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May 23, 2013

Ms. Cheryl Henlin
Environmental Planner
City of New Bedford
133 William Drive
New Bedford, MA 02740

**Subject: Spring 2013 Cap Inspection
Keith Middle School
New Bedford, Massachusetts**

Dear Ms. Henlin:

At the request of the City of New Bedford (City), TRC performed the fourteenth inspection of the protective cap installed at the Keith Middle School Site located at 225 Hathaway Boulevard in New Bedford, Massachusetts. In August 2012, TRC submitted a Revised Long-Term Monitoring and Maintenance Implementation Plan (LTMMIP) which was subsequently approved. The inspection was performed in accordance with the revised LTMMIP which requires two inspections per year in April and November to confirm that the cap is being properly maintained to prevent exposure to the impacted fill beneath.

The inspection was performed on April 22, 2013. The elevator vaults were inspected during the annual elevator inspection event on December 19, 2012.

SUMMARY OF RESULTS

The following issues were noted in the previous inspection report and have been addressed:

- The crack in the sidewalk observed near the southern parking lot entrance has been repaired.
- Cracks observed in the concrete walkway near the downspout were repaired.

The following issues were noted during the April 2013 inspection, and require repair by the next scheduled inspection:

- A crack greater than 1/4-inch wide was observed in the Men's Gym Locker Room and should be repaired.
- Animal burrows were observed on the north, west, and southwest slopes.

- Potentially deep rooted vegetation was observed on the ridge of the western, southern and southwestern slopes and should be cut down.

Although not necessarily required by the LTMMIP, TRC recommends addressing the following items to prevent potential cap issues in the future, or to otherwise maintain the integrity of school property:

- Vegetation was observed penetrating pavement surfaces, particularly in the areas adjacent to curbs and catch basins. Although the cracking/gaps in these areas are minor, potential expansion could occur if this situation is left untreated.
- Areas of caulking between the building walls and exterior walkways are continuing to deteriorate. These areas will likely need to be repaired in the future.
- The cap slope is sloughing in an area adjacent to the wetland west of the school, and is undermining the concrete fence support. A crack was observed in the concrete fence support.
- The vegetation on the southern cap slope remains sparse, and may not protect surface soils from erosion.

DESCRIPTION OF INSPECTION

The April 2013 cap inspection consisted of a walking traverse of the entire Site with visual observations of the cap, including the first floor concrete slab of the building (where visible), the courtyard within the building footprint, and the concrete, asphalt and landscaped surfaces outside the building. Access to most locked rooms within the building was provided by the facility engineer, Gary Gomes and/or a school custodian. The inspection was documented in a log book, and areas where important features were discovered are depicted in Figure 1. Copies of the log book pages are presented as Attachment 1. The findings of the inspection are documented on a site-specific Cap Inspection Form (Attachment 2) provided in the LTMMIP. Photographs taken during the inspection are presented as Attachment 3.

Based on TRC's inspection, the concrete floor within the footprint of the building is currently acting to prevent exposure to the impacted fill beneath. One crack larger than ¼-inch was observed in the Men's Gym Locker Room and requires repair. Four minor cracks were previously noted in the boiler room floor and still do not present a significant issue at this time. Three very minor cracks were also observed in storage room 44, and also do not require repairs at this time. Two hairline cracks were also noted in the Main Electric Room and the Emergency Generator Room. Each of the nine cracks noted above appears in a general east-to-west orientation.

During the summer of 2012, all cracks and seams within the asphalt parking lots were repaired using an elastic asphalt sealant. All of the asphalt parking lot repairs appeared in very good condition during the April 2013 cap inspection. In several areas around the exterior of the school building, a bead of caulking has been installed in the joint between the foot of the brick building walls and the concrete walkways. The caulking prevents weather elements (i.e., rain, snow, and ice) from entering the joint space. As noted in previous reports, the caulking appeared deteriorated in several areas. The caulking used to repair cracks in the walkways also appears to be deteriorating. Although conditions were not indicative of a potential for soil exposures, TRC



recommends continuous observation and repair/replacement of the caulking, as necessary. Continued infiltration of weather elements into the joint could eventually separate and deteriorate the walkway.

