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February 20, 2014

Ms. Kimberly Tisa
PCB Coordinator
U.S. Environmental Protection Agency Region 1
5 Post Office Square – Suite 100
Boston, Massachusetts 02109-3912

Re: PCB Remediation Completion Report – Sylvan Residential Complex
University of Massachusetts
Amherst, Massachusetts

Dear Ms. Tisa:

On behalf of the University of Massachusetts (UMass), this letter and attached documents have been prepared to document the completion of the polychlorinated biphenyl (PCB) remediation activities conducted at the Sylvan Residential Complex located at 112 Eastman Lane on the UMass Amherst campus in Amherst, Massachusetts.

The Sylvan Residential Area consists of three dormitories, all of similar construction and built consecutively starting in 1971. These buildings are referred to as the Brown, McNamara, and Cashin Residences (see attached figure). As previously communicated, UMass undertook a three year building envelope repair project at the three buildings beginning in 2011, which also included Americans with Disabilities Act (ADA) restroom upgrades at the Brown and McNamara Residences and common area interior renovations at the McNamara and Cashin Residences. The work activities were conducted during the summer break sessions (May through August) when students were not present in the buildings.

Although plan submittals, status updates, and other communications have occurred throughout the 2011, 2012, and 2013 activities, formal written Approval from the Agency has not been received to date. As previously discussed, the intent of the previous submittals was to "link" the activities being conducted at the three buildings into one "Approval" for the Sylvan Residential Complex to cover remediation activities associated with the building envelope work, interior renovation areas, and long term monitoring and maintenance activities.

A project timeline and list of significant project milestones and submittals associated with the Sylvan Residential Complex PCB remediation work is provided below:

<u>Brown Residence:</u>

- PCB Remediation Plan for the Building Envelope Repair Project submitted to EPA – April 6, 2011;
- PCB Remediation Plan for the ADA Bathroom Upgrade Project submitted to EPA – May 6, 2011;
- Supporting information/response to EPA questions regarding the Envelope Repair Project submitted to EPA – May 17, 2011;
- EPA Comment Letter received for the ADA Bathroom Upgrade Project PCB Remediation Plan – June 6, 2011;
- PCB Remediation activities substantially completed – May 2011 through August 2011;
- PCB Remediation Update and Addendum submitted to EPA – November 17, 2011;

- PCB Remediation Status Report (Building Envelope Repair Project) submitted to EPA – February 10, 2012;
- PCB Remediation Project Status Report (building envelope repair and ADA restroom projects) submitted to EPA – March 15, 2013; and
- Final completion of PCB Remediation activities (application of clear coat to low occupancy vertical joints) – May 2013 through July 2013 (final verification wipe samples collected November 2013).

McNamara Residence:

- PCB Remediation Plan for Building Envelope Repair and ADA Restroom Upgrade Project submitted to EPA – March 21, 2012;
- Supporting information/response to EPA questions (telephone and email communications) – May through June 2012;
- PCB Remediation activities substantially completed – building envelope repairs and ADA restroom upgrades – May 2012 through August 2012 (final verification wipe samples collected November 2012);
- PCB Remediation Status Report submitted to EPA – March 15, 2013;
- Sylvan Residential Complex PCB Remediation Plan Addendum submitted to EPA (interior renovation project) – June 19, 2013; and
- Interior Renovation PCB Remediation Activities Completed – July 2013 through August 2013.

Cashin Residence:

- PCB Remediation Plan for Building Envelope Repair submitted to EPA – March 15, 2013;
- Sylvan Residential Complex PCB Remediation Plan Addendum submitted to EPA (interior renovation project) – June 19, 2013; and
- PCB Remediation activities substantially completed – building envelope repairs and interior renovation activities – May 2013 through August 2013 (final verification wipe samples collected November 2013).

The following documents are attached to this letter and constitute the PCB Remediation Completion Report for the Sylvan Residential Complex, which is being submitted to comply with recordkeeping requirements of 40 CFR 761. Because the remediation plans and subsequent work was completed individually by building, the completion reports have also been prepared individually and by building:

- Brown Residence PCB Remediation Completion Report for the building envelope repair and ADA restroom upgrade projects;
- McNamara Residence PCB Remediation Completion Report for the building envelope repair, ADA restroom upgrade, and interior common area renovation projects; and
- Cashin Residence PCB Remediation Completion Report for the building envelope repair and interior common area renovation projects.

Also attached is a Long Term Monitoring and Maintenance Plan (MMIP) to monitor the effectiveness of the implemented remedy over time. This document has been prepared for the entire three building complex.

Given the use of encapsulation techniques and the low occupancy use criteria in select locations, it is assumed a deed notice will be required. UMass is in the process of preparing deed notice(s) for several areas on the campus as it relates to PCB remediation activities, and the Sylvan Residential Complex will be incorporated into one of the deed notices, accordingly.

As presented in previous submittals, the proposed plan to address any PCB-impacted ground surfaces adjacent to the Sylvan Residential Area buildings is to assess and remediate, if necessary, surfaces adjacent to the three buildings as a single event. This will allow the remediation contractor access to the three buildings during the same mobilization and completion of the ground surfaces work surrounding the buildings as one removal project. At this time, it is anticipated that the characterization and assessment will be conducted during the next Summer break session (May – August 2014) with plan preparation and submittals, as needed, in the Fall/Winter of 2014. Following the overall work schedule and in order to allow time for plan review, any ground surface remediation would be conducted during the following summer break session (May - August 2015), if required.

If you have any questions or require further information, please feel free to contact me at (978) 557-8150 or at jhamel@woodardcurran.com.

Sincerely,
WOODARD & CURRAN INC.

Jeffrey A. Hamel, LSP, LEP
Senior Vice President

cc: James Morrissey, University of Massachusetts
Terri Wolejko, University of Massachusetts

Enclosures: Site Location Map
Attachment 1 – PCB Remediation Completion Report – Brown Residence
Attachment 2 – PCB Remediation Completion Report – McNamara Residence
Attachment 3 – PCB Remediation Completion Report – Cashin Residence
Attachment 4 – Long Term Monitoring and Maintenance Plan – Sylvan Residential Complex

ATTACHMENT 1: PCB REMEDIATION COMPLETION REPORT – BROWN RESIDENCE

PCB REMEDIATION COMPLETION REPORT

Brown Residence

University of Massachusetts

Sylvan Residential Complex

Amherst, Massachusetts

224166

University of Massachusetts

February 2014

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1. INTRODUCTION

This Polychlorinated Biphenyl (PCB) Remediation Completion Report has been prepared by Woodard & Curran to document PCB remediation activities performed at the Brown Residence, one of three buildings within the Sylvan Residential Complex located at 112 Eastman Lane on the University of Massachusetts (UMass) campus in Amherst, Massachusetts (Figure 1-1).

Remedial activities were conducted and substantially completed in 2011 in accordance with a series of project submittals detailed in Section 1.3. Final remediation activities were completed in 2013 with the application of liquid coating to materials away from vertical control joints in low occupancy areas and subsequent verification sampling.

As indicated in other submittals, UMass has consolidated the building envelope repair projects at each of the three buildings within the Sylvan Residential Complex (Brown, McNamara, and Cashin), the Americans with Disabilities Act (ADA) restroom upgrade projects at the Brown and McNamara Residences, and the interior renovation projects at the McNamara and Cashin Residences into a single project for reporting and approval purposes. Although plan submittals, status reports, and other communications have occurred prior to and during the activities, to date, a formal written Approval from the EPA has not been received for these plans. This PCB Remediation Completion Report is being submitted to meet the recordkeeping requirements of 40 CFR 761.

1.1 SITE DESCRIPTION

The Brown Residential dormitory, originally constructed in 1971, is a residential dormitory for undergraduate students. The building is nine stories high with student rooms and common areas on all floors. The building is located within the Sylvan Residential Area and is surrounded by other dormitory buildings, parking areas and open areas. Surrounding ground surfaces are generally flat (south and west sides) or sloped toward the building (north and east sides) with an overall westward slope. Adjacent ground surfaces are mostly grass with some asphalt pavement, concrete walkways or landscaped areas.

1.2 SITE BACKGROUND / CONCEPTUAL SITE MODEL

The Brown Residential dormitory was constructed during a time period when PCBs were sometimes used in certain building materials (e.g. caulking). In preparation for a building envelope repair project, a materials survey was conducted of various hazardous materials that could be encountered during the project. This included inspection and sampling of suspect materials for PCBs.

Analytical results indicated that certain caulking materials contained PCBs at concentrations greater than 50 parts per million (ppm), at concentrations up to 218,700 ppm. Adjacent building materials were also sampled to determine whether PCBs had migrated from the caulking into these adjacent materials. Analytical results confirmed that PCBs were present in surrounding building materials at regulated concentrations. After completing the characterization of suspect materials at the Site, the results were used to develop a remedial approach that was incorporated into the overall envelope repair and ADA restroom upgrade projects as presented in the applicable PCB Remediation Plans submitted to EPA prior to project implementation.

1.3 SUBMITTALS AND PROJECT TIMELINE

The following list provides a summary of the major activities conducted and document submittals prepared as part of the PCB remediation activities. It should be noted that characterization sampling was conducted throughout the program in support of these submittals.

- PCB Remediation Plan for the Building Envelope Repair Project submitted to EPA – April 6, 2011;
- PCB Remediation Plan for the ADA Bathroom Upgrade Project submitted to EPA – May 6, 2011;
- Supporting information/response to EPA questions regarding the Envelope Repair Project submitted to EPA – May 17, 2011;
- EPA Comment Letter received for the ADA Bathroom Upgrade Project PCB Remediation Plan – June 6, 2011;
- PCB Remediation Activities Substantially Completed – May 2011 through August 2011;
- Brown Residence PCB Remediation Update and Addendum submitted to EPA – November 17, 2011;
- PCB Remediation Status Report (Building Envelope Repair Project) submitted to EPA – February 10, 2012;
- PCB Remediation Project Status Report (building envelope repair and ADA restroom projects) submitted to EPA – March 15, 2013;
- Application of clear coating to vertical control joints in low occupancy areas – May and June 2013; and
- Verification wipe sample collection of clear coated areas (vertical control joints in low occupancy areas) – November 11, 2013.

1.4 PROJECT TEAM

The remediation project team consisted of the following parties:

Building Envelope Repair Project

- University of Massachusetts Amherst - Owner
- Woodard & Curran – PCB Remediation Consultant
- Gale Associates Inc. – Project Manager for UMass
- Chapman Waterproofing – General Contractor
- Compass Restoration – PCB Remediation Subcontractor
- Con-Test Analytical Laboratory – Laboratory for sample analysis

ADA Restroom Upgrade Project

- University of Massachusetts Amherst – Owner
- Environmental Compliance Services – PCB Remediation Consultant (Planning and Implementation)
- Woodard & Curran – PCB Remediation Consultant (Completion Reporting)
- Safe Environment of America, Inc. – PCB Remediation Subcontractor
- Spectrum Analytical Laboratory – Laboratory for sample analysis

2. BUILDING ENVELOPE REPAIR REMEDY IMPLEMENTATION

This section describes the PCB cleanup and disposal activities conducted at the exterior building envelope in accordance with the PCB Remediation Plan, subsequent communications with EPA, and 40 CFR 761.61. Active remediation activities on the building (removals and encapsulations) began on May 17, 2011 and were concluded during the week of August 15, 2011 with the exception of the application of liquid coatings to building materials in low occupancy areas, which was completed between May and November of 2013. The remedial approach consisted of the following:

- Removal and off-site disposal of ≥ 50 ppm PCB caulking and backing materials in direct contact with caulking as ≥ 50 ppm PCB waste;
- Segregation and removal of parapet wall building materials (bricks, caps, etc.) for off-site disposal as either ≥ 50 ppm PCB waste or general construction/demolition debris following verification sampling; and
- Encapsulation of building materials which were scheduled to remain in place and contained PCBs at concentrations above high or low occupancy clean up levels, as applicable.

A summary of the remediation activities, including site preparations and controls, PCB impacted material removal or encapsulation, inspections and verification sampling, and off-site disposal of materials is presented in the following sections.

2.1 SITE PREPARATION AND CONTROLS

Prior to initiating the remediation activities, site preparations and controls were implemented and maintained for the duration of the project as described in the PCB Remediation Plan. These preparations included the development of Health & Safety and Contractor Work Plans, and securing access to the work areas through signage. During remediation activities, the dormitory was vacant.

Scaffolding on Roof Area Prior to Remediation

Removal of the ≥ 50 ppm PCB containing caulking and building materials was conducted within polyethylene containment structures constructed: 1) on the lift boom for vertical and horizontal control joints, 2) on the roof area for penthouse wall control joints, and 3) on the scaffolding for the parapet wall removal. Water misting was the primary means of dust control throughout the project. HEPA filtration was also utilized for additional dust controls during the removal of the horizontal and vertical control joints on the boom lift. Polyethylene sheeting was placed on the ground surfaces below work areas.

Perimeter air monitoring was conducted during active removal of brick and masonry materials from the parapet walls and from areas adjacent to caulked joints in accordance with Appendix D of the PCB Remediation Plan. A direct reading particulate meter (TSI Dust Trak Respirable Particulate Meter) was used to monitor total dust concentrations at a background location and at multiple stations surrounding the work areas at a frequency of every two hours

during these work activities. The exact locations of the stations varied based on the specific location of the work. Results of the air monitoring indicated that dust concentrations did not exceed the project action level during the work. A copy of the dust monitoring logs is provided in Appendix A.

2.2 SAMPLING AND ANALYTICAL METHODS

Verification samples collected in support of the remediation activities described herein were collected in accordance with generally accepted procedures for environmental sampling. Masonry samples were collected consistent with the EPA Region I Standard Operating Procedure for Sampling Porous Surfaces for PCBs (May 2011). Surface wipe samples were collected using hexane-saturated gauze wipes in accordance with the standard wipe test method under 40 CFR 761.123. Locations of verification samples are depicted graphically on the Plan Drawings provided in Appendix B.

Samples were transferred on ice to Con-Test Analytical Laboratory of East Longmeadow, Massachusetts under standard chain of custody procedures. Samples were extracted using USEPA Method 3540C (Soxhlet extraction) and analyzed for PCBs using USEPA Method 8082. Electronic versions of the laboratory analytical packages for the data presented in this section are provided in Appendix C.

2.3 PARAPET WALLS

The parapet wall cap joints and horizontal and vertical parapet wall control joints were identified as containing ≥ 50 ppm PCB-containing caulking. PCB concentrations ranged from 60.5 ppm in the parapet wall cap joint to 142,000 ppm in the parapet wall control joints. During removal activities, additional caulking at vertical control joints was identified on brick to brick joints on the inner side of the parapet wall beneath the membrane coating. This caulking was managed as ≥ 50 ppm PCB containing material for removal and disposal purposes. A summary of the removal and verification program is provided below.

2.3.1 Verification Sampling

Verification samples were collected prior to removal of the caulked joints to facilitate the removal and segregation of the parapet wall bricks. Verification samples were collected at a frequency of approximately one sample per 50 linear feet (l.f.) of caulked joint for waste segregation purposes as follows:

- Parapet Wall Cap Joints (960 l.f.) – 21 verification samples were collected from the top of the first row of horizontal bricks (i.e., immediately below the vertically aligned soldier bricks below the cap joints);

- Horizontal Parapet Wall Control Joints (750 l.f.) – 17 verification samples were collected from the second row of horizontal bricks above the caulked joint; and

- Vertical Parapet Wall Control Joints (200 l.f.) – 9 verification samples were collected from the first row of brick immediately past the initial half-brick (i.e., approximately 4.5 inches from the joint immediately past the first mortar joint).

A total of 47 verification samples were collected from brick materials. Analytical results indicated that PCBs were either non-detect (25 samples with reporting limits < 1 ppm) or < 1 ppm (22 samples with an average PCB concentration of approximately 0.3 ppm and a maximum reported concentration of 0.67 ppm). Locations of the verification samples are depicted on the Plan Drawings provided in Appendix B. Analytical results are summarized on Table 2-1.

2.3.2 Caulking and Building Material Removal

Following the establishment of site controls as described above, caulking, bricks, and other building materials associated with the parapet walls were removed and segregated for off-site disposal. The caulking associated with the parapet wall cap joints, the parapet wall control joints, and the vertical parapet wall control joints (the upper portions of the vertical building control joints) as well as the aluminum parapet wall cap, the first row of bricks below the cap joints, the first row of bricks above the parapet wall base control joints, and the first row of brick adjacent to the vertical parapet wall control joints were removed for off-site disposal as ≥ 50 ppm PCB waste. Remaining portions of the parapet wall were removed for off-site disposal as general construction/demolition debris.

2.4 ROOF TOP UNIT ENCLOSURE WALLS

Following submittal of the PCB Remediation Plan, the removal of enclosure walls surrounding the roof top air handling units (RTU) was added to the project scope as part of the overall roof replacement. Inspection of the enclosure walls indicated that at total of 50 l.f. of caulking was present along horizontal joints between the masonry blocks that made up the cap of the walls. The masonry cap blocks extended out approximately one to two inches beyond the face of the RTU walls. This construction resulted in no direct contact pathway between the caulking and the RTU walls themselves. Due to the overall project schedule, this caulking material was managed as ≥ 50 ppm PCB containing material. Following the establishment of site controls as described above, the caulking and the masonry cap blocks in direct contact with the caulking were removed for disposal as ≥ 50 ppm PCB waste; the RTU walls were managed for off-site disposal as general construction/demolition debris.

2.5 PENTHOUSE WALL JOINTS

Caulking identified as ≥ 50 ppm PCB-containing material was identified in the penthouse wall termination joints (220 l.f. of caulking with reported PCB concentrations of 15.65, 16, and 94 ppm), the penthouse wall horizontal and vertical control joints (170 l.f. of caulking with reported PCB concentrations of 170,000 ppm), and the northern stairway penthouse door joints (20 l.f. of caulking with reported PCB concentrations of 97,000 ppm). A summary of the removal and verification sampling program is provided below.

2.5.1 Verification Sampling

Other than the caulking and miscellaneous associated materials (flashing, etc.), no other building materials on the penthouse walls were planned to be removed during the renovation project. Penthouse wall materials designated to remain in place were proposed to be managed in the same manner as materials associated with the horizontal and vertical control joints on the remainder of the building façade. Verification sampling of the penthouse wall bricks is presented with the overall façade discussion in Section 2.6 below.

2.5.2 Caulking and Building Material Removal

Following the establishment of site controls as described above, caulking, door frames, termination joint flashing materials, and loose or damaged building materials associated with the penthouse wall joints were removed for off-site disposal as ≥ 50 ppm PCB waste.

2.5.3 Encapsulation and Verification Wipe Sample Collection

In accordance with Section 3.4.5 of the PCB Remediation Plan, brick materials within the return of the joint not planned for removal were encapsulated using two coats of Sikagard 62 liquid epoxy coating. Due to the location of the penthouses on the top of the building and the secured access to the roof top (the access door is kept locked and is alarmed to alert UMass Residential Life Security if the door is opened), these areas are considered to be low occupancy areas for the purposes of the extent of encapsulation of building materials away from the joint. The extent of the coating and the verification wipe sampling of the encapsulated materials is described in Sections 2.6.3 and 2.6.4 below.

In addition, following application of the encapsulating liquid coatings to building materials associated with the penthouse wall termination joint, replacement roofing and flashing materials were installed over the former joint as part of the overall roof replacement project.

2.6 HORIZONTAL AND VERTICAL CONTROL JOINTS

The horizontal and vertical control joints on the building façade were identified as containing ≥ 50 ppm PCB caulking. PCBs were reported at a concentration up to 218,700 ppm. A summary of the removal activities, verification sampling program, and the encapsulation of building materials associated with these joints is provided below.

2.6.1 Verification Sampling

In accordance with the PCB remediation plan, samples were collected from brick materials adjacent to the former caulked joints at various distances to determine the extent of PCBs at concentrations above the high and low occupancy criteria, as applicable. A summary of the areas associated with each criterion is as follows:

- High Occupancy Criteria (≤ 1 ppm) – Locations ≤ 8'-8" above ground surface including 135 l.f. of horizontal control joints and 278 l.f. of vertical control joints; and
- Low Occupancy Criteria (≤ 25 ppm) – Locations > 8'-8" above ground surface (including rooftop penthouses) including 3,972 l.f. of horizontal control joints and 1,632 l.f. of vertical control joints.

Locations of the verification samples are depicted on the Plan Drawings included in Appendix B. A schematic depicting the brick sample results at selected distances away from the former caulked joint is provided as Figure 2-1. Verification sampling analytical results are summarized on Table 2-2.

The following sections summarize the results of representative samples from both the initial characterization sampling (included in the PCB Remediation Plan) and the verification samples collected during implementation (as shown on Figure 2-1) to provide a complete summary of data collected in support of the encapsulation described in Section 2.6.4.

2.6.1.1 Horizontal Control Joints

Verification samples were collected from brick materials above and below the horizontal control joints at an approximate frequency of one sample per 50 l.f. of caulked joint at locations ≤ 8'-8" above ground surface and at an approximate frequency of one sample per 200 l.f. of caulked joint at locations > 8'-8". A summary of the analytical results is as follows:

- Above the joint – Verification samples were collected from the first row of brick above the caulked joints as follows:
    - ≤ 8'-8" Above Ground Surface – Four samples were collected from brick materials 1 to 1 ½ inches above the joint. Analytical results indicated that PCBs were present at concentrations < 1 ppm in all four samples with and average concentration of approximately 0.3 ppm;
    - > 8'-8" Above Ground Surface – 21 samples were collected from brick materials 1 to 1 ½ inches (one sample) and 1 ½ to 2 ½ inches (20 samples) above the joint. Analytical results were as follows:
        - Total PCBs < 1 ppm – 15 samples with an average PCB concentration of approximately 0.4 ppm; and
        - Total PCBs > 1 ppm – Six samples (1.1, 1.1, 1.4, 1.5, 2.4, and 3.7 ppm) with an average PCB concentration of approximately 1.9 ppm.

  Analytical results from all 25 of the samples collected indicated that the average PCB concentration was approximately 0.74 ppm in the first row of brick materials above the horizontal control joints.
- Below the Joint – Verification samples were collected from brick materials below the caulked joints as follows:
    - ≤ 8'-8" Above Ground Surface – Four samples were collected from the third row of brick below the caulked joints (samples collected at distances of 6 to 7 inches and 6 ½ to 7 ½ inches below the joints) and one sample was collected from the first row of brick below the caulked joint at a distance of 1 ½ to 2 ½ inches from the joint. Analytical results indicated that PCBs were non-detect in four of the five samples collected with an average PCB concentration of approximately 0.41 ppm (total PCBs were reported at a concentration of 1.2 ppm in one sample collected from 6 ½ to 7 ½ inches below the joint);
    - > 8'-8" Above Ground Surface – A total of 27 samples were collected from brick materials below the joint. One sample was collected from the second and fourth row of bricks and 25 samples were collected from the third row of bricks below the joint. Analytical results were as follows:
        - Second Row of Brick (2 to 3 inches below the joint) – Analytical results indicated that PCBs were present at a concentration of 4.1 ppm;
        - Third Row of Brick (6 to 7 and 6 ½ to 7 ½ inches below the joint) – Analytical results from 22 of the samples collected indicated that PCBs were non-detect (five samples with reporting limits < 1 ppm) or < 1 ppm (17 samples with an average concentration of approximately 0.44 ppm). Results from three samples indicated that PCBs were present at concentrations > 1 ppm with total PCBs of 2.0, 3.8, and 20 ppm reported; and
        - Fourth Row of Brick (7 ½ to 8 ½ inches below the joint) – Analytical results indicated that PCBs were non-detect with a reporting limit of < 0.087 ppm.

2.6.1.2 Vertical Control Joints

Verification samples were collected from brick materials adjacent to vertical control joints at a frequency of one sample per 25 l.f. of caulked joint at locations ≤ 8'-8" above ground surface and at an approximate frequency of one sample per 200 l.f. of caulked joint at locations > 8'-8". A summary of the analytical results is as follows:

- ≤ 8'-8" Above Ground Surface – Twelve verification samples were collected within five inches of the caulked joint. Analytical results indicated that PCBs were < 1 ppm in nine of the samples with an average concentration of approximately 0.41 ppm. Analytical results reported PCB concentrations of 1.1, 1.1, and 13 ppm in the other three samples; and
- > 8'-8" Above Ground Surfaces – Nine verification samples were collected at a distance of 2 ½ to 3 ½ inches from the caulked joint (i.e., the end of the first half-row of brick). PCBs were reported at a concentration < 1 ppm in three of the samples collected (total PCBs of 0.21, 0.28, and 0.38 ppm). Analytical results from the remaining six samples indicated that PCBs ranged from 2.1 to 170 ppm.

2.6.2 Caulking Removal

Following the establishment of site controls as described above, caulking and loose or damaged building materials associated with the horizontal and vertical control joints (including those damaged during verification sampling) were removed for off-site disposal as ≥ 50 ppm PCB waste. Following removal, the joints were inspected and additional removal was conducted as necessary prior to application of the encapsulant described below.

Polyethylene Containment on Boom Lift

2.6.3 Encapsulation and Verification Sampling – Materials Formerly In Direct Contact

Following caulking removal, brick materials within the return of the joint (i.e., formerly in direct contact with the caulking) were encapsulated using two coats of Sikagard 62 epoxy. Verification wipe samples were collected from the encapsulated surfaces at a frequency of one sample per 200 l.f. of joint. Analytical results were compared to the target project action level of 1 µg/100cm^2.

