatch. This minor flashing anomaly should be repaired as soon as it is feasible to do so.



Photo 11

The indicator arrow is pointing at an opening in the seam of the base flashing on the short parapet wall separating two(2) roof decks. This minor flashing anomaly should be repaired as soon as it is feasible to do so. (Note: This membrane flashing anomaly is present on other roof decks in random locations on this campus.)



Photo 12

The indicator arrow is pointing a seam between two(2) lengths of gutter. The deteriorated solder joint is now rusted.



**Roof Photos
Of
Austin Creek Elementary School**

Photo 13

The indicator arrow is pointing at a length of gutter that is so badly rusted / deteriorated that you can see daylight through the bottom of the gutter. Needless to say the gutter is no longer functional and should be replaced as soon as it is feasible to do so.

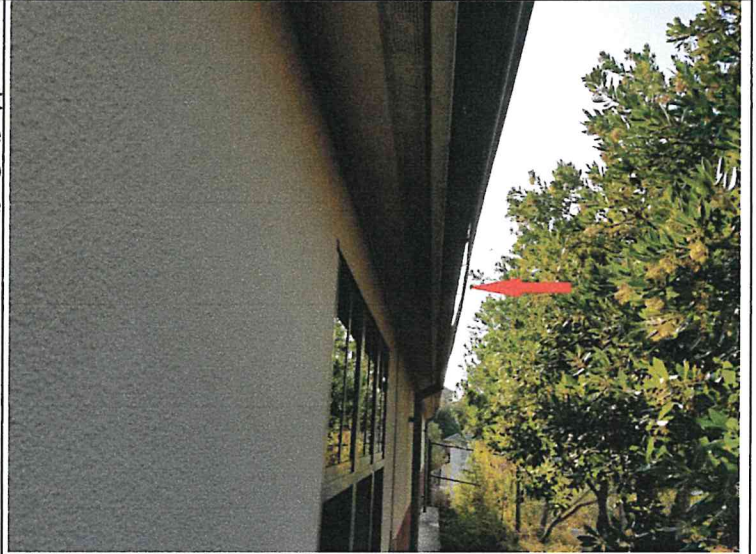


Photo 14

The indicator arrows are pointing at areas of a gutter length that is rusted so badly drainage water from the roof deck passes through the sheet metal gutter and stains the wood fascia.



**Roof Photos
Of
Binkley Elementary School**

Photo 1

Panoramic view of the primary type of roof system installed on this campus: composition asphalt shingles. Built-Up Roofing on this campus is limited to the low sloped roof decks in the mechanical equipment wells, on one(1) or two(2) short walkway canopies and one roof deck on the newly constructed buildings on the northwest corner of the campus. Standing seam metal roof systems are installed on the modular classrooms as well as on the Kindergarten classrooms (also modular.)



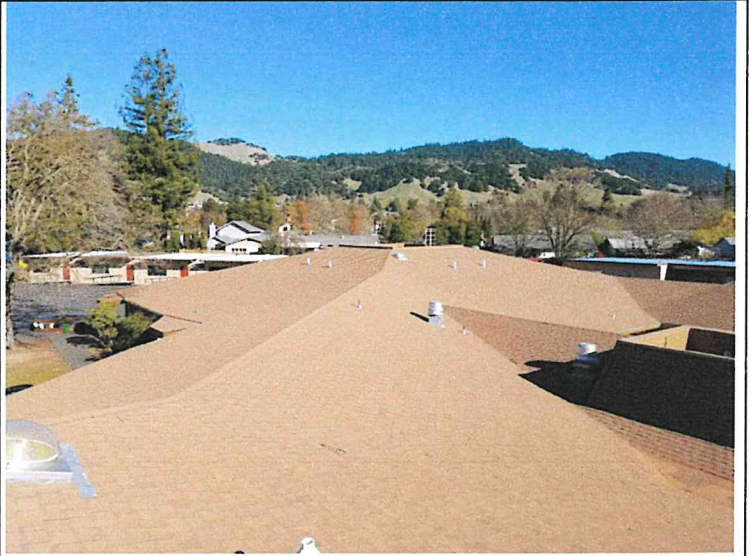
Photo 2

Panoramic view of the composition asphalt shingle roof system on the "new construction" on the campus. Note that the weather protective cover on the walkway canopy is made of standing seam metal panels. Also note the small area of built-up roofing on the corner of the low sloped roof deck in the new construction complex at the upper right center of the photo.



Photo 3

Panoramic view of a composition asphalt shingle roof system. Note that all of the shingled roof decks on this campus appear to be in very good condition.



Roof Photos Of Binkley Elementary School

Photo 4

Panoramic view of the built-up roof system on the low sloped roof deck in the new construction complex; the built-up roof is surfaced with a fiberglass cap sheet.



Photo 5

Photo 5 shows the mechanical equipment well on the new construction complex and built-up roofing. (Note: A leak into the interior space directly below this equipment well was reported and there was a stained ceiling tile but the leak may not be roof related; a follow-up investigation is required.)



