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January 24, 2013

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

**Subject: Fall 2012 Cap Inspection  
Keith Middle School  
New Bedford, Massachusetts**

Dear Ms. Henlin:

At the request of the City of New Bedford (City), TRC performed the thirteenth 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 November 27, 2012. The elevator vaults were inaccessible during this inspection, and were later 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:

- Animal burrows were confirmed to be vacated and then filled with clean soil.
- Asphalt cracks located in the parking lots to the north and south of the school have been repaired.
- The gaps at the seams in the asphalt at the entrances to the driveway/parking areas have been repaired.

The following issues were noted during the November 2012 inspection, and require repair by the next scheduled inspection:

- A crack in the sidewalk was observed near the southern parking lot entrance and should be filled or repaired. *(This repair was made in December 2012.)*

- New animal burrows were observed on the north, south, and southwest slopes. The burrows appeared to be inactive, but should be filled in or investigated in the spring.
- Potentially deep rooted vegetation was observed on the ridge of the southern and southwestern slope 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 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 is sparse, and may not protect surface soils from erosion.

## **DESCRIPTION OF INSPECTION**

The November 2012 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. 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. 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, and was observed separating from the wall and walkway surfaces. 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 repair/replacement of the



caulking. 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 new small holes were observed along the very northern, southern 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. Black separation fabric was also visible at the southwest corner of the slope, but was determined to be beyond the limits of the cap.

## **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, 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.

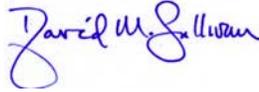


If you have any questions, please contact either of the undersigned at 978-970-5600.

Sincerely,



David M. Pettit  
Project Engineer



David M. Sullivan, LSP  
Senior Project Manager

Attachments

# **Attachment 1**

## **Log Book**

# 11/27/12 KMS Cap Inspection

- 0600 Zack Richards (ZKR) on site.  
Meet w/ Cheryl Henlin (CH).
- 0615 Take picture of bulge in community room kitchen.
- 0700 Note cracks in storage room 44 by the gym.
- 0730 Note cracks in boiler room and hairline cracks in emergency generator room and main electric room.  
Note: Both science room vaults were dry.
- 0735 Meet with Gary Gomes. Asphalt parking lot cracks/seams were repaired in the summer. Elevator sumps will be inspected in December when the elevator inspector comes.
- 0740 Begin outdoor inspection.
- 0750 Note animal burrow hole on north slope of cap.
- 0800 Note visible orange fabric by bottom of slope/end of rip rap. Also deep rooted vegetation at this location.
- 0810 Note deep rooted vegetation along