A total of 36 initial verification wipe samples were collected for laboratory analysis. Thirty of the samples were reported as non-detect or < 1 µg/100cm^2. At the six locations that exceeded 1 µg/100cm^2, additional liquid coatings were applied to the lengths of joints represented by these samples and follow-up wipe samples collected for analysis. At all locations, the wipe samples following additional coating application reported lower PCB concentrations compared to the initial samples. PCBs were not detected in 5 of the 6 follow-up wipe samples (< 0.2 µg/100cm^2) and at a concentration slightly over the 1 µg/100cm^2 level in one sample (reported at 1.2 µg/100cm^2).

Additional epoxy coats were not applied at this location for the following reasons: the individual concentration of this one sample compared to the target level; the location of this sample (6th floor of the building); all other sample results were less than the target level; and that the epoxy was subsequently covered with new caulking and therefore, this location was not accessible.

The locations of the verification wipe samples are depicted graphically on the Plan Drawings provided in Appendix B. A summary of analytical results is presented on Table 2-3.

2.6.4 Encapsulation and Verification Sampling – Façade Areas Away from the Caulked Joint

Following removal of the caulking and the application of the epoxy coating, two coats of Sikagard 670W clear acrylic coating were applied to brick materials away from the horizontal and vertical control joints in accordance with the PCB Remediation Plan and subsequent submittals, as described in the following sections. As presented in the November 17, 2011 Addendum to the PCB Remediation Plan, the application of the Sikagard 670W ("clear coat") onto the brick façade in areas > 8'-8" above grade was not completed during the 2011 mobilization given the project team concerns over potential long term effects to the brick, aesthetics, and monitoring / maintenance viewpoints. Based on the verification bulk samples, as presented in Section 2.6.1 above, the November Addendum proposed a revision to the Remediation Plan with regard to encapsulation application to these low occupancy areas.

The data collected from above and below the horizontal joints indicated that no representative samples reported PCBs at concentrations > 25 ppm at various distances from the joint; thereby, meeting the low occupancy criteria. Furthermore, the majority of the samples reported PCBs < 1 ppm with a combined average of representative samples calculated at approximately 1.0 ppm (56 samples). As noted previously, an important consideration in this evaluation is that all of the samples were collected while the PCB-containing caulking (with PCB concentrations in the hundreds of thousands parts per million range) was in-place and that currently (and into the future) this material has been removed, former direct contact areas sealed with two coats of an epoxy to seal / encapsulate any residual PCBs, and the joint replaced with new caulking. Given these existing concentrations and that the source of PCBs has been removed with residual PCBs encapsulated, leaching of PCBs at levels to cause adverse impacts to other materials is not anticipated.

Another consideration evaluated was the aesthetics of applying this coating to the horizontal joints throughout the building. Although the Sikagard 670W is a "clear coat," when applied to brick façades, a definite sheen and discoloration is visible. This is not as apparent on concrete masonry surfaces and given the proposed encapsulation areas, the application to the brick façade would result in a "striping" of the building. The visibility of the Sikagard 670W on the vertical joints is not as apparent given their location and position on the building. Testing of other coatings was completed to determine whether other coatings were aesthetically more preferable; however, similar results were observed.

2.6.4.1 Horizontal Control Joints

Based on the results of verification sampling and the evaluation described above, two coats of Sikagard 670W clear acrylic coating were applied to one full row of brick above and three full rows of brick below the horizontal control joints in high occupancy areas (building elevations ≤ 8'-8") to encapsulate PCBs in brick above the 1 ppm cleanup level. Within low occupancy areas (building elevations > 8'-8"), brick materials surrounding horizontal control joints were not encapsulated based on the verification sample results which indicated that PCBs > 25 ppm were not present on the façade away from horizontal joints.

2.6.4.2 Vertical Control Joints

Based on the results of verification sampling described in Section 2.6.1 above, two coats of Sikagard 670W clear acrylic coating were applied to one full row of bricks on either side of the vertical joints (i.e., approximately eight inches) in both high and low occupancy areas.

2.6.4.3 Verification Wipe Sampling

Following application, verification wipe samples were collected from the encapsulated materials at a frequency of one sample per 50 l.f. in high occupancy areas and at a frequency of one sample per 200 l.f. in low occupancy areas. A summary of the analytical results is as follows:

- Horizontal Control Joints – Analytical results indicated that PCBs were either non-detect (two samples at < 0.20 µg/100cm^2) or present at concentrations below the target level of 1.0 µg/100cm^2 (0.30 µg/100cm^2) in the three samples collected.

- Vertical Control Joints – Analytical results were as follows:

    - High Occupancy Areas – Total PCBs were reported as non-detect (2 samples at < 0.20 µg/100cm^2) or at concentrations below the target level of 1.0 µg/100cm^2 (3 samples at 0.45, 0.50, and 0.50 µg/100cm^2) in five of the six samples collected. Analytical results from the sixth sample indicated that PCBs were present at a concentration of 1.8 µg/100cm^2; and

    - Low Occupancy Areas – Total PCBs were reported as non-detect (6 samples at < 0.20 µg/100cm^2) or at concentrations below the target level of 1.0 µg/100cm^2 (3 samples at 0.33, 0.39, and 0.755 µg/100cm^2).

All reported concentrations were at or below the target level that is proposed for continued monitoring in the long term maintenance and monitoring program for the Sylvan Residential Complex. Based on these results, no additional remediation activities are proposed to be conducted for the encapsulation of residual PCBs in brick materials outside the return of the control joints. A summary of the verification wipe sample results is presented on Table 2-4. The locations of the samples are presented in Appendix B.

Additional monitoring of these locations will be conducted as part of the long term monitoring and maintenance program for the entire Sylvan Complex.

3. ADA RESTROOM UPGRADES REMEDY IMPLEMENTATION

As part of the ADA restroom upgrades to the first floor restrooms, caulking within vertical and horizontal joints in restrooms 110 and 113 and in the hallway surrounding the area was to be disturbed during the upgrade project. As part of project planning, characterization samples of the caulking were collected and detected PCBs at concentrations ≥ 50 ppm.

Within the restrooms, approximately 48 l.f. of PCB-containing caulking was identified along the vertical brick wall to structural concrete columns (three eight foot long joints per restroom). In the hallways outside the restrooms, caulking was identified along four vertical joints between the brick walls and the structural concrete columns for approximately 32 l.f. of caulking. Additionally, caulking was identified at the top of the brick hallway walls scheduled to be removed for the installation of the new restroom entrances (approximately 24 l.f. of wall was removed). Characterization samples of brick and mortar collected away from the caulked joints indicated that PCBs were present at concentrations > 1 ppm in masonry materials at a distance of three inches from the caulked joints.

A PCB Remediation Plan for the renovation activities was developed and submitted on May 6, 2011 by ECS and included a summary of the characterization sampling results, the proposed remediation plan for the PCB-containing materials and PCB-impacted building materials to be disturbed during the renovation project, and a verification strategy for implementation. EPA provided comments to the proposed plan in a letter dated June 6, 2011. The comments were addressed in the PCB Project Status Update for the Brown Residence submitted on March 15, 2013.

A summary of the PCB remediation activities conducted, including the results of verification testing, is provided in the following sections.

3.1 SAMPLING AND ANALYTICAL METHODS

Verification samples collected in support of the remediation activities described herein were collected in accordance with generally accepted procedures for environmental sampling. Surface wipe samples were collected using hexane-saturated gauze wipes in accordance with the standard wipe test method under 40 CFR 761.123.

Samples were transferred to Spectrum Analytical, Inc. under standard chain of custody procedures. Samples were extracted using USEPA Method 3540C (Soxhlet extraction) and analyzed for PCBs using USEPA Method 8082.

Summaries of the analytical results are presented on Tables 3-1 and 3-2 and described in the sections below. Locations of the samples are depicted on the figure provided in Appendix B. The complete analytical laboratory reports are provided in Appendix C.

3.2 REMEDY IMPLEMENTATION

Remedial activities were conducted as described in the following sections.

3.2.1 Building Materials Removed

In accordance with the May 2011 PCB Remediation Plan, following removal of the caulking, additional samples of brick and mortar were collected at distances of up to eight inches from the caulked joints in support of a waste segregation cut-line approach for these materials. A summary of the analytical results is presented on Table 3-1. The verification sample locations are presented on a figure provided in Appendix B. Analytical laboratory reports are included in Appendix C.

A summary of the samples collected and the analytical results is as follows:

- Vertical Joints – Samples of brick and mortar were collected in Room 110 and 113 from materials formerly in direct contact with the caulking and at a distance of eight inches from the joints. Analytical results indicated:
    - Brick – Analytical results from the two samples collected of brick formerly in direct contact with the caulked joints indicated that PCBs were present at concentrations > 1 ppm (13.79 and 17.29 ppm). Analytical results from the two samples collected at a distance of eight inches from the former caulked joints indicated that PCBs were non-detect (< 0.077 ppm) and present at a concentration of 0.2 ppm; and
    - Mortar – Analytical results from the two samples collected of mortar formerly in direct contact with the caulked joints indicated that PCBs were present at concentrations of 85.7 and 661 ppm. Analytical results from the two samples collected at a distance of eight inches from the caulked joint indicated that PCBs were present at concentrations of 0.474 and 3.739 ppm.
- Horizontal Joints – Samples of brick and mortar were collected at distances of up to six inches below the horizontal joints within the hallway areas outside the restrooms. Analytical results were as follows:
    - Brick – Two samples of brick were collected at a distance of four inches below the caulked joint. Analytical results indicated that PCBs were non-detect (< 0.239 ppm) and present at a concentration of 0.0912 ppm; and
    - Mortar – Analytical results from the two samples of mortar collected at a distance of three inches from the caulked joint indicated that PCBs were present at concentrations of 31.74 and 44.5 ppm. Analytical results from the two samples collected at a distance of six inches below the caulked joints indicated that PCBs were present at concentrations of 0.353 and 1.975 ppm.

Based on these results, building materials to a minimum distance of eight inches from vertical joints and a minimum distance of six inches below horizontal joints contained PCBs at concentrations > 1 ppm. Due to the overall project schedule which would not support multiple rounds of sampling, the project team decided to remove all brick and mortar materials within the project work area for off-site disposal as a single waste stream with the ≥ 50 ppm PCB containing caulking.

3.2.2 Building Materials Remaining In-Place

As described in the PCB Remediation Plan, the extent of PCB impacts in concrete materials (48 l.f. of joint at four concrete columns [in the restrooms and the hallways outside the restrooms]; and 24 l.f. of joint on the concrete ceiling) in Rooms 110 and 113 and in the hallway areas was not established. As such, the in-place management of these materials was incorporated into the remediation activities through encapsulation with a combination of liquid coatings and other physical barriers as described in the paragraphs below.

One coat of Sikagard 62 liquid epoxy coating was applied to concrete materials formally in direct contact with and to a distance of six inches from the former joint. Following curing, a coat of Sikagard 670W clear acrylic coating was applied over the Sikagard 62 liquid epoxy. Structural concrete surfaces in the restrooms were then covered with drywall as part of the restroom interior finish. Concrete ceilings throughout the work area and structural concrete surfaces within the hallway were coated with a final coat of acrylic latex paint to the first 90-degree angle from the joint. Finally, a bead of silicone caulking was installed over the former caulked joints along the newly installed wall to concrete column and ceiling joints.

Following curing of the caulking on the hallway joints, two verification wipe samples were collected from the hallway area and submitted for PCB analysis. Analytical results indicated that PCBs were non-detect (< 0.20 µg/100cm^2)

and present at a concentration of 0.7 µg/100cm^2. Based on these results and the surface finishes (e.g., drywall or latex paint over Sikagard encapsulation coatings), no additional remediation activities are proposed to be conducted in this area. Additional monitoring of these locations will be conducted as part of the long term maintenance and monitoring program that will be initiated for the entire Sylvan complex.

4. DATA USABILITY ASSESSMENT

This data quality and data usability assessment has been conducted to review the samples collected in support of the remediation and verification activities. Data validation and review was conducted by a third-party validator, Data Check, Inc. of New Durham, New Hampshire. This review included a check of field documentation including sample collection and preservation methods, a check of the laboratory data and documentation, a review of the internal laboratory QA/QC procedures and results including surrogate recoveries, blank results, matrix spike (MS) and matrix spike duplicate (MSD) results, laboratory control standard (LCS) and laboratory control standard duplicate (LCSD) results, an evaluation of sample holding times, and field duplicate results. Data Check's data validation summaries are provided in Appendix C.

A summary of the data usability assessment for the data is presented below:

- All samples were extracted by USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs by USEPA Method 8082.
- Consistent procedures and laboratory analysis of the data were achieved. Sample containers were packed on ice and delivered to the laboratory under standard chain of custody procedures. All samples were received at the laboratory within the acceptable temperature range. All samples were extracted and analyzed within allowable holding times for the method.
- Some samples were analyzed at dilutions due to the concentration of PCBs present in the samples and/or due to sample matrix. Elevated quantitation limits are reported in these samples as a result of the dilutions.
- A total of ten field duplicate samples were collected during the sampling events to assess the precision of the verification sample results. Relative percent difference (RPD) between the primary and associated duplicate samples met the acceptance criteria with the exception of two samples. Results of the primary and duplicate sample results for these samples were estimated based on this evaluation.
- The RPD between sample column results for individual samples were evaluated to assess the precision of the results. The RPD between sample column results were evaluated and determined to be within the acceptance criteria (≤ 25 %) with the exception of eight samples. Analytical results from these samples were estimated based on this evaluation.
- Accuracy of the analytical data was assessed by reviewing the recoveries for MS, MSD, surrogates, LCS, and LCSD. Recoveries were identified outside the acceptance limits for eight of the samples; however, results were not qualified due to only one of the two surrogates being outside acceptance limits (surrogate recoveries) or interferences from other Aroclors and non-detect results (MS/MSD results).
- No analytes were detected in the method blanks or the field blank samples collected during the sampling events.
- The data packages were reviewed to ensure that all sample and associated quality assurance results were available. Results of the completeness review indicated that all collected samples were analyzed and all quality control results were available to complete the data validation process.

Based on this review, the data adequately represents the materials tested, and the samples are considered usable for the purposes of characterizing PCB-affected media and verifying remediation efforts in accordance with 40 CFR Part 761.

5. WASTE STORAGE, DISPOSAL, AND EQUIPMENT DECONTAMINATION

Waste storage and disposal activities were completed in accordance with the procedures described in the PCB Remediation Plans and subsequent submittals. Caulking containing ≥ 50 ppm PCBs and PCB impacted building materials (backer rod, mortar, brick, etc.) scheduled to be removed were managed as a single waste stream and designated as ≥ 50 ppm PCBs. Polyethylene sheeting, PPE, and other disposable equipment and tools were also managed as ≥ 50ppm PCB wastes within the same waste stream.

Following use, non-disposable equipment and tools were decontaminated using a double wipe with diesel soaked rags following gross removal of any dust or debris. Decontamination materials were managed for off-site disposal as ≥ 50 ppm PCB waste. No free liquids were generated during the remediation project.

Wastes generated during the project were collected in secured, lined and covered roll-off waste containers in accordance with 40 CFR 761.65. These containers were properly labeled and marked in accordance with 40 CFR 761.40.

A total of 24.6 tons of material in three roll-offs were shipped off-site as ≥ 50 ppm PCB wastes for disposal at Environmental Quality's Wayne Disposal Landfill in Belleville, Michigan.

Copies of PCB waste shipment records including manifests and certificates of disposal are provided in Appendix D.

6. SUMMARY AND CONCLUSIONS

The PCB remediation activities described in this Completion Report have been completed in accordance with the PCB Remediation Plans and subsequent communications with EPA.

The work completed included the segregation via bulk verification testing with subsequent removal and off-site disposal of approximately 25 tons of bulk PCB waste (caulking, brick and other building materials, poly sheeting, etc.) contained in three roll-off containers. The containers were transported for off-site disposal as ≥ 50 ppm PCB waste at Environmental Quality's Wayne Disposal Landfill in Belleville, Michigan.

In addition, the work included the encapsulation of building materials scheduled to remain in place containing PCBs at concentrations above high or low occupancy clean up levels, as applicable, using a combination of liquid coatings and physical barriers (e.g., drywall and door frames). Encapsulated materials requiring subsequent long term monitoring and maintenance are as follows:

- Exterior Brick at Horizontal Control Joints (4,107 l.f.) – Brick materials formerly in direct contact with caulking on all elevations and brick materials away from the joints in high occupancy areas;
- Exterior Brick at Vertical Control Joints (1,910 l.f.) – Brick materials formerly in direct contact with and away from the joints in high and low occupancy areas;
- Interior Structural Concrete Columns (96 s.f.) – Structural concrete column materials within the ADA restroom upgrade project work area; and
- Interior Concrete Ceilings (120 s.f.) – Concrete ceiling materials within the ADA restroom upgrade project work area.

PCB impacted materials that are to be managed in-place will be incorporated into a single Long Term Monitoring and Maintenance Plan for all three buildings within the Sylvan Residential Complex. The plan is being submitted under a separate cover.

As presented in previous submittals, the proposed plan to address any impacted ground surfaces adjacent to the Sylvan Residential Area buildings is to assess and remediate, if necessary, surfaces adjacent to the three buildings as a single event. At this time, it is anticipated that the characterization / assessment will be conducted during the next Summer break session (May - August 2014) with plan preparation and submittals, as needed in the Fall/Winter of 2014. Following the overall work schedule and to allow time for plan review, any remediation, if required, would be conducted during the following break session (May - August 2015).

Table 2-1
Summary of Parapet Wall Verification Sampling Results

Brown Residence - UMass
Amherst, Massachusetts

Joint		Sample Location	Building Elevation	Sample ID	Sample Date	Total PCBs (mg/kg)
Parapet Wall Cap Joint	Penthouse Parapet (210 l.f.)	1st row brick below soldier brick	N. Penthouse, west	BR-VBB-001	5/17/2011	<0.087
			N. Penthouse, east	BR-VBB-006	5/18/2011	<0.10
			S. Penthouse, west	BR-VBB-007	5/18/2011	<0.10
			S. Penthouse, east	BR-VBB-008	5/18/2011	0.2
			Mech. Penthouse, west	BR-VBB-009	5/18/2011	<0.10
	Building Parapet (750 l.f.)	1st row brick below soldier brick	North	BR-VBB-032	5/27/2011	<0.095
				BR-VBB-033	5/27/2011	<0.091
			East	BR-VBB-034	5/27/2011	<0.10
				BR-VBB-035	5/27/2011	0.13
				BR-VBB-038	5/27/2011	<0.10
				BR-VBB-042	5/27/2011	<0.095
				BR-VBB-044	5/27/2011	<0.10
				BR-VBB-046	5/27/2011	<0.095
			South	BR-VBB-049	5/27/2011	<0.10
				BR-VBB-051	6/1/2011	<0.091
			West	BR-VBB-090	6/24/2011	<0.10
				BR-VBB-093	6/24/2011	<0.095
				BR-VBB-096	6/24/2011	<0.095
				BR-VBB-098	6/24/2011	<0.10
				BR-VBB-102	6/24/2011	<0.091
				BR-VBB-104	6/24/2011	<0.091
Parapet Wall Control Joint (base of wall)	Parapet Wall (750 l.f.)	2nd row of brick above joint	North	BR-VBB-027	5/26/2011	0.26
				BR-VBB-029	5/26/2011	0.31
			East	BR-VBB-031	5/26/2011	0.26
				BR-VBB-036	5/27/2011	<0.095
				BR-VBB-041	5/27/2011	0.14
				BR-VBB-043	5/27/2011	0.16
				BR-VBB-045	5/27/2011	0.32
				BR-VBB-047	5/27/2011	0.67
			South	BR-VBB-050	5/27/2011	0.24
				BR-VBB-052	6/1/2011	<0.091
			West	BR-VBB-017	5/24/2011	0.35
				BR-VBB-091	6/24/2011	<0.095
				BR-VBB-094	6/24/2011	<0.095
				BR-VBB-097	6/24/2011	<0.10
				BR-VBB-101	6/24/2011	0.15
				BR-VBB-103	6/24/2011	0.11
				BR-VBB-105	6/24/2011	<0.091
Parapet Wall Vertical Control Joint	Inside Parapet Vertical (60 l.f.)	just past mortar of first half brick (4.5-5.5 inches)	East	BR-VBB-086	6/8/2011	0.28
				BR-VBB-087	6/8/2011	0.18
			West	BR-VBB-107	6/24/2011	0.26
				BR-VBB-108	6/24/2011	0.61
			North	BR-VBB-088	6/8/2011	0.46
			South	BR-VBB-089	6/8/2011	0.31
	Exterior Parapet Wall (140 l.f.)	just past mortar of first half brick (4.5-5.5 inches)	South	BR-VBB-053	6/1/2011	0.21
			East	BR-VBB-054	6/1/2011	0.28
			West	BR-VBB-092	6/24/2011	0.64

Notes:
All samples extracted via method 3540C (Soxhlet Extraction) and analyzed via USEPA 8082.
All PCBs reported as Aroclor 1254. No other Aroclors reported at concentrations greater than the minimum laboratory reporting limits.

Table 2-2
Summary of Control Joint Verification Sampling Results

Brown Residence - UMass
Amherst, Massachusetts

Joint	Sample Location	Building Elevation	Sample ID	Sample Date	Total PCBs (mg/kg)
Horizontal Control Joint (> 8' 8")	1st row of brick above joint (top of brick) (1.5 to 2.5 inches)	North	BR-CBB-010	2/3/2011	0.85
			BR-VBB-010	5/23/2011	<0.091
		West	BR-VBB-015	5/24/2011	1.4
			BR-VBB-019	5/24/2011	0.35 J
			BR-VBB-023	5/24/2011	2.4
			BR-VBB-055	6/1/2011	<0.10
			BR-VBB-057	6/1/2011	0.53
			BR-VBB-061	6/1/2011	0.12
			BR-VBB-064	6/3/2011	0.49
			BR-VBB-067	6/3/2011	1.1
			BR-VBB-069	6/3/2011	0.43
			BR-VBB-071	6/3/2011	0.37
		East	BR-VBB-109	6/29/2011	0.34
			BR-VBB-112	6/29/2011	0.18
			BR-VBB-114	6/29/2011	0.77
			BR-VBB-117	6/29/2011	0.11
			BR-VBB-121	6/29/2011	3.7
			BR-VBB-123	6/29/2011	0.57
			BR-VBB-125	6/29/2011	1.5
			BR-VBB-128	6/30/2011	1.1
			BR-VBB-130	6/30/2011	0.43
	1st row of brick below joint (2 to 3 inches)	East	BR-CBB-013	2/3/2011	4.1
	3rd row of brick below joint (6.5 to 7.5 inches) bottom of brick	West	BR-VBB-016	5/24/2011	0.73
			BR-VBB-018	5/24/2011	0.13
			BR-VBB-022	5/24/2011	0.67
			BR-VBB-024	5/24/2011	0.35
			BR-VBB-056	6/1/2011	0.95
			BR-VBB-058	6/1/2011	0.14
			BR-VBB-062	6/1/2011	<0.091
			BR-VBB-065	6/3/2011	0.8J
			BR-VBB-068	6/3/2011	0.33
			BR-VBB-070	6/3/2011	0.56J
			BR-VBB-072	6/3/2011	0.6
			BR-VBB-095	6/24/2011	<0.091
			BR-VBB-106	6/24/2011	<0.095
		East	BR-CBB-014	2/3/2011	20
			BR-VBB-037	5/27/2011	<0.091
			BR-VBB-048	5/27/2011	3.8
			BR-VBB-110	6/29/2011	0.36
			BR-VBB-113	6/29/2011	<0.095
			BR-VBB-115	6/29/2011	0.39
			BR-VBB-118	6/29/2011	0.1
			BR-VBB-122	6/29/2011	0.34
			BR-VBB-124	6/29/2011	2.0
			BR-VBB-126	6/29/2011	0.30
			BR-VBB-129	6/30/2011	0.33
			BR-VBB-131	6/30/2011	0.38
	4th row of brick below joint (7.5 to 8.5 inches)	North	BR-CBB-004	2/3/2011	< 0.087

Table 2-2
Summary of Control Joint Verification Sampling Results

Brown Residence - UMass
Amherst, Massachusetts

Joint	Sample Location	Building Elevation	Sample ID	Sample Date	Total PCBs (mg/kg)
Horizontal control joint (< 8' 8")	1st row of brick above joint (top of brick) (1.5 to 2.5 inches)	North	BR-CBB-020	2/3/2011	0.32
		East	BR-VBB-075	6/6/2011	0.41
			BR-VBB-081	6/6/2011	0.21
		West	BR-VBB-084	6/6/2011	0.27
	1st row of brick below joint (1.5 to 2.5 inches)	South	BR-CBB-023	2/3/2011	0.18
	3rd row of brick below joint (6.0 to 7.5 inches) bottom of brick	South	BR-CBB-024	2/3/2011	0.23
		East	BR-VBB-076	6/6/2011	0.15
			BR-VBB-082	6/6/2011	0.28
		West	BR-VBB-085	6/6/2011	1.2J
Vertical control joint (> 8' 8")	Half brick adjacent to joint (2.5 to 3.5 inches)	West	BR-VBB-025	5/24/2011	19
			BR-VBB-066	6/3/2011	33
			BR-VBB-063	6/1/2011	0.38
		East	BR-VBB-054	6/1/2011	0.28
			BR-VBB-111	6/29/2011	2.1
			BR-VBB-116	6/29/2011	3.1
			BR-VBB-127	6/30/2011	83
			BR-VBB-132	6/30/2011	170
		South	BR-VBB-053	6/1/2011	0.21
Vertical control joint (< 8' 8")	Half brick adjacent to joint (1.5 to 2 inches)	East	BR-CBB-016	2/3/2011	1.1
		South	BR-CBB-026	2/3/2011	13
		West	BR-CBB-030	2/3/2011	0.92
	Half brick adjacent to joint (2.5 to 3.5 inches)	West	BR-VBB-013	5/24/2011	0.21
			BR-VBB-014	5/24/2011	0.31
		North	BR-VBB-074	6/6/2011	1.1J
		East	BR-VBB-077	6/6/2011	0.23
			BR-VBB-078	6/6/2011	0.34J
		South	BR-VBB-083	6/6/2011	0.94J
	Half brick adjacent to joint (4 to 5 inches)	East	BR-CBB-015	2/3/2011	0.19
		South	BR-CBB-027	2/3/2011	0.3
		West	BR-CBB-031	2/3/2011	0.28

Notes:
All samples submitted for PCB analysis were extracted via USEPA 3540C (Soxhlet Extraction) and analyzed via USEPA method 8082.
Total PCBs reported as Aroclor 1248 and 1254. All other Aroclors reported at concentrations below the minimum laboratory reporting limit.
J = Analytical results qualified as estimated based on data validation. See Appendix C for additional information.