Photo 6

Photo 6 shows a mechanical equipment well with a low sloped roof deck and built-up roofing.



Roof Photos Of Binkley Elementary School

Photo 7

The circle and indicator arrow point-out a roof drain with a bolt missing on the drain ring which minimizes the pressure seal on the flashing membranes that extend into and beneath the drain ring; the strainer is also missing from the drain assembly. This condition should be repaired as soon as possible.

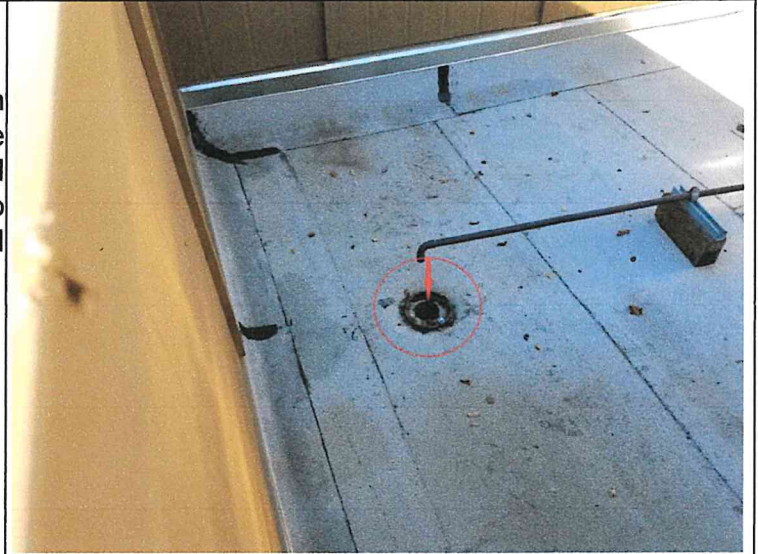


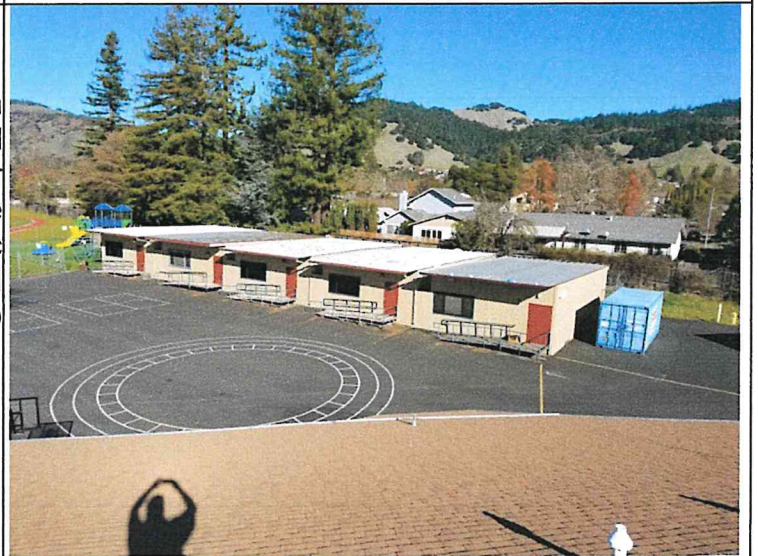
Photo 8

Panoramic view of the standing seam metal roof system on the Kindergarten classrooms.



Photo 9

Panoramic view of the five(5) modular classrooms on campus. These classrooms have standing seam metal roof systems but 3 of the 5 roofs have been repaired or reroofed. My recollection is that one(1) of the classrooms was reroofed with a thermoplastic membrane and two(2) were reroofed with sprayed polyurethane foam and acrylic coating. There were no reported roof leaks in the modular classrooms.



Roof Photos Of Madrone Elementary School

Photo 1

Panoramic view of the composition asphalt shingle roof system on the Multi-Use Building at Madrone Elementary School. The asphalt shingle roof systems on this campus are in good condition.



Photo 2

Panoramic view of the mineral surfaced built-up roof system on the walkway canopies as well as the composition asphalt shingle roof system(s) on the M/U building and shingled mansard of the School Office building. Note the indicator arrows pointing at the stained / watermarked roof surface on the walkway canopy roof deck indicating the presence of ponding water during inclement weather; this is a typical condition on low sloped roof decks.



Photo 3

Panoramic view of the mineral surfaced built-up roof system on the School Office building. Note the indicator arrows pointing at the various stained / watermarked areas on the surface of this roof deck indicating the presence of ponding water during inclement weather; this is a typical condition on low sloped roof decks.



Roof Photos Of Madrone Elementary School

Photo 4

Panoramic view of the north side of the built-up roof system on the School Office building. Note the roof surface near the top of the photo with white acrylic coating on it. My assumption is that the coating was applied as a means to mitigate a roof leak / roof leaks in that area of the building. (Note: There was no report of active roof leaks on this campus.)



