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May 4, 2012

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

**Subject: Spring 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 twelfth inspection of the protective cap installed at the Keith Middle School Site located at 225 Hathaway Boulevard in New Bedford, Massachusetts. The inspection was performed in accordance with the currently-approved Long-term Monitoring and Maintenance Implementation Plan (LTMMIP) dated October 20, 2006 prepared by the BETA Group, Incorporated (BETA). The LTMMIP requires three inspections per year in April, August, 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 18, 2012. The elevator vaults were inaccessible during this inspection, and will be inspected during the annual elevator inspection event in December 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.
- Cracks in the northern walkway have been repaired.
- Soil loss during an apparent shrub removal was replaced.

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

- Asphalt cracks are located in the parking lots to the north and south of the school.

- The gaps at the seams in the asphalt at the entrances to the driveway/parking areas are wide enough to require repair or filling.
- New animal burrows were observed on the north, south, and southwest slopes.
- Potentially deep rooted vegetation was observed on the ridge of the southern slope and should be cut down.

The KMS Plant Engineer indicated that the paved parking areas around the school would be refinished during the summer of 2012, and the relevant issues noted above would be addressed at that time.

Although not necessarily required by the LTMMIP at this time, 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 deteriorating.
- 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 current cap slope in this area is likely steeper than the intended design slope.
- The vegetation on the southern cap slope is sparse, and may not protect surface soils from erosion.

## **DESCRIPTION OF INSPECTION**

The April 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.

Cracks and seams greater than ¼-inch were again observed in the asphalt parking lots. The Plant Engineer indicated that repair would be scheduled for the summer of 2012. The asphalt seams at the entrances to the school parking lots have become greater than ¼-inch and should be repaired.



Repair of the asphalt cracks and seams could be completed with an elastic asphalt filler/sealer or similar product.

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. 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 edge and southwestern edge of the cap, which appear to have been burrowed by small animals.
- An area of erosion was observed adjacent to the eastern wall of the community room. The area appeared to be approximately six inches deep, and should be replaced with clean soil.
- 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 beyond the cap design slope. The crack in the concrete fence support is not identified as a cap integrity issue, but should be addressed to maintain the integrity of the fence.
- Vegetation is sparse along the southern edge of the cap. Significant rills in the surface soil were 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 of the school and should be cut down.

## **CONCLUSIONS**

At this time the black separation fabric that demarcates the underlying contaminated fill from the clean imported fill is not visible, 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.

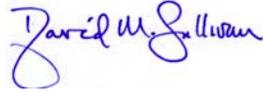


If you have any questions, please contact either of the undersigned at 978-970-5600.

Sincerely,

A handwritten signature in black ink that reads "David Pettit". The signature is written in a cursive style with a horizontal line extending from the end of the name.

David M. Pettit  
Project Engineer

A handwritten signature in blue ink that reads "David M. Sullivan". The signature is written in a cursive style with a horizontal line extending from the end of the name.

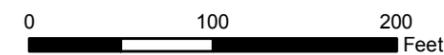
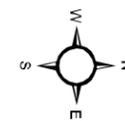
David M. Sullivan, LSP  
Senior Project Manager

Attachments



Base map: 30 cm Imagery, MassGIS 2009

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MASSACHUSETTS



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650 Suffolk Street  
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**SITE MAP**  
**KEITH MIDDLE SCHOOL**  
**NEW BEDFORD, MA**