Table 2-3
Summary of Epoxy Coating Verification Wipe Sampling Results

Brown Residence - UMass
Amherst, Massachusetts

Initial Sample ID	Building Elevation	Joint Type	Sample Date	Total PCBs (µg/100cm^2)	Follow Up Sample ID	Sample Date	Total PCBs (µg/100cm^2)
BR-VWB-143	West	Vertical	7/18/2011	**1.44**	BR-VWB-167	8/5/2011	< 0.20
BR-VWB-145		Vertical	7/18/2011	**1.61**	BR-VWB-166	8/5/2011	< 0.20
BR-VWB-147		Vertical	7/18/2011	**2.72**	BR-VWB-168	8/5/2011	**1.2**
BR-VWB-149		Vertical	7/18/2011	**3.80**	BR-VWB-169	8/5/2011	< 0.20
BR-VWB-151		Vertical	7/18/2011	<0.20	BR-VWB-175	8/8/2011	< 0.20
BR-VWB-153		Vertical	7/18/2011	<0.20	N/A	- -	- -
BR-VWB-137		Horizontal	7/18/2011	<0.20	N/A	- -	- -
BR-VWB-138		Horizontal	7/18/2011	0.71 J	N/A	- -	- -
BR-VWB-140		Horizontal	7/18/2011	<0.20	N/A	- -	- -
BR-VWB-141		Horizontal	7/18/2011	<0.20	N/A	- -	- -
BR-VWB-142		Horizontal	7/18/2011	<0.20	N/A	- -	- -
BR-VWB-144		Horizontal	7/18/2011	<0.20	N/A	- -	- -
BR-VWB-146		Horizontal	7/18/2011	0.33	N/A	- -	- -
BR-VWB-148		Horizontal	7/18/2011	0.92	N/A	- -	- -
BR-VWB-150		Horizontal	7/18/2011	<0.20	N/A	- -	- -
BR-VWB-152		Horizontal	7/18/2011	<0.20	N/A	- -	- -
BR-VWB-133		Horizontal	7/7/2011	0.41	BR-VWB-155	7/28/2011	< 0.20
BR-VWB-134		Horizontal	7/7/2011	**15**	BR-VWB-156	7/28/2011	< 0.20
BR-VWB-135	East	Horizontal	7/7/2011	<0.20	BR-VWB-137	7/18/2011	< 0.20
BR-VWB-136		Horizontal	7/7/2011	**1.4**	BR-VWB-158	7/28/2011	< 0.20
BR-VWB-154		Horizontal	7/18/2011	<0.20	N/A	- -	- -
BR-VWS-160		Horizontal	7/29/2011	0.3	N/A	- -	- -
BR-VWS-161		Vertical	7/29/2011	<0.20	N/A	- -	- -
BR-VWS-162		Horizontal	7/29/2011	0.58	N/A	- -	- -
BR-VWS-163		Vertical	7/29/2011	<0.20	N/A	- -	- -
BR-VWS-165		Horizontal	7/29/2011	0.24J	N/A	- -	- -
BR-VWS-170		Vertical	8/5/2011	0.37	N/A	- -	- -
BR-VWS-171		Horizontal	8/5/2011	<0.20	N/A	- -	- -
BR-VWS-172		Horizontal	8/5/2011	<0.20	N/A	- -	- -
BR-VWS-173		Horizontal	8/5/2011	<0.20	N/A	- -	- -
BR-VWS-174		Horizontal	8/5/2011	<0.20	N/A	- -	- -
BR-VWS-176		Horizontal	8/8/2011	0.24	N/A	- -	- -
BR-VWS-177		Horizontal	8/8/2011	<0.20	N/A	- -	- -
BR-VWS-178		Vertical	8/10/2011	<0.20	N/A	- -	- -
BR-VWS-180		Vertical	8/10/2011	<0.20	N/A	- -	- -
BR-VWS-181		Vertical	8/10/2011	<0.20	N/A	- -	- -

Notes:
Verification wipe samples collected from surfaces of encapsulated materials in accordance with 40 CFR 761.123.
All samples submitted for PCB analysis were extracted via USEPA 3540C (Soxhlet Extraction) and analyzed via USEPA method 8082.
Total PCBs reported as Aroclor 1248 and/or 1254. All other Aroclors reported at concentrations below the minimum laboratory reporting limits.
Shaded/bold results indicate total PCBs > 1 µg/100cm^2.
Follow up samples collected after application of additional encapsulants.
N/A = Not Applicable
J = Analytical results qualified as estimated based on data validation. Additional information is provided in Appendix C.

Table 2-4
Summary of Clear Coating Verification Wipe Sampling Results

Brown Residence - UMass
Amherst, Massachusetts

Category	Occupancy	Façade	Sample ID	Sample Date	Total PCBs (mg/kg)
Horizontal Control Joints					
Clear Coat Wipe Samples (1 per 50 l.f.)	High (135 l.f.) 4 samples	East	BR-VWB-188	11/11/2011	< 0.20
			BR-VWB-189	11/11/2011	0.30
		South	BR-VWB-187	11/11/2011	< 0.20
Vertical Control Joints					
Clear Coat Wipe Samples (1 per 50 l.f.)	High (278 l.f.) 6 samples	East	BR-VWB-182	11/11/2011	< 0.20
			BR-VWB-185	11/11/2011	0.45
			BR-VWB-186	11/11/2011	0.50
			BR-VWB-190	11/11/2011	**1.8**
		West	BR-VWB-183	11/11/2011	0.50
			BR-VWB-184	11/11/2011	< 0.20
Clear Coat Wipe Samples (1 per 200 l.f.)	Low (1,632 l.f.) 9 samples	East	BR-VWB-500	11/11/2013	0.33
			BR-VWB-501	11/11/2013	< 0.20
			BR-VWB-502	11/11/2013	0.39
		North	BR-VWB-503	11/11/2013	< 0.20
		West	BR-VWB-504	11/11/2013	< 0.20
			BR-VWB-505	11/11/2013	< 0.20
			BR-VWB-506	11/11/2013	< 0.20
		South	BR-VWB-507	11/11/2013	< 0.20
			BR-VWB-508	11/11/2013	0.75

Notes:
Verification samples collected in accordance with the standard wipe test procedures of 40 CFR 761.123.
Samples extracted via method 3540C (Soxhlet Extraction) and analyzed for PCBS via USEPA method 8082.
PCBs reported as Aroclor 1254 and/or Aroclor 1260. No other Aroclors reported above the minimum laboratory reporting limit.
J = Analytical results qualified as estimated based on data validation. Additional information presented in Appendix C.

Table 3-1
Summary of Bulk Verification Sampling Results
ADA Restroom Upgrade

Brown Residence - UMass
Amherst, Massachusetts

Building Materials	Location	Distance from Joint (inches)	Sample Date	Sample ID	Total PCBs (ppm)
Vertical Brick Wall to Concrete Column Joints - Restroom					
Brick	Room 113	0	6/20/2011	PCB-Bulk-02	13.40
	Room 110	0	6/20/2011	PCB-Bulk-04	17.30
	Room 113	8	6/27/2011	PCB-Bulk-12	< 0.077
	Room 110	8	6/27/2011	PCB-Bulk-14	0.20
Mortar	Room 113	0	6/20/2011	PCB-Bulk-03	85.7
	Rom 110	0	6/20/2011	PCB-Bulk-05	661
	Room 113	8	6/27/2011	PCB-Bulk-11	0.474
	Room 110	8	6/27/2011	PCB-Bulk-13	3.74
Horizontal Brick Wall to Concrete Ceiling Joints - Hallway					
Brick	Outside Kitchen	4	6/27/2011	PCB-Bulk-08	0.0912
	Vending Area	4	6/27/2011	PCB-Bulk-10	< 0.239
Mortar	Outside Kitchen	3	6/20/2011	PCB-Bulk-01	31.70
	Vending Area	3	6/20/2011	PCB-Bulk-06	44.500
	Outside Kitchen	6	6/27/2011	PCB-Bulk-07	0.353
	Vending Area	6	6/27/2011	PCB-Bulk-09	1.98

Notes:
1. Samples submitted to Spectrum Analytical Inc. for Soxhlet extraction (method 3540C) and analyzed for PCBs by EPA method 8082.
2. Total PCBs reported as Aroclor 1254 and/or Aroclor 1260. No other Aroclor reported at concentrations above the minimum laboratory reporting limits.

Table 3-2
Summary of Verification Wipe Sampling Results
ADA Restroom Upgrade

Brown Residence - UMass
Amherst, Massachusetts

Building Materials	Location	Distance from Joint (inches)	Sample Date	Sample ID	Total PCBs ($\mu g/100cm^2$)
Post-Encapsulation Verification Wipes					
Caulking	Hallway	0	7/7/2011	Caulking-Wipe-01	0.70
	Hallway	0	7/7/2011	Caulking-Wipe-02	< 0.20

Notes:
1. Verification wipe samples collected in accordance with the standard wipe test procedure of 40 CFR 761.123.
2. Samples submitted to Spectrum Analytical Inc. for Soxhlet extraction (method 3540C) and analyzed for PCBs by EPA method 8082.
3. Total PCBs reported as Aroclor 1254. No other Aroclor reported at concentrations above the minimum laboratory reporting limits.

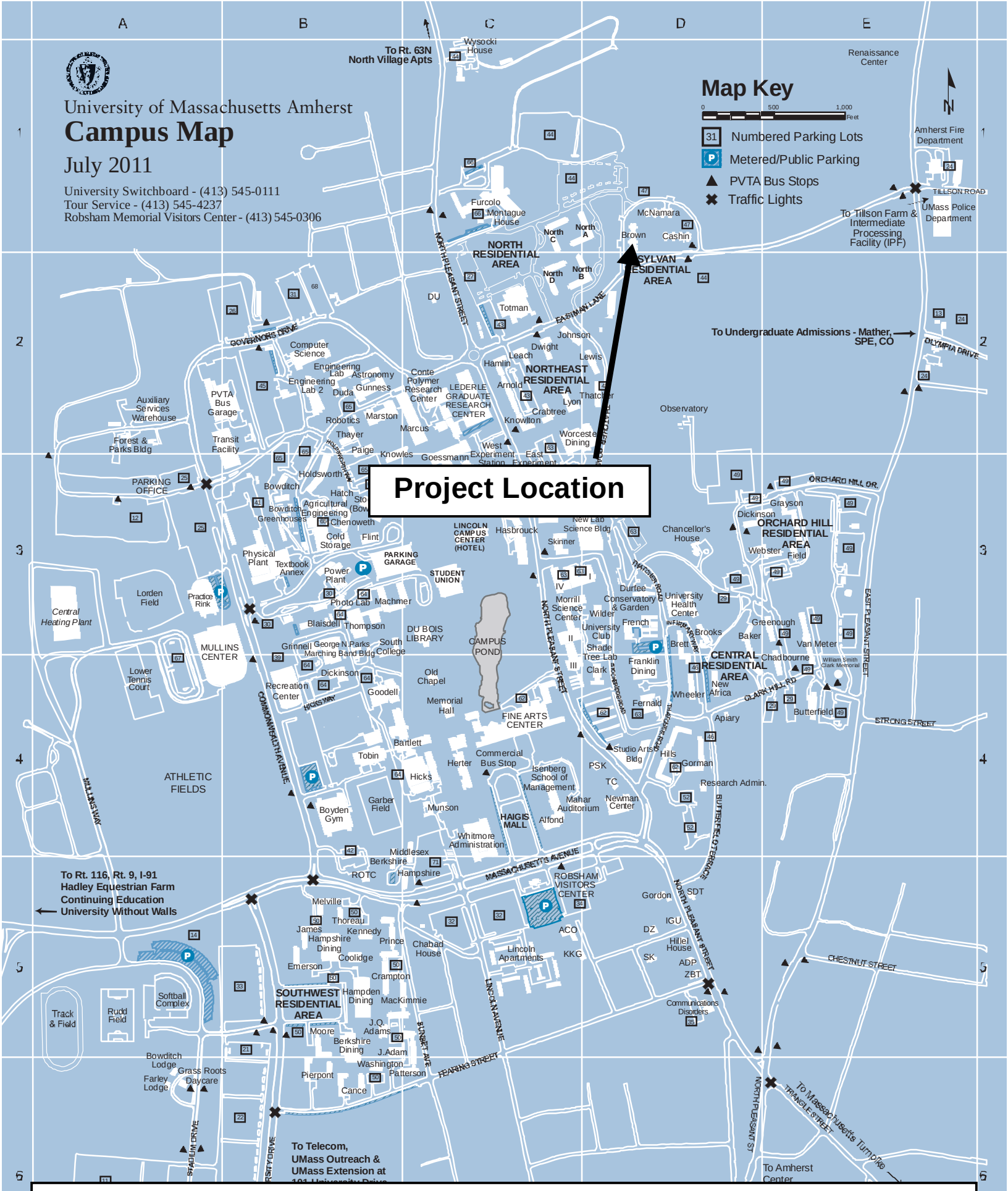


Figure 1-1 Site Location Map

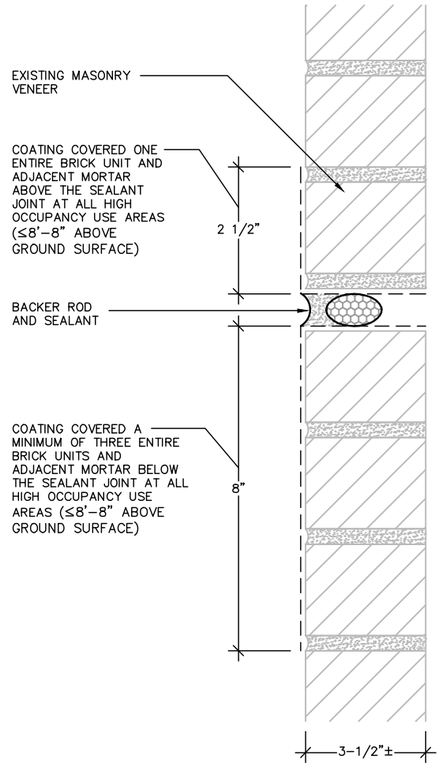
TYPICAL HORIZONTAL CONTROL JOINT

SCALE: NOT TO SCALE

FIRST FLOOR LOCATIONS
(≤ 8' 8" ABOVE GROUND SURFACE)
(HIGH OCCUPANCY USE)

Analytical Testing Results		
Above Horizontal Control Joints		
Distance Above Joint (inches)	Sample ID	Total PCBs (ppm)
1 - 1 1/2	BR-CBB-020	0.32
1 - 1 1/2	BR-VBB-075	0.41
1 - 1 1/2	BR-VBB-081	0.21
1 - 1 1/2	BR-VBB-084	0.27
Linear Footage: 135 l.f.		
1/8 - 1/2	BR-CBB-019	580*

Analytical Testing Results		
Below Horizontal Control Joints		
Distance Below Joint (inches)	Sample ID	Total PCBs (ppm)
1 1/2 - 2 1/2	BR-CBB-023	0.18
6.5 - 7.5	BR-VBB-076	0.15
6.5 - 7.5	BR-VBB-082	0.28
6.5 - 7.5	BR-VBB-085	1.2
6 - 7	BR-CBB-024	0.23
Linear Footage: 135 l.f.		
1/8 - 1/2	BR-CBB-022	2.5*



UPPER FLOOR LOCATIONS
(> 8' 8" ABOVE GROUND SURFACE)
(LOW OCCUPANCY USE)

Analytical Testing Results		
Above Horizontal Control Joints		
Distance Above Joint (inches)	Sample ID	Total PCBs (ppm)
1 - 1 1/2	BR-CBB-010	0.85
1 1/2 - 2 1/2	BR-VBB-010	<0.91
1 1/2 - 2 1/2	BR-VBB-015	1.4
1 1/2 - 2 1/2	BR-VBB-019	0.35
1 1/2 - 2 1/2	BR-VBB-023	2.4
1 1/2 - 2 1/2	BR-VBB-055	<0.1
1 1/2 - 2 1/2	BR-VBB-057	0.53
1 1/2 - 2 1/2	BR-VBB-061	0.12
1 1/2 - 2 1/2	BR-VBB-064	0.49
1 1/2 - 2 1/2	BR-VBB-067	1.1
1 1/2 - 2 1/2	BR-VBB-069	0.43
1 1/2 - 2 1/2	BR-VBB-071	0.37
1 1/2 - 2 1/2	BR-VBB-109	0.34
1 1/2 - 2 1/2	BR-VBB-112	0.18
1 1/2 - 2 1/2	BR-VBB-114	0.77
1 1/2 - 2 1/2	BR-VBB-117	0.11
1 1/2 - 2 1/2	BR-VBB-121	3.7
1 1/2 - 2 1/2	BR-VBB-123	0.57
1 1/2 - 2 1/2	BR-VBB-125	1.5
1 1/2 - 2 1/2	BR-VBB-128	1.1
1 1/2 - 2 1/2	BR-VBB-130	0.43
Linear Footage: 3,972 l.f.		
1/8 - 1/2	BR-CBB-009	17*

Analytical Testing Results		
Below Horizontal Control Joints		
Distance Below Joint (inches)	Sample ID	Total PCBs (ppm)
2 - 3	BR-CBB-013	4.1
6 - 7	BR-CBB-014	20
6.5 - 7.5	BR-VBB-016	0.73
6.5 - 7.5	BR-VBB-018	0.13
6.5 - 7.5	BR-VBB-022	0.67
6.5 - 7.5	BR-VBB-024	0.35
6.5 - 7.5	BR-VBB-037	<0.091
6.5 - 7.5	BR-VBB-048	3.8
6.5 - 7.5	BR-VBB-056	0.95
6.5 - 7.5	BR-VBB-058	0.14
6.5 - 7.5	BR-VBB-062	<0.09
6.5 - 7.5	BR-VBB-065	0.8
6.5 - 7.5	BR-VBB-068	0.33
6.5 - 7.5	BR-VBB-070	0.56
6.5 - 7.5	BR-VBB-072	0.6
6.5-7.5	BR-VBB-095	<0.091
6.5-7.5	BR-VBB-106	<0.095
6.5 - 7.5	BR-VBB-110	0.36
6.5 - 7.5	BR-VBB-113	<0.095
6.5 - 7.5	BR-VBB-115	0.39
6.5 - 7.5	BR-VBB-118	0.1
6.5 - 7.5	BR-VBB-122	0.34
6.5 - 7.5	BR-VBB-124	2.0
6.5 - 7.5	BR-VBB-126	0.30
6.5-7.5	BR-VBB-129	0.33
6.5-7.5	BR-VBB-131	0.38
7.5 - 8.5	BR-CBB-004	<0.087
Linear Footage: 4,722 l.f.		
1/8 - 1/2	BR-CBB-012	2.7*

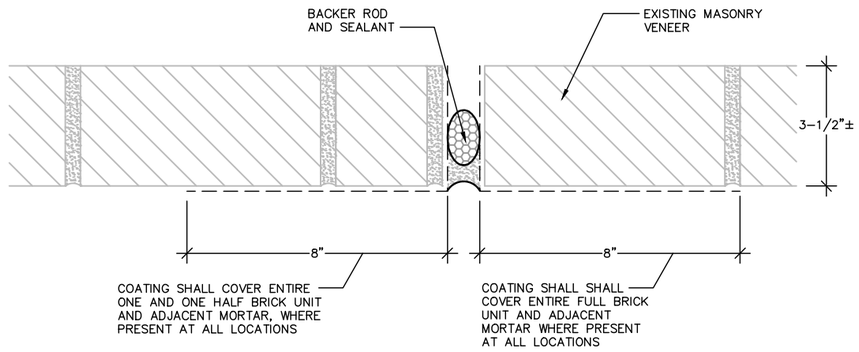
* SAMPLE DEEMED NOT REPRESENTATIVE GIVEN POTENTIAL CROSS CONTAMINATION FROM EXISTING PCB CAULKING.

NOTES:

1. VERIFICATION SAMPLES COLLECTED AT A FREQUENCY OF 1 SAMPLE PER 200 LINEAR FEET OF CAULKED JOINT AT UPPER FLOOR LOCATIONS (>8' 8" ABOVE GROUND SURFACE) AND AT A FREQUENCY OF 1 SAMPLE PER 50 LINEAR FEET OF CAULKED JOINT AT FIRST FLOOR LOCATIONS.
2. THE NUMBER OF SAMPLES COLLECTED ABOVE HORIZONTAL CONTROL JOINTS >8'–8" ABOVE GROUND SURFACE IS BASED ON A TOTAL OF 3,972 LINEAR FEET OF HORIZONTAL JOINTS BECAUSE THE MATERIALS ABOVE THE PARAPET WALL CONTROL JOINT WERE SAMPLED FOR WASTE SEGREGATION AT A FREQUENCY OF 1 SAMPLE PER 50 LINEAR FEET. THESE RESULTS ARE NOT INCLUDED ON THIS FIGURE.

TYPICAL VERTICAL CONTROL JOINT (PLAN)

SCALE: NOT TO SCALE



FIRST FLOOR LOCATIONS
(≤ 8' 8" ABOVE GROUND SURFACE)
(HIGH OCCUPANCY USE)

Analytical Testing Results		
Vertical Control Joints		
Distance From Joint (inches)	Sample ID	Total PCBs (ppm)
1 1/2 - 2	BR-CBB-016	1.1
1 1/2 - 2	BR-CBB-026	13
1 1/2 - 2	BR-CBB-030	0.92
2 1/2 - 3 1/2	BR-VBB-013	0.21
2 1/2 - 3 1/2	BR-VBB-014	0.31
2 1/2 - 3 1/2	BR-VBB-074	1.1
2 1/2 - 3 1/2	BR-VBB-077	0.23
2 1/2 - 3 1/2	BR-VBB-078	0.34
2 1/2 - 3 1/2	BR-VBB-083	0.94
4 - 5	BR-CBB-015	0.19
4 - 5	BR-CBB-027	0.30
4 - 5	BR-CBB-031	0.28
Linear Footage: 278 l.f.		
1/8 - 1/2	BR-CBB-017	21*
1/8 - 1/2	BR-CBB-025	46*
1/8 - 1/2	BR-CBB-029	5400*

UPPER FLOOR LOCATIONS
(> 8' 8" ABOVE GROUND SURFACE)
(LOW OCCUPANCY USE)

Analytical Testing Results		
Vertical Control Joints		
Distance From Joint (inches)	Sample ID	Total PCBs (ppm)
2 1/2 - 3 1/2	BR-VBB-025	19
2 1/2 - 3 1/2	BR-VBB-063	0.38
2 1/2 - 3 1/2	BR-VBB-066	33
2 1/2 - 3 1/2	BR-VBB-111	2.1
2 1/2 - 3 1/2	BR-VBB-116	3.1
2 1/2 - 3 1/2	BR-VBB-127	83
2 1/2 - 3 1/2	BR-VBB-132	170
Linear Footage: 1,632 l.f.		

* SAMPLE DEEMED NOT REPRESENTATIVE GIVEN POTENTIAL CROSS CONTAMINATION FROM EXISTING PCB CAULKING.

