ROOF ASSESSMENT REPORT

WHITMAN HANSON REGIONAL HIGH SCHOOL

NOVEMBER 08, 2010

PREPARED FOR:

FACILITIES DEPARTMENT

WHITMAN HANSON REGIONAL SCHOOL DISTRICT

1. Purpose

This Roofing Assessment Report provides a summary of the inspections performed at the Whitman Hanson Regional High School located in the Town of Whitman, MA.
Roofing inspections were conducted with the intent of assessing general roofing systems, their condition, and identifying any significant related concerns that may warrant immediate corrective action. This report includes a summary of these inspections, including specific concerns, recommendations for repairs or maintenance, and associated budgetary costs. A description of the inspections is given below.

Roof Inspection

Roof inspections at the Regional High School were performed by Evan Warner on September 28th, and October 1st, 2010. Inspections involved an assessment of the current roof conditions, specific observations, photographs, short term recommendations, and long term recommendations for the current problematic conditions.

2. Description

The High School Building consists of a combination of sloped and flat roof areas. The surface area is predominantly multi-level, flat 60 mil single ply PVC membrane, fully adhered and sloped to internal roof drains with minor areas of sloped asphalt shingle roofing to pre-formed metal gutters and down-spouts. Roof hatches, skylights, mechanical equipment and photovoltaic panels are located throughout the flat roof areas. The roofs are approximately five years old and mostly in good condition.

3. Observations

The High School Building has a number of items that require attention and/or ongoing monitoring. The majority of recommendations in this report involve repairs to improve long term serviceability.

Observation No. 1
Tear in PVC curb at Roof Top intake 100, lower PVC flat roof, coordinate E3.

Short Term Recommendations
Apply compatible roofing cement/sealant.

Long Term Recommendations
Install appropriate PVC patch.

Observation No. 2
Debris and organic growth at RTU-9 and RTU-10, lower PVC flat roof, coordinates H3-H6.

Short Term Recommendations
Remove debris and organic growth, clean impacted roof areas.

Long Term Recommendations
Inspect problematic areas yearly; implement short term recommendations as necessary. Coordinate installation of crickets/tapered insulation (to drain water away from mechanical units) at time of future roof replacement.

Observation No. 3
Suspect gravel stop/fascia and PVC roof edge terminations, intermediate PVC roof at coordinate A2. Past leaks at Kitchen below were reported, and evidence of repairs and attempts to address the problem. Leaks likely due to poor termination of PVC roof edges, lifting gravel stop spring clips and open corner seams at aluminum fascia.

Short Term Recommendations
Watch for future leaks at ceiling below (currently not reported as leaking).

Long Term Recommendations
Remove fascia/gravel stop assemblies; investigate PVC roof terminations in this area and institute

corrective action if/when leaks reappear or at time of future roof replacement. Review PVC termination and gravel stop/spring clip detail for compliance with manufacturer's recommendations.

Observation No. 4

Debris and organic growth at mechanical unit, intermediate PVC flat roof, coordinate A9.

Short Term Recommendations

Remove debris and organic growth, clean impacted roof area.

Long Term Recommendations

Inspect yearly for evidence of leaks; Coordinate installation pre-formed copper corner flashing at time of future roof replacement.

Observation No. 5

Open corner at copper roof-to-wall counter flashing, intermediate PVC flat roof, coordinate A10.

Short Term Recommendations

Install backer rod and compatible sealant, inspect yearly.

Long Term Recommendations

Install pre-formed copper corner cover.

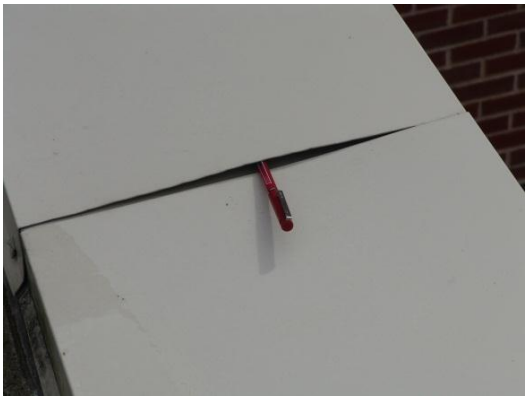
Observation No. 6

Tear and delamination at PVC lap seam, intermediate upper PVC flat roof, coordinate F7.