Photo 5

Photo 5 depicts the roof surface on the School Office building: built-up roofing on the low sloped top deck and composition asphalt shingles on the perimeter mansard roof deck. Note the staining / watermarks on the surface of the built-up roof surface; this low sloped roof deck ponds water during each rain storm in the inclement weather months. The shingle roof system installed on the mansard roof deck is in good condition.



Photo 6

Photo 6 depicts new HVAC equipment supported on newly installed sleepers with new roof penetrations for power supply and refrigerant lines. The newly installed membrane flashing plies are surfaced with a fiberglass cap sheet; the new patching & tie-in membranes were installed in a very professional manner. Although difficult to see there are wrinkles in the older built-up roof system and that may indicate there are two(2) roof systems in place.



**Roof Photos
Of
Madrone Elementary School**

Photo 7

Panoramic view of the standing seam metal roof system on the Library / Media Building. There were no reported roof leaks in the Library / Media Building.



Photo 8

The indicator arrow is pointing a gas line penetration through the roof surface that is not properly flashed with flashing membranes. Additionally, it's not clear whether this roof penetration has a roof jack or if the sleeve of the roof jack is simply very short and not properly capped. This condition should be repaired as soon as it is feasible to do so.

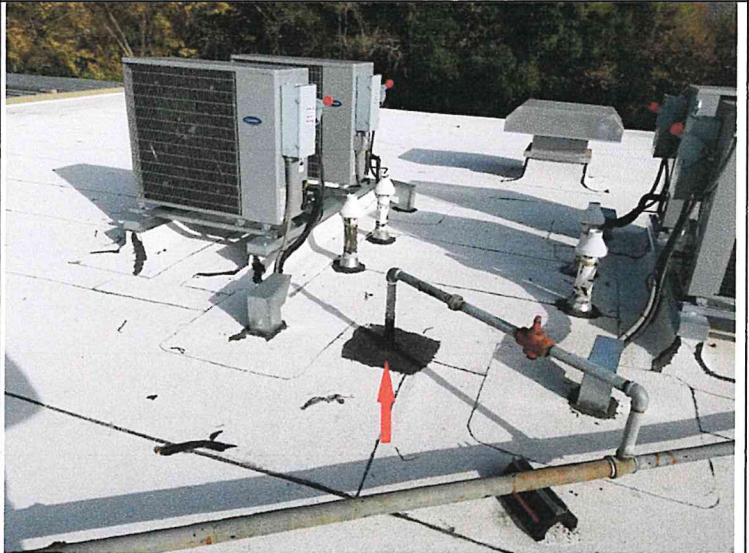


Photo 9

Although not a roofing or flashing issue, the indicator arrow is pointing at a broken electrical conduit; the subject conduit should be repaired as soon as it is feasible to do so.



**Roof Photos
Of
Madrone Elementary School**

Photo 10

Panoramic view of the roof surface on the new Day Care Building. Note that there is a minimal amount of standing water on the roof surface. Also note, and it's very difficult to see, that the new counter-flashing on the north parapet wall is dented, dinged and wrinkled in random locations. (This is new counter-flashing and the installation was not completed in a professional manner.)



Roof Photos Of Matanzas Elementary School

Photo 1

Matanzas Elementary School has three(3) types of roof systems on the campus:

1. Thermoplastic Single Ply Roofing (TPO Membrane)
2. Built-Up Roofing
3. Standing Seam Metal Roofing

The single ply roof membrane shown in Photo #1 (Thermoplastic Olefin) has the largest portion of the roofing on this campus. Note in Photo #1 the standing or ponding water on top of the thermoplastic Olefin which causes premature degradation of the membrane.



Photo 2

Inside the red circle in Photo #2 is a roof drain without a drain ring or strainer. Note the small bolts around the drain normally tighten the roof membrane under the drain ring holding it tight to the substrate and "squeezing" the membrane so no water can find its way under the membrane and into the interior space(s.) Also note the ponding water left & right of the drain which, again, is a typical condition at the roof perimeter of wood framed buildings. (Roof drains are usually located where they're supported by the building structure while the plywood sheeting making-up the roof deck spans the roof joists and can deflect / sag over time resulting in the roof deck being lower in spots than the roof drain.)



Photo 3

Photo #3 shows the roof deck of a walkway canopy with ponding water at the perimeter edge of the roof. Also note the dark gray color of the sediment at the bottom of the water which, I believe, is ash from the October 2017 firestorm. (Note: I did not see damage to any of the roof systems or roof membranes at this campus that made me suspect the damage was caused by last year's firestorm.)



Roof Photos Of Matanzas Elementary School

Photo 4

Panoramic view of the thermoplastic single ply roof system on the south side of Classroom Wing 2 (middle classroom wing.) Note the ponding water at the perimeter edge of the roof deck. Also note that the drain in the foreground has a drain ring but does not have a strainer.



Photo 5

Panoramic view of the thermoplastic single ply roof system on the north side of Classroom Wing 2 including the walkway canopy contiguous with the classroom wing. Note the substantial conduit run down the walkway canopy as well as the ponding water conditions.