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SUMMARY OF BRICK SAMPLING RESULTS VERTICAL AND HORIZONTAL CONTROL JOINTS

DESIGNED BY: GJF | CHECKED BY: JAH
DRAWN BY: EVR | Figure 2–1.dwg

UNIVERSITY OF MASSACHUSETTS
FACILITIES AND CAMPUS PLANNING DIV.
BROWN RESIDENCE HALL

PCB REMEDIATION COMPLETION REPORT

JOB NO: 224166
DATE: FEBRUARY 2012
SCALE: AS NOTED

FIGURE 2-1

\\ANDOVER\Projects\224166 UMass Amherst – Sylvan Residential PCBs\wip\Drawings\Status Report\Figure 2–1.dwg

APPENDIX A: DUST MONITORING LOGS

Air Monitoring for the week: 5/16/11-5/20/11

Date: 5/19/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
1040	Background	Parking lot enterance	0.006	Misty	Caulking Removal
	Point A	Midpoint W. Side of Building	0.004		
	Point B	SWZ SW Corner of Building	0.008		
	Point C	Eastman Lane Exit	0.001		
1415	Background	Parking lot enterance	0.009	Misty	Caulking Removal
	Point A	Midpoint W. Side of Building	0.006		
	Point B	SWZ SW Corner of Building	0.011		
	Point C	Eastman Lane Exit	0.01		

Date: 5/20/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
930	Background	Parking lot enterance	0.002	Misty	Caulking Removal
	Point A	Midpoint W. Side of Building	0.004		
	Point B	SWZ SW Corner of Building	0.009		
	Point C	Eastman Lane Exit	0.001		
1130	Background	Parking lot enterance	0.001	Misty	Car Drove by, next reading 0.009
	Point A	Midpoint W. Side of Building	0.058		
	Point B	SWZ SW Corner of Building	0.026		
	Point C	Eastman Lane Exit	0.002		
1330	Background	Parking lot enterance	0.002	Misty	Trimming Trees Caulking Removal
	Point A	Midpoint W. Side of Building	0.023		
	Point B	SWZ SW Corner of Building	0.046		
	Point C	Eastman Lane Exit	0.002		

Project action level: 0.1 mg/m^3 above background

Air Monitoring for the week: 5/23/11-5/27/11

Date: 5/23/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
900	Background	Parking lot enterance	0.002	Misty	Trying the new hammer drill method…
	Point A	Midpoint W. Side of Building	0.005		
	Point B	SWZ SW Corner of Building	0.001		
	Point C	Eastman Lane Exit	0.002		
1130	Background	Parking lot enterance	0.002	Misty	Caulking Removal
	Point A	Midpoint W. Side of Building	0.010		
	Point B	SWZ SW Corner of Building	0.021		
	Point C	Eastman Lane Exit	0.006		
1330	Background	Parking lot enterance	0.007	Misty	Scaffolding Work Generating dust at N end
	Point A	Midpoint W. Side of Building	0.000		
	Point B	SWZ SW Corner of Building	0.001		Caulking Removal
	Point C	Eastman Lane Exit	0.000		

Date: 5/24/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
800	Background	Parking lot enterance	0.024	Cloudy/Windy	Caulking Removal
	Point A	Midpoint W. Side of Building	0.007		
	Point B	SWZ SW Corner of Building	0.026		
	Point C	Eastman Lane Exit	0.010		
1000	Background	Parking lot enterance	0.011	Cloudy	Caulking Removal
	Point A	Midpoint W. Side of Building	0.010		
	Point B	SWZ SW Corner of Building	0.019		
	Point C	Eastman Lane Exit	0.004		
1200	Background	Parking lot enterance	0.006	Cloudy	Caulking Removal
	Point A	Midpoint W. Side of Building	0.004		
	Point B	SWZ SW Corner of Building	0.009		
	Point C	Eastman Lane Exit	0.004		
1400	Background	Parking lot enterance	0.006	Cloudy	Caulking Removal
	Point A	Midpoint W. Side of Building	0.000		
	Point B	SWZ SW Corner of Building	0.010		
	Point C	Eastman Lane Exit	0.011		

Date: 5/25/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
915	Background	Parking lot enterance	0.004	Sunny	
	Point A	Midpoint W. Side of Building	0.000		Caulking Removal
	Point B	SWZ SW Corner of Building	0.008		Caulking Removal
	Point C	Eastman Lane Exit	0.002		
1115	Background	Parking lot enterance	0.007	Sunny	Caulking Removal
	Point A	Midpoint W. Side of Building	0.012		
	Point B	SWZ SW Corner of Building	0.032		
	Point C	Eastman Lane Exit	0.004		
1315	Background	Parking lot enterance	0.006	Sunny	Caulking Removal
	Point A	Midpoint W. Side of Building	0.002		
	Point B	SWZ SW Corner of Building	0.000		
	Point C	Eastman Lane Exit	0.001		

Date: 5/26/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
945	Background	Parking lot enterance	0.006	Cloudy	
	Point A	Midpoint W. Side of Building	0.032		Caulking removal
	Point B	SWZ SW Corner of Building	0.041		Caulking removal
	Point C	Eastman Lane Exit	0.004		
1120	Background	Parking lot enterance	0.007	Cloudy	
	Point A	Midpoint W. Side of Building	0.006		Caulking removal
	Point B	SWZ SW Corner of Building	0.007		Caulking removal
	Point C	Eastman Lane Exit	0.004		
1310	Background	Parking lot enterance	0.009	Cloudy/Windy	
	Point A	Midpoint W. Side of Building	0.027		Caulking removal
	Point B	SWZ SW Corner of Building	0.044		Caulking removal
	Point C	Eastman Lane Exit	0.016		

Date: 5/27/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
1020	Background	Parking lot enterance	0.012	Sunny/Windy	
	Point A	Midpoint W. Side of Building	0.044		Caulking Removal
	Point B	SWZ SW Corner of Building	0.051		Caulking Removal
	Point C	Eastman Lane Exit	0.006		
	Point D	Center of Roof	0.014		Removing metal cap
1400	Background	Parking lot enterance	0.021	Sunny	
	Point A	Midpoint W. Side of Building	0.011		Caulking Removal
	Point B	SWZ SW Corner of Building	0.006		Caulking Removal
	Point C	Eastman Lane Exit	0.005		
	Point D	Center of Roof	0.029		Removing metal cap

Project action level: 0.1 mg/m^3 above background

Air Monitoring for the week: 5/31/11-6/3/11

Date: 5/31/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.012		
	Point A	Midpoint W. Side of Building	0.013		Removing Caulking
830	Point B	SWZ SW Corner of Building	0.019	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.004		
	Point D	Center of Roof	0.03		Removing Metal Cap
	Background	Parking lot enterance	0.006		
	Point A	Midpoint W. Side of Building	0.014		Removing Caulking
1030	Point B	SWZ SW Corner of Building	0.011	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.007		
	Point D	Center of Roof	0.021		Removing Metal Cap
	Background	Parking lot enterance	0.003		
	Point A	Midpoint W. Side of Building	0.009		Removing Caulking
1340	Point B	SWZ SW Corner of Building	0.032	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.010		
	Point D	Center of Roof	0.026		Removing Metal Cap

Date: 6/1/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.016		
	Point A	Midpoint W. Side of Building	0.029		
845	Point B	SWZ SW Corner of Building	0.048	Sunny	windy
	Point C	Eastman Lane Exit	0.006		
	Point D	Center of Roof	0.034		
	Background	Parking lot enterance	0.002		
	Point A	Midpoint W. Side of Building	0.018		Caulking removal
1045	Point B	SWZ SW Corner of Building	0.001	Sunny	Caulking removal
	Point C	Eastman Lane Exit	0.000		
	Point D	Center of Roof	0.01		Removing Metal Cap
	Background	Parking lot enterance	0.009		
	Point A	Midpoint W. Side of Building	0.004		
1300	Point B	SWZ SW Corner of Building	0.000	Sunny	Caulking removal
	Point C	Eastman Lane Exit	0.008		
	Point D	Center of Roof	0.002		Removing Metal Cap

Date: 6/2/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.002		
	Point A	Midpoint W. Side of Building	0.014		
900	Point B	SWZ SW Corner of Building	0.023	Sunny	windy
	Point C	Eastman Lane Exit	0.011		
	Point D	Center of Roof	0.028		
	Background	Parking lot enterance	0.002		
	Point A	Midpoint W. Side of Building	0.005		Caulking Removal
1100	Point B	SWZ SW Corner of Building	0.001	Sunny	Caulking Removal
	Point C	Eastman Lane Exit	0.000		
	Point D	Center of Roof	0.018		Removing Soldier Brick
	Background	Parking lot enterance	0.010		
	Point A	Midpoint W. Side of Building	0.006		Caulking Removal
1400	Point B	SWZ SW Corner of Building	0.009	Cloudy	Caulking Removal
	Point C	Eastman Lane Exit	0.004		
	Point D	Center of Roof	0.008		Removing Soldier Brick

Date: 6/3/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.001		
	Point A	Midpoint W. Side of Building	0.004		Caulking Removal
815	Point B	SWZ SW Corner of Building	0.000	Sunny	Caulking Removal
	Point C	Eastman Lane Exit	0.000		
	Point D	Center of Roof	0.009		Removing Soldier Brick/RT Units
	Background	Parking lot enterance	0.002		
	Point A	Midpoint W. Side of Building	0.009		Caulking Removal
1015	Point B	SWZ SW Corner of Building	0.027	Sunny	Caulking Removal
	Point C	Eastman Lane Exit	0.012		
	Point D	Center of Roof	0.01		Removing Soldier Brick/RT Units
	Background	Parking lot enterance	0.007		
	Point A	Midpoint W. Side of Building	0.008		Caulking Removal
1215	Point B	SWZ SW Corner of Building	0.006	Sunny	Caulking Removal
	Point C	Eastman Lane Exit	0.002		
	Point D	Center of Roof	0.005		Removing Soldier Brick/RT Units
	Background	Parking lot enterance	0.006		
	Point A	Midpoint W. Side of Building	0.012		Caulking Removal
1415	Point B	SWZ SW Corner of Building	0.022	Sunny	Caulking Removal
	Point C	Eastman Lane Exit	0.009		
	Point D	Center of Roof	0.006		Removing Soldier Brick/RT Units

Project action level: 0.1 mg/m^3 above background

Air Monitoring for the week: 6/6/11-6/10/11

Date: 6/6/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.003		
	Point A	Midpoint W. Side of Building	0.007		Removing Caulking
800	Point B	SWZ SW Corner of Building	0.002	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.001		
	Point D	Center of Roof	0.005		Rooftop Work
	Background	Parking lot enterance	0.003		
	Point A	Midpoint W. Side of Building	0.012		Removing Caulking
1000	Point B	SWZ SW Corner of Building	0.007	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.002		
	Point D	Center of Roof	0.010		Rooftop Work
	Background	Parking lot enterance	0.008		
	Point A	Midpoint W. Side of Building	0.026		Removing Caulking
1330	Point B	SWZ SW Corner of Building	0.026	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.015		
	Point D	Center of Roof	0.018		Rooftop Work

Date: 6/7/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.005		
	Point A	Midpoint W. Side of Building	0.009		Removing Caulking
820	Point B	SWZ SW Corner of Building	0.004	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.002		
	Point D	Center of Roof	0.004		Parapet Wall Work
	Background	Parking lot enterance	0.006		
	Point A	Midpoint W. Side of Building	0.022		
1020	Point B	SWZ SW Corner of Building	0.029	Sunny	
	Point C	Eastman Lane Exit	0.011		
	Point D	Center of Roof	0.034		Parapet Wall Work
	Background	Parking lot enterance	0.018		
	Point A	Midpoint W. Side of Building	0.006		
1330	Point B	SWZ SW Corner of Building	0.004	Sunny	
	Point C	Eastman Lane Exit	0.001		
	Point D	Center of Roof	0.016		Parapet Wall Work

Date: 6/8/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.002		
	Point A	Midpoint W. Side of Building	0.000		Removing Caulking
815	Point B	SWZ SW Corner of Building	0.003	Cloudy	Removing Caulking
	Point C	Eastman Lane Exit	0.001		
	Point D	Center of Roof	0.006		Rooftop Work
	Background	Parking lot enterance	0.000		
	Point A	Midpoint W. Side of Building	0.002		Removing Caulking
1015	Point B	SWZ SW Corner of Building	0.003	Cloudy	Removing Caulking
	Point C	Eastman Lane Exit	0.001		
	Point D	Center of Roof	0.008		Rooftop Work
	Background	Parking lot enterance	0.004		
	Point A	Midpoint W. Side of Building	0.002		Removing Caulking
1400	Point B	SWZ SW Corner of Building	0.004	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.007		
	Point D	Center of Roof	0.016		Rooftop Work

Date: 6/9/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.001		
	Point A	Midpoint W. Side of Building	0.002		Removing Caulking
915	Point B	SWZ SW Corner of Building	0.001	Rainy	Removing Caulking
	Point C	Eastman Lane Exit	0.000		
	Point D	Center of Roof	0.034		Mason's cutting mortar/Rooftop Work
	Background	Parking lot enterance	0.001		
	Point A	Midpoint W. Side of Building	0.007		Removing Caulking
1110	Point B	SWZ SW Corner of Building	0.016	Rainy	Removing Caulking
	Point C	Eastman Lane Exit	0.001		
	Point D	Center of Roof	0.051		Mason's cutting mortar/Rooftop Work
	Background	Parking lot enterance	0.008		
	Point A	Midpoint W. Side of Building	0.006		Removing Caulking
1400	Point B	SWZ SW Corner of Building	0.018	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.004		
	Point D	Center of Roof	0.039		Mason's cutting mortar/Rooftop Work

Date: 6/10/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.009		
	Point A	Midpoint W. Side of Building	0.014		
900	Point B	SWZ SW Corner of Building	0.004	Sunny	Caulking Removal
	Point C	Eastman Lane Exit	0.005		
	Point D	Center of Roof	0.002		Rooftop Work
	Background	Parking lot enterance	0.01		
	Point A	Midpoint W. Side of Building	0.014		
1100	Point B	SWZ SW Corner of Building	0.029	Sunny	Caulking Removal
	Point C	Eastman Lane Exit	0.004		
	Point D	Center of Roof	0.034		Rooftop Work
	Background	Parking lot enterance	0.008		
	Point A	Midpoint W. Side of Building	0.004		
1330	Point B	SWZ SW Corner of Building	0.016	Sunny	Caulking Removal
	Point C	Eastman Lane Exit	0.000		
	Point D	Center of Roof	0.02		Rooftop Work

Project action level: 0.1 mg/m^3 above background

Air Monitoring for the week: 6/13/11-6/17/11

Date: 6/13/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.003		
	Point A	Midpoint W. Side of Building	0.005		Removing Caulking
815	Point B	SWZ SW Corner of Building	0.009	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.016		
	Point D	Center of Roof	0.034		Rooftop Work
	Background	Parking lot enterance	0.000		
	Point A	Midpoint W. Side of Building	0.002		Removing Caulking
1015	Point B	SWZ SW Corner of Building	0.007	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.000		
	Point D	Center of Roof	0.056		Rooftop Work
	Background	Parking lot enterance	0.006		
	Point A	Midpoint W. Side of Building	0.014		Removing Caulking
1330	Point B	SWZ SW Corner of Building	0.007	Sunny	Removing Caulking
	Point C	Eastman Lane Exit	0.005		
	Point D	Center of Roof	0.019		Rooftop Work

Date: 6/14/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.000		
	Point A	Midpoint W. Side of Building	0.003		Removing Caulking
810	Point B	SWZ SW Corner of Building	0.002	Rain	Removing Caulking
	Point C	Eastman Lane Exit	0.002		
	Point D	Center of Roof	0.007		Parapet Wall Work
	Background	Parking lot enterance	0.000		
	Point A	Midpoint W. Side of Building	0.001		
1010	Point B	SWZ SW Corner of Building	0.000	Rain	
	Point C	Eastman Lane Exit	0.000		
	Point D	Center of Roof	0.002		Parapet Wall Work
	Background	Parking lot enterance	0.006		
	Point A	Midpoint W. Side of Building	0.004		
1310	Point B	SWZ SW Corner of Building	0.009	Cloudy	
	Point C	Eastman Lane Exit	0.002		
	Point D	Center of Roof	0.011		Parapet Wall Work

Date: 6/15/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.007		
	Point A	Midpoint W. Side of Building	0.015		Removing Caulking
800	Point B	SWZ SW Corner of Building	0.004	Sunny	
	Point C	Eastman Lane Exit	0.002		
	Point D	Center of Roof	0.046		Rooftop Work
	Background	Parking lot enterance	0.001		
	Point A	Midpoint W. Side of Building	0.009		Removing Caulking
1000	Point B	SWZ SW Corner of Building	0.012	Sunny	
	Point C	Eastman Lane Exit	0.006		
	Point D	Center of Roof	0.072		Rooftop Work (dust from non-PCB source)
	Background	Parking lot enterance	0.000		
	Point A	Midpoint W. Side of Building	0.004		Removing Caulking
1330	Point B	SWZ SW Corner of Building	0.006	Sunny	
	Point C	Eastman Lane Exit	0.003		
	Point D	Center of Roof	0.036		Rooftop Work

Date: 6/16/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.004		
	Point A	Midpoint W. Side of Building	0.012		Removing Caulking
1300	Point B	SWZ SW Corner of Building	0.012	Cloudy	Removing Caulking
	Point C	Eastman Lane Exit	0.009		
	Point D	Center of Roof	0.041		Mason's cutting mortar/Rooftop Work

Date: 6/17/11

Time	Location		Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.000		
	Point A	Midpoint W. Side of Building	0.000		
830	Point B	SWZ SW Corner of Building	0.001	Rainy	Caulking Removal
	Point C	Eastman Lane Exit	0.001		
	Point D	Center of Roof	0.005		Rooftop Work
	Background	Parking lot enterance	0.002		
	Point A	Midpoint W. Side of Building	0.000		
1030	Point B	SWZ SW Corner of Building	0.001	Rainy	Caulking Removal
	Point C	Eastman Lane Exit	0.003		
	Point D	Center of Roof	0.016		Rooftop Work
	Background	Parking lot enterance	0.000		
	Point A	Midpoint W. Side of Building	0.004		
1330	Point B	SWZ SW Corner of Building	0.000	Rainy	Caulking Removal
	Point C	Eastman Lane Exit	0.002		
	Point D	Center of Roof	0.014		Rooftop Work

Project action level: 0.1 mg/m^3 above background

Air Monitoring for the week: 6/20/11-6/24/11

Date: 6/24/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
	Background	Parking lot enterance	0.002		
	Point A	Midpoint W. Side of Building	0.000		Caulking Removal
1000	Point B	SWZ SW Corner of Building	0.004	Rainy	
	Point C	Eastman Lane Exit	0.003		
	Point D	Center of Roof	0.015		Soldier Brick Removal
	Background	Parking lot enterance	0.006		
	Point A	Midpoint W. Side of Building	0.004		Caulking Removal
1200	Point B	SWZ SW Corner of Building	0.000	Rainy	
	Point C	Eastman Lane Exit	0.000		
	Point D	Center of Roof	0.023		Parapet vertical removal

Project action level: 0.1 mg/m^3 above background

Air Monitoring for the week: 6/27/11-7/1/11

Date: 6/28/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
800	Background	Parking lot enterance	0.014	Cloudy	
	Point A	Midpoint W. Side of Building	0.008		
	Point B	SWZ SW Corner of Building	0.011		
	Point C	Eastman Lane Exit	0.002		
	Point D	Center of Roof	0.041		
1000	Background	Parking lot enterance	0.008	Cloudy	
	Point A	Midpoint W. Side of Building	0.005		
	Point B	SWZ SW Corner of Building	0.000		
	Point C	Eastman Lane Exit	0.001		
	Point D	Center of Roof	0.018		
1330	Background	Parking lot enterance	0.003	Cloudy	
	Point A	Midpoint W. Side of Building	0.009		
	Point B	SWZ SW Corner of Building	0.002		
	Point C	Eastman Lane Exit	0.001		
	Point D	Center of Roof	0.006		

Date: 6/29/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
900	Background	Parking lot enterance	0.004	Rainy	
	Point A	Midpoint W. Side of Building	0.009		
	Point B	SWZ SW Corner of Building	0.001		
	Point C	Eastman Lane Exit	0.002		
	Point D	Center of Roof	0.008		
1030	Background	Parking lot enterance	0.004	Sunny	
	Point A	Midpoint W. Side of Building	0.002		
	Point B	SWZ SW Corner of Building	0.007		
	Point C	Eastman Lane Exit	0.014		
	Point D	Center of Roof	0.026		
1330	Background	Parking lot enterance	0.000	Sunny	
	Point A	Midpoint W. Side of Building	0.002		
	Point B	SWZ SW Corner of Building	0.006		
	Point C	Eastman Lane Exit	0.003		
	Point D	Center of Roof	0.052		

Date: 6/30/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
900	Background	Parking lot enterance	0.000	Clear	
	Point A	Midpoint W. Side of Building	0.001		
	Point B	SWZ SW Corner of Building	0.007		
	Point C	Eastman Lane Exit	0.001		
	Point D	Center of Roof	0.058		
1230	Background	Parking lot enterance	0.000	Clear	
	Point A	Midpoint W. Side of Building	0.000		
	Point B	SWZ SW Corner of Building	0.001		
	Point C	Eastman Lane Exit	0.000		
	Point D	Center of Roof	0.004		
1505	Background	Parking lot enterance	0.001	Clear	
	Point A	Midpoint W. Side of Building	0.002		
	Point B	SWZ SW Corner of Building	0.002		
	Point C	Eastman Lane Exit	0.000		

Date: 7/1/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
730	Background	Parking lot enterance	0.001	Clear	
	Point A	Midpoint W. Side of Building	0.004		
	Point B	SWZ SW Corner of Building	0.001		
	Point C	Eastman Lane Exit	0.004		
1015	Background	Parking lot enterance	0.001	Clear	
	Point A	Midpoint W. Side of Building	0.001		
	Point B	SWZ SW Corner of Building	0.001		
	Point C	Eastman Lane Exit	0.005		
1415	Background	Parking lot enterance	0.000	Clear	
	Point A	Midpoint W. Side of Building	0.002		
	Point B	SWZ SW Corner of Building	0.000		
	Point C	Eastman Lane Exit	0.003		

Project action level: 0.1 mg/m^3 above background

Air Monitoring for the week: 7/5/11-7/8/11

Date: 7/5/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
915	Background	Parking lot enterance	0.017		
	Point A	Midpoint W. Side of Building	0.014		
	Point B	SWZ SW Corner of Building	0.015		
	Point C	Benches on East Side	0.014		
1120	Background	Parking lot enterance	0.014		
	Point A	Midpoint W. Side of Building	0.014		
	Point B	SWZ SW Corner of Building	0.015		
	Point C	Benches on East Side	0.015		
1425	Background	Parking lot enterance	0.01		
	Point A	Midpoint W. Side of Building	0.007		
	Point B	SWZ SW Corner of Building	0.011		
	Point C	Benches on East Side	0.013		

Date: 7/6/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
830	Background	Parking lot enterance	0.002		
	Point A	Midpoint W. Side of Building	0.001		
	Point B	SWZ SW Corner of Building	0.003		
	Point C	Benches on East Side	0.002		
1040	Background	Parking lot enterance	0.003	humid	
	Point A	Midpoint W. Side of Building	0.003		
	Point B	SWZ SW Corner of Building	0.002		
	Point C	Benches on East Side	0.002		

Project action level: 0.1 mg/m^3 above background

Air Monitoring for the week: 7/18/11-7/22/11

Date: 7/19/11

Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
1320	Background	Parking lot enterance	0.012	Sunny	
	Point A	Midpoint W. Side of Building	0.022		
	Point B	SWZ SW Corner of Building	0.004		
	Point C	Benches on East Side	0.007		

Date: 7/20/11

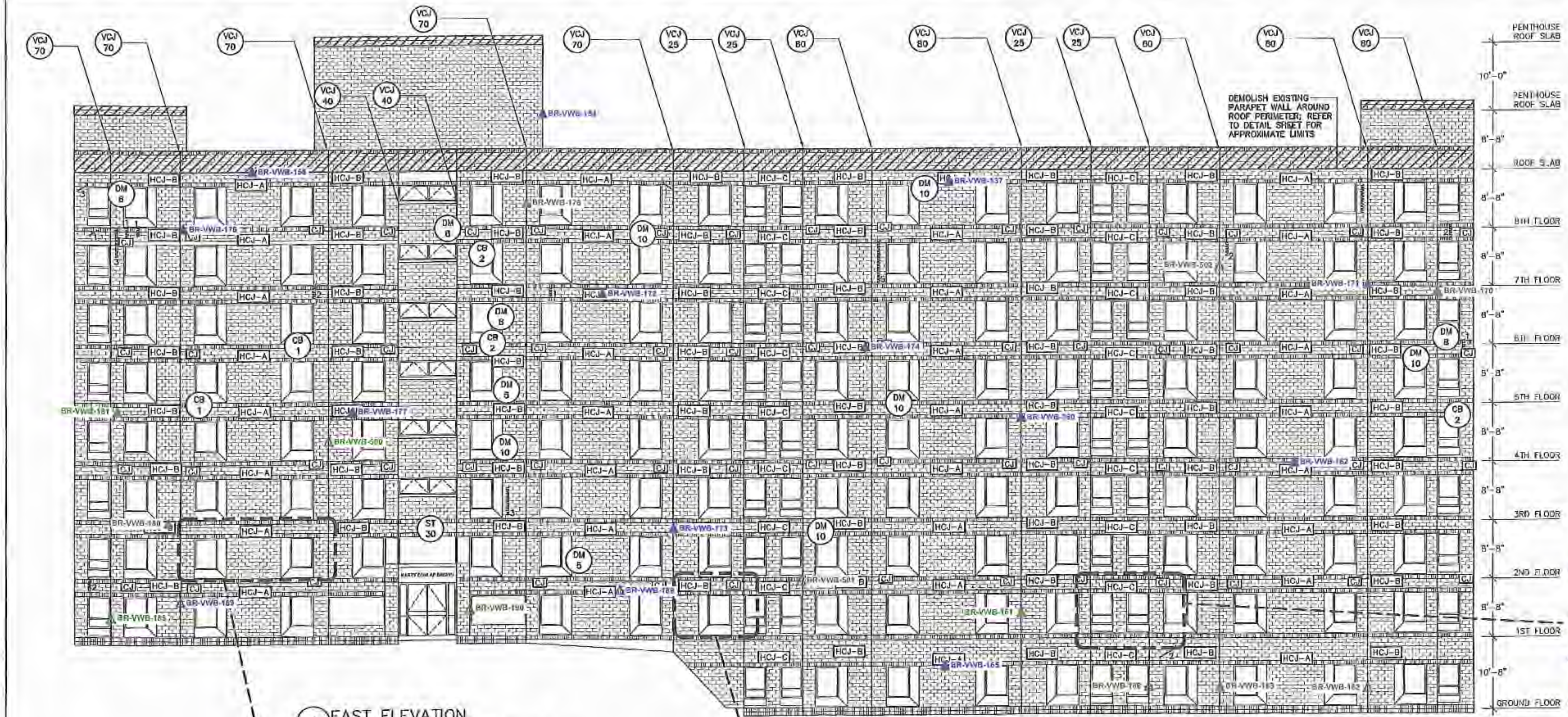
Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
800	Background	Parking lot enterance	0.000	Cloudy	
	Point A	Midpoint W. Side of Building	0.002		
	Point B	SWZ SW Corner of Building	0.007		
	Point C	Benches on East Side	0.001		
1000	Background	Parking lot enterance	0.006	Sunny	
	Point A	Midpoint W. Side of Building	0.004		
	Point B	SWZ SW Corner of Building	0.009		
	Point C	Benches on East Side	0.001		
1330	Background	Parking lot enterance	0.002	Sunny	
	Point A	Midpoint W. Side of Building	0.005		
	Point B	SWZ SW Corner of Building	0.001		
	Point C	Benches on East Side	0.002		