The landscaped areas around the exterior of the building were acceptable with the exception of the following:

- Several small holes were observed along the very northern, western and southwestern edges of the cap, which appear to have been burrowed by small animals.
- Sloughing riprap is undermining the concrete fence support at the top of the slope, and filling the outlet of the storm water drainage culvert on the west side of the Site. Areas of soil erosion were observed along the upper slope, as well as a crack in the concrete fence support. The area appears relatively stable at this time, but the condition is likely due to an increase in steepness. The crack in the concrete fence support is not identified as a cap integrity issue, nor is the riprap accumulating in the culvert outlet, but these issues should be addressed to maintain the integrity of the fence and the function of the culvert.
- Vegetation is sparse along the southern edge of the cap. Significant erosion in the surface soil was not visible at this time, but adding topsoil and perennial vegetation may prevent future erosion in this area.
- Potentially deep rooted vegetation was observed on the slope south and west of the school and should be cut down.
- The orange warning layer is visible by the base of a section of riprap, at the transition from the school slope area to the wetland remediation area. The area appears very stable, is covered in large-diameter riprap, and does not show any signs of erosion.

CONCLUSIONS

At this time the orange warning layer is visible at one riprap location, where the transition to the wetland remediation area occurs, but appears stable and exhibits no signs of erosion. The black separation fabric that demarcates the underlying contaminated fill from the clean imported fill is not visible within the cap area, and exposures to the impacted fill beneath the cap are being prevented. However, the issues identified in this report should be addressed in order to prevent further cap damage or erosion that could eventually expose the separation fabric.

Please refer to the attached Cap Inspection Form and photographs for additional details concerning the conditions described above.

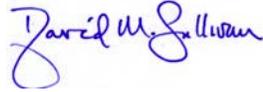


If you have any questions, please contact either of the undersigned at 978-970-5600.

Sincerely,

Handwritten signature of David M. Pettit in black ink.

David M. Pettit
Project Engineer

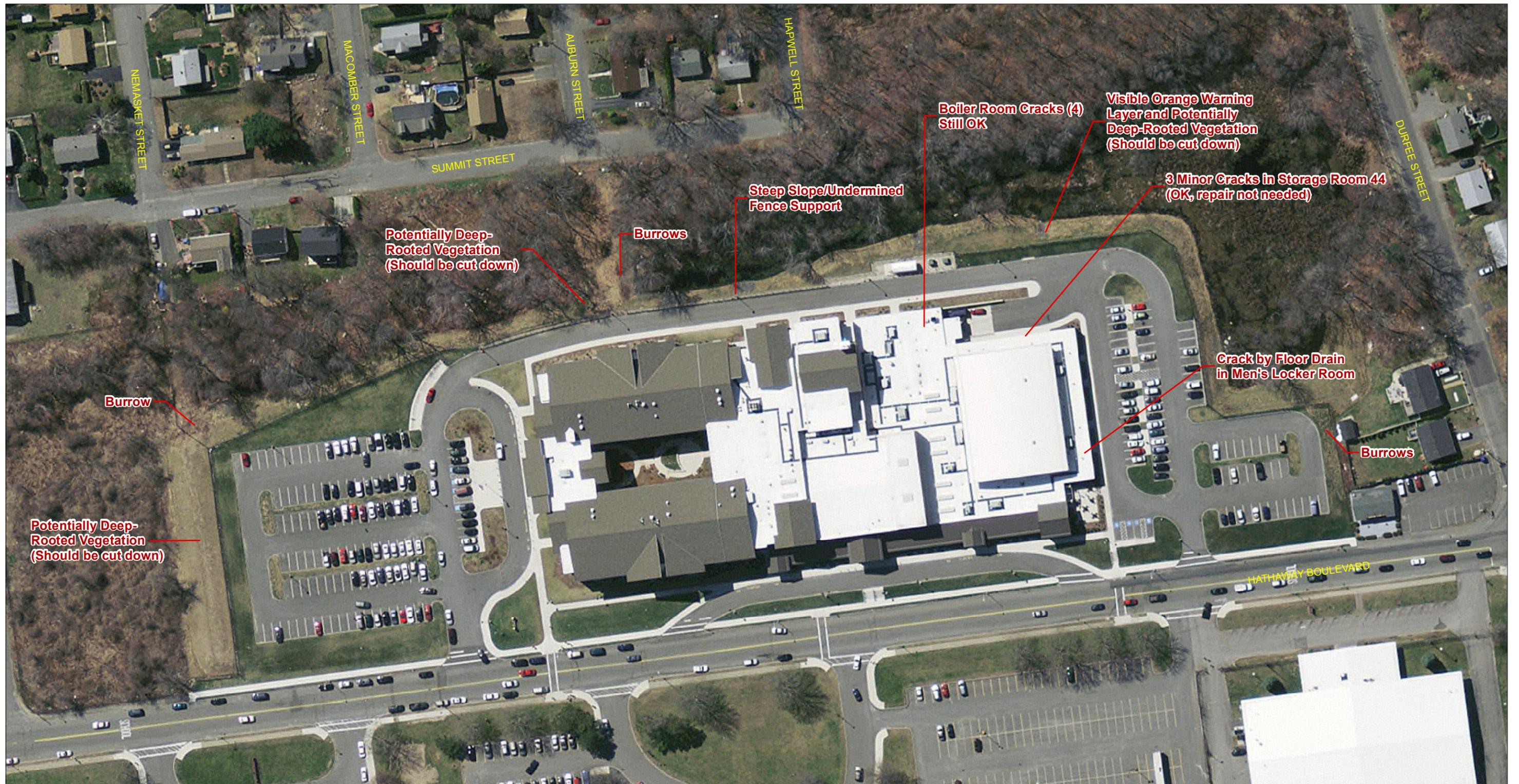
Handwritten signature of David M. Sullivan in blue ink.