Photo 6

Panoramic view of the west end of Classroom Wing 2 and the walkway canopy roof deck that transitions to the roof deck over the restrooms. The indicator arrows are pointing at the "sleeper supports" for the conduit runs which are pieces of 4" x 4" lumber that have little membrane protection or cushioning beneath them and pose a of damaging the thermoplastic membrane. This condition should be corrected as soon as possible.



**Roof Photos
Of
Matanzas Elementary School**

Photo 7

Panoramic view of the thermoplastic roof system down the center of Classroom Wing 2. The indicator arrows are pointing at severe ponding areas at the south and north perimeter edges of the roof deck.



Photo 8

Panoramic view of the mineral surfaced built-up roof on the M/U Building. Although aged this built-up roof system appears to be in good condition with only minor loss of some mineral granules.



Photo 9

Panoramic view of the standing seam metal roof on the Library / Media Building. The roof system appears to be in good condition and while no roof leaks were reported Photo #13 will show the badly deteriorated / rusted gutter on the east side of the building (the gutter we see in this photo to the right.)



Roof Photos Of Matanzas Elementary School

Photo 10

Panoramic view of the Charter School to the immediate south of Matanzas Elementary School's campus. The buildings are modular and the roof system is standing seam metal.



Photo 11

Panoramic view of the walkway canopy roof deck that runs north & south connecting all of the classroom wings, school office and M/U Building. Note the significant conduit runs down the middle of the walkway canopy as well as the gravel surfaced built-up roof system on the immediate right of the walkway canopy. (The gravel surfaced built-up roof was installed in the summer of 2016 so it's very new.)



Photo 12

Photo #12 shows another view of the north / south walkway canopy from a different vantage point. The electrical conduit (and gas line) presents a **very** severe roof maintenance / roof replacement issue. The school office is immediately to the right, one(1) step up from the walkway canopy.



**Roof Photos
Of
Matanzas Elementary School**

Photo 13

The indicator arrows are pointing at the very badly rusted and deteriorated gutter on the east side of the Library/Media Building. The gutter should be removed and replaced as soon as it is feasible to do so.



Photo 14

Panoramic view of the gravel surfaced built-up roof on the School Office Complex. The subject roof system appears to be in very good condition.



Photo 15

Panoramic view of the built-up roof system surfaced with emulsion & chopped glass and coated with urethane roof coatings. The subject roof system was installed in the summer of 2017. Note that there is still some ponding water at the roof perimeter edge on the north side of the roof deck although an attempt was made to mitigate the ponding condition by installing additional emulsion & chopped fiberglass in select areas prior to applying the elastomeric urethane coating(s.)



Roof Photos Of Spring Creek Elementary School

Photo 1

Panoramic view of the mineral surfaced built-up roof system on the School Office Complex. Note the indicator arrows pointing at ponding water along the roof perimeter on the south side of the building. Ponding water at the roof perimeters and over the walkway canopies is a typical condition at this campus during the inclement weather season.



Photo 2

Panoramic view of the built-up roofing on the kitchen roof deck looking back toward the School Office roof. Note the white roof on the M/U Building which was newly installed in July / August of 2017. The white coating held-up much better through & after the October 2017 firestorm because it's a different type of elastomeric coating (urethane) than the coating on Sequoia Elementary (acrylic.)



Photo 3

Inside the red circle you'll see a gas line penetration through the roof system that does not have the proper height for a roof jack to be properly installed & flashed to permanently seal the penetration. At this time water is prevented from entering the interior space by the asphalt roof mastic around the penetration. This condition should be repaired as soon as it is feasible to do so.



**Roof Photos
Of
Spring Creek Elementary School**

Photo 4

Panoramic view of the built-up roof system on the walkway canopy that connects the three(3) classroom wings with the School Office and M/U Building. Note the excessive conduit run down the center of the canopy roof deck. Also note the standing water beneath the conduit run in the foreground and the indicator arrows pointing at the ponding water along the roof perimeter. The foliage debris is also quite heavy next the Classroom Wing 1.



Photo 5

Photo 5 shows the same conduit run looking from the northeast corner of Classroom Wing 1 back toward the School Office. Note the ponding water beneath the conduit run.