Date: 7/21/11

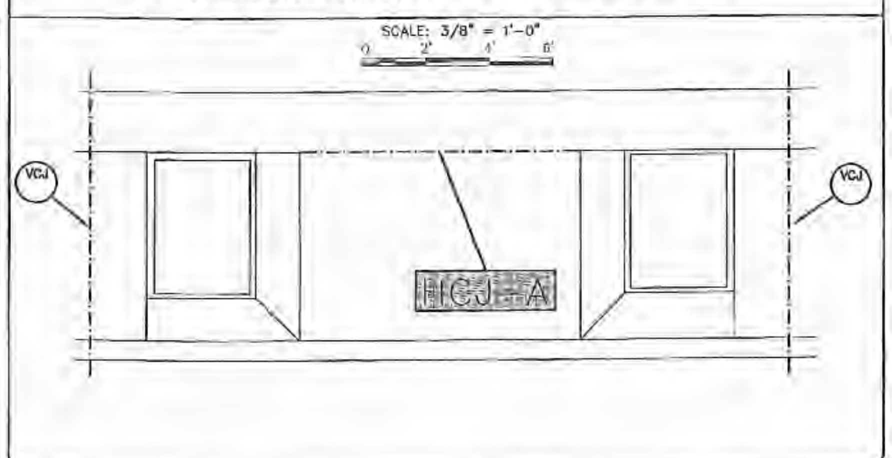
Time		Location	Reading (mg/m^3)	Weather Conditions	Activity
830	Background	Parking lot enterance	0.004	Cloudy	
	Point A	Midpoint W. Side of Building	0.000		
	Point B	SWZ SW Corner of Building	0.001		
	Point C	Benches on East Side	0.000		
1030	Background	Parking lot enterance	0.007	Sunny	
	Point A	Midpoint W. Side of Building	0.002		
	Point B	SWZ SW Corner of Building	0.000		
	Point C	Benches on East Side	0.004		
1330	Background	Parking lot enterance	0.006	Sunny	
	Point A	Midpoint W. Side of Building	0.012		
	Point B	SWZ SW Corner of Building	0.015		
	Point C	Benches on East Side	0.009		

Project action level: 0.1 mg/m^3 above background

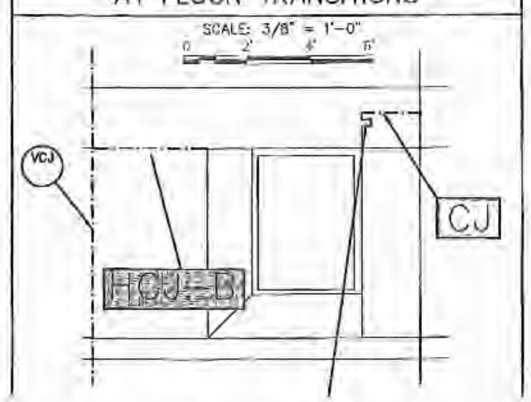
APPENDIX B: VERIFICATION SAMPLE LOCATIONS



1 EAST ELEVATION
SCALE: 1/8"=1'-0"± 0 4' 8' 16'



TYPICAL CONTROL JOINTS AT WINDOW LINTELS
SCALE: 3/8" = 1'-0"



TYPICAL CONTROL JOINTS AT FLOOR TRANSITIONS
SCALE: 3/8" = 1'-0"

LEGEND

Symbol	Description
CB #	CRACKED BRICK MASONRY TO BE REPLACED # INDICATES UNITS
DM #	DETERIORATED MORTAR TO BE REPOINTED # INDICATES SQUARE FEET
ST #	STAINING TO BE CLEANED # INDICATES SQUARE FEET
VCJ #	VERTICAL CONTROL JOINT TO BE REPLACED # INDICATES LINEAR FEET
CJ	FLOOR TRANSITION CONTROL JOINT; TYPICAL EVERY OTHER FLOOR (3 LF EACH JOINT)
HCJ-A	CONTROL JOINT AT LINTEL (9 LF EACH JOINT)
HCJ-B	CONTROL JOINT AT WINDOW HEAD (4 LF EACH JOINT)
HCJ-C	CONTROL JOINT AT WINDOW HEAD (2 LF EACH JOINT)
#	STEP CRACK THROUGH MASONRY; REMOVE MASONRY AND REPOINT AREA # INDICATES LINEAR FEET

NOTE: WINDOW PERIMETER SEALANTS AND RECESSED ALCOVE SEALANTS ARE NOT IN CONTRACT

LEGEND

Symbol	Description
BR-VWB-177 ▲	VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS WITHIN THE RETURN OF THE HORIZONTAL CONTROL JOINT
BR-VWB-100 ▲	VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS WITHIN THE RETURN OF THE VERTICAL CONTROL JOINT
WH-VWB-169 △	VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS AWAY FROM THE HORIZONTAL CONTROL JOINT
WH-VWB-165 △	VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS AWAY FROM THE VERTICAL CONTROL JOINT

GENERAL NOTES

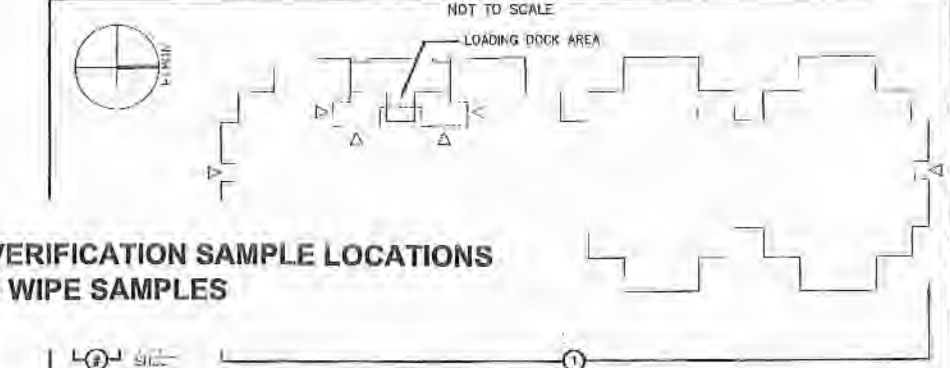
1. THE INFORMATION SHOWN ON THIS DRAWING HAS BEEN COMPILED FROM VARIOUS SOURCES, AND MAY NOT REFLECT THE ACTUAL CONDITIONS AT THE TIME OF CONSTRUCTION.
2. FOR THE SAKE OF CLARITY, EACH INDIVIDUAL DETAIL ON THIS SHEET HAS NOT BEEN INDICATED. INSTALLATION DETAILS HAVE BEEN INDICATED FOR TYPICAL COMPONENTS AT RANDOM LOCATIONS.
3. HATCH PATTERNS ARE FOR REPRESENTATION ONLY AND SHOULD NOT BE USED AS A MEANS FOR QUANTIFYING.
4. ALL ITEMS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS APPLICABLE TO THE PROJECT.
5. THE CONTRACTOR IS CAUTIONED THAT DUE TO BUILDING OCCUPANCY, THE OWNER REQUIRES COMPLIANCE ON WORK HOURS, SCHEDULING, SET-UP, CLEANUP, PARKING, SECURITY, ETC. REFER TO SPECIFICATIONS FOR OWNER REQUIREMENTS.
6. DETAILS NOT DEPICTED SHALL BE CONSTRUCTED IN A MANNER CONSISTENT WITH THE DETAIL DRAWINGS.
7. AREAS NOT NOTED ON THESE DRAWINGS EXHIBITING SIMILAR DEFECTS AS THOSE SHOWN SHALL BE REPAIRED IN A SIMILAR MANNER. REFER TO SECTION 01025 UNIT PRICES FOR ESTIMATED QUANTITIES.
8. REFER TO SHEET A8 FOR ABOVE ROOF LINE PENTHOUSE ELEVATIONS.

NOTES:

1. ORIGINAL DESIGN DRAWING BY GALE ASSOCIATES, INC. MODIFIED WITH THE ADDITION OF VERIFICATION SAMPLES COLLECTED DURING PCB REMEDIATION ACTIVITIES. ALL OTHER INFORMATION INCLUDED AS PRESENTED IN THE ORIGINAL DESIGN DOCUMENTS.
2. VERIFICATION SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.
3. VERIFICATION WIPE SAMPLES FOR WHICH FOLLOW-UP SAMPLES WERE COLLECTED AFTER APPLICATION OF ADDITIONAL COATINGS ARE NOT DEPICTED ON THIS DRAWING.

KEY PLAN

NOT TO SCALE



APPENDIX B BROWN RESIDENTIAL VERIFICATION SAMPLE LOCATIONS
EAST ELEVATION WIPE SAMPLES

Gale Associates, Inc.
Engineers Planners
163 Libbey Parkway | Weymouth, MA 02189 5004
P 781 335.6465 F 781 335.6467 www.gainc.com
Boston Baltimore Orlando San Francisco

GALE

REV. NO.	DESCRIPTION	BY	APP'D	DATE

UNIVERSITY OF MASSACHUSETTS
FACILITIES AND CAMPUS PLANNING DIVISION

BROWN RESIDENCE HALL
ROOF AND BUILDING ENVELOPE UPGRADE
EAST ELEVATION

	BY	DATE
DRN.	JAT/HGM	3/9/11
APP'D	CM	3/9/11
CKD.	CM	3/9/11
APP'D	CM/JFN	3/9/11

PROJECT NO. 10-001716
PROJ.-CONTRACT NO. UMA 11-01
SCALE 1/8"=1'-0"±
SHEET 4 OF 16
DRAWING NUMBER D-A-426-10-001715-A3

CADD FILE: 822260-A3 PLOT 1/1

LEGEND

CB #	CRACKED BRICK MASONRY TO BE REPLACED # INDICATES UNITS
SB #	SPALLED BRICK MASONRY TO BE REPLACED # INDICATES UNITS
DM #	DETERIORATED MORTAR TO BE REPOINTED # INDICATES SQUARE FEET
ST #	STAINING TO BE CLEANED # INDICATES SQUARE FEET
VCJ #	VERTICAL CONTROL JOINT TO BE REPLACED # INDICATES LINEAR FEET
CJ	FLOOR TRANSITION CONTROL JOINT; TYPICAL EVERY OTHER FLOOR (3 LF EACH JOINT)
HCJ-A	CONTROL JOINT AT LINTEL (9 LF EACH JOINT)
HCJ-B	CONTROL JOINT AT WINDOW HEAD (4 LF EACH JOINT)
HCJ-C	CONTROL JOINT AT WINDOW HEAD (2 LF EACH JOINT)
#	STEP CRACK THROUGH MASONRY; REMOVE MASONRY AND REPOINT AREA # INDICATES LINEAR FEET

1 WEST ELEVATION
SCALE: 1/8"=1'-0" 0 4' 8' 16'

LEGEND

BR-VWB-152 ▲ VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS WITHIN THE RETURN OF THE HORIZONTAL CONTROL JOINT

BR-VWB-175 ▲ VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS WITHIN THE RETURN OF THE VERTICAL CONTROL JOINT

WH-VWS-157 △ VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS AWAY FROM THE HORIZONTAL CONTROL JOINT

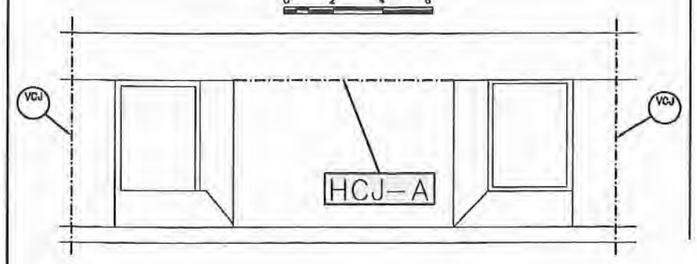
WH-VWS-164 △ VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS AWAY FROM THE VERTICAL CONTROL JOINT

NOTES:

1. ORIGINAL DESIGN DRAWING BY GALE ASSOCIATES, INC. MODIFIED WITH THE ADDITION OF VERIFICATION SAMPLES COLLECTED DURING PCB REMEDIATION ACTIVITIES. ALL OTHER INFORMATION INCLUDED AS PRESENTED IN THE ORIGINAL DESIGN DOCUMENTS.
2. VERIFICATION SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.
3. VERIFICATION WIPE SAMPLES FOR WHICH FOLLOW-UP SAMPLES WERE COLLECTED AFTER APPLICATION OF ADDITIONAL COATINGS ARE NOT DEPICTED ON THIS DRAWING.

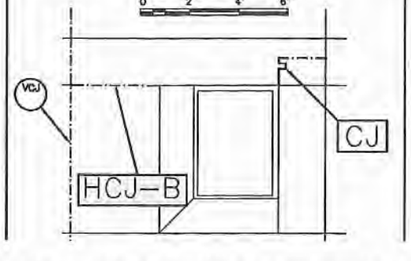
TYPICAL CONTROL JOINTS AT WINDOW LINTELS

SCALE: 3/8" = 1'-0"
0 2' 4' 6'



TYPICAL CONTROL JOINTS AT FLOOR TRANSITIONS

SCALE: 3/8" = 1'-0"
0 2' 4' 6'

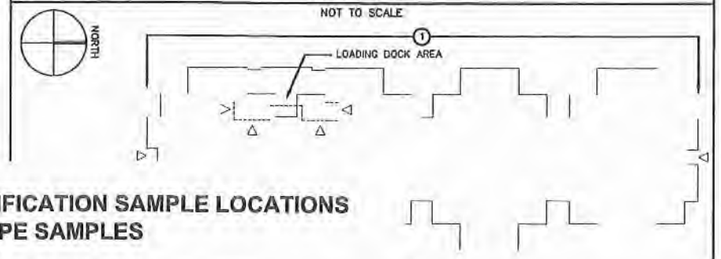


GENERAL NOTES

1. THE INFORMATION SHOWN ON THIS DRAWING HAS BEEN COMPILED FROM VARIOUS SOURCES, AND MAY NOT REFLECT THE ACTUAL CONDITIONS AT THE TIME OF CONSTRUCTION.
2. FOR THE SAKE OF CLARITY, EACH INDIVIDUAL DETAIL ON THIS SHEET HAS NOT BEEN INDICATED. INSTALLATION DETAILS HAVE BEEN INDICATED FOR TYPICAL COMPONENTS AT RANDOM LOCATIONS.
3. HATCH PATTERNS ARE FOR REPRESENTATION ONLY AND SHOULD NOT BE USED AS A MEANS FOR QUANTIFYING.
4. ALL ITEMS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS APPLICABLE TO THE PROJECT.
5. THE CONTRACTOR IS CAUTIONED THAT DUE TO BUILDING OCCUPANCY, THE OWNER REQUIRES COMPLIANCE ON WORK HOURS, SCHEDULING, SET-UP, CLEANUP, PARKING, SECURITY, ETC. REFER TO SPECIFICATIONS FOR OWNER REQUIREMENTS.
6. DETAILS NOT DEPICTED SHALL BE CONSTRUCTED IN A MANNER CONSISTENT WITH THE DETAIL DRAWINGS.
7. AREAS NOT NOTED ON THESE DRAWINGS EXHIBITING SIMILAR DEFECTS AS THOSE SHOWN SHALL BE REPAIRED IN A SIMILAR MANNER. REFER TO SECTION 01025 UNIT PRICES FOR ESTIMATED QUANTITIES.
8. REFER TO SHEET A8 FOR ABOVE ROOF LINE PENTHOUSE ELEVATIONS.

KEY PLAN

NOT TO SCALE



APPENDIX B BROWN RESIDENTIAL VERIFICATION SAMPLE LOCATIONS
WEST ELEVATION WIPE SAMPLES

Gale Associates, Inc.
Engineers Planners
165 Libbey Parkway | Weymouth, MA 02189-0004
P 781.335.6465 F 781.335.6497 www.gainc.com
Boston Baltimore Orlando San Francisco

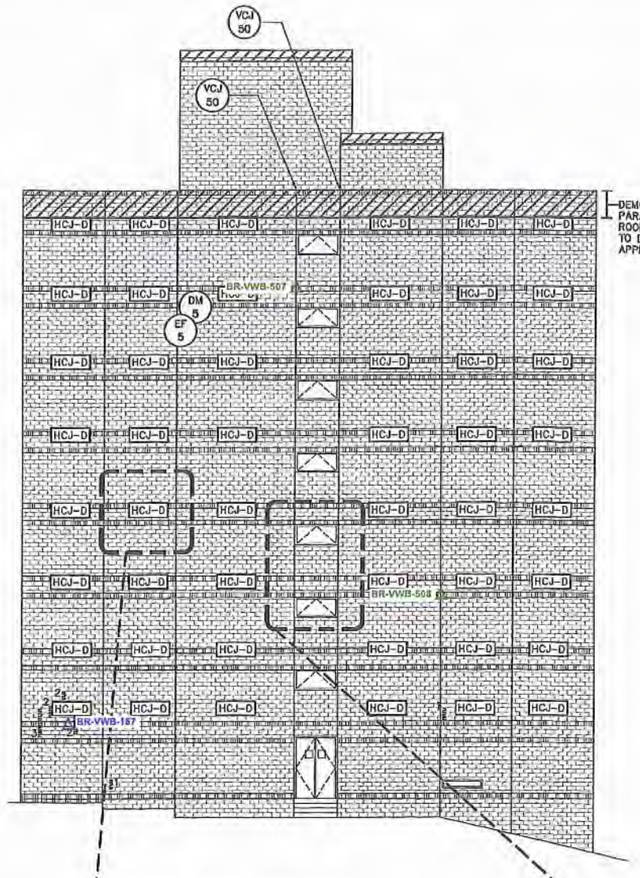
REV. NO.	DESCRIPTION	BY	APP'D	DATE

UNIVERSITY OF MASSACHUSETTS
FACILITIES AND CAMPUS PLANNING DIVISION

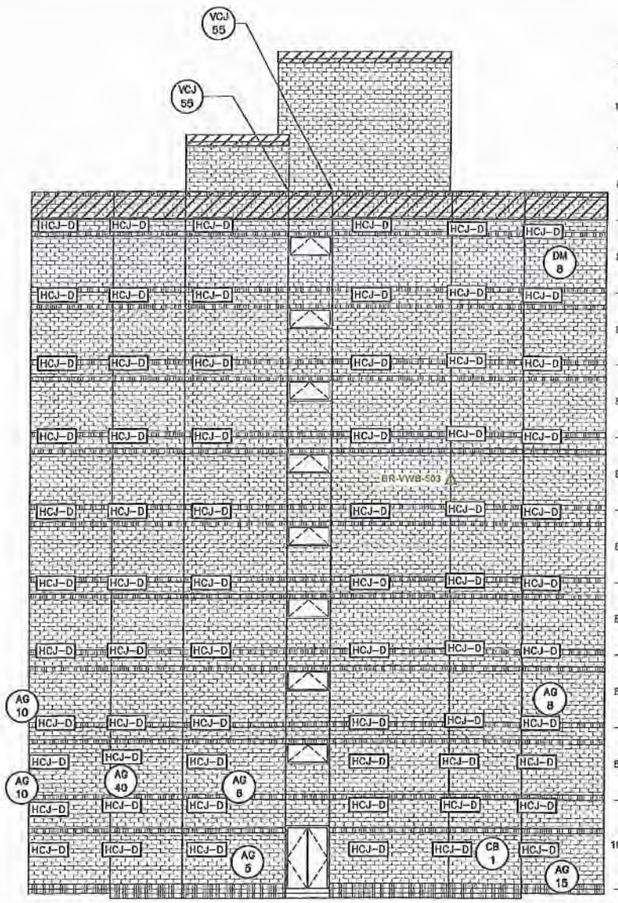
BROWN RESIDENCE HALL
ROOF AND BUILDING ENVELOPE UPGRADES
WEST ELEVATION

	BY	DATE	PROJECT NO. 10-001715	PROJ.-CONTRACT NO. UMA 11-31
DRN.	HGM	10.23.09	SCALE 1/8"=1'-0"	SHEET 8 OF 14
APP'D	CM	10.23.09		
CKD.	CM	10.23.09	DRAWING NUMBER D-A-426-10-001715-A5	
APP'D	CM	10.23.09		

CADD FILE: 822360-A5 PLOT 1:1



1 SOUTH ELEVATION
SCALE: 1/8"=1'-0"± 0 4' 8' 16'



2 NORTH ELEVATION
SCALE: 1/8"=1'-0"± 0 4' 8' 16'

LEGEND

CB #	CRACKED BRICK MASONRY TO BE REPLACED # INDICATES UNITS
DM #	DETERIORATED MORTAR TO BE REPOINTED # INDICATES SQUARE FEET
AG #	ALGAE GROWTH TO BE CLEANED # INDICATES SQUARE FEET
EF #	EFFLORESCENCE TO BE CLEANED # INDICATES SQUARE FEET
VCJ #	VERTICAL CONTROL JOINT TO BE REPLACED # INDICATES LINEAR FEET
HCJ-D	CONTROL JOINT AT FLOOR LEVEL (9'-10" EACH JOINT)
#	STEP CRACK THROUGH MASONRY; REMOVE MASONRY AND REPOINT AREA # INDICATES LINEAR FEET

GENERAL NOTES

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8. REFER TO SHEET A8 FOR ABOVE ROOF LINE PENTHOUSE ELEVATIONS.

LEGEND

BR-VWB-152 ▲ VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS WITHIN THE RETURN OF THE HORIZONTAL CONTROL JOINT

BR-VWB-175 ▲ VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS WITHIN THE RETURN OF THE VERTICAL CONTROL JOINT

WH-VWS-187 △ VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS AWAY FROM THE HORIZONTAL CONTROL JOINT

WH-VWS-164 △ VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM ENCAPSULATED MATERIALS AWAY FROM THE VERTICAL CONTROL JOINT

REFER TO DETAILS A, 26, 27, AND 28 FOR TYPICAL SEALANT REPAIRS

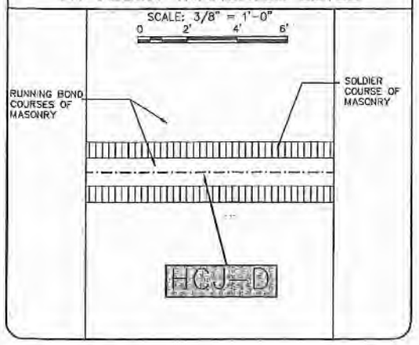
NOTE: PARTIAL ELEVATIONS AT STAIRWELLS ARE NOT SHOWN AS THERE ARE NO MASONRY REPAIRS AT THESE LOCATIONS. ACCESS WILL STILL BE REQUIRED TO PERFORM SEALANT REPAIRS.

NOTES:

1. ORIGINAL DESIGN DRAWING BY GALE ASSOCIATES, INC. MODIFIED WITH THE ADDITION OF VERIFICATION SAMPLES COLLECTED DURING PCB REMEDIATION ACTIVITIES. ALL OTHER INFORMATION INCLUDED AS PRESENTED IN THE ORIGINAL DESIGN DOCUMENTS.
2. VERIFICATION SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.
3. VERIFICATION WIPE SAMPLES FOR WHICH FOLLOW-UP SAMPLES WERE COLLECTED AFTER APPLICATION OF ADDITIONAL COATINGS ARE NOT DEPICTED ON THIS DRAWING.