Short Term Recommendations
Clean and apply compatible roofing cement/sealant.

Long Term Recommendations
Apply PVC patch.

Observation No. 7
Open butt joint at parapet cap flashing, intermediate upper PVC flat roof, coordinate H9.



Short Term Recommendations
Install 4" wide aluminum cap flashing expansion strip. Set in water-cut-off mastic/fasten to one side.

Long Term Recommendations-NA

Observation No. 8
Cracked/deteriorated sealant @ parapet, upper PVC flat roof, coordinate H10.

Short Term Recommendations
Remove old sealant, clean and apply compatible roofing cement/sealant.

Long Term Recommendations
Inspect areas with similar detail/condition for evidence of sealant failure and implement short term recommendation.

Observation No. 9
Water pocket at roof-to-wall expansion joint assembly, intermediate upper PVC flat roof, coordinates I7-I9.

Short Term Recommendations
Inspect yearly for evidence of leaks below or material failure.

Long Term Recommendations
Coordinate installation of alternate expansion joint profile (that allows water to drain away from wall flashing) at the time of future roof replacement.

Observation No. 10
Missing roof ladder bolt and cracked brick veneer, high, intermediate PVC flat roof, coordinate C6.

Short Term Recommendations
Seal brick crack, install epoxy anchor bolt.

Long Term Recommendations
Inspect ladder fasteners yearly.

Observation No. 11
High insulation at gravel stop/PVC roof termination, high intermediate PVC flat roof area allowing water to sit/pocket at edge, coordinate A10.

Short Term Recommendations
Inspect yearly for evidence of leaks below.

Long Term Recommendations
Coordinate modification of tapered insulation/protection board to drain water to internal roof drains at the time of future roof replacement.

Observation No. 12
Gap at fascia to brick veneer transition above high intermediate PVC flat roof, coordinate D10. Air/Vapor Barrier is exposed to varying degrees through-out.

Short Term Recommendations
Inspect yearly for evidence of leaks below and/or material deterioration.

Long Term Recommendations
Coordinate modification of fascia depth and/or profile to reduce gap at transition at the time of future roof replacement.

Observation No. 13
Crumbling CMU ballast @ PV support system, high intermediate PVC flat, coordinate A10. Approximately 35% significantly damaged possible property and/or personal damage from wind-blown CMU pieces.

Short Term Recommendations
Trap/cover immediately. Remove all cracked/damaged CMU, replace with alternate ballast material- minimal absorption- resistant to freeze/thaw cycles. Confirm weight and distribution design requirements for PV system and roof structure limitations.

Long Term Recommendations
Coordinate replacement of PV ballast system in its entirety- refer to short term recommendations. 270 sleds with (12) - 4x8x16 solid CMU blocks each.

Observation No. 14
Gap at alum. fascia/gravel stop, outside corners, high intermediate PVC flat roof, coordinate M9. Extent of void/gap at corners vary through-out entire roof. Largely a cosmetic issue depending on the integrity/workmanship of PVC corner and edge terminations below/adjacent to gap condition.

Short Term Recommendations
Inspect yearly for evidence of leaks below and/or material deterioration.

Long Term Recommendations
Coordinate modification of fascia/installation of alum. cover strip or preformed outside corner at the time of future roof replacement.

Observation No. 15
Gap at alum. Parapet to EIFS siding, high intermediate PVC flat roof, coordinates M1, M9.

Short Term Recommendations
Clean debris; install backer-rod and compatible sealant.

Long Term Recommendations
Inspect all sealant conditions as part of ongoing maintenance at regular intervals.