David M. Sullivan, LSP
Senior Project Manager

Attachments

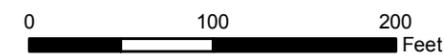
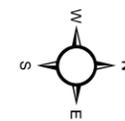
Figure 1

Site Map



Base map: 30 cm Imagery, MassGIS 2009

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MASSACHUSETTS



SITE LOCATION



Wannalancit Mills
650 Suffolk Street
Lowell, MA 01854
978-970-5600

SITE MAP
KEITH MIDDLE SCHOOL
NEW BEDFORD, MA

FIGURE 1

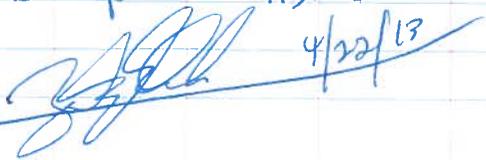
MAY 2013

Attachment 1

Log Book

4/22/13 KMS Cap Inspection

- 0600 Zack Richards (ZCR) on site.
ZCR meets w/ Cheryl Henlin (CH)
and retrieve key from janitor.
- 0610 Gary Gomes (GG) arrives and
briefly discusses cap inspection.
- 0615 ZCR and CH begin inspecting
interior floors of KMS.
- 0620 ZCR observes a crack wider than
 $\frac{1}{4}$ -inch in Men's Gym Locker Room.
- 0700 ZCR + CH show Gary Gomes crack
in locker room and he said he
will repair.
- 0710 Finished inspecting interior floors;
no other issues.
- 0715 ZCR + CH walking exterior; no
issues w/ asphalt or concrete
walkways.
- 0745 Mr. Oliveira on site, walks slope
of cap w/ ZCR + CH.
- 0800 Deep-rooted vegetation and animal
burrows observed - to be addressed.
- 0830 ZCR + CH complete cap inspection.
Packed up and offsite.

 4/22/13

Attachment 2
Cap Inspection Form

CAP INSPECTION FORM KEITH MIDDLE SCHOOL

Use this inspection form to document cap inspections. If unacceptable conditions are observed, complete an additional form immediately after repairs are completed.

Inspection Date: April 22, 2013

Inspection by: Zack Richards, TRC

A. ASPHALT AND CONCRETE PAVING – observe asphalt and concrete paving for cracking, holes, and asphalt removed during construction, other damage.

All asphalt crack repairs appear in very good condition and no additional cracks were observed. The concrete sidewalk and cracks observed next to the downspout were repaired after the November inspection. Other cracks appear OK at the present time, but will be monitored during future inspections.

All Asphalt and concrete paving acceptable? YES NO

If no, attach photograph

If no, describe unacceptable condition:

Location:

Condition:

Describe any repairs to asphalt and/or concrete paving conducted since previous inspection:

The sidewalk location where there was a missing chunk and cracked corner was repaired. Minor cracking observed next to a downspout along the concrete walkways has been repaired.