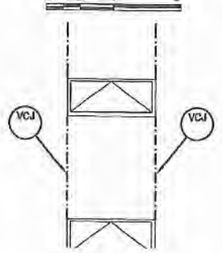
TYPICAL CONTROL JOINTS AT FLOOR TRANSITION LEVEL

SCALE: 3/8" = 1'-0"
0 2' 4' 6'



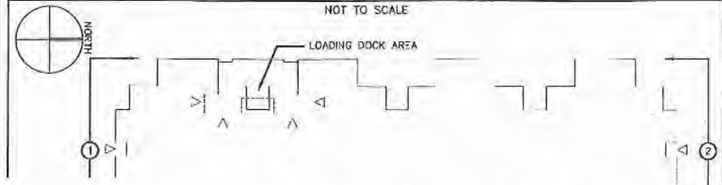
VERTICAL CONTROL JOINTS

SCALE: 1/4" = 1'-0"
0 2' 4' 8'



KEY PLAN

NOT TO SCALE



(#) AREA SHOWN THIS SHEET

APPENDIX B BROWN RESIDENTIAL VERIFICATION SAMPLE LOCATIONS
NORTH AND SOUTH ELEVATION WIPE SAMPLES

Gale Associates, Inc.
Engineers Planners
163 Libbey Parkway | Weymouth, MA 02189-0024
P 781.335.6435 F 781.335.6457 www.gainc.com
Boston Baltimore Orlando San Francisco

GALE

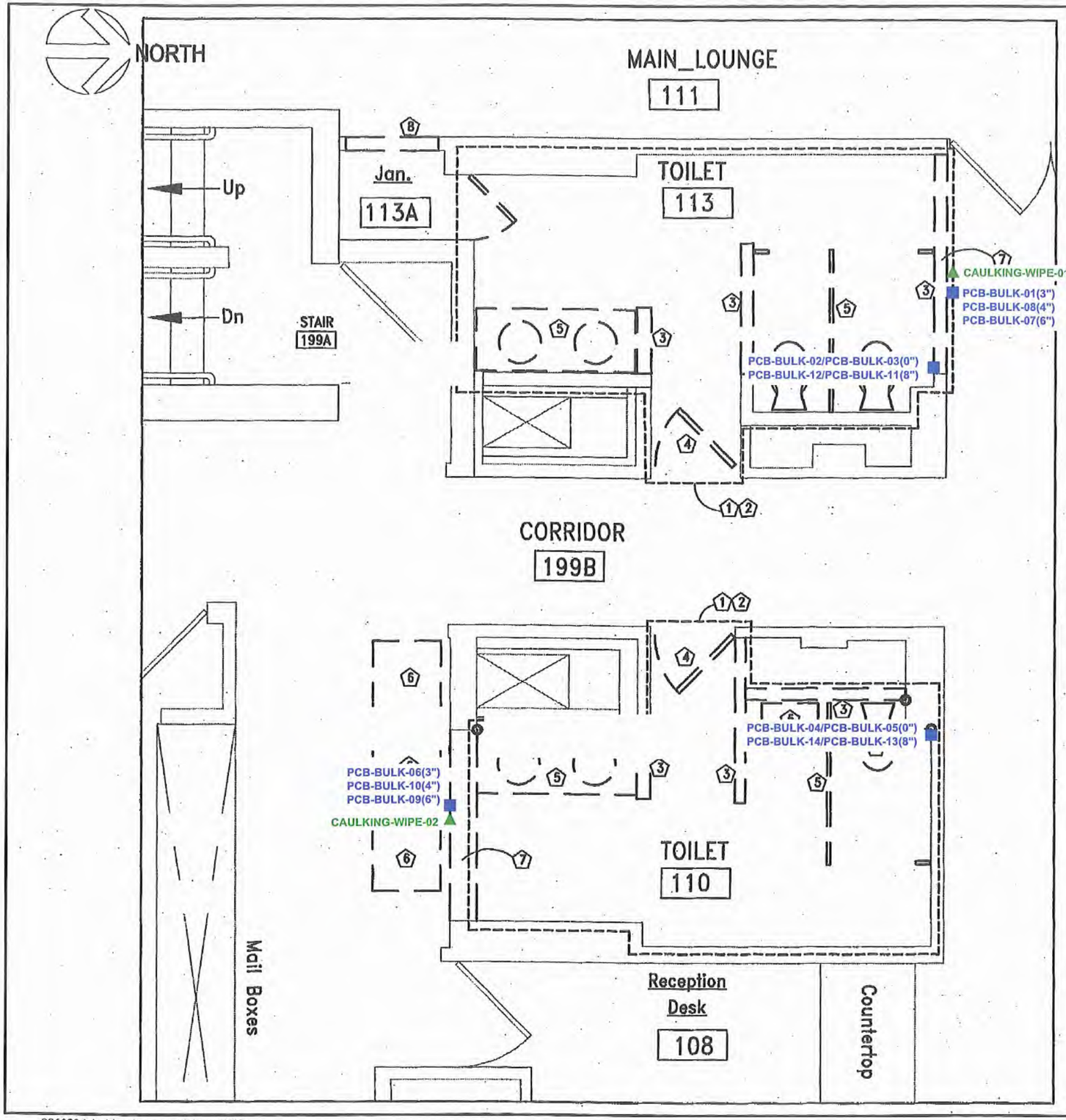
REV. NO.	DESCRIPTION	BY	APP'D	DATE

UNIVERSITY OF MASSACHUSETTS
FACILITIES AND CAMPUS PLANNING DIVISION

BROWN RESIDENCE HALL
ROOF AND BUILDING ENVELOPE UPGRADES
NORTH & SOUTH ELEVATIONS

	BY	DATE	PROJECT NO. 10-001715	PROJ-CONTRACT NO. UMA 11-31
DRN.	JMV RDM	3/9/11	SCALE 1/8"=1'-0"±	SHEET 8 OF 15
APP'D	CM	3/9/11		
CKD.	CM	3/9/11	DRAWING NUMBER	
APP'D	CM/JH	3/9/11	D-A-428-10-001715-A7	

CADD FILE: A27380-A7 PLOT 1:1



LEGEND

PCB-BULK-01 ■ BULK SAMPLE LOCATION AND IDENTIFIER. DISTANCE FROM JOINT INCLUDED IN PARENTHESIS.

CAULKING-WIPE-01 ▲ VERIFICATION WIPE SAMPLE LOCATION AND IDENTIFIER

NOTES:

1. ORIGINAL DESIGN DRAWINGS BY UNIVERSITY OF MASSACHUSETTS FACILITIES AND CAMPUS PLANNING. MODIFIED WITH THE ADDITION OF VERIFICATION SAMPLES COLLECTED FOR PCB REMEDIATION ACTIVITIES.
2. SAMPLE LOCATIONS APPROXIMATED BASED ON INFORMATION PROVIDED BY ECS, INC..

40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

SAMPLE LOCATIONS
ADA UPGRADE AREA

DESIGNED BY: GJF
DRAWN BY: PF
CHECKED BY: GJF
APPROVED BY: Bedrag

UMASS BROWN RESIDENCE
AMHERST, MASSACHUSETTS

PCB COMPLETION REPORT

JOB NO: 224166.01
DATE: DECEMBER 2013
SCALE: AS NOTED

APPENDIX B

1 EAST ELEVATION
SCALE: 1/8"=1'-0"±

LEGEND

- BR-VBB-112 — BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER ASSOCIATED WITH HORIZONTAL CONTROL JOINTS
- BR-VBB-111 — BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER ASSOCIATED WITH VERTICAL CONTROL JOINTS
- BR-VBB-046 — BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM PARAPET WALL MATERIALS ALONG HORIZONTAL JOINTS FOR WASTE SEGREGATION PURPOSES
- BR-VBB-054 — BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM PARAPET WALL MATERIALS ALONG VERTICAL JOINTS FOR WASTE SEGREGATION PURPOSES. USE OF (INT) INDICATES SAMPLE COLLECTED ALONG VERTICAL JOINT ON INNER SIDE OF PARAPET WALL

NOTES:

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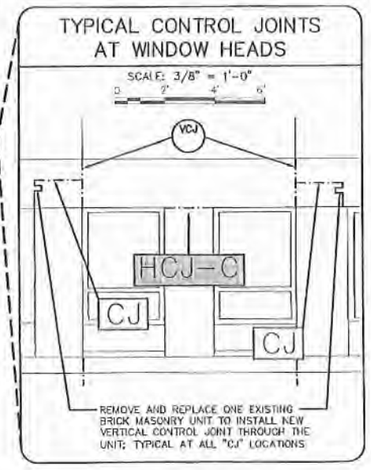
2. VERIFICATION SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

TYPICAL CONTROL JOINTS AT WINDOW HEADS

SCALE: 3/8" = 1'-0"

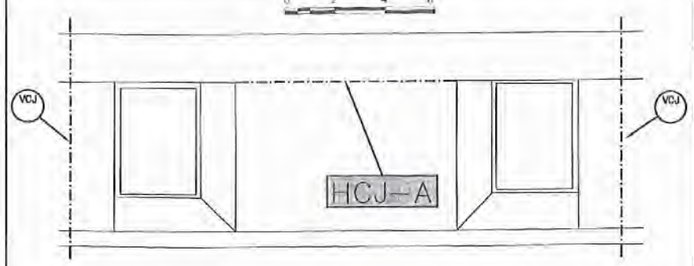


REMOVE AND REPLACE ONE EXISTING BRICK MASONRY UNIT TO INSTALL NEW VERTICAL CONTROL JOINT THROUGH THE UNIT; TYPICAL AT ALL "CJ" LOCATIONS

REFER TO DETAILS A, 26, 27, AND 28 FOR TYPICAL SEALANT REPAIRS

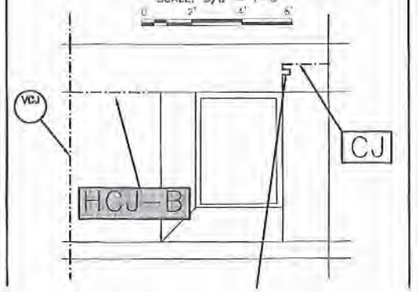
TYPICAL CONTROL JOINTS AT WINDOW LINTELS

SCALE: 3/8" = 1'-0"



TYPICAL CONTROL JOINTS AT FLOOR TRANSITIONS

SCALE: 3/8" = 1'-0"



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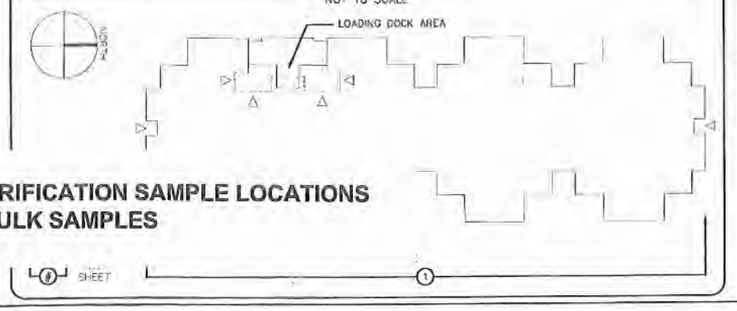
8. REFER TO SHEET A8 FOR ABOVE ROOF LINE PENTHOUSE ELEVATIONS.

KEY PLAN

NOT TO SCALE



APPENDIX B BROWN RESIDENTIAL VERIFICATION SAMPLE LOCATIONS
EAST ELEVATION BULK SAMPLES

Gale Associates, Inc.
Engineers Planners
563 Compass Parkway | Weymouth, MA 02189-3004
P 781.335.6465 F 781.335.6467 www.gainc.com
Boston Baltimore Orlando San Francisco

GALE

REV. NO.	DESCRIPTION	BY	APP'D	DATE

UNIVERSITY OF MASSACHUSETTS
FACILITIES AND CAMPUS PLANNING DIVISION

BROWN RESIDENCE HALL
ROOF AND BUILDING ENVELOPE UPGRADE
EAST ELEVATION

	BY	DATE	PROJECT NO. 10-001715	PROJ.-CONTRACT NO. UMA 11-31
DSN.	JAT/HW	3/9/11		
APP'D	DM	3/9/11	SCALE 1/8"=1'-0"	SHEET 4 OF 15
CKD.	DM	3/9/11	DRAWING NUMBER D-A-426-10-001715-A3	
APP'D	DM/JFL	3/9/11		

CADD FILE: 822380-A3 PLOT 1:1

1 WEST ELEVATION
SCALE: 1/8"=1'-0"± 0 4' 8' 16'

LEGEND

- BR-VBB-001 — BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER ASSOCIATED WITH HORIZONTAL CONTROL JOINTS
- BR-VBB-013 — BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER ASSOCIATED WITH VERTICAL CONTROL JOINTS
- BR-VBB-094 — BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM PARAPET WALL MATERIALS ALONG HORIZONTAL JOINTS FOR WASTE SEGREGATION PURPOSES
- BR-VBB-092 — BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM PARAPET WALL MATERIALS ALONG VERTICAL JOINTS FOR WASTE SEGREGATION PURPOSES. USE OF (INT) INDICATES SAMPLE COLLECTED ALONG VERTICAL JOINT ON INNER SIDE OF PARAPET WALL

NOTES:

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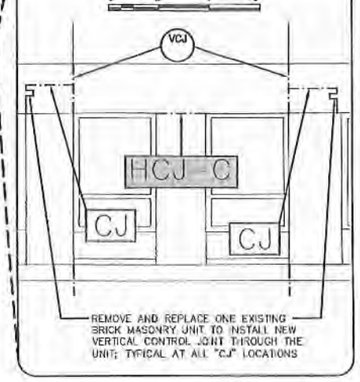
2. VERIFICATION SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

NOTE: WINDOW PERIMETER SEALANTS AND RECESSED ALCOVE SEALANTS ARE NOT IN CONTRACT

TYPICAL CONTROL JOINTS AT WINDOW HEADS

SCALE: 3/8" = 1'-0"
0 2' 4' 6'

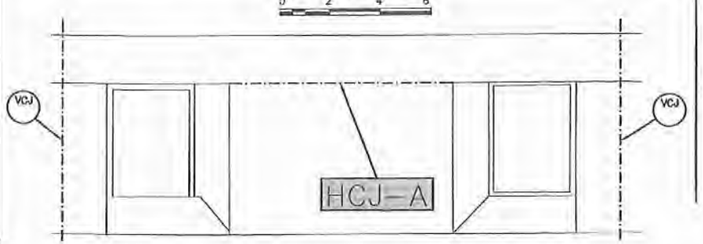


REMOVE AND REPLACE ONE EXISTING BRICK MASONRY UNIT TO INSTALL NEW VERTICAL CONTROL JOINT THROUGH THE UNIT; TYPICAL AT ALL "CJ" LOCATIONS

REFER TO DETAILS A, 26, 27, AND 28 FOR TYPICAL SEALANT REPAIRS

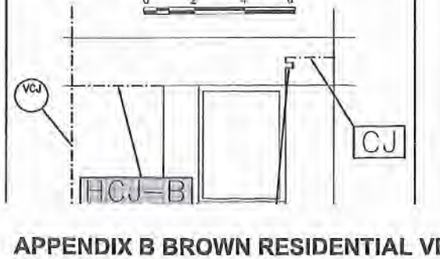
TYPICAL CONTROL JOINTS AT WINDOW LINTELS

SCALE: 3/8" = 1'-0"
0 2' 4' 6'



TYPICAL CONTROL JOINTS AT FLOOR TRANSITIONS

SCALE: 3/8" = 1'-0"
0 2' 4' 6'



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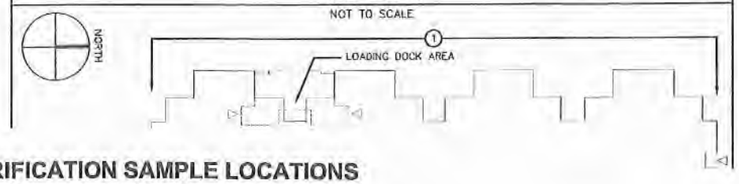
8. REFER TO SHEET A8 FOR ABOVE ROOF LINE PENTHOUSE ELEVATIONS.

KEY PLAN

NOT TO SCALE



Gale Associates, Inc.
Engineers Planners
183 Liberty Parkway | Weymouth, MA 02189-0004
P 781 335 6435 F 781 335 6407 www.galeinc.com
Boston Baltimore Orlando San Francisco

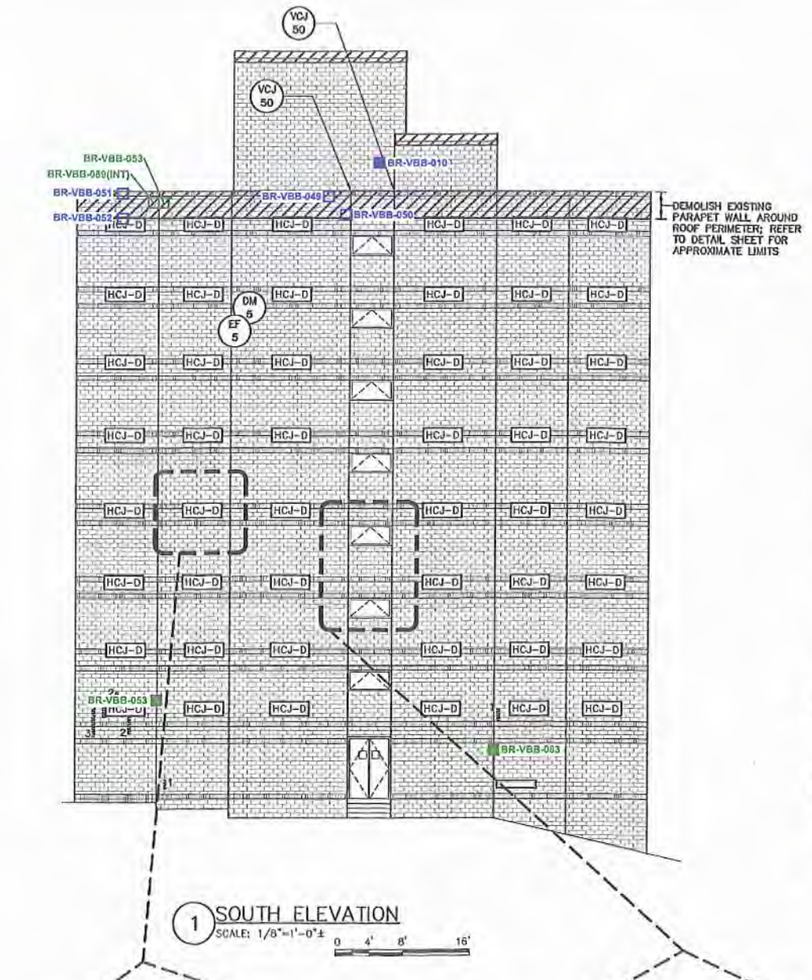
GALE

REV. NO.	DESCRIPTION	BY	APP'D	DATE

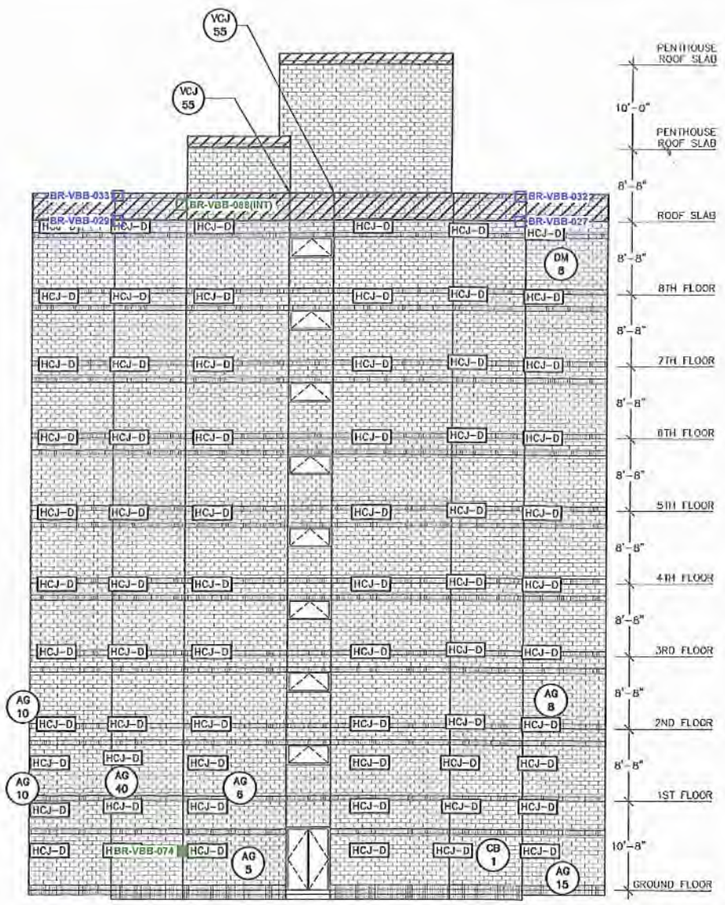
UNIVERSITY OF MASSACHUSETTS
FACILITIES AND CAMPUS PLANNING DIVISION

BROWN RESIDENCE HALL

APPENDIX B BROWN RESIDENTIAL VERIFICATION SAMPLE LOCATIONS
WEST ELEVATION BULK SAMPLES



1 SOUTH ELEVATION
SCALE: 1/8"=1'-0"± 0 4' 8' 16'

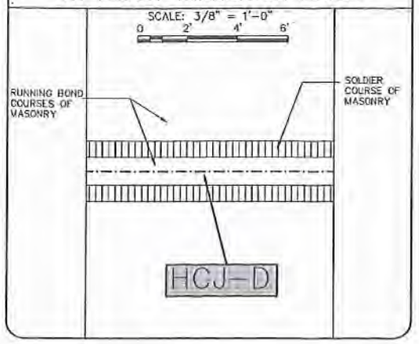


2 NORTH ELEVATION
SCALE: 1/8"=1'-0"± 0 4' 8' 16'

NOTE: PARTIAL ELEVATIONS AT STAIRWELLS ARE NOT SHOWN AS THERE ARE NO MASONRY REPAIRS AT THESE LOCATIONS. ACCESS WILL STILL BE REQUIRED TO PERFORM SEALANT REPAIRS.

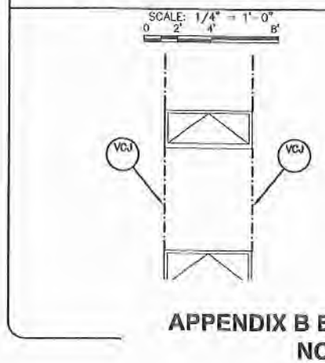
TYPICAL CONTROL JOINTS AT FLOOR TRANSITION LEVEL

SCALE: 3/8" = 1'-0"
0 2' 4' 6'



VERTICAL CONTROL JOINTS

SCALE: 1/4" = 1'-0"
0 2' 4' 8'



LEGEND

CB #	CRACKED BRICK MASONRY TO BE REPLACED # INDICATES UNITS
DM #	DETERIORATED MORTAR TO BE REPOINTED # INDICATES SQUARE FEET
AG #	ALGAE GROWTH TO BE CLEANED # INDICATES SQUARE FEET
EF #	EFFLORESCENCE TO BE CLEANED # INDICATES SQUARE FEET
VCJ #	VERTICAL CONTROL JOINT TO BE REPLACED # INDICATES LINEAR FEET
HCJ-D	CONTROL JOINT AT FLOOR LEVEL (9'-10" EACH JOINT)
	STEP CRACK THROUGH MASONRY; REMOVE MASONRY AND REPOINT AREA # INDICATES LINEAR FEET

GENERAL NOTES

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4. ALL ITEMS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS APPLICABLE TO THE PROJECT.
5. THE CONTRACTOR IS CAUTIONED THAT DUE TO BUILDING OCCUPANCY, THE OWNER REQUIRES COMPLIANCE ON WORK HOURS, SCHEDULING, SET-UP, CLEANUP, PARKING, SECURITY, ETC. REFER TO SPECIFICATIONS FOR OWNER REQUIREMENTS.
6. DETAILS NOT DEPICTED SHALL BE CONSTRUCTED IN A MANNER CONSISTENT WITH THE DETAIL DRAWINGS.
7. AREAS NOT NOTED ON THESE DRAWINGS EXHIBITING SIMILAR DEFECTS AS THOSE SHOWN SHALL BE REPAIRED IN A SIMILAR MANNER. REFER TO SECTION 01025 UNIT PRICES FOR ESTIMATED QUANTITIES.
8. REFER TO SHEET A8 FOR ABOVE ROOF LINE PENTHOUSE ELEVATIONS.

REFER TO DETAILS A, 28, 27, AND 28 FOR TYPICAL SEALANT REPAIRS

LEGEND

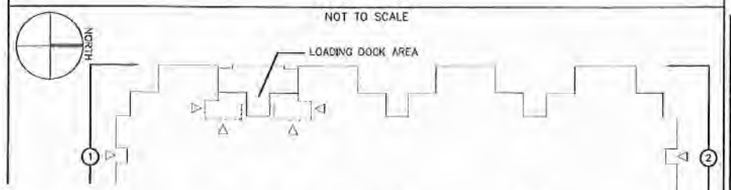
BR-VBB-112	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER ASSOCIATED WITH HORIZONTAL CONTROL JOINTS
BR-VBB-075	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER ASSOCIATED WITH VERTICAL CONTROL JOINTS
BR-VBB-035	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM PARAPET WALL MATERIALS ALONG HORIZONTAL JOINTS FOR WASTE SEGREGATION PURPOSES
BR-VBB-056	BULK VERIFICATION SAMPLE LOCATION AND IDENTIFIER COLLECTED FROM PARAPET WALL MATERIALS ALONG VERTICAL JOINTS FOR WASTE SEGREGATION PURPOSES. USE OF (INT) INDICATES SAMPLE COLLECTED ALONG VERTICAL JOINT ON INNER SIDE OF PARAPET WALL

NOTES:

1. ORIGINAL DESIGN DRAWING BY GALE ASSOCIATES, INC. MODIFIED WITH THE ADDITION OF VERIFICATION SAMPLES COLLECTED DURING PCB REMEDIATION ACTIVITIES. ALL OTHER INFORMATION INCLUDED AS PRESENTED IN THE ORIGINAL DESIGN DOCUMENTS.
2. VERIFICATION SAMPLE LOCATIONS APPROXIMATED BASED ON FIELD MEASUREMENTS.

