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June 9, 2014

Mr. Ray Holberger
Environmental Planner
City of New Bedford
133 William Drive
New Bedford, MA 02740

**Subject: Spring 2014 Cap Inspection
Keith Middle School
New Bedford, Massachusetts**

Dear Mr. Holberger:

At the request of the City of New Bedford (City), TRC performed the seventeenth 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 to confirm that the cap is being properly maintained to prevent exposure to the impacted fill beneath.

The cap inspection was performed on April 23rd 2014. The elevator vaults were inspected during the annual elevator inspection later in December 2013, and no cracks were noted in the concrete vault floors at that time.

SUMMARY OF RESULTS

The following issues were noted during the April 2014 inspection, and require repair by the next scheduled inspection:

- Animal burrows were observed on the western and northern slopes. Reportedly, six gophers were captured during 2013, but the burrows need to be filled in.
- Potentially deep-rooted vegetation was observed on the western and southern slopes and should be cut down.
- Two cracks larger than ¼ of an inch were observed in the southern parking lot, and should be repaired.

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. These areas should continue to be monitored.
- 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.
- A minor crack was observed in the eastern driveway pavement. Although less than ¼-inch at this time, this area should continue to be monitored and/or repaired to prevent potential further deterioration.
- Two clean-out drains located in the bathroom near room 148 and the school store appeared to be deteriorating, though no cracks greater than ¼-inch were observed at this time, please view photos 11 and 12. These areas should be monitored and/or repaired to prevent future deterioration.

DESCRIPTION OF INSPECTION

The April 2014 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. Elevator vaults were not accessible and were not inspected. 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 the 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 cap integrity issue at this time. Three very minor cracks were also observed in storage room 44, and also do not require repairs at this time. A hair line crack was observed in the electric closet, please view picture 13. Each of the eight cracks noted above appears in a general east-to-west orientation.

Two cracks were observed in the southern parking lot, which are greater than ¼ - inch. These cracks require repair prior to the next scheduled inspection. Several curbed areas along the exterior of the middle school had small tufts grass penetrating through the concrete and asphalt. This issue has been monitored and treated following previous inspection reports, and the results have been positive. Although these cracks through which vegetation is penetrating were not greater than ¼-inch, they do pose potential future problems as weathering could increase crack



size. The minor crack (less than ¼-inch) in the pavement which was observed during the previous inspection on the eastern driveway has not changed in size, and is not considered a cap integrity issue at this time.

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 western and northern edges of the cap, which may have been burrowed by small animals. As previously stated in this report, six gophers were previously removed, but the holes should be filled prior to the next cap inspection report.
- 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 slope 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.
- Potentially deep-rooted vegetation observed on the slopes south and west of the school and should be cut down.

CONCLUSIONS

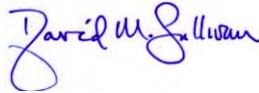
The black separation fabric that demarcates the underlying contaminated fill from the clean imported fill is not visible within the cap area, and exposures to the impacted fill beneath the cap are being prevented. However, the issues identified in this report should be addressed in order to prevent further 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,