All repairs adequate YES NO Photograph of repair attached

B. INTERIOR CONCRETE FLOORS – observe concrete for cracking, holes, and concrete removed during construction, other damage.

A crack greater than 1/4-inch wide was observed in the Men's Gym Locker Room, see Photograph #1. The crack was discussed with Gary Gomes who informed TRC that it would be repaired. Four cracks in the boiler room floor are less than 1/4-inch wide and have not increased in size, see Photographs #2 and #3. Three minor cracks in storage room 44 are also less than 1/4-inch wide and have not increased in size, see Photograph #4. The majority of interior concrete floors are covered with tiles or other type of flooring material. Based on visual inspection and conversations with current employees, there are no breaches or other significant damage or deterioration of the interior surficial flooring materials or, where visible, concrete floors. No construction was occurring within the building at the time of the inspection.

All interior concrete floors acceptable? YES NO

If no, attach photograph

If no, describe unacceptable condition:

Location:

1) Floor drain located in the Men's Gym Locker Room.

Condition:

1) A crack greater than 1/4-inch wide was observed around the floor drain in the Men's Gym Locker Room, see Photograph #1.

Describe any repairs to interior concrete floors conducted since previous inspection:

All repairs adequate YES NO Photograph of repair attached

C. LANDSCAPING – observe landscaping for erosion, animal holes, excavation, erosion control vegetation health.

Landscaping was inspected by TRC, Cheryl Henlin and Mr. Oliveira to observe unacceptable conditions. Several animal burrows were observed along the slopes to the north, west and southwest of the school. Deep-rooted vegetation was also observed along the slopes to the west, southwest and south of the school. Sloughing and erosion under the fence to the west of the school appears to be stable and the extent of erosion similar to conditions observed during past inspections.

All landscaped areas acceptable? YES NO

If no, attach photograph

If no, describe unacceptable condition:

Location:

- 1) The steep slope just above the wetland, to the west of the southern parking lot and school.
- 2) The slopes to the north, west and southwest of the school.
- 3) Riprap at base of slope to the west of the school.

Condition:

- 1) The structural integrity of the fence may be compromised if the sloughing and erosion continues, see Photograph #5. The cap soils beneath the riprap may also become exposed and susceptible to erosion. The area appears stable at the moment, but the condition is likely due to an increase in steepness beyond the cap design slope. The extent of erosion seems similar to the conditions observed during several previous inspections. See inspection report letters dated January 24, 2013, May 4, 2012 and August 31, 2011.
- 2) Animal burrow holes were observed on the slopes to the north, west and southwest of the school, see Photographs #6, #7 and #8. Potentially deep rooted vegetation was observed on the slope to the south and west of the school and should be cut down, see Photographs #9 and #10.
- 3) Potentially deep rooted vegetation was observed by riprap at the base of the slope to the west of the school, see Photograph #11. The orange snow fence protruding in this location appears to be located at the transition from the school slope area to the wetland remediation area. The area appears very stable, is covered in large-diameter riprap, and does not show any signs of erosion. The deep rooted vegetation in this area should be cut down to ground level.

Describe any repairs to landscaping since previous inspection:

All repairs adequate YES NO Photograph of repair attached

Deep-rooted vegetation had not been cut down.

D. Areas Not Inspected:

- 1) The elevator vaults were not inspected.

Reason: Not accessible. They were inspected in December, concurrent with elevator inspections.

Attachment 3

Site Inspection Photographs

SITE PHOTOGRAPHS
April 2013 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



1) Crack in Men's Gym Locker Room floor.



2) Minor crack in boiler room floor.

SITE PHOTOGRAPHS
April 2013 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



3) Minor crack in boiler room floor.



4) Minor crack in storage room 44 floor.

SITE PHOTOGRAPHS
April 2013 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



5) Undermining of concrete structure for fence west of school.



6) Animal burrows at northern slope of cap.

SITE PHOTOGRAPHS
April 2013 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



7) Animal burrows along land bridge to the west of the school.



8) Animal burrows at southwestern slope of cap.

SITE PHOTOGRAPHS
April 2013 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



9) Potentially deep-rooted vegetation at western slope of cap.



10) Potentially deep-rooted vegetation at southern slope of cap.

SITE PHOTOGRAPHS
April 2013 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



11) Potentially deep-rooted vegetation at western slope of cap by rip rap.