KEY PLAN

NOT TO SCALE



AREA SHOWN THIS SHEET

APPENDIX B BROWN RESIDENTIAL VERIFICATION SAMPLE LOCATIONS NORTH AND SOUTH ELEVATION BULK SAMPLES

Gale Associates, Inc.
Engineers Planners
165 Libbey Parkway | Weymouth, MA 02189-3004
P 781.335.6465 F 781.335.6467 www.gainc.com
Boston Baltimore Orlando San Francisco

GALE

REV. NO.	DESCRIPTION	BY	APP'D	DATE

UNIVERSITY OF MASSACHUSETTS
FACILITIES AND CAMPUS PLANNING DIVISION

BROWN RESIDENCE HALL
ROOF AND BUILDING ENVELOPE UPGRADES
NORTH & SOUTH ELEVATIONS

	BY	DATE	PROJECT NO.	PROJ.-CONTRACT NO.
DRN.	AEV/ HSH	2/8/11	10-001715	UMA 11-31
APP'D	CM	2/8/11	SCALE 1/8"=1'-0"±	SHEET 8 OF 16
CKD.	CM	2/8/11	DRAWING NUMBER	
APP'D	CM/AL	2/8/11	D-A-426-10-001715-A7	

CADD FILE: B22350-A7 PLOT 1:1

APPENDIX C: ANALYTICAL LABORATORY REPORTS AND DATA VALIDATION SUMMARIES

APPENDIX D: WASTE DISPOSAL DOCUMENTS

001913593JJK

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: MAD000844670
2. Page 1 of: 1
3. Emergency Response Phone: 800-535-5053
4. Manifest Tracking Number: 001913593 JJK

GENERATOR

5. Generator's Name and Mailing Address: UMASS EH+S
117 DRAPER HALL
AMHERST, MA 01003
Generator's Phone: 413-577-3632

Generator's Site Address (if different than mailing address):
UMASS CASHIN HOUSE
112 EASTMAN LANE
AMHERST, MA. 01003

6. Transporter 1 Company Name: E.Q. NORTHEAST, INC.
U.S. EPA ID Number: MAD 084814136

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address: WAYNE DISPOSAL INC SITE #2 LANDFILL
49350 N I-94 SERVICE DRIVE
BELLEVILLE, MI.
Facility's Phone: 800-592-5489
U.S. EPA ID Number: MID 048 090 633

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. R.Q. UN 3432, Polychlorinated Biphenyls Solid, 9, PG III ERG # 171	1	CM	7727 EST	K	MA02	PCB1	
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
C134148WDI / (5) PCB CAULKING MATERIALS / STORAGE START DATE 5/23/13 CONTAINER #257
EST. YARDS 35

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: [illegible] Signature: Michael Grover Month: 8 Day: 14 Year: 13

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Edward Harper Signature: Edward Harper Month: 08 Day: 14 Year: 13

Transporter 2 Printed/Typed Name: Signature: Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Actual weight 3555Kg ok per Glenn Topping with E.Q-NE 8/14/13
Manifest Reference Number:

18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
PCB			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: David Tornacchi Signature: [signature] Month: 8 Day: 19 Year: 13

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

COD #2

CERTIFICATE OF DISPOSAL

FOR MANIFESTED PCB WASTE

This certificate is to verify the wastes identified as PCB S.V.

and specified on Manifest # 0019 13593 JJK, Line Item 1 has been landfilled on

April 15, 2013 in accordance with all local, state and federal regulations by:

Wayne Disposal, Inc.

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 1-800-KWALITY (592-5489)
Fax: 1-800-KWALFAX (592-5329)

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: _____

010326732JJK

432

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: MAD 000 844 670
2. Page 1 of: 1
3. Emergency Response Phone: (800) 535-5053
4. Manifest Tracking Number: 010326732 JJK

GENERATOR

5. Generator's Name and Mailing Address: UMASS EH&S
117 DRAPER HALL
AMHERST, MA 01003
Generator's Phone: (413) 577-3632

Generator's Site Address (if different than mailing address):
UMASS - CASHIN HOUSE
112 EASTMAN LANE
AMHERST, MA 01003

6. Transporter 1 Company Name: EQ NORTHEAST, INC.
U.S. EPA ID Number: MAD 084 814 138

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address: WAYNE DISPOSAL, INC. SITE #2 LANDFILL
49350 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
Facility's Phone: (800) 592-5489
U.S. EPA ID Number: MID 048 090 633

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. RQ, UN3432, Polychlorinated biphenyls, solid, 9, PGIII, ERG #171	001	CM	13636 EST	K	MA02	PCB1	
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1. C134148WDI / (S) PCB CAULKING MATERIALS / STORAGE START DATE 6-3-13, CONTAINER NUMBER 368, EST YARDS 15

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent. I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Michael Groves
Signature:
Month Day Year: 06 24 13

INTL

16. International Shipments: ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: David MacLellan
Signature:
Month Day Year: 06 24 13
Transporter 2 Printed/Typed Name:
Signature:
Month Day Year:

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space: ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Actual weight 84600kg okper Glenn Topping with EQ-NE ARF 6/26/13
Manifest Reference Number:
18b. Alternate Facility (or Generator)
U.S. EPA ID Number:
Facility's Phone:
18c. Signature of Alternate Facility (or Generator)
Month Day Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. PCB 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Tonya Unger
Signature:
Month Day Year: 06 25 13

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

COD #2

CERTIFICATE OF DISPOSAL

FOR MANIFESTED PCB WASTE

This certificate is to verify the wastes identified as PCB S.I.

and specified on Manifest # 010326732 JJK, Line Item 1 has been landfilled on

Jun 25, 2013 in accordance with all local, state and federal regulations by:

Wayne Disposal, Inc.

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 1-800-KWALITY (592-5489)
Fax: 1-800-KWALFAX (592-5329)

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: [signature]

010326733JJK

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	MAD 000 844 670	1	(800) 535-5053	010326733 JJK

GENERATOR

5. Generator's Name and Mailing Address: UMASS EH&S
117 DRAPER HALL
AMHERST, MA 01003
Generator's Phone: (413) 577-3632

Generator's Site Address (if different than mailing address):
UMASS - CASHIN HOUSE
112 EASTMAN LANE
AMHERST, MA 01003

6. Transporter 1 Company Name: EQ NORTHEAST, INC. — U.S. EPA ID Number: MAD 064 814 136

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: WAYNE DISPOSAL, INC. SITE #2 LANDFILL
48350 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
Facility's Phone: (800) 592-5489
U.S. EPA ID Number: MID 048 090 633

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. RQ, UN3432, Polychlorinated biphenyls, solid, 9, PGIII, ERG #171	1	CM	EST 1360	K	MA02	PCB1	
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1. C134148WDI / (S) PCB CAULKING MATERIALS / STORAGE START DATE 6/3/13, CONTAINER NUMBER 230, EST YARDS 15

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Michael Grover — Signature: [signature] — Month 6 Day 24 Year 13

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Edward Harper — Signature: Edward Harper — Month 06 Day 24 Year 13

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Actual weight 7300kg ok per Glenn Topping with EQ-NE ARG 6/26/13
Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
PCB			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Tanya Towgar — Signature: [signature] — Month 06 Day 25 Year 13

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO GENERATOR

COD #2

CERTIFICATE OF DISPOSAL

FOR MANIFESTED PCB WASTE

This certificate is to verify the wastes identified as PCB S.J

and specified on Manifest # 010326733 JJK, Line Item 1 has been landfilled on

Jan 25, 2013 in accordance with all local, state and federal regulations by:

Wayne Disposal, Inc.

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 1-800-KWALITY (592-5489)
Fax: 1-800-KWALFAX (592-5329)

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: [signature]

010326885JJK

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: MAD 000 844 670
2. Page 1 of: 1
3. Emergency Response Phone: (800) 535-5053
4. Manifest Tracking Number: 010326885 JJK

GENERATOR

5. Generator's Name and Mailing Address: UMASS EH&S
117 DRAPER HALL
AMHERST, MA 01003
Generator's Phone: (413) 577-3632

Generator's Site Address (if different than mailing address):
UMASS - CASHIN HOUSE
112 EASTMAN LANE
AMHERST, MA 01003

6. Transporter 1 Company Name: EQ NORTHEAST, INC.
U.S. EPA ID Number: MAD 084 814 136

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address: WAYNE DISPOSAL, INC. SITE #2 LANDFILL
49350 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
U.S. EPA ID Number: MID 048 090 633
Facility's Phone: (800) 592-5489

9a. HM	9b. U.S. DOT Description (Including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. RQ, UN3432, Polychlorinated biphenyls, solid, 9, PGIII, ERG #171	1	CM	EST 5454	K	MA02	PCB1	
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1. C134148WDI / (S) PCB CAULKING MATERIALS / STORAGE START DATE 5/28/13 CONTAINER NUMBER 255, EST YARDS 15

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: JAMES M FIELD
Signature: James M Field
Month Day Year: 08 12 13

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Edward Harper
Signature: Edward Harper
Month Day Year: 08 12 13
Transporter 2 Printed/Typed Name:
Signature:
Month Day Year:

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Actual weight 7491 kg ok per Glenn Topping with EQ AR 8/13/13
Manifest Reference Number:
18b. Alternate Facility (or Generator)
U.S. EPA ID Number:
Facility's Phone:
18c. Signature of Alternate Facility (or Generator)
Month Day Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. PCB 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Charles DeWitt
Signature: Charles DeWitt
Month Day Year: 8 13 13

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

COD #2

CERTIFICATE OF DISPOSAL

FOR MANIFESTED PCB WASTE

This certificate is to verify the wastes identified as PCB S.I.J

and specified on Manifest # 010326885 JJK, Line Item 1 has been landfilled on

Aug 13, 2013 in accordance with all local, state and federal regulations by:

Wayne Disposal, Inc.

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 1-800-KWALITY (592-5489)
Fax: 1-800-KWALFAX (592-5329)

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: _____

012083932JJK

EQ 436

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	MAD 000 844 670	1	(800) 535-5053	012083932 JJK

GENERATOR

5. Generator's Name and Mailing Address: UMASS EH&S
117 DRAPER HALL
AMHERST, MA 01003
Generator's Phone: (413) 577-3632

Generator's Site Address (if different than mailing address): UMASS - CASHIN HOUSE - Interior
42 EASTMAN LANE
AMHERST, MA 01003

6. Transporter 1 Company Name: EQ NORTHEAST, INC.
U.S. EPA ID Number: MAD 064 814 136

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address: WAYNE DISPOSAL, INC. SITE #2 LANDFILL
49350 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
Facility's Phone: (800) 592-5489
U.S. EPA ID Number: MID 048 090 633

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
						PCB1	MA02	MA02
X	1. RQ, UN3432, Polychlorinated biphenyls, solid, 9, PGIII, ERG #171	001	CM	6500 LBS	K			
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1: MA2811 WMDI / (B) PCB CAULKING WIADM / STORAGE START DATE 6-24-13 CONTAINER NUMBER 2441 EST YARDS 30

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: V. Theresa Walejko
Signature:
Month 08 Day 28 Year 13

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: JAMES A. ARNO JR.
Signature:
Month 08 Day 28 Year 13
Transporter 2 Printed/Typed Name
Signature
Month Day Year

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Actual weight 5318 KG OK per JON Bowden W/ EQ Northeast SC 8/30/13
Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
PCB			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Charles Swope
Signature:
Month 08 Day 29 Year 13

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

COD #2

CERTIFICATE OF DISPOSAL

FOR MANIFESTED PCB WASTE

This certificate is to verify the wastes identified as PCB S.I.

and specified on Manifest # 012083932 JJK, Line Item 1 has been landfilled on

Aug 29, 2013 in accordance with all local, state and federal regulations by:

Wayne Disposal, Inc.

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 1-800-KWALITY (592-5489)
Fax: 1-800-KWALFAX (592-5329)

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (I8 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: [signature]

012084220JJK

442

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	MAD 000 844 670	1	(800) 535-5053	012084220 JJK

GENERATOR

5. Generator's Name and Mailing Address
UMASS EH&S
117 DRAPER HALL
AMHERST, MA 01003
Generator's Phone: (413) 577-3632

Generator's Site Address (if different than mailing address)
UMASS - CASHIN HOUSE
112 EASTMAN LANE
AMHERST, MA 01003

6. Transporter 1 Company Name
EQ NORTHEAST, INC.
U.S. EPA ID Number
MAD 064 814 136

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
WAYNE DISPOSAL, INC. SITE #2 LANDFILL
49350 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
Facility's Phone: (800) 592-5489
U.S. EPA ID Number
MID 048 090 633

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. RQ, UN3432, Polychlorinated biphenyls, solid, 9, PGIII, ERG #171	1	CM	C51 5454	K	MA02	PCB1	
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1. C134148WDI / (S) PCB CAULKING MATERIALS / STORAGE START DATE 5/27/13 CONTAINER NUMBER 25 EST YARDS 25

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: James M Field
Signature:
Month: 8 Day: 12 Year: 13

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Lee Milgram
Signature:
Month: 8 Day: 12 Year: 13
Transporter 2 Printed/Typed Name:
Signature:
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
PCB			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Tonya Cowgar
Signature:
Month: 08 Day: 21 Year: 13

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

COD #2

CERTIFICATE OF DISPOSAL

FOR MANIFESTED PCB WASTE

This certificate is to verify the wastes identified as PCB S.I.

and specified on Manifest # 012084220 JJK, Line Item 1 has been landfilled on

Aug 13, 2013 in accordance with all local, state and federal regulations by:

Wayne Disposal, Inc.

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 1-800-KWALITY (592-5489)
Fax: 1-800-KWALFAX (592-5329)

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: _____

012086695JJK

442

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	MAD 000844670	1	800-535-5053	012086695 JJK

GENERATOR

5. Generator's Name and Mailing Address: UMASS EH&S, 117 DRAPER HALL, AMHERST MA 01003, 413 577.3632
Generator's Site Address (if different than mailing address): UMASS - CASHIN HOUSE, 112 EAST PLEASANT LANE, AMHERST MA 01003

6. Transporter 1 Company Name: EQ NORTHEAST INC — U.S. EPA ID Number: MAD 084814136

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address: WASTE DISPOSAL, INC. STE #2 AND #11, 49350 N I94 SERVICE DRIVE, BELLEVILLE MI 48111 — U.S. EPA ID Number: MID 046 050 633
Facility's Phone: 800 592 5489

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ UN2315 Polychlorinated Biphenyls, Solid, 9, PG III ERG 171	1	CM	EST 5454	K	MA02 R261
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1. C1341 WDI (S) PCB CAULKING MATERIALS
STORAGE DATE 5/22/13 CONTAINER 199 EST. YARDS 25

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: A Michael Gruver — Signature — Month 8 Day 11 Year 13

INTL

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Lee J. Mullen — Signature — Month Day Year

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Actual weight 3231kg ok per Glenn Topping with EQ-NE ABC-8/14/13
Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
PCB			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: David Tarnacki — Signature — Month 8 Day 15 Year 13

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

COD #2

CERTIFICATE OF DISPOSAL

FOR MANIFESTED PCB WASTE

This certificate is to verify the wastes identified as PCB S.V.J

and specified on Manifest # 012086695 JJK, Line Item 1 has been landfilled on

Aug 15, 2013 in accordance with all local, state and federal regulations by:

Wayne Disposal, Inc.

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 1-800-KWALITY (592-5489)
Fax: 1-800-KWALFAX (592-5329)

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: _____

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: MAD 0 0 0 8 4 4 6 7 0
2. Page 1 of 1
3. Emergency Response Phone: 257-6300
4. Manifest Tracking Number: 010233705 JJK

5. Generator's Name and Mailing Address: ~~University of Massachusetts~~ Att: Theresa Wolajko
EHS/117 Draper Hall, 40 Campus Center Way
Amherst MA 01003
Generator's Phone: 413 545-2682

Generator's Site Address (if different than mailing address): ~~University of Massachusetts~~
Cashin Hall, 113 Eastman Lane - Interior
Amherst MA 01003

6. Transporter 1 Company Name: RED Technologies, LLC.
U.S. EPA ID Number: CTR000505953

7. Transporter 2 Company Name: ~~Freehold Cartage, Inc.~~ SJ TRANSPORTATION CO. INC.
U.S. EPA ID Number: ~~NJD054126184~~ NJD071629976

8. Designated Facility Name and Site Address: ~~Wayne Disposal, Inc. Site 2 Landfill~~
49350 N I-94 Service Drive
Belleville MI 48111
Facility's Phone: 800 5825463
U.S. EPA ID Number: MID048090633

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. ~~RQ UN3432, Polychlorinated biphenyls, solid~~ 9, PGII	001	DM	100	K	MA02	CR01	9081 PCBs
	2.							
	3.							
	4.							

1)(S) G131198MA01 PCB Debris ERG#171

14. Special Handling Instructions and Additional Information

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Michael Grover — Signature — Month 8 Day 6 Year 13

INTL
16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER
17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Ed Humberson — Signature — Month 8 Day 10 Year 13
Transporter 2 Printed/Typed Name: David N Wilson, Jr. — Signature: David N Wilson Jr. — Month 8 Day 14 Year 13

DESIGNATED FACILITY
18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
OK to make changes per Chris Windnagle with Red Tech ARG 8/15/13
Manifest Reference Number:
18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. PCB. 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Dan Thurber — Signature — Month 8 Day 15 Year 13

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. **DESIGNATED FACILITY TO GENERATOR**

COD #2

CERTIFICATE OF DISPOSAL

FOR MANIFESTED PCB WASTE

This certificate is to verify the wastes identified as ICB S.J

and specified on Manifest # 010233705 JJK, Line Item 1 has been landfilled on

Aug 15, 2013 in accordance with all local, state and federal regulations by:

Wayne Disposal, Inc.

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 1-800-KWALITY (592-5489)
Fax: 1-800-KWALFAX (592-5329)

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: [signature]

ATTACHMENT 4: LONG TERM MONITORING AND MAINTENANCE PLAN – SYLVAN RESIDENTIAL COMPLEX

MONITORING AND MAINTENANCE IMPLEMENTATION PLAN

University of Massachusetts

Sylvan Residential Complex

Amherst, Massachusetts

226020

University of Massachusetts

February 2014

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

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1. INTRODUCTION

This Monitoring and Maintenance Implementation Plan (MMIP) has been prepared for the long term monitoring and maintenance of encapsulated surfaces at three buildings identified as Brown Residence, McNamara Residence, and Cashin Residence. These three buildings comprise the Sylvan Residential Complex located at 112 Eastman Lane on the University of Massachusetts (UMass) campus in Amherst, Massachusetts (Figure 1-1).

Building renovation projects including the remediation of interior and exterior building materials found to contain polychlorinated biphenyls (PCBs) at regulated concentrations were conducted at the site between May 2011 and November 2013. The PCB remediation work was performed in accordance with a series of project submittals provided to the U.S. Environmental Protection Agency (EPA) as documented in the Completion Reports prepared for each of the three buildings and submitted under separate cover.

As previously discussed, the intent of the previous submittals was to "link" the activities being conducted at the three buildings into one "Approval" for the Sylvan Residential Complex to cover remediation activities associated with the building envelope work and interior renovation activities, as well as and long term monitoring and maintenance activities.

This MMIP presents the monitoring and maintenance activities that will be conducted to assess the long-term effectiveness of encapsulants applied, as an interim measure, to select building surfaces as part of the PCB remediation activities completed at the site.

1.1 SITE DESCRIPTION

The Brown, McNamara, and Cashin Residences, originally constructed in 1971, are residential dormitory buildings for undergraduate students. The buildings are each nine stories high with student rooms and common areas on all floors. The buildings comprise the Sylvan Residential Area and are surrounded by other dormitory buildings, parking areas, and open areas. Surrounding ground surfaces are generally flat with a slight overall westward slope. Adjacent ground surfaces are mostly grass with some asphalt pavement, concrete walkways or landscaped areas.

1.2 SITE BACKGROUND

The Sylvan Residential Complex was constructed during a time period when PCBs were sometimes used in certain building materials (e.g., caulking). In preparation for building envelope repair and interior renovation/upgrade projects to be performed at all three buildings, a materials survey was conducted of various hazardous materials that may have been encountered during the work. This included inspection and sampling of suspect materials for PCBs.

Analytical results indicated that certain caulking materials contained PCBs at concentrations greater than 50 parts per million (ppm) in certain interior and exterior caulking sealants. Adjacent building materials were also sampled to determine whether PCBs had migrated from the caulking into these adjacent materials. Analytical results confirmed that PCBs were present in surrounding building materials at regulated concentrations. After completing the characterization of suspect materials, the results were used to develop a remedial approach that was incorporated into the overall envelope repair projects at all three buildings, the ADA restroom upgrade projects at Brown and McNamara, and the interior common area renovation projects at McNamara and Cashin. These results were presented to EPA in the PCB Remediation Plans for each building and subsequent communications submitted for each building.

1.3 REMEDIATION SUMMARY

As documented in the Completion Reports for the PCB remediation work performed at each building, PCB bulk product waste materials including caulking, brick, and other building materials were removed for off-site disposal as ≥ 50 ppm PCB waste. Certain building materials formerly in direct contact with or adjacent to former PCB caulking were encapsulated as a risk-based management approach under 40 CFR 761.61(c) where it was determined that physical

removal was an infeasible remedial approach. This included porous masonry surfaces in former direct contact with the caulking (i.e., coated by) as well as a limited extent of certain masonry surfaces not in direct contact with the former caulking (i.e., away from the joint).

The completed PCB remediation activities are described in detail in the PCB Remediation Completion Reports for each building, which are being submitted concurrently with this MMIP. In summary the activities performed to remediate ≥ 50 ppm PCB containing caulking and PCB impacted building materials included the following activities:

- Removal and off-site disposal of ≥ 50 ppm PCB caulking and backing materials in direct contact with the caulking as ≥ 50 ppm PCB waste;
- Removal of adjacent building materials in direct contact with/coated by the ≥ 50 ppm PCB caulking and scheduled to be removed as part of the exterior and interior renovation projects (e.g., building parapet wall materials and interior wall materials) for off-site disposal as ≥ 50 ppm PCB waste (i.e., as a single waste stream with the caulking); and
- Encapsulation of building materials scheduled to remain in place containing PCBs at concentrations above the applicable high or low occupancy clean up levels using a combination of liquid coatings and physical barriers (e.g., dry wall in select location).

A summary of the encapsulated surfaces and baseline wipe sampling data at each of the three buildings is presented in Table 1-1. The locations of the baseline samples are presented in the individual completion reports for each building.

A review of the baseline wipe sample results from all three buildings by the different types of materials follows:

- Exterior - former direct contact areas:
  - Horizontal control joints on the building's façade
    - 83 wipe samples collected
    - Of which 79 samples were reported as < 1 ug/100cm^2 total PCBs (95%)
    - 4 samples > 1 ug/100cm^2 at 1,2, 1.3, 2.4, and 4.8 ug/100cm^2 (3 at McNamara and 1 at Cashin)
  - Vertical control joints on the building's façade
    - 38 wipe samples collected
    - Of which 23 samples were reported as < 1 ug/100cm^2 total PCBs (60%)
    - 15 samples > 1 ug/100cm^2; 12 of the 15 samples were collected from McNamara (up to 250 ug/100cm^2), 1 at Brown (1.2 ug/100cm^2; and 2 at Cashin (1.15 and 3.5 ug/100cm^2)
- Exterior - areas away from the former caulked joints:
  - Horizontal control joints on the building's façade in high occupancy areas
    - 19 wipe samples collected
    - All 19 samples were reported as < 1 ug/100cm^2 total PCBs (100%)
  - Vertical control joints on the building's façade
    - 44 wipe samples collected
    - Of which 35 samples were reported as < 1 ug/100cm^2 total PCBs (80%)
    - 9 samples > 1 ug/100cm^2; 8 of the 9 samples were collected from McNamara (up to 2.3 ug/100cm^2) and 1 at Brown (1.8 ug/100cm^2)

As indicated above, most locations met the target levels (with some minor areas slightly above the target level) with the exception of the vertical control joints at McNamara. As data was reviewed during the project additional measures were conducted including additional coats of epoxy and more frequent inspections. One observation indicated some of the backing material deep within the return of the narrow joint could not be removed without substantial damage to the façade; residual PCBs in this material may be affecting the epoxy wipe results; however, this material was subsequently covered by the epoxy, new backing material, and new caulking.

All baseline verification wipe samples from the interior encapsulated areas were below the target level of 1 ug/100cm^2 with the exception of three samples from McNamara (1.3, 1.5, and 1.6 ug/100cm^2).

2. MONITORING AND MAINTENANCE IMPLEMENTATION

The long term monitoring and maintenance activities proposed in this MMIP will include visual inspections and representative surface wipe samples from encapsulated surfaces as described below.

2.1 VISUAL INSPECTIONS

Visual inspections of the encapsulated surfaces will consist of an assessment of the following:

- A general inspection of the condition of accessible encapsulated surfaces;
- Signs of wear, pitting, peeling, or breakages in the coating; and
- Signs of weathering or disturbance of the replacement caulking or any other secondary barriers.

The results of these inspections will be documented in the report submitted to the EPA (see Section 4).

2.2 SAMPLING PLAN

Surface wipe samples will be collected from select encapsulated surfaces to aid in determining the effectiveness of the encapsulants over time. Surface wipe samples will be collected using a laboratory-supplied gauze pad over a 100 square centimeter surface area. As of the date of this Plan, the sampling gauze is assumed to be hexane saturated; however, the extracting solvent may be revised over time based on data developments and findings with regard to hexane's interaction with the coatings. Wipe samples will be transported to the laboratory under standard chain of custody procedures, extracted by USEPA Method 3540C (Soxhlet) and analyzed for PCBs by USEPA Method 8082.

To determine whether a surface would be selected for long-term monitoring, potential sample locations at each of the encapsulated surfaces were evaluated against the following criteria:

- Proximity to Former PCB Caulking Joint – surfaces closest to the former PCB ≥ 50 ppm caulking are preferred for sampling in order to represent "worst-case" conditions;
- Accessibility – surfaces were *not* selected for sampling where they are presently covered by a secondary physical barrier such as new caulking, a new door frame, or drywall (however, see discussion on following page with regard to the exterior vertical joints at McNamara); and
- Likelihood of Contact – surfaces were *not* selected for sampling in low-occupancy areas (i.e., exterior locations at heights greater than 8'-8" above ground surface); sample locations will be biased toward those locations most likely to be touched by a human receptor (i.e., high-occupancy areas at heights within 8'-8" above ground surface).