FIGURE 1

APRIL 2012

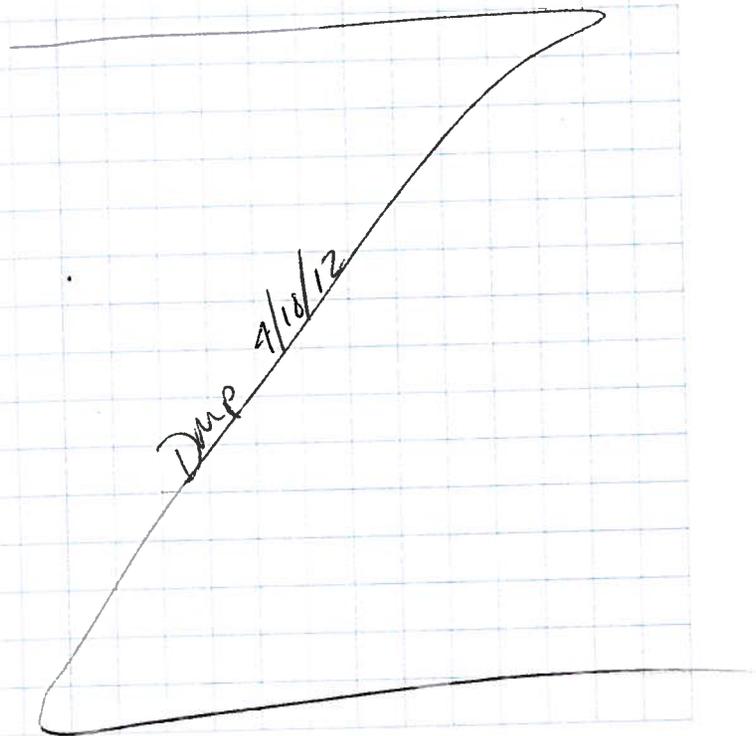
# **Attachment 1**

## **Log Book**

- 4/18/12 KMS Cap Inspection DMP  
0855 DMP & SB ON SITE  
Meet with Gary Gomes.  
0900 take picture of bulge in floor in community room kitchen  
0920 Note cracks in storage room by gym  
0930 Note hairline cracks in emergency generator room and main electric room.  
0935 Note cracks in boiler room  
0945 Note that room 150 is really hot, no ventilation for computer equipment,  
0950 western science room vault is dry on west side, slightly moist on east side. hydraulic cement appears dry.  
1020 Note that elevator sumps are not being inspected talk w/ Gary Gomes, this will be done in december when the elevator inspector comes.  
1030 Begin outdoor inspection,  
1040 No activity at previous burrow on northern slope, but sunken ground is present in one spot.  
1050 A fox hole is present to the <sup>far north</sup> ~~east~~  
1115 Note several holes in southwest knotweed area.  
1130 Note several cracks & seams in pavement.

DMP 4/18/12

- 4/18/12 KMS Cap Inspection DMP  
1145 Note erosion/holes outside east wall of community room.  
12:00 Finish inspection of fence around wetland, as requested by Cheryl Henline. No downed trees on fence, but several areas are off the ground enough for people/animals to crawl under.  
12:00 DMP & SB off site



**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: April 18, 2012

Inspection by: David Pettit, TRC

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

Cracking of the concrete sidewalks was observed, some cracks require repair and others 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) At the entrances to the KMS parking lot from Hathaway Boulevard and parking lots north and south of the school.

Condition:

- 1) Caulking in joints between brick walls and concrete walkways is deteriorating, see Photograph #6.
- 2) Separation of the seams of the asphalt parking lot entrances and cracks greater than 1/4-inch in parking lots, see Photographs #9 and #10.
- 4) Minor cracks were observed next to a light pole along the concrete walkways, see Photographs #5. These cracks appear ok at the present time, but may require repair in the near future.

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

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 #2 and #3. Three minor cracks in storage room 44 are also less than 1/4-inch wide, 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: Classroom 131.

Condition: Moisture and staining on the tiled floor of the classroom.

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.

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 landscaped area adjacent to the eastern wall of the community room.
- 3) The slopes to the north and south of the school.

Condition:

1) The structural integrity of the fence may be compromised if the sloughing and erosion continues, see Photograph #11. A crack in the concrete fence support was also observed, see Photograph #12. 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 August 31, 2011 and May 4, 2011.

2) New animal burrow holes were observed on the slopes to the north and southwest of the school, see Photograph #13.

3) Potentially deep rooted vegetation was observed on the slope to the south of the school and should be cut down.

Describe any repairs to landscaping since previous inspection:

All repairs adequate  YES  NO      Photograph of repair attached

D. Areas Not Inspected:

- 1) The elevator vaults were not inspected.

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

## **Attachment 3**

### **Site Inspection Photographs**

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



**1) Minor crack in electric room 54 floor.**



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

**SITE PHOTOGRAPHS**  
**April 2012 Cap Inspection**  
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**New Bedford, Massachusetts**



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



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

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



**5) Minor cracking of concrete next to light post.**

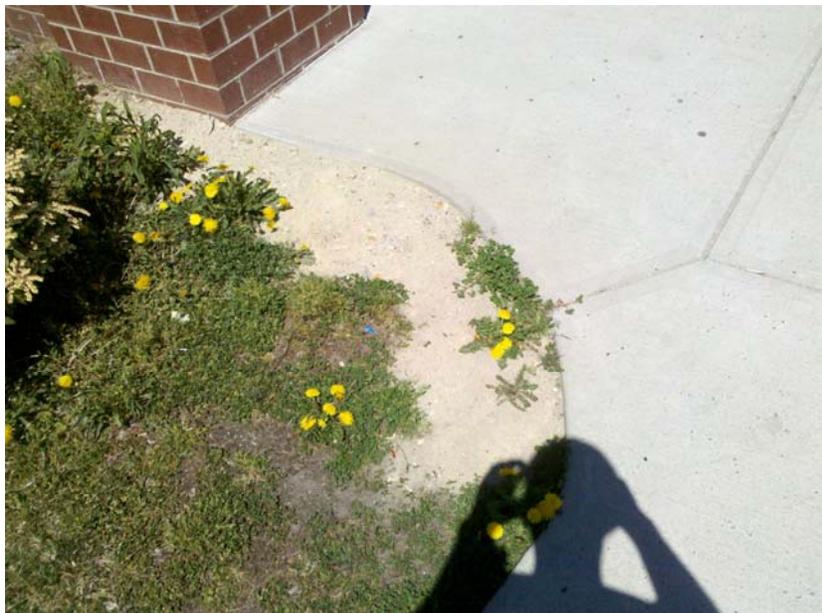


**6) Vegetation growing between building and concrete sidewalk near loading docks.**

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



**7) Repair to prevent undermining of concrete walkway at northeastern entrance (repaired prior to December 2011).**



**8) Repair to prevent undermining of concrete walkway at northeastern entrance (repaired prior to December 2011)..**

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



**9) Crack in asphalt parking lot north of school.**



**10) Seam in asphalt pavement near loading docks.**

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



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



**12) Crack in concrete fence support.**

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



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