David M. Pettit
Project Engineer

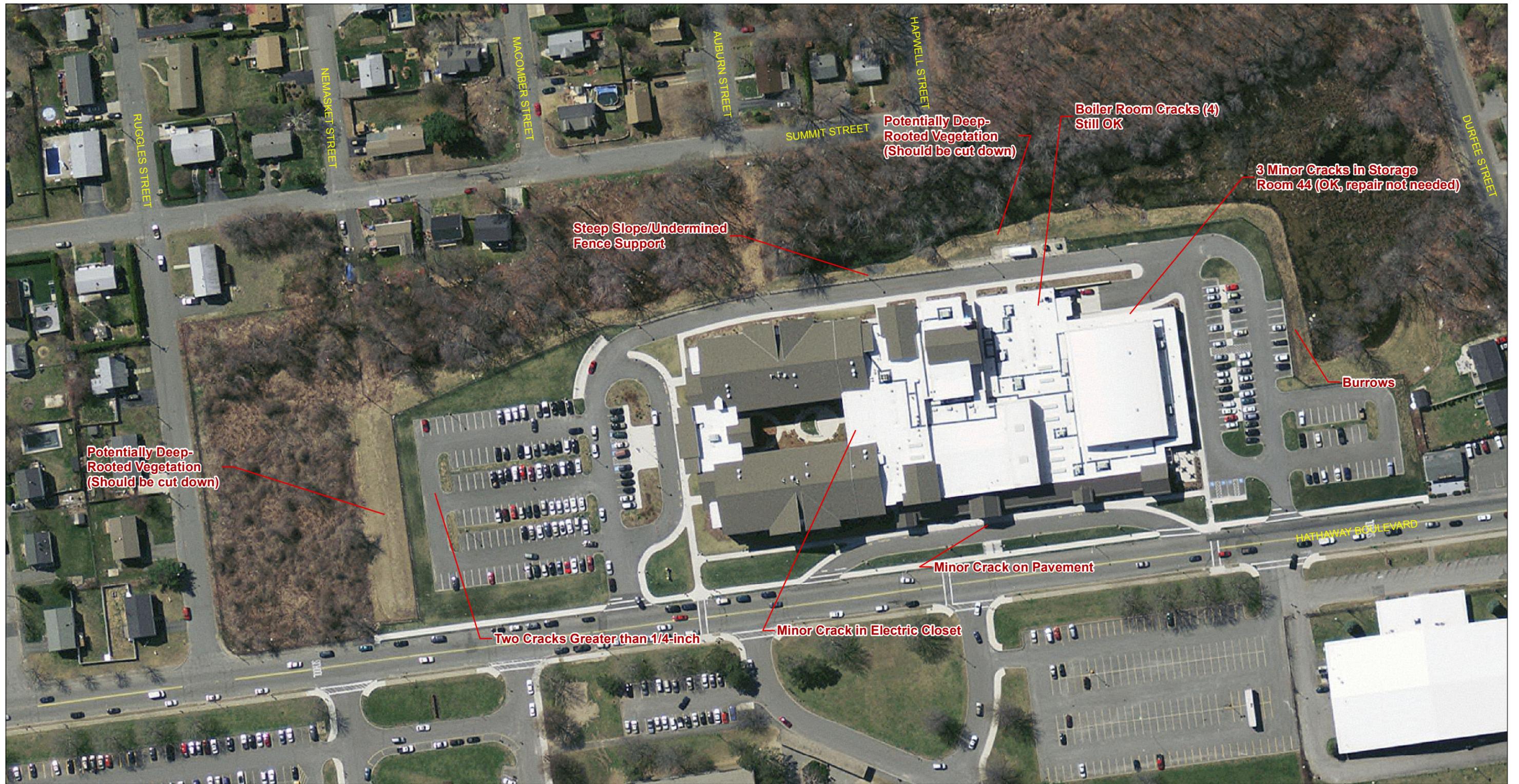


David M. Sullivan, LSP
Senior Project Manager

Attachments

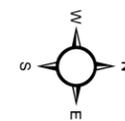
Figure 1

Site Map



Base map: 30 cm Imagery, MassGIS 2009

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0 100 200 Feet

MASSACHUSETTS



SITE LOCATION



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

SITE MAP

**KEITH MIDDLE SCHOOL
NEW BEDFORD, MA**

FIGURE 1

APRIL 2014

Attachment 1

Log Book

4/23/14 Rms CAP Inspection

710 Rishabh Iyer arrives onsite,
weather is partly cloudy 50°F
meets Gary Gomez onsite to let
him in the building to perform
inspection

900 RI finds no cracks bigger
than $1/4$ " , four hair line cracks
observed in boiler room, 2 hairline
cracks in storage room of the
gym, deteriorated clean out drain
in boys bathroom, may result
in a crack soon, bathroom located
near room 148, same is true of
the school store. Hair line crack
in electric closet

930 RI begins exterior inspection,
2 animal burrows near northern
parking lot, one animal burrow near
southern parking lot. Large vegetation
in southern parking lot near wetlands
and two large asphalt cracks also
located in the parking lot

1015 RI discusses deficiencies with
Gary Gomez

1030 RI packed up and offsite

~~Rules~~

4/23/14

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 23rd 2014

Inspection by: Rishabh Iyer, TRC

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

All asphalt areas look in good condition except for two cracks greater than ¼ - inch in the southern parking lot, please view Photographs 1 and 2. A minor crack less than ¼-inch was observed on the eastern “driveway” in the previous visit, but appears to be OK. Small tufts of grass were observed penetrating up through the curbed sidewalk in various areas but are less than a ¼-inch and deemed acceptable, see Photograph 3 These areas should be addressed to prevent potential cap issues in the future.