Based on the criteria presented above, encapsulated surfaces associated with the following locations have been selected for sampling as part of the long-term monitoring plan.

- Areas Adjacent to Exterior Façade Horizontal Control Joints in High Occupancy Areas (< 8'-8" ags) (860 l.f.) – 1 sample per building façade (total of 12 samples proposed for 4 per building [approximately 1 per 100 l.f.]);
- Areas Adjacent to Exterior Façade Vertical Control Joints in High Occupancy Areas (< 8' -8" ags) (878 l.f.) – 1 sample per building façade (total of 12 samples proposed for 4 per building [approximately 1 per 100 l.f.]);
- Interior Concrete Columns/Walls (Brown and McNamara) (352 s.f.) – 1 sample per work area (total of 3 samples proposed; 1 at Brown and 2 at McNamara); and
- Interior Concrete Ceilings (Brown, McNamara, and Cashin) (835 s.f.) – a total of five samples to be collected with a minimum of 1 sample per work area (1 at Brown; 2 at McNamara; and 2 at Cashin).

In summary, a total of 32 surface wipe samples will be collected from representative locations of the encapsulated surfaces. Where applicable, sample locations will be biased towards locations selected during baseline sampling activities. A table summarizing the rationale for the sampling proposed above is provided as Table 2-1.

Based on the criteria presented above, the rationale for excluding the remaining encapsulated surfaces from the sampling program is summarized below:

- Former Direct Contact Surfaces – no samples are proposed to be collected from surfaces in former direct contact with caulking based on the baseline epoxy wipe sample results and given that each of these surfaces are located beneath a secondary physical barrier (e.g., new caulking, drywall, etc.). The one exception to this condition is that given the baseline results from the exterior façade vertical joints at McNamara, wipe samples are proposed to be collected from the caulking at the same 4 locations described above for the brick wipe samples. This is proposed to be conducted during the first year of monitoring only with the results and recommendations provided in the first year report. In addition to the hexane saturated gauze samples, at each location a wipe sample will also be collected using a saline saturated gauze pad.
- Low-Occupancy Areas – as described above, no samples are proposed to be collected from exterior surfaces in low-occupancy areas (i.e., surfaces at heights greater than 8'-8" above ground surfaces) due to the low likelihood that these surfaces will be contacted by human receptors.

Based on the information provided above, a summary of the verification wipe samples to be collected at each building is presented on Table 2-2 and as follows:

- Brown – a total of 10 wipe samples are to be collected as follows:
    - Areas Adjacent to Exterior Façade Horizontal Control Joints in High Occupancy Areas (< 8'-8" ags) – 1 sample per building façade (total of 4 samples proposed);
    - Areas Adjacent to Exterior Façade Vertical Control Joints in High Occupancy Areas (< 8' -8" ags) – 1 sample per building façade (total of 4 samples proposed);
    - Interior Concrete Columns/Walls (ADA Restroom Upgrade Area) – 1 sample to be collected from encapsulated concrete columns in the hallway outside the restrooms; and
    - Interior Concrete Ceilings (ADA Restroom Upgrade Area) – 1 sample to be collected from concrete ceiling in the hallway outside the restrooms).
- McNamara – a total of 20 wipe samples are to be collected as follows:
    - Areas Adjacent to Exterior Façade Horizontal Control Joints in High Occupancy Areas (< 8'-8" ags) – 1 sample per building façade (total of 4 samples proposed);
    - Areas Adjacent to Exterior Façade Vertical Control Joints in High Occupancy Areas (< 8' -8" ags) – 1 sample per building façade (total of 4 samples proposed);
    - Former Direct Contact Materials Exterior Façade Vertical Control Joints in High Occupancy Areas (< 8' -8" ags) – 2 samples per building façade to be collected from the surface of the replacement caulking (total of 4 sample locations with two samples at each location [1 hexane wipe and 1 saline wipe] are proposed to be collected at locations co-located with the exterior façade samples collected from areas adjacent to the control joints). Samples to be collected during the first year of sampling;
    - Interior Concrete Columns/Walls – 2 samples to be collected from encapsulated concrete columns in the hallway outside the restrooms and the common area (1 sample per work area); and
    - Interior Concrete Ceilings – 2 samples to be collected from encapsulated concrete ceilings in the hallway outside the restrooms.

- Cashin – a total of 10 wipe samples are to be collected as follows:
    - Areas Adjacent to Exterior Façade Horizontal Control Joints in High Occupancy Areas (< 8'-8" ags) – 1 sample per building façade (total of 4 samples proposed);
    - Areas Adjacent to Exterior Façade Vertical Control Joints in High Occupancy Areas (< 8' -8" ags) – 1 sample per building façade (total of 4 samples proposed); and
    - Interior Concrete Ceilings – 2 samples to be collected from encapsulated concrete ceiling in the common area renovation area.

2.3 ROUTINE MAINTENANCE ACTIVITIES

Based on a review of the products' technical specifications and history of use at similar project sites, it is not anticipated that the coatings applied to the encapsulated surfaces will require any routine maintenance activities other than any corrective measures that may be deemed necessary as a result of the visual inspections.

2.4 ACTION LEVELS AND CORRECTIVE MEASURES

A combination of visual inspections and laboratory sample results will be used to verify the continued effectiveness of the coatings. Upon receipt of the laboratory results after each monitoring round, the data will be compared to baseline data and the following action levels to determine whether additional monitoring or corrective measures are needed:

- At locations where visual inspections indicated the encapsulant is in good physical condition and where sample results are reported with PCBs ≤ 1 µg/100 cm^2, no corrective measures will be implemented.
- At locations where significant encapsulant deterioration is observed or sample results are reported with PCBs ≥ 10 µg/100 cm^2, an additional liquid coating or some other barrier will be considered, as applicable. If analytical results indicate that PCBs continue to be present at concentrations ≥ 10 µg/100 cm^2, EPA will be notified of the subsequent plans to implement corrective measures.
- At locations where sample results are reported with PCBs > 1 and < 10 µg/100 cm^2, this location will be selected for follow-up monitoring during the next round of sampling to establish patterns or trends in concentrations. If increasing concentration trends are determined, then additional coatings may be applied and/or alternative solutions will be discussed with EPA.

These action levels are considered to be appropriate for this project given the limited accessibility to encapsulated areas in comparison to potential direct contact exposures.

3. TRAINING REQUIREMENTS

It is not anticipated that any workers or building occupants will come into prolonged or routine contact with the encapsulated areas. The only activities that may encounter the encapsulants are planned maintenance activities. It is not anticipated that workers performing maintenance activities would require any special training or need to take extra precautions due to the presence of the coatings and secondary barriers; however, UMass will conduct general awareness training for facility and maintenance personnel to ensure they are aware of the importance of maintaining the encapsulant.

For any non-routine projects that involve work that could encounter the encapsulant, relevant and appropriate worker training requirements and procedures specific to the task will be developed and implemented. Current UMass procedures dictate that all work that impacts building materials must undergo an "all hazard review". This review would indicate that portions of building materials within the Sylvan Complex have been flagged as a having residual PCB containing material under encapsulants/barriers. As such, any work that will disturb these materials will be conducted by appropriately trained workers following the necessary work procedures for containments (polyethylene sheeting, etc.) and disposal. These activities will be reported to EPA in the monitoring report. In addition, UMass has included, as a component of their annual "Right-To-Know" and Asbestos Training Program, a PCBs in materials awareness session, including the encapsulated areas on the campus.

4. COMMUNICATIONS, REPORTING & SCHEDULE

The activities completed as part of this plan will be documented and submitted to EPA as part of the campus-wide long term monitoring report submitted annually by UMass. This report will document the following:

- Results of the visual inspections;
- Results of the sampling and analyses;
- Comparisons to action levels and recommendations for corrective measures;
- Any corrective measures implemented;
- Any non-routine major projects conducted at the building that encountered the encapsulated area, and the training and protective measures that were implemented;
- Any proposed modifications to the monitoring and maintenance program (e.g., based on the sampling results or discussions with EPA, the frequency of the program may be modified); and
- A statement on the continued effectiveness of the encapsulants and/or secondary barriers.

It is possible that results of long term monitoring may warrant or require modifications to this plan. In the event that a modification to the MMIP is necessary, such an amendment will be proposed to EPA for approval as part of the scheduled report submittal.

Table 1-1
Summary of Encapsulated Materials

Sylvan Residential Complex - UMass
Amherst, Massachusetts

Building	Material	Surface Type	Encapsulant	Secondary Barrier or Coating	Location	Quantity	Baseline Monitoring Results
Brown	Exterior Brick Horizontal Control Joints	Former Direct Contact with Caulking	Sikagard 62 liquid epoxy	Caulking	High and low occupancy areas on all elevations	4,107 l.f.	24 wipe samples collected; Total PCBs reported as either non-detect (17 samples) or < 1 µg/100cm^2 (7 samples).
		Façade Areas Away from Caulking (one row of bricks above joints and three rows of bricks below joints)	Sikagard 670W clear acrylic coating	None	High-occupancy areas (within 8'-8" of ground surface)	135 l.f.	3 wipe samples collected; Total PCBs reported as either non-detect (2 samples) or < 1 µg/100cm^2 (1 sample).
	Exterior Brick Vertical Control Joints	Former Direct Contact with Caulking	Sikagard 62 liquid epoxy	Caulking	High and low occupancy areas on all elevations	1,910 l.f.	12 wipe samples collected; Total PCBs reported as either non-detect (10 samples) or at concentrations of 0.37 and 1.2 µg/100cm^2.
		Façade Areas Away from Caulking (one row of brick on both sides of joints)	Sikagard 670W clear acrylic coating	None	High and low occupancy areas on all elevations	1,910 l.f.	15 wipe samples collected; Total PCBs reported in 14 samples as either non-detect (8 samples) or < 1 µg/100cm^2 (6 samples). PCBs reported at a concentration of 1.8 µg/100cm^2 in 1 sample.
	Interior Structural Concrete Columns	Former Direct Contact with Caulking	Sikagard 62 liquid epoxy followed by Sikagard 670W clear acrylic coating	Concrete in restrooms covered with final layer of drywall and concrete in hallways covered with final coat of acrylic latex paint and replacement caulking.	Within Restrooms 110 and 113 and in the surrounding hallways	80 l.f.	2 wipe samples collected from former direct contact areas; Total PCBs reported as non-detect and at a concentration of 0.7 µg/100cm^2.
		Concrete Away from Caulking	Sikagard 62 liquid epoxy and Sikagard 670W clear acrylic coating to a distance of 6" from the caulked joints.	Concrete in restrooms covered with final layer of drywall and concrete in hallways covered with final coat of acrylic latex paint.	Within Restrooms 110 and 113 and in the surrounding hallways	96 s.f.	
	Interior Concrete Ceilings	Former Direct Contact with Caulking	Sikagard 62 liquid epoxy followed by Sikagard 670W clear acrylic coating	Final coat of acrylic latex paint	Hallways surrounding restrooms	24 l.f.	
		Concrete Away from Caulking	Sikagard 62 liquid epoxy and Sikagard 670W clear acrylic coating to a distance of 6" from the caulked joints.	Concrete ceiling throughout hallways covered with final coat of acrylic latex paint	Hallways surrounding restrooms	120 s.f.	
McNamara	Exterior Brick Horizontal Control Joints	Former Direct Contact with Caulking	Sikagard 62 liquid epoxy	Caulking	High and low occupancy areas on all elevations	5,140 l.f.	29 wipe samples collected; Total PCBs reported in 26 samples as either non-detect (7 samples at < 0.20 µg/100cm^2) or < 1 µg/100cm^2 (19 samples up to 0.86 µg/100cm^2). PCBs reported in 3 samples at concentrations of 1.2, 1.3, and 2.4 µg/100cm^2.
		Façade Areas Away from Caulking (one row of bricks above joints and three rows of bricks below joints)	Sikagard 670W clear acrylic coating	None	High-occupancy areas (within 8'-8" of ground surface)	225 l.f.	6 samples collected; Total PCBs reported as either non-detect (2 samples at < 0.20 µg/100cm^2) or < 1 µg/100cm^2 (4 samples up to 0.75 µg/100cm^2).
	Exterior Brick Vertical Control Joints	Former Direct Contact with Caulking	Sikagard 62 liquid epoxy	Caulking	High and low occupancy areas on all elevations	1,830 l.f.	15 samples collected; Total PCBs reported in 2 samples as either non-detect (1 sample at < 0.20 µg/100cm^2) or < 1 µg/100cm^2 (1 sample at 0.78 µg/100cm^2). Total PCBs reported in 12 samples up to 250 µg/100cm^2.
		Façade Areas Away from Caulking (one row of brick on either side of joints)	Sikagard 670W clear acrylic coating	None	High and low occupancy areas on all elevations	1,830 l.f.	14 samples collected; Total PCBs reported at concentrations < 1 µg/100cm^2 in 6 samples (total PCBs reported at concentrations up to 0.99 µg/100cm^2) and at concentrations up to 2.3 µg/100cm^2 in 8 samples.

Table 1-1
Summary of Encapsulated Materials

Sylvan Residential Complex - UMass
Amherst, Massachusetts

Building	Material	Surface Type	Encapsulant	Secondary Barrier or Coating	Location	Quantity	Baseline Monitoring Results
McNamara	Interior Structural Concrete Columns - Lower Level Renovations	Former Direct Contact with Caulking	Sikagard 62 liquid epoxy	Sikagard 550W elastomeric coating and replacement door frame	Lower Level Common Area	32 l.f.	2 samples collected; Total PCBs reported as non-detect (< 0.20 µg/100cm^2) in both samples.
		Concrete Away from Caulking (to the first wall opening; a distance of 5')	Sikagard 550W elastomeric coating	None	Lower Level Common Area	160 s.f. (40 s.f. x 4 locations)	2 samples collected; Total PCBs reported at concentrations of 0.56 and 1.0 µg/100cm^2.
	Interior Structural Concrete Columns - ADA Restrooms	Former Direct Contact with Caulking	Sikagard 62 liquid epoxy	Concrete in restrooms covered with final layer of drywall and concrete in hallways covered with final coat of acrylic latex paint.	ADA Restroom Upgrades	50 l.f.	4 samples collected prior to final drywall and acrylic latex application; Total PCBs reported non-detect (< 0.20 µg/100cm^2) and at concentrations of 0.5, 1.3 and 1.5 µg/100cm^2.
		Concrete Away from Caulking (to a distance of 12" in restrooms and 36" in hallways)	Sikagard 62 liquid epoxy to the first 90-degree angle (12" in the restrooms and 36" in hallways)	Concrete in restrooms covered with final layer of drywall and concrete in hallways covered with final coat of acrylic latex paint.	ADA Restroom Upgrades	96 s.f.	
	Interior Concrete Ceilings - ADA Restrooms	Former Direct Contact with Caulking	Sikagard 62 liquid epoxy	Acrylic latex paint	ADA Restroom Upgrades	65 l.f.	3 samples collected; Total PCBs reported as non-detect (< 0.20 µg/100cm^2) and at concentrations of 0.31 and 1.6 µg/100cm^2.
		Concrete Away from Caulking	Sikagard 62 liquid epoxy to a distance of 12" from the caulking	Acrylic latex paint to the first 90-degree angle (wall opposite side of hallway)	ADA Restroom Upgrades	325 s.f.	2 samples collected; Total PCBs reported as non-detect (< 0.20 µg/100cm^2) and at a concentration of 0.43 µg/100cm^2.
Cashin	Exterior Brick Horizontal Control Joints	Former Direct Contact with Caulking	Sikagard 62 liquid epoxy	Caulking	High and low occupancy areas on all elevations	5,750 l.f.	30 samples collected; Total PCBs reported in 29 samples as either non-detect (13 samples at < 0.20 µg/100cm^2) or < 1 µg/100cm^2 (16 samples up to 0.94 µg/100cm^2). PCBs reported in 1 sample at a concentration of 4.8 µg/100cm^2.
		Façade Areas Away from Caulking (one row of bricks above joints and three rows of bricks below joints)	Sikagard 670W clear acrylic coating	None	High-occupancy areas (within 8'-8" of ground surface)	500 l.f.	10 samples collected; Total PCBs reported as either non-detect (7 samples at < 0.20 µg/100cm^2) or < 1 µg/100cm^2 (3 samples at concentrations of 0.29, 0.36, and 0.40 µg/100cm^2).
	Exterior Brick Vertical Control Joints	Former Direct Contact with Caulking	Sikagard 62 liquid epoxy	Caulking	High and low occupancy areas on all elevations	1,950 l.f.	11 samples collected; Total PCBs reported in 9 samples as either non-detect (4 samples at < 0.20 µg/100cm^2) or < 1 µg/100cm^2 (5 samples up to 0.68 µg/100cm^2). PCBs reported in 2 samples at concentrations of 1.15 and 3.5 µg/100cm^2.
		Façade Areas Away from Caulking (one full brick width on either side of joints)	Sikagard 670W clear acrylic coating	None	High and low occupancy areas on all elevations	1,950 l.f.	15 samples collected; Total PCBs reported as either non-detect (7 samples at < 0.20 µg/100cm^2) or < 1 µg/100cm^2 (8 samples up to 0.64 µg/100cm^2).
	Interior Concrete Ceilings	Former Direct Contact with caulking and to 3" beyond caulking	Sikagard 62 liquid epoxy	Sikagard 550W elastomeric coating	Common Area	25 l.f.	2 samples collected; Total PCBs reported as non-detect (< 0.20 µg/100cm^2) and at a concentration of 1.0 µg/100cm^2.
		Concrete away from caulking	Sikagard 550W elastomeric coating	None	Common Area	390 s.f.	1 sample collected; Total PCBs reported as non-detect (< 0.20 µg/100cm^2).

Notes:
l.f. = linear feet; s.f. = square feet

Table 2-1
Proposed Surface Wipe Sampling Rationale

Sylvan Residential Complex - UMass
Amherst, Massachusetts

Area of Concern	Building	Surface Type	Encapsulant	Secondary Barrier or Coating	Location	Proposed Sample Frequency	Total Number of Samples
Exterior Brick High Occupancy Horizontal Control Joints (860 l.f.)	Brown, McNamara, Cashin	Façade Areas Away from Caulking (one row of bricks above joints and three rows of bricks below joints)	Sikagard 670W	None	High-occupancy areas (within 8'-8" of ground surface)	1 per building façade	12
Exterior Brick High Occupancy Vertical Control Joints (878 l.f.)	Brown, McNamara, Cashin	Façade Areas Away from Caulking (one row of brick on either side of joint)	Sikagard 670W	None	High-occupancy areas (within 8'-8" of ground surface)	1 per building façade	12
Interior Concrete Columns/Walls (352 s.f.)	Brown, McNamara	Structural Concrete Columns	Sikagard 62, Sikagard 670W, and/or Sikgard 550W	Acrylic-latex paint or Sikagard 550W	Brown ADA Restroom Area McNamara ADA Restroom Area and Lower Level Common Areas	1 or 2 per work area for a minimum of 1 per 200 s.f.	3
Interior Concrete Ceilings (835 s.f.)	Brown, McNamara, Cashin	Concrete Ceiling	Sikagard 62, Sikagard 670W, and/or Acrylic latex paint	Acrylic-latex paint	Hallways adjacent to Brown and McNamara ADA Restroom Areas Cashin first floor Common Area	1 or 2 per work area for a minimum of 1 per 200 s.f.	5

Notes:
Wipe samples to be collected over a 100 cm^2 area and submitted for PCB analysis by USEPA Method 8082 with USEPA Method 3540C extraction.
l.f. = linear feet
s.f. = square feet

Table 2-2
Proposed Surface Wipe Sampling Plan

Sylvan Residential Complex - UMass
Amherst, Massachusetts

Building	Area of Concern	Surface Type	Proposed Sample Frequency	Total Number of Samples
Brown	High Occupancy Horizontal Control Joints	Façade Areas Away from Caulking	1 per façade	4
	High Occupancy Vertical Control Joints	Façade Areas Away from Caulking	1 per façade	4
	Interior Concrete Columns/Walls (ADA Restroom Upgrade Area)	Concrete Column Away from Caulking	1 per work area	1
	Interior Concrete Ceilings (ADA Restroom Upgrade Area)	Concrete Ceiling Away from Caulking	1 per work area	1
McNamara	High Occupancy Horizontal Control Joints	Façade Areas Away from Caulking	1 per façade	4
	High Occupancy Vertical Control Joints	Façade Areas Away from Caulking	1 per façade	4
		Former Direct Contact Materials (surface of replacement caulking)	1 per façade	8 (1)
	Interior Concrete Columns/Walls (ADA Restroom Upgrade Area and Lower Level Common Area)	Concrete Materials Away from Caulking	1 per work area	2
	Interior Concrete Ceiling (ADA Restroom Upgrade Area)	Concrete Materials Away from Caulking	2 per work area	2
Cashin	High Occupancy Horizontal Control Joints	Façade Areas Away from Caulking	1 per façade	4
	High Occupancy Vertical Control Joints	Façade Areas Away from Caulking	1 per façade	4
	Interior Concrete Ceiling (Interior Common Area)	Concrete Materials Away from Caulking	2 per work area	2

Notes:
(1) Samples to be collected during first year only. Samples to be co-located with adjacent material wipe samples. At each location two samples to be collected; one with hexane solvent and one with saline solvent.
Wipe samples to be collected over a 100 cm^2 area and submitted for PCB analysis by USEPA Method 8082 with USEPA Method 3540C extraction.
l.f. = linear feet
s.f. = square feet

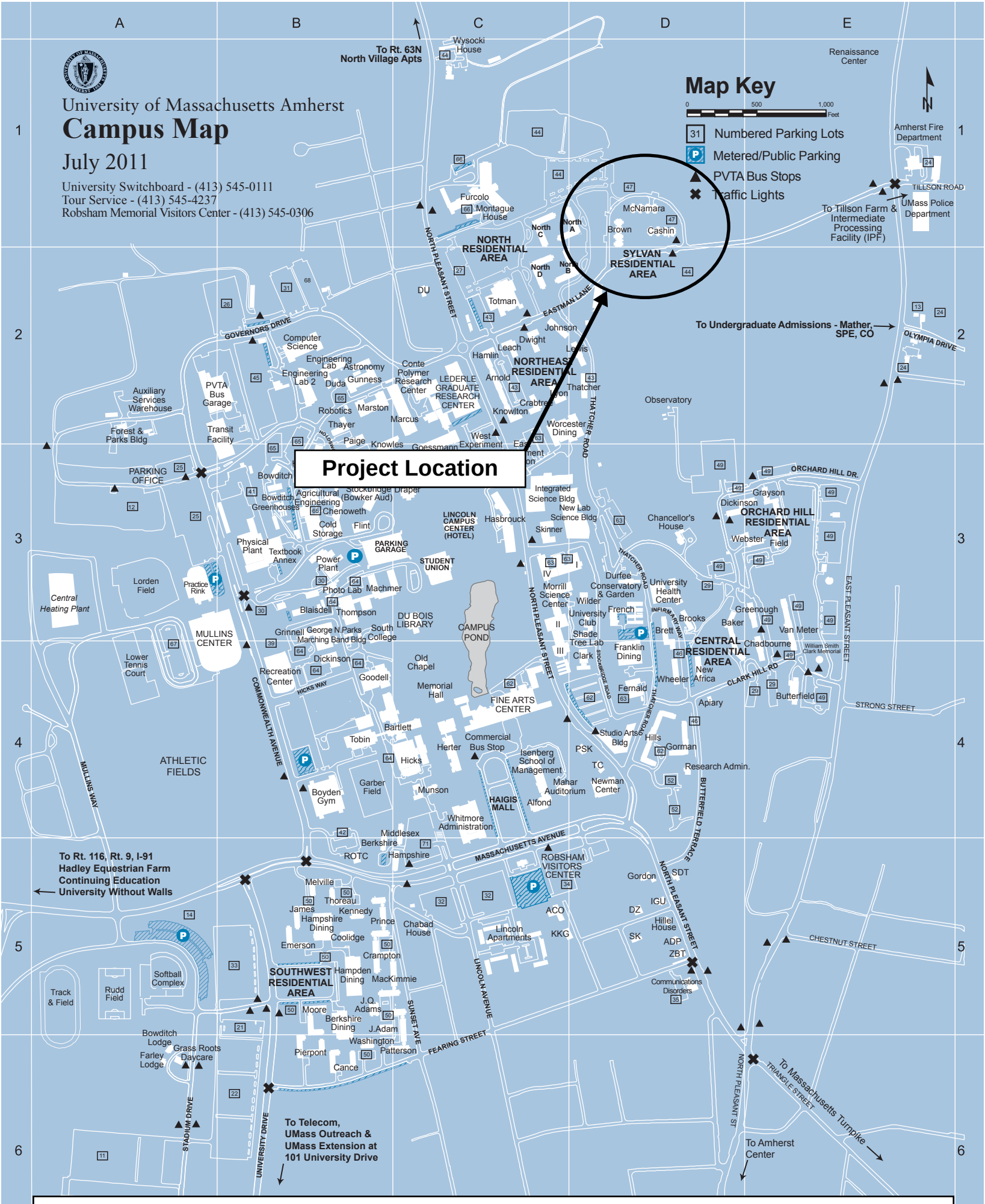

Figure 1-1 Site Location Map