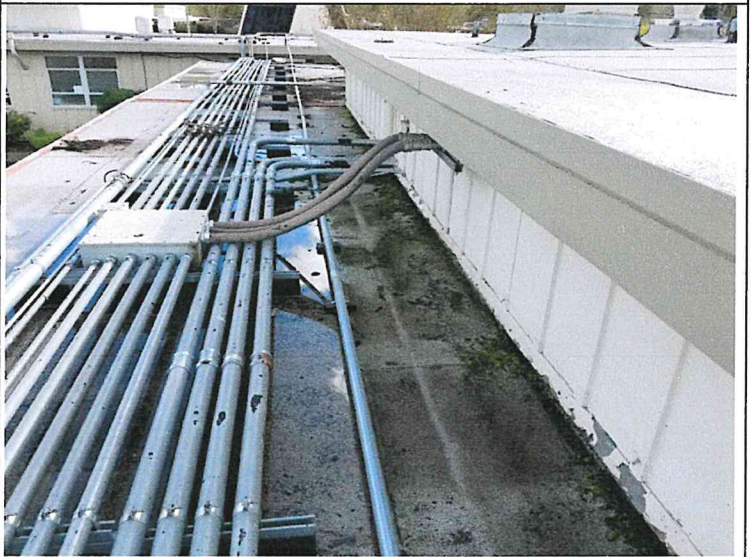


Photo 6

Panoramic view of the built-up roof system on Classroom Wing 1 and the contiguous walkway canopy looking east. Note the indicator arrows over the classroom building pointing at the severe accumulation of ponding water at the perimeter edge of the roof deck and the indicator arrow pointing at the ponding water on the lower level walkway canopy roof.



**Roof Photos
Of
Spring Creek Elementary School**

Photo 7

Photo 7 is again Classroom Wing 1 and the walkway canopy only I moved approximately 50 feet to the west in order to show the virtually the entire length of the walkway canopy has standing water on it during the inclement weather months.



Photo 8

Panoramic view of the built-up roof system on Classroom Wing 2 and the contiguous walkway canopy looking west. Note the ponding water on the walkway canopy roof deck.



Photo 9

Panoramic view of the built-up roof system on Classroom Wing 3 and the contiguous walkway canopy looking west. Again, note the ponding water on the classroom roof deck and walkway canopy roof deck.



**Roof Photos
Of
Spring Creek Elementary School**

Photo 10

Panoramic view of the built-up roof system on Classroom Wing 2 looking west. While this photo doesn't show much ponding water on the north perimeter photos 11 and 12 show ponding water on the south side of the classroom wing.



Photo 11

Photo 11 shows the southeast corner of Classroom Wing 2. Note the severe ponding water condition on the south perimeter of the roof deck.



Photo 12

Photo 12 also shows the south perimeter edge of the roof deck on Classroom Wing 2 but is taken approximately 60 feet further to the west in order to show that the ponding water condition is severe virtually the whole length of the classroom building. The indicator arrows point at severe ponding water conditions.



**Roof Photos
Of
SEQUOIA ELEMENTARY SCHOOL**

Photo 1

Panoramic view of the roof on Classroom Wing 1. Note the stained or watermarked areas on the roof surface along the perimeter edge of the roof deck that indicates ponding water is present during inclement weather; this is a common / typical condition on low sloped roof decks. Also note the bowl drain at the perimeter edge that doesn't have the watermarked area indicating the roof deck has deflected over time and the drain is now slightly higher than the deflected roof deck. Again, this is a common / typical condition.



Photo 2

This is a close-up photo of a watermarked area on Classroom Wing 1. Note that the dirt sediment at this location is quite heavy and, while fairly common, it does indicate that the ponding water during inclement weather is a problem that needs to be addressed to maintain the service life of the existing roof membranes. (Dirt and dust in the ambient air accumulates in the standing water and settles on the roof surface causing the stain and, over numerous evaporation cycles, the dirt sediment builds-up to the level you see in the photo.)



Photo 3

The stained or watermarked areas occur on both sides of the roof deck on Classroom Wing 1. Please note that premature failure of roof membranes & roof systems caused by ponding water conditions can quite often be mitigated and the service life of the existing roof systems can be greatly extended by employing roof rehabilitation procedures. (Please refer to the Roof Assessment Report for an explanation of roof rehabilitation procedures.)



**Roof Photos
Of
SEQUOIA ELEMENTARY SCHOOL**

Photo 4

This is a photo of a potential “leak source” at the base of a sheet metal flue over a furnace closet on Classroom Wing 1. The base unit of the flue flashing is open to the weather and needs a storm collar to divert rain water and keep it from running down the flue and into the furnace closet.



Photo 5

Panoramic view of the roof on Classroom Wing 2 (looking east.) Note the loss of mineral granules from the surface of the fiberglass cap sheet roof system. Loss of granules exposes the fiberglass and asphalt bitumen to the harmful UV rays of the sun and prematurely deteriorates the cap sheet membrane.



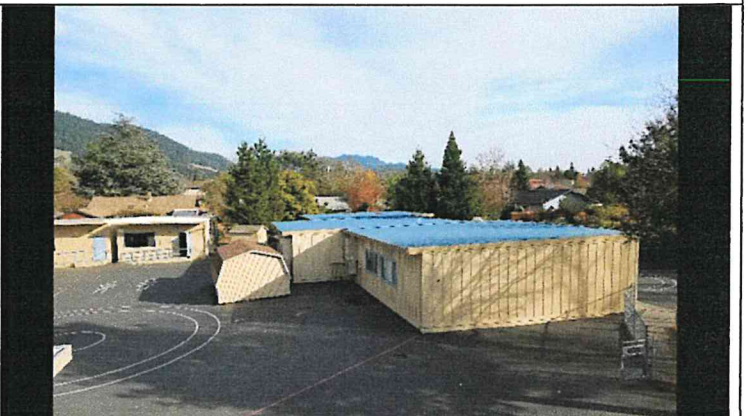
Photo 6

Panoramic view of the roof on Classroom Wing 2 (looking west.) Note the arrow in the foreground indicating a stained / watermarked area at the roof perimeter. The indicator arrows mid-photo are pointing at some “ridging” of the roof membrane that stretch for 20 – 30 feet. Note: Ridging of aged built-up roof systems surfaced with fiberglass cap sheets is fairly typical and presents a problem only if the ridged membrane is ruptured or cracks.