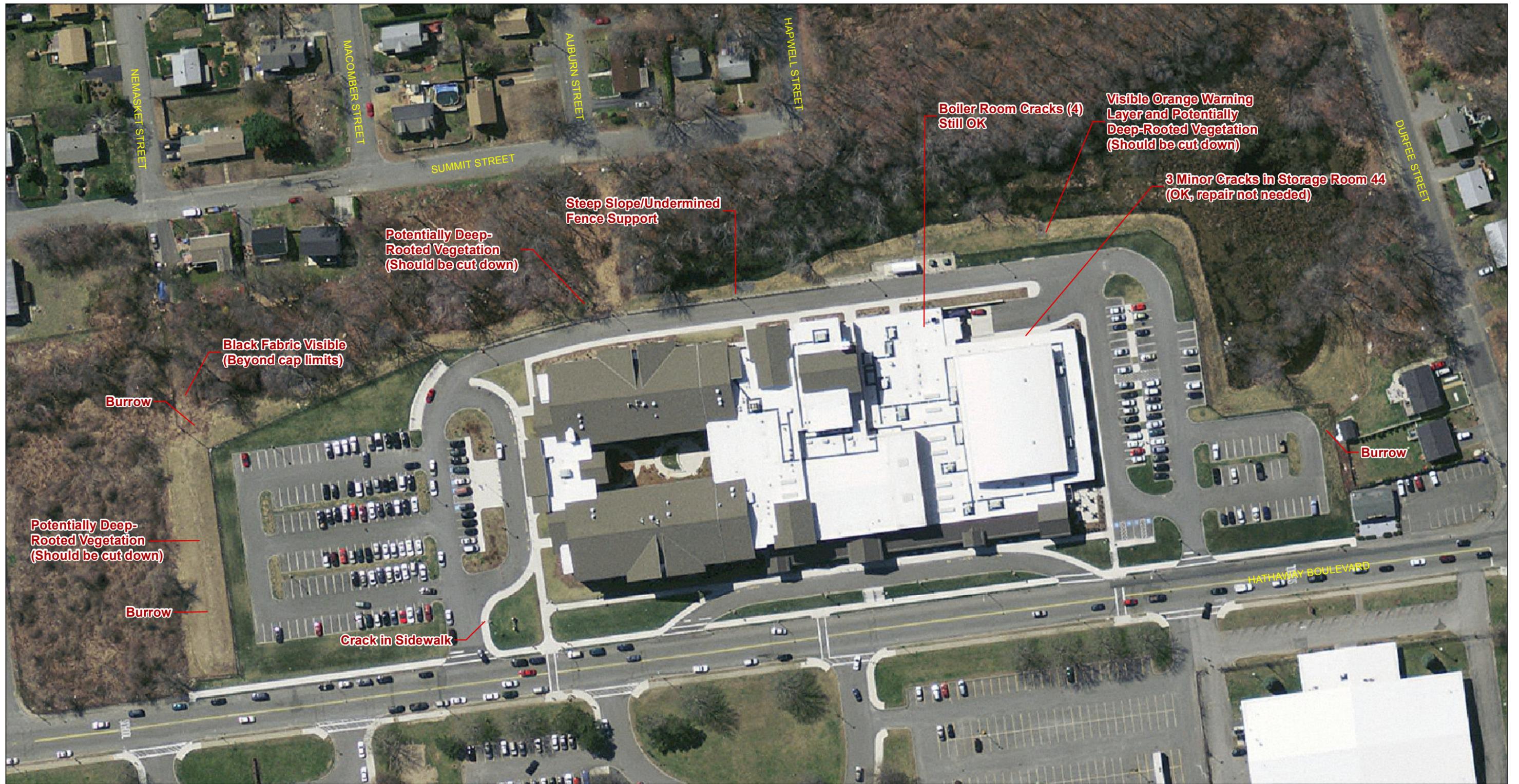
# KMS Cap Inspection 11/27/12

- west slope of cap.
- 0820 Note animal burrow on southwest corner of cap slope.  
Black fabric was seen at the surface in this corner but is determined to be outside of the KMS cap (farther to the southwest).
- 0825 Note deep rooted vegetation and an animal burrow on south slope of cap.
- 0830 ZKR + CH walking parking lot. Note crack in sidewalk near entrance to southern parking lot.
- 0840 ZKR + CH walking sidewalks and landscaping around perimeter of KMS.
- 0855 ZKR + CH finish cap inspection. Note fence was damaged along western edge of wetland and will be repaired next month.
- 0900 ZKR + CH packed up + off-site.

 11/27/12

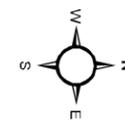
# **Figure 1**

## **Site Map**



Base map: 30 cm Imagery, MassGIS 2009

R:\Projects\GIS\_2011\115058\_KeithMS\_NewBedford\MXD\Site\_Map\_Keith\_Middle\_School\_2013-01-24.mxd



0 100 200 Feet

MASSACHUSETTS



SITE LOCATION



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

**SITE MAP**  
**KEITH MIDDLE SCHOOL**  
**NEW BEDFORD, MA**

FIGURE 1

DECEMBER 2012

**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 Dates: November 27, 2012

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 cracks were repaired during the summer. A chunk of concrete is missing from the sidewalk near the southern parking lot entrance and needs to be repaired. Caulking used to repair cracking of the concrete sidewalks is continuing to deteriorate and will require further repair in the near future. 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:

- 1) Sidewalk near southern parking lot entrance.
- 2) At locations along the concrete sidewalks where caulking was used to repair cracks.
- 3) Downspout located on the concrete sidewalk along the eastern wall of the school.