All Asphalt and concrete paving acceptable? YES NO

If no, attach photograph

If no, describe unacceptable condition:

Location: Southern Parking lot of Keith Middle School

Condition: Crack greater than ¼ -inch

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

There have been no repairs conducted to the asphalt and/or concrete since last visit.

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 ¼-inch wide and have not increased in size, see Photograph 4. Three minor cracks in storage room 44 are also less than ¼-inch wide and have not increased in size, see Photograph 5. A small crack was observed in the electric closet, and in the tile covering the concrete along the southern hallway (please see Photograph 6). 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

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

Landscaping was inspected by Rishabh Iyer to observe unacceptable conditions. Several animal borrows were observed along the west and northern slopes. Deep rooted vegetation was observed on the western and southern slope. All vegetation should be mowed in the near future. 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.

The structural integrity of this fence may be compromised if the sloughing and erosion continues, see Photograph 7. 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.

All landscaped areas acceptable? YES NO

If no, attach photograph

If no, describe unacceptable condition:

Location:

1) The exterior slopes surrounding the school.

Condition:

- 1) Animal burrow holes were observed on the slopes to the north and west of the school, see Photographs 8 & 9. Currently these borrow do not look active, TRC will monitor these areas for increased animal activity, i.e., resumed use of borrows and increased quantity of borrows. .
- 2) Potentially deep rooted vegetation was observed on the slope to the south and west of the school and should be cut down, see Photograph 10

Describe any repairs to landscaping since previous inspection:

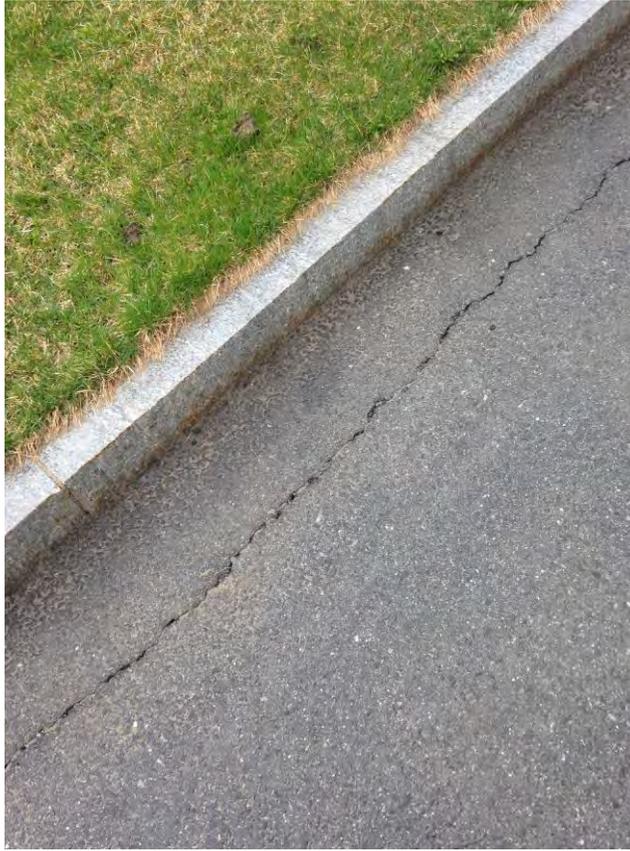
All repairs adequate YES NO Photograph of repair attached

D. Areas Not Inspected:

1) The elevator vaults were not inspected.

Attachment 3
Site Inspection Photographs

SITE PHOTOGRAPHS
April 2014 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



1) Crack in the asphalt greater than ¼-inch, located in the southern parking lot



2) Crack in the asphalt greater than ¼-inch, located in the southern parking lot

SITE PHOTOGRAPHS
April 2014 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



3) Tufts of grass protruding through the curb.



4) Cracks in boiler room

SITE PHOTOGRAPHS
April 2014 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



5) Cracks in gym storage room



6) Crack along the southern hallway

SITE PHOTOGRAPHS
April 2014 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



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



8) Animals burrows in the western slope.

SITE PHOTOGRAPHS
April 2014 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



9) Animals burrows in the northern slope.



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

SITE PHOTOGRAPHS
April 2014 Cap Inspection
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11) Deteriorating clean out drain in bathroom near room 148.



12) Deteriorating clean out drain in school store.

SITE PHOTOGRAPHS
April 2014 Cap Inspection
Keith Middle School
New Bedford, Massachusetts



13) Hairline crack in electric closet