Photo 7

Panoramic view of the Kindergarten modular classrooms with standing seam metal roof systems.



**Roof Photos
Of
SEQUOIA ELEMENTARY SCHOOL**

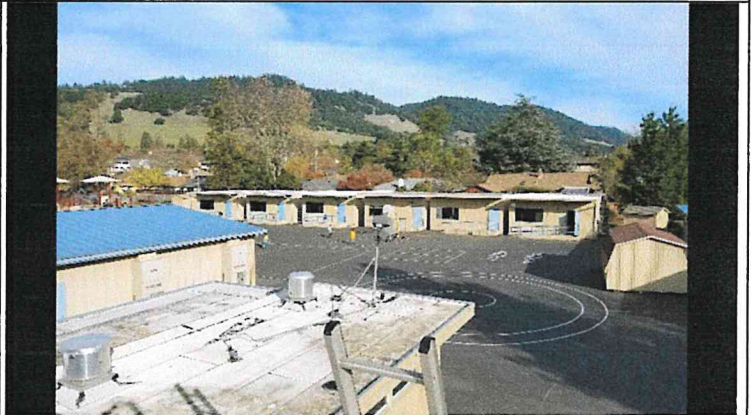
Photo 8

Panoramic view of the standing seam metal roof system on the Library / Media Building. Note: While no roof leaks were reported in this building the gutter on the north side of the roof is very badly deteriorated.



Photo 9

Panoramic view of the modular classrooms at the east side of the school campus; in the foreground is the roof over the bathrooms on Classroom Wing 1. The modular classrooms have standing seam metal roof systems and two(2) of the roofs have been sprayed with polyurethane foam & elastomeric coating while others have evidence of roof repairs being installed.



**Roof Photos
Of
Village Elementary School**

Photo 1

Panoramic view of the mineral surfaced built-up roof system on the walkway canopy in front of the M/U Building. Note the electrical conduit, refrigerant lines and gas lines running along the roof deck. Also note in the distance the mechanical equipment "jungle."



Photo 2

Panoramic view of the built-up roof system on the M/U Building. The built-up roof membranes, to include the fiberglass cap sheet, are in good condition with few (if any) roof anomalies.



Photo 3

The indicator arrows are pointing at the gutters on the perimeter of the walkway canopy roof deck to point-out that they are full of debris. The gutters at this campus, as well as all of RVUSD's campuses, should be cleaned of debris a minimum of one(1) time per year and ideally two(2) times per year. Preventive maintenance and cleaning of the gutters will prevent the premature deterioration and rusting of the gutters.



Roof Photos Of Village Elementary School

Photo 4

Panoramic view of the roof deck contiguous with M/U Building on the south side. Note that the fiberglass cap sheet is losing its mineral granules which exposes the fiberglass mat and asphalt bitumen to the UV rays of the sun causing accelerated degradation of the cap sheet and roof system.



Photo 5

Photo 5 is a panoramic view of the mechanical equipment “jungle” on the roof deck over the front of the school. (west side of campus) The maze of electrical conduit, gas lines and refrigerant lines as well as the cluster of mechanical units is not a welcome sight over the deteriorating fiberglass cap sheet surface of the built-up roof system. Also note on the right side of the photo that electrical penetrations are made through the wall of the buildings without being properly flashed or sealed against the weather. Compounding the problem is that the penetrations are through a wall facing to the west.



Photo 6

Photo taken at roof level showing the severity of the roof conditions in this area as the quantity of conduit and lack of height of the HVAC ductwork is as bad as I've seen in 35+ years of roof consulting / roof management. When the time comes that the existing roof system begins to fail RVUSD should be prepared for an awful “sticker shock” with respect to the cost to remove and replace the existing roof system.



Roof Photos Of Village Elementary School

Photo 7

Another photo taken at roof level of the mechanical equipment jungle. Please note the loss of mineral granules from the surface of the fiberglass cap sheet.



Photo 8

Photo 8 shows a cluster of roof penetrations in close proximity to each other and the “pitch pan” solution to seal the multiple penetrations. Note that the pitch pan “filler” is stiff, brittle and nearly void of volatile oils. Also note that roof mastic has been spread outside of the pitch pan collar in an apparent attempt to mitigate or stop a roof leak.