Observation No. 16

Gap at alum. Fascia/gravel stop to brick veneer siding, parapet, high intermediate PVC flat roof, coordinate J10.

Short Term Recommendations

Inspect yearly for evidence of leaks below and/or material deterioration.

Long Term Recommendations

Clean debris; install backer-rod and compatible sealant.

Observation No. 17

Improper terminations, missing copper counter-flashing corner termination, high intermediate PVC flat roof allowing water to sit/pocket at edge, coordinate J10.

Short Term Recommendations

Inspect yearly for evidence of leaks below.

Long Term Recommendations
Properly terminate PVC roof-to-wall condition. Set termination bar in water-cut-off mastic. Install proper copper counter-flashing termination wrapping corner.

Observation No. 18
Damaged shingle @ roof edge, low asphalt shingle roof, coordinate N4.

Short Term Recommendations
Replace damaged shingle.

Long Term Recommendations-NA

Observation No. 19
Lifted alum. Fascia @ courtyard, high PVC flat roof, coordinate G12.

Short Term Recommendations
Fasten with spring clip-allow slip joint for horiz. movement.

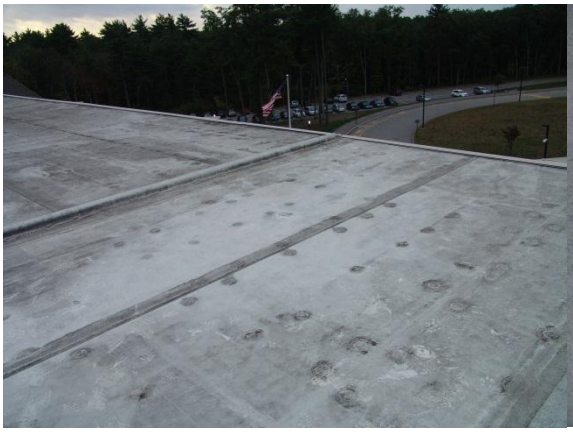
Long Term Recommendations-NA

Observation No. 20
Lifted gravel stop spring clip, high PVC flat roof, coordinate G12.

Short Term Recommendations
Inspect yearly for evidence of leaks below.

Long Term Recommendations
Coordinate proper installation of gravel stop, spring clip and PVC roof edge termination at the time of future roof replacement. Refer to manufacturer's standard/recommended installation details.

Observation No. 21
Spongy substrate, likely wet insulation/leaks reported @ Library below, high PVC flat roof, coordinates I14-J14. Possible water traveling to expansion joint, down to floor structure below, traveling to Library.




Short Term Recommendations
Inspect/confirm wet insulation after major rain event. Confirm water travel route at/along expansion joint. Patch/replace damaged materials and PVC roofing contingent on findings.

Long Term Recommendations-NA

Observation No. 22
Loose/delaminated PVC roofing and poor termination, high PVC flat roof, coordinates J14-J19. Billowing PVC under strong wind conditions, PVC roofing terminations @ vertical fascia not

sealed/allowing wind and possible driven rain infiltration.

Short Term Recommendations
Remove/replace or re-adhere PVC roofing. Remove alum. Fascia and gravel stop assembly and seal/properly terminate PVC roofing edges (approx. 125 linear feet).

Long Term Recommendations -NA

<u>Observation No. 23</u>
Evidence of water sitting against curbs of mechanical units, high PVC flat roof coordinates B11-B12.

Short Term Recommendations
Inspect yearly for evidence of leaks below.

Long Term Recommendations
Coordinate modification of tapered insulation/protection board to drain water to internal roof drains at the time of future roof replacement.

Observation No. 24
Voids at PVC roofing to EIFS wall siding at gravel stops/ roof termination, low intermediate PVC flat roof, coordinates K18 and K19.

Short Term Recommendations
Remove debris, patch EIFS, and install backer rod and sealant.

Long Term Recommendations
Inspect and replace sealants as part of periodic maintenance plan.