Condition:

- 1) There is a chunk missing from the sidewalk and a cracked corner that should be repaired or filled, see Photograph #7. (*This repair was made in December 2012, see Photograph #17.*)
- 2) Caulking in joints between brick walls and concrete walkways is deteriorating, see Photograph #8.
- 3) Minor cracks were observed next to a downspout along the concrete walkways, see Photograph #4. These cracks appear ok at the present time, but may require repair in the near future. (*This repair was made in December 2012, see Photograph #18.*)

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

All asphalt cracks in the parking lots and entrance were repaired during the summer, see Photographs #5 and #6.

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.

Four cracks in the boiler room floor are less than 1/4-inch wide, see Photographs #1 and #2. Three minor cracks in storage room 44 are also less than 1/4-inch wide, see Photograph #3. 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:

Condition:

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

All repairs adequate  YES  NO      Photograph of repair attached

Moisture and staining on tiled floor of Classroom 131 addressed.

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

**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, south and west of the school.
- 3) Riprap at base of slope to the west of the school.
- 4) Beyond the slope to the southwest of the school.

Condition:

- 1) The structural integrity of the fence may be compromised if the sloughing and erosion continues, see Photograph #10. 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 May 4, 2012 and August 31, 2011.
- 2) Animal burrow holes were observed on the slopes to the north, south and southwest of the school, see Photographs #11, #12 and #13. Potentially deep rooted vegetation was observed on the slope to the south and west of the school and should be cut down, see Photographs #14 and #15.
- 3) Potentially deep rooted vegetation was observed by riprap at the base of the slope to the west of the school, see Photograph #16. 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.
- 4) Black separation fabric was visible beyond the slope at the southwest corner of the cap. It was determined that this location was beyond the cap limits.

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**  
**November 2012 Cap Inspection**  
**Keith Middle School**  
**New Bedford, Massachusetts**



**1) Minor crack in boiler room floor.**



**2) Minor crack in boiler room floor.**

**SITE PHOTOGRAPHS**  
**November 2012 Cap Inspection**  
**Keith Middle School**  
**New Bedford, Massachusetts**



**3) Minor crack in storage room 44 floor.**



**4) Minor cracking of concrete next to downspout.**

**SITE PHOTOGRAPHS**  
**November 2012 Cap Inspection**  
**Keith Middle School**  
**New Bedford, Massachusetts**



**5) Parking lot crack repairs.**



**6) Parking lot seam repairs.**

**SITE PHOTOGRAPHS**  
**November 2012 Cap Inspection**  
**Keith Middle School**  
**New Bedford, Massachusetts**



**7) Sidewalk crack and missing chunk located southeast of school.**



**8) Sidewalk repair deteriorating at northern side of school.**

**SITE PHOTOGRAPHS**  
**November 2012 Cap Inspection**  
**Keith Middle School**  
**New Bedford, Massachusetts**



**9) Repair to prevent undermining of concrete walkway by eastern entrance.**



**10) Undermining of concrete structure for fence west of school.**

**SITE PHOTOGRAPHS**  
**November 2012 Cap Inspection**  
**Keith Middle School**  
**New Bedford, Massachusetts**



**11) Animal burrow at northern slope of cap.**



**12) Animal burrow at southwest corner of cap. Knotweed has been cut back.**

**SITE PHOTOGRAPHS**  
**November 2012 Cap Inspection**  
**Keith Middle School**  
**New Bedford, Massachusetts**



**13) Animal burrow at southern slope of cap.**



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

**SITE PHOTOGRAPHS**  
**November 2012 Cap Inspection**  
**Keith Middle School**  
**New Bedford, Massachusetts**



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



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

**SITE PHOTOGRAPHS**  
**November 2012 Cap Inspection**  
**Keith Middle School**  
**New Bedford, Massachusetts**



**17) Sidewalk repaired near southern parking lot entrance.**



**18) Concrete repaired next to downspout.**