Photo 9

Panoramic view of the built-up roof system on the southernmost classroom wing. The roof system appears to be in good condition. Note that the trees along the north side of the building drop their leaves onto the roof surface and into the perimeter gutters.



Roof Photos Of Village Elementary School

Photo 10

Photo 10 shows the same roof deck as photo 9 only at the east end of the classroom wing. Again the existing roof system in good condition. (Apparently a portion of the power supply to the new construction project beyond the end of the building requires electrical conduit to run on top of the roof system on the classroom wing as you can see a new conduit run being installed.)



Photo 11

The red circle in photo 11 shows an insulated pipe penetration through a deteriorated section of built-up roofing. Note that there is "zero vertical height" to the penetration and that the only thing keeping water out of the interior space below is roof mastic that looks brittle and lacks sufficient volatile oils.



Photo 12

Through the red circle in photo 12 is an electrical line penetration through the vertical siding without a proper flashing to seal the penetration. Note: There are 3 – 4 identical locations on campus.



**Roof Photos
Of
Village Elementary School**

Photo 13

Photo 13 shows the walkway canopy contiguous with northernmost classroom wing. The indicator arrows are pointing the gutters that are full debris and foliage. Note the leaves on the roof surface probably waiting to be washed into the gutter!



Photo 14

Panoramic view of the built-up roof system on the east end of the northernmost classroom wing. Note the staining of the mineral surfaced cap sheet which is a result of the leaves of the nearby trees falling on the roof surface and, I think to some degree, maybe from the heavy smoke and ash from the October 2017 firestorm. Having walked the subject roof deck I do think the existing roof system is in good condition.



Photo 15

Panoramic view of the built-up roof system on the northernmost classroom wing. (looking west) Again, note the new electrical conduit that I suspect is being installed over the roof surface to supply some of the electrical power to the new building being built to the east of this classroom wing.



**Roof Photos
Of
Village Elementary School**

Photo 16

Panoramic view of the standing seam metal roof on the Library / Media building. (No roof leaks were reported in the Library / Media building.) The same metal roof system is installed on the Kindergarten modular classrooms. (Active roof leaks were reported in the Kindergarten classrooms although no specific classroom was referred too.)



Photo 17

In the middle of the red circle is an electrical roof jack that is set in asphalt mastic but hasn't had flashing membranes installed over the flange of the roof jack. This condition should be corrected as soon as possible.



**Roof Photos
Of
Whited Elementary School**

Photo 1

Panoramic view of the School Office roof and portion of the Science Lab roof. Note that the reflective surface of the roof, which is white acrylic roof coating, appears fairly dirty (light gray / dingy white.) While the built-up roof system is fully protected from the harmful UV rays of the sun the roof coating is much duller than a typical white acrylic roof of the same age due to the intense smoke from the October 2017 fire storm. (Photo #9 shows a small spot about the size of a 50-cent piece where an ember from the October 2017 fire storm landed on the roof.)



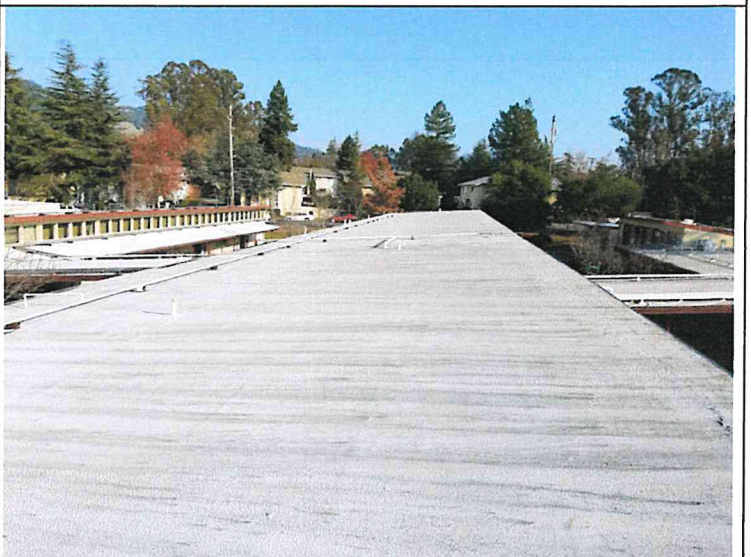
Photo 2

Panoramic view of Classroom Wing 1. Regardless of the dirty or dingy white roof surfaces, the waterproofing capability of the built-up roof system on this school is in excellent condition at 5+ years since its installation.



Photo 3

Panoramic view of the built-up roof surface on Classroom Wing 1 (looking east.) Note the blackish or dark gray staining of the acrylic roof surface which is due to the intense smoke from the October 2017 fire storm.



**Roof Photos
Of
Whited Elementary School**

Photo 4

The indicator arrow is pointing at an opening around a roof penetration where the sleeve of the roof jack flashing is not firmly or snugly clamped around the pipe penetration. Falling rain hitting the pipe penetration above the sleeve of the roof jack flashing can go down the side of the pipe and into the interior space. While this condition will only allow a small leak the condition should be corrected as soon as possible.

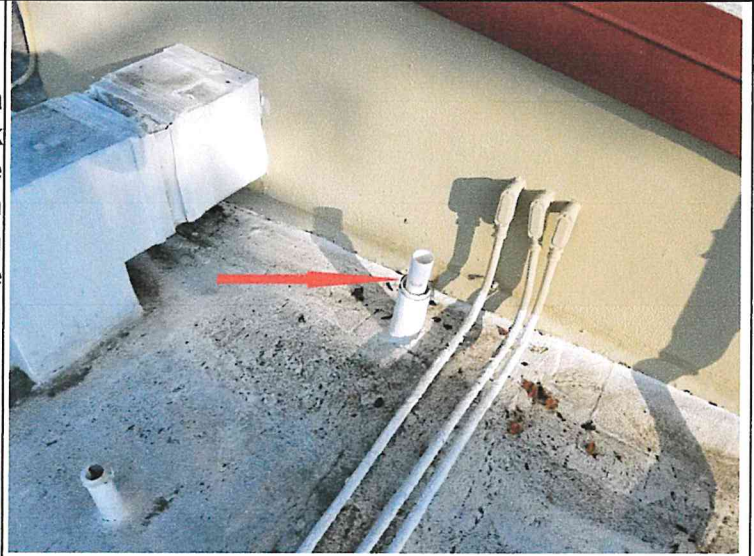


Photo 5

The indicator arrows are pointing at an accumulation of dirt, dust and ash held on the roof surface by the lip of the gravel stop at the roof perimeter. While no real harm is being done to the roofing & flashing at this location the condition unsightly.

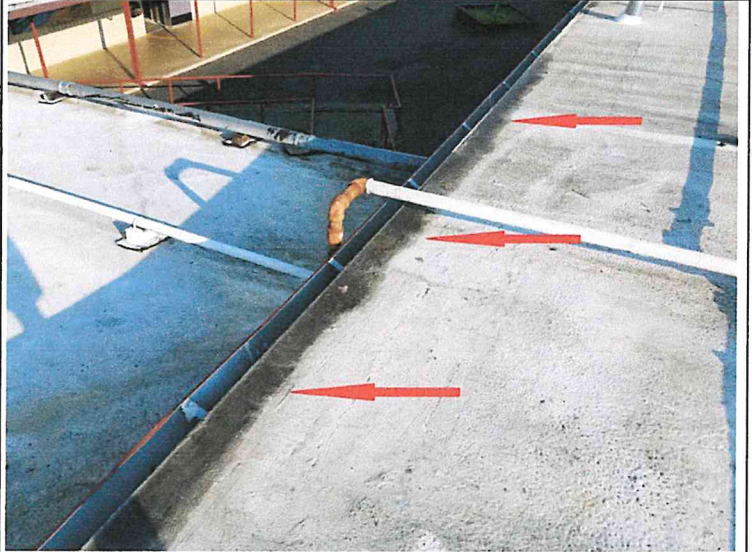


Photo 6

The indicator arrow is pointing at a broken union or joint in the electrical conduit that penetrates the roof surface. While this condition is only a minor leak source the conduit should be repaired as soon as possible.



**Roof Photos
Of
Whited Elementary School**

Photo 7

Panoramic view of the standing seam metal roof on the Library / Media Building and the built-up roofing with cap sheet surfacing on the walkway canopy that provides sheltered access to the building. No roof leaks were reported in the Library / Media Building but the gutter integral with the metal roofing on the north side of the building is badly rested / deteriorated. (See Photo #11)



Photo 8

Panoramic view of the built-up roof surface on Classroom Wing 2. Note how the electrical conduit run has "bellied-out" as gravity has had its effect on the weight of the conduit causing it to slip / slide down the roof slope over the past 5 years.



Photo 9

The indicator arrow is pointing toward a smallish anomaly in the acrylic roof coating caused by an ember from the October 2017 fire storm. While there were a number of similar but much smaller anomalies in the roof coating this location was the largest I observed during my roof inspection. I did reflect on the issue of fire code requirements and felt a sense of relief knowing that the Class A fire rating of the specified roof system answered the call when it was truly needed!



**Roof Photos
Of
Whited Elementary School**

Photo 10

The indicator arrows are pointing at the deteriorated roof coating at the roof perimeter on the south side of Classroom Wing 1 near the west end of the building. In addition to the dirt, dust and ash that's accumulated at the lip of the perimeter edge metal (gravel stop), a small amount of acrylic coating has curled-up and become flakey. There is no danger of damage to the roofing or flashing membranes because of this anomaly but it should be repaired as soon as it is feasible to do so. (The lip of the gravel stop flashing stops a small amount of water from getting to the gutter and it sits on the acrylic coating, which is water-based, and the water deteriorates the coating.)



Photo 11

The indicator arrow is pointing at the seamless gutter that has rusted through the sheet metal and you can see daylight through the underside of the gutter. This gutter run should be replaced as soon as possible.

